

## REFERENCES

- Abbasi, S.A., 1987. Aquatic plants based water treatment systems in Asia, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 175-198.
- Abira, M.A., van Bruggen, J.J.A., and Denny, P., 2005. Potential of a tropical subsurface constructed wetland to remove phenol from pre-treated pulp and papermill wastewater, *Wat. Sci. Tech.* **51**(9): 173-175.
- Abrew, W., 1996. Evapotranspiration measurements and modeling for three wetland systems in south Florida, *Water Resour. Bull.* **32**: 465-473.
- Abydoz Environmental, Inc., 2005. Company website www.abyzdoz.com
- Acea, M.J., Moore, C.R., and Alexander, M., 1988. Survival and growth of bacteria introduced into soil, *Soil Biol. Biochem.* **20**: 509-515.
- Acharya, C.N., 1935. Studies on the anaerobic decomposition of plant materials. III. Comparison of the course of decomposition under anaerobic, aerobic, and partially aerobic conditions, *Biochem. J.* **29**: 1116-1120.
- Ádám, K., Krogstad, T., Suliman, F.R.D., and Jenssen, P.D., 2005. Phosphorus sorption by Filtralite P – small scale box experiments, *J. Environ. Sci. Health* **40A**: 1239-1250.
- Ádám, K., Krogstad, T., Vrále, L., Søvik, A.K., and Jenssen, P., 2007. Phosphorus retention in the filter materials shellsand and Filtralite®-Batch and column experiments with synthetic P solution and secondary wastewater, *Ecol. Eng.* **29**: 200-208.
- Adams, D.F., Farwell, S.O., Pack, M.R., and Bamesberger, W.L., 1979. Preliminary measurements of biogenic sulfur-containing gas emissions from soils, *Air Pollut. Control Assoc. J.* **29**: 380-383.
- Adams, F., and Wear, J.T., 1957. Manganese toxicity and soil acidity in relation to crinkle leaf of cotton, *Soil Sci. Soc. Am. Proc.* **30**: 485-488.
- Adams, M.A., and Pate, J.S., 1992. Availability of organic and inorganic forms of phosphorus to lupinus (*Lupinus* spp.), *Plant Soil* **145**: 107-113.
- Adams, M.S., and McCracken, M.D., 1974. Seasonal production of the *Myriophyllum* component of the littoral of lake Wingra, Wisconsin, *J. Ecol.* **62**: 457-467.
- Adcock, P., and Ganf, G.G., 1994. Growth characteristics of three macrophyte species growing in natural and constructed wetland system, *Wat. Sci. Tech.* **29**: 95-102.
- Aeckersberg, F., Bak., and Widdel, F., 1991. Anaerobic oxidation of saturated hydrocarbons to CO<sub>2</sub> by a new type of sulfate-reducing bacterium, *Arch. Microbiol.* **156**, 5-14.
- Aeckersberg, F., Rainey, F.A., and Widdel, F., 1998. Growth, natural relationship, cellular fatty acids and metabolic adaptation of sulfate-reducing bacteria that utilize long-chain alkanes under anoxic conditions, *Arch. Microbiol.* **170**: 361-369.
- Aerts, R., and de Calluwe, H., 1994. Nitrogen use efficiency of *Carex* species in relation to nitrogen supply, *Ecology* **75**: 2362-2372.
- Aerts, R., and de Calluwe, H., 1995. Interspecific and intraspecific differences in shoot and leaf lifespan of four *Carex* species which differ in maximum dry matter production, *Oecologia* **102**: 467-477.
- Agami, M., and Waisel, Y., 1986. The ecophysiology of roots of submersed vascular plants, *Physiol. Veg.* **24**: 607-624.
- Agendia, P.L., Fonkou, T., Mefenya, R., Sonwa, D. J., and Kengne, I. N., 1996. The use of *Pistia stratiotes* for domestic sewage treatment in Cameroon: an integrated approach, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur Wien, Austria, Chapter VIII/3.
- Aguirre, P., Ojeda, E., García, J., Barragán, J., and Mujeriego, R., 2005. Effect of depth on the removal of organic matter in horizontal subsurface flow constructed wetlands, *J. Environ. Sci. Health* **40A**: 1457-1466.

- Ailstock, M.S., 1989. Utilization and treatment of thermal discharge by establishment of a wetlands plant nursery, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 719-726.
- Akratos, C.S., and Tsihrintzis, V.A., 2007. Effect of temperature, HRT, vegetation and porous media on removal efficiency of pilot-scale horizontal subsurface flow constructed wetlands, *Ecol. Eng.* **29**: 173-191.
- Alaerts, G.J., and Al-Nozaly, F.A., 2000. Pilot plant operation of a duckweed-covered sewage lagoon in Sana'a, Yemen, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, pp. 1213-1214.
- Albuzio, A., Lubian, C., Parolin, R., Balsamo, R., Camerin, I., and Valerio, P., 2007. Wastewater from a mountain village treated with a constructed wetland, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 76-78.
- Alexander, M., 1961. *Introduction to Soil Microbiology*, John Wiley and Sons, Inc., New York.
- Alexander, W.V., 1987. Experimental investigation into the use of emergent plants to treat sewage in South Africa, *Wat. Sci. Tech.* **19**(10): 51-59.
- Alkan, M., Çelikçapa, S., Demibraş, Ö., and Dogan, M., 2005. Removal of reactive blue 221 and acid blue 62 anionic dyes from aqueous solution by sepiolite, *Dyes and pigments* **65**: 251-259.
- Allam, A.I., and Hollis, J.P., 1972. Sulfide inhibition of oxidases in rice roots, *Phytopathology* **62**: 634-639.
- Allen, R.G., Pereira, L.S., Raes, D. and Smith, M., 1998. *Crop Evapotranspiration. Guidelines for computing Crop Water Requirements*, FAO Irrigation and Drainage paper 56, FAO, Rome, Italy.
- Allenby, K.G. 1968. Some analyses of aquatic plants and waters, *Hydrobiologia* **32**: 486-490.
- Allender, B.M., 1984. Water quality improvement of pulp and paper mill effluents by aquatic plants, *Appita* **37**: 303-306.
- Aller, R.A., Mackin, J.E., and Cox, T.R.Jr., 1986. Diagenesis of Fe and S in Amazon inner shelf muds: apparent dominance of Fe reduction and implications for the genesis of ironstones, *Cont. Shelf Res.* **6**: 263-289.
- Almgren, T., and Hagstrom, I., 1974. The oxidation rate of sulfide in seawater, *Water Research* **8**: 395-400.
- Al\_Omari, A., and Fayyad, M., 2003. Treatment of domestic wastewater by subsurface flow constructed wetlands in Jordan, *Desalination* **155**: 27-39.
- Alvord, H.H., and Kadlec, R.H., 1996. Atrazine fate and transport in the Des Plaines Wetlands, *Ecol. Model.* **90**: 97-107.
- Amon, J.P., Agrawal, A., Shelley, M.L., Opperman, B.C., Enright, M.P., Clemmer, N.D., Slusser, T., Lach, J., Sobolewski, T., Gruner, W., and Entingh, A.C., 2007. Development of a wetland constructed for the treatment of groundwater contaminated by chlorinated ethenes, *Ecol. Eng.* **30**: 51-66.
- Andersen, J.M., 1975. Influence of pH on release of phosphorus from lake sediments, *Arch. Hydrobiol.* **76**: 411-419.
- Andersen, F.Ø., 1976. Primary production in a shallow water lake with special reference to reedswamp, *Oikos* **27**: 243-250.
- Andersen, F.Ø., and Hansen, J.I., 1982. Nitrogen cycling and microbial decomposition in sediments with *Phragmites australis* (Poaceae), *Hydrobiol. B.* **16**: 11-19.
- Anderson, B.C., and Rosolen, S., 2000. Post-installation solutions for phosphorous reduction in cold climate treatment wetlands, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, p. 143-149.
- Anderson, J.L., Kallner Bastviken, S., and Tonderski, K.S., 2005. Free water surface wetlands for wastewater treatment in Sweden: nitrogen and phosphorus removal, *Wat. Sci. Tech.* **51**(9): 39-46.

- Anderson, P. 1993. Constructed wetland treatment of sugarbeet process wastewater - 1993 update - American Crystal Sugar Company, *Spec. Group on the Use of Macrophytes in Water Pollution Control Newsletter* **8**: 6-7.
- Anderson, K.K., and Hooper, A.B., 1983. O<sub>2</sub> and H<sub>2</sub>O are each the source of one O and NO<sub>2</sub><sup>-</sup> produced from NH<sub>3</sub> by *Nitrosomonas*, *FEBS Lett.* **164**: 236-240.
- Anderson, R.T., Rooney-Varga, J.N., Gaw, C.V., and Lovley, D.R., 1998. Anaerobic benzene oxidation in the Fe(III) reduction zone of petroleum-contaminated aquifers, *Environ. Sci. Technol.* **32**: 1222-1229.
- Andreottola, G., Bonomo, L., Pogiali, L., and Zaffaroni, C. 1994. A methodology for the estimation of unit nutrient and organic loads from domestic and non-domestic sources, *Europ. Water Pollut. Control.* **4**: 13-19.
- Andreottola, G., Foladori, P., Ragazzi, M., and Villa, R., 2002. Treatment of winery wastewater in a sequencing batch biofilm reactor, *Wat. Sci. Tech.* **45**: 347-354.
- Andrews, W.C., 1995. Continuous combined estrogen/progestin hormone replacement therapy, *Clin. Ther.* **17**: 812-820.
- Angeles, G., Evert, R.F., and Kozlowski, T.T., 1986. Development of lenticles and adventitious roots in flooded *Ulmus americana* seedlings, *Can. J. For. Res.* **16**: 585-590.
- Ann, Y., Reddy, K.R., and Delfino, J.J., 2000. Influence of chemical amendments on P retention in a constructed wetland, *Ecol. Eng.* **14**: 157-167.
- Aowal, A.F.S.A., and Singh, J., 1982. Water hyacinth for testing dairy waste, *J. Inst. Eng.* **62**: 73-75.
- APDDA, 1998. *Tratamento de Efluentes. Leitões de Macrófitas*. Comunicações do Seminário, 2 e 3 de Julho de 1998, Coimbra, Portugal.
- Apfelbaum, S.I., and Sams, C.E., 1987. Ecology and control of reed canary grass, *Natural Areas J.* **7**: 69-74.
- AQUA TT. Aqua Treatment Technologies. <http://www.aqua-tt.com>
- Arber, A., 1920. *Water Plants. A Study of Aquatic Angiosperms*, Cambridge University Press, Cambridge.
- Arcand-Hoy, L.D., Nimrod, A.C., and Bensen, W.H., 1998. Endocrine-modulating substances in the environment: estrogenic effects of pharmaceutical products, *Int. J. Toxicol.* **17**: 139-145.
- Arias, C.A., and Brix, H., 2005a. Initial experience from a compact vertical flow constructed wetland treating single household wastewater, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 52-64.
- Arias, C.A., and Brix, H., 2005b. Phosphorus removal in constructed wetlands: can suitable alternative media be identified? *Wat. Sci. Tech.* **51**(9): 267-273.
- Arias, C.A., and Brix, H., 2006. Onsite treatment of sewage in rural areas – comparison of vertical flow constructed wetland systems, sand filters and filterbeds, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1293-1301.
- Arias, C.A., del Bubba, M., and Brix, H., 2001. Phosphorus removal by sands for use as media in subsurface flow constructed reed beds, *Wat. Res.* **35**: 1159-1168.
- Arias, C.A., Cabello, A., Brix, H., and Johansen, N.-H., 2003a. Removal of indicator bacteria from municipal wastewater in an experimental two-stage vertical flow constructed wetland, *Wat. Sci. Tech.* **48**(5): 35-41.
- Arias, C.A., Brix, H., and Johansen, N.-H., 2003b. Phosphorus removal from municipal wastewater in an experimental two-stage vertical flow constructed wetland system equipped with a calcite filter, *Wat. Sci. Tech.* **48**(5): 51-58.
- Armentano, T.V., and Verhoeven, J.T.A., 1991. Biogeochemical cycles: global, in: *Wetlands and Shallow Continental Water Bodies*, B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 281-311.

- Armstrong, J., and Armstrong, W., 1988. *Phragmites australis* - a preliminary study of soil-oxidizing sites and internal gas transport pathways, *New Phytol.* **108**: 373-382.
- Armstrong, J., and Armstrong, W., 1990. Light-enhanced convective throughflow increases oxygenation in rhizomes and rhizosphere of *Phragmites australis* (Cav.) Trin. ex Steud., *New Phytol.* **114**: 121-128.
- Armstrong, J., Armstrong, W., and Beckett, P.M., 1992. *Phragmites australis*: Venturi- and humidity-induced pressure flows enhance rhizome aeration and rhizosphere oxidation, *New Phytol.* **120**: 197-207.
- Armstrong, W. 1964. Oxygen diffusion from the roots of some British bog plants, *Nature*, **204**: 801-802.
- Armstrong, W. 1967. The oxidizing activity of roots in waterlogged soils, *Physiol. Plant.* **20**: 920-926.
- Armstrong, W. 1971. Radial oxygen loss from intact rice roots as affected by distance from the apex, respiration and waterlogging, *Physiol. Plant.* **25**: 192-197.
- Armstrong, W., 1975. Waterlogged soils, in: *Environment and Plant Ecology*, J.E. Etherington, ed., John Wiley, London, pp. 181-218.
- Armstrong, W., 1978. Root aeration in the wetland conditions, in: *Plant Life in Anaerobic Environment*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci., Ann Arbor, Michigan, pp. 269-297.
- Armstrong, W., 1979. Aeration in higher plants, in: *Advances in Botanical Research*, H.W.W. Woolhouse, ed., Academic Press, London, pp. 226-332.
- Armstrong, W., Armstrong, J., and Beckett, P.M., 1990. Measurement and modelling of oxygen release from roots of *Phragmites australis*, in: P.F. Cooper, and B.C. Findlater, eds., *Constructed Wetlands in Water Pollution Control*, Pergamon Press, Oxford, UK, pp. 41-51.
- Armstrong, W., Armstrong, J., Beckett, P.M., and Justin, S.H.F.W., 1991. Convective gas-flows in wetland plant aeration, in: *Plant Life under Oxygen Deprivation*, M.B. Jackson, D.D. Davies and H. Lambers, eds., SPB Academic Publishing, The Hague, The Netherlands, pp. 283-302.
- Aslam, M.M., Malik, M., Baig, M.A., Qazi, I.A., and Iqbal, J., 2007. Treatment performance of compost-based and gravel-based vertical flow wetlands operated identically for refinery wastewater treatment in Pakistan, *Ecol. Eng.* **30**: 34-42.
- AS/NZS, 1547, 2000. Australian/New Zealand Standard<sup>TM</sup>: on site domestic-wastewater management, Standard Australia & Standard New Zealand.
- Atkin, O.K., 1996. Reassessing the nitrogen relations of arctic plants: A mini-review, *Plant Cell Environ.* **19**: 695-704.
- ATV-Hinweis H 262, 1989. Behandlung von häuslichen Abwasser in Pflanzenbeeten. Regelwerk Abwasser-Abfall, Gesellschaft zur Förderung der Abwassertechnik, Germany.
- ATV-A 262, 1998. Arbeitsblatt ATV-A 262. Grundsätze für Bemessung, Bau und Betrieb von Pflanzenbeeten für kommunales Abwasser bei Ausbaugrößen bis 1000 Einwohnerwerte (Principles for the dimensioning, construction and operation of planted beds for municipal wastewater up to 1000 PE), Gesellschaft zur Förderung der Abwassertechnik d. V., St. Augustin, Germany.
- Atwell, B.J., Veerkamp, M.T., Stuijver, B., and Kuiper, P.J.C., 1980. The uptake of phosphate by *Carex* species from oligotrophic to eutrophic swamp habitats, *Physiol. Plant.* **49**: 487-494.
- Ausland, G., Stevik, T.K., Hansen, J.F., Køhler, J.C., and Jenssen, P.D., 2002. Intermittent filtration of wastewater – removal of fecal coliforms and fecal streptococci, *Water Res.* **36**: 3507-3516.
- Avsar, Y., Tarabeah, H., Kimchie, S., and Ozturk, I., 2007. Rehabilitation by constructed wetlands of available wastewater treatment plant in Sakhnin, *Ecol. Eng.* **29**: 27-32.
- Ayaz, S.C., and Akça L., 2000. Treatment of wastewater by constructed wetland in small settlements, *Wat. Sci. Tech.* **41**(1): 69-72.

- Ayaz, S.C., and Akça L., 2001. Treatment of wastewater by natural systems, *Environ. Internat.* **26**: 189-195.
- Baars, J.K., 1930. Over sulfaatreductie door bacteriën, Ph.D. Thesis, University of Technology, Delft.
- Baars, J.K., 1957. Travel of pollution and purification en route in sandy soils, *Bull. WHO* **16**: 727-747.
- Baas-Becking, L.G.M., 1925. Studies on sulphur bacteria, *Annals of Botany* **39**: 613-650.
- Baas Becking, L.G.M., Kaplan, I.R., and Moore, D., 1960. Limits of the natural environment in terms of pH and oxidation-reduction potentials, *J. Geol.* **68**: 243-284.
- Bagnall, L.O., 1986. Harvesting systems for aquatic biomass, in: *Biomass Energy Development*, W.H. Smith, ed., Plenum Press New York, pp. 259-273.
- Bahlo, K.E., and Wachs, F.G., 1990. Purification of domestic sewage with and without faeces by vertical intermittent filtration in reed and rush beds, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 215-221.
- Bahlo, K., and Wach, G., 1993. *Naturnahe Abwasserreinigung*, Oekobuch, Staufen bei Freiburg, Germany.
- Bailey, L.D., 1976. Effects of temperature and root on denitrification in a soil, *Can. J. Soil Sci.* **56**: 79-87.
- Baker, K.A., Fennessy, M.S., and Mitsch, W.J., 1991. Designing wetlands for controlling mine drainage: an ecologic economic modelling approach, in: *Ecological Engineering: Predicting Metal Retention in a Constructed Mine Drainage*, N.E. Flanagan, W.J. Mitsch and K. Beach, eds., The Ohio State University, Columbus, Ohio, pp. 135-159.
- Baker, S.C., Goodhew, C.F., Thompson, I.P., Bramwell, P.A., Pettigrew, G., and Ferguson, S.J., 1995. A study on *Paracoccus denitrificans* using fatty acid methyl ester analysis and cytochromes c550 amino acid sequences, in: *Beijerinck Centennial*, W.A. Scheffers, and J.P. van Dijken, eds., Delft University Press, Delft, The Netherlands, pp. 311-312.
- Balandreau, J.P., Rinaudo, G., Fares-Hamad, I., and Dommergues, Y.R., 1975. Nitrogen fixation in the rhizosphere of rice plants, in: *Nitrogen Fixation by Free-Living Microorganisms*, W.D.P. Stewart, ed., Cambridge University Press, Cambridge, pp. 57-70.
- Banwart, W.L., and Bremner, J.M., 1976. Volatilization of sulfur from unamended and sulfate-treated soils, *Soil Biol. Biochem.* **8**: 19-22.
- Barber, D.A., and Martin, J.K., 1976. The release of organic substances by cereal roots into soils, *New Phytol.* **76**: 69-80.
- Barber, S.A., 1984. *Soil Nutrient Bioavailability: A Mechanistic Approach*, John Wiley and Sons, New York.
- Barbera, A., Cirelli, G.L., Cavallaro, V., Di Silvestro, I., Pacifici, P., Castiglione, V., Toscano, A., and Milani, M., 2007. Growth and biomass production of different plant species in two different constructed wetland systems in Sicily: first results, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 98-99.
- Barclay, A.M., and Crawford, R.M.M., 1982. Plant growth and survival under strict anaerobiosis, *J. Exp. Bot.* **33**: 541-549.
- Barko, J.W., 1982. Influence of K source (sediment vs open water) and sediment composition on the growth and nutrition of a submersed macrophyte (*Hydrilla verticillata*), *Aquat. Bot.* **12**: 157-172.
- Barko, J.W., and Smart, R.M., 1980. Mobilization of sediment phosphorus by freshwater macrophytes, *Freshwater Biol.* **10**: 229-238.
- Barko, J.W., and Smart, R.M., 1981. Comparative influence of light and temperature on the growth and metabolism of selected submersed freshwater macrophytes, *Ecol. Monogr.* **51**: 219-235.
- Barko, J.W., and Smart, R.M., 1986. Sediment related mechanisms of growth limitation in submerged macrophytes, *Ecology* **67**: 1328-1340.

- Barko, J.W., Gunnison, D., and Carpenter, S.R., 1991. Sediment interactions with submersed macrophyte growth and community dynamics. *Aquat. Bot.* **41**: 41-65.
- Barnes, R.O., and Goldberg, E.D., 1976. Methane production and consumption in anoxic marine sediments, *Geology* **20**: 962-970.
- Barrow, N.J., 1983. On the reversibility of phosphate sorption by soils, *J. Soil Sci.* **34**: 751-758.
- Bartlett, R.J., and Kimble, J.M., 1976. Behavior of chromium in soils. I. Trivalent forms, *J. Environ. Qual.* **5**: 370-383.
- Barton and Karathanasis, A.D., 1999. Renovation of a failed constructed wetland treating acid mine drainage, *Environ. Geol.* **39**: 39-50.
- Basilier, K., Granhall, U., and Stenström, T.-A. 1978. Nitrogen fixation in wet minerotrophic moss communities of a subarctic mire, *Oikos* **31**: 236-246.
- Bastian, R.K., ed., 1993. *Constructed Wetlands for Wastewater Treatment and Wildlife Habitat. 17 Case Studies*. US EPA 832-R-93-005, Municipal Technology Branch, Washington, D.C.
- Bastian, R.K., and Reed, S.C., eds., 1979. *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*. EPA 430/9-80-006, U.S. EPA, Washington, D.C.
- Batchelor, A., 2003. The application of subsurface flow wetlands in South Africa: from pilot to full scale, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 161-180.
- Batchelor, A., Scott, W.E., and Wood, A., 1990. Constructed wetland research programme in South Africa, in: *Constructed Wetland in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 373-382.
- Batchelor, A., and Loots, P., 1996. A critical evaluation of a pilot scale subsurface flow wetland: 10 years after commissioning, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, pp. XI/4-1-XI/4-9.
- Batty, L.C., Baker, A.J.M., Wheeler, B.D., and Curtis, C.D., 2000. The effect of pH and plaque on the uptake of Cu and Mn in *Phragmites australis* (Cav.) Trin ex. Steudel, *Ann. Bot.* **86**: 647-53.
- Batty, L.C., Baker, A.J., and Wheeler, B.D., 2002. Aluminum and phosphate uptake by *Phragmites australis*: the role of Fe, Mn and Al root plaques, *Annals of Botany* **89**: 443-449.
- Batty, L.C., Atkin, L., and Manning, D.A.C., 2005. Assessment of the ecological potential of mine-water treatment wetlands using a baseline survey of macroinvertebrate communities, *Environ. Pollut.* **138**: 412-419.
- Baughman, G.L., Perkins, W.S., Lasier, P.J., and Winger, P.V., 2003. Effect of treatment in a constructed wetland on toxicity of textile wastewater, *Review* **3**: 28-30.
- Bavor, H.J., and Schulz, T.J., 1993. Sustainable suspended solids and nutrient removal in large-scale, solid matrix, constructed wetland systems, in: *Constructed Wetland for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 219-225.
- Bavor, H.J., Millis, N.F. and Hay, A.J., 1981. Assimilative capacity of wetlands for sewage effluent. Minist. for Conserv., Victoria Environ. Studies Prog. ESP 363.
- Bavor, H.J., Roser, D.J., and McKersie, S., 1987. Nutrient removal using shallow lagoon-solid matrix macrophyte systems, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, (eds.), Magnolia Publishing, Orlando, Florida, pp. 227-235.
- Bavor, H.J., Roser, D.J., Mckersie, S.A., and Breen, P., 1988. Joint study on sewage treatment using shallow lagoon – aquatic plant system, Hawkesbury Agricultural College/CSIRO/Sydney Water Board, Sydney, NSW.

- Bavor, H.J., Roser, D.J., Fisher, P.J., and Smalls, I.C., 1989. Performance of solid-matrix wetland systems viewed as fixed-film reactors, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 646-656.
- Bavor, H.J., Davies, C.M., and Sakadevan, K., 2001. Stormwater treatment: do constructed wetlands yield improved pollutant management performance over a detention pond system? *Wat. Sci. Tech.* **44**(11/12): 565-570.
- Bayley, L.L., and Freeman, E.A., 1977. Seasonal variation of selected cations in *Acorus calamus* L., *Aquat. Bot.* **3**: 65-84.
- Bayley, M.L., and Greenway, M., 2005. Preliminary investigations into the dynamics of phytoplankton and associated PO<sub>4</sub> uptake from a stormwater treatment pond system, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE, pp. 557-564.
- Bayley, M.L., Davison, L., and Headley, T.R., 2003. Nitrogen removal from domestic effluent using subsurface flow constructed wetlands: influence of depth, hydraulic residence time and pre-nitrification, *Wat. Sci. Tech.* **48**(5): 175-182.
- Bedford, B.L., Bouldin, D.R., and Beliveau, B.D., 1991. Net oxygen and carbon-dioxide balances in solutions bathing roots of wetland plants, *J. Ecol.* **79**: 943-959.
- Beeson, R.C., Jr., and Knox, G.W., 1991. Analysis of efficiency of overhead irrigation in container production, *Hortic. Sci.* **26**: 848-857.
- Behrends, L.L., 2000. Reciprocating subsurface-flow wetlands for municipal and on-site wastewater treatment, in: *Wetlands & Remediation*, J.F. Means and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 179-186.
- Behrends, L.L., Coonrod, H.S., II, Bailey, E., and Bulls, M.J., 1993. Oxygen diffusion rates in reciprocating rock biofilters: potential application for subsurface flow constructed wetlands, in: *Proc. Subsurface Flow Constructed Wetlands Conference*, University of Texas, El Paso, pp. 1-12.
- Behrends, L.L., Bailey, E., Bulls, M.J., Coonrod, H.S., and Sikora, F.J., 1994. Seasonal trends in growth and biomass accumulation of selected nutrients and metals in six species of emergent aquatic macrophytes, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 274-289.
- Behrends, L.L., Sikora, F.J., Coonrod, H.S., Bailey, E., and Bulls, M.J., 1996. Reciprocating subsurface-flow wetlands for removing ammonia, nitrate and chemical oxygen demand: potential for tertiary domestic, industrial and agricultural wastewaters, in: *Proc. Water Environmental Federation 69<sup>th</sup> Annual Conf. and Exposition*, Vol. 5, Dallas, Texas, pp. 151-263.
- Behrends, L.L., Sikora, F.J., and Bader, D.F., 2000. Phytoremediation of explosives-contaminated groundwater using constructed wetlands, in: *Wetlands & Remediation*, J.L. Means, and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 375-381.
- Behrends, L.L., Houke, L., Bailey, E., Jansen, P., and Brown, D., 2001. Reciprocating constructed wetlands for treating industrial, municipal and agricultural wastewater, *Wat. Sci. Tech.* **44**(11-12): 399-405.
- Behrends, L.L., Bailey, E., Jansen, P., Houke, L., and Smith, S., 2007. Integrated constructed wetland systems: design, operation, and performance of low-cost decentralized wastewater treatment system, *Wat. Sci. Tech.* **55**(7): 155-161.
- Beijerinck, M.W., 1895. Über *Spirillum desulfuricans* als Ursache von Sulfatreduktion, *Zentbl. Bakt. Parasitkde II*, **1**: 1-9, 49-59, 104-114.
- Beijerinck, M.W., and Minkman, D.C.J., 1910. Bildung und Verbrauch von Stickoxydual durch Bakterien, *Centr. Blatt. Bacteriol. Parasit. Jena II* **25**: 30-63.
- Belmont, M.A., Cantellano, E., Thompson, S., Williamson, M., Sánchez, A., and Metcalfe, C.D., 2004. Treatment of domestic wastewater in a pilot-scale natural treatment system in central Mexico, *Ecol. Eng.* **23**: 299-311.

- Bendix, M., Tornbjerg, T., and Brix, H., 1994. Internal gas transport in *Typha latifolia* L. and *Typha angustifolia* L. 1. Humidity-induced pressurization and convective throughflow, *Aquat. Bot.* **49**: 75-89.
- Bentley, R., and Chasteen, T.G., 2002. Microbial methylation of metalloids: arsenic, antimony and bismuth, *Microbiol. Mol. Biol. Rev.* **66**: 250-271.
- Benyamine, M., Bäckström, N., and Sandén, P., 2004. Multi-objective environmental management in constructed wetlands, *Environ. Monitor. Assess.* **90**: 171-185.
- Bergman, H.F., 1920. The relation of aeration to the growth and activity of roots and its influence on the ecesis of plants in swamps, *Ann. Bot. (London)* **34**: 13-33.
- Bergman, H.F., 1959. Oxygen deficiency as a cause of diseases in plants, *Bot. Rev.* **25**: 418-485.
- Berkheiser, V.E., Street, J.J., Rao, P.S.C., and Yuan, T.L., 1980. Partitioning of inorganic orthophosphate in soil-water systems, *CRC Crit. Rev. Environ. Control* **10**: 179-224.
- Berks, B.C., Ferguson, S.J., Moir, J.W.R., Richardson, D.J., 1995. Enzymes and associated electron transport systems that catalyse the respiratory reduction of nitrogen oxides and oxyanions, *Biochim. Biophys. Acta* **1232**: 97-173.
- Bernard, J.M., 1974. Seasonal changes in standing crop and primary production in a sedge wetland and an adjacent dry old-field in central Minnesota, *Ecology* **55**: 350-359.
- Bernard, J.M., and Fiala, K., 1986. Distribution and standing crop of living and dead roots in three wetland *Carex* species, *Bull. Torrey Bot. Club* **113**: 1-5.
- Bernard, J.M., and Lauve, T.E., 1995. A comparison of growth and nutrient uptake in *Phalaris arundinacea* L. growing in a wetland and a constructed bed receiving landfill leachate, *Wetlands* **15**: 176-182.
- Bernatowicz, S., 1969. Macrophytes in the Lake Warniak and their chemical composition, *Ekol. Pol. A* **17**: 447-467.
- Bernatowicz, S., Leszczynski, S., and Tyczynska, S., 1976. The influence of transpiration by emergent plants on the water balance in lakes, *Aquat. Bot.* **2**: 275-288.
- Berner, R.A., 1980. *Early Diagenesis: A Theoretical Approach*, Princeton University Press, Princeton.
- Best, E.P.H., 1997. Seasonal changes in mineral and organic components of *Ceratophyllum demersum* and *Elodea canadensis*, *Aquat. Bot.* **3**: 337-348.
- Best, E.P.H., 1980. Effect of nitrogen on the growth and nitrogenous compounds of *Ceratophyllum demersum*, *Aquat. Bot.* **8**: 197-206.
- Best, E.P.H., 1982. Effects of water pollution on freshwater submerged macrophytes, *Water Pollut. Manage. Rev.* **1982**: 27-56.
- Best, E.P.H., and Mantai, K.E., 1978. Growth of *Myriophyllum*: Sediment or lake water as the source of nitrogen and phosphorus, *Ecology* **59**: 1075-1080.
- Best, E.P.H., Miller, J.L., and Larson, S.L., 2000. Explosives removal from groundwater at the Volunteer Army Ammunition Plant, TN, in small-scale wetland modules, in: *Wetlands and Remediation*, J.L. Means, and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 365-373.
- Bhanthumnavin, K., and McGarry, M.G., 1971. *Wolffia arrhiza* as a possible source of inexpensive protein, *Nature* **232**: 495.
- Billetter, R.C., Züst, B., and A. Schönborn, 1998. Switzerland, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 261-287.
- Billings, W.D., and Godfrey, P.J., 1967. Photosynthetic utilization of internal carbon dioxide by hollow-stemmed plants, *Science* **158**: 121-123.
- Billore, S.K., Dass, P., and Vyas, H. 1994. Ammonia volatilization through plant species in domestic wastewater applied agriculture field and the wetland, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 171-179.



- Billore, S.K., Singh, N., Sharma, J.K., Dass, P., and Nelson, R.M., 1999. Horizontal subsurface flow gravel bed constructed wetland with *Phragmites karka* in central India, *Wat. Sci. Tech.* **40**(3): 163-171.
- Billore, S.K., Singh, N., Ram, H.K., Sharma, J.K., Singh, V.P., Nelson, R.M., and Das, P., 2001. Treatment of a molasses based distillery effluent in a constructed wetland in central India, *Wat. Sci. Tech.* **44**(11/12): 441-448.
- Billore, S.K., Ram, H., Singh, N., Thomas, R., Nelson, R.M., and Pare, B., 2002. Treatment performance evaluation of surfactant removal from domestic wastewater in a tropical horizontal subsurface constructed wetland, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 393-399.
- Billore, S.K., Ram, H., and Jain, R., 2006. Evaluation of optimization processes for management of nitrogen removal from domestic wastewater in a horizontal sub-surface flow constructed wetland at central India, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 283-293.
- Birkbeck, A.E., Reil, D., and Hunter, R., 1990. Application of natural and engineered wetlands for treatment of low-strength leachate, in: P.F. Cooper, and B.C. Findlater, eds., *Constructed Wetlands in Water Pollution Control*, Pergamon Press, Oxford, UK, pp. 411-418.
- Birkett, J.W., and Lester, J.N., 2003. *Endocrine Disrupters in Wastewater and Sludge Treatment Processes*, IWA Publishing and Lewis Publishers, Washington, DC.
- Bishay, F., and Kadlec, R.H., 2005. Wetland treatment at Musselwhite mine, Ontario, Canada, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 176-198.
- Bishop, P.L., and Eighmy, T.T., 1989. Aquatic wastewater treatment using *Elodea nuttallii*, *J. Water Pollut. Control Fed.* **61**: 641-648.
- Bista, K.R., Sharma, P., Khatiwada, N.R., Bhattarani, K.K., 2004. Cost effective design of horizontal reed beds treating wastewater in Nepal, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE, and Cemagref, Lyon, France, pp. 299-305.
- Bittmann, M., and Seidel, K. 1967. Entwässerung und Aufbereitung von Chemieschlamm mit Hilfe von Pflanzen, *GWF* **108**: 488-491.
- Bitton, G., 1980. Adsorption of viruses to surfaces: Technological and ecological implications, in: *Adsorption of Microorganisms to Surfaces*, G. Bitton and K.C. Marshall, eds., John Wiley and Sons, New York, pp. 331-374.
- Bitton, G., Lahav, N., and Henis, Y., 1974. Movement and retention of *Klebsiella aerogenes* in soil columns, *Plant Soil* **40**: 373-380.
- Bjerre, G.K., and Schierup, H.-H., 1985. Uptake of six heavy metals by oat as influenced by soil type and additions of cadmium, lead, zinc and copper, *Plant Soil* **88**: 57-69.
- Björk, S., 1967. Ecologic investigations of *Phragmites communis*. Studies in theoretic and applied limnology, *Folia Limnol. Scand.* **14**: 1-248.
- Blackburn, T.H., Kleiber, P., and Fenchel, T., 1975. Photosynthetic sulfide oxidation in marine sediments, *Oikos* **26**: 103-108.
- Blackmer, A.M., and Bremner, J.M., 1979. Stimulatory effect of nitrate on reduction of N<sub>2</sub>O to N<sub>2</sub> by soil microorganisms, *Soil Biol. Biochem.* **11**: 313-315.
- Błażejowski, R., and Murat-Błażejowska, S., 1997. Soil clogging phenomena in constructed wetlands with subsurface flow, *Wat. Sci. Technol.* **35**: 183-188.
- Błażejowski, R., Rembeza, L., and Górski, P., 1994. New concepts in hydraulic design of horizontal constructed wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 752-759.
- Bloom, A.J., Sukrapanna, S.S., and Warner, R.L., 1992. Root respiration associated with ammonium and nitrate absorption and assimilation in barley, *Plant Physiol.* **99**: 1294-1301.

- Blom, J.J., and Verhoeven, C.A., 2006. Vertical flow reed bed Leidsche Rijn: first results of the full scale pilot plant investigation, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 675-684.
- Boar, R.R., Crook, C.E., and Moss, B., 1989. Regression of *Phragmites australis* reedswamps and recent changes of water chemistry in the Norfolk Broadland, England, *Aquat. Bot.* **35**: 41-55.
- Bock, E., Koops, H.-P., and Harms, A., 1986. Cell biology of nitrifying bacteria, in: *Nitrification*, J.J. Prosser, ed., Society for General Microbiology, IRL Press, Oxford, UK, pp. 17-38.
- Bock, E., Wilderer, P.A., and Freitag, A., 1988. Growth of *Nitrobacter* in the absence of dissolved oxygen, *Water Research* **22**: 245-250.
- Bock, E., Koops, H.P., Harms, H., and Ahlers, B., 1991. The biochemistry of nitrifying organisms, in: J.M. Shively, ed., *Variations of Autotrophic Life*, Academic Press, London, pp. 171-200.
- Bock, E., Koops, H.P., Ahlers, B., and Harms, H., 1992. Oxidation of inorganic nitrogen compounds as energy source, in: *The Prokaryotes*, A. Balows, H.G. Trüper, M. Dworkin, W. Harder, and K.H. Schleiffer, eds., Springer Verlag, Berlin, pp. 414-430.
- Bock, E., Schmidt, I., Stüven, R., and Zart, D., 1995. Nitrogen loss caused by denitrifying *Nitrosomonas* cells using ammonium or hydrogen as electron donors and nitrite as electron acceptor, *Arch. Microbiol.* **163**: 16-20.
- Bodelier, P.L.E., Libochant, J.A., Blom, C.W.P.M., and Laanbroek, H.J., 1996. Dynamics of nitrification and denitrification in root-oxygenated sediments and adaptation of ammonia-oxidizing bacteria to low-oxygen or anoxic habitats, *Appl. Environ. Microbiol.* **62**: 4100-4107.
- Boettcher, B., and Koops, H.P., 1994. Growth of lithotrophic ammonia-oxidizing bacteria on hydroxylamine, *FEMS Microbiol. Lett.* **122**: 263-266.
- Bogdanowicz, R., Etmier, C., and Noren, G., 1996. Ecotechnology in wastewater management functioning facilities in the Baltic region, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, poster 3.1-3.6.
- Bohn, H.L., 1971. Redox potentials, *Soil Sci.* **112**: 39.
- Bojcevska, H., Raburu, P.O., and Tonderski, K.S., 2006. Free water surface wetlands for polishing sugar factory effluent in western Kenya – macrophyte nutrient recovery and treatment results, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 709-718.
- Bole, J.B., and Allan, J.R., 1978. Uptake of P from the sediment by the aquatic plants *Myriophyllum spicatum* and *Hydrilla verticillata*, *Water Res.* **12**: 353-358.
- Bolliger, C., Kleikemper, J., Zeyer, J., Schroth, M.H., and Bernasconi, S.M., 2001. Sulfur isotope fractionation during microbial sulfate reduction by toluene-degrading bacteria, *Geochim. Cosmochim. Acta* **65**: 3289-3298.
- Bolter, E., and Butz, T.R., 1977. Heavy metal mobilization by natural organic acids, in: *Internat. Conf. on Heavy Metals in the Environment*, Vol. II, T.C. Hutchinson and T. Davey, eds., pp. 353-362.
- Bonin, P., 1996. Anaerobic nitrate reduction to ammonium in two strains isolated from coastal marine sediment: a dissimilatory pathway, *FEMS Microbiol. Ecol.* **19**: 27-38.
- Bonin, P., Omnes, P., and Chalamet, A., 1998. Simultaneous occurrence of denitrification and nitrate ammonification in sediments of the French Mediterranean coast, *Hydrobiologia* **389**: 169-182.
- Bonomo, L., Pastorelli, G., and Zambon, N., 1996. Advantages and limitations of duckweed-based wastewater treatment systems, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Univ. für Bodenkultur Wien, Austria, Chapter VIII/2.
- Boon, A.G., 1986. Report of a visit by members of staff of WRc to Germany (FRG) to investigate the root zone method for treatment of wastewater. WRc Report 367-S/1, Stevenage, UK.

- Borin, M., Bonaiti, G., Santamaria, G., and Giardini, L., 2001. A constructed surface flow wetland treating agricultural waste waters, *Wat. Sci. Tech.* **44**(11/12): 523-530.
- Börner, T., von Felde, K., Gschlössl, T., Gschlössl, E., Kunst, S. and Wissing, F.W., 1998. Germany, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, B. Green and Haberl, R. (eds.), Backhuys Publishers, Leiden, The Netherlands, pp. 169-190.
- Bornkamm, R., and Raghi-Atri, F., 1986. Über die Wirkung unterschiedlicher Gaben von Stickstoff und Phosphor auf die Entwicklung von *Phragmites australis* (Cav.) Trin. ex Steudel, *Arch. Hydrobiol.* **105**: 423-441.
- Boström, B., Jansson, M., and Forsberg, C., 1982. Phosphorus release from lake sediments, *Arch. Hydrobiol. Beih. Ergebn. Limnol.* **18**: 5-59.
- Both, G.J., Gerards, S., and Laanbroek, H.J., 1992. The occurrence of chemolitho-autotrophic nitrifiers in water-saturated grassland soils, *Microb. Ecol.* **23**: 15-26.
- Boulé, M.E., 1994. An early history of wetland ecology, in *Global Wetlands: Old World and New*, W.J. Mitsch, ed., Elsevier Science, Amsterdam, The Netherlands, pp. 57-74.
- Boutin, C., 1987. Domestic wastewater treatment in tanks planted with rooted macrophytes: case study, description of the system, design criteria, and efficiency, *Wat. Sci. Tech.* **19**(10): 29-40.
- Boutin, C., and Liénard, A., 2003. Constructed wetlands for wastewater treatment: The French experience, in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 437-466.
- Bouwer, H., 1984. Elements of soil science and groundwater hydrology, in: *Groundwater pollution Microbiology*, Bitton, G., and Gerba, C.P., eds., Wiley, New York, pp. 9-38.
- Bowden, W.B., 1987. The biogeochemistry of nitrogen in freshwater wetlands, *Biogeochemistry* **4**: 313-348.
- Bowes, G., and Salvucci, M.E., 1989. Plasticity in the photosynthetic carbon metabolism of submersed aquatic macrophytes, *Aquat. Bot.* **34**: 233-266.
- Boxma, R., 1972. Bicarbonate as the most important soil factor in lime-induced chlorosis in the Netherlands, *Plant Soil* **37**: 233-243.
- Boyd, C.E. 1969. Production, mineral nutrient absorption, and biochemical assimilation by *Justicia americana* and *Alternanthera philoxeroides*, *Arch. Hydrobiol.* **66**: 139-160.
- Boyd, C.E. 1970a. Production, mineral accumulation and pigment concentrations in *Typha latifolia* and *Scirpus americanus*, *Ecology* **51**: 285-290.
- Boyd, C.E., 1970b. Losses of mineral nutrients during decomposition of *Typha latifolia*, *Arch. Hydrobiol.* **66**: 511-517.
- Boyd, C.E. 1971. The dynamics of dry matter and chemical substances in a *Juncus effusus* population, *Am. Midl. Nat.* **86**: 28-45.
- Boyd, C.E., 1976. Accumulation of dry matter, nitrogen and phosphorus by cultivated water hyacinth, *Econ. Bot.* **30**: 51-56.
- Boyd, C.E., 1987. Evapotranspiration/evaporation (E/E<sub>0</sub>) ratios for aquatic plants, *J. Aquat. Plant Manage.* **25**: 1-3.
- Boyd, C.E. and Hess, L.W. (1970). Factors influencing shoot production and mineral levels in *Typha latifolia*, *Ecology* **51**: 296-300.
- Boyd, C.E., and Vickers, D.H. 1971. Relationship between production, nutrient accumulation, and chlorophyll synthesis in an *Eleocharis quadranugulata*, *Can. J. Bot.* **49**: 883-888.
- Boyd, C.E., and Scarsbrook, E., 1975. Influence of nutrient additions and initial density of plants on production of water hyacinth *Eichhornia crassipes*, *Aquat. Bot.* **1**: 252-261.
- Boyt, F.L., Bayley, S.E., and Zoltek, J., Jr. 1977. Removal of nutrients from treated municipal waste water by wetland vegetation, *J. Water Pollut. Control Fed.* **49**: 789-799.
- Bradbury, I.K., and Hofstra, G., 1976. Vegetation death and its importance in primary production measurements, *Ecology* **57**: 209-211.

- Brady, N.C., 1990. *Nature and Properties of Soil*, Macmillan Publishing Company, New York.
- Bræckveilt, M., Rokadia, H., Mirschel, G., Weber, S., Imfeld, G., Stelzer, N., Kuschik, P., Kastner, M., and Richnow, H.H., 2006. Biodegradation of chlorobenzene in a constructed wetland treating contaminated groundwater, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1927-1935.
- Brändle, R., and Crawford, R.M.M., 1987. Rhizome anoxia tolerance and habitat specialization in wetland plants, in: *Plant Life in Aquatic and Amphibious Habitats*, R.M.M. Crawford, ed., Blackwell Scientific, Oxford, U.K, pp. 397-410.
- Brändle, R., Čížková, H., and Pokorný, J. eds., 1996. *Adaptation Strategies in Wetland Plants: Linkd between Ecology and Physiology*, Special Features in Vegetation Science 10, *Folia Geobot. Phytotax.* **31**, Opulus Press, Uppsala, Sweden.
- Brannon, J.M., Engler, R.M., Rose, J.R., Hunt, P.G., and Smith, I., 1976. Selective analytical partitioning of sediments to evaluate potential mobility of chemical constituents during dredging and disposal operations, U.S. Army Engineer Waterways Esp. Station Tech. Report D-76-7, CE, Vicksburg, Mississippi.
- Brannon, J.M., and Patrick, W.H., Jr., 1987. Fixation, transformation, and mobilization of arsenic in sediments, *Environ. Sci. Technol.* **21**: 450-459.
- Braskerud, B.C., 2002. Factors affecting phosphorus retention in small constructed wetlands treating agricultural non-point source pollution, *Ecol. Eng.* **19** : 41-61.
- Braskerud, B.C., and Haarstad, K., 2003. Screening and retention of thirteen pesticides in a small constructed wetland, *Wat. Sci. Tech.* **48**(5) : 267-274.
- Braumann, C.A. 2001. Constant effort and constant quota fishing policies with cut-offs in a random environment, *Nat. Resour. Model.* **14**: 199-232.
- Braxton, J.W. (1981). Nitrogen and Phosphorus Accumulation and Biomass Production in a Meadow-Marsh-Pond Sewage Treatment System. Ph.D. Thesis, Rutgers University.
- Breal, E., 1892. De la presence, dans la paille, d'un ferment aerobie, reducteur des nitrates, *Compte Rendu Acad. Sci.* **114** : 681-684.
- Breen, P.F., 1990. A mass balance method for assessing the potential of artificial wetlands for wastewater treatment, *Water Res.* **24**: 689-697.
- Breen, P.F., and Chick, A.J., 1995. Rootzone dynamics in constructed wetlands receiving wastewater: a comparison of vertical and horizontal flow systems, *Wat. Sci. Tech.* **32**(3): 281-290.
- Bremner, J.M., and Shaw, K., 1958. Denitrification in soil. II. Factors affecting denitrification, *J. Agric. Sci.* **51**: 40-52.
- Bremner, J.M., and Blackmer, A.M. 1978. Nitrous oxide: emission from soils during nitrification of fertilizer nitrogen, *Science* **199**: 295-296.
- Bresciani, R., Perco, P., La Volpe, V., and Masi, F., 2007. Constructed wetlands for highway runoff treatment: the Villesse-Gorizia project, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 198-199.
- Breteler, R.J., and Teal, J.M., 1981. Trace elements enrichment in decomposing litter of *Spartina alterniflora*, *Aquat. Bot.* **11**: 111-120.
- Brezny, O., Mehra, I., and Sharma, R.K., 1973. Studies on evapotranspiration of some aquatic weeds, *Weed Sci.* **21**: 197-204.
- Bridge, T.A.M., and Johnson, D.B., 1998. Reduction of soluble iron and reductive dissolution of ferric iron-containing minerals by moderately thermophilic iron-oxidizing bacteria, *Appl. Environ. Microbiol.* **64**: 2181-2190.
- Bridge, T.A.M., and Johnson, D.B., 2000. Reductive dissolution of ferric iron minerals by *Acidiphilium* SJH, *Geomicrobiol. J.* **17**: 193-206.
- Brinson, M.M., Lugo, A.E., and Brown, S., 1981. Primary productivity, decomposition and consumer activity in freshwater wetlands, *Ann. Rev. Ecol. Syst.* **12**: 123-161.
- Bristow, J.M., 1974. Nitrogen fixation in the rhizosphere of freshwater angiosperms, *Can. J. Bot.* **52**: 217-221.

- Bristow, J.M., 1975. The structure and function of roots in aquatic vascular plants, in: *The Development and Function of Roots*, J.G. Torrey and D. Clarkson, eds., Academic Press, London, pp. 221-236.
- Bristow, J.M., and Whitcombe, M., 1971. The role of roots in the nutrition of aquatic vascular plants, *Am. J. Bot.* **58**: 8-13.
- Brix, H., 1987a. Applicability of the wastewater treatment plant in Othfresen as scientific demonstration of the root zone method, *Wat. Sci. Tech.* **19**: 19-24.
- Brix, H., 1987b. Treatment of wastewater in the rhizosphere of wetland plants – the root zone method, *Wat. Sci. Tech.* **19**: 107-118.
- Brix, H., 1988. Light-dependent variations in the composition of the internal atmosphere of *Phragmites australis* (Cav.) Trin. ex Steudel, *Aquat. Bot.* **30**: 319-329.
- Brix, H., 1989. Gas exchange through dead culms of reed *Phragmites australis* (Cav.) Trin. ex Steudel, *Aquat. Bot.* **35**: 81-93.
- Brix, H., 1990a. Gas exchange through the soil-atmosphere interface and through dead culms of *Phragmites australis* in a constructed wetland receiving domestic sewage, *Water Res.* **24**: 259-266.
- Brix, H., 1990b. Uptake and photosynthetic utilization of sediment-derived carbon by *Phragmites australis* (Cav.) Trin. ex Steudel, *Aquat. Bot.* **38**: 377-389.
- Brix, H., 1993a. Wastewater treatment in constructed wetlands: system design, removal processes, and treatment performance, in: *Constructed Wetlands for Water Quality Improvement*, A.G. Moshiri, ed., CRC Press, Boca Raton, Florida, pp. 9-22.
- Brix, H., 1993b. Macrophyte-mediated oxygen transfer in wetlands: transport mechanisms and rates, in: *Constructed Wetlands for Water Quality Improvement*, A.G. Moshiri, ed., CRC Press, Boca Raton, Florida, pp. 391-398.
- Brix, H., 1994a. Functions of macrophytes in constructed wetlands, *Wat. Sci. Tech.* **29**: 71-78.
- Brix, H., 1994b. Constructed wetlands for municipal wastewater treatment, in: *Global Wetlands: Old World and New*, W.J. Mitsch, ed., Elsevier, Amsterdam, pp. 325-333.
- Brix, H., 1996. Role of macrophytes in constructed treatments wetlands, in: Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control, Universität für Bodenkultur, Vienna, Austria, keynote address 2-1.
- Brix, H., 1997. Do macrophytes play a role in constructed treatment wetlands? *Wat. Sci. Tech.* **35**(5): 11-17.
- Brix, H., 1998. Denmark, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green, and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 123-156.
- Brix, H., 1999. How “green” are aquaculture, constructed wetlands and conventional wastewater treatment systems, *Wat. Sci. Tech.* **40**(3): 45-50.
- Brix, H., 2003a. Plants used in constructed wetlands and their functions, in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 81-109.
- Brix, H., 2003b. Danish experience with wastewater treatment in constructed wetlands. in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 327-361.
- Brix, H., and Schierup, H.-H., 1989a. Sewage treatment in constructed wetlands – Danish experience, *Wat. Sci. Tech.* **21**: 1665-1668.
- Brix, H., and Schierup, H.-H., 1989b. Danish experience with sewage treatment in constructed wetlands, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 565-573.
- Brix, H., and Schierup, H.-H., 1989c. The use of aquatic macrophytes in water pollution control, *Ambio* **18**: 100-107.
- Brix, H., and Schierup, H.-H., 1990. Soil oxygenation in constructed reed beds: the role of macrophyte and soil-atmosphere interface oxygen transport, in: P.F. Cooper, and B.C.

- Findlater, eds., *Constructed Wetlands in Water Pollution Control*, Pergamon Press, Oxford, UK, pp. 53-66.
- Brix, H., and Johansen, N.H., 1999. Treatment of domestic sewage in a two-stage constructed wetland - design principles, in: *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, Vymazal, J. (Ed.), Backhuys Publishers, Leiden, The Netherlands, pp. 155-163.
- Brix, H., and Gregersen, P., 2002. Water balance of willow dominated constructed wetlands, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, Tanzania, pp.669-670.
- Brix, H., and Johansen, N.H., 2004. Retningslinier for etablering af beplantede filteranlæg op til 30 PE (Guidelines for vertical flow constructed wetland systems up to 30 PE). Økologisk Byfornyelse og Spildevandsrensning N. 52, Miljøstyrelsen, Miljøministeriet (in Danish).
- Brix, H., and Arias, C.A., 2005. Danish guidelines for small-scale constructed wetland systems for onsite treatment of domestic sewage, *Wat. Sci. Tech.* **51**(9): 1-9.
- Brix, H., Sorrell, B.K., and Orr, P.T., 1992. Internal pressurization and convective gas flow in some emergent freshwater macrophytes, *Limnol. Oceanogr.* **37**: 1420-1433.
- Brix, H., Birkedal, K., and Johansen, N.H., 1993. *Designer's Manual: Wastewater Treatment in Constructed Wetlands*, The Management Institute Molsvej, Ebeltoft, Denmark.
- Brix, H., Sorrell, B.K., and Schierup, H.-H., 1996. Gas fluxes achieved by in situ convective flow in *Phragmites australis*, *Aquat. Bot.* **54**: 151-163.
- Brix, H., Sorrell, B.K., and Lorenzen, B., 2001a. Are *Phragmites*-dominated wetlands a net source or net sink of greenhouse gases? *Aquat. Bot.* **69**: 313-324.
- Brix, H., Arias, C.A., and Del Bubba, M., 2001b. Media selection for sustainable phosphorus removal in subsurface flow constructed wetlands, *Wat. Sci. Tech.* **44**(11-12): 47-54.
- Brix, H., Arias, C.A., and Johansen, N.H., 2002. BOD and nitrogen removal from municipal wastewater in an experimental two-stage vertical flow constructed wetland with recycling, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, Tanzania, pp. 400-410.
- Brix, H., Arias, C.A., and Johansen, N.H., 2003. Experiments in a two-stage constructed wetland system: nitrification capacity and effects of recycling on nitrogen removal, in: *Wetlands-Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 237-258.
- Brix, H., Koottatep, T., and Laugesen, C.H., 2006a. Re-establishment of wastewater treatment in tsunami affected areas of Thailand by the use of constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 59-67.
- Brix, H., Schierup, H.-H., and Arias, C.A., 2006b. Twenty years experience with constructed wetland systems in Denmark – what did we learn? in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1633-1641.
- Broadbent, F.E., and Clark, F., 1965. Denitrification, in: *Soil Nitrogen*, W.V. Bartholomew, and F.E. Clark, ed., *Agronomy* **10**: 344-359.
- Brock, T.C.M., Arts, G.H.P., Goossen, L.L.M., and Rutenfrans, A.H.M., 1983. Structure and annual biomass production of *Nymphoides peltata* (Gmel.) O. Kuntze (Menyanthaceae), *Aquat. Bot.* **17**: 167-188.
- Broda, E., 1977. Two kinds of lithotrophs missing in nature, *Z. Allg. Mikrobiol.* **17**: 491-493.
- Brodie, G.A., Hammer, D.A., and Tomljanovich, D.A., 1986. Man-made wetlands for acid mine drainage control, in: *Proc. 8<sup>th</sup> Annual National Abandoned Mine Lands Conference*, Billings, Montana, pp. 87-105.
- Brodie, G.A., Hammer, D.A., and Tomljanovich, D.A., 1988. Constructed wetlands for acid drainage control in the Tennessee Valley, in: *Proc. Conf. Mine Drainage and Surface Mine Reclamation*, Vol. 1: *Mine Water and Mine Waste*, U.S. Dept. of the Interior, Bureau of Mines, Information Circular 9183, pp. 325-331.

- Brodie, G.A., Hammer, D.A., and Tomljanovich, D.A., 1989. Constructed wetlands for treatment of ash pond seepage, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 211-219.
- Brodie, G.A., Britt, C.R., Tomaszewski, T.M., and Taylor, H.N., 1993. Anoxic limestone drains to enhance performance of aerobic acid drainage treatment wetlands: experiences of the Tennessee Valley Authority, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 129-138.
- Bromfield, S.M., 1958. The properties of a biologically formed manganese oxide, its availability to oats and its solution by root washings, *Plant Soil* **9**: 325-338.
- Brookes, P.C., Tate, K.R., and Jenkinson, D.S., 1983. The adenylate energy charge of the soil microbial biomass, *Soil Biol. Biochem.* **15**: 9-16.
- Brooks, A.S., Rozenwald, M.N., Geohring, L.D., Lion, L.W., Steenhuis, T.S., 2000. Phosphorus removal by Wollastonite: A constructed wetland substrate *Ecol. Eng.* **15**: 121-132.
- Brooks, B.B., Presley, J.J., and Kaplan, I.R., 1968. Trace elements in the interstitial waters of marine sediments, *Geochim. Cosmochim. Acta* **32**: 397-414.
- Brooks, R.H., Brezonik, P.L., Putnam, H.D., and Keirn, M.A., 1971. Nitrogen fixation in an estuarine environment: The Waccasassa on the Florida Gulf Coast, *Limnol. Oceanogr.* **16**: 701-710.
- Brown, D.S., and Reed, S.C., 1992. Inventory of constructed wetlands in the United States, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 14.1-14.8.
- Brown, J.C., 1966. Fe and Ca uptake as related to root-sap and stem exudate citrate in soybean, *Physiol. Plant.* **19**: 968-976.
- Brown, K.A., 1985. Sulphur distribution and metabolism in waterlogged peat, *Soil Biol. Biochem.* **17**: 39-45.
- Browning, K., and Greenway, M., 2003. Nutrient removal and plant biomass in a subsurface flow constructed wetland in Brisbane, Australia, *Wat. Sci. Tech.* **48**(5): 183-189.
- Brownlee, B.G., and Murphy, T.P., 1983. Nitrogen fixation and phosphorus turnover in a hypertrophic prairie lake, *Can. J. Fish. Aquat. Sci.* **40**: 1853-1860.
- Brucculeri, M., Bolzonella, D., Battistoni, P., and Cecchi, F., 2005. Treatment of mixed municipal and winery wastewaters in a conventional activated sludge process: a case study, *Wat. Sci. Tech.* **51**(1): 89-98.
- Brüser, T, Lens, P.N.L., and Trüper, H.G., 2000. The biological sulfur cycle, in: *Environmental Technologies to Treat Sulfur Pollution. Principles and Engineering*, P.N.L. Lens and L. Hulshoff Pol, eds., IWA Publishing, London, pp. 47-85.
- Bryan, B.A., 1980. Cell yield and energy characteristics of denitrification with *Pseudomonas stutzeri* and *Pseudomonas aeruginosa*, Ph.D. thesis, University of California Davis, Diss. Abstract 80: 27-39.
- Buckley, A., 1989. An electronic microprobe investigation of the chemistry of ferromanganese coating on freshwater sediments, *Geochim. Cosmochim. Acta* **53**: 115-124.
- Bucksteeg, K., 1985. Initial experience of the Root Zone Process in Bavaria, in: Proc. Symp. held at technical University of Darmstad, July 11, 1985
- Bucksteeg, K., 1986. Sumpfpflanzenkläranlagen – Verfahrensvarianten, Betriebserfahrungen, Problem Bodenhydraulik, *GWF Wasser/Abwasser* **127**: 429-434.
- Bucksteeg, K., 1987a. Sewage treatment in helophyte beds – first experience with a new treatment process, *Wat. Sci. Tech.* **19**(10): 1-10.
- Bucksteeg, K., 1987b. Einführung in die Problematik, in: *Pflanzenkläranlagen. Bau und Betrieb von Anlagen zur Wasser-und Abwasser-Reinigung mit Hilfe von Wasserpflanzen. Grundlagen, Verfahrensvarianten, Praktische Erfahrungen*, Udo Pfriemer Buchverlag in Der Bauverlag GmbH, Wiesbaden und Berlin, pp. 9-18.

- Bucksteeg, K., 1990. Treatment of domestic sewage in emergent helophyte beds – German experiences and ATV-Guidelines H262, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 505-515.
- Bucksteeg, K., Müller, H.H., Mörtl, R., Adelt, H., Scheer, G., Labitzky, W., Sendl, H., Hörmann, O., and Kästner, P., 1985. Erste Erfahrungen mit 12 Sumpfpflanzenkläranlagen, *Korrespondenz Abwasser* **32**: 376-385.
- Bucksteeg, K., Kraft, H., Haider, R., Rausch, F., de Jong, J., Ebeling, W., Geller, G., Hülstede, E., Schwedtke, P., and Czinski, L., 1987. *Pflanzenkläranlagen*, Udo Pfiemer Buchverlag in der Bauverlag GmbH, Wiesbaden, Berlin.
- Buddhavarapu, L.R., and Hancock, S.L. 1991. Advanced treatment for lagoons using duckweed, *Water Environ. Technol.* **March 1991**: 41-44.
- Bulc, T.G., 2006. Long term performance of a constructed wetland for landfill leachate treatment, *Ecol. Eng.* **26**: 365-374.
- Bulc, T., Vrhovšek, D., and Kukanja, V., 1996. The use of constructed wetland for landfill leachate treatment, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, pp. XII/4-1-XII/4-8.
- Bulc, T.G., Ojstrsek, A., and Vrhovšek, D., 2006. The use of constructed wetland for textile wastewater treatment, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1667-1675.
- Bulc, T.G., Sajin Slak, A., and Vrhovšek, D., 2007. Ecoremediation – a new concept of multi-functional ecosystem technologies for environment protection, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 2-5.
- Burdick, D.M., 1989. Root aerenchyma development in *Spartina patens* in response to flooding, *Am. J. Bot.* **76**: 777-780.
- Burdick, D.M., and Mendelsohn, I.A., 1990. Relationship between anatomical and metabolic response to waterlogging in the coastal grass *Spartina patens*, *J. Exp. Bot.* **41**: 233-238.
- Burdige, D.J., 1989. The effects of sediment slurring on microbial processes, and the role of amino acids as substrates for sulfate reduction in anoxic marine sediments, *Biogeochemistry* **8**: 1-23.
- Burdige, D.J., and Neelson, K.H., 1985. Microbial manganese reduction by enrichment cultures from coastal marine sediments, *Appl. Environ. Microbiol.* **50**: 491-497.
- Buresh, R.J., and Patrick, W.H., Jr. 1978. Nitrate reduction to ammonium in anaerobic soil, *Soil Sci. Soc. Am. J.* **42**: 913-918.
- Buresh, R.J., and Patrick, W.H., Jr. 1981. Nitrate reduction to ammonium and organic nitrogen in an estuarine sediment, *Soil Biol. Biochem.* **13**: 279-283.
- Buresh, R.J., Casselman, M.E., and Patrick, W.H., Jr., 1980a. Nitrogen fixation in flooded soil systems: a review, *Adv. Agron.* **33**: 149-192.
- Buresh, R.J., DeLaune, R.D., and Patrick, W.H., Jr., 1980b. Nitrogen and phosphorus distribution and utilization by *Spartina alterniflora* in a Louisiana Gulf coast marsh, *Estuaries* **3**: 111-121.
- Burford, J.R., and Bremner, J.M., 1975. Relationships between denitrification capacities of soils and total, water-soluble and readily decomposable soil organic matter, *Soil Biol. Biochem.* **7**: 389-394.
- Burgoon, P.S., Reddy, K.R., and DeBusk, T.A., 1989. Domestic wastewater treatment using emergent plants cultured in gravel and plastic substrate, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 536-541.
- Burka, U., and Lawrence, P., 1990. A new community approach to wastewater treatment with higher water plants, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 359-371.



- Burrell, P.C., Keller, J., and Blackall, L.L., 1998. Microbiology of a nitrite-oxidizing bioreactor, *Appl. Environ. Microbiol.* **64**: 1878-1883.
- Burris, J.E., ed., 1984. *Treatment of Mine Drainage by Wetlands*, Pennsylvania State University, University Park, Pennsylvania.
- Burvall, J., 1997. Influence of harvest time and soil type on fuel quality in reed canary grass (*Phalaris arundinacea* L.), *Biomass Bioenergy* **12**: 149-154.
- Butler, J.E., Ford, M.G., Loveridge, R.F., and May, E., 1990. Design, construction, establishment and operation of gravel bed hydroponic (GBH) systems for secondary and tertiary sewage treatment, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 539-542.
- Butler, J.E., Ford, M.G., May, E., Ashworth, R.F., Williams, J.B., Dewedar, A., El-Housseini, M., and Baghat, M.M.M., 1993. Gravel bed hydroponic sewage treatment: performance and potential, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 237-247.
- Butler, R.G., Orlob, G.T., and McGauhey, P.H., 1954. Underground movement of bacterial and chemical pollutants, *Am. Water Works Assoc. J.* **46**: 97-111.
- Butlin, K.R., Adams, M.E., and Thomas, M., 1949. The isolation and cultivation of sulphate-reducing bacteria, *J. gen. Microbiol.* **3**: 46-59.
- Buxton, D.R., Anderson, I.C., and Hallam, A., 1998. Intercropping sorghum into alfalfa and reed canarygrass to increase biomass yield, *J. Prod. Agric.* **11**: 481-486.
- Byekwaso, E., Kansime, F., Logstrum, J., and Andersen, S., 2002. The optimisation of a reed bed filter for effluent treatment at Kasese Cobalt Company Limited - Uganda, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, Tanzania, pp. 660-668.
- Cabrera, R.I., 1997. Let the nutrients fly...slowly, *Am. Nurseryman* **185**: 32-34.
- Cadelli, D., Radoux, M., and Nemcova, M. 1998. Belgium, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 77-93.
- Cadelli, D., Nemcova, M., and Radoux, M., 2005. On-site domestic wastewater treatment by MHEA<sup>®</sup> technology: case study in Belgium, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 65-81.
- Cady, F.B., and Bartholomew, W.V., 1960. Sequential products of anaerobic denitrification in Norfolk soil material, *Soil Sci. Soc. Am. Proc.* **27**: 546-549.
- Caffrey, J.M., and Kemp, W.M., 1991. Seasonal and spatial patterns of oxygen production, respiration and root-rhizome release in *Potamogeton perfoliatus* L. and *Zostera marina* L., *Aquat. Bot.* **40**: 109-128.
- Cakmak, I., Sari, N., Marschner, H., Kalayci, M., Yilmaz, A., and Braun, H.J., 1996. Phytosiderophore release in bread wheat genotypes differing in zinc efficiency, *Plant Soil* **180**: 183-189.
- Calheiros, C.S.C., Rangel, A.O.S.S., and Castro, P.K.L., 2007. Constructed wetland systems vegetated with different plants applied to the treatment of tannery wastewater, *Wat. Res.* **41**: 1790-1798.
- Cameron, K., Madramootoo, Crolla, A., and Kinsley, C., 2003. Pollutant removal from municipal sewage lagoon effluent with a free-surface wetland, *Wat. Res.* **37**: 2803-2812.
- Campbell, C.S., and Ogden, M.H., 1999. *Constructed Wetlands in the Sustainable Landscape*, John Wiley and Sons, New York.
- Campbell, W.H., 1996. Nitrate reductase biochemistry comes of age, *Plant Physiol.* **111**: 355-361.
- Caraco, N., Cole, J., Likens, G.E., 1990. A comparison of phosphorus immobilization in sediments of freshwater and coastal marine systems, *Biogeochemistry* **9**: 277-290.
- Carapeto, C., and Purchase, D., 2000. Distribution and removal of cadmium and lead in a constructed wetland receiving urban runoff, *Bull. Environ. Contam. Toxicol.* **65**: 322-329.

- Carignan, R., and Kalff, J., 1979. Quantification of the sediment phosphate available to aquatic macrophytes, *J. Fish. Res. Board Can.* **36**: 1002-1005.
- Carignan, R., and Kalff, J., 1980. Phosphorus sources for aquatic weeds: Water or sediments? *Science* **207**: 987-989.
- Carleton, J.N., Grizzard, T.J., Godrej, A.N., and Post, H.E., 2001. Factors affecting the performance of stormwater treatment wetlands, *Wat. Res.* **35**: 1552-1562.
- Carlson, C.A., and Inghramm, J.L., 1983. Comparison of denitrification by *Pseudomonas stutzeri*, *Pseudomonas aeruginosa* and *Pracoccus denitrificans*, *Appl. Environ. Microbiol.* **45**: 1247-1253.
- Carlson, I.T., Oram, R.N., and Surprenant, J., 1996. Reed canarygrass and other *Phalaris* species, *Agron. Monograph* **34**: 569-604.
- Carpenter, E.J., Van Raalte, C.D., and Valiela, I., 1978. Nitrogen fixation by algae in a Massachusetts salt marsh, *Limnol. Oceanogr.* **23**: 318-327.
- Carpenter, S.R., 1980. Estimating net shoot production by a hierarchical cohort method of herbaceous plants subject to high mortality, *Am. Midl. Nat.* **104**: 163-175.
- Carpenter, S.R., 1981. Decay of heterogenous detritus: a general model, *J. theor. Biol.* **89**: 539-547.
- Carpenter, S.R., 1982. Comparisons of equations for decay of leaf litter in tree-hole ecosystems, *Oikos* **39**: 17-22.
- Carroll, D., 1958. Role of clay minerals in the transportation of iron, *Cosmochim. Acta* **14**: 1-27.
- Carroll, P., Harrington, R., Keohane, J., and Ryder, C., 2005. Water treatment performance and environmental impact of integrated constructed wetlands in the Anne valley watershed, Ireland, in: *Nutrient Management in Agricultural Watersheds: A Wetlands Solution*, E.J. Dunne, K.R. Reddy and O.T. Carton, eds., Wageningen Academic Publishers, Wageningen, The Netherlands, pp. 207-217.
- Carter, J.P., Hsiao, Y.S., Spiro, S., and Richardson, D.J., 1995. Soil and sediment bacteria capable of aerobic nitrate respiration, *Appl. Environ. Microbiol.* **61**: 2852-2858.
- Carter, S., Ward, G.M., Wetzel, R.G., and Benke, A.C., 2000. Growth, production, and senescence of *Nymphaea odorata* Aiton in a southeastern (U.S.A.) wetland (in Wetzel, 2001).
- Caskey, W.H., and Tiedje, J.M. 1979. Evidence for clostridia as agents of dissimilatory reduction of nitrate to ammonium in soils, *Soil Sci. Soc. Am. J.* **43**: 931-936.
- Caskey, W.H., and Tiedje, J.M., 1980. The reduction of nitrate to ammonium in soils, *J. Gen. Microbiol.* **119**: 217-223.
- Casler, M.D., and Hovin, A.W., 1980. Genetics of vegetative stand establishment characters in Reed canary grass clones, *Crop Sci.* **20**: 511-515.
- Casler, M.D., Undersander, D.J., Fredericks, C., Combs, D.K. and Reed, J.D., 1998. An on-farm test of perennial forage grass varieties under management intensive grazing, *J. Proc. Agric.* **11**: 92-99.
- Caselles-Osorio, A., Puigagut, J., Segú, E., Vaello, N., Granés, F., García, D., and García, J., 2007. Solids accumulation in six full-scale subsurface flow constructed wetlands, *Wat. Res.* **41**: 1388-1398.
- Casselman, M.E., Patrick, W.H., Jr., and DeLaune, R.D., 1981. Nitrogen fixation in a Gulf Coast salt marsh, *Soil Sci. Soc. Am. J.* **45**: 51-56.
- Cattaneo, A., and Kalff, J. 1980. The relative contribution of aquatic macrophytes and their epiphytes to the production of macrophyte beds, *Limnol. Oceanogr.* **25**: 280-289.
- Cedergreen, N., and Madsen, T.V., 2003. Nitrate reductase activity in roots and shoots of aquatic macrophytes, *Aquat. Bot.* **76**: 203-212.
- Center, T.D., and Spencer, N.R., 1981. The phenology and growth of water hyacinth (*Eichhornia crassipes* (Mart.) Solms.) in a eutrophic North Central Florida, *Aquat. Bot.* **12**: 1-32.

- Cervantes, C., Campos-Garcia, J., Devars, S., Gutierrez-Corona, F., Loza-Tavera, H., Torres-Guzman, J.C., and Moreno-Sanchez, R., 2001. Interactions of chromium with microorganisms and plants, *FEMS Microbiol. Rev.* **25**: 335-347.
- Chambers, J.M., and McComb, A.J., 1994. Establishing wetland plants in artificial systems, *Wat. Sci. Tech.* **29**: 79-84.
- Chambers, P.A., and Kalff, J., 1987. Light and nutrients in the control of aquatic plant community structure. I. *In situ* experiments, *J. Ecol.* **75**: 611-619.
- Chambers, P.A., Prepas, E.E., Bothwell, M.L., and Hamilton, H.R., 1989. Roots versus shoots in nutrient uptake by aquatic macrophytes in flowing waters, *Can. J. Fish. Aquat. Sci.* **46**: 435-439.
- Chamie, J.P.M., and Richardson, C.J., 1978. Decomposition in northern wetlands, in: *Freshwater Wetlands: Ecological Processes and Management Potential*, R.E. Good, D.F. Whigham and R.L. Simpson, eds., Academic Press, New York, pp. 115-130.
- Chan, E., Bursztynsky, T.A., Hantzsche, N., and Litwin, Y.J., 1982. *The Use of Wetlands for Water Pollution Control*, US EPA Report EPA-600/2-82-086, Municipal Environmental Research Lab, Cincinnati, Ohio.
- Chappell, K.R., and Goulder, R., 1994. Seasonal variation of epiphytic extracellular enzyme activity on two freshwater plants, *Phragmites australis* and *Elodea canadensis*, *Arch. Hydrobiol.* **132**: 237-252.
- Chapple, M., Cooper, P., Cooper, D., and Revitt, M., 2002. Pilot trials of a constructed wetland system for reducing the dissolved hydrocarbon in the runoff from a decommissioned refinery, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 877-883.
- Chazarenc, F., and Merlin, G., 2005. Influence of surface layer on hydrology and biology of gravel bed vertical flow constructed wetlands, *Wat. Sci. Tech.* **51**(9): 91-97.
- Chazarenc, F., Brisson, J., and Comeau, Y. 2006. Slag – columns for upgrading phosphorus removal from constructed wetlands effluents, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 165-173.
- Chazarenc, F., Boumeceid, A., Brisson, J., Boulanger, Y., and Comeau, Y., 2007. Phosphorus removal in a fresh water fish farm using constructed wetlands and slag filters, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 50-51.
- Chen, C.C., Dixon, J.B., and Turner, F.T., 1980. Iron coatings on rice roots: morphology and models of development, *Soil Sci. Soc. Am. J.* **44**: 1113-1119.
- Chen, M.Y., Ike, M., Fujita, M., 2002. Acute toxicity, mutagenity and extrogenicity of bisphenol-A and other bisphenols, *Environ. Toxicol.* **17**: 80-88.
- Chen, R.L., and Barko, J.W., 1988. Effects of freshwater macrophytes on sediment chemistry, *J. Freshwat. Ecol.* **4**: 279-289.
- Chen, R.L., Keeney, D.R., Graetz, D.A., and Holding, A.J. 1971. Denitrification and nitrate reduction in lake sediments, *J. Environ. Qual.* **1**: 158-162.
- Chen, R.Y.S., Butler, J.N., and Stumm, W., 1973. Kinetic study of phosphate reaction with aluminum oxide and kaolinite, *Environ. Sci. Technol.* **7**: 327-332.
- Chen, S., Cothren, G.M., DeRamus, H.A., Langlinais, S., Huner, J.V., and Malone, R.F., 1995. Design of constructed wetlands for dairy waste water treatment in Louisiana, in: *Animal Waste and the Land-Water Interface*, K. Steele, ed., CRC Press, Boca Raton, Florida, pp. 197-204.
- Cheung, K.C., and Venkitachalam, T.H., 2000. Improving phosphate removal of sand infiltration system using alkaine fly ash, *Chemosphere* **41**: 243-249.
- Chirkova, T.V., and Gutman, T.S., 1972. Physiological role of branch lenticels in willow and poplar under conditions of root anaerobiosis, *Sov. Plant Physiol.* (Engl. Translat.) **19**: 289-295.

- Choate, K.D., Steiner, G.R., and Watson, J.T., 1989. First semiannual monitoring report: Demonstration of constructed wetlands for municipal wastewater, March to December 1988, Tennessee Valley Authority Report TVA/WR/WQ-89/5, Chattanooga, Tennessee.
- Choate, K.D., Watson, J.T., and Steiner, G.R., 1990. Demonstration of constructed wetlands for treatment of municipal wastewater, monitoring report for the period: March 1988 to October 1989, Tennessee Valley Authority Technical report TVA/WR/WQ-90/11, Chattanooga, Tennessee.
- Choate, K.D., Watson, J.T., and Steiner, G.R., 1993. TVA's constructed wetlands demonstration, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 509-516.
- Christensen, P.B., and Sørensen, J., 1986. Temporal variation of denitrification activity in plant-covered, littoral sediment from Lake Hampen, Denmark, *Appl. Environ. Microbiol.* **51**: 1174-1179.
- Christian, J.N.W., 1990. Reed bed treatment systems: experimental gravel beds at Gravesend – the Southern Water Experience, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 309-319.
- Chudoba, J., Dohányos, M., and Wanner, J., 1991. *Biologické čištění odpadních vod (Biological Treatment of Wastewaters)*. SNTL Praha, Czech Republic (in Czech).
- Ciupa, R., 1996. The experience in the operation of constructed wetlands in North-Eastern Poland, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Univ. für Bodenkultur Wien, Austria, Chapter IX/6.
- Čížková, H., 1999. Growth dynamics and ecophysiology of *Phragmites* in relation to the climatic conditions in boreal-Mediterranean and oceanic-continental gradients, in: *Eureed II*, H. Brix, ed., Final Project for contracts ENV4-CT95-0147 and IC20-CT-960020, University of Aarhus, Denmark, pp. 45-52.
- Čížková, H., Strand, J.A., and Lukavská, J., 1996a. Factors associated with reed decline in a eutrophic fishpond, Rožmberk (South Bohemia, Czech Republic), *Folia Geobot. Phytotax.* **31**: 73-84.
- Čížková-Končalová, H., Květ, J., and Lukavská, J. 1996b. Response of *Phragmites australis*, *Glyceria maxima* and *Typha latifolia* to addition of piggery sewage in a flooded sand culture, *Wetlands Ecology and Management* **4**: 43-50.
- Čížková, H., Pechar, L., Husák, Š., Květ, J., Bauer, V., Radochová, J., and Edwards, K., 2001. Chemical characteristics of soils and pore waters of three wetland sites dominated by *Phragmites australis*: relation to vegetation composition and reed performance, *Aquat. Bot.* **69**: 235-249.
- Clarholm, M., 1981. Protozoan grazing of bacteria in soil – impact and importance, *Microbiol. Ecol.* **7**: 343-350.
- Clarkson, D.T., 1985. Factors affecting mineral nutrient acquisition by plants, *Annu. Rev. Plant Physiol.* **36**: 77-115.
- Claussen, W., and Lenz, F., 1999. Effect of ammonium or nitrate nutrition on net photosynthesis, growth, and activity of the enzymes nitrate reductase and glutamine synthetase in blueberry, raspberry and strawberry, *Plant Soil* **208**: 95-102.
- Clements, F.E., 1920. *Plant Indicators. The Relation of Plant Communities to Process and Practice*, Carnegie Institution of Washington, Washington, D.C.
- Clemens, S., Palmgren, M.G., and Krämer, U., 2002. A long way ahead: understanding and engineering plant metal accumulation, *TRENDS Plant. Sci.* **7**: 309-315.
- Clough, K.S., DeBusk, T.A., and Reddy, K.R., 1987. Model water hyacinth and pennywort systems for the secondary treatment of domestic wastewater, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 775-781.
- Coates, J.D., Bhupathiraju, V.K.A.L.A., McInerney, M.J., and Lovley, D.R., 2001. *Geobacter hydrogenophilus*, *Geobacter chapellei*, and *Geobacter grbiciae*, three new, strictly anaerobic dissimilatory Fe(III)-reducers, *Int. J. Syst. Evol. Microbiol.* **51**: 581-588.

- Cobbett, C.S., 2000. Phytochelatins and their roles in heavy metal detoxification, *Plant Physiol.* **123**: 825-832.
- Cochran, P.H., 1972. Tolerance of lodgepole and ponderosa pine seedlings to high water tables, *Northwest Sci.* **46**: 322-331.
- Cohen, Y., Jørgensen, B.B., Padan, E., and Shilo, M. 1975. Sulphide-dependent anoxygenic photosynthesis in the cyanobacterium *Oscillatoria limnetica*, *Nature* **256**: 489-491.
- Cole, J.A., and Brown, C.M. 1980. Nitrite reduction to ammonia by fermentative bacteria: a short circuit in the biological nitrogen cycle, *FEMS Microbiol. Lett.* **7**: 65-72.
- Cole, B.S., and Toetz, D.W., 1975. Utilization of sedimentary ammonia by *Potamogeton nodosus* and *Scirpus*, *Verh. Internat. Verein. Limnol.* **19**: 2765-2772.
- Cole, C.V., Sterling, R., and Scott, C.O., 1953. The nature of phosphate sorption by calcium carbonate, *Soil Sci. Soc. Am. Proc.* **17**: 352-357.
- Coleman, G.S., 1960. A sulfate-reducing bacterium from the sheep rumen, *J. Gen. Microbiol.* **22**: 423-436.
- Coleman, J., Hench, K., Garbutt, K., Sextone, A., Bissonnette, G., and Skousen, J., 2001. Treatment of domestic wastewater by three plant species in constructed wetlands, *Water Air Soil Pollut.* **128**: 283-295.
- Collins, B., McArthur, J.V., and Sharitz, R.R., 2004. Plant effects on microbial assemblages and remediation of acidic coal pile runoff in mesocosm treatment wetlands, *Ecol. Eng.* **23**: 107-115.
- Comeau, Y., Brisson, J., Réville, J.-P., Forget, C., and Drizo, A., 2001. Phosphorus removal from trout farm effluents by constructed wetlands, *Wat. Sci. Tech.* **44**(11/12): 55-60.
- Compton, R.H., 1916. The botanical results of a fenland flood, *J. Ecol.* **4**: 15-17.
- Conchou, O., and Fustec, E., 1988. Influence of hydrological fluctuations on the growth and nutrient dynamics of *Phalaris arundinacea* L. in a riparian environment, *Plant Soil* **112**: 53-60.
- Conlin, T.S.S., and Crowder, A.A., 1989. Location of radial oxygen loss and zone of potential iron uptake in a grass and two non-grass emergent species, *Can. J. Bot.* **67**: 717-722.
- Connell, E.L., Colmer, T.D., and Walker, D.I., 1999. Radial oxygen loss from intact roots of *Halophila ovalis* as a function of distance behind the root tip and shoot illumination, *Aquat. Bot.* **63**: 219-228.
- Connell, W.E., and Patrick, W.H.Jr., 1968. Sulfate reduction in soil: effects of redox potential and pH, *Science* **159**: 86-87.
- Conte, G., Martinuzzi, N., Giovannelli, L., Pucci, B., and Masi, F., 2001. Constructed wetlands for wastewater treatment in central Italy, *Wat. Sci. Tech.* **44**(11-12): 339-343.
- Cooke, T.D., and Bruland, K.W., 1987. Aquatic chemistry of selenium: Evidence of biomethylation, *Environ. Sci. Technol.* **21**: 1214-1219.
- Cooke, S.S., and Azous, A.L., 1997. The hydrologic requirements of common Pacific Northwest wetland species, in: *Wetlands and Urbanization: Implications for the Future*, A.L. Azous and R.R. Horner, eds., Final Report of the Puget Sound Wetlands and Stormwater Management Research Program, pp. 174-193.
- Coombes, C., 1990. Reed bed treatment systems in Anglian Water, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 223-234.
- Cooper, C.M., and Testa, S., III., 1997. A constructed wetland for treatment of cattle waste, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-14-II-24.
- Cooper, D., Griffin, P., and Cooper, P., 2005. Factors affecting the longevity of sub-surface horizontal flow systems operating as tertiary treatment for sewage effluent, *Wat. Sci. Tech.* **51**(9): 127-135.
- Cooper, P.F., ed., 1990. European Design and Operation Guidelines for Reed Bed Treatment Systems. Prepared for the European Community/European Water pollution Control

- Association Emergent Hydrophyte Treatment System Expert Contact Group. WRc Report UI 17.
- Cooper, P.F., 1993. The use of reed bed systems to treat domestic sewage: The European design and operations guidelines for reed bed treatment systems, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 203-217.
- Cooper, P. F., 1999. A review of the design and performance of vertical flow and hybrid reed bed treatment systems, *Wat. Sci. Tech.* **40**(3): 1-9.
- Cooper, P.F., 2001. Nitrification and denitrification in hybrid constructed wetlands systems, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 257-270.
- Cooper, P.F., 2003. UK experience with reed bed and constructed wetland systems 1985 to 2003, in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 403-420.
- Cooper, P.F., 2005. The performance of vertical flow constructed wetland systems with special reference to the significance of oxygen transfer and hydraulic loading rates, *Wat. Sci. Tech.* **51**(9): 81-90.
- Cooper, P.F., 2006. The constructed wetland association UK database of constructed wetland systems, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 29-36.
- Cooper, P.F., 2007. What can we learn from old wetlands? Lessons that we have learned and forgotten over the past 20 years, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 10-11.
- Cooper, P.F., and Boon, A.G., 1987. The use of *Phragmites* for wastewater treatment by the Root Zone Method: the UK approach, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R.Reddy and W.H. Smith, eds., Magnolia Publishing: Orlando, Florida, pp. 153-174.
- Cooper, P.F., and Hobson, J.A., 1989. Sewage treatment by reed bed systems: The present situation in the United Kingdom, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 153-171.
- Cooper, P.F., and Findlater, B.C., eds., 1990. *Constructed Wetlands in Water Pollution Control*, Pergamon Press, Oxford.
- Cooper, P.F., and Green, M.B., 1995. Reed bed treatment systems for sewage treatment – the first 10 years experience, *Wat. Sci. Tech.* **32**: 317-327.
- Cooper, P.F., and Green, M.B., 1998. United Kingdom, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 315-335.
- Cooper, P., and Cooper, D., 2005. Evaluation of tidal flow reed bed system for the treatment of domestic sewage – nitrification trials, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 222-232.
- Cooper, P.F., Hobson, J.A., and Findlater, B.C., 1990. The use of reed bed systems in the UK, *Wat. Sci. Tech.* **22**: 57-64.
- Cooper, P. F., Job, G. D., Green, M. B., and Shutes, R. B. E. 1996. *Reed Beds and Constructed Wetlands for Wastewater Treatment*, WRc Publications, Medmenham, Marlow, UK.
- Cooper, P.F., Smith, M., and Maynard, H., 1997. The design and performance of a nitrifying vertical-flow reed bed system, *Wat. Sci. Tech.* **35**(5): 215-22
- Coops, H., and Van der Velde, G., 1995. Seed dispersal, germination and seedling growth of six helophyte species in relation to water-level zonation, *Freshwater Biol.* **34**: 13-20.

- Coops, H., van der Brink, F.W.B., and van der Velde, G., 1996. Growth and morphological responses of four helophyte species in an experimental water-depth gradient, *Aquat. Bot.* **54**: 11-24.
- Corapcioglu, M.Y., and Haridas, A., 1984. Transport and fate of microorganisms in porous media: a theoretical investigation, *J. Hydrol.* **72**: 149-169.
- Cottin, N.C., and Merlin, G., 2006. Removal of polycyclic aromatic hydrocarbons from experimental columns simulating a vertical flow constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, p. 695.
- Coult, D.A., 1964. Observations on gas movement in the rhizome of *Menyanthes trifoliata* L. with comments on the role of the endodermis, *J. Exp. Bot.* **15**: 205-218.
- Coult, D.A., and Vallance, K.B., 1951. Observations on the gaseous exchanges which take place between *Menyanthes trifoliata* and its environment, I. *J. Exp. Bot.* **2**: 212-222.
- Coult, D.A., and Vallance, K.B., 1958. Observations on the gaseous exchanges which take place between *Menyanthes trifoliata* and its environment, II. *J. Exp. Bot.* **9**: 384-402.
- Coutts, M.P., and Philipson, J.J., 1978a. Tolerance of tree roots to waterlogging. I. Survival of Sitka spruce and Lodgepole pine, *New Phytol.* **80**: 63-69.
- Coutts, M.P., and Philipson, J.J., 1978b. Tolerance of tree roots to waterlogging. II. Adaptation of Sitka spruce and lodgepole pine to waterlogged soil, *New Phytol.* **80**: 71-77.
- Cox, C.D., and Payne, W.J., 1973. Separation of soluble denitrifying enzymes and cytochromes from *Pseudomonas perfectamarinus*, *Can. J. Microbiol.* **19**: 861-872.
- Craig, P.J., 1980. Metal cycles and biological methylation, in: *The Handbook of Environmental Chemistry*, Volume 1, Part A, *The Natural Environment and the Biogeochemical Cycles*, O. Hutzinger, ed., Springer Verlag, Berlin, pp. 169-227.
- Craft, C.B., and Richardson, C.J. 1993a. Peat accretion and N, P, and organic C accumulation in nutrient-enriched and unenriched Everglades peatlands, *Ecol. Appl.* **3**: 446-458.
- Craft, C.B., and Richardson, C.J. 1993b. Peat accretion and phosphorus accumulation along a eutrophication gradient in the northern Everglades, *Biogeochemistry* **22**: 133-156.
- Craft, B.C., and Richardson, C.J., 1998. Recent and long-term organic soil accretion and nutrient accumulation in the Everglades, *Soil Sci. Soc. Am. J.* **62**: 834-843.
- Crawford, R.M.M., 1978. Metabolic adaptation to anoxia, in: *Plant Life under Anaerobic Environments*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci. Publ., Ann Arbor, Michigan, pp. 119-154.
- Crawford, R.M.M., 1982. Physiological responses to flooding, in: *Encyclopedia of Plant Physiology*, Vol. 12B. *Physiological Plant Ecology*, Springer Verlag, Berlin, pp. 453-477.
- Crawford, R.M.M., 1983. Root survival in flooded soils, in: *Ecosystems of the World. 4A. Mires: Swamp, Bog, Fen, and Moor*, A.J.P. Gore, ed., Elsevier Scientific Publishing, Amsterdam, pp. 257-283.
- Crawford, R.M.M., 1987. *Plant Life in Aquatic and Amphibious Habitats*, Blackwell Scientific, Oxford, U.K.
- Crawford, R.M.M., and Tyler, P.D., 1969. Organic acid metabolism in relation to flooding tolerance in roots, *J. Ecol.* **57**: 235-244.
- Crawford, R.M.M., and Brändle, R., 1996. Oxygen deprivation stress in a changing environment, *J. Exp. Bot.* **47**: 145-159.
- Crites, R.W., 1992. Design criteria and practice for constructed wetlands, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of New South Wales, Sydney, Australia, pp. 6.1-6.8.
- Crites, R., and Tchobanoglous, G., 1998. *Small and Decentralized Wastewater Management Systems*, McGraw-Hill Companies, Boston.
- Cronk, J.K., 1996. Constructed wetlands to treat wastewater from dairy and swine operations: a review, *Agricult. Ecosyst. Environ.* **58**: 97-114.
- Crook, C.E., Boat, R.R., and Moss, B.D., 1983. *The Decline of Reedswamps in the Norfolk Broadland: Causes, Consequences and Solutions*, Broads Authority (BARS 6), UK.

- Crowder, A.A., St.-Cyr, L., 1991. Iron oxide plaque on wetland roots, *Trends Soil Sci.* **1**: 315-329.
- ČSN 75 6402, (1998). Čistírny odpadních vod do 500 ekvivalentních obyvatel (Wastewater treatment plants up to 500 population equivalent). Czech technical norm, Praha.
- Culley, D. D., Jr., and Epps, E. A., 1973. Use of duckweed for waste treatment and animal feed, *J. Water Pollut. Control Fed.* **45**: 337-347.
- Culley, D.D., Gholson, J.H., Chisholm, T.S., Standifer, L.F., and Epps, E.A. 1978. Water quality renovation of animal waste lagoons utilizing aquatic plants, EPA 600/2-78-153. U.S. EPA, Ada, Oklahoma.
- Culley, D. D., Jr., Rejmánková, E., Květ, J., and Frye, J. B. 1981. Production, chemical quality and use of duckweeds (Lemnaceae) in aquaculture, waste management, and animal feed. *J. World Maricul. Soc.* **12**: 27-49.
- Cummins, K.W., Klug, M.J., Wetzel, R.G., Petersen, R.C., Suberkropp, K., Manny, B.A., Wuycheck, J.C., and Howard, F.O., 1972. Organic enrichment with leaf leachate in experimental lotic ecosystems, *BioScience* **22**: 719-722.
- CWA, 2006. Constructed Wetland Association. [www.constructedwetland.co.uk](http://www.constructedwetland.co.uk)
- Dacey, J.W.H., 1980. Internal winds in water lilies – an adaptation for life in anaerobic sediments, *Science* **210**: 1017-1019.
- Dacey, J.W.H., 1981. Pressurized ventilation in the yellow waterlily, *Ecology* **62**: 1137-1147.
- Dacey, J.W.H., 1987. Knufsen-transitional flow and gas pressurization in leaves of *Nelumbo*, *Plant Physiol.* **85**: 199-203.
- Dacey, J.W.H., and Klug, M.J., 1979. Tracer studies of gas circulation in *Nuphar*:  $^{18}\text{O}_2$  and  $^{14}\text{CO}_2$  transport, *Physiol. Plant.* **56**: 361-366.
- Dacey, J.W.H., and Klug, M.J., 1982. Floating leaves and ventilation in *Nuphar*, *Am. J. Bot.* **69**: 999-1003.
- Dafner, G., 1992. 8jährige Betriebserfahrungen mit einer Pflanzenkläranlage, *Korrespondenz Abwasser* **39**: 880-885.
- Dahab, M.F., and Surampalli, R.Y., 2001. Subsurface-flow constructed wetlands treatment in the plains: five years of experience, *Wat. Sci. Tech.* **44**(11-12): 375-380.
- Dahab, M.F., Surampalli, R.Y., and Liu, W., 2001. Performance modeling of subsurface-flow constructed wetlands systems, *Wat. Sci. Tech.* **44**(11-12): 231-235.
- Dallas, S., and Ho, G., 2005. Subsurface flow reedbeds using alternative media for the treatment of domestic greywater in Monteverde, Costa Rica, Central America, *Wat. Sci. Tech.* **51**(10): 119-128.
- Dallas, S., Scheffe, B., and Ho, G., 2004. Reedbeds for greywater treatment – case study in Santa Elena-Monteverde, Costa Rica, Central America, *Ecol. Eng.* **23**: 55-61.
- Dalsgaard, T., and Thamdrup, B., 2002. Factors controlling anaerobic ammonium oxidation with nitrite in marine sediments, *Appl. Environ. Microbiol.* **68**: 3802-3808.
- Dalsgaard, T., Canfield, D.E., Petersen, J., Thamdrup, B., and Acuña-González, J., 2003.  $\text{N}_2$  production by the anammox reaction in the anoxic water column of Golfo Dulce, Costa Rica, *Nature* **422**: 606-608.
- D'Angelo, E.M., and Reddy, K.R., 1994. Diagenesis of organic matter in a wetland receiving hypereutrophic lake water. I. Distribution of dissolved nutrients in the soil and water column, *J. Environ. Qual.* **23**: 925-936.
- Daniels, R.E., 1991. Variation in performance of *Phragmites australis* in experimental culture, *Aquat. Bot.* **42**: 41-48.
- Daniels, R., 1998. You're now entering the root zone – investigation: the potential of reed beds for treating waste waters from leather manufacture, *World Leather* **11**: 48-50.
- Daniels, R., 2001a. Enter the root-zone: green technology for the leather manufacturer, Part 1, *World Leather* **14**: 63-67.
- Daniels, R., 2001b. Enter the root-zone: green technology for the leather manufacturer, Part 3, *World Leather* **14**: 85-88.



- Darke, A.K., Walbridge, M.R., and Lockaby, B.G., 1997. Changes in Al and Fe crystallinity and P sorption capacity in a floodplain forest soil subjected to artificially manipulated flooding regimes in field mesocosms, *Wetlands Ecology and Management* **4**: 234-244.
- Das, H., 1984. Mercury absorption capacity of the water hyacinth *Eichhornia crassipes*, *Env. Eco.* **2**: 338-340.
- Das, D.K., and Jat, R.L., 1977. Influence of three soil-water regimes on root porosity and growth of four rice varieties, *Agron. J.* **69**: 197-200.
- Daubenmire, R.F., 1947. *Plants and Environment. A Textbook of Plants Autecology*, John Wiley and Sons, New York.
- Daughton, C.G., and Ternes, T.A., 1999. Pharmaceuticals and personal care products in the environment: agents of subtle change? *Environ. Health Persp.* **107**: 907-938.
- Davies, C.M., Sakadevan, K., and Bavor, H.J., 2001. Removal of stormwater-associated nutrients and bacteria in constructed wetland and water pollution control pond systems, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 483-495.
- Davies, D.D., 1980. Anaerobic metabolism and the production of organic acids, in: *The Biochemistry of Plants*, Vol. 2, D.D. Davies, ed., Academic Press, New York, pp. 581-611.
- Davies, L.C., Carias, C.C., Novais, J.M., and Martins-Dias, S., 2005. Phytoremediation of textile effluents containing azo dye by using *Phragmites australis* in a vertical flow intermittent feeding constructed wetland, *Ecol. Eng.* **25**: 594-605.
- Davies, T.H., and Hart, B.T., 1990a. Use of aeration to promote nitrification in reed beds treating wastewater, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 77-84.
- Davies, T.H., and Hart, B.T., 1990b. Reed bed treatment of wastewaters in a pilot-scale facility, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 517-520.
- Davies, T.H., and Cottingham, P.D., 1992. The use of constructed wetlands for treating industrial effluent, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 53.1 – 53.5.
- Davies, T.H., Cottingham, P.D., and Hart, B.T., 1993. Application of constructed wetlands to treat wastewaters in Australia, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 577-584.
- Davis, C.B., and Van der Valk, A.G., 1978. The decomposition of standing and fallen litter of *Typha glauca* and *Scirpus fluviatilis*, *Can. J. Bot.* **56**: 662-675.
- Davis, J.A., and Leckie, J.O., 1978. Effects of adsorbed complexing ligands on trace metal uptake by hydrous oxides, *Environ. Sci. Technol.* **12**: 1309-1315.
- Davis, J.A., and Leckie, J.O., 1980. Surface ionization and complexation at the oxide/water interface. 3. Adsorption of anions, *J. Colloid Interface Sci.* **74**: 32-43.
- Davis, S.M., 1982. Patterns of radiophosphorus accumulation in the Everglades after its introduction into surface water, Tech. Pub. 82-2. South Florida Water Management District, West Palm Beach, Florida.
- Davison, K., Headley, T., and Edmonds, M., 2001. On-site domestic wastewater treatment by reed bed in the moist subtropics, *Wat. Sci. Tech.* **44**(11-12): 353-360.
- Davison, L., Headley, T., and Pratt, K., 2005. Aspects of design, structure, performance and operation of reed beds – eight years' experience in northeastern New South Wales, Australia, *Wat. Sci. Tech.* **51**: 129-138.
- Davison, L., Pont, D., Bolton, K., and Headley, T., 2006. Dealing with nitrogen in subtropical Australia: Seven case studies in the diffusion of ecotechnological innovation, *Ecol. Eng.* **28**: 213-223.
- Dawson, F.H., 1976. The annual production of the aquatic macrophyte *Ranunculus penicillatus* var. *calcareus* (RW Butcher) CDK Cook, *Aquat. Bot.* **2**: 51-73.

- Dawson, R.N., and Murphy, K.L., 1972. The temperature dependence of biological denitrification, *Water Research* **6**: 71-83.
- DeBusk, T.A., and Reddy, K.R., 1987a. Wastewater treatment using floating aquatic macrophytes: contaminant removal processes and management strategies, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 643-656.
- DeBusk, T.A., and Reddy, K.R., 1987b. Density requirements to maximize productivity and nutrient removal capability of water hyacinth, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 673-680.
- DeBusk, T.A., Ryther, J.H., Hanisak, M.D., and Williams, L.D., 1981. Effects of seasonality and plant density on the productivity of some freshwater macrophytes, *Aquat. Bot.* **10**: 133-142.
- DeBusk, T.A., Ryther, J.H., and Williams, L.D., 1983. Evapotranspiration of *Eichhornia crassipes* (Mart.) Solms and *Lemna minor* L. in central Florida: relation to canopy structure and season, *Aquat. Bot.* **16**: 31-39.
- DeBusk, T.A., Burgoon, P.S., and Reddy, K.R., 1987. Secondary treatment of domestic wastewater using floating and emergent macrophytes, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 525-529.
- DeBusk, T.A., Peterson, J.E., Reddy, K.R., Graetz, D.A., and Clough, K.S., 1989. Optimization of the vegetative uptake of phosphorus from dairy wastewater. Final Report, Azurea, Inc. Rockledge, Florida.
- DeBusk, T.A., Langston, M.A., Burgoon, P.S., and Reddy, K.R., 1990. A performance comparison of vegetated submerged beds and floating macrophytes for domestic wastewater treatment, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 301-308.
- DeBusk, W.F., 1999. Evaluation of a constructed wetland for treatment of leachate at a municipal landfill in Northwest Florida, in: *Constructed Wetlands for the Treatment of Landfill Leachates*, G. Mulamootil, E.A. McBean, and F. Rovers, eds., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 175-186.
- Decamp, O., and Warren, A., 1998. Bacteriivory in ciliates isolated from constructed wetlands (reed beds) used for wastewater treatment, *Water Res.* **32**: 1989-1996.
- Decamp, O., and Warren, A., 2000. Investigation of *Escherichia coli* removal in various designs of subsurface flow wetlands used for wastewater treatment, *Ecol. Eng.* **14**: 293-299.
- Decamp, O., Warren, A., and Sanchez, R., 1999. The role of ciliated protozoa in subsurface flow wetlands and their potential as bioindicators, *Wat. Sci. Tech.* **40**(3): 91-98.
- De Jong, J., 1976. The purification of wastewater with the aid of rush or reed ponds, in: *Biological Control of Water Pollution*, J. Tourbier and R.W. Pierson, (eds.), Pennsylvania University Press, Philadelphia, pp. 133-139.
- De la Cruz, A.A., 1979. Production and transport of detritus in wetlands, in: *Wetland Values and Functions: The State of Our Understanding*, P.E. Greeson, J.R. Clark and J.E. Clark, eds., Am. Water Resour. Assoc., Minneapolis, Minnesota, pp. 162-174.
- De la Haba, P., Aguera, E., Benitez, L., and Maldonado, J.M., 2001. Modulation of nitrate reductase activity in cucumber (*Cucumis sativus*) roots, *Plant Sci.* **161**: 231-237.
- DeLaune, R.D., and Pezeshki, S.R., 1991. Role of soil chemistry in vegetative ecology of wetlands, *Trends in Soil Sci.* **1**: 101-112.
- DeLaune, R.D., Reddy, C.N., and Patrick, W.H., Jr., 1981. Organic matter decomposition in soil as influenced by pH and redox conditions, *Soil Biol. Biochem.* **13**: 533-534.
- DeLaune, R.D., Smith, C.J., and Sarafyan, M.N., 1986. Nitrogen cycling in a freshwater marsh of *Panicum hemitomon* on the deltaic plain of the Mississippi River, *J. Ecol.* **74**: 249-256.

- DeLaune, R.D., Devai, I., Mulbah, C., and Lindau, C.W., 1997. The influence of soil redox conditions on atrazine degradation in wetlands, *Agric. Ecosyst. Environ.* **66**: 41-46.
- DeLaune, R.D., Patrick, W.H., Jr., and Guo, T., 1998. The redox-pH chemistry of chromium in water and sediment, in: *Metals in Surface Waters*, H.E. Allen, A.W. Garrison and G.W. Luther, eds., Sleeping Bear Press, Inc., pp. 241-255.
- DeLaune, R.D., Devai, I., Crozier, C.R., and Kelle, P., 2002. Sulfate reduction in Louisiana marsh soils of varying salinities, *Commun. Soil Sci. Plant Anal.* **33**: 79-94.
- Del Bubba, M., and Lepri, L., 2002. Surfactant removal by Horizontal Subsurface Flow (SFS-h) pilot-scale constructed wetland, *Res. Adv. Wat. Res.* **3**: 89-109.
- Del Bubba, M., Checchini, L., Lepri, L., Ducceschi, L., Griffini, O., and Tabani, F., 1998. Use of subsurface horizontal wetlands as tertiary treatment systems, in: *Proc. 6<sup>th</sup> Internat. Conf. on Wetlands Systems for Water Pollution Control*, S.M. Tauk-Tornisielo and E. Salati Filho, eds., Universidade Estadual Paulista, Sao Paulo State, Brazil and IAQW, pp. 688-698.
- Del Bubba, M., Lepri, L., Cincinelli, A., Griffini, O., and Tabani, F., 2000. Linear alkylbenzensulfonates (LAS) removal in a pilot submerged horizontal flow constructed wetland, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, pp. 919-925.
- Del Bubba, M., Arias, C.A., and Brix, H., 2003. Phosphorus adsorption maximum of sands for use as media in subsurface flow constructed reed beds as measured by the Langmuir isotherm, *Wat. Res.* **37**: 3390-3400.
- De Leeuw, J., Wielemaker, A., de Munck, W., and Herman, P.M.J., 1996. Net aerial primary production (NAPP) of the marsh macrophyte *Scirpus maritimus* estimated by a combination of destructive and non-destructive sampling methods, *Vegetatio* **123**: 101-108.
- Delhaize, E.P., and Ryan, R., 1995. Aluminum toxicity and tolerance in plants, *Plant Physiol.* **107**: 315-321.
- Delhaize, E., Ryan, P.R., and Randall, P.J., 1993. Aluminium tolerance in wheat (*Triticum aestivum* L.). II. Aluminium-stimulated excretion of malic acid from root species, *Plant Physiol.* **103**: 695-702.
- De Lucas, A., Villaseñor, J., Gómez, R., and Mena, J., 2006. Influence of polyphenols in winery wastewater wetland treatment with different plant species, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1677-1685.
- DeLucia, E.H., and Schlesinger, W.H., 1995. Photosynthetic rates and nutrient-use efficiency among evergreen and deciduous shrubs in Okefenokee Swamp, *Int. J. Plant Sci.* **156**: 19-28.
- Delwiche, C.C., and Bryan, B.A., 1976. Denitrification, *Ann. Rev. Microbiol.* **30**: 241-262.
- DeMarte, J.A., and Hartman, R.T., 1974. Studies on absorption of <sup>32</sup>P, <sup>59</sup>Fe and <sup>45</sup>Ca by water milfoil, *Ecology* **55**: 188-194.
- De Matos, C.F., and Da Gama, C.D., 2004. Constructed wetlands for the treatment of acid mine drainage of a lignite mine – Design and full scale performance, in: *Proc. 9<sup>th</sup> Internat., Conf. Wetlands Systems for Water Pollution Control*, ASTEE, Lyon, France, pp. 377-383.
- Demil, C., 1996. Kleinschalige waterzuiveringssystem een groot idee. *De Standaard*, 3. May.
- De Morais, L.J., Vymazal, J., Bartolomeu, F., and Dias, V.N., 2003. Operation, maintenance and costs of constructed wetlands, in: *Proc Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 315-323.
- Denny, P. 1980. Solute movement in submerged angiosperms, *Biol. Rev.* **55**: 65-92.
- Denny, P., 1987. Mineral cycling by wetland plants – a review, *Arch. Hydrobiol. Beih. Ergebn. Limnol.* **27**: 1-25.

- De Polli, H., Matsui, E., Döbereiner, J., and Salati, E., 1977. Confirmation of nitrogen fixation in two tropical grasses by  $^{15}\text{N}_2$  incorporation, *Soil Biol. Biochem.* **9**: 119-123.
- Dévai, I., and Delaune, R.D., 1995a. Evidence for phosphine production and emission from Louisiana and Florida marsh soils, *Organic Geochem.* **23**: 277-279.
- Dévai, I., and DeLaune, R.D., 1995b. Formation of volatile sulfur compounds in salt marsh sediment as influenced by soil redox condition, *Org. Geochem.* **23**: 283-287.
- Dévai, I., Felföldy, M., Wittner, I., and Plócz, S., 1988. Detection of phosphine: new aspects of the phosphorus cycle in the hydrosphere, *Nature* **333**: 343-345.
- Devai I., Delaune R.D., Devai G., Patrick W.H.Jr., and Czegegy I., 1999. Phosphine production of various wastewater and sewage sludge sources, *Anal. Lett.* **32**: 1447-1457.
- De Vos, C.R., Lubberding, H.J., and Bienfait, H.F., 1986. Rhizosphere acidification as response to iron deficiency in bean plants, *Plant Physiol.* **81**: 842-846.
- De Vries, J., 1972. Soil filtration of wastewater effluent and the mechanism of pore clogging, *J. Water Pollut. Control Fed.* **44**: 565-573.
- De Wit, M.C.J., 1978. Morphology and functions of roots and shoot growth of crop plants under oxygen deficiency, in: *Plant Life under Anaerobic Environments*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci. Publ., Ann Arbor, Michigan, pp. 333-350.
- De Zeeuw, W., Heijnen, G., and De Vries, J., 1990. Reed bed treatment as a wastewater (post) treatment alternative in the potato starch industry, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper, and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 551-553.
- Dialynas, G., Kefalakis, N., Dialynas, M., and Angelakis, A., 2002. Performance of an innovative FWS constructed wetland in Crete, Greece, *Wat. Sci. Tech.* **46**(4-5): 355-360.
- Dias, V.N., and Pacheco, P.M., 2001. Constructed wetlands for wastewater treatment in Portugal: a global overview, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 271-303.
- Dias, V.N., Silva, N., Serra, H., Imácio, M.M., and Vaz, A.S., 2000. Constructed wetlands for wastewater treatment in Portugal: inventory and performance, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, pp. 845- 857.
- Dias, V.N., Canseiro, C., Gomes, A.R., Serra, V., Picarra Martins, C., 2005. Sado wastewater treatment plant – Beja, Portugal, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 169-175.
- Dias, V.N., Canseiro, C., Gomes, A.R., Correia, B., and Bicho, C., 2006. Constructed wetlands for wastewater treatment in Portugal: a global overview, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 91-101.
- Diaz, O.A., Reddy, K.R., and Moore, P.A., Jr. 1994. Solubility of inorganic P in stream water as influenced by pH and Ca concentration, *Water Res.* **28**: 1755-1763.
- Dickerman, J.A., Stewart, A.J., and Wetzal, R.G., 1986. Estimates of net aerial aboveground production to sampling frequency, *Ecology* **67**: 650-659.
- Dickson, R.E., Hosner, J.P., and Hosley, N.W., 1965. The effects of four water regimes upon the growth of four bottomland tree species, *For. Sci.* **11**: 299-305.
- Dinges, R., 1979. Development of hyacinth wastewater treatment systems in Texas, in: *Aquaculture Systems for Wastewater Treatment. Seminar Proceedings and Technology Assessment*, R.K. Bastian and S.C. Reed, eds., EPA 430/9-80-006, U.S. EPA, Washington, D.C., pp. 193-226.
- Dinges, R., 1982. *Natural Systems for Water Pollution Control*, Van Nostrand Reinhold, New York.
- Dinges, R., and Doersam, J., 1987. The Hornsby Bend Hyacinth Facility in Austin, Texas, *Wat. Sci. Tech.* **19**: 41-49.
- DLG, EPA, NSW, DLWC, DUAP, 1998. On-site sewage management for single households, Department of Local Government, Environmental Protection Agency NSW,

- NSW Health, Department of Land and Water Conservation, Department of Urban Affairs and Planning.
- Dobelmann, J.K., Müller, D.H., and Hahn, H.H., 2000. Tropical waterhyacinth in constructed wetlands as a seasonal water treatment possibility by moderate climate zone, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, pp. 1207-1211.
- Döbereiner, J., and Day, J.M., 1975. Nitrogen fixation in the rhizosphere of tropical grasses, in: *Nitrogen Fixation by Free-Living Microorganisms*, W.D.P. Stewart, ed., Cambridge University Press, Cambridge, pp. 39-56.
- Döbereiner, J., Day, J.M., and Dart, P.J., 1972. Nitrogenase activity and oxygen sensitivity of the *Paspalum notatum* – *Azotobacter paspali* association, *J. Gen. Microbiol.* **71**: 103-116.
- Dobrokhotova, K.V., ed., 1982. *Vodnye rastenija (Water Plants)*, Kainar, Alma Ata, Kazakhstan (in Russian).
- Dohányos, M., Koller, J., and Strnadová, N., 2004. *Wastewater Treatment*, Prague Institute of Chemical Technology, Praha, Czech Republic (in Czech).
- Dombeck, G.D., Perry, M.W., and Phinney, J.T., 1998. Mass balance on water column trace metals in a free-surface-flow-constructed wetlands in Sacramento, California, *Ecol. Eng.* **10**: 313-339.
- Dommergues, Y., Balandreau, J., Rinaudo, G., and Weinhard, P., 1973. Non-symbiotic nitrogen fixation in the rhizosphere of rice, maize, and different tropical grasses, *Soil Biol. Biochem.* **5**: 83-89.
- Dong, K., and Lin, C., 1994. The purification mechanism of the system of wetlands and oxidation ponds, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 230-236.
- Dormaer, J., 1972. Seasonal patterns of soil organic phosphorus, *Can. J. Soil Sci.* **52**: 107-122.
- dos Santos Oliveira, J.F., 1995. *A Lagunagem em Portugal. Conceitos Básicos e Aplicações Práticas*. Ed. Universitárias Lusófonas, Lda., Lisbon, Portugal.
- Dotro, G., Fitch, M., Larsen, D., and Palazolo, P., 2006. Treatment of chromium-bearing wastewaters from tannery operations with constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1725-1733.
- Doyle, M.O., and Otte, M.L., 1997. Organism-induced accumulation of iron, zinc and arsenic in wetland soils, *Environ. Pollut.* **96**: 1-11.
- Dreiss, S.J., 1986. Chromium migration through sludge treated soils, *Groundwater* **24**: 312-321.
- Drever, J.I., 1988. *The Geochemistry of Natural Waters*, Prentice Hall, Englewood Cliffs, NJ.
- Drew, M.C., and Lynch, J.M., 1980. Soil anaerobiosis, micro-organisms, and root function, *Annu. Rev. Phytopathol.* **18**: 37-66.
- Drew, M.C., Jackson, M.B., and Gifford, S., 1979. Ethylene-promoted adventitious rooting and development of cortical air spaces (aerenchyma) in roots may be adaptive responses to flooding in *Zea mays* L., *Planta* **147**: 83-88.
- Drewes, K. 1928. Über die Assimilation des Luftstickstoffs durch Blaualgen. *Zentr. Bakteriell. Parasitenk. Abt. II.* **76**: 88-101.
- Drizo, A., 1998. Phosphate and ammonium removal from waste water using constructed wetland systems, Ph. D. Thesis, University of Edinburgh, United Kingdom.
- Drizo, A., Frost, C.A., Grace, J., and Smith, K.A., 1997. Phosphate and ammonium removal by constructed wetlands with horizontal subsurface flow, using shale as a substrate, *Wat. Sci. Tech.* **35**(5): 95-102.
- Drizo, A., Frost, C.A., Grace, J., and Smith, K.A., 1999. Physico-chemical screening of phosphate removing substrates for use in constructed wetlands, *Water Res.* **33**: 3595-3602.

- Drizo, A., Frost, C.A., Grace, J., and Smith, K.A., 2000. Phosphate and ammonium distribution in a pilot-scale constructed wetland with horizontal subsurface flow using shale as a substrate, *Water Res.* **34**: 2483-2490.
- Drizo, A., Comeau, Y., Forget, C., and Chapuis, R.P., 2002. Phosphorus saturation potential: a parameter for estimating the longevity of constructed wetland systems, *Environ. Sci. Technol.* **36**: 4642-4648.
- Drizo, A., Twohig, E., Weber, D., Bird, S., and Ross, D., 2006. Constructed wetlands for dairy effluent treatment in Vermont: two years of operation, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1611-1621.
- Drobotko, V.G., Rashba, E.Y., Aizenman, B.E., Zelepukha, S.I., Novikova, S.I., and Kaganskaya, M.B., 1958. Antimicrobial activity of alkaloids obtained from *Valeriana officinalis*, *Chelidonium majus*, *Nuphar luteum* and *Asarum europeum*, *Antibiotiki* **22**, Chem. Abstr. 53: 12589d.
- Dubius, L.G., and Becquer, T., 2001. Phosphorus sorption and desorption in oxide-rich Ferralsols of New Caledonia, *Austr. J. Soil Res.* **39**: 403-414.
- DuBowy, P., and Reaves, P. (eds.), 1994. *Constructed Wetlands for Animal Waste Management*, Conservation Technology Information Center, U.S. Dept. of Agriculture Soil Conservation Service, U.S: EPA Region V and Purdue University Agric. Res. Program, Lafayette, Indiana.
- Dufour, A.P., 1977. *Escherichia coli*: the fecal coliform, in: *Bacterial Indicators/Health Hazards Associated with Water*, Hoadley, A.W. and Dutka, B.J., eds., American Society for Testing and Materials: Philadelphia, PA, pp. 48-58.
- Duncan, C.B.M., 1992. Constructed subsurface flow wetland treatment of municipal wastewater: some New Zealand experience, *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 23.1 – 23.8.
- Dunne, E.J. and Reddy, K.R., 2005. Phosphorus biogeochemistry of wetlands in agricultural watersheds, in: *Nutrient Management in Agricultural Watersheds: A Wetland Solution*, E.J. Dunne, K.R. Reddy and O.T. Carton, eds., Wageningen Academic Publishers, Wageningen, The Netherlands, pp. 105-119.
- Dunnette, D.A., 1989. Origin of hydrogen sulfide in freshwater sediments in biogenic sulfur in the environment, *ACS Symposium Series* **393**: 72-78.
- Durán de Bazúa, C., Haberl, R., Kreiner, I., Ranjani-Krishnan, Luna-Pabello, V.M., Fenoglio-Limón, F.E., Kneidinger, C., Millán-Hernández, S., Miranda-Rios, M., Ramírez-Carillo, H.F., Salinas-Castillo, N.V., Sánchez-García, H., Schaller, P., and Soto-Esquivel, M.G., 2000. Artificial wetlands: viable options for rural, suburban, and urban areas in Mexico City, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., pp. 873-879.
- Durska, B., 1970. Changes in the reed (*Phragmites communis* Trin.) condition caused by diseases of fungal and animal origin, *Pol. Arch. Hydrobiol.* **17**: 373-396.
- Dušek, J., and Květ, J., 1996. Monitoring of plants in constructed wetlands, Final report of a research project 206/94/1621. Czech Academy of Sciences, Institute of Botany, Trebon, Czech Republic (in Czech).
- DWA. 2006. Grundsätze für Bemessung, Bau und Betrieb von Pflanzenkläranlagen mit bepflanzten Bodenfiltern zur biologischen Reinigung kommunalen Abwassers. Arbeitsblatt DWA-A 262, DWA – Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V., Hennef, Germany (in German).
- Dykyjová, D., 1971. Production, vertical structure and light profiles in littoral stands of reed bed species, *Hidrobiologia* (Bucharest) **12**: 361-376.
- Dykyjová, D. 1973. Content of mineral macronutrients in emergent macrophytes during their seasonal growth and decomposition, in: *Ecosystem Study on Wetland Biome in*

- Czechoslovakia, S. Hejný, ed., Czechoslovak IBP/PT-PP Report No. 3, Třeboň, Czech Republic, pp. 163-172.
- Dykyjová, D., 1980. Production ecology of *Acorus calamus*, *Folia Geobot. Phytotax.* (Praha) **15**: 29-57.
- Dykyjová, D., 1989. Methods for determination of mineral nutrients pool and their cycling in the ecosystem, in: *Methods for Ecosystem Studies*, D. Dykyjová, ed., Academia, Praha, Czech Republic, pp. 414-435 (in Czech).
- Dykyjová, D., and Příbáň, K., 1975. Energy content in the biomass of emergent macrophytes and their ecological efficiency, *Arch. Hydrobiol.* **75**: 90-108.
- Dykyjová, D., and Hradecká, D., 1973. Productivity of reed-bed stands in relation to the ecotype, microclimate, and trophic conditions in the habitat, *Pol. Arch. Hydrobiol.* **20**: 111-119.
- Dykyjová, D., and Hradecká, D., 1976. Production ecology of *Phragmites communis*. 1. Relation of two ecotypes to the microclimate and nutrient conditions of habitat, *Folia Geobot. Phytotax.* **11**: 23-61.
- Dykyjová, D. and Květ, J., eds. 1978. *Pond Littoral Ecosystems: Structure and Functioning*, Springer-Verlag, Berlin.
- Dykyjová, D., and Květ, J., 1982. Mineral nutrient economy in wetlands of the Třeboň Basin Biosphere Reserve, Czechoslovakia, in: *Wetlands. Ecology and Management*, B. Gopal, R.E. Turner, R.G. Wetzel and D.F. Whigham, eds., Internat. Sci. Publ., and Natl. Inst. Ecol., Jaipur, India, pp. 335-355.
- Dzikiewicz, M., 1996. The use of macrophytes for wastewater treatment in rural areas of Poland – social aspects, *Environ. Res. Forum* **5-6**: 249-254.
- Eary, L., and Rai, D., 1988. Chromate removal from aqueous wastes by reduction with ferrous ion, *Environ. Sci. Technol.* **22**: 972-977.
- Eberhardt, T.L., Min, S.-H., and Han, J.S., 2006. Phosphate removal by refined aspen wood fiber treated with carboxymethyl cellulose and ferrous chloride, *Bioresource Technol.* **97**: 2371-2376.
- Ebert, M., Evans, N.T.S., and Barber, D.A., 1962. The movement of <sup>15</sup>O through barley and rice plants, *J. Exp. Bot.* **39**: 397-403.
- Eckhardt, D.A.V., Surface, J.M., and Peverly, J.H., 1999. A constructed wetland system for treatment of landfill leachate, Monroe County, New York, in: *Constructed Wetlands for the Treatment of Landfill Leachates*, G. Mulamootil, E.A. McBean, and F. Revers, eds., Lewis Publisher/CRC Press, Boca Raton, pp. 205-222.
- ECOFYT, 2007. <http://www.ecofyt.nl>
- Economopoulou, M.A., and Tsihrintzis, V.A., 2003. Design methodology and area sensitivity analysis of horizontal subsurface flow constructed wetlands, *Water Resour. Management* **17**: 147-174.
- Economopoulou, M.A., and Tsihrintzis, V.A., 2004. Design methodology of free water surface constructed wetlands, *Water Resour. Management* **18**: 541-565.
- Edwards, M.E., Brinkmann, K.C., and Watson, J.T., 1993. Growth of soft-stem bulrush (*Scirpus validus*) plants in gravel-based subsurface flow constructed wetlands, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 415-425.
- Eger, P., Melchert, G., Antonson, D., and Wagner, J., 1993. The use of wetland treatment to remove trace metals from mine drainage, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 171-178.
- Egli, K., Fanger, U., Alvarez, P.J.J., Siegrist, H., van der Meer, J.R., and Zehnder, A.J.B., 2001. Enrichment and characterization of an anammox bacterium from a rotating biological contactor treating ammonium-rich leachate, *Arch. Microbiol.* **175**: 198-207.
- Ehrenreich, A., and Widdel, F., 1994. Anaerobic oxidation of ferrous iron by purple bacteria, a new type of phototrophic metabolism, *Appl. Environ. Microbiol.* **60**: 4517-4526.

- Ehrich, S., Behrens, D., Lebedev, E., Ludwig, W., and Bock, E., 1995. A new obligately chemolithoautotrophic nitrite-oxidizing bacterium, *Nitrospira moscoviensis* sp nov and its phylogenetic relationship, *Arch. Microbiol.* **164**: 16-23.
- Eighmy, T.T., and Bishop, P.L., 1988. Autotrophic nitrification and its role in nitrogen removal in *Elodea nuttallii*-based aquatic treatment system, *Wat. Supply* **6**: 119-124.
- Elgala, A.M., and Amberger, A., 1982. Effect of pH, organic matter and plant growth on the movement of iron soils, *J. Plant. Nutr.* **5**: 841-855.
- El Hafiane, F., and El Hamouri, B., 2004. Subsurface-horizontal flow constructed wetland for polishing high rate ponds effluent, in: *Wetland Systems and Waste Stabilization Ponds Communications of Common Interest*, ASTEE. Lyon, France, pp. 141-146.
- Elias, J.M., Salati Filho, E., and Salati, E., 2001. Performance of constructed wetland system for public water supply, *Wat. Sci. Tech.* **44**(11/12): 579-584.
- Elliott, R.G., and Gilmour, C.R., 1971. Growth of *Pseudomonas stutzeri* with nitrate and oxygen as terminal electron acceptors, *Soil Biol. Biochem.* **3**: 331-335.
- Ellis, J.B., Revitt, D.M., and Liewelly, N., 1997. Transport and the environment: effects of organic pollutants on water quality, *J. Inst. Wat. Environ. Manage.* **11**: 170-177.
- Elrashidi, M.A., Adriano, D.C., Workman, S.M., and Lindsay, W.L., 1987. Chemical selenium equilibria in soils, *Soil Sci. Soc. Am. J.* **51**: 141-152.
- Elshahed, M.S., and McInerney, M.J., 2001. Is interspecies hydrogen transfer needed for toluene degradation under sulfate-reducing conditions? *FEMS Microbiol. Ecol.* **35**: 163-169.
- Emsley, J., 1980. The phosphorus cycle, in: *The Handbook of Environmental Chemistry*, Volume 1, Part A, *The Natural Environment and the Biogeochemical Cycles*, O. Hutzinger, ed., Springer Verlag, Berlin, pp. 147-167.
- Engler, R.M., Brannon, J., and Rose, J., 1977. A practical selective extraction procedure for sediment characterization, in: *Chemistry of Marine Sediments*, T.F. Yen, ed., Ann Arbor Sci. Inc., Ann Arbor Michigan, pp. 163-172.
- Engler, R.P., and Patrick, W.H., Jr., 1975. Stability of sulfides of manganese, iron, zinc, copper, and mercury in flooded and nonflooded soil, *Soil Sci.* **119**: 217-221.
- Ennabili, A., Ater, M., and Radoux, M., 1998. Biomass production and NPK retention in macrophytes from wetlands of the Tingitan Peninsula, *Aquat. Bot.* **62**: 45-56.
- Erickson, L.E., and Lee, K.H., 1989. Degradation of atrazine and related s-triazines, *CRC Crit. Rev. Environ. Control* **19**: 1-14
- Ernst, W.H.O., 1990. Ecophysiology of plants in waterlogged and flooded environments, *Aquat. Bot.* **38**: 73-90.
- Ernst, W., Mathys, W., and Janiesch, G., 1975. *Physiologische Grundlagen der Schwermetallresistenz*. Forsch, Landes Nord. Westfalen Nr. 2496.
- Esser, D., Jusiak, P., and Liénard, A., 2006. The use of constructed wetlands for the treatment of effluents from housing schemes and villages in an island in the tropics: the case of Mayotte, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 877-888.
- Esser, D., Pietri, C., and Murillo, B., 2007. A compact one-stage reed bed filter providing primary and secondary treatment for small communities, in: *Book of Abstracts of the 2<sup>nd</sup> Internat. Congress SmallWat07*, CENTA, Sevilla, Spain, pp. 94.
- Esteves, F. A., 1979. Die Bedeutung der aquatischer Makrophyten für den Stoffhaushalt des Schöhsees. I. Die Produktion an Biomasse, *Arch. Hydrobiol. Suppl.* **57**: 117-143.
- Esteves, F.A., and Barbieri, R., 1983. Dry weight and chemical changes during decomposition of tropical macrophytes in Lobo Reservoir-Sao Paulo, Brazil, *Aquat. Bot.* **16**: 285-295.
- Evans, K.M., Gatehouse, J.A., Lindsay, W.P., Shi, J., Tommey, A.M., and Robinson, N.J., 1992. Expression of the pea metallothionein-like gene *PsMT<sub>A</sub>* in *Escherichia coli* and *Arabidopsis thaliana* and analysis of trace metal ion accumulation, implications for *PsMT<sub>A</sub>* function, *Plant Mol. Biol.* **20**: 1019-1028.



- Evans, N.T.S., and Ebert, M., 1960. Radioactive oxygen in the study of gas transport down the root of *Vicia faba*, *J. Exp. Bot.* **11**: 246-257.
- Ewel, K.C., and Odum, H.T., eds., 1984. *Cypress Swamps*, University of Florida Press, Gainesville, Florida.
- Ewel, K.C., Harwell, M.A., Kelly, J.R., Grover, H.D., and Bedford, B.L., 1982. *Evaluation of the Use of Natural Ecosystems for Wastewater Treatment*, Cornell University Ecosyst. Res. Center Report No. 15.
- Eymont, A., 1995. *Conception of Sewage Treatment for Pomorze Village, Community Opinogora*. ZIS IBMER, Warsaw, Poland.
- Farahbakhshazad, N., and Morrison, G.M., 2003. Phosphorus removal in a vertical upflow constructed wetland system, *Wat. Sci. Tech.* **48**(5): 43-50.
- Farwell, S.O., Sherrard, A.E., Pack, M.R., and Adams, D.F., 1979. Sulfur compounds volatilized from soils at different moisture contents, *Soil Biol. Biochem.* **11**: 411-415.
- Fatoki, O.S., 1997. Biomethylation in the natural environment, *S. Afr. J. Sci.* **93**: 366-370.
- Faulkner, S.P., and Richardson, C.J., 1989. Physical and chemical characteristics of freshwater wetland soils, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, D.A., ed., Lewis Publishers, Chelsea, Michigan, pp. 41-72.
- Feely, R.D., Massoth, G.J., Paulson, A.J., and Gendron, J.F., 1983. Possible evidence for enrichment of trace elements in the hydrous manganese oxide phases of suspended matter from an urbanized embayment, *Estuar. Coast. Shelf Sci.* **7**: 693-708.
- Fehr, G., Geller, G., Goetz, D., Hagendorf, U., Kunst, S., Rustige, H., and Welker, B., 2003. Bewachsene Bodenfilter als Verfahren der Biotechnologie (Endbericht des DBU-Verbundprojektes AZ 14178-01). Texte Nr. 05/03, Umweltbundesamt, Berlin, Germany (in German).
- Fierabend, J.S., 1989. Wetlands: The lifeblood of wildlife, in: *Constructed Wetlands for Wastewater treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 107-118.
- Fejtitel, T.C., DeLaune, R.D., and Patrick, W.H., Jr., 1988. Biogeochemical control on metal distribution and accumulation in Louisiana sediments, *J. Environ. Qual.* **17**: 88-94.
- Ferguson, A.R., and Bollard, E.G. 1969. Nitrogen metabolism of *Spirodela oligorhizza*. I. Utilization of ammonium, nitrate and nitrite, *Planta* **88**: 344-352.
- Ferguson, J.F., and Gavis, J., 1972. A review of the arsenic cycle in natural waters, *Water Res.* **6**: 1259-1274.
- Ferris, F.G., Schultze, S., Witten, T.C., Fyfe, W.S., and Beveridge, T.J., 1989. Metal interactions with microbial biofilms in acidic and neutral pH environments, *Appl. Environ. Microbiol.* **55**: 1249-1257.
- Fetter, C.W., Sloey, W.E., and Spangler, F.L., 1976. Potential replacement of septic tank drain fields by artificial marsh wastewater treatment systems, *Ground Water* **14** (6), 1-7.
- Fewson, C.A., and Nicholas, D.J.D., 1961. Utilization of nitrate by micro-organisms, *Nature* **190**: 2-7.
- Fiala, K., 1976. Underground organs of *Phragmites communis*, their growth, biomass, and net production, *Folia Geobot. Phytotax.* (Praha) **11**: 225-259.
- Fiala, K., 1978. Underground organs of *Typha angustifolia* and *Typha latifolia*, their growth, propagation and production, *Acta Sci. Nat. Brno* **12**(8): 1-43.
- Fiala, K., Dykyjová, D., Květ, J., and Svoboda, J., 1968. Methods of assessing rhizome and root production in reed bed stands, in: *Methods of Productivity Studies in Root Systems and Rhizosphere Organisms*, M.S. Ghilarov, V.S. Kovda, L.N. Novichkova-Ivanova, L.E. Rodin, and V.M. Sveshnikova, eds., Nauka Leningrad, Russia, pp. 36-47.
- Fiegel, C.R., Collins, B., and Wein, G., 1995. Variation in survival and biomass of two wetland grasses at different nutrient and water levels over a six week period, *Bull. Torrey Bot. Club.* **122**: 24-29.
- Filbin, G.J., and Hough, R.A., 1985. Photosynthesis, photorespiration and productivity in *Lemma minor* L., *Limnol. Oceanogr.* **30**: 322-334.

- Findlater, B.C., Hobson, J.A., and Cooper, P.F., 1990. Reed bed treatment systems: performance evaluation, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 193-204.
- Finell, M., Nilsson, C., Olsson, R., Agnemo, R., and Svensson, S., 2002. Briquetting of fractionated reed canary grass for pulp production, *Industr. Crops Products* **16**: 185-192.
- Finlayson, C.M., and Chick, A.J., 1983. Testing the potential of aquatic plants to treat abattoir effluent, *Water Res.* **17**: 415-422.
- Finlayson, M., Chick, A., von Oertzen, I., and Mitchell, D., 1987. Treatment of piggery effluent by an aquatic plant filter, *Biol. Wastes* **19**: 179-196.
- Finlayson, M., von Oertzen, I., and Chick, A.J., 1990. Treating poultry abattoir and piggery effluents in gravel trenches, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 559-562.
- Finster, K., Liesack, W., and Tindall, B.J., 1997. *Desulfospira joergensenii*, gen. nov., sp. nov., a new sulfate-reducing isolated from marine surface sediment, *Syst. Appl. Microbiol.* **20**: 201-208.
- Firestone, M.K., 1982. Biological denitrification, in: *Nitrogen in Agriculture*, F.J. Stevenson, ed., American Society of Agronomy, Madison, Wisconsin, pp. 289-326.
- Firestone, M.K., Smith, M.S., Firestone, R.B., and Tiedje, J.M. 1979. The influence of nitrate, nitrite, and oxygen on the composition of the gaseous products of denitrification in soil. *Soil Sci. Soc. Am. J.* **43**: 1140-1144.
- Fisher, M.M., and Reddy, K.R., 1987. Water hyacinth (*Eichhornia crassipes* [Mart.] Solms.) for improving eutrophic lake water: water quality and mass balance, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 969-976.
- Fisher, P.J., 1990. Hydraulic characteristics of constructed wetlands at Richmond, NSW, Australia, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 21-31.
- Fitzgerald, G.P., 1969. Some factors in the competition or antagonism between bacteria, algae and aquatic weeds, *J. Phycol.* **5**: 351-359.
- Flanagan, N.E., Mitsch, W.J., and Beach, K., 1994. Predicting metal retention in a constructed mine dewaterage, *Ecol. Eng.* **3**: 135-159.
- Flughafen Direktion Zürich, 1999. Reinigung der Enteiserabwasser and Flughafen Zürich, Flughafendirektion Zürich, Switzerland.
- Focht, D.D., 1974. The effect of temperature, pH, and aeration on the production of nitrous oxide and gaseous nitrogen - a zero order kinetic model, *Soil Sci.* **118**: 173-179.
- Focht, D.D., and Verstraete, W., 1977. Biochemical ecology of nitrification and denitrification, *Adv. Microbiol. Ecol.* **1**: 135-214.
- Fogg, G.E., 1974. Nitrogen fixation, in: *Algal Physiology and Biochemistry*, W.D.P. Stewart, ed., University of California Press, Berkeley, pp. 560-582.
- Fonder, N., and Xanthoulis, D., 2007. Removal processes and their distribution inside a subsurface horizontal flow constructed wetland, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 60-61.
- Fontes, D.E., Mills, A.L., Hornberger, G.M., and Herman, J.S., 1991. Physical and chemical factors influencing transport of microorganisms through porous media, *Appl. Environ. Microbiol.* **57**: 2473-2481.
- Ford, T.E., ed., 1993. *Aquatic Microbiology*, Blackwell Scientific, Cambridge, Massachusetts.
- Forsberg, C., 1960. Subaquatic macrovegetation in Ösbysjön, Djursholm, *Oikos* **11**: 183-191.
- Foss, J.G., 1982. Resistance to winter stress factors of varieties of Reed Canarygrass (*Phalaris arundinacea* L.) as related to hardening conditions and to carbohydrate store and consumption, *Meldinger fra Norges landhukshgskole* **62**: 1-29.
- Fox, R.L., and Kamprath, E.J., 1970. Phosphate adsorption isotherms for evaluating the phosphate requirements of soil, *Soil Sci. Soc. Am. Proc.* **34**: 902-906.

- Francis, A.J., and Dodge, C.J. 1988. Anaerobic microbial dissolution of transition and heavy metal oxides, *Appl. Environ. Microbiol.* **54**: 1009-1014.
- Francis, A.J., Duxbury, J.M., and Alexander, M., 1974. Formation of volatile organic products in soils under anaerobiosis II, *Soil Biol. Biochem.* **7**: 51-56.
- Frankland, P.F., and Frankland, G.C., 1890. The nitrifying process and its specific ferment. Part 1, *Phil. Trans. R. Soc. London B* **181**: 107-128.
- Freitag, T.E., and Prosser, J.I., 2003. Community structure of ammonia-oxidizing bacteria within anoxic marine sediments, *Appl. Environ. Microbiol.* **69**: 1359-1371.
- Freney, J.R., Denmead, O.T., and Simpson, J.R. 1979. Nitrous oxide emission from soils at low moisture contents, *Soil Biol. Biochem.* **11**: 167-173.
- Friedrich, C.G., 1998. Physiology and genetics of sulfur-oxidizing bacteria, *Adv. Microb. Physiol.* **39**: 235-289.
- Friedrich, M., and Schink, B., 1995. Isolation and characterization of a desulforubidin-containing sulfate-reducing bacterium growing with glycolate, *Arch. Microbiol.* **164**: 271-279.
- Froelich, P.N., 1988. Kinetic control of dissolved phosphate in natural rivers and estuaries: a primer on the phosphate buffer mechanism, *Limnol. Oceanogr.* **33**: 649-668.
- Froelich, P.N., Klinkhammer, G.P., Bender, M.L., Luedtke, N.A., Heath, G.R., Cullen, D., Dauphin, P., Hammond, D., Hartman, P., and Maynard, V., 1979. Early oxidation of organic matter in pelagic sediments of the eastern equatorial Atlantic: suboxic diagenesis, *Geochim. Cosmochim. Acta* **43**: 1075-1090.
- Fude, L., Harris, B., Urrutia, M.M., and Beveridge, T.J., 1994. Reduction of Cr(VI) by a consortium of sulfate-reducing bacteria (SRB III), *Appl. Environ. Microbiol.* **60**: 1525-1531.
- Fujita, M., and Kawanishi, T., 1986. Purification and characterization of a Cd-binding complex from the root tissue of water hyacinth cultivated in a Cd<sup>2+</sup>-containing medium, *Plant Cell Physiol.* **27**: 1317-1325.
- Fujita, M., and Nakano, K., 1988. Metal specificities on induction and binding affinities of heavy metal-binding complexes in water hyacinth root tissues, *Agric. Biol. Chem.* **52**: 2335-2336.
- Furumai, H., and Ohgaki, S., 1982. Fractional composition of phosphorus forms in sediment related to release. *Wat. Sci. Tech.* **14**: 215-226.
- Gächter, R., and Meyer, J.S. 1993. The role of microorganisms in mobilization and fixation of phosphorus in sediments, *Hydrobiologia* **253**: 103-121.
- Gagnon, V., Chazarenc, F., Comeau, Y., and Brisson, J., 2006. Influence of macrophytes species on microbial density and activity in constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1025-1033.
- Galatowitsch, S.M., Anderson, N.O., and Ascher, P.D., 1999. Invasiveness in wetland plants in temperate North America, *Wetlands* **19**: 733-755.
- Galatowitsch, S.M., Whited, D.C., Lehtinen, R., Husveth, J., and Schik, K., 2000. The vegetation of wet meadows in relation to their land-use, *Environ. Monitor. Assess.* **60**: 121-144.
- Gale, P.M., Reddy, K.R., and Graetz, D.A., 1994. Phosphorus retention by wetland soils used for treated wastewater disposal, *J. Environ. Qual.* **23**: 370-377.
- Galinato, M.I., and van der Valk, A.G., 1986. Seed germination traits of annuals and emergents recruited during drawdowns in the Delta Marsh, Manitoba, Canada, *Aquat. Bot.* **26**: 89-102.
- Gallagher, J.L., 1978. Decomposition processes. Summary and recommendations, in: *Wetlands: Ecological Processes and Management Potential*, R.E. Good, D.F. Whigham, and Simpson, R.L., eds., Academic Press, New York, pp. 145-151.
- Gambrell, R.P., 1994. Trace and toxic metals in wetlands – a review, *J. Environ. Qual.* **23**: 883-891.

- Gambrell, R.P., and Patrick, W.H., Jr., 1978. Chemical and microbiological properties of anaerobic soils and sediment, in: *Plant Life in Anaerobic Environments*, D.D. Hook, and R.M.M. Crawford, eds., Ann Arbor Science Publishers, Ann Arbor, Michigan, pp. 375-423.
- Gambrell, R.P., and Patrick, W.H., Jr., 1988. The influence of redox potential on the environmental chemistry of contaminants in soils and sediments, in: *The Ecology and Management of Wetlands*, Vol. 1, *Ecology of Wetlands*, D.D. Hook, W.H., McKee, Jr., H.K. Smith, J. Gregory, V.G. Burrell, Jr., M.R. DeVoe, R.E. Sojka, S. Gilbert, R. Banks, L.H. Stolzy, C. Brooks, T.D. Matthews, and T.H. Shear, eds., Timber Press, Portland, Oregon, pp. 319-333.
- Gambrell, R.P., Khalid, R.A., and Patrick, W.H., Jr., 1980. Chemical availability of mercury, lead, and zinc in mobile bay sediment suspensions as affected by pH and oxidation-reduction conditions, *Environ. Sci. Technol.* **14**: 431-436.
- Gambrell, R.P., DeLaune, R.D., and Patrick, W.H., Jr., 1991. Redox processes in soils following oxygen depletion, in: *Plant Life Under Oxygen Deprivation*, M.B. Jackson, and D.D. Davies, eds., SPB Academic Publishing, The Hague, The Netherlands, pp. 101-117.
- Gammack, S.M., Peterson, E., Kemp, J.S., Cresser, M.S., and Kilham, K., 1992. Factors affecting the movement of microorganisms in soil, in: *Soil Biochemistry*, G. Stotzky, J.M. Bollag, eds., Marcel Dekker, New York, pp. 263-305.
- Gao, S., Tanji, K.K., Peters, D.W., Lin, Z., and Terry, N., 2003. Selenium removal from irrigation drainage water flowing through constructed wetland cells with special attention to accumulation in sediments, *Water Air Soil Pollut.* **144**: 263-284.
- García-Novo, F., and Crawford, R.M.M., 1973. Soil aeration, nitrate reduction and flooding tolerance in higher plants, *New Phytol.* **72**: 1031-1039.
- García, J., and Corzo, A., 2007. *Depuración con Humedales Construidos, Guía Práctica de Diseño, Construcción y Explotación de Sistemas de Humedales de Flujo Subsuperficial*. UPC, Barcelona.
- García, J., Vivar, J., Aromir, M., and Mujeriego, R., 2003. Role of hydraulic retention time and granular medium in microbial removal in tertiary treatment reed beds, *Wat. Res.* **37**: 2645-2653.
- García, J., Aguirre, P., Mujeriego, R., Huang, Y., Ortiz, L., and Bayona, J.M., 2004a. Initial contaminant removal performance factors in horizontal flow reed bed used for treating urban wastewater, *Wat. Res.* **38**: 1669-1678.
- García, J., Chiva, J., Aguirre, P., Álvarez, E., Sierra, J.P., and Mujeriego, R., 2004b. Hydraulic behavior of horizontal sub-surface flow constructed wetlands with different aspect ratio and granular medium size, *Ecol. Eng.* **23**: 177-187.
- García, J., Morató, J., and Bayona, J.M., eds., 2004c. *Nuevos Criterios para el Diseño y Operación de Humedales Construidos*. Ediciones CPET, Barcelona.
- García, J., Aguirre, P., Barragán, J., Mujeriego, R., Matamoros, V., and Bayona, J.M., 2005. Effect of key design parameters on the efficiency of horizontal subsurface flow constructed wetlands, *Ecol. Eng.* **25**: 405-418.
- Gardiner, J., 1974. The chemistry of cadmium in natural water. I. A study of cadmium complex formation using the cadmium specific-ion electrode, *Water Res.* **8**: 23-30.
- Garnett, T.P., Shabala, S.N., Smethurst, P.J., and Newman, I.A., 2001. Simultaneous measurement of ammonium, nitrate and proton fluxes along the length of eucalypt roots, *Plant Soil* **236**: 55-62.
- Garten, C.T., Jr., 1976. Correlations between concentrations of elements in plants, *Nature* **261**: 686-688.
- Garver, E.G., Dubbe, D.R., and Pratt, D.C., 1988. Seasonal patterns in accumulation and partitioning of biomass and macronutrients in *Typha* spp., *Aquat. Bot.* **32**: 115-130.
- Gasiunas, V., and Strusevičius, Z., 2003. The experience of wastewater treatment using constructed wetlands with horizontal subsurface flow in Lithuania, in: *Proc. Internat. Conf. Constructed and Riverine Wetlands for Optimal Control of Wastewater at*

- Catchment Scale*, Ü. Mander, C. Vohla and A. Poom, eds., University of Tartu, Institute of Geography, Tartu, Estonia, *Publ. Instituti Geographici Universitatis Tartuensisi* **94**, pp. 242-249.
- Gasiunas, V., Strusevičius, Z., and Strusevičiėne, M.-S., 2005. Pollutant removal by horizontal subsurface flow constructed wetlands in Lithuania, *J. Environ. Sci. Health* **40A**: 1467-1478.
- Gaudet, J.J., 1982. Nutrient dynamics of papyrus swamp, in: *Wetlands. Ecology and Management*, B. Gopal, R.E. Turner, R.G. Wetzel and D.F. Whigham, eds., Internat. Sci. Publ., and Natl. Inst. Ecol., Jaipur, India, pp. 305-319.
- Gayon, U., and Dupetit, G., 1886. Recherches sur la reduction des nitrates par les infinement petits, *Mem. Soc. Sci. Phys. Nat. Bordeaux Ser. 3*, **2**: 201-307.
- Geary, P.M., 1992. Diffuse pollution from wastewater disposal in small unsewered communities, *Aust. J. Soil Water Conserv.* **5** : 28-33.
- Geary, P.M., Mendez, H., and Dunstan, R.H., 2006. Design considerations in the performance of stormwater devices incorporating constructed wetlands, in : *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1833-1842.
- Geiger, W.F., 1998. Combined sewer outflow treatment – knowledge or speculation, *Wat. Sci. Tech.* **38**(10): 1-8.
- Geller, G., 1984. Der bepflanzte Bodenfilter-Bauanleitung, in: *Biologische Abwasserreinigung in Haus*, Verlag Ökobuch, Grebenstein, Germany, pp. 46-68.
- Geller, G., 1996. “Horizontal flow systems” for wastewater treatment: long term scientific and practical experience s: recommendations, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur Wien, Austria, Chapter III/2.
- Geller, G., and Lenz, A., 1982. Bewachsene Bodenfilter zur Wasserreinigung, *Korrespondenz Abwasser* **29**: 142-147.
- Geller, G., Kley, K., and Lenz, A. 1990. “Planted Soil Filters” for wastewater treatment: the complex system “Planted Soil Filter”, its components and their development, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 161-170.
- George, D.B. et al., 2000. Development of guidelines and design equations for subsurface flow constructed wetlands treating municipal wastewater, U.S. EPA, Office of Research and Development, Cincinnati, Ohio.
- Gerba, C.P., and Bitton, G., 1984. Microbial pollutants: their survival and transport pattern to groundwater, in: *Groundwater Pollution Microbiology*, G. Bitton and C.P. Gerba, eds., Wiley, New York, pp. 65-88.
- Gerba, C.P., Wallis, C., and Melnick, J.L., 1975. Fate of wastewater bacteria and viruses in soil, *J. Irrig. Drain. Div.* **101**: 157-174.
- Gersberg, R.M., Elkins, B.V., and Goldman, C.R., 1983. Nitrogen removal in artificial wetlands, *Wat. Res.* **17**: 1009-1014.
- Gersberg, R.M., Lyon, S.R., Elkins, B.V., and Goldman, C.R., 1984a. The removal of heavy metals by artificial wetlands, in: *Proc. Conf. Future of Water Use*, AWWA Research Foundation, Denver, Colorado, pp. 639-648.
- Gersberg, R.M., Elkins, B.V., and Goldman, C.R., 1984b. Use of artificial wetlands to remove nitrogen from wastewater, *J. Water Pollut. Control. Fed.* **56**: 152-156.
- Gersberg, R.M., Elkins, B.V., Lyon, S.R., and Goldman, C.R., 1986. Role of aquatic plants in wastewater treatment by artificial wetlands, *Wat. Res.* **20**: 363-368.
- Gersberg, R.M., Lyons, S.R., Brenner, R., and Elkins, B.V., 1987a. Fate of viruses in artificial wetlands, *Appl. Environ. Microbiol.* **53**: 731-736.
- Gersberg, R.M., Brenner, R., Lyon, S.R., and Elkins, B.V., 1987b. Survival of bacteria and viruses in municipal wastewater applied to artificial wetlands, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 237-245.

- Gersberg, R.M., Gearhart, R.A., and Ives, M., 1989a. Pathogen removal in constructed wetlands, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 431-446.
- Gersberg, R.M., Lyon, S.R., Brenner, R., and Elkins, B.V., 1989b. Integrated wastewater treatment using artificial wetlands: a gravel marsh case study, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 145-152.
- Gerth, A., Hebner, A., Kiessig, G., Kuchler, A., and Zellmer, A., 2005. Passive treatment of minewater at the Schlema-Alberoda site, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 53-54.
- Gessner, F., 1955. Hydrobotanik. *Die Physiologischen Grundlagen der Pflanzenverbreitung im Wasser*. 1. *Energiehaushalt*, VEB Deutscher Verlag der Wissenschaften, Berlin.
- Gessner, M.O., Schieferstein, B., Müller, U., Barkmann, S., and Lenfers, U.A., 1996. A partial budget of primary organic carbon flows in the littoral zone of a hardwater lake, *Aquat. Bot.* **55**: 93-105.
- Ghiorse, W.C., 1984. Biology of iron- and manganese-depositing bacteria, *Ann. Rev. Microbiol.* **38**: 515-550.
- Ghiorse, W.C., and Hirsch, P., 1978. Iron and manganese deposition by budding bacteria, in: *Environmental Biogeochemistry and Geomicrobiology 3: Methods, Metals and Assessment*, W.E. Krumbein, ed., Ann Arbor Science, Ann Arbor, Michigan, pp. 897-909.
- Ghiorse, W.C., and Hirsch, P., 1982. Isolation and properties of ferromanganese-depositing budding bacteria from Baltic sea ferromanganese concretions, *Appl. Environ. Microbiol.* **43**: 1464-1472.
- Giblin, A.E., and Howarth, R.W., 1984. Porewater evidence for a dynamic sedimentary iron cycle in salt marshes, *Limnol. Oceanogr.* **29**, 47-63.
- Giæver, H.M., 2003. Experience and results from the northernmost constructed wetland in Norway, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 215-235.
- Gilbert, B., Souchu, P., Bianchi, M., and Bonin, P., 1997. Influence of shellfish farming activities on nitrification, nitrate reduction to ammonium and denitrification at the water-sediment interface of the Thau lagoon, France, *Mar. Ecol. Prog. Ser.* **151**: 143-153.
- Gill, C.J., 1970. The flooding tolerance of woody species – a review, *For. Abstr.* **31**: 671-688.
- Gill, C.J., 1975. The ecological significance of adventitious rooting as a response to flooding in woody species with special reference to *Alnus glutinosa* (L.) Gaertn., *Flora* **164**: 85-97.
- Gillespie, W.B., Jr., Hawkins, W.B., Rodgers, J.H., Jr., Cano, M.L., and Dorn, P.B., 2000. Transfers and transformations of zinc in constructed wetlands: Mitigation of a refinery effluent, *Ecol. Eng.* **14**: 279-292.
- Ginn, T.R., Wood, B.D., Nelson, K.E., Scheibe, T.D., Murphy, E.M., and Clement, T.P., 2002. Processes in microbial transport in the natural subsurface, *Adv. Water Resour.* **25**: 1017-1042.
- Giraldo, E., and Zárate, E., 2001. Removal of hydrogen sulphide BOD from brackish water using vertical flow wetlands in a Caribbean environment, *Wat. Sci. Tech.* **44**(11/12): 361-367.
- Giraud, F., Guiraud, P., Kadri, M., Blake, G., and Steiman, R., 2001. Biodegradation of anthracene and fluoranthene by fungi isolated from an experimental constructed wetland for wastewater treatment, *Wat. Res.* **35**: 4126-4136.
- Girts, M.A., and Kleinmann, R.L.P., 1986. Constructed wetlands for treatment of acid mine drainage: a preliminary review, in: *Proc. 1986 National Symp. on Mining, Hydrology, Sedimentology and Reclamation*, University of Kentucky, Lexington, pp. 165-171.
- Girts, M.A., Kleinmann, R.L.P., and Erickson, P.M., 1987. Performance data on *Typha* and *Sphagnum* wetlands constructed to treat coal mine drainage, *Paper presented at the 8<sup>th</sup> Annual Surface Mine Drainage Task Force Symp.*, Morgantown, West Virginia, April 7-8, 1987.

- Glanzer, U., 1974. Experimentelle Untersuchungen über das Verhalten submerser Macrophyten bei  $\text{NH}_4^+$ -Belastung, *Verh. Ges. Ökol.* **3**: 175-179.
- Glenn, E., Thompson, T.L., Frye, R., Riley, J., and Baumgartner, D., 1995. Effects of salinity on growth and evapotranspiration of *Typha domingensis* Pers., *Aquat. Bot.* **52**: 75-91.
- Gnauck, A., and Weise, G., 1976. Zur Stabilität der Stoffproduktion submerser Makrophyten bei Nitratbelastung gemessen am  $\text{CO}_2$  Umsatz, *Wiss. Z. tech. Univ. Dresden* **25**: 250-252.
- Godbold, D.L., Horst, W.J., Collins, J.C., Thurman, D.A., and Marschner, H., 1984. Accumulation of zinc and organic acids in roots of zinc tolerant and non-tolerant ecotypes of *Deschampsia caespitosa*, *J. Plant Physiol.* **116**: 59-69.
- Godeaux, D., 1994. Systèmes extensifs d'épuration des eaux usées. Etat des lieux du lagunage naturel et aéré en Région Wallone. Mémoire de la Faculté des Sciences Agronomiques de Gembloux.
- Godo, G.H., and Reisenauer, H.M., 1980. Plant effects on soil manganese availability, *Soil Sci. Soc. Am. J.* **44**: 993-995.
- Godshalk, G.L., and Wetzel, R.G., 1978a. Decomposition of aquatic angiosperms, I. Dissolved components, *Aquat. Bot.* **5**: 281-300.
- Godshalk, G.L., and Wetzel, R.G., 1978b. Decomposition of aquatic angiosperms. II. Particulate components, *Aquat. Bot.* **5**: 301-327.
- Godshalk, G.L., and Barko, J.W., 1985. Vegetative succession and decomposition in reservoirs, in: *Microbial Processes in Reservoirs*, D. Gunnison, ed., Dr. W. Junk Publishers, Dordrecht, The Netherlands, pp. 59-77.
- Goel, P.K., Trivedy, R.K., and Vaidya, R.R., 1985. Accumulation of nutrients from wastewater by water hyacinth *Eichhornia crassipes*, *Geobios.* **12**: 115-119.
- Goldberg, E.D., 1954. Marine geochemistry. I. Chemical scavengers of the sea, *J. Geol.* **62**: 249-265.
- Goldhaber, M.B., and Kaplan, I.R., 1974. The sulfur cycle, in: *The Sea*, Vol. 5, E.D. Goldberg, ed., John Wiley, New York, pp. 569-655.
- Golob, V., and Ojstršek, A., 2005. Removal of vat and disperse dyes from residual pad liquors, *Dyes and pigments* **64**: 57-61.
- Golterman, H.L., 1973. Vertical movement of phosphate in freshwater, in: *Environmental Phosphorus Handbook*, E.J. Griffith, A. Beeton, J.M. Spencer and D.T. Marshall, eds., John Wiley and Sons, New York, pp. 509-538.
- Gómez Cerezo, R., Suárez, M.L., and Vidal-Abarca, M.R., 2001. The performance of a multi-stage system of constructed wetlands for urban wastewater treatment in a semiarid region of SE Spain, *Ecol. Eng.* **16**: 501-517.
- Gopal, B., 1990. Nutrient dynamics of aquatic plant communities, in: *Ecology and Management of Aquatic Vegetation in the Indian Subcontinent*, B. Gopal, ed., Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 177-197.
- Gopal, B., and Sharma, K.P., 1984. Seasonal changes in concentration of major nutrient elements in the rhizomes and leaves of *Typha elephantina* Roxb., *Aquat. Bot.* **20**: 65-73.
- Gopal, B., and Masing, V., 1990. Biology and ecology, in: *Wetlands and Shallow Continental Water Bodies*, B.C. Patten (ed.), SPB Academic Publishing bv, The Hague, The Netherlands, pp. 91-239.
- Gopal, B., and Goel, U., 1993. Competition and allelopathy in aquatic plant communities, *Bot. Rev.* **59**: 155-210.
- Gopal, B., Sharma, K.P., and Trivedy, R.K., 1979. Studies on the ecology and production in Indian freshwater ecosystems at primary producer level with emphasis on macrophytes, in: *Glimpses of Ecology*, J.S. Singh and B. Gopal, eds., Int. Sci. Publs., Jaipur, India, pp. 349-376.
- Gorra, R., Freppaz, M., Ambrosoli, R., and Zanini, E., 2007. Seasonal performance of a constructed wetland for wastewater treatment in alpine environment, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 66-67.

- Gotoh, S., and Patrick, W.H. Jr., 1972. Transformation of manganese in a waterlogged soil as affected by redox potential and pH, *Soil Sci. Soc. Am. Proc.* **36**: 738-742.
- Gotoh, S., and Patrick, W.H., Jr., 1974. Transformation of iron in a waterlogged soil as influenced by redox potential and pH, *Soil Sci. Soc. Am. Proc.* **38**: 66-71.
- Goulder, R., 1969. Interactions between the rates of production of a freshwater macrophyte and phytoplankton in a pond, *Oikos* **20**: 300-309.
- Goulet, R., and Sérodes, J., 2000. Principles and actual efficiency of constructed wetlands, Field trip guide during 2000 INTECOL Wetland Conference, Québec, Canada.
- Goulet, R.R., and Pick, F.R., 2001. Changes in dissolved and total Fe and Mn in a young constructed wetland: Implications for retention performance, *Ecol. Eng.* **17**: 373-384.
- Grabher, D., 1997. Pflanzekläranlagen in Österreich. Diploma Thesis, Universität für Bodenkultur, Vienna, Austria.
- Grace, J.B., and Wetzel, R.G., 1981. Phenotypic and genotypic components of growth and reproduction of *Typha latifolia*: Experimental studies in marshes of differing successional maturity, *Ecology* **62**: 789-801.
- Graetz, D.A., Keeney, D.R., and Aspiras, R.B., 1973. Eh status of lake sediment-water system in relation to nitrogen transformations, *Limnol. Oceanogr.* **18**: 908-917.
- Granéli, W., 1984. Reed *Phragmites australis* (Cav.) Trin. ex Steudel as an energy source in Sweden, *Biomass* **4**: 183-208.
- Granéli, W., 1989. Influence of standing litter on shoot production in reed *Phragmites australis* (Cav.) Trin ex Steudel, *Aquat. Bot.* **35**: 99-109.
- Granéli, W., Weisner, S.E.B., and Sytsma, M.D., 1992. Rhizome dynamics and resource storage in *Phragmites australis*, *Wetlands Ecol. Manage.* **1**: 239-247.
- Green, M., Safray, I., Agami, M., 1996. Constructed wetlands for river reclamation: Experimental design, start-up and preliminary results, *Bioresource Technol.* **55**: 157-162.
- Grant, J., and Bathman, U.V., 1987. Swept away: resuspension of bacterial mats regulates benthic-pelagic exchange of sulfur, *Science* **236**: 1472-1474.
- Grant, N., 1995. Reed Bed Designer, Hereford, U.K. Personal communication to P.F. Cooper.
- Grant, N., and Griggs, J., 2001. *Reed Beds for the Treatment of Domestic Wastewater*, Building Research Establishment, CRC Press Ltd., London, UK.
- Grant, W.D., and Long, P.E. 1981. *Environmental Microbiology*, Blackie and Son, Glasgow.
- Grant, W.D., and Long, P.E., 1985. Environmental microbiology, in: *The Handbook of Environmental Chemistry*, Vol. 1. Part D, *The Natural Environment and Biogeochemical Cycles*, O. Hutzinger, ed., Springer-Verlag, Berlin, pp. 125-237.
- Gray, K.R., Biddlestone, A.J., Job, G., and Galanos, E., 1990. The use of reed beds for the treatment of agricultural effluents, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper, and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 333-346.
- Gray, S., Kinross, J., Read, P., and Marland, A. 2000. The nutrient assimilative capacity of maerl as a substrate in constructed wetland systems for waste treatment, *Wat. Res.* **34**: 2183-2190.
- Green, E.K., and Galatowitsch, S.M., 2001. Differences in wetland plant community establishment with additions of nitrate-N and invasive species (*Phalaris arundinacea* and *Typha x glauca*), *Can. J. Bot.* **79**: 170-178.
- Green, M., Safray, I., and Agami, M., 1996. Constructed wetlands for river reclamation: Experimental design, start-up and preliminary results, *Bioresource Technol.* **55**: 157-162.
- Green, M., Friedler, E., Ruskol, Y., and Safray, I., 1997. Investigation of alternative method for nitrification in constructed wetlands, *Wat. Sci. Tech.* **35**(5): 63-70.
- Green, M.B., and Upton, J., 1993. Reed bed treatment for small communities: U.K. experience, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 517-524.
- Green, M.B., and Upton, J., 1994. Constructed reed beds: A cost effective way to polish wastewater effluents for small communities, *Water Environ. Res.* **66**: 188-192.



- Green, M.B., and Upton, J., 1995. Constructed reed beds: appropriate technology for small communities, *Wat. Sci. Tech.* **32**: 339-348.
- Green, M.B., and Martin, J.R., 1996. Constructed reed beds clean up stormwater overflows on small wastewater treatment works, *Water Environ. Res.* **68**: 1054-1060.
- Green, M.B., Martin, J.R., and Findlay, G.E., 1995. Using constructed reed beds treating combined sewer overflows on small wastewater treatment works, in: *Natural and Constructed Wetlands for Wastewater treatment and Reuse – Experience. Goals and Limits*, R. Hennadori, L. Cingolani and L. Camenorio, eds., Centro Studio, Perugia, Italy, pp. 175-184.
- Green, M.B., Griffin, P., Seabridge, J.K., and Dhoobie, D., 1997. Removal of bacteria in subsurface flow wetlands, *Wat. Sci. Tech.* **35(5)**: 109-116.
- Greenway, M. and Simpson, J.S., 1996. Artificial wetlands for wastewater treatment, water reuse and wildlife in Queensland, Australia, *Wat. Sci. Tech.* **33(11)**: 221-229.
- Greenway, M. and Woolley, A., 1999. Constructed wetlands in Queensland: Performance efficiency and nutrient bioaccumulation, *Ecol. Eng.* **12**: 39-55.
- Greenway, M. and Woolley, A., 2001. Changes in plant biomass and nutrient removal in a constructed wetland, Cairns, Australia, *Wat. Sci. Tech.* **44(11/12)**: 303-310.
- Greenway, M., Dale, P., and Chapman, H., 2003. An assessment of mosquito breeding and control in four surface flow wetlands in tropical-subtropical Australia, *Wat. Sci. Tech.* **48(5)**: 249-256.
- Greenway, M., Jenkins, G., and Polson, C., 2006. Macrophyte zonation in stormwater wetlands-getting it right! A case study from subtropical Australia, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1807-1819.
- Greenwood, D.J., 1961. The effect of oxygen concentration on the decomposition of organic materials in soil. *Plant and Soil* **14**: 360-376.
- Greenwood, D.J., 1962. Measurement of microbial metabolism in soil, in: T.R.G. Gray, and D. Parkinson, eds., *The Ecology of Soil Bacteria*, University of Toronto Press, Toronto, Canada. pp. 138-157.
- Greenwood, D.J., 1967. Studies of the transport of oxygen through the stem and roots of vegetable seedlings, *New Phytol.* **66**: 337-347.
- Greenwood, D.J., and Goodman, D., 1964. Oxygen diffusion and aerobic respiration in soil spheres, *J. Sci. Food Agric.* **15**: 579-588.
- Gregersen, P., and Brix, H., 2001. Zero-discharge of nutrients and water in a willow dominated constructed wetland, *Wat. Sci. Tech.* **44(11-12)**: 407-412.
- Gregory, E., and Staley, J.R., 1982. Widespread distribution of ability to oxidize manganese among freshwater bacteria, *Appl. Environ. Microbiol.* **44**: 509-511.
- Greiner, R.W., and de Jong, J., 1984. The Use of Marsh Plants for the Treatment of Waste Water in Areas Designated for Recreation and Tourism. RIJP Report No. 225, Lelystad, The Netherlands.
- Greipsson, S., and Crowder, A.A., 1992. Amelioration of copper and nickel toxicity by iron plaque on roots of rice (*Oryza sativa*), *Can. J. Bot.* **70**: 824-830.
- Gries, C., and Garbe, D., 1989. Biomass, nitrogen, phosphorus and heavy metal content of *Phragmites australis* during the third growing season in a root zone waste water treatment, *Arch. Hydrobiol.* **117**: 97-105.
- Gries, C., Kappen, L., and Lösch, R., 1990. Mechanism of flood tolerance in reed, *Phragmites australis* (Cav.) Trin. ex Steudel, *New Phytol* **114**: 589-593.
- Griffin, D.M. and Quail, G., 1968. Movement of bacteria in moist, particulate systems, *Aust. J. Biol. Sci.* **21**: 579-582.
- Griffin, P., and Pamplin, C., 1998. The advantages of a constructed reed bed based strategy for small sewage treatment works, *Wat. Sci. Tech.* **38(3)**: 143-150.
- Grill, E., Winnacker, E.L., and Zenk, M.H., 1985. Phytochelations: The principal heavy-metal complexing peptides of higher plants, *Science* **230**: 674-676.

- Grismer, M., Carr, M., and Shepherd, H., 2003. Evaluation of constructed wetland treatment performance for winery wastewater, *Wat. Env. Res.* **75**: 412-421.
- Grosse, W., and Mevi-Schütz, J., 1987. A beneficial gas transport system in *Nymphoides peltata*, *Am. J. Bot.* **74**: 947-952.
- Grüneberg, B., and Kern, J., 2001. Phosphorus retention capacity of iron-ore blast furnace slag in subsurface flow constructed wetlands, *Wat. Sci. Tech.* **44**(11/12): 69-75.
- Grunes, D.L., Haas, H.J., and Shih, S.H., 1955. Effect of dryland cropping on available phosphorus of Cheyenne fine sandy loam, *Soil Sci.* **80**: 127-138.
- Gschlössl, T., Steinmann, C., Schleypen, P., and Melzer, A., 1998. Constructed wetlands for effluent polishing of lagoons, *Wat. Res.* **32**: 2639-2645.
- Gu, B., DeBusk, T.A., Dierberg, F.E., Chimnex, M.J., Pietro, K.C., and Aziz, T., 2001. Phosphorus removal from Everglades agricultural runoff by submerged aquatic vegetation/limerock treatment technology: an overview of research, *Wat. Sci. Tech.* **44**(11/12): 101-108.
- Gudekar, V.R., Borkar, L.P., Kavadia, K.M., and Trivedy, R.K., 1984. Studies on the feasibility of removal of sodium pentachlorophenate (SPCP) with water hyacinth, *Poll. Res.* **3**: 71-75.
- Guida, V.G., and Kugelman, I.J., 1989. Experiments in wastewater polishing in constructed tidal marshes: Does it work? Are the results predictable?, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 727-734.
- Guimaraes, J.R., Meili, M., Hylander, R., De Castro e Silva, E., Roulet, R., and Mauro, J.N., 2000. Mercury net methylation in five tropical flood plain regions of Brazil: high in the root zone of floating macrophyte mats but low in the surface sediments and flooded soils, *Sci. Total Environ.* **261**: 99-107.
- Gumbrecht, T., 1993a. Nutrient removal processes in freshwater submersed macrophyte systems, *Ecol. Eng.* **2**: 1-30.
- Gumbrecht, T., 1993b. Nutrient removal capacity in submersed macrophyte pond systems in a temperate climate, *Ecol. Eng.* **2**: 49-61.
- Gunnison, D., and Barko, J.W., 1988. The rhizosphere microbiology of rooted aquatic plants. Miscellaneous Paper A-88-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Gunnison, D., and Barko, J.W., 1989. The rhizosphere ecology of submersed macrophytes, *Water Resour. Bull.* **25**: 193-201.
- Guo, T., DeLaune, R.D., and Patrick, W.H., Jr., 1997. The influence of sediment redox chemistry on chemically active forms of arsenic, cadmium, chromium and zinc in estuarine sediment, *Environ. Internat.* **23**(3): 305-316.
- Guo, T., DeLaune, R.D., and Patrick, W.H., Jr., 2000. Iron and manganese transformation in Louisiana salt and brackish marsh sediment, *Commun. Soil Sci. Plant Anal.* **31**: 2997-3009.
- Gupta, A.B., 1997. *Thiosphaera pantotropa*: A sulphur bacterium capable of simultaneous heterotrophic nitrification and aerobic denitrification, *Enzyme Microb. Technol.* **21**: 589-595.
- Gupta, S.K., and Chen, K.Y., 1975. Partitioning of trace metals in selective chemical fractions of nearshore sediments, *Environ. Lett.* **10**: 129-158.
- Güsewell, S., Le Nédic, C., and Buttler, A., 2000. Dynamics of common reed (*Phragmites australis* Trin.) in Swiss fens with different management, *Wetlands Ecol. Manage.* **8**: 375-389.
- Haas, A.R.C., 1936. Growth and water relations of the avocado fruit, *Plant Physiol.* **11**: 383-400.
- Haas, H.J., Grunes, D-L., and Reichman, G.A., 1961. Phosphorus changes in Great Plains soils as influenced by cropping and manure applications, *Soil Sci. Soc. Am. Proc.* **25**: 215-218.

- Haberl, R., 1999. Constructed wetlands: a chance to solve wastewater problems in developing countries, *Wat. Sci. Tech.* **40**(3): 11-17.
- Haberl, R., and Perfler, R., 1989. Root-zone system: Mannersdorf – new results, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 606-621.
- Haberl, R., and Perfler, R., 1990. Seven years of research work and experience with wastewater treatment by a reed bed system, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 205-214.
- Haberl, R., Perfler, R., Laber, J., and Grabher, D., 1998. Austria, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 67-76.
- Hadad, R.H., Maine, M.A., and Bonetto, C.A., 2006. Macrophyte growth in a pilot-scale constructed wetland for industrial wastewater treatment, *Chemosphere* **63**: 1744-1753.
- Hadas, O., and Pinkas, R., 1992. Sulfate-reduction process in sediments of Lake Kinneret, Israel, *Hydrobiologia* **235**: 295-301.
- Hadders, G., and Olsson, R., 1997. Harvest of grass for combustion in late summer and in spring, *Biomass Bioenergy* **12**: 171-175.
- Hafenbradl, D., Keller, M., Dirmeier, R., Rachel, R., Rossnagel, P., Burggraf, S., Huber, H., and Stetter, K.O., 1996. *Ferroglobus placidus* gen. nov., sp. nov., a novel hyperthermophilic archaeum that oxidizes Fe<sup>2+</sup> at neutral pH under anoxic conditions, *Arch. Microbiol.* **166**: 308-314.
- Hagendorf, U., Diehl, K., Feuerpfel, I., Hummel, A., and Szewczyk, R., 2000. Retention of Microbiological Organisms in Constructed Wetlands, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, IWA and University of Florida: Gainesville, pp. 391-397.
- Hagland, R.E., and Williams, R.D., 1985. The influence of secondary plant compounds on the associations of soil microorganisms and plant roots, in: *The Chemistry of Allelopathy: Biochemical Interactions Among Plants*, A.C. Thompson, ed., Amer. Chem. Soc., Washington, C.C., pp. 301-325.
- Haider, S.Z., Malik, K.M.A., Rahman, M.M., and Ali, M.A., 1983. Pollution control by water hyacinth of waste effluents of pulp and paper mills and of tanneries, in: *Int. Conf. Water Hyacinth*, Hyderabad, Synopsis of papers, p.54.
- Haldemann, C., and Brändle, R., 1983. Avoidance of oxygen deficit stress and release of oxygen by stalked rhizomes of *Schoenoplectus lacustris*, *Physiol. Veg.* **21**: 109-113.
- Hall, G., Swash, P., and Kotilainen, S., 2005. The importance of biological oxidation of iron in the aerobic cells of the Whale Jane pilot passive treatment system, *Sci. Total Environ.* **338**: 67-72.
- Hallberg, K.B., and Johnson, D.B., 2005. Biological manganese removal from acid mine drainage in constructed wetlands and prototype bioreactors, *Sci. Total Environ.* **338**: 115-124.
- Haller, W.T., and Sutton, D.L., 1973. Effect of pH and high phosphorus concentrations on growth of water hyacinth, *Hyacinth Control J.* **11**: 59-61.
- Halva, J., and Števicová, L., 2005. Evaluation of constructed wetlands in Slovakia, in: *Alternative Treatment Systems for Wastewater Treatment in Small Villages*, B. Novotná and L. Konc, eds., Slovak Agriculture University, Nitra, pp. 7-12 (in Slovak).
- Ham, J.H., Yoon, C.G., Hwang, S.J., and Jung, K.W., 2004. Seasonal performance of constructed wetland and winter storage pond for sewage treatment in Korea, *J. Environ. Sci. Health A* **39**: 1329-1343.
- Hammer, D.A., ed., 1989a. *Constructed Wetlands for Wastewater Treatment*, Lewis Publishers, Chelsea, Michigan.
- Hammer, D.A. 1989b. Constructed wetlands for treatment of agricultural waste and urban stormwater, in: *Wetlands Ecology and Conservation: Emphasis in Pennsylvania*, S.K.

- Majumdar, R.P. Brooks, F.J. Brenner and R.W. Tiner, eds., The Pennsylvania Academy of Sciences, Easton, Pennsylvania, pp. 333-348.
- Hammer, D.A. 1992. Designing constructed wetlands systems to treat agricultural nonpoint source pollution, *Ecological Engineering* **1**: 49-82.
- Hammer, D.A., and Rogers, P., 1980. Treating fish rearing pond discharge waters with artificial wetlands. Tennessee Valley Authority Report, Knoxville, Tennessee.
- Hammer, D.A., and Bastian, R.K. 1989. Wetland ecosystems: natural water purifiers? in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 5-19.
- Hammer, D.A., and Knight, R.L., 1992. Designing constructed wetlands for nitrogen removal, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of New South Wales, Sydney, Australia, pp. 3.1-3.37.
- Hammer, D.A., Pullin, B.P., McCaskey, T.A., Eason, J., and Payne, V.W.E., 1993a. Treating livestock wastewaters with constructed wetlands, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 343- 347.
- Hammer, D.A., Pullin, B.P., McMurry, D.K., and Lee, J.W., 1993b. Testing color removal from pulp mill wastewaters with constructed wetlands, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 449-452.
- Han, J.S., 1985. Net primary production in a marsh, *Mich. Bot.* **24**: 55-62.
- Hancock, S. J., and Buddhavarapu, L. 1993. Control of algae using duckweed (*Lemna*) systems, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press, Boca Raton, Florida, pp. 399-406.
- Handoo, J.K., and Kaul, V., 1982. Phytosociology and standing crop studies in wetlands of Kashmir, in: *Wetlands. Ecology and Management*, B. Gopal, R.E. Turner, R.G. Wetzel and D.F. Whigham, eds., Internat. Sci. Publ., and Natl. Inst. Ecol., Jaipur, India, pp. 187-195.
- Hanson, A.R., 2002. An overview of wastewater treatment performance and wildlife habitat use of two small constructed wetlands in Nova Scotia, Canada, in: *Treatment Wetlands for Water Quality Improvement*, J. Pries, ed., CH2M HILL Canada Limited, Waterloo, Ontario, pp. 73-81.
- Hanson, R.B., 1977. Nitrogen fixation (acetylene reduction) in a salt marsh amended with sewage sludge and organic carbon and nitrogen compounds, *Appl. Environ. Microbiol.* **33**: 846-852.
- Hares, R.J., and Ward, R.J., 2004. Sediment accumulation in newly constructed vegetative treatment facilities along a new major road, *Sci. Tot. Environ.* **334-335**: 473-479.
- Harkare, W.P., Pavgi, J.M., Pendharkar, M.A., Hooda, M., Babar, P., and Bapat, D.W., 1996. Status of rootzone in India, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, pp. Poster 14.
- Harms, W.R., 1973. Some effects of soil type and water regime on growth of tupelo seedlings, *Ecology* **54**: 188-193.
- Harris, S.W., and Marshall, W.H., 1960. Experimental germination of seed and establishment of seedlings of *Phragmites communis*, *Ecology* **4**: 395.
- Harvey, R.M., and Fox, J.L. 1973. Nutrient removal using *Lemna minor*, *J. Water Pollut. Control Fed.* **45**: 1928-1938.
- Harvey, R.W., and Garabedian, S.P., 1991. Use of colloid filtration theory in modeling movement of bacteria through a contaminated sandy aquifer, *Environ. Sci. Technol.* **25**: 178-185.
- Harter, R.D., and McLean, K.O., 1965. The effects of moisture level and incubation time on the chemical equilibria of a Toledo clay loam soil, *Agron. J.* **57**: 583-588.
- Hasan, S.M., and Hall, J.B. 1975. The physiological function of nitrate reductase in *Clostridium perfringens*, *J. gen. Microbiol.* **87**: 120-128.

- Haselkorn, R., and Buikema, W.J., 1992. Nitrogen fixation in cyanobacteria, in: *Biological Nitrogen Fixation*, G. Stacey, R.H. Burris, and H.J. Evans, eds., Chapman and Hall, New York, pp. 166-190.
- Haslam, S.M., 1969. The development and emergence of buds in *Phragmites communis* Trin., *Ann. Bot.* **33**: 289-301.
- Haslam, S.M., 1971a. Community regulation in *Phragmites communis* Trin. I. Monodominant stands, *J. Ecol.* **59**: 65-73.
- Haslam, S.M., 1971b. The development and establishment of young plants of *Phragmites communis* Trin., *Ann. Bot.* **35**: 1059-1072.
- Haslam, S.M., 1971c. Shoot height and density in *Phragmites* stands, *Hydrobiologia (Bucharest)* **12**: 113-119.
- Haslam, S.M., 1973a. Some aspects of the life history and autecology of *Phragmites communis* Trin. A review, *Pol. Arch. Hydrobiol.* **20**: 79-100.
- Haslam, S.M., 1973b. The management of British wetlands. I. Economic and amenity use, *J. Environ. Manage.* **1**: 303-320.
- Hatano, K., Frederick, D.J., and Moore, J.A., 1992. Microbial ecology of constructed wetlands used for treating pulp mill wastewater, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 62.1. – 63.7.
- Hatano, K., Trettin, C.C., House, C.H., and Wolynn, A.G., 1993. Microbial populations and decomposition activity in three subsurface flow constructed wetlands, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 541-547.
- Hauck, R.D., 1984. Atmospheric nitrogen chemistry, nitrification, denitrification, and their relationships in: *The Handbook of Environmental Chemistry*, Vol. 1, Part C, *The Natural Environment and Biogeochemical Cycles*, O. Hutzinger, ed., Springer-Verlag, Berlin, pp. 105-127.
- Haule, A.T., Pratap, H.B., Katima, H.J.Y., Mbwette, T.S.A., and Njau, K., 2002. Nitrogen removal from domestic wastewater in subsurface flow constructed wetlands by indigenous macrophytes in the tropics. A comparative study for six potential macrophytes in Tanzania, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and IWA, pp. 938-951.
- Häusslink, M., and Marschner, H., 1989. Organic and inorganic soil phosphates and acid phosphatase activity in the rhizosphere of 80-year-old Norway spruce (*Picea abies* (L.) Karst.) trees, *Biol. Fertil. Soils* **8**: 128-135.
- Havill, D.C., Ingold, A., and Pearson, J., 1985. Sulfide tolerance in coastal halophytes, *Vegetatio* **62**: 279-285.
- Hawke, C.J., and José, P.V., 1996. Reedbeds. *Management for Commercial and Wildlife Interests*, The Royal Society for the Protection of Birds, Sandy, Beds, UK.
- Headley, T.R., 2004. Removal of nutrients and plant pathogens from nursery runoff using horizontal subsurface-flow constructed wetlands, Dissertation, Southern Cross University, Lismore, NSW, Australia.
- Headley, T.R., Huett, D.O., and Davison, L., 2001. The removal of nutrients from plant nursery irrigation runoff in subsurface horizontal-flow wetlands, *Wat. Sci. Tech.* **44**(11-12): 77-84.
- Headley, T.R., Huett, D.O., and Davison, L., 2002. Seasonal variation in phosphorus removal processes within reed beds-mass balance investigations, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 982-996.
- Headley, T.R., Davison, L., and Yeomans, A., 2004. Removal of ammonia-N from landfill leachate by vertical flow wetland: a pilot study, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE, Lyon, France, pp. 143-150.

- Headley, T.R., Huett, D.O., and Davison, L., 2005. Temporal and spatial dynamics in biomass and nutrient uptake of *Phragmites australis* within reed beds treating irrigation runoff in sub-tropical Australia, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 67-68.
- Heal, K.V., Dobbie, K.E., Bozika, E., McHaffie, H., Simpson, A.E., and Smith, K.A., 2005. Enhancing phosphorus removal in constructed wetlands with ochre from mine drainage treatment, *Wat. Sci. Tech.* **51**(9): 275-282.
- Hedin, R.S., and Nairn, R.W., 1993. Contaminant removal capabilities of wetlands constructed to treat coal mine drainage, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 187-195.
- Heijthuijsen, J.H.F.G., and Hansen, T.A., 1989. Betaine fermentation and oxidation by marine *Desulfuromonas* strains, *Appl. Environ. Microbiol.* **55**: 965-969.
- Heinicke, A.J., 1932. The effect of submerging the roots of apple trees at different seasons of the year, *J. Am. Soc. Hortic. Sci.* **29**: 205-207.
- Heinicke, A.J., Boynton, D., and Reither, W., 1940. Cork experimentally produced in Northern Spy apples, *Proc. Am. Soc. Hortic. Sci.* **37**: 47-52.
- Heising, S., and Schink, B., 1998. Phototrophic oxidation of ferrous iron by a *Rhodomicrobium vannielli* strain, *Microbiology* **144**: 2263-2269.
- Heising, S., Richter, L., Ludwig, W., and Schink, B., 1999. *Chlorobium ferrooxidans* sp. nov., a phototrophic green sulfur bacterium that oxidizes ferrous iron in coculture with a *Geospirillum* sp. strain, *Arch. Microbiol.* **172**: 116-124.
- Hejny, S., and Hroudová, Z., 1987. Plant adaptations to shallow water habitats, *Arch. Hydrobiol. Beih. Ergebn. Limnol.* **27**: 157-166.
- Hejny, S., Květ, J., and Dykyjová, D., 1981. Survey of biomass and net production of higher plant communities in fish ponds, *Folia Geobot. Phytotax. Praha* **16**: 73-94.
- Hellquist, S., Finell, M., and Landström, S., 2003. Reed canary grass – observations of effects on crop stand and fibre quality caused by infestation of *Epicalamus phalaridis*, *Agric. Food Sci. Finland* **12**: 49-56.
- Hench, K.R., Bissonnette, G.K., Sextone, A.J., Coleman, J.G., Garbutt, K., and Skousen, J.G., 2003. Fate of physical, chemical, and microbial contaminants in domestic wastewater following treatment by small constructed wetlands, *Wat. Res.* **37**: 921-927.
- Henry, C.P., and Amoros, C., 1996. Are the banks a source of recolonization after disturbance: an experiment on aquatic vegetation in a former channel of the Rhone river, *Hydrobiologia* **330**: 151-162.
- Herbert, R.A., 1975. Heterotrophic nitrogen fixation in shallow estuarine sediments, *J. Exp. Mar. Biol. Ecol.* **18**: 215-225.
- Hermans, P., and Pries, J., 1997. Essex treatment wetland, Essex, Ontario, Canada, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-25-II-29.
- Herold, D., Neskakis, A., and Angelakis, A., 2000. Design of a constructed wetland system for the treatment of olive oil wastewater in the Mediterranean, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., p. 1390.
- Herskowitz, J., 1986. Town of Listowel artificial marsh project final report, Project No. 128RR, Ontario Ministry of the Environment, Toronto, Canada.
- Hess, R.E., and Blanchar, R.W., 1976. Arsenic stability in contaminated soils, *Soil Sci. Soc. Am. J.* **40**: 847-852.
- Hesse, P.R., 1962. Phosphorus fixation in mangrove swamp muds, *Nature* **193**: 295.
- Higgins, J.P., and Maclean, J., 2002. The use of a very large constructed sub-surface flow wetland to treat glycol-contaminated stormwater from aircraft de-icing operations, *Water Quality Res. J. Can.* **37**: 785-792.

- Higgins, J., and Dechaine, L., 2006. The use of large sub-surface flow wetlands to treat glycol-contaminated stormwater from aircraft deicing operations, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1879-1889.
- Higgins, M.J., Rock, C.A., Bouchard, R., and Wengrezynek, B., 1993. Controlling agricultural run-off by the use of constructed wetlands, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., Lewis Publishers, Boca Raton, Florida, pp. 359-367.
- Higgins, N.M.P., Johnston, P.J., and Gill, L.W., 2006. The performance of a constructed wetland for treating runoff from a highway in Ireland, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1821-1831.
- Higuchi, K., Kanazawa, K., Nishizawa, N.K., Chino, M., and Mori, S., 1994. Purification and characterization of nicotianamine synthase from Fe-deficient barley roots, *Plant Soil* **165**: 173-179.
- Higuchi, K., Kanazawa, K., Nishizawa, N.K., and Mori, S., 1996. The role of nicanianamine synthase in response to Fe nutrition status in Gramineae, *Plant Soil* **178**: 171-177.
- Hill, A.R., 1982. Phosphorus and major cation mass balances for two rivers during low summer flows, *Freshwater Biol.* **12**: 293-304.
- Hill, C.M., Duxbury, J.M., Goehring, L.D., and Peck, T., 2003. Designing constructed wetlands to remove phosphorus from barnyard run-off: Seasonal variability in loads and treatment, in: *Constructed Wetlands for Wastewater Treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 181-196.
- Hill, D.T., and Rogers, J.W., 1997. Auburn University constructed wetland for the treatment of poultry lagoon effluent – a case study, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-34-II-40.
- Hill, V.R., 2003. Prospects for pathogen reductions in livestock wastewaters: A review, *Crit. Rev. Environ. Sci. Technol.* **30**: 187-235.
- Hillman, W.S., 1961. The Lemnaceae, or duckweeds. A review of the descriptive and experimental literature, *Bot. Rev.* **27**: 221-287.
- Hillman, W. S., and Culley, D. D., Jr. 1973. The uses of duckweed, *Am. Sci.* **66**: 442-451.
- Hines, M.E., Lyons, W.B., Armstrong, P.B., Orem, W.H., Spencer, M.J., Gaudette, H.E., and Jones, G.E., 1984. Seasonal metal remobilization in the sediments of Great Bay, New Hampshire, *Mar. Chem.* **15**: 173-187.
- Hlávková-Kumnacká, H., 1980. Production of Some Herbaceous Plant Species from Wetlands, Thesis, Faculty of Agriculture, University of South Bohemia, České Budějovice, Czech republic (in Czech).
- Ho, Y.B., 1979a. Growth, chlorophyll and mineral nutrient studies on *Phalaris arundinacea* L. in three Scottish lochs, *Hydrobiologia* **63**: 33-43.
- Ho, Y.B., 1979b. Shoot development and production studies of *Phragmites australis* (Cav.) Trin. ex Steudel. in Scottish lochs, *Hydrobiologia* **64**: 215-222.
- Hocking, P.J., 1985. Effect of sodium and potassium chlorides on the growth and accumulation of mineral ions by *Cyperus involucratus* Rottb., *Aquat. Bot.* **21**: 210-217.
- Hocking, P.J., 1989. Seasonal dynamics of production, and nutrient accumulation and cycling by *Phragmites australis* (Cav.) Trin. ex Stuedel in a nutrient-enriched swamp in inland Australia. I: Whole plants, *Aust. J. Mar. Freshwater Res.* **40**: 421-444.
- Hocking, P.J., Finlayson, C.M., and Chick, A.J., 1983. The biology of Australian weeds. 12. *Phragmites australis* (Cav.) Trin. ex Steudel, *J. Aust. Inst. Agric. Sci.* **40**: 123-132.
- Hoffland, E., 1992. Quantitative evaluation of the role of organic acid exudation in the mobilization of rock phosphate by rape, *Plant Soil* **140**: 279-289.

- Hoffmann, K., 1986. Wachstumverhalten von Schilf (*Phragmites australis* [Trin.] Trin. ex Steudel) in klärschlammbeschickten Filterbeeten, *Arch. Hydrobiol.* **107**: 385-409.
- Holford, I.C.R., and Mattingly, G.E.G., 1976. Phosphate adsorption and plant availability phosphate, *Plant Soil* **44**: 377-389.
- Holford, I.C.R., and Patrick, W.H., Jr., 1979. Effect of reduction and pH changes on phosphate sorption and mobility in an acid soil, *Soil Sci. Soc. Am. J.* **43**: 292-296.
- Holmberg, G., 1959. Vegetating critical areas, *J. Soil Water Conser.* **14**: 165-168.
- Holmer, M., Jensen, H.S., Christensen, K.K., Wigand, C., and Andersen, F.Ø., 1998. Sulfate reduction in lake sediments inhabited by the isoetid macrophytes *Littorella uniflora* and *Isoetes lacustris*, *Aquat. Bot.* **60**: 307-324.
- Holst, R.W., and Yopp, J.H., 1979. Comparative utilization of inorganic and organic compounds as sole nitrogen sources by the submergent duckweed, *Lemna trisulca* L. *Biol. Plantarum (Praha)* **21**: 245-252.
- Holzappel-Pschorn, A., Conrad, R., and Seiler, W., 1986. Effect of vegetation on the emission of methane from submerged paddy soil, *Plant Soil* **92**: 223-233.
- Hook, D.D., 1968. Growth and development of swamp tupelo [*Nyssa sylvatica* var. *biflora* (Walt.) Sarg.] under different root environments, Ph.D. Dissertation, University of Georgia, Athens, Georgia.
- Hook, D.D., 1984. Adaptations to flooding with fresh water, in: *Flooding and Plant Growth*, T.T. Kozlowski, ed., Academic Press, Inc., Orlando, pp. 265-294.
- Hook, D.D., and Brown, C.L., 1973. Root adaptations and relative flood tolerance of live hardwood species, *For. Sci.* **19**: 225-229.
- Hook, D.D., and Scholtens, J.R., 1978. Adaptations and flood tolerance of tree species, in: *Plant Life in Anaerobic Environments*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci. Publ., Ann Arbor, Michigan, pp. 299-331.
- Hook, D.D., and McKevlin, M.R., 1988. Use of oxygen microelectrodes to measure aeration in the roots of intact tree seedlings, in: *The Ecology and Management of Wetlands*, Vol. 1, *Ecology of Wetlands*, D.D. Hook, W.H., McKee, Jr., H.K. Smith, J. Gregory, V.G. Burrell, Jr., M.R. DeVoe, R.E. Sojka, S. Gilbert, R. Banks, L.H. Stolzy, C. Brooks, T.D. Matthews, and T.H. Shear, eds., Timber Press, Portland, Oregon, pp. 467-476.
- Hook, D.D., Langdon, O.G., Stubbs, J., and Brown, C.L., 1970. Effect of water regimes on the survival, growth, and morphology of tupelo seedlings, *For. Sci.* **16**: 304-311.
- Hook, D.D., Brown, C.L., and Kormanik, P.P., 1971. Inductive flood tolerance in swamp tupelo [*Nyssa sylvatica* var. *biflora* (Walt.) Sarg.], *J. Exp. Bot.* **22**: 78-89.
- Hook, D.D., DeBell, D.S., McKee, W.H., Jr., and Askew, J.L., 1983. Responses of loblolly pine (Mesophyte) and swamp tupelo (Hydrophyte) seedlings to soil flooding and phosphorus, *Plant Soil* **71**: 383-394.
- Hook, P.B., Stein, O.R., Allen, W.C., and Biederman, J.A., 2003. Plant species effects on seasonal performance patterns in model subsurface wetlands, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 87-105.
- Hooper, A.B., Vannelli, T., Bergmann, D.J., and Arciero, D.M., 1997. Enzymology of the oxidation of ammonia to nitrite by bacteria, *Antonie van Leeuwenhoek* **71**: 59-67.
- Hootsmans, M.J.M., and Blindow, I., 1994. Allelopathic limitation of algal growth by macrophytes, in: *Lake Veluwe, a Macrophyte-Dominated System under Eutrophication Stress*, W. van Vierssen, M. Hootsmans and J. Vermaat, eds., Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 175-192.
- Hordijk, K.A., Hagenaars, C.P.M., and Cappenberg, T.E., 1985. Kinetic studies of bacterial sulfate reduction in freshwater sediments by high pressure liquid chromatography and microdistillation, *Appl. Environ. Microbiol.* **49**: 434-440.
- Home, A.J., 1979. Nitrogen fixation in Clear Lake, California. 4. Diel studies on *Aphanizomenon* and *Anabaena* biofilms, *Limnol. Oceanogr.* **24**: 329-341.



- Horne, A.J., and Fogg, G.E., 1970. Nitrogen fixation in some English lakes, *Proc. R. Soc. London, B* **175**: 351-366.
- Horrocks, R.D., and Washko, J.B., 1971. Studies of tiller formation in Reed canarygrass (*Phalaris arundinacea* L.) and Climax timothy (*Phleum pratense* L.), *Crop Sci.* **11**:41-45.
- Hosner, J.F., 1960. Relative tolerance to complete inundation of fourteen bottomland tree species, *For. Sci.* **6**: 246-251.
- Hosner, J.F., and Boyce, S.G., 1962. Tolerance to water saturated soil of various bottomland hardwoods, *For. Sci.* **8**: 180-186.
- Hosomi, M., Okada, M., and Sudo, R., 1981. Release of phosphorus from sediments, *Verh. Internat. Verein. Limnol.* **21**: 628-633.
- House, C.H., and Broome, S.W., 2000. Vertical flow-horizontal flow constructed wetlands combined treatment system design and performance, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville and IWA, pp. 1025-1033.
- House, W.A. 1990. The prediction of phosphate co-precipitation with calcite in freshwaters, *Water Res.* **8**: 1017-1023.
- Hovanec, T.A., Taylor, L.T., Blakis, A., and DeLong, E.F., 1998. *Nitrospira*-like bacteria associated with nitrite oxidation in freshwater aquaria, *Appl. Environ. Microbiol.* **64**: 258-264.
- Hoveland, C.S., 1992. Grazing systems for humid regions, *J. Prod. Agric.* **5**: 23-27.
- Howard, D.L., Frea, J.I., Pfister, R.M., and Dugan, P.R., 1970. Biological nitrogen fixation in Lake Erie, *Science* **169**: 61-62.
- Howard-Williams, C., 1978. Growth, and production of aquatic macrophytes in a south temperate saline lake, *Verh. Internat. Verein. Limnol.* **20**: 1153-1158.
- Howard-Williams, C., 1979. The distribution of aquatic macrophytes in Lake Chilwa. Annual and long term environmental fluctuations, in: *Lake Chilwa*, M. Kalk, A.C. McLachlan and C. Howard-Williams, eds., Dr. W. Junk Publishers, The Hague, pp. 109-124.
- Howard-Williams, C., Pickmere, S., and Davies, J., 1983. Decay rates and nitrogen dynamics of decomposing watercress (*Nasturium officinale* R. Br.), *Hydrobiologia* **99**: 207-214.
- Howarth, R.W., 1979. Pyrite: Its rapid formation in a salt marsh and its importance in ecosystem metabolism, *Science* **203**: 1066-1069.
- Howarth, R.W., 1984. The ecological significance of sulfur in the energy dynamics of salt marsh and coastal marine sediments, *Biogeochemistry* **1**: 5-27.
- Howarth, R.W., and Teal, J.M., 1979. Sulfate reduction in a New England salt marsh, *Limnol. Oceanogr.* **24**: 999-1013.
- Howarth, R.W., and Teal, J.M., 1980. Energy flow in a salt marsh ecosystem: the role of reduced inorganic sulfur compounds, *American Naturalist* **116**: 862-872.
- Howarth, R.W., and Giblin, A., 1983. Sulfate reduction in the salt marshes at Sapelo Island, Georgia, *Limnol. Oceanogr.* **28**: 70-82.
- Howeler, R.H., and Bouldin, D.R., 1971. The diffusion and consumption of oxygen in submerged soils, *Soil Sci. Soc. Am. Proc.* **35**: 202-208.
- Howeler, R.H., 1972. The oxygen status of lake sediments, *J. Environ. Qual.* **1**: 366-371.
- Hroudová, Z., and Zákavský, P., 1999. Vegetation dynamics in a fishpond littoral related to human impact, *Hydrobiologia* **415**: 139-145.
- Hsieh, Y.P., 1996. Assessing aboveground net primary production of vascular plants in marshes, *Estuaries* **19**: 82-85.
- Hu, K.P., Hart, W.C., and Xu, Z., 1994. Overview: Design of sub-surface flow constructed wetland systems, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 13-24.
- Huang, Y., Latorre, A., Barcelo, D., Garcia, J., Aguirre, P., Mujeriego, R., and Bayona, J.M., 2004. Factors affecting linear alkylbenzene sulfonates removal in subsurface flow constructed wetlands, *Environ. Sci. Technol.* **38**: 2657-2663.

- Huebert, D.B., and Gorham, P.R., 1983. Biphasic mineral nutrition of the submersed aquatic macrophyte *Potamogeton pectinatus* L., *Aquat. Bot.* **16**: 269-284.
- Huenneke, L.F., 1982. Wetland forests of Tompkins County, New York, *Bull. Torrey Bot. Club* **109**: 51-63.
- Humphreys, E., Meyer, W.S., Prathapar, S.A., and Smith, D.J., 1994. Estimation of evapotranspiration from rice in southern New South Wales: A review, *Aust. J. Exp. Agric.* **34**: 1069-1078.
- Hunt, P.G., and Poach, M.E., 2001. State of the art for animal wastewater treatment in constructed wetlands, *Wat. Sci. Tech.* **44** (11/12): 19-25.
- Hunt, P.G., Thom, W.O., Szögi, A.A., and Humenik, F.J., 1995. State of the art for animal wastewater treatment in constructed wetlands, in: *Proc. 7<sup>th</sup> Internat. Symp. Agricultural and Food Processing Wastes*, C.C. Ross, ed., Chicago, Illinois, ASAE, St. Joseph, Michigan, pp. 53- 65.
- Hunt, P.G., Vanotti, M.B., Szögi, A.A., Humenik, F.J., and Rice, J.M., 1997. Constructed wetlands for animal waste water treatment, in: *Proc. of the Southern Animal Waste Management Workshop*, Tifton, Georgia, pp. 161-175.
- Hunt, P.G., Poach, M.E., Szogi, A.A., Reddy, G.B., and Humenik, F.J., 2002. Treatment of swine wastewater in constructed wetlands, in: *Treatment Wetlands for Water Quality Improvement*, J. Pries, ed., CH2M HILL Canada limited, Waterloo, Ontario, Canada, pp. 3-13.
- Hunter, R., Birkbeck, A.E., and Coombs, G., 1993. Innovative marsh treatment systems for control of leachate and fish hatchery wastewater, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 477- 484.
- Huntsman, B.E., Solch, J.G., and Porter, M.D., 1978. Utilization of *Sphagnum* sp. dominated bog for coal acid mine drainage abatement. Geol. Soc. Amer. 91<sup>th</sup> Annual Meeting Book of Abstracts, Toronto, p. 322.
- Hurry, R.J., and Bellingier, E.G., 1990. Potential yield and nutrient removal by harvesting of *Phalaris arundinacea* in a wetland treatment system, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 543-546.
- Hwang, Y.H., Fan, C.W., and Yin, M.H., 1996. Primary production and chemical composition of emergent aquatic macrophytes, *Schoenoplectus mucronatus* ssp. *robustus* and *Spartanium fallax*, in Lake Yuan-Yang, Taiwan, *Biol. Bull. Acad. Sin.* **37**: 265-273.
- Idso, S.B., 1979. Evapotranspiration from water hyacinth (*Eichhornia crassipes* (Mart.) Solms) in Texas reservoirs, *Water Resour. Bull.* **15**: 1466-1467.
- Ikusima, I., 1966. Ecological studies on the productivity of aquatic plant communities. 2. Seasonal changes in standing crop and productivity of a natural submerged community of *Vallisneria denserrulata*, *Bot. Mag. Tokyo* **79**: 7-19.
- Ingestad, T., and Ågren, G.I., 1988. Nutrient uptake and allocation at steady-state nutrition, *Physiol. Plant.* **72**: 450-459.
- Ingvorsen, K., Zeikus, J.G., and Brock, T.D., 1981. Dynamics of bacterial sulfate-reduction in a eutrophic lake, *Appl. Environ. Microbiol.* **42**: 1029-1036.
- Ingvorsen, K., and Jørgensen, B.B., 1984. Kinetics of sulfate uptake by freshwater and marine species of *Desulfovibrio*, *Arch. Microbiol.* **132**: 61-66.
- IRIDRA, 2002. Database of Italian constructed wetlands. Electronic version.
- Ishaque, M., and Aleem, M.I.H., 1973. Intermediates of denitrification in the chemoautotroph *Thiobacillus denitrificans*, *Arch. Microbiol.* **94**: 269-282.
- Islam, A., Mandal, R., and Osman, K.T., 1979. Direct absorption of organic phosphate by rice and jute plants, *Plant Soil* **53**: 49-54.
- Jackson, M.B., and Drew, M.C., 1984. Effects of flooding on growth and metabolism of herbaceous plants , in: *Flooding and Plant Growth*, T.T. Kozlowski, ed., Academic Press, New York, pp. 47-128.

- Jackson, M.B., Fenning, T.M., Drew, M.C., and Sarker, L.R., 1985. Stimulation of ethylene production and gas space formation in adventitious roots of *Zea mays* by small partial pressures of oxygen, *Planta* **165**: 486-492.
- Jackson, M.B., Davies, D.D., and Lambers, H., eds., 1991. *Plant Life Under Oxygen Deprivation. Ecology, Physiology and Biochemistry*, SPB Academic Publishing, The Hague, The Netherlands.
- Jackson, W.T., 1955. The role of adventitious roots in recovery of shoots following flooding of the original root system, *Am. J. Bot.* **42**: 816-819.
- Jacob, D.L., and Otte, M.L., 2003. Conflicting processes in the wetland plant rhizosphere: metal retention or mobilization, *Water, Air and Soil Pollut.* **3**: 91-104.
- Jacobson, M.E., 1994. Chemical and biological mobilization of Fe(III) in marsh sediments, *Biogeochemistry* **25**: 41-60.
- Jacobson, M.E., Mackin, J.E., and Capone, D.G., 1987. Ammonium production in sediments inhibited with molybdate; implications for the sources of ammonium in anoxic marine sediments, *Appl. Environ. Microbiol.* **53**: 2435-2439.
- Jagger, J., 1983. Physiological effects of near ultraviolet radiation on bacteria, *Photochem. Photobiol. Rev.* **7**: 1-75.
- Jakobsen, P., Patrick, W.H., Jr., and Williams, B.G., 1981. Sulfide and methane formation in soils and sediments, *Soil Science* **132**: 279-287.
- Jakrlová, J., 1975. Primary production and plant chemical composition in floodplain meadows, *Acta Sci. Nat. Brno* **9**: 1-52
- Jakrlová, J., 1989. Primary production, in: *Methods for Ecosystem Studies*, D. Dykyjová, ed., Academia Praha, Czech Republic (in Czech).
- Janetschek, H., 1982. *Ökologische Feldmethoden*, E. Ulmer Verlag, Stuttgart, Germany.
- Jardinier, N., Blake, G., Mauchamp, A., and Merlin, G., 2001. Design and performance of experimental constructed wetlands treating coke plant effluents, *Wat. Sci. Tech.* **44** (11/12): 485-491.
- Jauregui, M.A., and Reisenauer, H.M., 1982. Dissolution of oxides of manganese and iron by root exudate components, *Soil Sci. Soc. Am. J.* **46**: 314-317.
- Jayakumar, K.V., and Dandigi, M.N., 2002. A study on the use of constructed wetlands for treatment of municipal wastewater during all seasons, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, University of Dar-es-Salaam and IWA, pp. 314-323.
- Jayaraman, A.P., and Prabhakar, S., 1982. The water hyacinth's uptake of <sup>137</sup>Cs and <sup>90</sup>Sr and its decontamination potential as an approach to the zero-release concept, in: *Proc. Conf. Environmental Migration of Long-Lived Radionuclides*, International Atomic Energy Agency, Vienna, pp. 557-569.
- Jenne, E.A., 1968. Controls of Mn, Fe, Co, Ni, Cu, and Zn concentration in soils and water: Significant role of hydrous Mn and Fe oxides, *Adv. Chem. Ser.* **73**: 337-387.
- Jenny, H., Gessel, S.P., and Bingham, F.T., 1949. Comparative study of decomposition rates of organic matter in temperate and tropical regions, *Soil Sci.* **68**: 417-432.
- Jensen, M.W., Riley, K.W., and Bavor, H.J., 2006. Long-term performance assessment of a constructed wetland system for removal of trace elements from power station process water, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 271-282.
- Jenssen, P.D., and Krogstad, T., 2003. Design of constructed wetlands using phosphorus sorbing lightweight aggregate (LWA), in: *Constructed Wetlands for Wastewater Treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 260-271.
- Jenssen, P.D., and Mæhlum, T., 2003. Treatment performance of multistage wastewater constructed wetlands in Norway, in: *Proc. Internat. Conf. Constructed and Riverine Wetlands for Optimal Control of Wastewater at Catchment Scale*, Ü. Mander, C. Vohla and A. Poom, eds., University of Tartu, Institute of Geography, Tartu, Estonia, *Publ. Instituti Geographici Universitatis Tartuens* **94**, pp. 11-16.

- Jenssen, P.D., Krogstad, T., and Mæhlum, T., 1991. Wastewater treatment by constructed wetlands in the Norwegian climate: Pretreatment and optimal design, in: *Proc. Internat. Conf. Ecological Engineering for Wastewater Treatment*, C. Etnier and B. Guterstam, eds., Bokskogen, Gothenburg, Sweden, pp. 227-238.
- Jenssen, P.D., Mæhlum, T., Zhu, T., and Warner, W.S., 1994. Cold-climate constructed wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 428-436.
- Jenssen, P.D., Mæhlum, T., Krogstad, T., and Vråle, L., 2005. High performance constructed wetlands for cold climates, *J. Environ. Sci. Health* **40A**: 1343-1353.
- Jervis, R.A., 1969. Primary production in the freshwater marsh ecosystem of Troy Meadow, New Jersey, *Bull. Torrey Bot. Club* **96**: 209-231.
- Jetten, M.S.M., 2001. New pathways for ammonia conversion in soil and aquatic systems, *Plant and Soil* **230**: 9-19.
- Jetten, M.S.M., Logemann, S., Muyzer, G.M., Robertson, L.A., DeVries, S., Van Loosdrecht, M.C.M., and Kuenen, J.G., 1997. Novel principles in the microbial conversion of nitrogen compounds, *Antonie van Leeuwenhoek* **71**: 75-93.
- Jetten, M.S.M., Strous, M., van de Pas-Schoonem, K.T., Schalk, J., van Dongen, U.G.J.M., van de Graaf, A.A., Logemann, S., Muyzer, G., Loosdrecht, M.C.M., and Kuenen, J.G., 1999. The anaerobic oxidation of ammonium, *FEMS Microbiol. Rev.* **22**: 421-437.
- Ji, G., Sun, T., Zhou, Q., Sui, X., Chang, S., and Li, P., 2002. Constructed subsurface slow wetland for treating heavy oil-produced water of the Liaohe Oilfield in China, *Ecol. Eng.* **18**: 459-465.
- Jiang, Z.C., and Hull, R.J., 1999. Partitioning of nitrate assimilation between shoots and roots of Kentucky bluegrass, *Crop. Sci.* **39**: 746-754.
- Jing, S.-R., Lin, Y.-F., Lee, D.-Y., and Wang, T.-W., 2001. Nutrient removal from polluted river water by using constructed wetlands, *Bioresource Technol.* **76**: 131-135.
- Johansen, N.H., and Brix, H., 1996. Design criteria for a two-stage constructed wetland, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur Wien, Austria, Chapter IX/3.
- Johansen, N.H., Brix, H., and Arias, C.A., 2002. Design and characterization of a compact constructed wetland system removing BOD, nitrogen and phosphorus from single household sewage, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, pp. 47-61.
- Johansson, L., 1997. The use of LECA (light expanded clay aggregates) for the removal of phosphorus from wastewater, *Wat. Sci. Tech.* **35**(5): 87-93.
- Johansson, L., and Gustafsson, J.P., 2000. Phosphate removal using blast furnace slags and opoka-mechanisms, *Wat. Res.* **34**: 259-265.
- John, C.D., and Greenway, H., 1976. Alcoholic fermentation and activity of shoots following flooding of the original root systems, *Aust. J. Plant Physiol.* **3**: 325-326.
- John, C.K., 1983. Use of water hyacinth in the treatment of effluents from rubber industry, in: *Proc. Conf. Water Hyacinth*, Hyderabad, UNEP Nairobi, pp. 699-712.
- John, C.K., 1984. Treatment of agro-industrial wastes using water hyacinth, *Wat. Sci. Tech.* **17**: 781-790.
- Johnson, D.B., and Hallberg, K.B., 2005. Biogeochemistry of the compost bioreactor components of a composite acid mine drainage passive remediation system, *Sci. Total Environ.* **338**: 81-93.
- Johnson, K.D., Martin, C.D., Moshiri, G.A., and McCrory, W.C., 1999. Performance of a constructed wetland leachate treatment system at the Chunchula landfill, Mobile County, Alabama, in: *Constructed Wetlands for the Treatment of Landfill Leachates*, G. Mulamootil, E.A. McBean, and F. Rovers, eds., CRC Press/Lewis Publishers, Boca Raton, Florida, pp.57-70.
- Johnston, C.A., 1991. Sediments and nutrient retention by freshwater wetlands: effects on surface water quality, *CRC Crit. Rev. Environ. Control* **21**: 491-565.

- Jones, F.E., 1992. *Evaporation of Water with Emphasis on Applications and Measurements*, Lewis Publishers, Chelsea, Michigan.
- Jones, H.E., and Etherington, J.R., 1970. Comparative studies of plant growth and plant distribution in relation to waterlogging. VI. The survival of *Erica cinerea* L. and *E. tetralix* L. and its apparent relationship to iron and manganese uptake in waterlogged soil, *J. Ecol.* **58**: 487-496.
- Jones, J.G., 1986. Iron transformations by freshwater bacteria, *Adv. Microb. Ecol.* **9**: 149-185.
- Jones, K., 1974. Nitrogen fixation in a salt marsh, *J. Ecol.* **62**: 553-565.
- Jones, M.B., 1988. Photosynthetic responses of C<sub>3</sub> and C<sub>4</sub> wetland species in a tropical swamp, *J. Ecol.* **76**: 253-262.
- Jones, M.B., and Muthuri, F.M., 1977. Standing biomass and carbon distribution in a papyrus (*Cyperus papyrus* L.) swamp on Lake Naivasha, Kenya, *Tropical Ecol.* **13**: 347-356.
- Jørgensen, B.B., 1977a. Bacterial sulfate reduction within reduced microniches of oxidized marine sediments, *Mar. Biol.* **41**: 7-17.
- Jørgensen, B.B., 1977b. Distribution of colorless sulfur bacteria (*Beggiatoa* spp.) in a coastal marine sediments, *Mar. Biol.* **41**: 19-28.
- Jørgensen, B.B., 1982. Mineralisation of organic matter in the sea bed – the role of sulphate reduction, *Nature* **296**: 643-645.
- Jørgensen, K.S., and Tiedje, J.M., 1993. Survival of denitrifiers in nitrate-free, anaerobic environments, *Appl. Environ. Microbiol.* **59**: 3297-3305.
- Jugsujinda, A., Krairapanond, A., and Patrick, W.H.Jr., 1995. Influence of extractable iron, aluminum, and manganese on P-sorption in flooded acid sulfate soils, *Biol. Fertil. Soils* **20**: 118-124.
- Junsan, W., Yuhua, C., and Qian, S., 2000. The application of constructed wetland to effluent purification in pig plant, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., pp. 1477-1480.
- Juwarkar, A.S., Verma, M., Meshram, J., Bal, A.S., and Juwarkar, A., 1992. Wastewater treatment in constructed wetlands, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, IWA and University of Western Sydney, pp. 35.1-35.4
- Juwarkar, A.S., Oke, B., Juwarkar, A., and Patnaik, S.M., 1994. Domestic wastewater treatment through constructed wetland in India, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS Secretariat, Guangzhou, P.R.China. appendix.
- Kadlec, R. H., 1994. Overview: surface flow constructed wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS Secretariat, Guangzhou, P.R.China, pp. 1-12.
- Kadlec, R.H., 1997. Deterministic and stochastic aspects of constructed wetland performance and design, *Wat. Sci. Tech.* **35**(5): 149-156.
- Kadlec, R.H., 1999. Constructed wetlands for treating landfill leachates, in: *Constructed Wetlands for the Treatment of Landfill Leachates*, G. Mulamoottil, E.A. McBean, and F. Revers, eds., Lewis Publisher/CRC Press, Boca Raton, pp. 17-31.
- Kadlec, R.H., 2000. The inadequacy of first-order treatment wetland models, *Ecol. Eng.* **15**: 105-119.
- Kadlec, R.H., 2003. Status of treatment wetlands in North America, in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal., pp. 363-401.
- Kadlec, R.H., 2005. Vegetation effects on ammonia reduction in treatment wetlands, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 233-260.
- Kadlec, R.H., and Tilton, D.L., 1979. The use of freshwater wetlands as a tertiary wastewater treatment alternative, *CRC Crit. Rev. Environ. Control* **9**: 185-212.
- Kadlec, R. H., and Bevis F. B., 1990. Wetlands and wastewater: Kinross, Michigan, *Wetlands* **10**: 77-92.

- Kadlec, R.H., and Knight, R.L., 1996. *Treatment Wetlands*, CRC Press, Boca Raton, Florida.
- Kadlec, R.H., Richardson, C.J., and Kadlec, J.A., eds., 1975. The Effects of Sewage Effluent on Wetland Ecosystems. Semi-Annual Report No. 4, NTIS PB 2429192.
- Kadlec, R.H., Burgoon, P.S., and Henderson, M.E., 1997. Integrated natural systems for treating potato processing wastewater, *Wat. Sci. Tech.* **35**(5): 263-270.
- Kadlec, R.H., Knight, R.L., Vymazal, J., Brix, H., Cooper, P. F., and Haberl, R., 2000. *Constructed Wetlands for Water Pollution Control: Processes, Performance, Design and Operation*, IWA Scientific and Technical Report No. 8, London.
- Kadlec, R.H., Axler, R., McCarthy, B., and Henneck, J., 2003. Subsurface treatment wetlands in the cold climate in Minnesota, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 19-52.
- Kalhon, S., and Emerson, S., 1984. The oxidation state of manganese in surface sediment of the deep sea, *Geochim. Cosmochim. Acta* **48**: 897-902.
- Kalibbala, H.M., Nalubega, M., and Kulabako, R.N., 2002. Challenges in the use of constructed wetland in the treatment of industrial wastewater, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam and IWA, pp. 504-513.
- Kalin, M., and Smith, M. P., 1992. The development of floating *Typha* mats. Paper presented during 3<sup>th</sup> Conf. Wetland Systems for Water Pollution Control, Sydney, Australia.
- Kalin, M., Cairns, J., and McCreasy, R., 1989. Ecological engineering methods for acid mine drainage treatment of coal wastes, in: *Proc. Workshop Bioprocessing of Fossil Fuels*, P.E. Bayer, ed., U.S. Department of Energy, Office of Fossil Energy and Idaho Operations Office, CONF 890884, pp. 208-219.
- Kalisz, L., and Salbut, J., 1995. Evaluation of wastewater treatment in selected wetlands with macrophytes, in: *Proc. Conf. Hydrobotanical Methods in Wastewater Treatment – Design, Exploitation and Application Conditions*, Ministry of Environmental Protection, Natural Resources and Forestry, Warszawa, Poland, pp. 40-55.
- Kanazawa, K., Higuchi, K., Nishizawa, N.K., Fushiya, S., Chino, M., and Mori, S., 1994. Nicotianamine aminotransferase activities are correlated to the phytosiderophore secretion under Fe-deficient conditions in Gramineae, *J. Exp. Bot.* **45**: 1903-1906.
- Kansanen, A., and Niemi, R., 1974. On the production ecology of isoetids, especially *Isoetes lacustris* and *Lobelia dortmanna*, in Lake Pääjärvi, southern Finland, *Ann. Bot. Fennici* **11**: 178-187.
- Kansanen, A., Niemi, R., and Överlund, K., 1974. Pääjärven makrofytyt, *Luonnon Tutkija* **78**: 111-118.
- Kantawanichkul, S., and Neamkam, P., 2003. Optimum recirculation ratio for nitrogen removal in a combined system: vertical flow vegetated bed over horizontal flow sand bed, in: *Wetlands: Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 75-86.
- Kantawanichkul, S., and Somprasert, S., 2005. Using combined constructed wetland system to treat high nitrogen wastewater, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 49-55.
- Kantawanichkul, S., and Somprasert, S., 2005. Using a compact combined constructed wetland system to treat agricultural wastewater with high nitrogen, *Wat. Sci. Tech.* **51**(9): 47-53.
- Kantawanichkul, S., and Wara-Aswapati, S., 2005. LAS removal by a horizontal flow constructed wetland in tropical climate, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 261-270.

- Kantawanichkul, S., Neamkam, P., and Shutes, R.B.E., 2001. Nitrogen removal in a combined system: vertical vegetated bed over horizontal flow sand bed, *Wat. Sci. Tech.* **44** (11-12): 137-142.
- Kantawanichkul, S., Somprasert, S., Aekasin, U., and Shutes, R.B.E., 2003. Treatment of agricultural wastewater in two experimental combined constructed wetland systems in a tropical climate, *Wat. Sci. Tech.* **48**(5): 199-205.
- Kao, C.M., Wang, J.Y., Lee, H.Y., and Wen, C.K., 2001. Application of a constructed wetland for non-point source pollution control, *Wat. Sci. Tech.* **44**(11/12): 585-590.
- Kapellakis, I.E., Tsagarakis, K.P., and Angelakis, A.N., 2004. Performance of free water surface constructed wetlands for olive mill wastewater treatment, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004, pp. 113- 120.
- Kaplan, W., Valiela, I., and Teal, J.M., 1979. Denitrification in a salt marsh ecosystem, *Limnol. Oceanogr.* **24**: 726-734.
- Karathanasis, A.D., and Thompson, Y.L., 1995. Mineralogy of iron precipitates in a constructed acid mine drainage wetland, *Soil Sci. Soc. Am. J.* **59**: 1773-1781.
- Karathanasis, A.D., and Johnson, C.M., 2003. Metal removal potential by three aquatic plants in an acid mine drainage wetland, *Mine Water Environ.* **22**: 22-30.
- Karathanasis, A.D., Potter, C.L., and Coyne, M.S., 2003. Vegetation effect on fecal bacteria, BOD, and suspended solid removal in constructed wetlands treating domestic wastewater, *Ecol. Eng.* **20**: 157-169.
- Karnchanawong, S., and Sanjitt, J. 1994. Comparative study of domestic wastewater treatment efficiencies between facultative pond and water spinach pond, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS Secretariat, Guangzhou, P.R.China, pp. 396-404.
- Karpiscak, M.M., Gerba, C.P., Watt, P.M., Foster, K.E., Falabi, J.A., 1996. Multi-species plant systems for wastewater quality improvement and habitat enhancement, *Wat. Sci. Tech.* **33**: 231-236.
- Karrh, J.D., Moriarty, J., Kornue, J.J., and Knight, R.L., 2002. Sustainable management of aircraft anti/de-icing process effluents using a subsurface-flow treatment wetland, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 187-195.
- Kaseva, M.E., 2004. Performance of a sub-surface flow constructed wetland in polishing pre-treated wastewater – a tropical case study, *Wat. Res.* **38**: 681-687.
- Kaseva, M.E., Mbwette, T.S., Katima, J.H., and Mashauri, D.A., 2000. Performance of a sub-surface horizontal flow constructed wetland in polishing upward flow anaerobic sludge blanket pre-treated domestic wastewater under tropical conditions- a case study in Dar es Salaam, Tanzania, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., pp. 1051-1059.
- Kaseva, M.E., Mbwette, T.S.A., and Katima, J.H.Y., 2002. Domestic sewage treatment in a pilot plant composed of septic tank and a constructed wetland system – a case study in Dar es Salaam, Tanzania, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and IWA, pp. 367-379.
- Kasper, T., and Jenkins, G.A., 2005. Background concentration of suspended solids in a constructed stormwater treatment wetland, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE, pp. 557-564.
- Kastelan-Macan, M., and Petrovic, M. 1996. The role of fulvic acids in phosphorus sorption and release from mineral particles, *Wat. Sci. Tech.* **34**: 259-265.
- Kassenga, G.R., Pardue, J.H., Blair, S., and Ferraro, T., 2003. Treatment of chlorinated volatile organic compounds in upflow wetland mesocosms, *Ecol. Eng.* **19**: 305-323.
- Kaswadji, R.F., Gosselink, J.G., and Turner, E.G., 1990. Estimation of primary production using five different methods in a *Spartina alterniflora* salt marsh, *Wetlands Ecology and Management* **1**: 57-64.

- Kätterer, T. and Andrén, O., 1999. Growth dynamics of reed canarygrass (*Phalaris arundinacea* L.) and its allocation of biomass and nitrogen belowground in a field receiving daily irrigation and fertilisation, *Nutr. Cycling Agroecosyst.* **54**: 21-29.
- Kätterer, T., Andrén, O., and Pettersson, R., 1998. Growth and nitrogen dynamics of reed canarygrass (*Phalaris arundinacea* L.) subjected to daily fertilization and irrigation in the field, *Field Crops Res.* **55**: 153-164.
- Kato, K., Koba, T., Ietsugu, H., Saigusa, T., Nozoe, T., Kobayashi, S., Kitagawa, K., and Yanagiya, S. 2006. Early performance of hybrid reed bed system to treat milking parlour wastewater in cold climate in Japan, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1111-1118.
- Kaul, V., and Baskaya, U., 1976. The noxious floating lemniid-*Salvinia* aquatic weed complex in Kashmir, in: *Aquatic Weeds in South East Asia*, C.K. Varshney and J. Rzoska, eds., Dr. W. Junk Publishers, The Hague, The Netherlands, pp. 188-192.
- Kaul, V., Trisal, C.L., and Handoo, J.K., 1978. Distribution and production of macrophytes in some water bodies of Kashmir, in: *Glimpses of Ecology*, J.S. Singh and B. Gopal, eds., Internat. Sci. Publications, Jaipur, India, pp. 313-34.
- Kawase, M., 1981. Anatomical and morphological adaptation to waterlogging, *Hort-Science Special Insert* **16**: 30-34.
- Kawase, M., and Whitmoyer, R.E., 1980. Aerenchyma development in waterlogged plants, *Am. J. Bot.* **67**: 18-22.
- Kee, N.G., and Bloomfield, C., 1961. The solution of some minor element oxides by decomposing plant material, *Geochim. Cosmochim. Acta* **24**: 206-225.
- Keeley, J.E., 1979. Population differentiation along a flood frequency gradient: Physiological adaptations to flooding in *Nyssa sylvatica*, *Ecol. Monogr.* **49**: 89-108.
- Keeley, D.R., and Franz, E.H., 1979. Alcoholic fermentation in swamp and upland populations of *Nyssa sylvatica*: temporal changes in adaptive strategy, *Am. Nat.* **113**: 587-591.
- Keeney, D.R., 1973. The nitrogen cycle in sediment-water system, *J. Environ. Qual.* **2**: 15-29.
- Keeney, D.R., Chen, R.L., and Graetz, D.A. 1971. Denitrification and nitrate reduction in sediments: Importance to the nitrogen budget in lakes, *Nature* **233**: 66-67.
- Keeney, D.R., Fillery, I.R., and Marx, G.P., 1979. Effect of temperature on the gaseous nitrogen products of denitrification in a silt loam soil, *Soil Sci. Soc. Am. J.* **43**: 1124-1128.
- Keirn, M.A., and Brezonik, P.L., 1971. Nitrogen fixation by bacteria in Lake Mize, Florida, and in some lacustrine sediments, *Limnol. Oceanogr.* **16**: 720-731.
- Keith, L.H., 1997. *Environmental Endocrine Disruptors – A Handbook of Property Data*, John Wiley and Sons, New York.
- Keith, S.M., and Herbert, R.A., 1983. Dissimilatory nitrate reduction by a stain of *Desulfovibrio desulfuricans*, *FEMS Microbiol. Lett.* **18**: 55-59.
- Kellogg, C.H., Bridgham, S.D., and Leicht, S.A., 2003. Effects of water level, shade and time on germination and growth of freshwater marsh plants along a simulated successional gradient, *J. Ecol.* **91**: 274-282.
- Kelly, D.P., 1982. Biochemistry of chemolithotrophic oxidation of inorganic sulphur, *Phil. Trans. R. Soc. Lond. B* **298**: 499-528.
- Kemp, M.C., and George, D.B., 1997. Subsurface flow constructed wetlands treating municipal wastewater for nitrogen transformation and removal, *Water Environ. Res.* **69**: 1254-1262.
- Kemp, W.M., and Murray, L., 1986. Oxygen release from roots of the submersed macrophyte *Potamogeton perfoliatus* L.: Regulating factors and ecological implications, *Aquat. Bot.* **26**: 271-283.
- Kephart, K.D., and Buxton, D.R., 1993. Forage quality responses of C3 and C4 perennial grasses to shade, *Crop Sci.* **33**: 831-837.
- Kerchler, S.M., and Zedler, J.B., 2004. Multiple disturbances accelerate invasion of reed canary grass (*Phalaris arundinacea* L.) in a mesocosm study, *Oecologia* **138**: 455-464.



- Kern, J., 2003. Seasonal efficiency of a constructed wetland for treating dairy farm wastewater, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 197-214.
- Kern, J., and Idler, C., 1999. Treatment of domestic and agricultural wastewater by reed bed systems, *Ecol. Eng.* **12**: 13-25.
- Kern, J., and Brettar, I., 2002. Nitrogen turnover in a subsurface constructed wetland receiving dairy farm wastewater, in: *Treatment Wetlands for Water Quality Improvement*, J. Pries, ed., CH2M Hill Canada Limited, Waterloo, Ontario, pp. 15-21.
- Khalid, R.A., 1980. Chemical mobility of cadmium in sediment-water systems, in: *Cadmium in the Environment*, Part I, J.O. Nriagu, ed., John Wiley and Sons, New York, pp. 257-304.
- Khalid, R.A., Patrick, W.H., and DeLaune, R.D., 1977. Phosphorus sorption characteristics of flooded soils, *Soil Sci. Soc. Am J.* **41**: 305-310.
- Khalid, R.A., Patrick, W.H., Jr., and Gambrell, R.P., 1978. Effect of dissolved oxygen on chemical transformations of heavy metals, phosphorus, and nitrogen in an estuarine sediment, *Estuar. Coast. Mar. Sci.* **6**: 21-35.
- Khalil, A., Prudent, P., Bettäieb, M.M., and Domeizel, M., 2005. Pilot treatment plant: constructed soil reed bed for a cheese dairy farm effluent, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 77-78.
- Khatiawada, N.R., and Pradhan, B.B.N., 2006. Media effects on performance of constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1169-1176.
- Kickuth, R., 1969. Höhere Wasserpflanzen und Gewässerreinigung, *Schiffenreihe der Vereinigung Deutscher Gewässerschutz EV-VDG* **19**: 3-14.
- Kickuth, R., 1977. Degradation and incorporation of nutrients from rural wastewaters by plant hydrosphere under limnic conditions, in: *Utilization of Manure by Land Spreading*, Comm. Europ. Commun., EUR 5672e, London, pp. 335-343.
- Kickuth, R., 1978. Elimination gelöster Laststoffe durch Röhrichtbestände, *Arbeiten des Deutschen Fischereiverbandes* **25**: 57-70.
- Kickuth, R., 1980. Abwasserbehandlung im Wurzelraumverfahren. *Wlb "wasser, luft und betrieb"* **11**: 21-24.
- Kickuth, R., 1981. Abwasserreinigung in Mosaikmatritzen aus aeroben und anaeroben Teilbezirken, in: *Grundlagen der Abwasserreinigung*, F. Moser, ed., Verlag Oldenburg, Munchen, Wien, pp. 639-665.
- Kickuth, R., 1982a. Das Wurzelraumverfahren - ein kosten-günstiges Klärverfahren für den dezentralen Einsatz in Kommunen und Gewerbe, *Der Tropenlandwirt* **83**: 141-154.
- Kickuth, R., 1982b. A low-cost process for purification of municipal and industrial waste water, *Der Tropenlandwirt* **83**: 141-154.
- Kickuth, R., 1984. Das Wurzelraumverfahren in der praxis, *Landschaft und Stadt* **16**: 145-153.
- Kickuth, R., and Kaitzis, G., 1975. Mikrobizid wirksame aromaten aus *Scirpus lacustris* L., *Umweltschutz* **4-5**: 134-135.
- Kielland, K., 1994. Amino acid absorption by Arctic plants: Implications for plant nutrition and nitrogen cycling, *Ecology* **75**: 2373-2383.
- Kiene, R.P., 1988. Dimethyl sulfide metabolism in salt marsh sediments, *FEMS Microbiol. Ecol.* **53**: 71-78.
- Kiessig, G., Küchler, A., and Kalin, M., 2003. Passive treatment of contaminated water from uranium mining and milling, in: *Constructed and Riverine Wetlands for Optimal Control of Wastewater at Catchment Scale*, Ü. Mander, C. Vohla and A. Poom, eds., University of Tartu, Estonia, Publicationes Institutti Geographici Universitatis Tartuenssis 94, p. 116.
- Killham, K., 1994. *Soil Ecology*, Cambridge University Press, Cambridge, UK.

- Kim, K.-H., and Andreae, M.O., 1987. CS<sub>2</sub> in seawater and the marine atmosphere over the North Atlantic, *J. Geophys. Res.* **92D**: 14733-14738.
- Kimwaga, R.J., Mbwette, T.S.A., Mashauri, D.A., Katima, J.H.Y., and Jørgensen, S.E., 2002a. Modelling sludge accumulation in dynamic roughing filters coupled to a horizontal subsurface flow constructed wetland, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 788-798.
- Kimwaga, R.J., Mbwette, T.S.A., Mashauri, D.A., Katima, J.H.Y., and Jørgensen, S.E., 2002b. Mathematical modeling of the TSS removal in a coupled dynamic roughing filter and subsurface horizontal flow constructed wetland system treating WSP effluents, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 843-857.
- Kimwaga, R.J., Mashauri, D.A., Mbwette, T.S.A., Katima, J.H.Y., and Jørgensen, S.E., 2004. Use of coupled dynamic roughing filters and subsurface horizontal flow constructed wetland system as appropriate technology for upgrading waste stabilisation ponds effluents in Tanzania, *Physics and Chemistry of the Earth* **29**: 1243-1251.
- Kincanon, R., and McAnally, A.S., 2004. Enhancing commonly used model predictions for constructed wetland performance: as-built design considerations, *Ecol. Model.* **174**: 309-322.
- King, D., and Nedwell, D.B., 1985. The influence of nitrate concentration upon the endproducts of nitrate dissimilation by bacteria in anaerobic salt marsh sediments, *FEMS Microbiol. Ecol.* **31**: 23-28.
- King, D., and Nedwell, D.B., 1987. The adaptation of nitrate-reducing bacterial communities in estuarine sediments in response to overlying water load, *FEMS Microbiol. Ecol.* **45**: 15-20.
- King, G.M., and Klug, M.J., 1982. Comparative aspects <sup>35</sup>SO<sub>4</sub><sup>2-</sup> of sulfur mineralization in sediments of eutrophic lake basin, *Appl. Environ. Microbiol.* **43**: 1406-1412.
- Kinnersley, A.M., 1993. The role of phytochelates in plant growth and productivity, *Plant Growth Regul.* **12**: 207-217.
- Kinsley, C.B., Crolla, A.M., Kuyucak, N., Zimmer, M., and Lafleche, A., 2004. A pilot peat filter & constructed wetland system treating landfill leachate, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE and Cemagref, Lyon, pp. 635-642.
- Kinsley, C.B., Crolla, A.M., Kuyucak, N., Zimmer, M., and Lafleche, A., 2006. Nitrogen dynamics in a constructed wetland system treating landfill leachate, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 295-305.
- Kishinami, I., and Widholm, J.M., 1987. Characterization of Cu and Zn resistant *Nicotiana plumbaginifolia* suspension cultures, *Plant Cell Physiol.* **28**: 203-210.
- Kleeberg, A., and Schlungbaum, M. 1993. In situ phosphorus release experiments in the Warnow River (Mecklenburg, northern Germany), *Hydrobiologia* **253**: 263-274.
- Kleinmann, L.P., 1985. Treatment of acid mine water by wetlands, in: *Proc. Technology Transfer Seminar Control of Acid Mine Drainage*, U.S. Dept. of the Interior, Bureau of Mines, Information Circular 9027, pp. 48-52.
- Klimešová, J., 1994. The effect of timing and duration of floods on growth of young plants of *Phalaris arundinacea* L. and *Urtica dioica* L.: an experimental study, *Aquat. Bot.* **48**: 21-29.
- Klimešová, J., 1995. population dynamics of *Phalaris arundinacea* L. and *Urtica dioica* L. in a floodplain during a dry period, *Wetlands Ecol. Manage.* **3**: 79-85.
- Klimešová, J., 1996. *Phalaris arundinacea* as its altitudinal maximum in the Czech Republic: effect of cutting on carbohydrate and nitrogen content in rhizomes, *Ekológia* (Bratislava) **15**: 161-167.
- Klimešová, J., and Čížková, H., 1996. Limitations of establishment and growth of *Phalaris arundinacea* in the floodplains, in: *Floodplain Ecology and Management*, K. Prach, J.

- Jeník and A.R.G. Large, eds., SPB Academic Publishing, Amsterdam, The Netherlands, pp. 131-145.
- Kline, P., and Broersma, K., 1983. The yield, nitrogen and nitrate content of reed canarygrass, meadow foxtail and timothy fertilized with nitrogen, *Can. J. Plant. Sci.* **63**: 943-950.
- Klopatek, J.M., 1975. The role of emergent macrophytes in mineral cycling in a freshwater marsh, in: *Mineral Cycling in Southeastern Ecosystems*, F.G. Howell, J.B. Gentry and M.H. Smith, eds., Symposium Series, CONF 740513, Energy Research and Development Administration, Washington, D.C., pp. 367-383.
- Kludze, H.K., and DeLaune, R.D., 1994. Methane emissions and growth of *Spartina patens* in response to soil redox intensity, *Soil Sci. Soc. Am. J.* **58**: 1838-1845.
- Kludze, H.K., and DeLaune, R.D., 1996. Soil redox intensity effects on oxygen exchange and growth of cattail and sawgrass, *Soil Sci. Soc. Am. J.* **60**: 616-621.
- Kludze, H.K., Pezeshki, S.R., and DeLaune, R.D., 1994. Evaluation of root oxygenation and growth in bald cypress in response to short-term soil hypoxia, *Can. J. For. Res.* **24**: 804-809.
- Kluyver, A.J., 1936. Bacterial metabolism, *Ann. Rev. Bacteriol.* **5**: 539-560.
- Kluyver, A.J., and Donker, H.J.K., 1926. Die Einheit in der Biochemie, *Chem. Zelle u. Gewebe*, **13**: 134-190.
- Kluyver, A.J., and Verhoeven, W., 1954. Studies on true dissimilatory nitrate reduction II. On the adaptation of *Micrococcus denitrificans*, *Antonie van Leeuwenhoek* **20**: 241-262.
- Kniemeyer, O., Fischer, T., Wilkes, H., Glockner, F.O., and Widdel, F., 2003. Anaerobic degradation of ethylbenzene by a new type of marine sulfate-reducing bacterium, *Appl. Environ. Microbiol.* **69**: 760-768.
- Knight, R.L., 1996. Wildlife habitat and public use of treatment wetlands, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, Keynote address 5.
- Knight, R.L., Winchester, B.H., and Higman, J.C., 1985. Ecology, hydrology, and advanced wastewater treatment potential of an artificial wetland in north-central Florida, *Wetlands* **5**: 167-180.
- Knight, R.L., Kadlec, R.H., and Reed, S., 1992. Wetlands for wastewater treatment data base, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 15.1 – 15.20.
- Knight, R.L., Ruble, R.W., Kadlec, R.H., and Reed, S., 1993. Wetlands for wastewater treatment: performance database, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 35-58.
- Knight, R.L., Hilleke, J., and Grayson, S., 1994. Design and performance of the Champion pilot-constructed wetland treatment system, *Tappi J.* **77**: 240-245.
- Knight, R.L., Payne, V.W.E., Jr., Borer, R.E., Clarke, R.A., Jr., and Pries, J.H., 2000. Constructed wetlands for livestock wastewater management, *Ecol. Eng.* **15**: 41-55.
- Knight, R.L., Clarke, R.A., Jr., and Bastian, R.K., 2001. Surface flow (sf) treatment wetlands as a habitat for wildlife and humans, *Wat. Sci. Tech.* **44**(11/12): 27-38.
- Knipling, E.B., West, S.H., and Haller, W.T., 1970. Growth characteristics, yield potential and nutritive content of water hyacinth, *Soil and Crop Sci. Soc. Fla. Proc.* **30**: 51-63.
- Knowles, R. 1982. Denitrification, *Microbiol. Rev.* **46**: 43-70.
- Koch, M.S., and Mendelsohn, I.A., 1989. Sulphide as a soil phytotoxin: differential responses in two marsh species, *J. Ecol.* **77**: 565-578.
- Koerselman, W., and Beltman, B., 1988. Evapotranspiration from fens in relation to Penman's potential free water evaporation (Eo) and pan evaporation, *Aquat. Bot.* **31**: 307-320.
- Koerselman, W., and Meulman, A.F.M., 1996. The vegetation N:P ratio: A new tool to detect the nature of nutrient limitation, *J. Appl. Ecol.* **33**: 1441-1450.

- Kohl, J.-G., Woitke, P., Kühl, H., Dewender, M., and König, G., 1998. Seasonal changes in dissolved amino acids and sugars in basal internodes as physiological indicators of the C/N-balance of *Phragmites australis* as littoral sites of different trophic status, *Aquat. Bot.* **60**: 217-223.
- Kohler, E.A., Poole, V.L., Reicher, Z.J., and Turco, R.F., 2004. Nutrient, metal and pesticide removal during storm and nonstorm events by a constructed wetland on an urban golf course, *Ecol. Eng.* **23**: 285-298.
- Koike, I., and Hattori, A., 1975. Growth yield of denitrifying bacterium *Pseudomonas denitrificans* under aerobic and denitrifying conditions, *J. Gen. Microbiol.* **88**: 1-10.
- Koike, I., and Hattori, A., 1978. Denitrification and ammonia formation in anaerobic coastal sediment, *Appl. Environ. Microbiol.* **35**: 278-282.
- Kok, C.J., van der Welde, G., and Landsberger, K.M., 1990. Production, nutrient dynamics and initial decomposition of floating leaves of *Nymphaea alba* L. and *Nuphar lutea* (L.) Sm. (Nymphaeaceae) in alkaline and acid waters, *Biogeochemistry* **11**: 235-250.
- Kolpin, D.W., Furlong, E.T., Meyer, M.T., Thurman, E.M., Zaugg, S.D., Barber, L., and Buxton, H.T., 2002. Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: a national reconnaissance, *Environ. Sci. Technol.* **36**: 1202-1211.
- Konings, H., Koot, E., and Tijman-deWolf, A., 1989. Growth characteristics, nutrient allocation, and photosynthesis of carex species from floating fens, *Oecologia* **80**: 111-121.
- Koops, H.P., and Möller, U.C., 1992. The lithotrophic ammonia-oxidizing bacteria, in: *The Prokaryotes*, vol. 3, A. Balows, H.G. Trüper, M. Dworkin, W. Harder, and K.H. Schleiffer, eds., Springer Verlag, Berlin, pp. 2625-2637.
- Kopecký, K., 1969. Ökologische Hauptunterschiede zwischen Röhrichtgesellschaften fleissender und stehender Binnengewässer Mitteleuropas, *Folia Geobot. Phytotax.* **1**: 93-192.
- Kopecký, K., and Hejny, S., 1965. Allgemeine charakteristik der Pflanzengesellschaften des *Phalaridion arundinaceae* Verbandes, *Preslia* (Praha) **3**: 53-78.
- Korkusuz, E.A., 2005. Manual of practice on constructed wetlands for wastewater treatment and reuse in Mediterranean countries, Added Value Knowledge Report AVKR 5, Med-Reunet II(INCO-CT-2003-502453), Technical University of Crete, Greece.
- Korkusuz, E.A., Demirer, G.N., and Beglioğlu, M., 2002. First pilot-scale constructed wetland implemented in Turkey for domestic wastewater treatment, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 380-391.
- Korkusuz, E.A., Beglioğlu, M., and Demirer, G.N., 2004. Comparison of gravel and slag based vertical flow reed bed performance in Turkey, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE, Lyon, pp. 173- 180.
- Korkusuz, E.A., Beglioğlu, M., and Demirer, G.N., 2005. Comparison of the treatment performances of blast furnace slag-based and gravel-based vertical flow wetlands operated identically for domestic wastewater treatment in turkey, *Ecol. Eng.* **24**: 187-200.
- Korkusuz, E.A., Beglioğlu, M., and Demirer, G.N., 2006. Phosphorus retention mechanisms of blast furnace granulated slag utilized as a substrate in a vertical flow reed bed, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 175-186.
- Kosolapov, D.B., Kuschik, P., Vainshtein, M.B., Vatsourina, A.V., Wiessner, A., Kästner, M., and Müller, R.A., 2004. Microbial processes of heavy metal removal from carbon-deficient effluents in constructed wetlands, *Eng. Life Sci.* **4**: 403-411.
- Kowalik, U., and Pringsheim, E.G., 1966. The oxidation of hydrogen sulfide by *Beggiatoa*, *Am. J. Bot.* **53**: 801-806.
- Kowalik, P., and Obarska-Pempkowiak, H., 1998. Poland, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 217-225.

- Kozlowski, T.T., 1982. Water supply and tree growth. II. Flooding, *For. Abstr.* **43**: 145-161.
- Kozlowski, T.T., 1984a. Responses of woody plants to flooding, in: *Flooding and Plant Growth*, T.T. Kozlowski, ed., Academic Press, New York, pp. 126-163.
- Kozlowski, T.T., 1984b. Plant responses to flooding of soil, *BioScience* **34**: 162-167.
- Kozlowski, T.T., ed. 1984c. *Flooding and Plant Growth*, Academic Press, New York.
- Krairapanond, N., DeLaune, R.D., and Patrick, W.H.Jr., 1992. Distribution of organic and reduced sulfur forms in marsh soil of coastal Louisiana, *Org. Geochem.* **18**: 489-500.
- Kramer, P.J., 1951. Causes of injuries to plants resulting from flooding of soil, *Plant Physiol.* **26**: 722-736.
- Kramer, P.J., 1969. *Plant and Soil Water Relationships: A Modern Synthesis*, McGraw-Hill, New York.
- Kramer, P.J., and Jackson, W.F., 1954. Causes of injury to flooded tobacco plants, *Plant Physiol.* **29**: 241-245.
- Kramer, S.N., 1981. *History Begins at Sumer*, University of Pennsylvania Press, Philadelphia.
- Kramer, U., Cotter-Howells, J.D., Charnock, J.M., Baker, A.J.M., and Smith, J.A.C., 1996. Free histidine as a metal chelator in plants that accumulate nickel, *Nature* **379**: 635-638.
- Kraus, M.L., Weis, P., and Crow, J., 1986. The excretion of heavy metals by the salt marsh cord grass, *Spartina alterniflora* and *Spartina's* role in mercury cycling, *Mar. Environ. Res.* **20**: 307-316.
- Krauskopf, K.B., 1956. Separation of manganese from iron in sedimentary processes, *Geochim. Cosmochim. Acta* **12**: 61-84.
- Kristiansen, R., 1981. Sand-filter trenches for purification of septic effluents: III: The microflora, *J. Environ. Qual.* **10**: 361-364.
- Kroehler, C.J., and Linkins, A.E., 1991. The absorption of inorganic phosphate from <sup>32</sup>P-labelled inositol hexaphosphate by *Eriophorum vaginatum*, *Oecologia* **85**: 424-428.
- Krogstad, T., and Løvstad, Ø., 1989. Erosion, phosphorus and phytoplankton response in rivers of South-Eastern Norway, *Hydrobiologia* **183**: 33-41.
- Krone, R.B., Orlob, G.T., and Hodgkinson, C., 1958. Movement of coliform bacteria through porous media, *Sewage Ind. Wastes* **30**: 1-13.
- Kronzucker, H.J., Siddiqi, M.Y., and Glass, A.D.M., 1997. Conifer root discrimination against soil nitrate and the ecology of forest succession, *Nature* **385**: 59-61.
- Kronzucker, H.J., Siddiqi, M.Y., Glass, A.D.M., and Kirk, G.J.D., 1999. Nitrate-ammonium synergism in rice. A subcellular flux analysis, *Plant Physiol.* **119**: 1041-1046.
- Kröpfelová, L., and Vymazal, J., 2006. Multiple harvest of *Phalaris arundinacea* in horizontal flow constructed wetlands: implications for growth and nutrient removal, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 829-837.
- Kruzic, A.P., 1979. Development of hyacinth wastewater treatment systems in Texas, in: *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*, R.K. Bastian, and S.C. Reed, eds., EPA 430/9-80-006, U.S. EPA, Washington, D.C., pp. 257-271.
- Küçük, O.S., Sengul, F., and Kapdan, I.K., 2003. Removal of ammonia from tannery effluents in a reed bed constructed wetland, *Wat. Sci. Tech.* **48**(11-12): 179-186.
- Kuenen, J.G., 1975. Colourless sulfur bacteria and their role in the sulfur cycle, *Plant Soil Sci.* **43**: 49-76.
- Kuenen, J.G., and Beudeker, R.F., 1982. Microbiology of thiobacilli and other sulphur-oxidizing autotrophs, mixotrophs and heterotrophs, *Phil. Trans. R. Soc. London B* **298**: 473-497.
- Kuenen, J.G., and Robertson, L.A., 1987. Ecology of nitrification and denitrification, in: *The Nitrogen and Sulphur Cycles*, J.A. Cole, and S.J. Ferguson, ed., Cambridge University Press, Cambridge, UK, pp. 162-218.
- Kuenen, J.G., Robertson, L.A., and Gernerden, H.V., 1985. Microbial interactions among aerobic and anaerobic sulfur-oxidizing bacteria, *Adv. Microb. Ecol.* **8**: 1-58.

- Kuerver, J., Konneke, M., Galushko, A., and Drzyzga, O., 2001. Reclassification of *Desulfobacterium phenolicum* as *Desulfobacula phenolica* comb. nov. and description of strain Sax (T) as *Desulfotignum balticum* gen. nov., sp. nov., *Int. J. Syst. Evol. Microbiol.* **51**: 171-177.
- Kufel, L., 1982. The phosphorus turnover in reed beds, *Pol. Ecol. Stud.* **8**: 87-111.
- Kufel, I., 1991. Lean and molybdenum in reed and cattail –open versus closed type of metal cycling, *Aquat. Bot.* **40**: 275- 288.
- Kühl, H., and Kohl, J.-G., 1993. Seasonal nitrogen dynamics in reed beds (*Phragmites australis*) in relation to productivity, *Hydrobiologia* **251**: 1-12.
- Kühl, H., Woitke, P., and Kohl, J.-G., 1997. Strategies of nitrogen cycling of *Phragmites australis* at two sites differing in nutrient availability, *Int. Rev. Ges. Hydrobiol.* **82**: 57-66.
- Kunii, H., 1999. Annual and seasonal variations in net production, biomass and life span of floating leaves of *Brassia schreberi* J.F.Gmel., *Jpn. J. Limnol.* **60**: 281-289.
- Kunii, H., and Aramaki, M., 1992. Annual net production and life span of floating leaves of *Nymphaea tetragona* Georgi: A comparison with other floating-leaved macrophytes, *Hydrobiologia* **242**: 185-193.
- Kuo, S., and Lotse, E.G., 1972. Kinetics of phosphate adsorption by calcium carbonate and Ca-kaolinite, *Soil Sci. Soc. Amer. Proc.* **36**: 725-729.
- Kupfer, D., 1975. Effects of pesticides and related compounds on steroid metabolism and function, *Crit. Rev. Toxicol.* **4**: 83-123.
- Kuusemets, V., Lõhmus, K., and Mander, Ü., 2002. Nitrogen and phosphorus assimilation and biomass production by *Scirpus sylvaticus* and *Phragmites australis* in a horizontal subsurface flow constructed wetlands, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and IWA, pp. 930-937.
- Kuypers, M.M.M., Sliemers, A.O., Lavik, G., Schmid, M., Jørgensen, B.B., Kuennen, J.G., Sinninghe Damsté, J.S., Strous, M., and Jetten, M.S.M., 2003. Anaerobic ammonium oxidation by anammox bacteria in the black Sea, *Nature* **422**, 608-611.
- Kvarnström, M.E., Morel, C.A.L., and Krogstad, T., 2004. Plant-availability of phosphorus in filter substrates derived from small-scale wastewater treatment systems, *Ecol. Eng.* **22**: 1-15.
- Květ, J., 1973. Transpiration of South Moravian *Phragmites communis* littoral of the Nesyt Fishpond, *Studies Czech Acad. Sci.* **15**: 143-146.
- Květ, J., 1982. Production of organic matter in macrophyte stands, in: *Proc. Conf. Macrophytes in Water Management, Water Hygiene and Fisheries*, Dům Techniky ČSVTS České Budějovice, Czech Republic, pp. 73-81 (in Czech).
- Květ, J., and Ondok, J.P., 1973. Zonation of higher-plant shoot biomass in the littoral of the Opatovický fishpond, in: *Ecosystem Study on Wetland Biome in Czechoslovakia*, Hejný, S., ed., Czechoslovak IBP/PT-PP Report No. 3, Třeboň, Czech Republic, pp. 87-92.
- Květ, J., and Husák, Š., 1978. Primary data on biomass and production estimates in typical stands of fishpond littoral plant communities, in: *Pond Littoral Ecosystems: Structure and Functioning*, D. Dykyjová and J. Květ, eds., Springer Verlag, Berlin, pp. 211-215.
- Květ, J., Rejmánková, E., and Rejmánek, M. 1979. Aquatic macrophytes and biological wastewater treatment. The outline of possibilities, in: *Proc. Conf. Aktiv Jihočeských vodohospodářů*, České Budějovice, Czech Republic, pp. 1-8, (in Czech).
- Květ, J., Dušek, J., and Husák, Š., 1999. Vascular plants suitable for wastewater treatment in temperate zones. In: *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 101-110.
- Kwon, S.-K., Yoon, C.-G., and Chung, I.-K., 2001. Feasibility study of treated sewage irrigation on paddy rice culture, *J. Environ. Sci. Health* **A36**: 807-818.
- Kyambadde, J., Kansime, F., Gumaelius, L., and Dalhammar, G., 2004. A comparative study of *Cyperus papyrus* and *Miscanthidium violaceum*-based constructed wetlands for wastewater treatment in tropical climate, *Wat. Res.* **38**: 475-485.

- Kyambadde, J., Kansime, F., and Dalhammar, G., 2005. Nitrogen and phosphorus removal in substrate-free pilot constructed wetlands with horizontal surface flow in Uganda, *Water Air Soil Pollut.* **165**: 37-59.
- Kylefors, K., Grennberg, K., and Lagerkvist, A., 1994. Local treatment of landfill leachates, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 539-548.
- Laanbroek, H.J., 1990. Bacterial cycling of minerals that affect plant growth in waterlogged soils: a review, *Aquat. Bot.* **38**: 109-125.
- Laanbroek, H.J., and Veldkamp, H., 1982. Microbial interactions in sediment communities, *Phil. Trans. R. Soc. Lond. B* **297**: 533-550.
- Laanbroek, H.J., and Woldendorp, J.W., 1995. Activity of chemolithotrophic nitrifying bacteria under stress in natural soils, *Adv. Microbial. Ecol.* **14**: 275-304.
- Laber, J., Haberl, R., and Shrestha, R., 1999. Two-stage constructed wetland for treating hospital wastewater in Nepal, *Wat. Sci. Tech.* **40**(3): 317-324.
- Laber, J., Haberl, R., and Langergraber, G., 2003. Secondary treatment of hospital wastewater with a 2-stage constructed wetland system, in: *Book of Abstracts of the Workshop Achievements and Prospects of Phytoremediation in Europe*, R. Haberl and G. Langergraber, eds., University of Natural Resources and Applied Life Sciences, Vienna, Austria, p. 85.
- Lack, T.J., 1973. Studies on the macrophytes and phytoplankton of the river Thames and Kennet at Reading, Ph.D. Thesis, University of Reading, Reading, U.K.
- Lafleur, P.M., 1990. Evapotranspiration from sedge-dominated wetland surfaces, *Aquat. Bot.* **37**: 341-353.
- Laing, H.E., 1940. Respiration of the rhizomes of *Nuphar advenum* and other water plants, *Am. J. Bot.* **27**: 574-581.
- Lakatos, G., 1998. Hungary. In: *Constructed Wetlands for Wastewater Treatment in Europe*, edited by J. Vymazal, H. Brix, P.F. Cooper, B. Green and R. Haberl, Backhuys Publishers, Leiden, The Netherlands, pp. 191-206.
- Lallana, V.H., Sabattini, R.A., and Lallana, M.C., 1987. Evapotranspiration from *Eichhornia crassipes*, *Pistia stratiotes*, *Salvinia herzogii* and *Azolla caroliniana* during summer in Argentina, *J. Aquat. Plant Manage.* **25**: 48-50.
- Lambers, H., Chapin, F.S., III., and Pons, T.L., 1998. *Plant Physiological Ecology*, Springer, New York.
- Lance, J.C., 1984. Land disposal of sewage effluents and residues, in: *Groundwater Pollution Microbiology*, G. Bitton and C.P. Gerba, eds., Wiley, New York, pp. 197-233.
- Landgraff, A., and Juntilla, O., 1979. Germination and dormancy of reed canary grass seeds (*Phalaris arundinacea* L.), *Physiol. Plant.* **45**: 96-102.
- Landolt, E., 1957. Physiologische und ökologische Untersuchungen an Lemnaceae, *Berichte der Schweizerischen Bot. Ges.* **67**: 271-410.
- Landolt, E. 1980a. Key to the determination of taxa within the family Lemnaceae, in: *Biosystematic Investigation on the Family of Duckweeds (Lemnaceae)*, E. Landolt, ed., Veroff. Geobotanisches Institut ETH, Zürich, Switzerland, pp. 13-21.
- Landolt, E. 1980b. Description of six new species of Lemnaceae, in: *Biosystematic Investigation on the Family of Duckweeds (Lemnaceae)*, E. Landolt, ed., Veroff. Geobotanisches Institut ETH, Zürich, Switzerland, pp. 22-29.
- Landsberg, E.C.H., 1981. Organic acid synthesis and release of hydrogen ions in response to Fe deficiency stress of mono- and dicotyledonous plant species, *J. Plant Nutr.* **3**: 579-591.
- Langergraber, G., 2003. Simulation of subsurface flow constructed wetlands-results and further research needs, *Wat. Sci. Tech.* **48**: 157-168.
- Langergraber, G., 2005. The role of uptake on the removal of organic matter and nutrients in subsurface flow constructed wetlands: a simulation study, *Wat. Sci. Tech.* **51**(9): 213-223.
- Langergraber, G., Haberl, R., Laber, J., and Pressl, A., 2003. Evaluation of substrate clogging processes in vertical flow constructed wetlands, *Wat. Sci. Tech.* **48**(5): 25-34.

- Langergraber, G., Prandstetten, C., Pressl, A., Rohrhofer, R., and Haberl, R., 2006. Removal efficiency of subsurface vertical flow constructed wetlands for different organic loads, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 587-597.
- Laouali, G., Dumont, L., Radoux, M., and Vincent, G., 1996. General design and performance of reed and emergent hydrophyte beds for domestic wastewater treatment in Québec, Canada, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur Wien, Austria, Chapter IX/5.
- Larsen, E.I., and Greenway, M., 2002. Assessment of the microbial load in a constructed subsurface flow wetland, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 411-423.
- Larsen, V.J., and Schierup, H.-H., 1981. Macrophyte cycling of zinc, copper, lead and cadmium in the littoral zone of a polluted and non-polluted lake. II. Seasonal changes in heavy metal content of aboveground biomass and decomposing leaves of *Phragmites australis* (Cav.) Trin, *Aquat. Bot.* **11**: 211-230.
- Larson, A.C., Gentry, L.E., David, M.B., Cooke, R.A., and Kovacic, D.A., 2000. The role of seepage in constructed wetlands receiving agricultural tile drainage, *Ecol. Eng.* **15**: 91-104.
- Larson, J.S., 1990. Wetland value assessment, in: *Wetlands and Shallow Continental Water Bodies*, Vol. 1., B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 389-400.
- Lasat, M.M., Norvell, W.A., and Kochian, L.V., 1997. Potential for phytoextraction of Cs-137 from a contaminated soil, *Plant Soil* **195**: 99-106.
- Lavergne, S., and Molofsky, J., 2004. Reed canary grass (*Phalaris arundinacea*) as a biological model in the study of plant invasions, *Crit. Rev. Plant Sci.* **23**: 415-429.
- Lavigne, R.L., and Jankiewicz, J., 2000. Artificial wetland treatment technology and its use in the Amazon River forests of Ecuador, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, pp. 813-820.
- Lawrence, J.R., and Hendry, M.J., 1996. Transport of bacteria through geologic media, *Can. J. Microbiol.* **42**: 410-422.
- Lawrence, T., and Ashford, R., 1969. Effect of stage and height of cuttings on the dry matter yield and persistence of intermediate wheatgrass, bromegrass, and reed canarygrass, *Can. J. Plant. Sci.* **49**: 321-332.
- Lawson, G.J., 1985. Cultivating reeds (*Phragmites australis*) for root zone treatment of sewage, Contract Report ITE, 965<sup>th</sup> edition, Cumbria, UK: Water Research Centre.
- Leadbetter, E.R., 1974. Family II. Beggiatoaceae, in: *Bergey's Manual of Determinative Bacteriology*, 8<sup>th</sup> Edition, R.E. Buchanan and N.E. Gibbons, eds., The Williams & Wilkins Co., Baltimore.
- Lee, C.Y., Lee, C.C., Lee, F.Y., Tseng, S.K., and Liao, C.J., 2004. Performance of subsurface flow constructed wetland taking pretreated swine effluent under heavy loads, *Bioresour. Technol.* **92**: 173-179.
- Lee, P.-K., Baillif, P., and Touray, J.-C., 1997a. Geochemical behaviour and relative mobility of metals (Mn, Cd, Zn and Pb) in recent sediments of a retention pond along the A-71 motorway in Sologne, France, *Environ. Geol.* **32**: 142-153.
- Lee, P.-K., Touray, J.-C., Baillif, P., and Ildefonse, J., 1997b. Heavy metal contamination of settling particles in a retention pond along the A-71 motorway in Sologne, France, *Sci. Total. Environ.* **201**: 1-15.
- Lesage, E., 2006. *Behaviour of Heavy Metals in Constructed Treatment Wetlands*, Ph.D. Thesis, Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium.
- Levine, S.N., and Lewis, W.M., Jr., 1984. Diel variation in nitrogen fixation in Lake Valencia, Venezuela, *Limnol. Oceanogr.* **29**: 887-893.



- Lewandowski, I., Scurlock, J.M.O., Lindvall, E., and Christou, M., 2003. The development and current status of perennial rhizomatous grasses as energy crops in the US and Europe, *Biomass Bioenergy* **25**: 335-361.
- Lewis, J.A., Papavizas, G.C., 1970. Evolution of volatile sulfur-containing compounds from decomposition of crucifers in soils, *Soil Biol. Biochem.* **2**: 239-246.
- Lewis, W.M., Jr., Ed., 1995. *Wetlands. Characteristics and Boundaries*. National Academy Press, Washington, DC.
- Li, X.Z., and Oaks, A., 1993. Induction and turnover of nitrate reductase in *Zea mays*. Influence of  $\text{NO}_3^-$ , *Plant Physiol.* **102**: 1251-1257.
- Liebowitz B.L., Collins A.G., Theis T.L., and Young T.C., 2000. Subsurface flow wetland for wastewater treatment at Minoa, New York, New York State Energy Research and Development Authority, New York.
- Lienard, A., Boutin, C., and Esser, D., 1990. Domestic wastewater treatment with emergent helophyte beds in France, in: *Constructed Wetlands in Water Pollution*, P.F. Cooper, and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 183-192.
- Lienard, A., Boutin, C., and Esser, D., 1998. France in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green, and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 153-167.
- Lieth, H., and Whittaker, R.H., 1975. *Primary Productivity of the Biosphere*. Ecol. Studies. No. 14. Springer Verlag, Berlin.
- Lim, P.E., Mak, K.Y., Mohamed, N., and Noor A.M., 2003. Removal and speciation of heavy metals along the treatment of wastewater in subsurface-flow constructed wetlands, *Wat. Sci. Tech.* **48**(5): 307-313.
- Lin, L.Y., 1995. Wastewater treatment for inorganics, in: *Encyclopedia of Environmental Biology*, vol. 3, Academic Press, San Diego, pp. 479-484.
- Lin, Y.F., Jing, S.R., Lee, D.Y., and Wang, T.W., 2002. Nutrient removal from aquaculture wastewater using a constructed wetlands system, *Aquaculture* **209**: 169-184.
- Lin, Y.F., Jing, S.R., and Lee, D.Y., 2003. The potential use of constructed wetlands in a recirculating aquaculture system for shrimp culture, *Environ. Poll.* **123**: 107-113.
- Lin, Y.F., Jing, S.R., Lee, D.Y., Chang, Y.F., Chen, Y.M., and Shih, K.C., 2005. Performance of a constructed wetland treating intensive shrimp aquaculture wastewater under high hydraulic loading rate, *Environ. Poll.* **134**: 411-421.
- Lind, A., 1996. Root-zone plants – not the one and only solution. VAV-Nytt, No. 1/96 (in Swedish).
- Lindenblatt, C., 2005. Planted soil filters with activated pretreatment for composting-place wastewater treatment, in: *Proc. Workshop Wastewater treatment in Wetlands. Theoretical and Practical Aspects*, I. Toczyłowska and G. Guzowska, eds., Gdańsk University of Technology Printing Office, Gdansk, Poland, pp. 87-93.
- Lindig-Cisneros, B., and Zedler, J.B., 2002. Relationships between canopy complexity and germination microsites for *Phalaris arundinacea* L., *Oecologia* **133**: 159-167.
- Lindsay, A.L., 1979. *Chemical Equilibria in Soils*, John Wiley and Sons, New York.
- Lindsey, A.A., Petty, R.O., Sterling, D.K., and van Asdall, W., 1961. Vegetation and environment along the Wabash and Tippecanoe Rivers, *Ecol. Monogr.* **31**: 105-154.
- Lippert, I., Roletschek, H., Kühl, H., and Kohl, J.-G., 1999. Internal and external nutrient cycles in stands of *Phragmites australis* – a model for two ecotypes, *Hydrobiologia* **408/409**: 343-348.
- Lipton, D.S., Blanchar, R.W., and Blevins, D.G., 1987. Citrate, malate, and succinate concentration in exudates from P-sufficient and P-stressed *Medicago sativa* L. seedlings, *Plant Physiol.* **85**: 315-317.
- Litchfield, D.K., 1993. Constructed wetlands for wastewater treatment at Amoco Oil Company's Mandan, North Dakota Refinery, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 485-488.

- Litchfield, D.K., and Schatz, D.D., 1989. Constructed wetlands for wastewater treatment at Amoco Oil Company's Mandan, North Dakota refinery, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 233-237.
- Litsky, W., Rosenbaum, M.I., and France, R.L., 1953. A comparison of the most probable numbers of coliform bacteria and Enterococci in raw sewage, *Appl. Microbiol.* **1**: 247.
- Loeppert, R.H., Hossner, L.R., and Chmielewski, M.A., 1984. Indigenous soil properties influencing the availability of Fe in calcareous hot spots, *J. Plant Nutr.* **7**: 135-147.
- Löffler, H., 1990. Human uses, in: *Wetlands and Shallow Continental Water Bodies*, Vol. 1., B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 17-27.
- Logan, T.J., 1982. Mechanisms for release of sediment-bound phosphate to water and the effects of agricultural land management on fluvial transport of particulate and dissolved phosphate, *Hydrobiologia* **92**: 519-530.
- Lovley, D.R., 1987. Organic matter mineralization with the reduction of ferric iron: A review, *Geomicrobiol. J.* **5**: 375-399.
- Lovley, D.R., 1991. Dissimilatory Fe(III) and Mn(IV) reduction, *Microbial Reviews* **55**: 259-287.
- Lovley, D.R., 1995. Microbial reduction of iron, manganese, and other metals, *Adv. Agronomy* **54**: 175-231.
- Lovley, D.R., and Phillips, E.J.P., 1986a. Organic matter mineralization with reduction of ferric iron in anaerobic sediments, *Appl. Environ. Microbiol.* **51**: 683-689.
- Lovley, D.R., and Phillips, E.J.P., 1986b. Availability of ferric iron for microbial reduction in bottom sediments of the freshwater tidal Potomac River, *Appl. Environ. Microbiol.* **52**: 751-757.
- Lovley, D.R., and Phillips, E.J.P., 1987. Competitive mechanisms for inhibition of sulfate reduction and methane production in the zone of ferric iron reduction in sediments, *Appl. Environ. Microbiol.* **53**: 2636-2641.
- Lovley, D.R., and Phillips, E.J.P., 1989. Requirement for a microbial consortium to completely oxidize glucose in Fe(III)-reducing sediments, *Appl. Environ. Microbiol.* **55**: 3234-3236.
- Lovley, D.R., Phillips, E.J.P., and Lonegran, D.J., 1989. Hydrogen and formate oxidation coupled to dissimilatory reduction of iron and manganese by *Alteromonas putrefaciens*, *Appl. Environ. Microbiol.* **55**: 700-706.
- Lovley, D.R., Giovannoni, S.J., White, D.C., Champline, J.E., Phillips, E.J.P., Gorby, Y.A., and Goodwin, S., 1993. *Geobacter metallireducens* gen. nov., sp. nov., a microorganism capable of coupling the complete oxidation of organic matter to the reduction of iron and other metals, *Arch. Microbiol.* **159**: 336-344.
- Lovley, D.R., Coates, J.D., Woodward, J.C., and Phillips, E.J., 1995. Benzene oxidation coupled to sulfate reduction, *Appl. Environ. Microbiol.* **61**: 953-958.
- Ludwig, W., Mittenhuber, G., and Friedrich, C.G., 1993. Transfer of *Thiosphaera pantotropa* to *Paracoccus denitrificans*, *Int. J. Syst. Bacteriol.* **43**: 363-367.
- Luederitz, V., Eckert, E., Lange-Weber, M., Lange, A., and Gersberg, R.M., 2001. Nutrient removal efficiency and resource economics of vertical flow and horizontal flow constructed wetlands, *Ecol. Eng.* **18**: 157-171.
- Lukavská, J., 1989. Influence of Mowing on the Wet Grassland Productivity. Thesis, Faculty of Agriculture, University of South Bohemia, České Budějovice, Czech republic (in Czech).
- Lundgren, A., 1978. Nitrogen fixation induced by phosphorus fertilization of a subarctic lake. in: *Environmental Role of Nitrogen-Fixing Blue-Green Algae and Asymbiotic Bacteria*, *Ecol. Bull.* (Stockholm) **26**: 52-59.
- Lundgren, D.G., and Dean, W., 1979. Biogeochemistry of iron, in: *Biogeochemical Cycling of Mineral-Forming Elements*, P.A. Trudinger and D.J. Swaine, eds., Studies in Environmental Science 3, Elsevier, Amsterdam, pp. 211-251.

- Lüönd, A. 1980. Effects of nitrogen and phosphorus upon the growth of some Lemnaceae, in: *Biosystematic Investigations of the Family of Duckweeds (Lemnaceae)*, E. Landolt, ed., Veroff. Geobotanisches Institut ETH, Zürich, Switzerland, pp. 118-141.
- Luther, G.W., Church, T.M., Scudlark, J.R., and Cosman, M., 1986. Inorganic and organic sulfur cycling in salt marsh pore waters, *Science* **232**: 746-749.
- Maberly, S.C., and Spence, D.H.N., 1983. Photosynthetic inorganic carbon use by freshwater plants, *J. Ecol.* **71**: 705-724.
- Maberly, S.C., and Spence, D.H.N., 1989. Photosynthesis and photorespiration in freshwater organisms: amphibious plants, *Aquat. Bot.* **34**: 267-286.
- MacFarlane, G.T., and Herbert, R.A. 1982. Nitrate dissimilation by *Vibrio* spp. isolated from estuarine sediments, *J. gen. Microbiol.* **128**: 2463-2468.
- Macfie, S.M., and Crowder, A.A., 1987. Soil factors influencing ferric hydroxide plaque formation on roots of *Typha latifolia* L., *Plant Soil* **102**: 177-184.
- MacGregor, A.N., Keeney, D.R., and Chen, K.L., 1973. Nitrogen fixation in lake sediments: Contribution to nitrogen budget of Lake Mendota, *Environ. Lett.* **4**: 21-26.
- Machate, T., Noll, H., Behrens, H., and Kettrup, A., 1997. Degradation of phenanthrene and hydraulic characteristics in a constructed wetland, *Wat. Res.* **31**: 554-560.
- Macklon, A.E.S., Mackie-Dawson, L.A., Sim, A., Shand, C.A., and Lilly, A., 1994. Soil P resources, plant growth and rooting characteristics in nutrient poor upland grassland, *Plant Soil* **163**: 257-266.
- Maddison, M., Soosaar, K., Lõhmus, L., and Mander, Ü., 2003. *Typha* populations in wastewater treatment wetlands in Estonia: Biomass production, retention of nutrients and heavy metals, in: *Proc. Conf. Constructed and Riverine Wetlands for Optimal Control of Wastewater at Catchment Scale*, Ü. Mander, C. Vohla and A. Poom., eds., University of Tartu, Estonia, pp. 274-281.
- Maddison, M., Soosaar, K., Mäuring, T., and Mander, Ü., 2007. Cattails and reeds produced in wastewater treatment wetlands in Estonia as raw material, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 74-95.
- Madigan, M.T., 1988. Microbiology, physiology, and ecology of phototrophic bacteria, in: *Biology of Anaerobic Microorganisms*, A.J.B. Zehnder, ed., John Wiley & Sons, New York, pp. 39-111.
- Madsen, T.V., and Sand-Jensen, K., 1991. Photosynthetic carbon assimilation in aquatic macrophytes, *Aquat. Bot.* **41**: 5-40.
- Madsen, T.V., and Baattrup-Pedersen, A., 1995. Regulation of growth and photosynthetic performance in *Elodea canadensis* in response to inorganic nitrogen, *Funct. Ecol.* **9**: 239-247.
- Mæhlum, T., 1994. Treatment of landfill leachate in on-site lagoons and constructed wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 553-559.
- Mæhlum, T., and Stålnacke, P., 1999. Removal efficiency of three cold-climate constructed wetlands treating domestic wastewater: effects of temperature, seasons, loading rates and input concentrations, *Wat. Sci. Tech.* **40**(3): 273-281.
- Mæhlum, T., and Roseth, R., 2000. Phosphorus sorbents in treatment wetlands – investigation of iron rich sand, shell sand and the light weight aggregate Filtralite-P, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, p. 243.
- Mæhlum, T., and Jenssen, P.D., 2003. Design and performance of integrated subsurface flow wetlands in a cold climate, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 69-86.
- Mæhlum, T., Warner, W.S., Stålnacke, P., and Jenssen, P.D., 1999. Leachate treatment in extended aeration lagoons and constructed wetlands in Norway, in: *Constructed Wetlands*

- for the Treatment of Landfill Leachates, G. Mulamootil, E.A. McBean, and F. Revers, eds., Lewis Publisher/CRC Press, Boca Raton, pp. 151-163.
- Mæhlum, T., Haarstad, K., and Kraft, P.I., 2002. Treatment wetlands for landfill leachates-case studies from cold temperate climate, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and IWA, pp. 1157-1163.
- Mahnken, G.E., Skroch, W.A., Leidy, R.B., and Sheets, T.J., 1999. Metolachlor and simazine in surface runoff water from a simulated container Plant Nursery, *Weed Technol.* **13**: 799-806.
- Maine, M.A., Hadad, H., Sánchez, G., Caffaratti, S., and Bonetto, C. 2006. Removal efficiency in a constructed wetland for wastewater treatment from a tool factory, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR Lisbon, pp. 1753-1761.
- Majer Newman, J., Clausen, J.C., and Neafsey, J.A., 2000. Seasonal performance of a wetland constructed to process dairy milkhouse wastewater in Connecticut, *Ecol. Eng.* **14**: 181-198.
- Májovský, J., Činčura, F., Feráková, V., Šomšák, L., and Krejča, J., 1982. Plants of Wetlands and Wet Meadows, Vol. 4, Obzor, Bratislava (in Slovak).
- Maki, J., 1993. The air-water interface as an extreme environment, in: *Aquatic Microbiology*, T. Ford, ed., Blackwell Scientific, Cambridge, Massachusetts, pp. 409-440.
- Malajczuk, N., and Lamont, B.B., 1981. Specialized roots of symbiotic origin in heathlands, in: *Ecosystems of the World 9B, Heathlands and related Shrublands. Analytical Studies*, R.L. Specht, ed., Elsevier, Amsterdam, pp. 165-182.
- Maltby, E., 1986. *Waterlogged Wealth*, Earthscan, Russell Press, Nottingham, UK.
- Maltby, E., 1991. Wetlands and their values, in: *Wetlands*, M. Finlayson and M. Moser, eds., Facts on File, Oxford, UK, pp. 8-26.
- Mancini, I.M., Boari, G., and Trulli, E., 1994. Integrated biological treatment for high strength agro-industries wastewaters, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 589-598.
- Mandal, L.N., and Mitra, R.R., 1982. Transformation of iron and manganese in rice soils under different moisture regimes and organic matter application, *Plant Soil* **69**: 45-56.
- Mander, Ü., and Janssen, P., eds., 2002. *Natural Wetlands for Wastewater Treatment in Cold Climates*. WIT Press, Southampton, UK.
- Mander, Ü., and Janssen, P., eds., 2003. *Constructed Wetlands for Wastewater Treatment in Cold Climates*. WIT Press, Southampton, UK.
- Mander, Ü., Kuusemets, V., Öövel, M., Mauring, T., Ihme, R., and Pieterse, A., 2001. Wastewater purification efficiency in experimental treatment wetlands in Estonia, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 201-224.
- Mander, Ü., Teiter, S., Lõhmus, K., Mauring, T., Nurk, K., and Augustin, J., 2003a. Emission rates of N<sub>2</sub>O and CH<sub>4</sub> in riparian alder forest and subsurface flow constructed wetland, in: *Wetlands: Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 259-279.
- Mander, Ü., Teiter, S., Kuusemets, V., Lõhmus, K., Öövel, M., Nurk, K., Mauring, T., Noorvee, A., and Augustin, J., 2003b. Nitrogen and phosphorus budgets in a horizontal subsurface flow wastewater treatment wetland, in: *Proc. Internat. Conf. Constructed and Riverine Wetlands for Optimal Control of Wastewater at Catchment Scale*, Ü. Mander, C. Vohla and A. Poom, eds., University of Tartu, Institute of Geography, Tartu, Estonia, *Publ. Instituti Geographici Universitatis Tartuenssis* **94**, pp. 136-141.
- Mander, Ü., Lõhmus, K., Kuusemets, V., Teiter, S., and Nurk, K., 2004. Dynamics of nitrogen and phosphorus budgets in a horizontal subsurface flow constructed wetland, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004, pp. 693-700.

- Mander, Ü., Tooming, A., Muring, T., and Öövel, M., 2005. Performance dynamics of an LWA-filled hybrid constructed wetland in Estonia, in: *Proc. Workshop Wastewater treatment in Wetlands. Theoretical and Practical Aspects*, I. Toczyłowska and G. Guzowska, eds., Gdańsk University of Technology Printing Office, Gdansk, Poland, pp. 95-102.
- Mander, Ü., Nõges, T., and Kimmel, K., 2007. Estonian wetlands and lakes: an overview, in: *Proc. 2<sup>nd</sup> Internat. Symp. Wetland Pollution Dynamics and Control, WETPOL 2007*, Ü. Mander, M., Kõiv and C. Vohla, eds., *Publ. Inst. Geograph. Univ. Tartuensis* **104**, Tartu Ülikool, Tartu, Estonia, pp. 12-15.
- Mandernack, K.W., Lynch, L., Krouse, H.R., and Morgan, M.D., 2000. Sulfur cycling in wetland peat of the New Jersey Pinelands and its effect on stream water chemistry, *Geochim. Cosmochim. Acta* **64**: 3949-3964.
- Mandi, L., Houhoum, B., Asmana, S., and Schwartzbrod, J., 1996. Wastewater treatment by reed beds: an experimental approach, *Wat. Res.* **30**: 2009-2016.
- Manfrinato, W.S., Salati, E., Jr., and Salati, E., 1993. Water supply system utilizing the edaphic-phytodepuration technique, in: *Constructed Wetlands for Water Quality Improvement*, A.G. Moshiri, ed., CRC Press, Boca Raton, Florida, pp. 331-340.
- Mann, R.A., 1990. Phosphorus removal by constructed wetlands: substratum adsorption, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 97-105.
- Mann, R.A., and Bavor, H.J., 1993. Phosphorus removal in constructed wetlands using gravel and industrial waste substrate, *Wat. Sci. Tech.* **27**: 107-113.
- Mantovi, P., Piccinini, S., Marmiroli, N., and Maestri, E., 2002. Treating dairy parlor wastewater using subsurface-flow constructed wetlands, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 205-212.
- Mantovi, P., Marmiroli, M., Maestri, E., Tagliavini, S., Piccinini, S., and Marmiroli, N., 2003. Application of a horizontal subsurface flow constructed wetland on treatment of dairy parlor wastewater, *Bioresour. Technol.* **88**: 85-94.
- Mantovi, P., Piccinni, S., Lina, F., Marmiroli, M., and Marmiroli, N., 2007. Treating wastewaters from cheese productions in H-SSF constructed wetlands, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 72-73.
- Mariangel, L., and Vidal, G., 2007. Constructed wetlands in Chile: research and application, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 28-29.
- Marks, M., Lapin, B., and Randall, J., 1994. *Phragmites australis (P. communis)*: Threats, management, and monitoring, *Natur. Areas J.* **14**: 285-294.
- Marschner, H., 1995. *Mineral Nutrition of Higher Plants*, Academic Press, London.
- Marschner, H., and Römheld, V., 1996. Root-induced changes in the availability of micronutrients in the rhizosphere, in: *Plant Roots: The Hidden Half*, Y. Waisel, A. Eshel and U. Kafkaki, eds., Marcel Decker, Inc., New York, pp. 557-580.
- Marshall, K.C., 1979. Biogeochemistry of manganese minerals, in: *Biogeochemical Cycling of Mineral-Forming Elements*, P.A. Trudinger and D.J. Swaine, eds., Studies in Environmental Science 3, Elsevier, Amsterdam, pp. 253-292.
- Marsho, T.V., Burchard, R.P., and Fleming, R., 1975. Nitrogen fixation in the Rhode River estuary of Chesapeake Bay, *Can. J. Microbiol.* **21**: 1348-1356.
- Marsili-Libelli, S., and Checchi, N., 2005. Identification of dynamic models for horizontal subsurface constructed wetlands, *Ecol. Model.* **187**: 201-218.
- Marsteiner, E.L., Collins, A.G., Theis, T.L., and Young, T.C., 1996. The influence of macrophytes on subsurface flow wetland (SSFW) hydraulics. in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control, Universität für Bodenkultur, Vienna, Austria*, Chapter II/2.

- Marten, G.C., 1985. Reed canarygrass, in: *Forages: the Science of Grassland Agriculture*, 4<sup>th</sup> ed., M.E. Heath et al., eds., Iowa State University Press, Ames, Iowa, pp. 207-216.
- Marten, G.C., and Hovin, A.W., 1980. Harvest schedule, persistence, yield and quality interactions among four perennial grasses, *Agron. J.* **72**: 378-387.
- Martens, C.S., and Berner, R.A., 1977. Interstitial water chemistry of anoxic Long Island Sound sediments: 1. Dissolved gases, *Limnol. Oceanogr.* **22**: 10-25.
- Martin, C.D., and Moshiri, G.A., 1992. Nutrient reduction in an in-series constructed wetland system treating landfill leachate, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 61.1 – 61.8.
- Martin, C.D., Moshiri, G.A., and Miller, C.C., 1993. Mitigation of landfill leachate incorporating in-series constructed wetlands of a closed-loop design, in: *Constructed Wetlands for Water Pollution Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 473-476.
- Martin, E.J., and Martin, E.T., 1991. *Technologies for Small Water- and Wastewater Systems*, Van Nostrand Reinhold, New York.
- Masbough, A., Frankowski, K., Hall, K.J., and Duff, S.J.B., 2005. The effectiveness of constructed wetland for treatment of woodwaste leachate, *Ecol. Eng.* **25**: 552-566.
- Mashauri, D.A., and Kayombo, S., 2002. Application of the two coupled models for water quality management: facultative pond cum constructed wetland models, *Phys. Chem. Earth* **27**: 773-781.
- Mashauri, D.A., Mulungu, D.M.M., and Abdulhussein, B.S., 2000. Constructed wetland at the University of Dar es Salaam, *Wat. Res.* **34**: 1135-1144.
- Masi, F., Martinuzzi, N., Loisel, S., Peruzzi, P., and Bacci, M., 1999. The tertiary treatment pilot plant of PubliSer SpA (Florence, Tuscany): a multistage experience, *Wat. Sci. Tech.* **40(3)**: 195-202.
- Masi, F., Bendoricchio, G., Conte, G., Garuti, G., Innocenti, A., Franco, D., Pietrelli, L., Pineschi, G., Pucci, B., and Romagnolli, F., 2000. Constructed wetlands for wastewater treatment in Italy: state-of-the art and obtained results, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., pp. 979-985.
- Masi, F., Conte, G., Martinuzzi, N., and Pucci, B., 2002. Winery high organic content wastewaters treated by constructed wetlands in Mediterranean climate, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 274-282.
- Masi, F., Conte, G., Lepri, L., Martellini, T., and Del Bubba, M., 2004. Endocrine Disrupting Chemicals (EDCs) and pathogen removal in a hybrid CW system for a tourist facility wastewater treatment and reuse, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004, pp. 461-468.
- Masi, F., Giovannelli, L., Cortés, V., Innocenti, A., and Pucci, B., 2006a. Reed bed treatment systems as an affordable and reliable opportunity for solving sanitary emergencies in developing countries with tropical climate, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1124.
- Masi, F., Martinuzzi, N., Bresciani, R., Giovanelli, L., and Conte, G., 2006b. Tolerance to hydraulic and organic load fluctuations in constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1177- 1189.
- Mason, C.F., 1977. *Decomposition*, Studies in Biology No. 74, Edward Arnold, Ltd., London.
- Mason, C.F., and Bryant, R.J., 1975. Production, nutrient content and decomposition of *Phragmites communis* Trin. and *Typha angustifolia* L., *J. Ecol.* **63**: 71-95.
- Masscheleyn, P.H., and Patrick, W.H., Jr., 1994. Selenium, arsenic and chromium redox chemistry in wetland soils and sediments, in: *Biogeochemistry of Trace Elements*, D.C. Adriano, Z.S. Chen, and S.S. Yang, eds., pp. 615-625.

- Masscheleyn, P.H., DeLaune, R.D., and Patrick, W.H., Jr., 1990. Transformations of selenium as affected by sediment oxidation-reduction potential and pH, *Environ. Sci. Technol.* **24**: 91-96.
- Masscheleyn, P.H., DeLaune, R.D., and Patrick, W.H., Jr., 1991a. Arsenic and selenium as affected by sediment redox potential and pH, *J. Environ. Qual.* **20**: 522-527.
- Masscheleyn, P.H., DeLaune, R.D., and Patrick, W.H., Jr., 1991b. Effect of redox and pH on arsenic speciation and solubility in a contaminated soil, *Environ. Sci. Technol.* **25**: 1414-1419.
- Masscheleyn, P.H., DeLaune, R.D., and Patrick, W.H., Jr., 1991c. Biogeochemical behavior of selenium in anoxic soils and sediments: an equilibrium thermodynamics approach, *J. Environ. Sci. Health A* **26**: 555-573.
- Masscheleyn, P.H., Pardue, J.H., DeLaune, R.D., and Patrick, W.H., Jr., 1992. Chromium redox chemistry in lower Mississippi Valley Bottomland Hardwood wetland, *Environ. Sci. Technol.* **26**: 1217-1226.
- Mathys, W., 1977. The role of malate, oxalate, and mustard oil glucosides in the evolution of zinc resistance in herbage plants, *Physiol. Plant.* **40**: 130-136.
- Matamoros, V., García, J., and Bayona, J.M., 2005. Elimination of PPCPs in subsurface and surface flow constructed wetlands, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 107-108.
- Mathys, W., 1977. The role of malate, oxalate and mustard oil glucosides in the evolution of zinc resistance in herbage plants, *Physiol. Plant.* **40**: 130-136.
- Mattsson, J.E., 1997. Tendency to bridge over openings for chopped *Phalaris* and straw of *Triticum* mixed in different proportions with wood chips, *Biomass Bioenergy* **12**: 199-210.
- Maurer, D., and Zedler, J.B., 2002. Differential invasion of a wetland grass explained by tests of nutrients and light availability on establishment and clonal growth, *Oecologia* **131**: 279-288.
- Mauring, T., Lesta, M., Sütt, P., Kanal, A., and Mander, Ü., 2003. Estimation of landscape potential for construction of free water surface wetlands for wastewater treatment, in: *Wetlands-Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 321-340.
- Mauro, J.B., Guimaraes, J.R., and Malemed, R., 1999. Mercury methylation in a tropical macrophyte: influence of abiotic parameters, *Appl. Ogranomet. Chem.* **13**: 1-6.
- Mawdsley, J.L., Bardgett, R.D., Merry, R.J., Pain, B.F., and Theodorou, M.K., 1995. Pathogens in livestock waste, their potential for movement through soil and environmental pollution, *Appl. Soil Ecol.* **2**: 1-15.
- Maxwell, G., 1957. *A Reed Shaken by the Wind*, Longmans Green, London.
- May, E., Butler, J.E., Ford, M.G., Ashworth, R., Williams, J., and Bahgat, M.M.M., 1990. Chemical and microbiological processes in gravel-bed hydroponic (GBH) systems for sewage treatment, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, UK, pp. 33-39.
- May, R.M., Beddington, J.R., Clark, C.W., Holt, S., and Laws, R.M. 1979. Management of multispecies fisheries, *Science* **205**: 267-276.
- Mays, P.A., and Edwards, G.S., 2001. Comparison of heavy metal accumulation in a natural wetland and constructed wetlands receiving acid mine drainage, *Ecol. Eng.* **16**: 487-500.
- Mbagwu, I.G., and Adeniji, H.A. 1988. The nutritional content of duckweed (*Lemna paucicostata* Hegelm.) in the Kainji Lake area, Nigeria, *Aquat. Bot.* **29**: 357-366.
- Mbuligwe, S.E., 2004. Comparative effectiveness of engineered wetland systems in the treatment of anaerobically pre-treated domestic wastewater, *Ecol. Eng.* **23**: 269-284.
- Mbuligwe, S.E., 2005. Comparative treatment of dye-rich wastewater in engineered wetland system (EWSs) vegetated with different plants, *Wat. Res.* **39**: 271-280.
- McBean, E.A., and Rovers, F., 1999. Landfill leachate characteristics as inputs for the design of wetlands used as treatment systems, in: *Constructed Wetlands for the Treatment of*

- Landfill Leachates*, G. Mulamoottil, E.A. McBean, and F. Revers, eds., Lewis Publisher/CRC Press, Boca Raton, pp. 1-16.
- McBean, E.A., Rovers, F., and Farquhar, G., 1995. *Solid Waste Landfill Engineering and Design*, Prentice-Hall, Engelwood Cliffs, New Jersey.
- McCallister, D.L., and Logan, T.J., 1978. Phosphate adsorption-desorption characteristics of soils and bottom sediments in the Maumee River Basin of Ohio, *J. Environ. Qual.* **7**: 87-92.
- McCaskey, T.A., and Hannah, T.C., 1997. Performance of a full scale constructed wetland treating swine lagoon effluent in northern Alabama, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-5-II-8.
- McClure, J.W., 1970. Secondary constituents of aquatic angiosperms, in: *Phytochemical Phylogeny*, J.B. Harbone, ed., Academic Press, New York, pp. 233-265.
- McCormick, L.L., and Hiltbold, A.E., 1966. Microbial decomposition of atrazine and diuron in soil, *Weeds* **14**: 77-82.
- McCready, R.G.L., Gould, W.D., and Cook, F.D., 1983. Respiratory nitrate reduction by *Desulfovibrio* sp., *Arch. Microbiol.* **135**: 182-185.
- McDermot, R.E., 1954. Effect of saturated soil on seedling growth of some bottomland hardwood species, *Ecology* **35**: 36-41.
- McDowell-Boyer, L.M., Hunt, J.R., and Sitar, N., 1986. Particle transport through porous media, *Water Resour. Res.* **22**: 1901-1921.
- McGill, R., Basran, D., Flindall, R., and Pries, J., 2000. Vertical-flow constructed wetland for the treatment of glycol-laden stormwater runoff at Lester B. Pearson International Airport, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida, University of Florida and IWA, pp. 1080-1081.
- McIntyre, B.D., and Riha, S.J., 1991. Hydraulic conductivity and nitrogen removal in an artificial wetland system, *J. Environ. Qual.* **20**: 259-263.
- McKinlay, R.G., and Kasperek, K., 1999. Observations on decontamination of herbicide-polluted water by marsh plant systems, *Wat. Res.* **33**: 505-511.
- McLaughlin, B.E., van Loon, G.W., and Crowder, A.A., 1985. Comparison of selected washing treatments on *Agrostis gigantea* sample from mine tailings near Copper Cliff, Ontario, before analysis for Cu, Ni, Fe and K content, *Plant Soil* **85**: 433-436.
- McLaughlin, J.R., Ryden, J.C., and Syers, J.K., 1981. Sorption of inorganic phosphate by iron- and aluminum-containing components, *J. Soil Sci.* **32**: 365-377.
- McNabb, C.D., 1976. The potential of submerged vascular plants for reclamation of wastewater, in: *Biological Control of Water Pollution*, J. Tourbier and R.W. Pearson, eds., The University of Pennsylvania Press, Philadelphia, Pennsylvania, pp. 123-132.
- McNaughton, S.J., 1966. Ecotype function in the *Typha* community-type, *Ecol. Monogr.* **36**: 297-325.
- McPherson, D.C., 1939. Cortical air spaces in the roots of *Zea mays* L., *New Phytol.* **35**: 64-73.
- Mdamo, A., 2002. Performance of Duckweed (*Lemna minor* and *Spirodela polyrrhiza*) on paper mill waste water, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam and IWA, pp. 472-484.
- Megonikal, J.P., Hines, M.E., and Visscher, P.T., 2004. Anaerobic metabolism: linkage to trace gases and aerobic processes, in: *Biogeochemistry*, W.H. Schlesinger (ed.), Elsevier-Pergamon, Oxford, U.K., pp. 317-424.
- Mehrer, I., and Mohr, H., 1989. Ammonium toxicity – description of the syndrome in *Sinapis alba* and the search for its causation, *Physiol. Plant.* **77**: 545-554.
- Meiklejohn, J., 1940. Aerobic denitrification, *Ann. Appl. Biol.* **27**: 558-573.



- Meiorin, E.C., 1989. Urban runoff treatment in a fresh/brackish water marsh in Fremont, California, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 677-685.
- Meira, C.M.B.S., Ceballos, B.S.O., König, A., and de Oliveira, R., 2004. Performance of horizontal subsurface flow constructed wetlands vegetated with rice treating a sewage polluted surface water, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 443-448.
- Mendelssohn, I.A., and Seneca, E.D., 1980. The influence of soil drainage on the growth of salt marsh cordgrass *Spartina alterniflora* in North Carolina, *Estuar. Coast. Mar. Sci.* **2**: 27-40.
- Mendelssohn, I.A., and Postek, M.T., 1982. Elemental analysis of deposits on the roots of *Spartina alterniflora* Loisel, *Am. J. Bot.* **69**: 904-912.
- Mendelssohn, I.A., McKee, K.L., and Patrick, W.H., Jr., 1981. Oxygen deficiency in *Spartina alterniflora* roots: metabolic adaptations to anoxia, *Science* **214**: 439-441.
- Mengel, K.M., Breininger, T., and Bubl, W., 1984. Bicarbonate, the most important factor inducing iron chlorosis in vine grapes on calcareous soil, *Plant Soil* **81**: 333-344.
- Menges, E.S., and Waller, D.M., 1983. Plant strategies to elevation and light in floodplain herbs, *Am. Nat.* **123**: 454-473.
- MENV, 1999. Lignes directrices applicables aux piscicultures. Revised version of June. Ministry of Environment of Québec, Canada.
- Merigliano, M.F., and Lesica, P., 1998. The native status of reed canary grass (*Phalaris arundinacea* L.) in the inland Northwest, USA, *Natural Areas J.* **18**: 223-230.
- Merlin, G., Pajeau, J-L., and Lissolo, T., 2002a. Performances of constructed wetlands for municipal wastewater treatment in rural mountainous area, *Hydrobiologia* **469**: 87-98.
- Merlin, G., Sedilot, C., Herbert, N., and Grasselly, D., 2002b. Treatment of tomato greenhouses drainage solutions by experimental constructed wetlands, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 526-533.
- Mestayer, C., 1980. A study on the solar energy conversion efficiency and growth aspects of duckweed, *Spirodela oligorhiza*. M.S. Thesis, Louisiana State University, Baton Rouge, LA.
- Meusel, E., 1875. De la putrefaction produite par les bacteries, en presence des nitrates alcalins, *Comp. Rendus Acad. Sci. (Paris)* **81**: 533-534.
- Meusel, E., 1876. De la putrefaction produite par les bacteries en presence des nitrates alcalins, *Ann. Chim. Pphys.* **7**: 287-288.
- Meyer, R.L., Risgaard-Petersen, N., and Allen, D.E., 2005. Correlation between anammox activity and microscale distribution of nitrite in a subtropical mangrove sediment, *Appl. Environ. Microbiol.* **71**: 6142-6149.
- Meyerson, L.A., Saltonstall, K., Windham, L., Kiviat, E., and Findlay, S., 2000. A comparison of *Phragmites australis* in freshwater and brackish marsh environments in North America, *Wetlands Ecol. Manage.* **8**: 89-103.
- M'hiri, F.M., Kouki, S., and Hanchi, B., 2005. Performance of constructed wetland treating domestic wastewaters in Tunisia: first experience, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 114-115.
- Michael, J.H., Jr., 2003. Nutrients in salmon hatchery wastewater and its removal through the use of a wetland constructed to treat off-line settling pond effluent, *Aquaculture* **226**: 213-225.
- Middlebrooks, E.J., 1980. Aquatic plant processes assessment in: *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*, S.C. Reed and R.K. Bastian, eds., EPA 430/9-80-007, U.S. EPA, Washington, D.C., pp. 43-62.
- Middlebrooks, E.J., and Pano, A., 1983. Nitrogen removal in aerated lagoons, *Water Research* **17**: 1369-1374.

- Middelburg, J.J., 2000. The geochemical sulfur cycle, in: *Environmental Technologies to Treat Sulfur Pollution. Principles and Engineering*, P.N.L. Lens, and L. Hulshoff Pol, eds., IWA Publishing, London, pp. 33-46.
- Mikkelsen, D.S., DeDatta, S.K., and Obcemea, W.N., 1978. Ammonia volatilisation losses from flooded rice soils, *Soil Sci. Soc. Am. J.* **42**: 725-730.
- Mikola, P., 1973. Application of mycorrhiza symbiosis in forestry practise, in: *Ectomycorrhizae*, G.C. Marks and T.T. Kozlowski, eds., Academic Press, New York, pp. 383-411.
- Miller, R.C., and Zedler, J.B., 2003. Responses of native and invasive wetland plants to hydroperiod and water depth, *Plant Ecol.* **167**: 57-69.
- Milner, C., and Hughes, R.E., 1968. *Methods for the Measurement of the Primary Production of Grassland*, International Biological program Handbook 7, Blackwell, Oxford, UK.
- Min, D.H., Vough, L.R., and Reeves, J.B., III., 2002. Dairy slurry effects on forage quality of orchards, reed canarygrass and alfalfa-grass mixtures, *Animal Feed Sci. Technol.* **95**: 143-157.
- Ministerium für Umwelt Rheinland-Pfalz, 1990. Bericht zur Wurzelraumanlage Obersülzen.
- Ministry of Environment and Energy, 1997. Act No. 325 of 14 May 1997 on wastewater treatment in rural areas (in Danish).
- Ministry of Environment and Energy, 1999. Environmental guidelines for root zone systems up to 30 PE, Guidelines from the Danish Environmental Protection Agency No. 1. (in Danish).
- Ministry of Environment and Energy, 2003a. Guidelines for willow systems up to 30 PE. Økologisk Byfornyelse og Spildevandsrensning No. 25, (in Danish).
- Ministry of Environment and Energy, 2003b. Guidelines for willow systems with soil infiltration up to 30 PE, Økologisk Byfornyelse og Spildevandsrensning No. 26. (in Danish).
- Mitchell, C., and McNevin, D., 2001. Alternative analysis of BOD removal in subsurface flow constructed wetlands employing Monod kinetics, *Wat. Res.* **35**: 1295-1303.
- Mitchell, C., Wiese, R., and Young, R., 1998. Design of wastewater wetlands, in: *The Constructed Wetlands Manual*, Vol., 2, R. Young, G. White, M. Brown, J. Burton and B. Atkins, eds., Department of Land and Water Conservation, Sydney, NSW, pp. 256-289.
- Mitchell, D.S., 1976. The potential for wastewater treatment by aquatic plants in Australia, *Water Aust.* **5**: 15-17.
- Mitchell, D.S., Breen, P.F., and Chick, A.J., 1990. Artificial wetlands for treating wastewaters from single households and small communities, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 383-389.
- Mitchell, D.S., Chick, A.J., and Rainsin, G.W., 1994. The use of wetlands for water pollution control in Australia: an ecological perspective, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 709-716.
- Mitchell, G.J., Jones, J.G., and Cole, J.A., 1986. Distribution and regulation of nitrate and nitrite reduction by *Desulfovibrio* and *Desulfotomaculum* species, *Arch. Microbiol.* **144**: 35-40.
- Mitsch, W.J. 1977. Waterhyacinth (*Eichhornia crassipes*) nutrient uptake and metabolism in a north-central Florida marsh, *Arch. Hydrobiol.* **81**: 188-210.
- Mitsch, W.J., and Gosselink, J.G., 1993. *Wetlands*, 2<sup>nd</sup> ed., Van Nostrand Reinhold, New York.
- Mitsch, W.J., and Wise, K.M., 1998. Water quality, fate of metals, and predictive model validation of a constructed wetland treating acid mine drainage, *Wat. Res.* **32**: 1888-1900.
- Mitsch, W.J., and Gosselink, J.G., 2000. *Wetlands*, John Wiley and Sons, 3<sup>rd</sup> ed., New York.
- Mitsch, W.J., Dorge, C.L., and Weimhoff, J.R., 1979. Ecosystem dynamics and a phosphorus budget of an alluvial cypress swamp in southern Illinois, *Ecology* **60**: 1116-1124.

- Mitterer-Reichmann, G.M., 2002. Data evaluation of constructed wetlands for treatment of domestic sewage, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, Tanzania, pp. 40-46.
- Miyasaki, S.C., Buta, J.G., Howell, R.K., and Foy, C.D., 1991. Mechanism of aluminium tolerance in soybeans root exudates of citric acid, *Plant Physiol.* **96**: 737-743.
- Mlay, H., Njau, K.N., Katima, J.H.Y., Jørgensen, S.E., Mbvette, T.S.A., Nielsen, S.N., and Kayombo, S. 2006. Modelling the treatment of acid mine drainage (AMD) using a horizontal sub-surface flow constructed wetland (HSSFCW): a case of copper (Cu) removal, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1363-1382.
- Moffet, J.W., and Zika, R.G., 1987. The photochemistry of copper complexes in sea water, in: *Photochemistry of Environmental Aquatic Systems*, R.G. Zika and W.J. Cooper, eds., American Chemical Society, Washington, pp. 116-130.
- Moletta, R., 2005. Winery and distillery wastewater treatment by anaerobic digestion, *Wat. Sci. Tech.* **51**(1): 137-144.
- Molle, P., Liénard, A., Grasmick, A., and Iwema, A., 2002. Phosphorus sorption in subsurface constructed wetlands: Investigations focused on calcareous materials and their chemical reactions, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, University of Dar Es Salaam, Tanzania, pp. 94-108.
- Molle, P., Liénard, A., Grasmick, A., and Iwema, A., 2003. Phosphorus retention in subsurface constructed wetlands: Investigations focused on calcareous materials and their chemical reactions, *Wat. Sci. Tech.* **48**(5): 75-83.
- Molle, P., Liénard, A., Boutin, C., Merlin, G., and Iwema, A., 2005a. How to treat raw with constructed wetlands: an overview of French systems, *Wat. Sci. Tech.* **51**(9): 11-21.
- Molle, P., Liénard, A., Grasmick, A., Iwema, A., and Kabbabi, A., 2005b. Apatite as an interesting seed to remove phosphorus from wastewater in constructed wetlands, *Wat. Sci. Tech.* **51**(9): 193-203.
- Mook, J.H., and van der Toorn, J., 1982. The influence of environmental factors and management on stands of *Phragmites australis*. II. Effects on yield and its relationships with shoot density, *J. Appl. Ecol.* **19**: 501-517.
- Moore, A.W., 1969. *Azolla*: Biology and agronomic significance, *Bot. Rev.* **35**: 17-34.
- Moore, J.A., and Niswander, S.F., 1997. Oregon State University dairy wetland, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-30-II-33.
- Moore, J.A., Skarda, S.M., Sherwood, R., 1992. Wetland treatment of pulp mill wastewater, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 63.1. – 63.9.
- Moore, B.J., Ross, S.D., Gibson, D., and Callow, L., 2000a. Constructed wetlands for treatment of dissolved phase hydrocarbons in cold climates. in: *Wetlands & Remediation*, J.L. Means, and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 333-340.
- Moore, M.T., Rodgers, J.H., Jr., Cooper, C.M., and Smith, S., Jr., 2000b. Constructed wetlands for mitigation of atrazine-associated agricultural runoff, *Environ. Poll.* **110**: 393-399.
- Moore, M.T., Rodgers, J.H., Jr., Smith, S., Jr., and Cooper, C.M., 2001. Mitigation of metolachlor-associated agricultural runoff using constructed wetlands in Mississippi, USA, *Agric. Ecosyst. Environ.* **84**: 169-176.
- Moore, M.T., Schulz, R., Cooper, C.M., Smith, S., Jr., and Rodgers, J.H., Jr., 2002. Mitigation of chlorpyrifos runoff using constructed wetlands, *Chemosphere* **46**: 827-835.
- Moore, P.A., and Patrick, W.H., Jr., 1989. Manganese availability and uptake by rice in acid sulfate soils, *Soil Sci. Soc. Am. J.* **53**: 104-109.
- Moore, P.A., and Reddy, K.R., 1994. Role of Eh and pH on phosphorus geochemistry in sediments of Lake Okeechobee, Florida, *J. Environ. Qual.* **23**: 955-964.

- Moorhead, K. K., and Reddy, K. R., 1988. Oxygen transport through selected aquatic macrophytes, *J. Environ. Qual.* **17**: 138-142.
- Moorhead, K. K., and Reddy, K. R. 1990. Carbon and nitrogen transformation in wastewater during treatment with *Hydrocotyle umbellata* L., *Aquat. Bot.* **37**: 153-161.
- Morel, F., McDuff, R.E., and Morgan, J.J., 1973. Interactions and chemostatis in aquatic chemical systems: role of Eh, pE, solubility, and complexation, in: *Trace Metals and Metal Organic Interactions in Natural Water*, P.C. Singer, ed., Ann Arbor Science Publ., Ann Arbor, Michigan, pp. 157-200.
- Morgan, J.J., and Stumm, W., 1965. The role of multivalent metal oxides in limnological transformations as exemplified by iron and manganese, in: *Proc. of 2<sup>nd</sup> Water Pollution Research Conference*, O. Jaag, ed., Pergamon Press, New York, pp. 103-131.
- Morris, J.T., 1980. The nitrogen uptake kinetics of *Spartina alterniflora* culture, *Ecology* **61**: 1114-1121.
- Mortimer, C.H. 1941. The exchange of dissolved substances between mud and water in lakes, *J. Ecol.* **29**: 280-329.
- Mortimer, C.H., 1942. The exchange of dissolved substances between mud and water in lakes. *J. Ecol.* **30**: 147-201.
- Moshiri, G.A., ed., 1993. *Constructed Wetlands for Water Quality Improvement*, CRC Press/Lewis Publishers, Boca Raton, Florida.
- Moura, I., Bursakov, S., Costa, C., and Moura, J.J.G., 1997. Nitrate and nitrite utilization in sulfate-reducing bacteria, *Anaerobe* **3**: 279-290.
- Mulder, A., van de Graaf, A.A., Robertson, L.A., and Kuenen, J.G., 1995. Anaerobic ammonium oxidation discovered in a denitrifying fluidized-bed reactor, *FEMS Microbiol. Ecol.* **16**: 177-183.
- Muller, E., Alberts, B.P., and Janiesch, P., 1994. Influence of NO<sub>3</sub><sup>-</sup> and NH<sub>4</sub><sup>+</sup> nutrition on fermentation, nitrate reductase activity and adenylate energy charge of roots of *Carex pseudocyperus* L. and *Carex sylvatica* Huds. exposed to anaerobic nutrient solution, *Plant Soil.* **166**: 221-230.
- Müller, G., 1988. *Mikrobiologie pflanzlicher Lebensmittel*. Institut für Nahrungsgüterwirtschaft und Lebensmitteltechnologie der Humboldt-Universität Berlin, VEB Fachbuchverlag Leipzig, Germany.
- Müller, M.M., Sundman, V., and Skujins, J., 1980. Denitrification in low pH spodosols and peats determined with the acetylene inhibition method, *Appl. Environ. Microbiol.* **40**: 235-239.
- Mulligan, H.F., and Baranowski, A., 1969. Growth of phytoplankton and vascular plants at different nutrient levels, *Verh. Internat. Verein. Limnol.* **17**: 802-810.
- Mulligan, H.F., Baranowski, A., and Johnson, R., 1976. Nitrogen and phosphorus fertilization of aquatic vascular plants and algae in replicated ponds. (1). Initial response to fertilization, *Hydrobiologia* **48**: 109-116.
- Mulliss, R., Revitt, D.M., and Shutes, R.B.E., 1997. The impacts of discharges from two combined sewer overflows on the water quality of an urban watercourse, *Wat. Sci. Tech.* **36**(8-9): 195-199.
- Münch, C., Kusch, P., and Röske, I., 2005. Root stimulated nitrogen removal: only a local effect or important for water treatment, *Wat. Sci. Tech.* **51**(9): 185-192.
- Mungur, A.S., Shutes, R.B.E., Revitt, D.M., and House, M.A., 1995. An assessment of metal removal from highway runoff by a natural wetland, *Wat. Sci. Tech.* **32**(3): 169-175.
- Munns, D.N., and Fox, R.L., 1976. The slow reaction which continues after phosphate adsorption: kinetics and equilibrium in some tropical soils, *Soil Sci. Soc. Amer. J.* **40**: 46-51.
- Munzarová, E., Lorenzen, B., Brix, H., Vojtišková, L., and Votrubová, O., 2006. Effects of NH<sub>4</sub><sup>+</sup>/NO<sub>3</sub><sup>-</sup> availability on nitrate reductase activity and nitrogen accumulation in wetland helophytes *Phragmites australis* and *Glyceria maxima*, *Environ. Exp. Bot.* **55**: 49-60.

- Muramoto, S., and Oki, Y., 1983. Removal of some heavy metals from polluted water by water hyacinth (*Eichhornia crassipes*), *Bull. Environ. Contam. Toxicol.* **30**: 170-171.
- Muramoto, S., and Oki, Y., 1984. Influence of anionic surface-active agents on the uptake of heavy metals by water hyacinth (*Eichhornia crassipes*), *Bull. Environ. Contam. Toxicol.* **33**: 444-450.
- Murray-Gulde, C.L., Huddleston, G.M., III., Garber, K.V., and Rodgers, J.H., Jr., 2005a. Contributions of *Schoenoplectus californicus* in a constructed wetland system receiving copper contaminated wastewater, *Water Air Soil Pollut.* **163**: 355-378.
- Murray-Gulde, C.L., Bearn, J., and Rodgers, J.H., 2005b. Evaluation of a constructed wetland treatment system specifically designed to decrease bioavailable copper in a wastestream, *Ecotoxicol. Environ. Safety* **61**: 60-73.
- Murray, J.W., 1979. Iron oxides, in: *Marine Minerals*, R.G. Burns, ed., Mineralogical Society of America, Washington, DC, pp. 47-98.
- Murray, J.W., and Gill, G., 1978. The geochemistry of iron in the Puget Sound, *Geochim. Cosmochim. Acta* **42**: 9-19.
- Murray, J.W., Balistieri, L.S., and Paul, B., 1984. The oxidation state of manganese in marine sediments and ferromanganese nodules, *Geochim. Cosmochim. Acta* **48**: 1237-1247.
- Musiwa, J.M.S., Nabuyanda, M., and Nalumino, N., 2002. Design of a pilot treatment wetland at Nanga Farms for surface runoff water from sugarcane fields, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam, Tanzania, pp. 859-869.
- Mwegoha, W., Katima, J.H.Y., Mbwette, T.S.A., Njau, K.N., Jørgensen, S.E., and Nielsen, S.N., 2002. Modelling the effect of suspended solids accumulation on hydraulic conductivity of gravel packed horizontal sub-surface flow constructed wetland, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar-es-Salaam, Tanzania and IWA, pp. 799-812.
- Nairn, R.W., and Hedin, R.S., 1992. Generation of alkalinity in an anoxic limestone drain, in: *Proc. 9<sup>th</sup> Annual National Meeting of the American Soc. for Surface Mining and Reclamation "Achieving Land Use Potential through Reclamation"*, Duluth, Minnesota, Am. Soc. Surface Mining and Reclamation, Princeton, West Virginia, pp. 206-219.
- Nasim, A., and James, A.P., 1978. Life under conditions of high irradiation, in: *Microbial Life in Extreme Environments*, D.J. Kushner, ed., Academic Press, London, pp. 409-439.
- Navara, G., 1996. Experience with horizontal flow systems in cleaning waste water from remote mountain cabins in the Austrian Alps, paper presented during the 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control, Universität für Bodenkultur, Vienna Austria.
- Naylor, S., Brisson, J., Labelle, M.A., Drizo, A., and Comeau, Y., 2003. Treatment of freshwater fish farm effluent using constructed wetlands: the role of plants and substrate, *Wat. Sci. Tech.* **48**(5): 215-222.
- Neal, R.H., Sposito, G., Holtzclaw, K.M., and Traina, S., 1987. Selenite adsorption on alluvial soils: II. Solution composition effect, *Soil Sci. Soc. Am. J.* **51**: 1165-1169.
- Nedwell, D.B., and Floodgate, G.D., 1972. The effect of microbial activity upon the sedimentary sulfur cycle, *Mar. Biol.* **16**: 192-200.
- Nedwell, D.B., and Abram, J.W., 1978. Bacterial sulphate reduction in relation to sulphur geochemistry in two contrasting areas of saltmarsh sediment, *Estuar. Coast. Mar. Sci.* **6**: 341-351.
- Needham, J., Lu Gwei-Djen, and Huang Hsing-Tsung., 1986. *Science and Civilization in China*, Vol. 6, *Biology and Biological Technology*, Part I, *Botany*, Cambridge University Press, Cambridge, UK.
- Nelson, D.C., and Castenholz, R.W., 1981. Use of reduced sulfur compounds by *Beggiatoa* sp., *J. Bacteriol.* **147**: 140-154.
- Nelson, M., 1998. Limestone wetland mesocosm for recycling saline wastewater in coastal Yuacatan, Ph.D. Thesis, University of Florida, Gainesville.

- Neori, A., Reddy, K.R., Čiškóvá-Končalová, H., and Agami, M., 2000. Bioactive chemicals and biological-biochemical activities and their functions in rhizospheres of wetland plants, *Bot. Rev.* **66**: 350-378.
- Neeralla, S., Weaver, R.W., Lesikar, B.J., Persyn, R.A., 2000. Improvement of domestic wastewater quality by subsurface flow constructed wetlands, *Bioresource Technol.* **75**: 19-25.
- Netter, R., and Bischofsberger, W., 1990. Hydraulic investigations on planted soil filters, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 11-20.
- Neurohr, G.A., 1983. Use of aquatic macrophytes for sludge treatment, in: *Proc. 6<sup>th</sup> Symposium on Wastewater Treatment*, Montréal, Canada, pp. 262-284.
- Nevel, B.E., Hanganu, J., and Griffin, C.R., 1997. Reed harvesting in the Danube Delta, Romania? *Wildlife Soc. Bull.* **25**: 117-124.
- Ngo, V., 1987. Boosting pond performance with aquaculture, *Operations Forum* **4**: 20-24.
- Nguyen, L., 2001. Accumulation of organic matter fractions in a gravel-bed constructed wetland, *Wat. Sci. Tech.* **44**(11-12): 281-287.
- Nicholas, D.J.D., 1963. The metabolism of inorganic nitrogen and its compounds in microorganisms, *Biol. Rev.* **38**: 530-568.
- Nichols, D.S., 1983. Capacity of natural wetlands to remove nutrients from wastewater, *J. Water Pollut. Control Fed.* **55**: 495-505.
- Nichols, D.S., and Keeney, D.R., 1976. Nitrogen nutrition in *Myriophyllum spicatum*: Uptake and translocation of <sup>15</sup>N by shoots and roots, *Freshwater Biol.* **6**: 145-154.
- Nicholson, S.A., and Best, D.G., 1974. Root:shoot and leaf area relationships of macrophyte communities in Chautauqua Lake, New York, *Bull. Torrey Bot. Club* **101**: 96-100.
- Niering, W.A., 1953. The past and present vegetation of High Point State Park, New Jersey, *Ecol. Monogr.* **23**: 127-147.
- Nijburg, J.W., and Laanbroek, H.J., 1997. The fate of 15-nitrate in healthy and declining *Phragmites australis* stands, *Microbial. Ecol.* **34**: 254-262.
- Nilsson, D., and Hansson, P.A., 2001. Influence of various machinery combinations, fuel proportions and storage capacities on costs for co-handling of straw and reed canary grass to district heating plants, *Biomass Bioenergy* **20**: 247-260.
- Nissenbaum, A., Presley, B.J., and Kaplan, I.R., 1972. Early diagenesis in a reducing fjord, Saanich Inlet, British Columbia-I. Chemical and isotopic changes in major components of interstitial water, *Geochim. Cosmochim. Acta* **36**: 1007-1012.
- Niu X., Geng J., Wang X., Wang C., Gu X., Edwards M., and Glindemann D., 2004. Temporal and spatial distributions of phosphine in Taihu Lake, China, *Sci. Tot. Environ.* **323**: 169-178.
- Nilvala, J., Hoos, M.B., Cross, C., Wallace, S.D., and Parkin, G., 2005. Jones County landfill constructed wetland: six years' experience, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 122-123.
- Nix, S.T., Heaney, J.P., Huber, W.C., 1988. Suspended solids removal in detention basins, *J. Environ. Eng.* **114**: 1331-1342.
- Nixon, S.W., and Lee, W. 1986. Wetlands and Water Quality. A regional review of recent research in the United States on the role of freshwater and saltwater wetlands as sources, sinks, and transformers of nitrogen, phosphorus, and various heavy metals, Tech. Report Y-86-2, prepared, by University of Rhode Island for US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Nogueira, R., Ferreira, I., Janknecht, P., Rodríguez, J.J., Oliveira, P., and Brito, A.G., 2006. Energy-saving wastewater treatment systems: formulation of cost functions, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 47-57.

- Nogueira, S.F., Merli, G., Salati Filho, E., and Elias, J.M., 2000. Evaluation of sewage treatment system on constructed wetlands, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville and IWA, p. 1220.
- Nokes, R.L., Gerba, C.P., Karpiscak, M.M., 2003. Microbial water quality improvement by small scale on-site subsurface wetland treatment, *J. Environ. Sci. Health* **A38**: 1849-1855.
- Nommik, H. 1956. Investigations on denitrification in soil, *Acta Agr. Scand.* **6**: 195-228.
- Noller, B.N., Woods, P.H., and Ross, B.J., 1994. Case studies of wetland filtration of mine waste water in constructed and naturally occurring systems in northern Australia, *Wat. Sci. Tech.* **29**: 257-266.
- Novais, J.M., and Martins-Dias, S., 2003. Constructed wetlands for industrial wastewater treatment contaminated with nitroaromatic organic compounds and nitrate at very high concentrations, in: *Proc. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 277-288.
- Nümann, W., 1970. Die Möglichkeiten der Gewässerreinigung mit höheren Pflanzen nach den bisherigen Untersuchungsergebnissen und theoretischen Überlegungen, *Internat. Rev. Hydrobiol., Berlin* **55**: 149-158.
- Nungesser, M.K., and Chimney, M.J., 2001. Evaluation of phosphorus retention in a South Florida treatment wetland, *Wat. Sci. Tech.* **44**(11/12): 109-115.
- Nyakang'o, J.B., and van Bruggen, J.J.A., 1999. Combination of well functioning constructed wetland with a pleasing landscape design in Nairobi. Kenya, *Wat. Sci. Tech.* **40**(3): 249-256.
- Obarska-Pempkowiak, H., 1999. Nutrient cycling and retention in constructed wetland systems in Darzłubie near Puck Bay Southern Baltic Sea, in: *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp 41-48.
- Obarska-Pempkowiak, H., 2000. Retention of selected heavy metals: Cd, Cu, Pb in a hybrid wetland system, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Internat. Water Association, pp. 1285-1294.
- Obarska-Pempkowiak, H., 2001. Retention of selected heavy metals: Cd, Cu, Pb in a hybrid wetland system, *Wat. Sci. Tech.* **44**(11-12): 463-468.
- Obarska-Pempkowiak, H., 2003. Removal and retention of selected heavy metals in components of a hybrid wetland system, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 299-309.
- Obarska-Pempkowiak, H., and Sobocinski, T., 2002. Experience with retention and removal of nitrogen in vegetated submerged beds in Poland, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, University of Dar Es Salaam, Tanzania, pp. 116-127.
- Obarska-Pempkowiak, H., and Ozimek, T., 2003. Comparison of usefulness of three emergent macrophytes for surface water protection against pollution and eutrophication: case study, Bielkowo, Poland, in: *Wetlands-Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 215-226.
- Obarska-Pempkowiak, H., and Gajewska, M., 2003. The dynamics of processes responsible for transformation of nitrogen compounds in hybrid wetlands systems in a temperate climate, in: *Wetlands- Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 129-142.
- Obarska-Pempkowiak, H., Mierzejewski, M., and Toczyłowska, I., 1994. Application of surface flow wetlands for treatment of municipal wastewater – two full scale systems, in: *Proc. Conf. Willow Vegetation Filters for Municipal Wastewater and Slusges. A Biological Purification System*, P. Aronsson and K. Perttu, eds., Swedish University of Agricultural Sciences, Uppsala, Sweden, pp. 49-58.

- Obarska-Pempkowiak, H., Gajewska, H., and Wojciechowska, E., 2005. Application, design and operation of constructed wetland systems, in: *Proc. Workshop Wastewater Treatment in Wetlands. Theoretical and Practical Aspects*, I. Toczyłowska and G. Guzowska, eds., Gdańsk University of Technology Printing Office, Gdansk, Poland, pp. 119-125.
- Oceans-ESU, 2008. www.oceans-esu.com
- O'Connor, R., and Douglas, K., 1993. Cleaning up after the big chill, *New Scientist* **137**: 22-23.
- Odland, A., 1997. Development of vegetation in created wetlands in western Norway, *Aquat. Bot.* **59**: 45-62.
- Odland, A., and del Moral, R., 2002. Thirteen years of wetland vegetation succession following a permanent drawdown, Myrkdalen Lake, Norway, *Plant Ecol.* **162**: 185-198.
- Odum, H.T., 1985. Self-Organization of Estuarine Ecosystems in Marine Ponds Receiving Treated Sewage. Data from Experimental Pond Studies at Morehead City, North Carolina, 1968-1972. A Data Report. University of North Carolina Sea Grant Publications UNC-SG-85-04.
- Odum, H.T., Ewel, K.C., Mitsch, W.J., and Ordway, J.W., 1977. Recycling treated sewage through cypress wetlands in Florida, in: *Wastewater Renovation and Reuse*, F.M. D'Itri, ed., Marcel Dekker, New York, pp. 35-67.
- O'Hogain, S., 2003. The design, operation and performance of a municipal hybrid reed bed treatment system, *Wat. Sci. Tech.* **48**(5): 119-126.
- O'Hogain, S., 2004. Colecott reed and willow bed wastewater treatment system, in: *Wetland Systems and Waste Stabilization Ponds Communications of Common Interest*, ASTEE. Lyon, France, pp. 105-112.
- Ojima, K., Abe, H., and Ohira, K., 1984. Release of citric acid into medium by aluminium tolerant carrot cells, *Plant Cell Physiol.* **25**: 855-858.
- O'Keefe, D.H., Wiese, T.A., Brummet, S., and Miller, T.W., 1987. Uptake and metabolism of phenolic compounds by the water hyacinth (*Eichhornia crassipes*), in: *Phytochemical Effects of Environmental Compounds*, J. A. Saunders, L. Kosak-Channing, and E.E. Conn, eds., Plenum Publishing Corporation, pp. 101-129.
- Oki, Y., 1983. Potential utilization of water hyacinth in Japan, in: *Proc. 9<sup>th</sup> Asian-Pacific Weed Science Society Conf.*, Manila, Philippines, Asian Pacific Weed Sci. Soc., Los Baños, Philippines, pp. 588-593.
- Oki, Y., Nakagawa, K., and Nogi, A., 1981. Production and nutrient removal potentials of *Eichhornia crassipes* in Japan, in: *Proc. 8<sup>th</sup> Asian-Pacific Weed Sci. Soc. Conf.*, APWSS, University of the Philippines, Los Baños, Philippines, pp. 113-116.
- Okurut, T.O., 2000. A pilot study on municipal wastewater treatment using a constructed wetland in Uganda, Dissertation, University of Wageningen, The Netherlands.
- Okurut, T.O., 2001. Plant growth and nutrient uptake in a tropical constructed wetland, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 451-462.
- Okurut, T.O., Rijs, G.B.J., and van Bruggen, J.J.A. 1999. Design and performance of experimental constructed wetlands in Uganda, planted with *Cyperus papyrus* and *Phragmites mauritianus*, *Wat. Sci. Tech.* **40**(3): 265-271.
- Oliveira, E., Talamoni, J., Enokibara, M., and Traficante, C., 2006. Constructed wetlands for wastewater treatment in The Botanical Garden in the city of Bauru, Brazil, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1093-1100.
- Olsen, S.R., and Watanabe, F.S., 1957. A method to determine a phosphorus adsorption maximum of soils as measured by the Langmuir isotherm, *Soil Sci. Soc. Am. Proc.* **21**: 144-149.
- Olson, J.S., 1963. Energy storage and the balance of producers and decomposition in ecological systems, *Ecology* **44**: 322-332.



- Olson, R.K., ed., 1993. *Created and Natural Wetlands for Controlling Nonpoint Source Pollution*, U.S. EPA Office of Research and Development, Office of Wetlands, Oceans, and Watersheds, Corvallis, Oregon.
- Ondok, J.P., and Dykyjová, D., 1973. Assessment of shoot biomass of dominant reed-beds in Třeboň basin methodological aspects, in: *Ecosystem Study on Wetland Biome in Czechoslovakia*, Hejný, S., ed., Czechoslovak IBP/PT-PP Report No. 3, Třeboň, Czech Republic, pp. 79-82.
- Ondok, J.P., and Květ, J., 1978. Selection of sampling areas in assessment of production. in: *Pond Littoral Ecosystems: Structure and Functioning*, D. Dykyjová and J. Květ, eds., Springer-Verlag, Berlin, pp. 163-174.
- Ondok, J.P., and Pokorný, J., 1987a. Modelling photosynthesis of submersed macrophyte stands in habitats with limiting inorganic carbon. 1. Model description, *Photosynthetica* **21**: 543-554.
- Ondok, J.P., and Pokorný, J., 1987b. Modelling photosynthesis of submersed macrophyte stands in habitats with limiting inorganic carbon. 2. Application to a stand of *Elodea canadensis* Michx., *Photosynthetica* **21**: 555-565.
- ÖNORM B 2505. 1997. Bepflanzte Bodenfilter (Pflanzenkläranlagen) – Anwendung, Bemessung, Bau und Betrieb (Subsurface-flow constructed wetlands – application, dimensioning, installation and operation). Österreichisches Normungsinstitut, Vienna, Austria (in German).
- ÖNORM B 2505. 2005. Bepflanzte Bodenfilter (Pflanzenkläranlagen) – Anwendung, Bemessung, Bau und Betrieb (Subsurface-flow constructed wetlands – application, dimensioning, installation and operation). Österreichisches Normungsinstitut, Vienna, Austria (in German).
- Ontario Ministry of Natural Resources. Provincial Wetlands Working Group, 1992. *Systems for Evaluating Wetlands in Southern Ontario*, Toronto, Ontario.
- Öövel, M., Tooming, A., Muring, T., and Mander, Ü., 2007. Schoolhouse wastewater purification in a LWA-filled hybrid constructed wetland in Estonia, *Ecol. Eng.* **29**: 17-26.
- Oremland, R.S., Hollibaugh, J.T., Maest, A.S., Presser, T.S., Miller, L.G., and Culbertson, C.W., 1989. Selenate reduction to elemental selenium by anaerobic bacteria in sediments and culture: Biogeochemical significance of a novel, sulfate independent respiration, *Appl. Environ. Microbiol.* **55**: 2333-2343.
- Ornes, W.H., and Sutton, D.L., 1975. Removal of phosphorus from static sewage effluent by waterhyacinth, *Hyacinth Control J.* **13**: 56-58.
- Orth, H.M., and Sapkota, D.P., 1988. Upgrading a facultative pond by implicating water hyacinth, *Water Res.* **22**: 1503-1511.
- Oskamp, J., and Batjer, L., 1932. Soils in relation to fruit growing in New York. II: Size, production, and rooting habit of apple trees on different soil types in the Hilton and Morton area, Monroe County, Cornell University Agric. Exp. Stn. Bull. No. 550.
- Osterkamp, S., Lorenz, U., and Schirmer, M., 1999. Einsatz von Pflanzenkläranlagen zur Behandlung von Schadstoffbelastetem Oberflächenabfluss städtischer Strassen, *Limnologica-Ecol. Manage. Inland Waters* **29**: 93-102.
- O'Sullivan, A.D., Moran, B.M., and Otte, M.L., 2004. Accumulation and fate of contaminants (Zn, Pb, Fe and S) in substrates of wetlands constructed for treating mine wastewater, *Water Air Soil Pollut.* **157**: 345-364.
- Otis, C.H., 1914. The transpiration of emerged water plants: its measurement and relationships, *Bot. Gaz. (Chicago)* **58**: 457-494.
- Otsuki, A.K., and Wetzel, R.G., 1974. Release of dissolved organic matter by autolysis of a submersed macrophyte, *Scirpus subterminalis*, *Limnol. Oceanogr.* **19**: 842-845.
- Otte, M.L., Kearns, C.C., and Doyle, M.O., 1995. Accumulation of arsenic and zinc in the rhizosphere of wetland plants, *Bull. Environ. Contam. Toxicol.* **55**: 154-161.
- Otte, M.L., Rozema, J., Koster, L., Haarsma, M.S., and Broekman, R.A., 1987. The iron-plaque on the roots of saltmarsh plants: A barrier to heavy metal uptake?, in: *Proc.*

- Internat. Conf. on Heavy Metals in the Environment*, S.E. Lindberg and T.C. Hutchinson, eds., CEP Consultants, Edinburgh, pp. 407-409.
- Otte, M.L., Rozema, J., Koster, L., Haarsma, M.S., and Broekman, R.A., 1989. Iron plaque on roots of *Aster tripolium* L.: interaction with zinc uptake, *New Phytol.* **111**: 309-317.
- Ouellet-Plamondon, C., Chazarenc, F., Commeau, Y., and Brisson, J., 2006. Artificial aeration to increase pollutant removal efficiency of constructed wetlands in cold climates, *Ecol. Eng.* **27**: 258-264.
- Overall, R.A., and Parry, D.L., 2004. The uptake of uranium by *Eleocharis dulcis* (Chinese water chestnut) in the Ranger Uranium Mine constructed wetland filter, *Environ. Pollut.* **132**: 307-320.
- Ozimek, T. 1996. Usefulness of *Lemna minor* in wastewater treatment in temperate climate-myth or fact? *Environ. Res. Forum* **5/6**: 297-302.
- Ozimek, T., 2003. *Lemnaceae* in wastewater treatment in cold climate – case study, in: *Proc. Abstr. of the Workshop Nutrient Cycling and Retention in Natural and Constructed Wetlands*, J. Vymazal, ed., ENKI, Třeboň, Czech Republic, pp. 23-24.
- Ozimek, T., and Klekot, L., 1979. *Glyceria maxima* (Hartm) Holmb. in ponds supplied with post-sewage water, *Aquat. Bot.* **7**: 231-239.
- Ozimek, T., and Renman, G., 1996. Can submerged macrophytes be useful in wastewater treatment? in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur Wien, Austria, Poster 24.
- Ozimek, T., and Czyprzński, P., 2003. Ten years' experience of constructed wetlands in Poland, *Publ. Inst. Geogr. Univ. Tartuensis* **94**: 163-167.
- Ozimek, T., Prejs, A., and Prejs, K., 1976. Biomass and distribution of underground parts of *Potamogeton perfoliatus* L. and *P. lucens* L. in Mikolajskie Lake, Poland, *Aquat. Bot.* **2**: 309-316.
- Ozimek, T., Prejs, K., and Prejs, A., 1986. Biomass and growth of *Potamogeton pectinatus* L. in lakes of different trophic state, *Ekol. Pol.* **34**: 125-131.
- Paerl, H.W., 1985. Microzone formation: Its role in the enhancement of aquatic N<sub>2</sub> fixation, *Limnol. Oceanogr.* **30**: 1246-1252.
- Paerl, H.W., Webb, K.L., Baker, J., and Wiebe, W.J., 1981. Nitrogen fixation in waters, in: *Nitrogen Fixation*, Vol. 1. *Ecology*, W.J. Broughton, ed., Clarendon Press, Oxford, UK, pp. 193-240.
- Pahkala, K., and Pihala, M., 2000. Different plant parts as raw material for fuel and pulp production, *Industr. Crops Products* **11**: 119-128.
- Paing, J., and Voisin, J., 2005. Vertical flow constructed wetlands for municipal septage treatment in French rural areas, *Wat. Sci. Tech.* **51**(9): 145-155.
- Paing, J., Dugue, L., Gonzales, H., and Hendou, M., 2006. Removal performances of vertical flow constructed wetlands for new design guidelines, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 651-660.
- Painter, H.A., and Zabel, T., 1989. The behaviour of LAS in sewage treatment, *Tens. Surfactant Detergent* **26**: 108-115.
- Pandey, M.K., Kansakar, B.R., Tare, V., and Jenssen, P.D., 2006. Feasibility study of municipal wastewater treatment using pilot scale constructed wetlands in Nepal, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1919-1926.
- Pane, W.J., 1973. Reduction of nitrogenous oxides by microorganisms, *Bacteriol. Rev.* **37**: 409-452.
- Pant, H.K., Reddy, K.R., and Lemon, E., 2001. Phosphorus retention capacity of root bed media of subsurface flow constructed wetlands. *Ecol. Eng.* **17**: 345-356.
- Pantano, J., Bullock, R., McCarthy, D., Sharp, T., and Stilwell, C., 2000. Using wetlands to remove metals from mining impacted groundwater, in: *Wetlands & Remediation*, J.L. Means, and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 383-390.

- Para, J.V., and Hortensine, C.C., 1974. Plant nutritional content of some Florida waterhyacinths and response by pearl millet to incorporation of waterhyacinth in three soil types, *Hyacinth Control J.* **12**: 85-90.
- Pardue, J.H., and Patrick, W.H., Jr., 1995. Changes in metal speciation following alterations of sediment redox status, in: *Metal Contaminated Aquatic Sediments*, H.E. Allen, ed., Ann Arbor Press, Inc., Ann Arbor, Michigan, pp. 169-185.
- Pardue, J.H., DeLaune, R.D., and Patrick, W.H., Jr., 1992. Metal to aluminum correlation in Louisiana coastal wetlands: identification of elevated metal concentrations, *J. Environ. Qual.* **21**: 539-545.
- Parfitt, R.L., 1989. Phosphate reactions with natural allophane, ferrihydrite and goethite, *J. Soil Sci.* **40**: 359-369.
- Parfitt, R.L., Atkinson, R.J., and Smart, R.S.C., 1975. The mechanism of phosphate fixation by iron oxides, *Soil Sci. Soc. Amer. Proc.* **39**: 837-841.
- Parker, J., 1949. The effects of flooding on the transpiration and survival of some southeastern forest tree species, *Plant Physiol.* **25**: 453-460.
- Pasricha, N.S., and Ponnampuruma, F.N., 1976. Influence of salt and alkali on ionic equilibria in submerged soils, *Soil Sci. Soc. Am. J.* **40**: 374-376.
- Patrick, W.H., Jr., 1960. Nitrate reduction rates in a submerged soil as affected by redox potential, *7<sup>th</sup> Internat. Congress of Soil Sci* **2**: 494-500.
- Patrick, W.H., Jr., 1964. Extractable iron and phosphorus in a submerged soil at controlled redox potentials, *Trans. 8<sup>th</sup> Internat. Congr. Soil Sci.* (Bucharest, Romania) **66**: 605-609.
- Patrick, W.H., Jr., 1981. The role of inorganic redox system in controlling reduction in paddy soils, in: *Proc. Symp. on Paddy Soils*, Inst. of Soil Sci. Acad. Sinica, China, Springer-Verlag, New York, pp. 107-117.
- Patrick, W.H., Jr., and Mahapatra, I.C., 1968. Transformation and availability to rice of nitrogen and phosphorus in waterlogged soils, *Adv. Agron.* **20**: 323-359.
- Patrick, W.H., Jr., and Turner, F.T., 1968. Effect of redox potential on manganese transformations in waterlogged soils, *Soil Sci.* **108**: 476-478.
- Patrick, W.H., Jr., and DeLaune, R.D., 1972. Characterization of the oxidized and reduced zones in flooded soil, *Soil Sci. Soc. Am. Proc.* **36**: 573-576.
- Patrick, W.H., Jr., and Khalid, R.A. 1974. Phosphate release and sorption by soils and sediments: effect of aerobic and anaerobic conditions, *Science* **186**: 53-55.
- Patrick, W.H., Jr., and Reddy, K.R., 1976. Nitrification-denitrification reactions in flooded soils and sediments: dependence on oxygen supply and ammonia diffusion, *J. Environ. Qual.* **5**: 469-472.
- Patrick, W.H., Jr., and Henderson, R.E., 1981. A method for controlling redox potential in packed soil cores, *Soil Sci. Soc. Am. J.* **45**: 35-38.
- Patrick, W.H., Jr., and Jugsujinda, A., 1992. Sequential reduction and oxidation of inorganic nitrogen and manganese in flooded soil, *Soil Sci. Soc. Am. J.* **56**: 1071-1073.
- Patrick, W.H., Jr., Gotoh, S., and Williams, B.G. 1973. Strengite dissolution in flooded soils and sediments, *Science* **179**: 564-566.
- Patrick, W.H., Jr., Mikkelsen, D.S., and Wells, B.R., 1985. Plant nutrient behavior in flooded soils, in: *Fertilizer Technology and Use*, 3<sup>rd</sup> edition, Soil Sci. Soc. Am., Madison, Wisconsin, pp. 197-228.
- Patriquin, D., and Knowles, R., 1972. Nitrogen fixation in rhizosphere of marine angiosperms, *Mar. Biol.* **16**: 49-58.
- Patriquin, D.G., and McClung, C.R., 1978. Nitrogen accretion and the nature and possible significance of N<sub>2</sub> fixation (acetylene reduction) in Nova Scotian *Spartina alterniflora* stands, *Mar. Biol.* **47**: 227-242.
- Patureau, D., Godon, J.J., Dabert, J., Bouchez, T., Bernet, N., Delgenes, J.P., and Moletta, R., 1998. *Microvirgula aerodentificans* gen. nov., sp. nov., A new Gram-negative bacterium exhibiting co-respiration of oxygen and nitrogen oxides up to oxygen-saturated conditions, *Int. J. Syst. Bacteriol.* **48**: 775-782.

- Paul, E.A., and Clark, F.E., 1996. *Soil Microbiology and Biochemistry*, 2<sup>nd</sup> ed, Academic Press, San Diego, California.
- Payne, W.J., 1973. Reduction of nitrogenous oxides by microorganisms, *Bacteriol. Rev.* **37**: 409-452.
- Payne, W.J., 1981. *Denitrification*, John Wiley and Sons, New York.
- Payne, V.W.E., and Knight, R.L., (eds.), 1997. *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, Gulf of Mexico Program, Stennis Space Center, Mississippi.
- Pearsall, W.H., 1950. The investigation on wet soils and its agricultural implications, *Emp. J. Agr.* **18**: 289-298.
- Pearsall, W.H., and Gorham, E., 1956. Production ecology. I. Standing crops of natural vegetation, *Oikos* **7**: 193-201.
- Peck, H.D. Jr., and LeGall, J., 1982. Biochemistry of dissimilatory sulphate reduction, *Phil. Trans. R. Soc. Lond. B* **298**: 443-466.
- Pedersen, O., Sand-Jensen, H., and Revsbech, N.P., 1995. Diel pulses of O<sub>2</sub> and CO<sub>2</sub> in sandy lake sediments inhabited by *Lobelia dortmanna*, *Ecology* **76**: 1536-1545.
- Pekdeger, A., and Matthes, G., 1983. Factor of bacteria and virus transport in groundwater, *Environ. Geol.* **5**: 49-52.
- Penfound, W.T., 1934. Comparative structure of the wood in the "knees", swollen bases, and normal trunks of the tupelo gum (*Nyssa aquatica* L.), *Am. J. Bot.* **21**: 623-631.
- Penfound, W.T., 1956. Primary production of vascular aquatic plants, *Limnol. Oceanogr.* **1**: 92-101.
- Penfound, W.T., and Earle, T.T., 1948. The biology of the water hyacinth, *Ecol. Monogr.* **18**: 447-472.
- Pénzes, A., 1960. Über die Morphologie, Dynamik und zöologische Rolle der sprosskolonien-bildenden Pflanzen, *Fragm. Florist. Geobot. (Kraków)* **6**: 501-515.
- Perdomo, S., Fujita, M., and Furukawa, K., 1996. Oxygen transport through *Pistia stratiotes* L., in: *Proc. 5th Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, chapter VIII/4.
- Perdomo, S., Banguesses, C., Fuentes, J., Castro, J., Avevedo, H., and Michelotti, C., 2000. Constructed wetlands: a more suitable alternative for wastewater purification in Uruguay dairy processing industry, in: *Proc. 7th Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, pp. 1407-1415.
- Perdomo, S., Fujita, M., Ike, M., Tateda, M., and Banguesses, D., 2005. Dynamics of oxygen transport through *Pistia stratiotes* – a lab scale approach, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, J., ed., Backhuys Publishers, Leiden, The Netherlands, pp. 282-311.
- Pereira, J.S., and Kozłowski, T.T., 1977. Variations among woody angiosperms in response to flooding, *Physiol. Plant.* **41**: 184-192.
- Perkins, T.E., and Wilson, M.V., 2005. The impacts of *Phalaris arundinacea* (reed canarygrass) invasion on wetland plant richness in the Oregon Coast Range, USA depend on beavers, *Biol. Conservation* **124**: 291-295.
- Pesavento, B.G. 1984. Factors to be considered when constructing wetlands for utilization as biomass filters to remove minerals from solution, in: *Treatment of Mine Drainage by Wetlands*, J.E. Burris, ed., The Pennsylvania University, University Park, Pennsylvania, pp. 45-49.
- Peterson, T.C., and Ward, R.C., 1989. Development of a bacterial transport model for coarse soils, *Water Res. Bull.* **25**: 349-357.
- Pettecrew, E.L., and Kalff, J., 1992. Water flow and clay retention in submerged macrophyte bed, *Can. J. Fish. Aquat. Sci.* **49**: 2483-2489.
- Petersen, R.C., and Cummins, K.W., 1974. Leaf processing in a woodland stream, *Freshwat. Biol.* **4**: 343-368.

- Petrovic, M., and Kastelan-Macan, M. 1996. The uptake of inorganic phosphorus by insoluble metal-humic complexes, *Wat. Sci. Tech.* **34**: 253-258.
- Petruccioli, M., Cardoso, J., Eusebio, A., and Federici, F., 2002. Aerobic treatment of winery wastewater using a jet-loop activated sludge reactor, *Process Biochem.* **37**: 821-829.
- Peverly, J.H., Sanford, W.E., Steenhuis, T.S., and Surface, J., 1993. *Constructed Wetlands for Municipal Soils Waste Landfill Leachate Treatment*, Final Report to the New Research and Development Authority No. 94-1, Cornell University and U.S. Geological Survey, Ithaca, New York.
- Peverly, J.H., Surface, J.M., and Wang, T., 1995. Growth and trace metal absorption by *Phragmites australis* in wetlands constructed to landfill leachate treatment, *Ecol. Eng.* **5**: 21-35.
- Pezechki, S.R., 1994. Plant response to flooding, in: *Plant-Environment Interactions*, R.E. Wilkinson, ed., Marcel Dekker, Inc., New York, pp. 289-321.
- Pfennig, N., 1967. Photosynthetic bacteria, *Ann. Rev. Microbiol.* **21**: 285-324.
- Pfennig, N., 1975. The phototrophic bacteria and their role in the sulfur cycle, *Plant and Soil* **43**: 1-16.
- Pfennig, N., and Widell, F., 1981. Ecology and physiology of some anaerobic bacteria from the microbial sulfur cycle, in: *Biology of Inorganic Nitrogen and Sulfur*, H. Bothe and A. Trebst, eds., Springer-Verlag, Berlin, pp. 169-177.
- Philippi, L.S., da Costa, R.H.R., and Sezerino, P.H., 1999. Domestic effluent treatment through integrated system of septic tank and root zone, *Wat. Sci. Tech.* **40(3)**: 125-131.
- Philippi, L.S., Sezerino, P.H., Panceri, B., Olijnyk, D.P., and Kossatz, B., 2006. Root zone system to treat wastewater in rural areas in south of Brazil, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 901-908.
- Phillips, G.L., Eminson, D., and Moss, B., 1978. A mechanism to account for macrophyte decline in progressively eutrophicated freshwaters, *Aquat. Bot.* **4**: 103-126.
- Pickering, C. 1879., *Chronological History of Plants*, Little Brown and Co., Boston.
- Pierce, M.I., and Moore, C.B., 1982. Adsorption of arsenite and arsenate on amorphous iron hydroxide, *Water Res.* **16**: 1247-1253.
- Pietro, K.C. 1998. Phosphorus uptake rates of a *Ceratophyllum*/periphyton community in a southern Florida freshwater marsh. M.Sc. Thesis, Florida Atlantic University, Boca Raton, Florida.
- Platen, H., Temmes, A., and Schink, B., 1990. Anaerobic degradation of acetone by *Desulfococcus biacutus* sp. nov., *Arch. Microbiol.* **154**: 335-361.
- Platzer, C., 1998. Entwicklung eines Bemessungsansatzes zur Stickstoffelimination in Pflanzenkläranlagen. Ph.D. Thesis, Technische Universität Berlin, Germany.
- Platzer, C., 1999. Design recommendations on subsurface flow constructed wetlands for nitrification and denitrification, *Wat. Sci. Tech.* **40(3)**: 257-263.
- Platzer, C., and Netter, R. 1992. Factors affecting nitrogen removal in horizontal flow reed beds, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of New South Wales, Sydney, Australia. pp. 4.1-4.6.
- Platzer, C., and Mauch, K. 1997. Soil clogging in vertical-flow reed beds – mechanisms, parameters, consequences, and ...solutions? *Wat. Sci. Tech.* **35(5)**: 175-181.
- Platzer, M., Cáceres, V., Fong, N., and Haberl, R., 2002. Investigations and experiences with subsurface flow constructed wetlands in Nicaragua, Central America, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and IWA, pp. 350-365.
- Poach, M.E., Hunt, P.G., Reddy, G.B., Stone, K.C., Johnson, M.H., and Grubbs, A.M., 2004. Swine wastewater treatment by marsh-pond-marsh constructed wetlands under varying nitrogen loads, *Ecol. Eng.* **23**: 165-175.
- Poggi-Varaldo, H.M., Gutiérrez-Saravia, A., Fernández-Villagómez, G., Martínez-Pereda, P., and Rinderknecht-Seijas, N., 2002. A full-scale system with wetlands for slaughterhouse

- wastewater treatment, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 213-223.
- Polunin, N.V.C., 1982. Processes contributing to the decay of reed (*Phragmites australis*) litter in fresh water, *Arch. Hydrobiol.* **94**: 182-209.
- Ponnamperuma, F.N., 1972. The chemistry of submerged soils, *Adv. Agron.* **24**: 29-96.
- Ponnamperuma, F.N., Loy, T.A., and Tianco, E.M., 1969. Redox equilibria in flooded soils. II. The manganese oxide systems, *Soil Sci.* **108**: 48-57.
- Pontier, H., Williams, J.B., and May, E., 2003. Behaviour of metals associated with sediments in a wetland based system for road runoff control, *Wat. Sci. Tech.* **48**(5): 291-298.
- Pontier, H., Williams, J.B., and May, E., 2004. Progressive changes in water and sediment quality in a wetland system for control of highway runoff, *Sci. Tot. Environ.* **319**: 215-224.
- Pope, P.R., 1981. Wastewater treatment by rooted aquatic plants in sand and gravel trenches, U.S. EPA-600/2-81-091, U.S. Environmental Protection Agency, Cincinnati, Ohio.
- Porath, D., Hefner, B., and Koton, A., 1979. Duckweed as an aquatic crop: evaluation of clones for aquaculture, *Aquat. Bot.* **7**: 273-278.
- Postgate, J.R., 1959. Sulphate reduction by bacteria, *Ann. Rev. Microbiol.* **13**: 505-520.
- Postgate, J.R., 1978. *Nitrogen Fixation*, Studies in Biology No. 92. Edward Arnold, London.
- Postgate, J.R. 1979. *The Sulphate-Reducing Bacteria*, Cambridge University Press, Cambridge, U.K.
- Postgate, J.R., 1984. *The Sulphate-Reducing Bacteria*, Cambridge University Press, Cambridge, U.K.
- Prakasam, T.B.S., and Loehr, R.C., 1972. Microbial nitrification and denitrification in concentrated wastewater, *Wat. Res.* **6**: 859-869.
- Prasad, B.G.S., Madhavakrishna, W., and Nayudamma, Y., 1983. Utilization of water hyacinth in the treatment and disposal of tannery wastewater, *Internat. Conf. on Water Hyacinth*, Hyderabad, Synopsis of Papers, p. 56.
- Prasittikhet, J., and Gambrell, R.P., 1989. Acidic sulfate soils, in: *Acidic Precipitation*, Vol. 4: *Soils, Aquatic Processes, and Lake Acidification*, S.A. Norton, S.E. Lindberg and A.L. Page, eds., Springer-Verlag, New York, pp. 35-62.
- Prats, D., Ruiz, F., Vazquez, B., Zarzo, D., Berna, D., and Moreno, A., 1993. LAS homologue distribution shift during wastewater treatment and composting: Ecological implications, *Environ. Tox. Chem.* **12**: 1599-1608.
- Příbáň, K., and Šmíd, P., 1982. Water losses through evapotranspiration in littoral macrophyte stands, in: *Proc. Conf. Macrophytes in Water Management, Water Hygiene and Fisheries*, Dům Techniky ČSVTS České Budějovice, Czech Republic, pp. 65-72 (in Czech).
- Příbáň, K., and Ondok, J.P., 1985. Heat balance components and evapotranspiration from a sedge-grass marsh, *Folia Geobot. Phytotax. Praha* **20**: 41-56.
- Příbáň, K., and Ondok, J.P., 1986. Evapotranspiration of a willow carr in summer, *Aquat. Bot.* **25**: 203-216.
- Pries, J.H., 1994. Wastewater and stormwater applications of wetlands in Canada. North American Wetlands Conservation Council (Canada). Sustaining wetlands, Issue paper No. 1994-1.
- Pringsheim, E.G., 1967. Die Mixotrophie von *Beggiatoa*, *Arch. Mikrobiol.* **59**: 247-254.
- Proceedings, 1998. *Proceedings of the 6<sup>th</sup> International Conference on Wetland Systems for Water Pollution Control*, Aguas de Saõ Pedro, Brazil, Int. Water Association.
- Proceedings, 2000. *Proceedings of the 7<sup>th</sup> International Conference on Wetland Systems for Water Pollution Control* Lake Buena Vista, Florida, University of Florida, Gainesville and Int. Water Association.
- Proceedings, 2002. *Proceedings of the 8<sup>th</sup> International Conference on Wetland Systems for Water Pollution Control*, Arusha, Tanzania, University of Dar es Salaam and Int. Water Association.
- Proceedings, 2004. *Proceedings of the 9<sup>th</sup> International Conference on Wetland Systems for Water Pollution Control*, Avignon, France, Cemagref and Int. Water Association.

- Prochaska, C.A., and Zouboulis, A.I., 2006. Removal of phosphates by pilot vertical-flow constructed wetlands using a mixture of sand and dolomite as substrate, *Ecol. Eng.* **26**: 293-303.
- Prosser, J.I., 1989. Autotrophic nitrification in bacteria, in: *Advances in Microbial Physiology*, A.H. Rose, and D.W. Tempest, eds., Vol. 30, Academic Press, London, pp. 125-181.
- Prunster, R.W., 1940. The control of cumbungi (*Typha* spp.) in irrigation channels, *J. Sci. Industr. Res.* **13**: 1-6.
- Prystay, W., and Lo, K.V., 1996. An assessment of constructed wetlands for treatment of greenhouse/glasshouse effluents, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, Poster 26.
- Prystay, W., and Lo, K.V., 1998. Assessment of constructed wetlands for the reduction of nitrogen and phosphorus from greenhouse wastewaters, in: *Proc. 6<sup>th</sup> Internat. Conf. on Wetlands Systems for Water Pollution Control*, S.M. Tauk-Tornisielo and E. Salati Filho, eds., Universidade Estadual Paulista, Sao Paulo State, Brazil and IAQW, pp. 101-114.
- Pucci, B., Conte, G., Martinuzzi, N., Giovannelli, L., and Masi, F., 2000. Design and performance of a horizontal flow constructed wetland for treatment of dairy and agricultural wastewater in the "Chianti" countryside, in: *Proc. 7<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, Lake Buena Vista, Florida. University of Florida, Gainesville and Int. Water Association., pp. 1433-1436.
- Pucci, B., Masi, F., Conte, G., Martinuzzi, N., and Bresciani, R., 2004. Linee guida per la progettazione e gestione di zone umide artificiali per la depurazione dei reflui civili, IRIDRA, S.r.l., Firenze, Italy.
- Puigagut, J., Villaseñor, J., Salas, J.J., Bécas, E., and García, J., 2007. Subsurface-flow constructed wetlands in Spain for the sanitation of small-communities: a comparative study, *Ecol. Eng.* **30**: 312-319.
- Pullin, B.P., and Hammer, D.A., 1991. Aquatic plants improve wastewater treatment, *Water Environ. Technol.* **3**: 36-40.
- Pundsack, J., Axler, R., Hicks, R., Henneck, J., Nordmann, D., and McCarthy, B., 2001. Seasonal pathogen removal by alternative on-site wastewater treatment system, *Water Environ. Res.* **73**: 204-212.
- Putnam, A.R., 1985. Allelopathic research in agriculture: Past highlights and potential, in: *The Chemistry of Allelopathy: Biochemical Interactions among Plants*, C. Thompson, ed., Am. Chem. Soc., Washington, D.C., pp. 1-20.
- QDNR, 2000. Queensland Department of Natural Resources. Guidelines for Using Freewater Surface Constructed Wetlands to Treat Municipal Sewage, QDNR, Brisbane, Australia.
- Quiñónez-Díaz, M. de J., Karpiscak, M.M., Ellman, E.D., and Gerba, C.P., 2001. Removal of pathogenic and indicator microorganisms by a constructed wetland receiving untreated domestic wastewater, *J. Environ. Sci. Health* **A36**: 1311-1320.
- Radoux, M., 1982. Étude comparée des technologies rustiques d'épuration la mosaïque hiérarchisée d'écosystèmes artificiels, in: *Studies on Aquatic Vascular Plants*, J.J. Symoens, S.S. Hooper and P. Compère, eds., Royal Botanic Society of Belgium, Brussels, Belgium, pp. 346-352.
- Radoux, M., 1994. L'optimisation des technologies rustiques d'épuration la mosaïque hiérarchisée d'écosystèmes artificiels, in: *Ateliers de l'Eau*, S. Dautrebande, D. Xanthoulis, J. Van Gysel and C. Willam, eds., CEBEDOC, Liege, Belgium, pp. 227-245.
- Radoux, M., Cadelli, D., Nemcova, M., Ennabili, A., and Ezzahri, J., 2003. Optimisation of extensive wastewater treatment systems under Mediterranean conditions (Morocco): Compared purification efficiency of artificial ecosystems, in: *Wetlands-Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 143-168.
- Ragusa, S.R., McNevin, D., Qasem, S., Mitchell, C., 2004. Indicators of biofilm development and activity in constructed wetlands microcosms, *Wat. Res.* **38**: 2865-2873.

- Rai, D.N., and Munshi, J.D., 1979. The influence of thick floating vegetation (waterhyacinth-*Eichhornia crassipes*) on the physicochemical environment of a freshwater wetland, *Hydrobiologia* **62**: 65-69.
- Raisin, G.W., and Mitchell, D.S., 1994. The use of wetlands for the control of non-point source pollution, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 687-696.
- Raisin, G.W., Mitchell, D.S., and Croome, R.L., 1997. The effectiveness of a small constructed wetland in ameliorating diffuse nutrient loadings from an Australian rural catchment, *Ecol. Eng.* **9**: 19-35.
- Rajan, S.S.S., 1975. Adsorption of divalent phosphate on hydrous aluminum oxide, *Nature* **253**: 434-436.
- Ramírez Masferrer, J.A., 2002. Passive treatment of acid mine drainage at the La Extranjera Mine (Puertollano, Spain), *Mine Water Environ.* **21**: 111-113.
- Ramos, L., Hernandez, L.M., and Gonzales, M.J., 1994. Sequential fraction of copper, lead, cadmium and zinc in soils from or near Donana National Park, *J. Environ. Qual.* **23**: 50-57.
- Ranieri, E., 2004. Chromium and nickel removal in lab and pilot scale CW plants under different clogging conditions, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE and Cemagref, Lyon, pp. 587-594.
- Rao, A.S., 1988. Evapotranspiration rates of *Eichhornia crassipes* (Mart.) Solms, *Salvinia molesta* D.S. Mitchell and *Nymphaea lotus* (L.) Willd. Linn. in a humid tropical climate, *Aquat. Bot.* **30**: 215-222.
- Rao, D.N., and Mikkelsen, D.S., 1977. Effect of acetic, propionic, and butyric acids on young rice seedlings' growth, *Agron. J.* **69**: 923-928.
- Rao, K.V., Khandekar, A.K., and Vaidyanadhan, D., 1973. Uptake of fluoride by water hyacinth *Eichhornia crassipes*, *Ind. J. Exp. Biol.* **11**: 68-69.
- Raskin, I., and Kende, H., 1983. How does deep water rice solve its aeration problem? *Plant Physiol.* **72**: 447-454.
- Raskin, I., and Kende, H., 1985. Mechanism of aeration in rice, *Science* **228**: 327-329.
- Rattray, M.R., Howard-Williams, C., and Brown, J.M.A. 1991. Sediment and water as sources of nitrogen and phosphorus for submerged rooted aquatic macrophytes, *Aquat. Bot.* **40**: 225-237.
- Raunkiaer, C., 1905. Types biologiques pour la géographie botanique, *Bull. Acad. Roy. D. Sci. De Danemark* **1905**: 347-437.
- Raunkiaer, C., 1934. *The Life Forms of Plants and Statistical Plant Geography*, Oxford University Press, Oxford, U.K.
- Rausser, W.E., 1999. Structure and function of metal chelators produced by plants. The case for organic acids, amino acids, phytin, and metallothioneins, *Cell Biochem. Biophys.* **31**: 19-48.
- Reaves, R.P., and DuBow, P.J., 1997. Tom Brother's dairy constructed wetland, in: *Constructed Wetlands for Animal Waste Treatment. A Manual on Performance, Design, and Operation With Case Histories*, V.W.E. Payne and R.L. Knight, eds., Gulf of Mexico Program, Stennis Space Center, Mississippi, pp. II-9-II-13.
- Reckerzügl, T., and Bringezu, S., 1998. Vergleichende Materialintensitätsanalyse verschiedener Abwasserbehandlungssysteme, *GWF-Wasser/Abwasser* **139**: 706-713.
- Reddy, K.R., 1981. Diel variations in physico-chemical parameters of water in selected aquatic systems, *Hydrobiologia* **85**: 201-207.
- Reddy, K.R., 1982. Nitrogen cycling in a flooded-soil ecosystem planted to rice (*Oryza sativa* L.), *Plant and Soil* **67**: 209-220.
- Reddy, K.R., and Patrick, W.H., Jr., 1975. Effect of alternate aerobic and anaerobic conditions on redox potential. Organic matter decomposition, and nitrogen loss in a flooded soil, *Soil Biol. Biochem.* **7**: 87-94.



- Reddy, K.R., and Bagnall, L.O., 1981. Biomass production of aquatic plants used in agricultural drainage water treatment, in: *Internat. Gas Res. Conf. Proc.*, pp. 376-390.
- Reddy, K.R., and Sacco, P.D., 1981. Decomposition of waterhyacinth in agricultural drainage water, *J. Environ. Qual.* **10**: 228-234.
- Reddy, K.R., and Patrick, W.H., Jr., 1983. Effects of aeration on reactivity and mobility of soil constituents, in: *Chemical Mobility and Reactivity in Soil Systems*, Amer. Soc. of Agriculture and Soil Science Soc. Amer., Madison, Wisconsin, pp. 11-33.
- Reddy, K.R., and Tucker, J.C., 1983. Effect of nitrogen source on productivity and nutrient uptake of waterhyacinth (*Eichhornia crassipes*), *Econ. Bot.* **37**: 236-246.
- Reddy, K. R., and DeBusk, W. F., 1984. Growth characteristics of aquatic macrophytes cultured in nutrient-enriched water. I. Water hyacinth, water lettuce and pennywort, *Econ. Bot.* **38**: 229-239.
- Reddy, K.R., and Patrick, W.H., 1984. Nitrogen transformations and loss in flooded soils and sediments, *CRC Crit. Rev. Environ. Control.* **13**: 273-309.
- Reddy, K.R., and DeBusk, W.F. 1985. Growth characteristics of aquatic macrophytes cultured in nutrient-enriched water. II. *Azolla*, duckweed, and *Salvinia*, *Econ. Bot.* **39**: 200-208.
- Reddy, K.R., and Patrick, W.H., Jr., 1986. Denitrification losses in flooded rice fields, *Fertilizer Research* **9**: 99-116.
- Reddy, K. R., and DeBusk, W. F. 1987. Nutrient storage capabilities of aquatic and wetland plants, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp 337-357.
- Reddy, K.R., and Smith, W.H., eds., 1987. *Aquatic Plants for Wastewater Treatment and Resource Recovery*, Magnolia Publishing, Orlando, Florida.
- Reddy, K.R., and Graetz, D.A., 1988. Carbon and nitrogen dynamics in wetland soils, in: *Ecology and Management of Wetlands*, Vol. 1, *Ecology of Wetlands*, D.D. Hook, eds., Timber Press, Portland, Oregon, pp. 307-318.
- Reddy, K.R., and D'Angelo, E.M., 1994. Soil processes regulating water quality in wetlands, in: *Global Wetlands: Old World and New*, W.J. Mitsch, ed., Elsevier Science, Amsterdam, pp. 309-324.
- Reddy, K.R., and D'Angelo, E.M., 1996. Biogeochemical indicators to evaluate pollution removal efficiency in constructed wetlands, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, Keynote address I.
- Reddy, K.R., and D'Angelo, E.M., 1997. Biogeochemical indicators to evaluate pollution removal efficiency in constructed wetlands, *Water Sci. Tech.* **35**(5): 1-10.
- Reddy, K.R., Campbell, K.L., Graetz, D.A., Portier, K.M., 1982. Use of biological filters for treating agricultural drainage effluents, *J. Environ. Qual.* **11**: 591-595.
- Reddy, K.R., Hueston, F.M., and McKim, T., 1983. Water hyacinth biomass production in sewage effluent, in: *Symp. Proc. Energy from Biomass and Wastes VII*, Inst. Gas Tech., Chicago, Illinois, pp. 135-167
- Reddy, K.R., Fejitel, T.C., and Patrick, W.H., Jr., 1986. Effect of soil redox conditions on microbial oxidation of organic matter, in: *The Role of Organic Matter in Modern Agriculture*, Y. Chen, and Y. Avnimelech, eds., Martinus Nijhoff, Dordrecht, pp. 117-156.
- Reddy, K.R., Agami, M., and Tucker, J.C., 1989. Influence of nitrogen supply rates on growth and nutrient storage by water hyacinth (*Eichhornia crassipes*) plants, *Aquat. Bot.* **36**: 33-43.
- Reddy, K.R., DeBusk, W.F., Wang, Y., DeLaune, R., and Koch, M., 1991. Physico-chemical properties of soils in the Water Conservation Area 2 of the Everglades. Report to the South Florida Water Management District, West Palm Beach, Florida.
- Reddy, K.R., Diaz, O.A., Scinto, L.J., and Agami, M. 1995. Phosphorus dynamics in selected wetlands and streams of the Lake Okechobee, *Ecol. Eng.* **5**: 183-208.

- Reddy, K.R., Flaig, E., Scinto, L.J., Diaz, O. and DeBusk, T.A., 1996. Phosphorus assimilation in a stream system of the Lake Okeechobee Basin, *Water Resour. Bull.* **32**: 901-915.
- Reddy, K.R., O'Connor, G.A., and Gale, P.M., 1998. Phosphorus sorption capacities of wetland soils and stream sediments impacted by dairy effluent, *J. Environ. Qual.* **27**: 438-447.
- Reddy, K.R., Kadlec, R.H., Flaig, E., and Gale, P.M., 1999. Phosphorus retention in streams and wetlands: a review, *Crit. Rev. Environ. Sci. Tech.* **29**: 83-146.
- Redfield, A.C., 1958. Biological control of chemical factors in the environment, *Am. Sci.* **46**: 205-221.
- Redington, C.B., 1994. *Plants in Wetlands*, Redington Field Guides to Biological Interactions, Kendall/Hunt Publishing Company, Dubuque, Iowa.
- Reeb, G., and Werckmann, M., 2005. First performance data on the use of two pilot-constructed wetlands for highly loaded non-domestic sewage, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 43-51.
- Reeburgh, W.S., 1976. Methane consumption in Cariaco Trench waters and sediments, *Earth Planet. Sci. Lett.* **28**: 337-344.
- Reed, S.C., 1993. *Subsurface Flow Constructed Wetlands for Wastewater Treatment: A Technology Assessment*, US EPA 832-R-93-008, Washington, DC.
- Reed, S.C., and Bastian, R.K., eds., 1980. *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*. EPA 430/9-80-007, U.S. EPA, Washington, D.C.
- Reed, S.C., and Brown, D., 1992. Performance of gravel bed wetlands in the United States, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 16.1 – 16.8.
- Reed, S.C., Middlebrooks, E.J., and Crites, R.W. 1988. *Natural Systems for Waste Management and Treatment*, 1<sup>st</sup> ed., McGraw-Hill Book Company, New York.
- Reed, S.C., Middlebrooks, E.J., and Crites, R.W. 1995. *Natural Systems for Waste Management and Treatment*, 2<sup>nd</sup> ed., McGraw-Hill Book Company, New York.
- Rees, A.P.T., Jenkins, L.E.T., Smith, A.M., and Wilson, P.M., 1987. The metabolism of flood-tolerant plants, in: *Plant Life in Aquatic and Amphibious Habitats*, R.M.M. Crawford, ed., Blackwell Scientific, Oxford, U.K., pp. 227-238.
- Regehr, D.L., Bazzaz, F.A., and Boggess, W.R., 1975. Photosynthesis, transpiration, and leaf conductance of *Populus deltoides* in relation to flooding and drought, *Photosynthetica* **9**: 52-61.
- Regulations, 1991. Regulation of Environmental Department Regarding the Conditions of Sewage Discharging to the Water and Soil. Decree of the Minister of the Environment, 16.12. 1991 (in Polish).
- Regulations, 2002. Regulation of Environmental Department Regarding the Conditions of Sewage Discharging to the Water and Soil and Especially Hazardous Substances for the Environment. Decree of the Minister of the Environment, 29.11. 2002 (in Polish).
- Reiset, J., 1868. Note sur la production du gaz nitreux pendant le marche des fermentations dans les distilleries. Dosage des proportions d'ammoniaque continues dans le jus de la betterave, *Comp. Rendus Acad. Sci. (Paris)* **66**: 117-180.
- Rejmánková, E., 1971. The influence of temperature and irradiance on the growth and production of duckweeds (*Lemna gibba*, *Lemna minor* and *Spirodela polyrhiza*). Thesis, Charles University, Prague, Czech Republic (in Czech).
- Rejmánková, E., 1975. Comparison of *Lemna gibba* and *Lemna minor* from the production viewpoint, *Aquat. Bot.* **1**: 423-427.
- Rejmánková, E. 1978. Growth, production, and mineral uptake of duckweeds in fishponds and in experimental culture, in: *Pond Littoral Ecosystems: Structure and Functioning*, D. Dykyjová and J. Květ, eds., Springer-Verlag, Berlin, pp. 278-284.

- Rejmánková, E. 1979. Functions of duckweeds in fishpond ecosystems, Ph.D. Thesis, Institute of Botany, Czechoslovak Academy of Sciences, Prague, (in Czech).
- Rejmánková, E., 1982: The role of duckweeds (Lemnaceae) in small wetland water bodies of Czechoslovakia, in: *Wetlands. Ecology and Management*, B. Gopal, R.E. Turner, R.G. Wetzel and D.F. Whigham, eds., Internat. Sci. Publ., and Natl. Inst. Ecol., Jaipur, India, pp. 397-403.
- Rejmánková, E., and Hapala, P. 1982. The importance of duckweeds in pond management, in: *Proc. Conf. Macrophytes in Water Management, Water Hygiene and Fishery*, Dům Techniky ČSVTS, České Budějovice, Czech Republic, pp. 94-100, (in Czech).
- Rejmánková, E., Rejmánek, M., and Květ, J. 1990. Minimizing duckweed (Lemnaceae) production by suitable harvest strategy, in: *Wetland Ecology and Management: Case Studies*, D.F. Whigham, R.E. Good and J. Květ, J., eds., Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 39-43.
- Relvão, A.M. 1994. *Tecnologias Adequadas para o Tratamento de Águas Residuais de Pequenos Aglomerados Urbanos*. DRARN – Centro, Coimbra, Portugal.
- Renalda, M., Njau, K.N., and Katima, J.H.Y., 2006. Performance of horizontal subsurface flow constructed wetland (HSSFCW) in the treatment of tannins wastewater, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1603-1610.
- Revitt, D.M., Shutes, R.B.E., Llewellyn, N.R., and Worrall, P., 1997. Experimental reed bed systems for the treatment of airport runoff, *Wat. Sci. Tech.* **36**(8/9): 385-390.
- Revitt, D.M., Worrall, P., and Brewer, D., 2001. The integration of constructed wetlands into a treatment system for airport runoff, *Wat. Sci. Tech.* **44**(11-12): 469-474.
- Revitt, D.M., Shutes, R.B.E., Jones, R.H., Forshaw, M., and Winter, B., 2004. The performance of vegetative treatment systems for highway runoff during dry and wet conditions, *Sci. Tot. Environ.* **334-335**: 261-270.
- Rhue, R.D., and Harris, W.G. 1999. Phosphorus sorption/desorption reactions in soils and sediments, in: *Phosphorus Biogeochemistry in Subtropical Ecosystems*, K.R. Reddy, G.A. O'Connor and C.L. Schelske, eds., CRC Press, Boca Raton, Florida, pp. 187-206.
- Rice, E.E., 1984. *Allelopathy*, 2<sup>nd</sup> ed., Academic Press, New York.
- Rice, W.A., and Paul, E.A., 1972. The organisms and biological processes involved in asymbiotic nitrogen fixation in waterlogged soil amended with straw, *Can. J. Microbiol.* **18**: 715-723.
- Rice, W.A., Paul, E.A., and Wetter, L.R., 1967. The role of anaerobiosis in asymbiotic nitrogen fixation, *Can. J. Microbiol.* **13**: 829-836.
- Richards, F.A., 1965a. Anoxic basins and fjords, in: *Chemical Oceanography*, Vol. 1, J.P. Riley, and G. Skirrow, eds., Academic Press, London, pp. 611-645.
- Richards, F.A., 1965b. Chemical observations in some anoxic, sulfate-bearing basins and fjords, in: *Advances in Water Pollution Research*, Vol. 3, E.A. Pearson, ed., Pergamon Press, London, pp. 215-232.
- Richardson, C.J., 1978. Primary productivity values in fresh water wetlands, in: *Wetland Functions and Values: The State of our Understanding*, P.E. Greeson, J.R. Clark and J.E. Clark, eds., American Water Resources Association, Minneapolis, Minnesota.
- Richardson, C.J. 1985. Mechanisms controlling phosphorus retention capacity in freshwater wetlands, *Science* **228**: 1424-1427.
- Richardson, C.J., 1989. Freshwater wetlands: transformers, filters, or sinks? in: *Freshwater Wetlands and Wildlife*, R.R. Sharitz, and J.W. Gibbons, eds., CONF-8603101, DOE Symposium Series No. 61, US Dept. of Energy Office of Scientific and Tech. Inf., Oak Ridge, Tennessee, pp. 26-46.
- Richardson, C.J., 1991. Biogeochemical cycles: regional, in: *Wetlands and Shallow Continental Water Bodies*, B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 259-279.

- Richardson, C.J. 1999. The role of wetlands in storage, release, and cycling of phosphorus on the landscape: a 25-year retrospective, in: *Phosphorus Biogeochemistry in Subtropical Ecosystems*, K.R. Reddy, G.A. O'Connor and C.L. Schelske, eds., CRC Press, Boca Raton, Florida, pp. 47-68.
- Richardson, C.J., and Nichols, D.S. 1985. Ecological analysis of wastewater management criteria in wetland ecosystems, in: *Ecological Considerations in Wetlands Treatment of Municipal Wastewater*, P.J. Godfrey, E.R., Kaynor, S. Pelczarski and J. Benforado, eds., Van Nostrand Reinhold, New York. pp. 351-391.
- Richardson, C.J., and Marshall, P.E. 1986. Processes controlling movement, storage, and export of phosphorus in a fen peatland, *Ecol. Monogr.* **56**: 279-302.
- Richardson, C.J., and Craft, B.C. 1993. Effective phosphorus retention in wetlands-fact or fiction? in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, G.A., ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 271-282.
- Richardson, C.J., and Vaitiyanathan, P. 1995. Phosphorus sorption characteristics of the Everglades soils along an eutrophication gradient, *Soil Sci. Soc. Am. J.* **59**: 1782-1788.
- Richardson, C.J., and Qian, S.S., 1999. Long-term phosphorus assimilative capacity in freshwater wetlands: A new paradigm for sustaining ecosystem structure and function, *Environ. Sci. Technol.* **33**: 1545-1551.
- Richardson, C.J., and Vymazal, J., 2001. Sampling macrophytes in wetlands, in: *Bioassessment and Management of North American Freshwater Wetlands*, R.B. Rader, D.P. Batzer, and S.A. Wissinger, eds., John Wiley & Sons., New York, pp. 297-337.
- Richardson, C.J., Qian, S.S., Craft, B.C., and Qualls, R.G. 1997. Predictive models for phosphorus retention in wetlands, *Wetlands Ecology and Management* **4**: 159-175.
- Richardson, C.J., Tilton, D.L., Kadlec, J.A., Chamie, J.P.M., and Wentz, W.A., 1978. Nutrient dynamics of northern wetland ecosystems, in: *Freshwater Wetlands: Ecological Processes and Management Potential*, R.E. Good, D.F. Whigham, D.F., and R.L. Simpson, eds., Academic Press, New York, pp. 217-241.
- Richter, K.M., Guymier, I., Worrall, P., and Jones, C., 2004. Treatment performance of Heathrow constructed wetlands, in: *Wetland Systems and Waste Stabilization Ponds Communications of Common Interest*, ASTEE. Lyon, France, pp. 125-131.
- Rickard, D.T., 1975. Kinetics and mechanism of pyrite formation at low temperatures, *Am. J. Sci.* **275**: 636-652.
- Riddolls, A., 1985. Aspects of nitrogen fixation in Lough Neagh. I. Acetylene reduction and the frequency of *Aphanizomenon flos-aquae* heterocysts, *Freshwater Biol.* **15**: 289-297.
- Rinaudo, G., Balandreau, J., and Dommergues, Y., 1971. Algal and bacterial non-symbiotic nitrogen fixation in paddy soils, *Plant Soil Spec. Vol.*: 471-479.
- Risgaard-Petersen, N., Meyer, R.L., Schmid, M., Jetten, M.S.M., Enrich-Prast, A., Rysgaard, S., and Revsbech, N.P., 2004. Anaerobic ammonium oxidation in an estuarine sediment, *Aquat. Microb. Ecol.* **36**: 293-304.
- Rivera, F., Warren, A., Ramirez, E., Decamp, O., Bonilla, P., Gallogos, E., Calderon, A., and Sanchez, J.T., 1995. Removal of pathogens from wastewaters by the root zone method (RZM), *Wat. Sci. Tech.* **32**: 211-218.
- Rivera, F., Warren, A., Curds, C.R., Robles, E., Gutierrez, A., Gallegos, E., and Calderón, A., 1996. The application of the root zone method for the treatment and reuse of high-strength abattoir waste in Mexico, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, pp. X/4-1-X/4-8.
- Riviera-Monroy, V.H., Twilley, R.R., Boustany, R.G., Day, J.W., Vera-Herrera, F., and Ramirez, M.C., 1995. Direct denitrification in mangrove sediments in Tarrimos Lagoon, Mexico, *Mar. Ecol. Prog. Ser.* **126**: 97-109.
- Robarge, W.P., and Corey, R.B., 1979. Adsorption of phosphate by hydroxy-aluminum species on a cation exchange resin, *Soil Sci. Soc. Am. J.* **43**: 481-487.
- Robertson, L.A., and Kuennen, J.G., 1984. Aerobic denitrification – old wine in new bottles, *Antonie van Leeuwenhoek* **50**: 525-544.

- Robertson, L.A., and Kuenen, J.G., 1990. Combined heterotrophic nitrification and aerobic denitrification in *Thiosphaera pantotropha*, and other bacteria, *Antonie van Leeuwenhoek* **57**: 139-152.
- Robertson, L.A., and Kuenen, J.G., 1991. Physiology of nitrifying and denitrifying bacteria, in: *Microbial Production and Consumption of Greenhouse Gases: Methane Nitrogen Oxides and Halomethanes*, J.E. Rogers and W.B. Whitman, eds., American Society for Microbiology, Washington, D.C., pp. 189-199.
- Robertson, L.A., Dalsgaard, T., Revsbech, N.P., and Kuenen, J.G., 1995. Confirmation of "aerobic denitrification" in batch cultures, using gas chromatography and N-15 mass spectrometry, *FEMS Microbiol. Ecol.* **18**: 113-119.
- Robinson, H., Harris, G., Carville, M., Barr, M., and Last, S., 1999. The use of an engineered reed bed system to treat leachate at Monument Hill landfill site, southern England, in: *Constructed Wetlands for the Treatment of Landfill Leachate*, G. Mulamootil, E.A. McBean and F. Rovers, eds., Lewis Publishers/CRC Press, Boca Raton, Florida, pp. 71-97.
- Robinson, N.J., and Thurman, D.A., 1986. Isolation of a copper complex and its rate of appearance in roots of *Mimulus guttatus*, *Planta* **169**: 192-197.
- Rochard, J., Ferrier, V.M., Kaiser, A., and Salomon, N., 2002. The application of constructed wetlands in the viticultural sector: experimentation on a winery effluent treatment device, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam and IWA, pp. 494-503.
- Rodewald-Rudescu, L., 1974. *Das Schilfrohr Phragmites communis Trinus*, Die Binnengewässer 27, E. Schweizerbart, Stuttgart, Germany.
- Roels J., Huyghe G., and Verstraete W., 2004. Microbially mediated phosphine emission, *Sci. Tot. Environ.* **338**: 253-265.
- Rogers, F.E.H., 1985. *Wetlands for Wastewater Treatment with Special Reference to Municipal Wastewater*, Witwatersrand University Press, Johannesburg, South Africa.
- Rogers, H.H., and Davis, D.E., 1972. Nutrient removal by water hyacinth, *Weed Sci.* **20**: 423-427.
- Rogers, K.H., Breen, P.F., and Chick, A.J., 1990. Hydraulics, root distribution and phosphorus removal in experimental wetland system, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, ed., Pergamon Press, Oxford, UK, pp. 587-590.
- Rolletschek, H., 1997. Gradients of nutrients, dissolved oxygen and sulfide in wave-protected and unsheltered stands of *Phragmites australis*, *Int. Rev. Hydrobiol.* **82**: 329-339.
- Rolletschek, H., Rolletschek, A., Hartzendorf, T., and Kohl, J.-G., 2000. Physiological consequences of mowing and burning of *Phragmites australis* stands for rhizome ventilation and amino acid metabolism, *Wetlands Ecology and Management* **8**: 425-433.
- Roman, C.T., and Daiber, F.C., 1984. Aboveground and belowground primary production dynamics of two Delaware Bay tidal marshes, *Bull. Torrey Bot. Club* **3**: 31-41.
- Roman, C.T., Niering, W.A., and Warren, R.S., 1984. Salt marsh vegetation changes in response to tidal restrictions, *Environ. Manage.* **8**: 141-150.
- Römheld, V., 1991. The role of phytosiderophores in acquisition of iron and other micronutrients in graminaceous species: an ecological approach, *Plant Soil* **130**: 127-134.
- Rooney-Varga, J.N., Anderson, R.T., Fraga, J.L., Ringelberg, D., and Lovley, D.R., 1999. Microbial communities associated with anaerobic benzene mineralization in a petroleum-contaminated aquifer, *Appl. Environ. Microbiol.* **65**: 3056-3063.
- Rose, A.H., 1976. *Chemical Microbiology*, Plenum Press, New York.
- Rosenberg, N.J., 1969. Advective contribution of energy utilized in evapotranspiration by alfalfa in the East Central Great Plains, *Agric. Meteorol.* **6**: 179-184.
- Roseth, R., 2000. Shell sand: a new filter medium for constructed wetlands and wastewater treatment, *J. Environ. Health Sci.* **A35**: 1335-1355.

- Rosson, R.A., Tebo, B.M., and Neelson, K.H., 1984. Use of poison in determination of microbial manganese binding rates in seawater, *Appl. Environ. Microbiol.* **47**: 740-745.
- Röthlisberger, F., 1996. Kickuth reed bed technology – the situation in Switzerland with a comparison between technical wastewater treatment and Kickuth reed bed technology, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, Poster 36.
- Roulet, N.T., and Woo, M.-K., 1988. Wetland and lake evaporation in the low arctic, *Arctic Alpine Res.* **18**: 195-200.
- Rousseau, D.P.L., Vanrolleghem, P.A., and De Pauw, N., 2004a. Model-based design of horizontal subsurface flow constructed wetlands: a review, *Wat. Res.* **38**: 1484-1493.
- Rousseau, D.P.L., Vanrolleghem, P.A., and De Pauw, N., 2004b. Constructed wetlands in Flanders: a performance analysis, *Ecol. Eng.* **23**: 151-163.
- Rousseau, D.P.L., Horton, D., Griffin, P., Vanrolleghem, and De Pauw, N., 2005. Impact of operational maintenance on the asset life of storm reed beds, *Wat. Sci. Tech.* **51**(9): 243-250.
- Rovers, F., and Farquhar, G., 1973. Infiltration and landfill behavior, *J. Environ. Eng.* **99**: 671-690.
- Rovira, A.D., 1969. Plant root exudates, *Bot. Rev.* **35**: 35-57.
- Rowe, C. B., 1998. The upflow option for vertical flow rootzone wetlands, a New Zealand experience, in: *Proc. 6<sup>th</sup> Internat. Conf. on Wetlands Systems for Water Pollution Control*, S. M. Tauk-Tornisielo, ed., Universidade Estadual Paulista, São Paulo State, Brazil, pp. 115-125.
- Royle, R.N., and King, R.J., 1991. Aquatic macrophytes in Lake Lindell, New South Wales: biomass, nitrogen and phosphorus status, and changing distribution from 1981 to 1987, *Aquat. Bot.* **41**: 281-298.
- Rudolfs, W., Frank, L.L., and Ragotzkie, R.A., 1950. Literature review on the occurrence and survival of enteric, pathogenic, and relative organisms in soil, water, sewage, and sludge, and on vegetation, *Sewage Ind. Waste* **22**: 1261-1281.
- Runes, H.B., Jenkins, J.J., Moore, J.A., Bottomley, P.J., and Wilson, B.D., 2003. Treatment of atrazine in nursery irrigation runoff by a constructed wetland, *Water Research* **37**: 539-550.
- Rusoff, L.L., Blakeney, E.W., Jr., and Culley, D.D., Jr., 1980. Duckweeds (Lemnaceae family): a potential source of protein and amino acids, *J. Agric. Food Chem.* **28**: 848-850.
- Russell, E.W., 1973. *Soil Conditions and Plant Growth*, 10<sup>th</sup> ed., Longman, London.
- Russell, J.E., 1961. *Soil Conditions and Plant Growth*, John Wiley and Sons, New York.
- Rustige, H., Tomac, I., and Höner, G., 2003. Investigations on phosphorus retention in subsurface flow constructed wetlands, *Wat. Sci. Tech.* **48**(5): 67-74.
- Rychnovská, M., and Šmíd, P., 1973. Preliminary evaluation of transpiration in two *Phragmites* stands, in: *Ecosystem Study on Wetland Biome in Czechoslovakia*, S. Hejný, ed., Czechoslovak IBP/PT-PP Report No. 3, Třeboň, Czech Republic, pp. 111-120.
- Rychnovská, M., Květ, J., Glosser, J., and Jakřlová, A., 1972. Plant water relation in three zones of grassland, *Acta Sci. Natur. Brno* **6**: 1-38.
- Ryden, J.C., and Syers, J.K., 1977. Desorption and isotopic exchange relationships of phosphate sorbed by soils and hydrous ferric oxide, *J. Soil Sci.* **28**: 596-609.
- Ryden, J.C., McLaughlin, J.R., and Syers, J.K., 1977. Mechanisms of phosphate sorption by soils and hydrous ferric oxide gel, *J. Soil Sci.* **28**: 72-92.
- Rysgaard, S., and Glud, R.N., 2004. Anaerobic N<sub>2</sub> production in Arctic sea ice, *Limnol. Oceanogr.* **49**: 86-94.
- Saarinen, T., 1996. Biomass and production of two vascular plants in a boreal mesotrophic fen, *Can. J. Bot.* **74**: 934-938.
- Saarinen, T., 1998. Internal C:N balance and biomass partitioning of *Carex rostrata* grown at three levels of nitrogen supply, *Can. J. Bot.* **76**: 762-768.

- Sahai, R., and Sinha, A.B., 1976. Productivity of submerged macrophytes in polluted and non-polluted regions of the eutrophic lake, Ramgarh (U.P.), in: *Aquatic Weeds in S.E. Asia*, C.K. Varshney and J. Rzoska, eds., Dr. Junk Publ., The Hague, The Netherlands, pp. 131-140.
- Sahramaa, M., and Jauhiainen, L., 2003. Characterization of development and stem elongation of reed canary grass under northern conditions, *Industrial Crops Products* **18**: 155-169.
- Said, M.Z., Culley, D.D., Jr., Standifer, L.C., Epps, E.A., Myers, R.W., and Boney, S.A., 1979. Effect of harvest rate, waste loading, and stocking density on the yield of duckweeds, *Proc. World Maricul. Soc.* **10**: 769-780.
- Saijonkari-Pahkala, K., 2001. Non-wood plants as raw material for pulp and paper, *Agric. Food Sci. Finland* **10**: 1-101.
- Sajn Slak, A., Bulc, T.G., and Vrhovšek, D., 2006. Ecoremediation – a new concept of natural treatment system – review of experiences in Slovenia, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1323-1330.
- Sainty, G.R., and Jacobs, S.W.L., 1981. *Waterplants of New South Wales*, Water Resource Commission N.S.W.
- Sainty, G.R., and Jacobs, S.W.L., 2003. *Waterplants in Australia, A Field Guide*, 4<sup>th</sup> ed., Geoff Sainty, Leslie McCullough and Surrey Jacobs, Sainty and Associates Pty Ltd, Potts Point, Australia.
- Sakadevan, K., and Bavor, H.J., 1998. Phosphate adsorption characteristics of soils, slags and zeolite to be used as substrates in constructed wetland systems, *Wat. Resour.* **32**: 391-399.
- Salati, E., 1987. Edaphic-phytodepuration: a new approach to wastewater treatment, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, (eds.), Magnolia Publishing, Orlando, Florida, pp. 199-208.
- Salati, E.Jr., Salati, E., and Salati, E., 1999. Wetland projects developed in Brazil, *Wat. Sci. Tech.* **40**(3): 19-25.
- Salmon, C., Crabos, J.L., Sambuco, J.P., Bessiere, J.M., Basseres, A., Caumette, P., and Baccou, J.C., 1998. Artificial wetland performances in the purification efficiency of hydrocarbon wastewater, *Water Air Soil Pollut.* **104**: 313-329.
- Salt, D.E., Smith, R.D., and Raskin, I., 1998. Phytoremediation, *Annu. Rev. Plant Physiol. Plant Mol. Biol.* **49**: 643-668.
- Salt, D.E., Thurman, D.A., Tomsett, A.B., and Sewell, A.K., 1989. Copper phytochelatins of *Mimulus guttatus*, *Proc. R. Soc. London* **236**: 79-89.
- Samecka-Cymerman, A., and Kempers, A.J., 2001. Concentration of heavy metals and plant nutrients in water, sediments and aquatic macrophytes of anthropogenic lakes (former open cut brown coal mines) differing in stage of acidification, *Sci. Tot. Environ.* **281**: 87-98.
- Sanders, J.G., and Osman, R.W., 1985. Arsenic incorporation in a salt marsh ecosystem, *Estuar. Coast. Shelf. Sci.* **20**: 387-392.
- Sand-Jensen, K., and Søndergaard, M., 1978. Growth and production of isoetids in oligotrophic Lake Kalgaard, Denmark, *Verh. Internat. Verein. Limnol.* **20**: 659-666.
- Sand-Jensen, K., and Søndergaard, M., 1979. Distribution and quantitative development of aquatic macrophytes in relation to sediment characteristics in oligotrophic Lake Kalgaard, Denmark, *Freshwat. Biol.* **9**: 1-11.
- Sand-Jensen, K., and Søndergaard, M., 1981. Phytoplankton epiphyte development and their shading effect on submerged macrophytes in lakes of different nutrient status, *Int. Revue ges. Hydrobiol.* **66**: 529-552.
- Sand-Jensen, K., and Borum, J., 1983. Regulation of growth of eelgrass (*Zostera marina* L.) in Danish coastal waters, *Mar. Techn. Soc. J.* **17**: 15-21.
- Sand-Jensen, K., and Borum, J., 1991. Interactions among phytoplankton, periphyton, and macrophytes in temperate freshwaters and estuaries, *Aquat. Bot.* **41**: 137-175.

- Sand-Jensen, K., Prah, C., and Stokholm, H., 1982. Oxygen release from roots of submerged aquatic macrophytes, *Oikos* **38**: 349-354.
- Sands, Z., Gill, L.S., and Rust, R., 2000. Effluent treatment reed beds: results after ten years of operation, in: *Wetlands and Remediation*, J.F. Means and R.E. Hinchee, eds., Battelle Press, Columbus, Ohio, pp. 273-279.
- Sanford, W.E., 1999. Substrate type, flow characteristics, and detention times related to landfill leachate treatment efficiency in constructed wetlands, in: *Constructed Wetlands for the Treatment of Landfill Leachate*, G. Mulamootil, E.A. McBean and F. Rovers, eds., Lewis Publishers/CRC Press, Boca Raton, Florida, pp. 47-56.
- Sanford, W.E., Steenhuis, T.S., Parlange, J.-Y., Surface, J.M., and Peverly, J.H., 1995a. Hydraulic conductivity of gravel and sand as substrates in rock-reed filters, *Ecol. Eng.* **4**: 321-336.
- Sanford, W.E., Steenhuis, J.M., Surface, J.M., and Peverly, J.H., 1995b. Flow characteristics of rock-reed filters for treatment of landfill leachate, *Ecol. Eng.* **5**: 37-50.
- Sanyal, S.K. and DeDatta, S.K., 1991. Chemistry of phosphorus transformations in soils, *Advan. Agron.* **16**: 1-18.
- Sapkota, D.P., and Bavor, H.J., 1992. Horizontal gravel-media filter for the reduction of suspended solids from maturation pond effluent, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 26.1-26.19.
- Sapkota, D.P., and Bavor, H.J., 1994. Gravel bed filtration as a constructed wetland component for the reduction of suspended solids from maturation pond effluent, *Wat. Sci. Tech.* **29**(4): 55-66.
- Sardón, N., Salas, J.J., Pidre, J.R., and Cuenca, I., 2006. Vertical and horizontal subsurface flow constructed wetlands in the experimental plant of Carrión de los Céspedes (Seville), in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 729-739.
- Sarkar, A.N., and Wyn Jones, R.G., 1982. Effect of rhizosphere pH on the availability and uptake of Fe, Mn, and Zn, *Plant Soil* **66**: 361-372.
- Sartaj, M., Fernandes, L., and Castonquay, N., 1999. Treatment of leachate from a landfill receiving industrial, commercial, institutional and construction/demolition wastes in an engineered wetland, in: *Constructed Wetlands for the Treatment of Landfill Leachates*, G. Mulamootil, E.A. McBean, and F. Revers, eds., Lewis Publisher/CRC Press, Boca Raton, pp. 165-174.
- Sasakawa, H., and Yamamoto, Y., 1978. Comparison of the uptake of nitrate and ammonium by rice seedlings, *Plant Physiol.* **62**: 665-669.
- Sass, A., Rutters, H., Cypionka, H., and Sass, H., 2002. *Desulfobulbus mediterraneus* sp. nov., a sulfate-reducing bacterium growing on mono- and disaccharides, *Arch. Microbiol.* **177**: 468-474.
- Sather, J.H., Smith, R.D., and Larson, J.S., 1990. Natural values of wetlands, in: *Wetlands and Shallow Continental Water Bodies*, Vol. 1., B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 373-387.
- Sato, H., and Kondo, T., 1981. Biomass production of waterhyacinth and its ability to remove inorganic minerals from water. I. Effect of the concentration of culture solution on the rates of plant growth and nutrient uptake, *Jpn. J. Ecol.* **31**: 257-267.
- Saunders, G.W., 1976. Decomposition in freshwater, in: *The Role of Terrestrial and Aquatic Organisms in Decomposition Processes*, J.M. Anderson and A. Macfayden, eds., Blackwell Scientific Publications, Oxford, UK, pp. 341-373.
- Saunders, G.W., Cummins, K.W., Gak, D.Z., Pieczynska, E., Straškrabová, V., and Wetzel, R.G., 1980. Organic matter and decomposers, in: *The Functioning of Freshwater Ecosystems*, E.D. Le Cren, and R.H. Lowe-McConnell, eds., Cambridge University Press, Cambridge, UK, pp. 341-392.



- SAV, 1999. Submerged aquatic vegetation/limerock treatment system technology for removing phosphorus from Everglades Agricultural Area waters. DB Environmental Laboratories, Inc., Rockledge, Florida.
- Savant, N.K., and DeDatta, S.K., 1982. Nitrogen transformations in wetland rice soils, *Adv. Agron.* **35**: 241- 302.
- Schaafsma, J.A., Baldwin, A.H., and Streb, C.A., 2000. An evaluation of a constructed wetland to treat wastewater from a dairy farm in Maryland, USA, *Ecol. Eng.* **14**: 1999-206.
- Schalk, J., de Vries, S., Kuenen, J.G., and Jetten, M.S.M., 2000. Involvement of a novel hydroxylamine oxidoreductase in anaerobic ammonium oxidation, *Biochemistry*, **39**: 5405-5412.
- Schelske, C.L., 1962. Iron, organic matter and other factors limiting primary productivity in a marl lake, *Science* **136**: 45-46.
- Schiemer, F., and Prosser, M., 1976. Distribution and biomass of submerged macrophytes in Neusiedler See, *Aquat. Bot.* **2**: 289-307.
- Schierup, H.-H., 1978. Biomass and primary production in a *Phragmites communis* Trin. swamp in North Jutland, Denmark, *Verh. Internat. Verein. Limnol.* **20**: 93-99.
- Schierup, H.-H., Brix, H., and Lorenzen, B., 1990a. Spildevandsrensning i rodzoneanlæg. Status for danske anlæg 1990 samt undersøgelse og vurdering af de vigtigste rensningsprocesser. Spildevandsforskning fra Miljøstyrelsen No. 8. (in Danish)
- Schierup, H.-H., Brix, H., and Lorenzen, B., 1990b. Wastewater treatment in constructed reed beds in Denmark – state of the art, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 495-504.
- Schink, B., Thiemann, V., Laue, H., and Friedrich, M.W., 2002. *Desulfotignum phosphitoxidans* sp. nov., a new marine sulfate reducer that oxidizes phosphite to phosphate, *Arch. Microbiol.* **177**: 381-391.
- Schloesing, T., 1868. Sur la decomposition des nitrates pendant les fermentations, *Comp. Rendus Acad. Sci. (Paris)* **66** : 237-239.
- Schloesing, J.J.T., and Muntz, A., 1877. Sur la nitrification par les ferments organisés, *Comp. Rendus Acad. Sci. (Paris)* **84** : 301-303.
- Schmid, M., Twachtmann, U., Klein, M., Strous, M., Juretschko, S., Jetten, M., Metzger, J.W., Schleifer, K.H., and Wagner, M., 2000. Molecular evidence for genus level diversity of bacteria capable of catalyzing anaerobic ammonium oxidation, *Syst. Appl. Microbiol.* **23**: 93-106.
- Schmid, M., Walsh, K., Webb, R., Rijpstra, W.I.C., van de Pas-Schoonen, K., Verbruggen, M.J., Hill, T., Moffett, B., Fuerst, J., Schouten, S., Sinninghe Damste, J.S., Harris, J., Shaw, P., Jetten, M., and Strous, M., 2003. *Candidatus* “*Scalindua brodae*”, sp. nov., *Candidatus* “*Scalindua wagneri*” sp. nov., two new species of anaerobic ammonium oxidizing bacteria, *Syst. Appl. Microbiol.* **26**: 529-538.
- Schmid, M.C., Maas, B., Dapena, A., van de Pas-Schoonen, K., van de Vossenberg, J., Kartal, B., van Niftrik, L., Schmidt, I., Cirpus, I., Kuenen, J.G., Wagner, M., Sinninghe Damsté, J.S., Kuypers, M., Revsbech, N.P., Mendez, R., Jetten, M.S.M., and Strous, M., 2005. Biomarkers for in situ detection of anaerobic ammonium-oxidizing (anammox) bacteria, *Appl. Environ. Microbiol.* **71**: 1677-1684.
- Schmidt, E.L., 1982. Nitrification in soils, in: *Nitrogen in Agricultural Soil*, F.J. Stevenson, ed., Am. Soc. Agron., Madison, Wisconsin, *Agronomy*, **22**, 253-267.
- Schmidt, I., Zart, D., and Bock, E. 2001. Effects of gaseous NO<sub>2</sub> on cells of *Nitrosomonas europaea* previously incapable of using ammonia as an energy source, *Antonie van Leeuwenhoek* **79**: 39-47.
- Schmidt, I., Sliemers, O., Schmid, M., Cirpus, I., Strous, M., Bock, E., Kuenen, J.G., and Jetten, M.S.M., 2002. Aerobic and anaerobic ammonia oxidizing bacteria – competitors or natural partners? *FEMS Microbiol. Ecol.* **39**: 175-181.

- Schmidt, I., Sliemers, O., Schmid, M., Bock, E., Fuerst, J., Kuenen, J.G., Jetten, M.S.M., and Strous, M., 2003. New concepts of microbial treatment process for the nitrogen removal from wastewaters, *FEMS Microbiol. Rev.* **27**: 481-492.
- Schnitzer, M., and Skinner, S.I.M., 1966. Organo-metallic interactions in soils: 5. Stability constants for  $\text{Cu}^{++}$ ,  $\text{Fe}^{++}$ , and  $\text{Zn}^{++}$ -fulvic acid complexes, *Soil Sci.* **102**: 361-365.
- Scholander, P.F., van Dam, L., and Scholander, S.I., 1955. Gas exchange in the roots of mangroves, *Am. J. Bot.* **42**: 92-98.
- Scholes, L.N.L., Shutes, R.B.E., Revitt, D.M., Forshaw, M., Andrews, K., and Purchase, D., 1995. Constructed wetlands and sustainable environment management in the UK, *Spec. Group on the Use of Macrophytes in Water Pollution Control Newsletter* **13**: 11-13.
- Scholes, L.N.L., Shutes, R.B.E., Revitt, D.M., Purchase, D., and Forshaw, M., 1999. The removal of urban pollutants by constructed wetlands during wet weather, *Wat. Sci. Tech.* **40**(3): 333-340.
- Scholten, E., Lukow, T., Auling, G., Kroppenstedt, R.M., Rainey, F.A., and Diekmann, H., 1999. *Thaurea mechernichensis* sp. nov., an aerobic denitrifier from a leachate treatment plant, *Int. J. Syst. Bacteriol.* **49**: 1045-1051.
- Scholz, M., 2006. *Wetland Systems to Control Urban Runoff*, Elsevier, Amsterdam.
- Schönborn, A., and Züst, B., 1994. Langzeiterfahrungen mit der naturnahen Kläranlage Schattweid, *Gas-Wasser-Abwasser* **74**: 674-683.
- Schönborn, A., Züst, B., and Underwood, E., 1997. Long term performance of the sand-plant-filter Schattweid, Switzerland, *Wat. Sci. Tech.* **35**(5): 307-314.
- Schouten, S., Strous, M., Kuypers, M.M.M., Rijpstra, W.I.C., Baas, M., Schubert, C.J., Jetten, M.S.M., and Sinninghe Damsté, J.S., 2004. Stable carbon isotopic fractionations associated with inorganic carbon fixation by anaerobic ammonium-oxidizing bacteria, *Appl. Environ. Microbiol.* **70**: 3785-3788.
- Schouw, J.F., 1822. *Grundtrack til en Almindlig Plantegeografie*, German edition, Berlin, Germany.
- Schröder, P., Grosse, W., and Woermann, D., 1986. Localization of thermo-osmotically active partitions in young leaves of *Nuphar lutea*, *J. Exp. Bot.* **37**: 1450-1461.
- Schroeder, D.C., and Lee, G.F., 1975. Potential transformation of chromium in natural waters, *Water Air Soil Pollut.* **4**: 355-365.
- Schueler, T.R., 1992. Design of stormwater wetland systems: guidelines for creating diverse and effective stormwater wetlands in the Mid-Atlantic region, Anacostia Restoration Team, Dept. of Environ. Programs, Metropolitan Washington Council of Governments, Washington, DC.
- Schulz, C., Gelbrecht, J., and Rennert, B., 2003. Treatment of rainbow trout farm effluents in constructed wetland with emergent plants and subsurface horizontal water flow, *Aquaculture* **217**: 207-221.
- Schulz, R., and Peall, S.K.C., 2001. Effectiveness of a constructed wetland for retention of nonpoint-source pesticide pollution in the Lourens River Catchment, South Africa, *Environ. Sci. Technol.* **35**: 422-426.
- Schwartz, M.F., and Boyd, C.E., 1995. Constructed wetlands for treatment of channel catfish pond effluent, *Progress. Fish-Culturist* **57**: 255-266.
- Schwertmann, U., and Taylor, R.M., 1989. Iron oxides, in: *Minerals in Soil Environments*, J.B. Dixon, and S.B. Weed, eds., Soil Sci. Soc. of America, Madison, Wisconsin, pp. 380-438.
- Schwoerbel, J., and Tillmanns, G.C., 1964a. Konzentrationsabhängige Aufnahme von wasserlöslichen  $\text{PO}_4\text{-P}$  bei submersen Wasserpflanzen, *Naturwissenschaften* **51**: 319-320.
- Schwoerbel, J., and Tillmanns, G.C., 1964b. Untersuchungen über die Stoffwechselformen in Fliessgewässern. I. Die Rolle höhere Wasserpflanzen: *Callitriche hamulata* Kütz., *Arch. Hydrobiol. Suppl.* **28**: 245-258.
- Schwoerbel, J., and Tillmanns, G.C., 1964c. Untersuchungen über die Stoffwechselformen in Fliessgewässern. II. Experimentelle Untersuchungen über die Ammoniumaufnahme und

- pH-Änderung in Wasser durch *Callitriche hamulata* Kütz. and *Fontinalis antipyretica* L., *Arch. Hydrobiol. Suppl.* **28**: 259-267.
- Sculthorpe, C.D., 1967. *The Biology of Aquatic Vascular Plants*, St. Martin's Press, New York.
- Sculthorpe, C.D., 1971. *The Biology of Aquatic Vascular Plants*, 2<sup>nd</sup> ed., Edward Arnold, London.
- Seidel, K., 1953. Pflanzungen zwischen Gewässern und Land, *J. Max Planck Inst.* **1953**: 17-20.
- Seidel, K., 1955. Die Flechtbinse *Scirpus lacustris*, in: *Ökologie, Morphologie und Entwicklung, ihre Stellung bei den Volkern und ihre wirtschaftliche Bedeutung*, Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, pp. 37-52.
- Seidel, K., 1961. Zur Problematik der Keim- und Pflanzengewässer, *Verh. Internat. Verein. Limnol.* **14**: 1035-1039.
- Seidel, K., 1964: Abau von Bacterium coli durch höhere Pflanzen, *Naturwissenschaften* **51**: 395.
- Seidel, K., 1965a. Phenol-Abbau in Wasser durch *Scirpus lacustris* L. wehrend einer versuchsdauer von 31 Monaten, *Naturwissenschaften* **52**: 398-406.
- Seidel, K., 1965b. Neue Wege zur Grundwasseranreicherung in Krefeld, Vol. II. Hydrobotanische Reinigungsmethode, *GWF Wasser/Abwasser* **30**: 831-833.
- Seidel, K., 1966. Reinigung von Gewässern durch höhere Pflanzen, *Naturwissenschaften* **53**: 289-297.
- Seidel, K., 1976. Macrophytes and water purification, in: *Biological Control of Water Pollution*, J. Tourbier, and R.W. Pierson, eds., Pennsylvania University Press, Philadelphia, pp. 109-122.
- Seidel, K. 1978. Gewässerreinigung durch höhere Pflanzen, *Zeitschrift Garten und Landschaft* **H1**: 9-17.
- Seidel, K., and Happel, H., 1983. Limnologie in Stichworten (IV). Kleine Pflanzen-Kläranlagen, *Wasserkalender*, **1983**: 119-141.
- Seitz, H.J., and Cypionka, H., 1986. chemolithotrophic growth of *Desulfovibrio desulfuricans* with hydrogen coupled to ammonification of nitrate and nitrite, *Arch. Microbiol.* **146**: 63-67.
- Seitzinger, S.P., 1988. Denitrification in freshwater and coastal marine ecosystems: ecological and geochemical significance, *Limnol. Oceanogr.* **33**: 702-724.
- Sekiranda, S.B.K., and Kiwanuka, S., 1998. A study of nutrient removal efficiency of *Phragmites mauritianus* in experimental reactors in Uganda, *Hydrobiologia* **364**: 83-91.
- Seliskar, D.M.: 1988. Waterlogging stress and ethylene production in the dune slack plant, *Scirpus americanus*, *J. Exp. Bot.* **39**: 1639-1648.
- Sena Gomes, A.R., and Kozlowski, T.T., 1980. Growth responses and adaptations of *Fraxinus pennsylvanica* seedlings to flooding, *Plant Physiol.* **66**: 267-271.
- Senden, M.H.M.N., van der Meer, A.J.G.M., Verburg, T.G., and Wolterbeek, H.T., 1995. Citric acid in tomato plant roots and its effect on cadmium uptake and distribution, *Plant Soil* **171**: 333-339.
- Senko, J.M., and Stolz, J.F., 2001. Evidence for iron-dependent nitrate respiration in the dissimilatory iron-reducing bacterium *Geobacter metallireducens*, *Appl. Environ. Microbiol.* **67**: 3750-3752.
- Senzia, A.M., Mashauri, D.A., Mayo, A.W., Mbwette, T.S.A., Katima, J.H.Y., and Jørgensen, S.E., 2002. Performance of horizontal subsurface flow constructed wetlands located at primary facultative and maturation ponds in Tanzania, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, University of Dar Es Salaam, Tanzania, pp. 190-199.
- Senzia, A.M., Mashauri, D.A., Mayo, A.W., Mbwette, T.S.A., Katima, J.H.Y., and Jørgensen, S.E., 2002. Modelling nitrogen transformations in horizontal subsurface flow constructed

- wetlands planted with *Phragmites mauritianus*, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, University of Dar Es Salaam, Tanzania, pp. 813-827.
- Senzia, A.M., Mashauri, D.A., and Mayo, A.W., 2003. Suitability of constructed wetlands and waste stabilisation ponds in wastewater treatment: nitrogen transformation and removal, *Phys. Chem. Earth* **28**: 1117-1124.
- Seo, D.C., Cho, J.S., Lee, H.J., and Heo, J.S., 2005. Phosphorus retention capacity of filter media for estimating the longevity of constructed wetland, *Wat. Res.* **39**: 2445-2457.
- Seyring, P., and Kuschik, P., 2005. Are constructed wetlands a cost-effective alternative to activated sludge systems? Investigation of plants in Germany and Mexico (2005), in: *Proc. Int. Meeting Phytodepuration*, Lorca, Spain, pp. 136-141.
- Shaeffer, C.C., and Marten, G.C., 1992. Seedling patterns affect grass and Alfalfa yield in mixture, *J. Proc. Agric.* **5**: 328-332.
- Shadan, M., 1980. Fixation, translocation, and root exudation of  $^{14}\text{CO}_2$  by *Phaseolus vulgaris* L. subjected to root anoxia, M.S. Thesis, Michigan State University, East Lansing.
- Shalabi, M., 2004. Constructed wetlands in Croatian Adriatic area, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 307-312.
- Sharma, M.M., Chang, Y.I., and Yen, T.F., 1985. Reversible and irreversible surface charge modification of bacteria for facilitating transport through porous media, *Colloids Surf.* **16**: 193-206.
- Sheoran, A.S., and Sheoran, V., 2006. Heavy metal removal mechanism of acid mine drainage in wetlands: A critical review, *Minerals Engineering* **19**: 105-116.
- Shepherd, H.L., Tchobanoglous, G., and Grismer, M.E., 2001. Time-dependant retardation model for chemical oxygen demand removal in a sub-surface flow constructed wetland for winery wastewater treatment, *Water Environ. Res.* **73**: 597-606.
- Sheridan, C., Peterson, J., Rohwer, J., and Burton, S., 2006. Engineering design of subsurface flow constructed wetlands for the primary treatment of winery effluent, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1623-1632.
- Sherrard, R.M., Berr, J.S., Murray-Gulde, C.L., Rodgers, J.H., Jr., and Shah, Y.T., 2004. Feasibility of constructed wetlands for removing chlorothalonil and chlorpyrifos from aqueous mixtures, *Environ. Pollut.* **127**: 385-394.
- Shew, D.M., Linhurst, R.A., and Seneca, E.D., 1981. Comparison of production computation methods in a southeastern North Carolina *Spartina alterniflora* salt marsh, *Estuaries* **4**: 97-109.
- Shively, J.M., 1974. Inclusion bodies in procaryotes, *Ann. Rev. Microbiol.* **28**: 167-187.
- Sholkowitz, E.R., and Copland, D., 1981. The chemistry of suspended matter in Esthwaite water, a biologically productive lake with seasonally anoxic hypolimnion, *Geochim. Cosmochim. Acta* **46**: 393-410.
- Shore, J., 1995. Cellulosic dyeing, Bradford, *Soc. of Dyers and Colourists*: 214-278.
- Shrestha, R.R., 1999. Application of Constructed Wetlands for Wastewater Treatment in Nepal. Dissertation, BOKU University, Vienna, Austria.
- Shrestha, R.R., 2004. Fecal sludge management through constructed wetland system in Nepal: concern and quest, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 241-247.
- Shrestha, R.R., Haberl, R., and Laber, J., 2001a. Constructed wetland technology transfer to Nepal, *Wat. Sci. Tech.* **43**(11): 345-350.
- Shrestha, R.R., Haberl, R., Laber, J., Manandhar, R., and Mader, J., 2001b. Application of constructed wetlands for wastewater treatment in Nepal, *Wat. Sci. Tech.* **44**(11-12): 381-386.
- Shroff, K.C., 1982. Reuse of water and sludge for cultivation of variety of value added botanical species, in: *ENPC-IIT Joint Workshop on Strategy and Technology for Water Quality Management*, Indian Institute of Technology, Bombay, pp. 379-425.

- Shuckrow, A.J., Pajak, A.P., and Touhill, C.J., 1980. Management of hazardous waste leachate. US E.P.A. Report SW-871.
- Shutes, R.B.E., Revitt, D.M., Mungur, A.S., and Scholes, L.N., 1997. The design of wetland systems for the control of urban runoff, *Wat. Sci. Tech.* **35**(5): 19-25.
- Shutes, R.B.E., Revitt, D.M., Lagerberg, I.M., and Barraud, V.C.E., 1999. The design of vegetative constructed wetlands for the treatment of highway runoff, *Sci. Tot. Environ.* **235**: 189-197.
- Shutes, R.B.E., Revitt, D.M., Scholes, L.N.L., Forshaw, M., and Winter, B., 2001. An experimental constructed wetland system for the treatment of highway runoff in the UK, *Wat. Sci. Tech.* **44**(11-12): 571-578.
- Shutes, R.B.E., Ellis, J.B., Revitt, D.M., Forshaw, M., and Winter, B., 2003. Urban and highway runoff treatment by constructed wetlands, in: *Proc Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., ICN and INAG, Lisbon, Portugal, pp. 289-314.
- Shutes, B., Ellis, J.B., Revitt, D.M., and Scholes, L.N.L., 2005. Constructed wetlands in UK urban surface drainage systems, *Wat. Sci. Tech.* **51**(9): 31-37.
- Siegrist, R.L., 1987. Soil clogging during subsurface wastewater infiltration as affected by effluent composition and loading rate, *J. Environ. Qual.* **16**: 181-187.
- Sievers, D.M., 1993. Design of submerged flow wetlands for individual homes and small wastewater flows. Special report 457, Missouri Small Wastewater Flows Education and Research Center, University of Missouri, Columbia, Columbia, MO.
- Sifton, H.B., 1945. Air-space tissue in plants. I., *Bot. Rev.* **11**: 108-143.
- Sifton, H.B., 1957. Air-space tissue in plants. II., *Bot. Rev.* **23**: 303-312.
- Sikora, F.J., Zhu, T., Behrend, L.L., Steinberg, S.L., and Coonrod, H.S., 1995. Ammonium removal in constructed wetlands with recirculating subsurface flow: removal rates and mechanisms, *Wat. Sci. Tech.* **32**(3): 193-202.
- Sikora, F.J., Behrends, L.L., Brodie, G.A., and Taylor, H.N., 2000. Design criteria and required chemistry for removing manganese in acid mine drainage using subsurface flow wetlands, *Wat. Environ. Res.* **72**: 536-544.
- Silva, N.M.L.P., and Braga, J.P.M., 2006a. Inventory of constructed wetlands in the centre of Portugal, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 105-115.
- Silva, N.M.L.P., and Braga, J.P.M., 2006b. Construction and maintenance costs of constructed wetlands in the centre of Portugal, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 149-157.
- Silver, W.S., and Jump, A., 1975. Nitrogen fixation associated with vascular aquatic macrophytes, in: *Nitrogen Fixation by Free-Living Microorganisms*, W.D.P. Stewart, ed., Cambridge University Press, Cambridge, pp. 121-125.
- Silverman, G.S., 1989. Development of an urban runoff treatment wetlands in Fremont, California, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 669-676.
- Silverman, M.P., and Ehrlich, H.L., 1964. Microbial formation and degradation of minerals, in: *Advances in Applied Microbiology*, W.W. Umbreit, ed., Academic Press, New York, pp. 153-206.
- Silyn-Roberts, G., and Lewis, G., 2003. Substrata effects on bacterial biofilm development in a subsurface flow dairy waste treatment wetland, *Wat. Sci. Tech.* **48**(8): 261-269.
- Singh, S.P., Pant, M.C., Sharma, A.C., Sharma, P.C., and Purohit, R., 1982. Limnology of shallow water zones of lakes in Kamaun Himalaya (India), in: *Wetlands. Ecology and Management*, B. Gopal, R.E. Turner, R.G. Wetzel and D.F. Whigham, eds., Internat. Sci. Publ., and Natl. Inst. Ecol., Jaipur, India, pp. 39-49.
- Singer, A., Eshel, A., Agami, M., and Beer, S., 1994. The contribution of aerenchymal CO<sub>2</sub> to the photosynthesis of emergent and submerged culms of *Scirpus lacustris* and *Cyperus papyrus*, *Aquat. Bot.* **49**: 107-116.

- Singer, P.C., and Stumm, W., 1970. Acid mine drainage – the rate limiting step, *Science* **167**: 1121-1123.
- Sinha, S.N., and Sinha, L.P., 1969. Studies on use of water hyacinth culture in oxidation ponds treating digested sugar wastes and effluents of septic tank, *Environ. Health* **11**: 197-207.
- Sirko, A., Zatyka, M., Sadowy, E., and Hulanicka, D., 1995. Sulfate and thiosulfate transport in *Escherichia coli* K-12: evidence for a functional overlapping of sulfate- and thiosulfate-binding proteins, *J. Bacteriol.* **177**: 4134-4136.
- Skakkebaeck, N.E., Leffers, H., Rajpert-De Maeys, E., Carlsen, E., and Grigor, K.M., 2000. Should we watch what we eat and drink? Report on the international workshop on hormones and endocrine disrupters in food and water: possible impact on human health, Copenhagen, Denmark, *Trends Endocrinol. Metab.* **11**: 291.
- Skyring, G.W., Oshrain, R.L., and Wiebe, W.J., 1978. Sulfate reduction rates in Georgia marshland soils, *Geomicrobiol. J.* **1**: 389-400.
- Sliekers, A.O., Derwort, N., Campos Gomez, J.L., Strous, M., Kuenen, J.G., and Jetten, M.S.M., 2002. Completely autotrophic nitrogen removal over nitrite in one single reactor, *Water Research* **36**: 2475-2482.
- Sloop, G.M., Kozub, D.D., and Liehr, S.K., 1996. Use of constructed wetlands for treating high ammonia nitrogen landfill leachate, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, pp. XII/2-1-XII/2-8.
- Small, M., and Wurm, C., 1977. Data Report. Meadow/Marsh/Pond System. Brookhaven National Laboratory, BNL 50675.
- Smeulders, F., Maes, A., Sinnaeue, J., and Cremers, A., 1983. *In situ* immobilization of heavy metals with tetraethylene-pentamine (tetren) in natural soils and its effect on toxicity and plant growth, *Plant Soil* **70**: 37-47.
- Šmíd, P., 1975. Evaporation from a reedswamp, *J. Ecol.* **63**: 299-309.
- Smid, A.E., and Beauchamp, E.G., 1976. Effects of temperature and organic matter on denitrification in soil, *Can. J. Soil Sci.* **56**: 385-391.
- Smillie, R.H., Hunter, K., and Loutit, M., 1981. Reduction of chromium (VI) by bacterially produced hydrogen sulphide in a marine environment, *Water Res.* **15**: 1351-1354.
- Smirnov, N., and Crawford, R.M.M., 1983. Variation in the structure and response to flooding of root aerenchyma in some wetland plants, *Ann. Bot.* **51**: 237-249.
- Smith, A.M., and ap Rees, T., 1979. Effects of anaerobiosis on carbohydrate oxidation by roots of *Pisum sativum*, *Phytochemistry* **18**: 1453-1458.
- Smith, I.D., Bis, G.N., Lemon, E.R., and Rozema, L.R., 1996. A thermal analysis of a subsurface, vertical flow constructed wetland, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Universität für Bodenkultur, Vienna, Austria, Chapter I/1.
- Smith, M.P., and Kalin, M., 1988. Biological polishing: the *Chara* process, in: *Proc. 13<sup>th</sup> CLRA Convention Reclamation, Conservation and the Environment*, Energy, Mines and Resources Canada, pp. 87-95.
- Smith, M.P., and Kalin, M., 1989. Biological polishing of mining waste waters: bioaccumulation with Characeae, in: *Proc. Conf. Biohydrometallurgy '89*, Jackson Hole, Wyoming, pp. 1-15.
- Smith, M.P., and Kalin, M., 2002. Floating wetland vegetation covers for suspended solids removal, in: *Treatment Wetlands for Water Quality Improvement*, J. Pries, ed., CH2M Hill Canada, Waterloo, Ontario, pp. 143-148.
- Smith, M.S., and Zimmerman, K., 1981. Nitrous oxide production by non-denitrifying soil nitrate reducers, *Soil Sci. Soc. Am. J.* **45**: 865-871.
- Smith, M.S., and Parsons, L.L., 1985. Persistence of denitrifying enzyme activity in dried soils, *Appl. Environ. Microbiol.* **49**: 316-320.
- Smith, M.S., Thomas, G.W., White, R.E., Ritonga, D., 1985. Transport of *E. coli* through intact and disturbed columns, *J. Environ. Qual.* **14**: 87-91.

- Smith, M.W., 1969. Changes in environment and biota of a natural lake after fertilization, *J. Fish. Res. Bd. Can.* **26**: 3101-3132.
- Smith R.L., and Klug, M.J., 1981. Reduction of sulfur compounds in the sediments of a eutrophic lake basin, *Appl. Environ. Microbiol.* **41**: 1230-1237.
- Smith, W.G., 1913. Raunkiaer's "life-forms" and statistical methods, *J. Ecol.* **1**: 16-26.
- Snoeyenbos-West, O.L., Nevin, K.P., and Lovley, D.R., 2000. Stimulation of dissimilatory Fe(III) reduction results in a predominance of *Geobacter* species in a variety of sandy aquifers, *Microb. Ecol.* **39**: 153-167.
- Snow, L.M., 1904. The effects of external agents on the production of root hairs, *Bot. Gaz.* **37**: 143-145.
- Snyder, J.A., and Mokry, L.E., 2000. Chemical industry's constructed wetland – an environmental education success story, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, pp. 1349-1355.
- Snyder, R.L., and Boyd, C.E., 1987. Evapotranspiration by *Eichhornia crassipes* (Mart.) Solms and *Typha latifolia* L., *Aquat. Bot.* **27**: 217-227.
- So, M.L. 1987. Growth characteristics of duckweeds and their potential use as organic fertilizers in Hong Kong, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 755-762.
- Sobolewski, A., 1996. Metal species indicate the potential of constructed wetlands for long-term treatment of mine drainage, *J. Ecol. Eng.* **6**: 259-271.
- Soetaert, K., Hoffmann, M., Meire, P., Starink, M., van Oevelen, D., Van Regenmortel, S., and Cox, T., 2004. Modelling growth and carbon allocation in two reed beds (*Phragmites australis*) in the Scheldt estuary, *Aquat. Bot.* **79**: 211-234.
- Solano, M.L., Soriano, P., and Ciria, M.P., 2004. Constructed wetlands as a sustainable solution for wastewater treatment in small villages, *Biosystems Engineering* **87**: 109-118.
- Somes, N-L-G., Breen, P.F., and Wong, T.H.F., 1996. Integrated hydrologic and botanical design of stormwater control wetlands, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, Universität für Bodenkultur, Vienna, Austria, Chapter III/4.
- Somes, N.L.G., Fabian, J., and Wong, T.H.F., 2000. Tracking pollutant detention in constructed stormwater wetlands, *Urban Water* **2**: 29-37.
- Sommers, L.E., Harris, R.F., Williams, J.D.H., Armstrong, D.E., and Syers, J.K., 1972. Fractionation of organic phosphorus in lake sediments, *Soil Sci. Soc. Am. Proc.* **36**: 51-54.
- Sonzogni, W.C., Chapra, S.C., Armstrong, D.E., and Logan, T.J., 1982. Bioavailability of phosphorus inputs to lakes, *J. Environ. Qual.* **11**: 555-563.
- Sørensen, J. 1978. Capacity for denitrification and reduction of nitrate to ammonia in a coastal marine sediments, *Appl. Environ. Microbiol.* **35**: 301-305.
- Sørensen, J., 1982. Reduction of ferric iron in anaerobic, marine sediments and interaction with reduction of nitrate and sulfate, *Appl. Environ. Microbiol.* **43**: 319-324.
- Sørensen, J., and Jørgensen, B.B., 1987. Early diagenesis in sediments from Danish coastal waters: microbial activity and Mn-Fe-S geochemistry, *Geochim. Cosmoch. Acta* **51**: 1583-1590.
- Sorokin, Y., 1957. On the ability of sulfate reducing bacteria to utilize methane for the reduction of sulfate to hydrogen sulfide, *Mikrobiologiya* **115**: 816.
- Sorokin, Y.I., 1972. The bacterial population and the processes of hydrogen sulfide oxidation in the Black Sea, *Journal du Conseil, Conseil permanent international pour l'Exploration de la Mer* **34**: 423-454.
- Soroko, M., 2005. Treatment of wastewater from small slaughterhouse in hybrid constructed wetlands system, in: *Proc. Workshop Wastewater treatment in Wetlands. Theoretical and Practical Aspects*, I. Toczyłowska and G. Guzowska, eds., Gdańsk University of Technology Printing Office, Gdansk, Poland, pp. 171-176.
- Sorrell, B.K., and Boon, P.I., 1992. Biogeochemistry of billabong sediments. II. Seasonal variations in methane production, *Freshwater Biol.* **27**: 435-445.

- Sorrell, B.K., and Armstrong, W., 1994. On the difficulties of measuring oxygen release by root systems of wetland plants, *J. Ecol.* **82**: 177-183.
- Soto, F., Garcia, M., de Luis, E., and Becares, E., 1999. Role of *Scirpus lacustris* in bacterial and nutrient removal from wastewater, *Wat. Sci. Tech.* **40**: 241-247.
- Søvik, A.K., and Kløve, B., 2005. Phosphorus retention processes in shell sand filter systems treating municipal wastewater, *Ecol. Eng.* **25**: 168-182.
- Spangler, F.L., Sloey, W.E. and Fetter, C.W., 1976. Wastewater treatment by natural and artificial marshes. EPA-600/2-76-2007, US EPA, Ada, Oklahoma.
- Spratt, H.G., Morgan, M.D., and Good, R.E., 1987. Sulfate reduction in peat from a new Jersey Pinelands cedar swamp, *Appl. Environ. Microbiol.* **53**: 1406-1411.
- Sprent, J.I., 1987. *The Ecology of the Nitrogen Cycle*, Cambridge University Press, Cambridge.
- Sprent, J.I., and Sprent, P., 1990. *Nitrogen Fixing Organisms. Pure and Applied Aspects*, Chapman and Hall, London, UK.
- Šrůtek, M., 1993. Distribution of the stands with *Urtica dioica* L. along the Lužnice River floodplain on the border between Austria and Czechoslovakia and land management, *Vegetatio* **106**: 73-87.
- Stainbridge, H.H., 1976. *History of Sewage Treatment in Britain. 5. Land Treatment*, Inst. Water Pollution Control: Maidstone, Kent, UK.
- Stales, C.A., Peterson, D.R., Parkerton, D.F., and Adams, W.J., 1997. The environmental fate of phthalate esters: a literature review, *Chemosphere* **35**: 667-749.
- Stanford, G., Legg, J.O., and Staley, T.E. 1975. Fate of 15a-labelled nitrate in soils under anaerobic conditions, in: *Proc. 2<sup>nd</sup> Internat. Conf. on Stable Isotopes*, E.R. Klein, and P.D. Klein, eds., Argonne National Laboratory, Argonne, Illinois, pp. 20-23.
- Staubitz, W.W., Surface, J.M., Steenhuis, T.S., Peverly, J.H., Lavine, M.J., Weeks, N.C., Sanford, W.E., and Kopka, R.J., 1989. Potential use of constructed wetlands to treat landfill leachate, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 735-742.
- St-Cyr, L., and Crowder, A.A., 1990. Manganese and copper in the root plaque of *Phragmites australis* (Cav.) Trin. ex Steudel, *Soil Sci.* **149**: 191-198.
- St-Cyr, L., and Campbell, P.G.C., 1996. Metals (Fe, Mn, Zn) in the root plaque of submerged aquatic plants collected in situ: Relations with metal concentrations in the adjacent sediments and in the root tissue, *Biogeochemistry* **33**: 45-76.
- Stearman, G.K., George, D.B., Carlson, K., and Lansford, S., 2003. Pesticide removal from container nursery runoff in constructed wetland cells, *J. Environ. Qual.* **32**: 1548-1556.
- Steer, D., Fraser, L., Boddy, J., and Seibert, B., 2002. Efficiency of small constructed wetlands for subsurface treatment of single-family domestic effluent, *Ecol. Eng.* **18**: 429-440.
- Stefanson, R.C., 1973. Evolution of patterns of nitrous oxide and nitrogen in sealed soil-plant systems, *Soil Biol. Biochem.* **5**: 1441-1445.
- Steffens, J.C., 1990. The heavy metal-binding peptides of plants. *Ann. Rev. Plant Physiol. Mol. Biol.* **41**: 553-575.
- Stein, O.R., Biederman, J.A., Hook, P.B., and Allen, W.C., 2006. Plant species and temperature effects on the k-C\* first-order model for COD removal in batch-loaded SSF wetlands, *Ecol. Eng.* **26**: 100-112.
- Steiner, G.R., and Combs, D.W., 1993. Small constructed wetlands systems for domestic wastewater treatment and their performance, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 491-498.
- Steiner, G.R., and Watson, J.T., 1993. General design, construction, and operation guidelines: Constructed wetlands wastewater treatment systems for small users including individual residences. 2<sup>nd</sup> ed., TVA/WM-93/10, Tennessee Valley Authority Resource Group Water Management, Chattanooga, Tennessee.



- Steiner, G.R., Watson, J.T., Hammer, D.A., and Harker, D.F., Jr., 1987. Municipal wastewater treatment with artificial wetlands: A TVA/Kentucky demonstration, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 923-932.
- Steiner, G.R., Watson, J.T., and Hammer, D.A., 1988. Municipal wastewater treatment by constructed wetlands: A TVA demonstration in western Kentucky, in: *Proc. Conf. Increasing Our Wetland Resources*, J. Zelazny and J.S. Feierabend, eds., National Wildlife Federation, Washington, D.C., pp. 160-167.
- Steiner, G.R., Watson, J.T., and Choate, K.D., 1991. General design, construction, and operation guidelines: Constructed wetlands wastewater treatment systems for small users including individual residences, Tennessee Valley Authority Technical report TVA/WR/WQ-91/2, Chattanooga, Tennessee.
- Steiner, G.R., Watson, J.T., and Choate, K.D., 1993. General design, construction, and operation guidelines for small constructed wetlands wastewater treatment systems, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 499-507.
- Steinmann, C.R., Weinhart, S., and Melzer, A., 2003. A combined system of lagoon and constructed wetland for an effective wastewater treatment, *Wat. Res.* **37**: 2035-2042.
- Stenström, T.A., and Hoffner, S., 1982. Reduction of enteric microorganisms in soil infiltration systems, in: *Alternative Wastewater Treatment*, A.S. Eikum and R.W. Seabloom, eds., D. Reidel Publishing Company, The Netherlands, pp. 169-181.
- Stephan, U.W., and Scholz, G., 1993. Nicotianamine: mediator of transport of iron and heavy metals in the phloem? *Physiol. Plant.* **88**: 522-529.
- Stephan, U.W., Schmidke, I., Stephan, V.W., and Scholz, G., 1996. The nicotianamin molecule is made-to-measure for complexation of metal micronutrients in plants, *Biometals* **9**: 84-90.
- Stephenson, M., Turner, G., Pope, P., Colt, J., Knight, A., and Tchobanoglous, G., 1980. The use and potential of aquatic species for wastewater treatment. Appendix A: The environmental requirements of aquatic plants. California State Water Resources Control Board, Sacramento, California.
- Stepniewski, W., and Glinski, J., 1988. Gas exchange and atmospheric properties of flooded soils, in: *The Ecology and Management of Wetlands*. Vol. 1. *Ecology and Wetlands*, D.D. Hook, W.M. McKee, H.K. Smith, J. Gregory, V.G. Burrell, M.R. DeVoe, R.E. Sojka, S. Gilbert, R. Banks, L.H. Stolzy, C. Brooks, T.D. Matthews, and T.H. Shear, eds., Timber Press, Portland, Oregon, pp. 269-278.
- Studel, R., 2000. The chemical sulfur cycle, in: *Environmental Technologies to Treat Sulfur Pollution. Principles and Engineering*, P.N.L. Lens and L. Hulshoff Pol, eds., IWA Publishing, London, pp. 1-31.
- Stevik, T.K., Ausland, G., Hansen, J.F., and Jenssen, P.D., 1999. The influence of physical and chemical factors on the transport of E-coli through biological filters for wastewater purification, *Water Res.* **33**: 3701-3706.
- Stevik, T.K., Geir Ausland, K.A., and Hanssen, J.F., 2004. Retention and removal of pathogenic bacteria in wastewater percolating through porous media: a review, *Water Res.* **38**: 1355-1367.
- Steward, K.K., 1970. Nutrient removal potentials of various aquatic plants, *Hyacinth Control J.* **9**: 34-35.
- Stewart, E., 2005. Evaluation of Septic Tank and Subsurface Flow Wetland for Jamaican Public School Wastewater Treatment, MSc. Thesis, Michigan Technological University.
- Stewart, E.A.III., 1979. Utilization of water hyacinths for control of nutrients in domestic wastewater – Lakeland, Florida, in: *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*, R.K. Bastian, and S.C. Reed, eds., EPA 430/9-80-006, U.S. EPA, Washington, D.C., pp. 273-293.

- Stewart, E.A., III., Haselow, D.L., and Wyse, N.M. 1987. Review of operations and performance data of five water hyacinth based treatment systems in Florida, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy, and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 279-288.
- Stewart, W.D.P., 1969. Biological and ecological aspects of nitrogen fixation by free-living micro-organisms, *Proc. R. Soc. Lond. B* **172**: 367-388.
- Stewart, W.D.P., 1975. *Nitrogen Fixation by Free-living Micro-organisms*, Cambridge University Press, Cambridge, UK.
- Stewart, W.D.P. 1973. Nitrogen fixation. In: *The Biology of the Blue-Green Algae*, N.G. Carr and B.A. Whitton, eds., University of California Press, Berkeley, California, pp. 260-278.
- Stewart, W.D.P., 1977. Blue-green algae, in: *A Treatise on Dinitrogen Fixation*, R.W.F. Hardy, and W.S. Silver, eds., Wiley (Interscience), New York, pp. 63-124.
- Stillings, L.L., Gryta, J.J., and Ronning, T.A., 1988. Iron and manganese removal in a Typha-dominated wetland during ten months following its construction, in: *Proc. Conf. Mine Drainage and Surface Mine Reclamation*, Vol. 1: *Mine Water and Mine Waste*, U.S. Dept. of the Interior, Bureau of Mines, Information Circular 9183, pp. 317-324.
- St. Louis, V.L., Rudd, J.W., Kelly, C.A., Beaty, K.G., Bloom, N.S., and Flett, J.R., 1994. Importance of wetlands as sources of methylmercury to boreal forest ecosystems, *Can. J. Fish. Aquat. Sci.* **51**: 1065-1076.
- Stolz, J.F., 1991. The ecology of phototrophic bacteria, in: *Structure of Phototrophic Prokaryotes*, J.F. Stolz, ed., CRC Press, Boca Raton, Florida, pp. 105-123.
- Stone, A.T., and Morgan, J.J. 1984. Reduction and dissolution of manganese (III) and manganese (IV) oxides by organics. 2. Survey of the reactivity of organics, *Environ. Sci. Tech.* **18**: 617-624.
- Stone, A.T., and Morgan, J.J. 1987. Reductive dissolution of metal oxides, in: *Aquatic Surface Chemistry: Chemical Processes at the Particle Water Interface*, W. Stumm, ed., John Wiley and Sons, Inc., New York, pp. 221-254.
- Stone, K.C., Hunt, P.G., Szögi, A.A., Humenik, F.J., and Rice, J.M., 2002. Constructed wetlands design and performance for swine lagoon wastewater treatment, *Trans. ASAE* **45**: 723-730.
- Stone, R.W., 1984. The presence of iron and manganese - oxidizing bacteria in natural and simulated bogs, in: *Treatment of Mine Drainage by Wetlands*, J.E. Burris, ed., The Pennsylvania University, University Park, Pennsylvania, pp. 30-36.
- Stott, R., Jenkins, T., Shabana, M., and May, E., 1997. A survey of the microbial quality of wastewater in Ismalia, Egypt and the implications of wastewater reuse, *Wat. Sci. Tech.* **35**(11-12): 211-217.
- Stott, R., Jenkins, T., Bahgat, M., and Shalaby, I., 1999. Capacity of CWs to remove parasite eggs from wastewater in Egypt, *Wat. Sci. Tech.* **40**(3): 117-123.
- Stott, R., May, E., Matsushita, E., and Warren, A., 2001. Protozoan predation as a mechanism for the removal of *Cryptosporidium* oocysts from wastewaters in constructed wetlands, *Wat. Sci. Tech.* **44**(11-12): 191-198.
- Stott, R., Williams, J., Jenkins, T., Ramirez, E., and Warren, A., 2002. Pathogen and parasite removal in wastewater treatment constructed wetlands, in: *Proc. 8<sup>th</sup> Internat. Conf. on Wetland Systems for Water Pollution Control*, University of Dar Es Salaam, Tanzania, pp. 1206-1220.
- Stouthamer, A.H., De Boer A.P.N., Van Der Oost, J., Van Spanning, R.J.M., 1997. Emerging principles of inorganic nitrogen metabolism in *Paracoccus denitrificans* and related bacteria, *Antonie van Leeuwenhoek* **71**: 33-41.
- Straub, K.L., Benz, M., Schlink, B., and Widdel, F., 1996. Anaerobic, nitrate-dependent microbial oxidation of ferrous iron, *Appl. Environ. Microbiol.* **62**: 1458-1460.
- Straub, K.L., Rainey, F.A., and Widdel, F., 1999. *Rhodovulum iodolum* sp. nov. and *Rhodovulum robiginosum* sp. nov., two new marine phototrophic ferrous-oxidizing purple bacteria, *Int. J. Systemat. Bacteriol.* **49**: 729-735.

- Straub, K.L., Benz, M., and Schlink, B., 2001. Iron metabolism in anoxic environments at near neutral pH, *FEMS Microbiol. Ecol.* **34**: 181-186.
- Strohl, W.R., and Larkin, J.M., 1978. Enumeration, isolation, and characterization of *Beggiatoa* from fresh water sediments. *Appl. Environ. Microbiol.* **36**: 755-770.
- Strous, M., and Jetten, M.S.M., 2004. Anaerobic oxidation of methane and ammonium, *Annu. Rev. Microbiol.* **58**: 99-117.
- Strous, M., van Gerven, E., Kuenen, J.G., and Jetten, M., 1997. Effects of aerobic and microaerobic conditions on anaerobic ammonium-oxidizing (anammox) sludge, *Appl. Environ. Microbiol.* **63**: 2446-2448.
- Strous, M., Kuenen, J.G., and Jetten, M.S.M., 1999a. Key physiology of anaerobic ammonium oxidation. *Appl. Environ. Microbiol.* **65**: 3248-3250.
- Strous, M., Fuerst, J.A., Kramer, E.H.M., Logemann, S., Muyzer, G., van de Pas- Schoonen, K., Webb, R., Kuenen, J.G., Jetten, M.S.M., 1999b. Missing lithotrophs identified as new planctomycete, *Nature* **400**: 446-449.
- Strusevičius, Z., and Strusevičiene, S.M., 2003. Investigations of wastewater produced on cattle-breeding farms and its treatment in constructed wetlands, in: *Proc. Internat. Conf. Constructed and Riverine Wetlands for Optimal Control of Wastewater at Catchment Scale*, Ü. Mander, C. Vohla and A. Poom, eds., University of Tartu, Institute of Geography, Tartu, Estonia, *Publ. Instituti Geographici Universitatis Tartuensis* **94**, pp. 317-324.
- Stuanes, A., and Nilsson, P., 1987. Investigation of soil treatment systems for septic tank effluent. 3. The fate of phosphorus, *Vatten* **43**: 45-53.
- Studer, C., and Brändle, R., 1984. Sauerstoffkonsum und versorgung der Rhizome von *Acorus calamus* L., *Glyceria maxima* (Hartmann) Holmberg, *Menyanthes trifoliata* L., *Phalaris arundinacea* L., *Phragmites communis* Trin. und *Typha latifolia* L., *Bot. Helvetica* **94**: 23-31.
- Stumm, W., and Morgan, J.J. 1970. *Aquatic Chemistry. An Introduction Emphasizing Chemical Equilibria in Natural Waters*, Wiley-Interscience, New York.
- Stumm, W., and Morgan, J.J. 1981. *Aquatic Chemistry. An Introduction Emphasizing Chemical Equilibria in Natural Waters*, 2<sup>nd</sup> edition, Wiley-Interscience, New York.
- Stünzi, J.T., and Kende, H., 1989. Gas composition in the internal air spaces of deepwater rice in relation to growth induced by submergence, *Plant Cell Physiol.* **30**: 49-56.
- Sukias, J.P.S., Davies-Colley, R.J., and Tanner, C.C., 1997a. Results of the questionnaire on "Natural" wastewater treatment, *Water and Wastes New Zealand* **97**: 35-39.
- Sukias, J.P.S., Davie-Colley, R.J., Tanner, C.C., Lowe, H., Ray, D., Van Oostrom, A., and Docherty, R., 1997b. Issues and directions for "natural" wastewater treatment-feedback from the workshop, *Water and Wastes New Zealand* **98**: 47-50.
- Sun, G., Gray, K.R., and Biddlestone, A.J., 1999a. Treatment of agricultural wastewater in a pilot-scale tidal flow reed bed system, *Environ. Technol.* **20**: 233-237.
- Sun, G., Gray, K.R., Biddlestone, A.J., and Cooper, D.J., 1999b. Treatment of agricultural wastewater in a combined tidal flow-downflow reed bed system, *Wat. Sci. Tech.* **40**(3): 139-146.
- Sunda, W.G., Huntsman, S.A., and Harvey, G.R., 1983. Photoreduction of manganese oxides in sea water and its geochemical and biological implications, *Nature* **301**: 234-236.
- Sundaravadivel, M., and Vigneswaran, S., 2001. Wastewater collection and treatment technologies for semi-urban areas of Indias: a case study, *Wat. Sci. Tech.* **43**(11): 329-336.
- Sundblad, K. 1998. Sweden, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 251-259.
- Sundblad, K., and Wittgren, H.-B., 1989. *Glyceria maxima* for wastewater nutrient removal and forage production, *Biol. Wastes* **27**: 29-42.

- Sundby, B., Anderson, L.G., Hall, P.O.J., Iverfelt, A., Loeff, M.M.R.V.D., and Westerlund, S.F.G., 1986. The effect of oxygen on release and uptake of cobalt, manganese, iron and phosphate at the sediment-water interface, *Geochim. Cosmochim. Acta* **50**: 1281-1288.
- Surface, M.J., Peverly, J.H., Steenhuis, T.S., and Sanford, W.E., 1993. Effect of season, substrate composition, and plant growth on landfill leachate treatment in a constructed wetland, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., Lewis Publishers, Boca Raton, Florida, pp. 461-472.
- Sutton, D.L., and Ornes, W.H., 1975. Phosphorus removal from static sewage effluent using duckweed, *J. Environ. Qual.* **4**: 367-370.
- Suzuki, T., Ariyawathie Nissanka, W.G., and Kurihara, Y. (1989). Amplification of total dry matter, nitrogen and phosphorus removal from stands of *Phragmites australis* by harvesting and reharvesting regenerated shoots, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer (ed.), Lewis Publishers, Chelsea, Michigan, pp. 530-535.
- Swett, D., 1979. A water hyacinth advanced wastewater treatment system, in: *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*, R.K. Bastian and S.C. Reed, eds., EPA 430/9-80-006, U.S. EPA, Washington, D.C., pp. 227-255.
- Swift, J., and Landsdown, R.V., 1994. Design of a vegetative system for motorway run-off treatment: constraints and design criteria, in: *Proc 4<sup>th</sup> Internat. Conf. Constructed Wetland Systems for Water Pollution Control*, ICWS, Guangzhou, P.R.China, pp. 697-703.
- Swift, M.J., Heal, D.W., and Anderson, J.M., 1979. *Decomposition in Terrestrial Environments*, Blackwell Scientific Publications, Oxford, U.K.
- Swisher, R.D., 1987. *Surfactant Biodegradation*, 2<sup>nd</sup> Edition, Marcell Dekker, Inc., New York.
- Syers, J.K., Harris, R.F., and Armstrong, D.E., 1973. Phosphate chemistry in lake sediments, *J. Environ. Qual.* **2**: 1-14.
- Szczepańska, W., 1976. Development of the underground parts of *Phragmites communis* Trin. and *Typha latifolia* L., *Pol. Arch. Hydrobiol.* **23**: 227-232.
- Szczepański, A.J., 1977. Allelopathy as a means of biological control of water weeds, *Aquat. Bot.* **3**: 193-197.
- Szilagyi, F., Somlyody, L., and Kónocsos, L. 1990. Operation of the Kis-Balaton reservoir: evaluation of nutrient removal rates, *Hydrobiologia* **19**: 297-305.
- Tal, Y., Watts, J.E.M., Schreier, H.J., 2005. Anaerobic ammonia-oxidizing bacteria and related activity in Baltimore Inner Harbor sediment, *Appl. Environ. Microbiol.* **71**: 1816-1821.
- Tan, K., Jackson, W.A., Anderson, T.A., and Pardue, J.H., 2004. Fate of perchlorate-contaminated water in upflow wetlands, *Water Research* **38**: 4173-4185.
- Tan, Y., Bond, W.J., and Griffen, D.M., 1992. Transport of bacteria during unsteady unsaturated soil water flow, *Soil Sci. Soc. Am. J.* **56**: 1331-1340.
- Tang, Z.C., and Kozlowski, T.T., 1982. Some physiological and morphological responses of *Quercus macrocarpa* seedlings to flooding, *Can. J. For. Res.* **12**: 196-202.
- Tanner, C.C., 1992. Treatment of dairy farm wastewaters in horizontal and up-flow gravel-bed constructed wetlands, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 21.1 – 21.9.
- Tanner, C.C., 1994. Treatment of agricultural wastewaters and growth of *Schoenoplectus validus* in constructed wetlands. Ph.D. Thesis, University of Waikato, Hamilton, New Zealand.
- Tanner, C.C., 1996. Plants for constructed wetland treatment systems – A comparison of the growth and nutrient uptake of eight emergent species, *Ecol. Eng.* **7**: 59-83.
- Tanner, C.C., 2001. Growth and nutrient dynamics of soft-stem bulrush in constructed wetlands treating nutrient-rich wastewater, *Wetlands Ecol. Manage.* **9**: 49-73.

- Tanner, C.C., and Sukias, J.P.S., 1995. Accumulation of organic solids in gravel-bed constructed wetland, *Wat. Sci. Tech.* **32**(3): 229-239.
- Tanner, C.C. and Kadlec, R.H., 2003. Oxygen flux implications of observed nitrogen removal rates in subsurface-flow treatment wetlands, *Wat. Sci. Tech.* **48**(5): 191-198.
- Tanner, C.C., Clayton, J.S., and Upsdell, M.P., 1995a: Effect of loading rate and planting on treatment of dairy farm wastewaters – I. Removal of oxygen demand, suspended solids and faecal coliforms, *Water Research* **29**: 17-26.
- Tanner, C.C., Clayton, J.S., and Upsdell, M.P., 1995b. Effect of loading rate and planting on treatment of dairy farm wastewaters – II. Removal of nitrogen and phosphorus, *Wat. Res.* **29**: 27-34.
- Tanner, C.C., Sukias, J.P.S., and Upsdell, M.P., 1998a. Relationship between loading rates and pollutant removal during maturation of gravel-bed constructed wetlands, *J. Environ. Qual.* **27**: 448-458.
- Tanner, C.C., Sukias, J.P.S., and Upsdell, M.P., 1998b. Organic matter accumulation during maturation of gravel-bed constructed wetlands treating farm dairy wastewaters, *Wat. Res.* **32**: 3046-3054.
- Tanner, C.C., Sukias, J.P.S., and Upsdell, M.P., 1999. Substratum phosphorus accumulation during maturation of gravel-bed constructed wetland, *Wat. Sci. Tech.* **40**(3): 147-154.
- Tanner, C.C., Sukias, J.P.S., and Dall, C., 2000. Constructed wetlands in New Zealand – evaluation of an emerging “natural” wastewater treatment technology, in: *Proc. Conf. Water 2000: Guarding the Global Resource*, NZWWA, Auckland, New Zealand, pp. 1-11.
- Tanner, C.C., Long Nguyen, M., and Sukias, J.P.S., 2003. Using constructed wetlands to treat subsurface drainage from intensively grazed dairy pastures in New Zealand, *Wat. Sci. Tech.* **48** (5): 207-203.
- Tanner, C.C., Nguyen, M.L., and Sukias, J.P.S., 2005a. Constructed wetland attenuation of nitrogen exported in subsurface drainage from irrigated and rain-fed dairy pasture, *Wat. Sci. Tech.* **51**(9): 55-61.
- Tanner, C.C., Nguyen, M.L., and Sukias, J.P.S., 2005b. Nutrient removal by a constructed wetland treating subsurface drainage from a grazed dairy pasture, *Agric. Ecosyst. Environ.* **105**: 145-162.
- Tao, W., and Hall, K.J., 2004. Dynamics and influencing factors of heterotrophic bacterial utilization of acetate in constructed wetlands treating woodwaste leachate, *Wat. Res.* **38**: 3442-3448.
- Tarutis, W.J., Jr., and Unz, R.F., 1995. Iron and manganese release in coal mine drainage wetland microcosms, *Wat. Sci. Tech.* **32**(3): 187-192.
- Tarutis, W.J., Jr., Stark, L.R., and Williams, F.M., 1999. Sizing and performance estimation of coal mine drainage wetlands, *Ecol. Eng.* **12**: 353-373.
- Tarver, D.P., Rodgers, J.A., Mahler, M.J., and Lazor R.L., 1988. *Aquatic and Wetland Plants of Florida*, 4<sup>th</sup> edition, Bureau of Aquatic Plant Management, Florida Dept. of Nat. Resour., Tallahassee, Florida.
- Tasaki, M., Kamagata, Y., Nakamura, K., and Mikami, F., 1992. Propionate formation from alcohols or aldehydes by *Desulfobulbus propionicus* in the absence of sulfate, *J. Ferment. Bioeng.* **73**: 329-331.
- Tate, K.R., 1984. The biological transformations of P in soil, *Plant Soil* **76**: 245-256.
- Tatsuyama, K., Egawa, H., Yamamoto, H., and Nahamura, M., 1977. Sorption of heavy metals by the water hyacinth from the metal solutions. Some experimental conditions influencing the sorption, *Weed Res. Japan* **22**: 151-156.
- Taylor, K.R., and Crowder, A.A., 1983. Use of the DCB technique for extraction of hydrous iron oxides from roots of wetland plants, *Amer. J. Bot.* **70**: 1254-1257.
- Taylor, G.J., Crowder, A.A., and Rodden, R., 1984. Formation and morphology of an iron plaque on the roots of *Typha latifolia* L. grown in solution culture, *Am. J. Bot.* **71**: 666-675.

- Taylor, R.W., and Ellis, B.G., 1978. A mechanism of phosphate adsorption on soil and anion exchange resin surfaces, *Soil Sci. Soc. Am. J.* **42**: 432-436.
- Tchobanoglous, C., 1987. Aquatic plant systems for wastewater treatment: engineering considerations, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 27-48.
- Tchobanoglous, C., 2003. Preliminary treatment in constructed wetlands, in: *Proc. Internat. Conf. The Use of Aquatic Macrophytes for Wastewater Treatment in Constructed Wetlands*, V. Dias and J. Vymazal, eds., Instituto da Conservação da Natureza and Instituto Nacional da Água, Lisbon, Portugal, pp. 13-33.
- Teal, J.M., and Kanwisher, J.W., 1966. Gas transport in the marsh grass *Spartina alterniflora*, *J. Exp. Bot.* **17**: 355-361.
- Teal, J.M., Valiela, I., and Berlo, D., 1979. Nitrogen fixation by rhizosphere and free-living bacteria in salt marsh sediments, *Limnol. Oceanogr.* **24**: 126-132.
- Tebo, B.M., and Obratsova, A.Y., 1998. Sulfate-reducing bacterium grows with Cr(VI), U(VI), Mn(IV), and Fe(III) as electron acceptors, *FEMS Microbiol. Lett.* **162**: 193-198.
- Terzic, S., Hrsak, D., and Ahel, M., 1992. Primary biodegradation kinetics of linear alkylbenzene sulphonates in estuarine waters, *Wat. Res.* **26**: 585-591.
- Tettleton, R.P., Howell, F.G., and Reaves, R.P., 1993. Performance of a constructed marsh in the tertiary treatment of bleach kraft pulp mill effluent: results of a 2-year pilot project, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 437-440.
- Thamdrup, B., 2000. Bacterial manganese and iron reduction in aquatic sediments, *Adv. Microb. Ecol.* **16**: 41-84.
- Thamdrup, B., and Dalsgaard, T., 2002. Production of N<sub>2</sub> through anaerobic ammonium oxidation coupled to nitrate reduction in marine sediments, *Appl. Environ. Microbiol.* **68**: 1312-1318.
- Thauer, R.K., Jungermann, K., and Decker, K., 1977. Energy conservation in chemotrophic anaerobic bacteria, *Bacteriol. Rev.* **41**: 100-180.
- Thesiger, W., 1964. *The Marsh Arabs*, Longmans, London.
- Third, K.A., Paxman, J., Schmid, M., Strous, M., Jetten, M.S.M., and Cord-Ruwisch, R., 2005. Enrichment of Anammox from activated sludge and its application in the CANON process, *Microbial Ecology* **49**: 236-244.
- Thomas, G.W., and Philips, R.E., 1979. Consequences of water movement in macropores, *J. Environ. Qual.* **8**: 49-52.
- Thomas, P.R., Glover, P., and Kalaroopan, T., 1994. An evaluation of pollutant removal from secondary treated sewage effluent using a constructed wetland system, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 421-427.
- Thomas, R., Freeman, C., Rehman, N., and Fox, K., 2003. Removal of linear alkylbenzene sulphonate (LAS) in constructed wetlands, in: *Wetlands-Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 35-47.
- Thomas, R.E., Schwartz, W.A., and Bendixen, T.W., 1966. Soil chemical changes and infiltration rate reduction under sewage spreading, *Soil Sci. Soc. Am. Proc.* **30**: 641-646.
- Thompson, K., Sherwy, P.R., and Woolhouse, H.W., 1979. Papyrus swamp development in the Uganda Basin, Zaire: Studies on population structure in *Cyperus papyrus* stands, *Bot. J. Linn. Soc.* **78**: 299-316.
- Thorén, A.K., Legrand, C., and Hermann, J., 2003. Transport and transformation of de-icing urea from airport runways in a constructed wetland system, *Wat. Sci. Tech.* **48**(5): 283-290.
- Thurman, D.A., and Rankin, J.L., 1982. The role of organic acids in zinc tolerance in *Deschampsia caespitosa*, *New Phytol.* **91**: 629-635.

- Thurston, J.A., Gerba, C.P., Foster, K.E., and Karpiscak, M.M., 2001. Fate of indicator microorganisms, *Girardia* and *Cryptosporidium* in subsurface flow constructed wetlands, *Water Res.* **35**: 1547-1551.
- Thut, R.N., 1989. Utilization of artificial marshes for treatment of pulp mill effluents, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 239-244.
- Thut, R.N., 1990a. Utilization of artificial marshes for treatment of pulp mill effluents, *Tappi J.* **73**: 93-96.
- Thut, R.N., 1990b. Treatment of pulp mill effluent by an artificial marsh-large-scale pilot study, in: *Proc. TAPPI Environmental Conference*, TAPPI, Washington, DC, pp. 121-126.
- Thut, R.N. 1993. Feasibility of treating pulp mill effluent with a constructed wetland, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., Lewis Publishers, Boca Raton, Florida, pp. 441-447.
- Tiedje, J.M., 1988. Ecology of denitrification and dissimilatory nitrate reduction to ammonium, in: *Biology of Anaerobic Microorganisms*, A.J.B. Zehnder, ed., Wiley, New York, pp. 179-244.
- Tiedje, J.M., Sextone, A.J., Myrold, D.D., and Robinson, J.A. 1982. Denitrification: ecological niches, competition and survival, *Antonie van Leeuwenhoek* **48**: 569-583.
- Tiller, K.G., Gerth, J., and Brummer, G., 1984. The relative affinities of Cd, Ni, and Zn for different soil clay fractions and goethite, *Geoderma* **34**: 17-35.
- Tilley, D.R., and Brown, M.T., 1998. Wetland network for stormwater management in subtropical urban watersheds, *Ecol. Eng.* **10**: 131-158.
- Tilley, D.R., Badrinarayanan, H., Rosati, R., and Son, J., 2002. Constructed wetlands as recirculation filters in large-scale shrimp aquaculture, *Aquacultural Eng.* **26**: 81-109.
- Timmer, C.E., and Weldon, L.W., 1967. Evapotranspiration and pollution by water hyacinth, *Hyacinth Control J.* **6**: 34-37.
- Tiner, R.W., 1999. *Wetland Indicators. A Guide to Wetland Identification, Delineation, Classification, and Mapping*, Lewis Publishers/CRC Press, Boca Raton, Florida.
- Tischler, G., Robra, K.H., and Nekrep, K., 1985. Beurteilung für hydrobotanische Kläranlagen. Kurzbericht. Institut für Umweltforschung in der Forschungsgesellschaft Joanneum, Graz, Austria.
- Tobe, J.D., Burks, K.C., Cantrell, R.W., Garland, M.A., Sweeley, M.E., Hall, D.W., Wallace, P., Anglin, G., Nelson, G., Cooper, J.R., Bickner, D., Gilbert, K., Aymond, N., Greenwood, K., and Raymond, N., 1998. *Florida Wetland Plants. An Identification Manual*, Florida department of Environmental Protection, Tallahassee, Florida.
- Tobias, C.R., Anderson, I.C., Canuel, E.A., and Macko, S.A., 2001. Nitrogen cycling through a fringing marsh-aquifer cotone, *Mar. Ecol. Prog. Ser.* **210**: 25-39.
- Toet, S., Van Logtestijn, R.S.P., Schreier, M., Kampf, R., and Verhoeven, J.T.A., 2005. The functioning of a wetland system used for polishing effluent from a sewage treatment plant, *Ecol. Eng.* **25**: 101-124.
- Toetz, D.W., 1973. The kinetics of NH<sub>4</sub> uptake by *Ceratophyllum*, *Hydrobiologia* **41**: 275-290.
- Toetz, D.W., 1974. Uptake and translocation of ammonia by freshwater hydrophytes, *Ecology* **55**: 199-201.
- Toivonen, H., and Lappalainen, T., 1980. Ecology and production of aquatic macrophytes in the oligotrophic, mesohumic lake Suomnjärvi, eastern Finland, *Acta Bot. Fenn.* **17**: 69-85.
- Tonderski, K.S., Grönlund, E., and Billgren, C., 2005. Management of sugar effluent in The Lake Victoria region, in: *Proc. Workshop Wastewater treatment in Wetlands. Theoretical and Practical Aspects*, I. Toczyłowska and G. Guzowska, eds., Gdańsk University of Technology Printing Office, Gdansk, Poland, pp. 177-184.
- Topa, M.A., and McLeod, K.W., 1988. Promotion of aerenchyma formation in *Pinus serotina* seedlings by ethylene, *Can. J. For. Res.* **18**: 276-280.

- Tornbjerg, T., Bendix, M., and Brix, H., 1994. Internal gas transport in *Typha latifolia* L. and *Typha angustifolia* L. 1. Convective throughflow pathways and ecological significance, *Aquat. Bot.* **49**: 91-105.
- Toth, L., 1972. Reeds control eutrophication of Balaton Lake, *Wat. Res.* **6**: 1533-1539.
- Tourbier, J., and R.W. Pierson, eds., 1976. *Biological Control of Water Pollution*, University of Pennsylvania Press, Philadelphia.
- TransForm, 2006. <http://www.rootzone.dk>
- Trevors, J.T., 1986. Mercury methylation by bacteria, *J. Basic Microbiol.* **26**: 499-504.
- Trimmer, M., Nicholls, J.C., and Deflandre, B., 2003. Anaerobic ammonium oxidation measured in sediments along the Thames estuary, United Kingdom, *Appl. Environ. Microbiol.* **69**: 6447-6454.
- Trimmer, M., Nicholls, J.C., Morley, N., Davies, C.A., and Aldridge, J., 2005. Biphasic behavior of anammox regulated by nitrite and nitrate in an estuarine sediment, *Appl. Environ. Microbiol.* **71**: 1923-1930.
- Trivedy, R.K., Goel, P.K., Gudekar, V.R., and Kirpekar, M.G., 1983. Treatment of tannery and dairy wastes using water hyacinth, *Indian J. Environ. Protection* **3**: 106-111.
- Trivedy, R.K., and Khomane, B.V., 1985. Water hyacinth for removal of nutrients from wastewater, *Comp. Physiol. Ecol.* **10**: 123-128.
- Troccoli, A., Codianni, P., Ronga, G., Gallo, A., and di Ponzo, N., 1997. Agronomical performance among farro species and durum wheat in a drought-flat land environment of southern Italy, *J. Agron. Crop Sci.* **178**: 211-217.
- Truax, R., Culley, D., Griffith, M., Johnson, W., and Wood, J. 1972. Duckweed for chick feed? *Louisiana Agriculture* **16**: 8-9.
- Trudinger, P.A., 1979. The biological sulfur cycle, in: *Biogeochemical Cycling of Mineral-Forming Elements*, P.A. Trudinger and D.J. Swaine, eds., Studies in Environmental Science 3, Elsevier, Amsterdam, pp. 293-313.
- Tsihrintzis, V.A., Karamouzis, D., Akrotos, C., and Angelakis, A.N., 2004. Comparison of a free-water surface and vertical subsurface flow constructed wetland system, in: *Wetland Systems and Waste Stabilization Ponds Communications of Common Interest*, ASTEE. Lyon, France, pp. 199-206.
- Tsuchiya, T., Nohara, S., and Iwakuma, T., 1990. Net primary production of *Nymphoides peltata* (Gmel.) O. Kuntze growing on sandy sediment in Edosaki-iri Bay in Lake Kasumigaura, Japan, *Jpn. J. Limnol.* **51**: 307-312.
- Tsukahara, H., and Kozlowski, T.T., 1985. Importance of adventitious roots to the growth of flooded *Platanus occidentalis* seedlings, *Plant Soil* **88**: 123-132.
- Tua, T.V., Duc, P.V., Anh, B.K., Thuy, L.T., Anh, D.T., and Kim, D.D. 2006. The use of constructed wetland system for treatment of fish processing wastewater in Vietnamese conditions, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR Lisbon, pp. 69-77.
- Tucker, G.C., 1990. The genera of Arundinoideae (Gramineae) in the southeastern United States, *J. Arnold Arbor.* **71**: 145-163.
- Tunçsiper, B., Ayaz, S.Ç., and Akça, L., 2006. An assessment of water pollution control in drinking water catchments by a pilot-scale constructed wetland system, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR Lisbon, pp. 1893-1900.
- Turner, F.T., and Patrick, W.H., Jr., 1968. Chemical changes in waterlogged soils as a result of oxygen depletion, *Trans. 9<sup>th</sup> Internat. Congress Soil Sci.* **4**: 53-56.
- Turner, S.M., and Liss, P.S., 1985. Measurements of various sulfur gases in a coastal marine environment, *J. Atmosph. Chem.* **2**: 223-232.
- Turon, C., 2006. EDSS – maintenance prototype. An environmental decision support system to assess the definition of operation and maintenance protocols for horizontal subsurface constructed wetlands. Dissertation, Universitat de Girona, Spain.



- Tuszyńska, A., and Obarska-Pempkowiak, H., 2006. Impact of organic matter quality on effectiveness of contaminants removal in hybrid constructed wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR Lisbon, Portugal, pp. 721-728.
- Tusneem, M.E., and Patrick, W.H., Jr., 1971. Nitrogen transformations in waterlogged soil. Louisiana State University Agricultural Experimental Station, Baton Rouge, Louisiana, Bulletin No. 657.
- Twilley, R.R., Brinson, M.M., and Davis, G.J., 1977. Phosphorus absorption, translocation, and secretion in *Nuphar luteum*, *Limnol. Oceanogr.* **22**: 1022-1032.
- Twilley, R.R., Blanton, L.R., Brinson, M.M., and Davis, G.J., 1985a. Biomass production and nutrient cycling in aquatic macrophyte communities of the Chowan River, North Carolina, *Aquat. Bot.* **22**: 231-252.
- Twilley, R.R., Kemp, W.M., Staver, K.W., Stevenson, J.C., and Boynton, W.R., 1985b. Nutrient enrichment of estuarine submersed vascular plant communities. 1. Algal growth and effects on production of plants and associated communities, *Mar. Ecol. Prog. Ser.* **23**: 179-191.
- Tyler, S.E., Jobling, S., and Sumpter, J.P., 1998. Endocrine disruption in wildlife: a critical review of the evidence, *Crit. Rev. Toxicol.* **28**: 319-343.
- Tylova-Munzarova, E., Lorenzen, B., Brix, H., and Votrubova, O., 2005. The effects of  $\text{NH}_4^+$  and  $\text{NO}_3^-$  on growth, resource allocation and nitrogen uptake kinetics of *Phragmites australis* and *Glyceria maxima*, *Aquat. Bot.* **81**: 326-342.
- Ultsch, G.R., and Anthony, D.S., 1973. The role of aquatic exchange of carbon dioxide in the ecology of the water hyacinth (*Eichhornia crassipes*), *Florida Sci.* **36**: 16-22.
- Updegraff, D.M., 1983. Plugging and penetration of reservoir rock by microorganisms, in: *Proc. Internat. Conf. Microbial Enhancement of Oil Recovery*, E.C. Donaldson and J.B. Clark, eds., US Department of Energy, Bartlesville Energy Technology Center, Bartlesville, Oklahoma, pp. 80-85.
- Upton, J., and Griffin, P., 1990. Reed bed treatment for sewer dykes, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 391-398.
- Urbanc-Berčič, O., 1992. Reed bed system for leachate water treatment, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, IAWQ and Australian Water and Wastewater Association, Sydney, NSW, Australia, pp. 64.1. – 64.7.
- Urbanc-Berčič, O., 1997. Constructed wetlands for the treatment of landfill leachates: the Slovenian Experience, *Wetlands Ecol. Manage.* **4**: 189-197.
- Urbanc-Berčič, O., and Gaberščik, A., 1989. The influence of temperature and light intensity on activity of water hyacinth (*Eichhornia crassipes* (Mart.) Solms.), *Aquat. Bot.* **35**: 403-408.
- Urbanc-Berčič, O., and Bulc, T., 1994. Integrated constructed wetland for small communities, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 138-146.
- Urbanc-Berčič, O., Bulc, T., and Vrhovšek, D., 1998. Slovenia, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 241-250.
- Uren, N.C., 1984. Forms, reactions and availability of iron in soils, *J. Plant Nutr.* **7**: 165-176.
- U.S. EPA, 1988. Design manual: Constructed wetlands and aquatic plant systems for municipal wastewater treatment. EPA 625/1-88/022, U.S. Environmental Protection Agency Office of Water, Cincinnati, Ohio.
- U.S. EPA, 1993. Constructed wetlands for wastewater treatment and wildlife habitat. 17 Case studies, EPA 832-R-93-005.
- U.S. EPA, 1996. Evaluation of alternative wastewater treatment technologies. An interim process evaluation of the AEES "Living Machine", Frederick County, MD, Report no. 832-B-96-002.

- U.S. EPA, 2000. Constructed wetlands treatment of municipal wastewater. Manual. EPA 625/R-99/010, U.S. Environmental Protection Agency, Cincinnati, Ohio.
- Vacca, G., Wand, H., Nikolausz, M., Kusch, P., and Kästner, M., 2005. Effect of plants and filter materials on bacteria removal in pilot-scale constructed wetlands, *Water Res.* **39**: 1361-1373.
- Vaidyanathan, S., Kavadia, K.M., Rao, M.G., and Basu, S., 1983. Removal of phenol using water hyacinth in a continuous unit, *Internat. J. Environ. Studies* **21**: 183-191.
- Valderrama, L.T., and Ahumada, J.A. 2006. Calibration of model for the harvesting of duckweed in wastewater treatment system, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR Lisbon, Portugal, pp. 1583-1590.
- Valiela, I., 1984. *Marine Ecological Processes*, Springer-Verlag, New York.
- Valoras, N., and Letey, J., 1966. Soil oxygen and water relationships to rice growth, *Soil Sci.* **101**: 210-215.
- Van Breemen, N., 1982. Genesis, morphology and classification of acid sulfate soils in coastal plains, in: *Acid Sulfate Weathering*, J.A. Kittrick, D.S. Fanning, and L.R. Hossner, eds., Spec. Publ. 10, Soil Science Society of America, Madison, Wisconsin, pp. 95-108.
- Van Bruggen, J.J.A., Okia, O.T., and Kansime, F. 1994. Wastewater purification by the tropical macrophyte *Cyperus papyrus* in a segmented channel in the greenhouse, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, China, pp. 121-128.
- Van Cleemput, O., and Patrick, W.H., Jr., 1974. Nitrate and nitrite reduction in flooded gamma-irradiated soil under controlled pH and redox potential conditions, *Soil Biol. Biochem.* **6**: 85-88.
- Van Cleemput, O., Patrick, W.H., Jr., and McIlhenny, R.C., 1975. Formation of chemical and biological denitrification and products in flooded soil at controlled pH and redox potential, *Soil Biol. Biochem.* **7**: 329-332.
- Van de Graaf, A.A., Mulder, A., Slijkhuis, H., Robertson, L.A., and Kuenen, J.G., 1990. Anoxic ammonium oxidation, in: *Proc. 5<sup>th</sup> European Congress on Biotechnology*, Vol. 1, Christiansen, C., Munck, L., and Villandsen, J., eds., Munksgaard, Copenhagen, Denmark, pp. 338-391.
- Van de Graaf, A.A., Mulder, A., de Bruijn, P., Jetten, M.S.M., Robertson, L.A., and Kuenen, J.G., 1995. Anaerobic oxidation of ammonium is a biologically mediated process, *Appl. Environ. Microbiol.* **61**: 1246-1251.
- Van de Graaf, A.A., de Bruijn, P., Robertson, L.A., Jetten, M.S.M., and Kuenen, J.G., 1996. Autotrophic growth of anaerobic, ammonium-oxidising micro-organisms in a fluidized bed reactor, *Microbiology* **142**: 2187-2196.
- Van de Graaf, A.A., de Bruijn, P., Robertson, L.A., Jetten, M.S.M., and Kuenen, J.G., 1997. Metabolic pathway of anaerobic ammonium oxidation in the basis of <sup>15</sup>N studies in a fluidized bed reactor, *Microbiology* **143**: 2415-2421.
- Van de Moortel, A.M.K., Six, H., Lesage, E., Vanacker, J., Tack, F.M.G., and De Pauw, N., 2006. Mobility of nutrients and heavy metals in the sediment of a retention basin for combined sewer overflow, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 1565-1572.
- Van der Maarel, M., Jansen, M., Haanstra, R., Meijer, W.G., and Hansen, T.A., 1996. Demethylation of dimethylsulfoniopropionate to 3-S-methylmercaptopropionate by marine sulfate-reducing bacteria, *Appl. Environ. Microbiol.* **62**: 3978-3984.
- Van der Sman, A.J.M., Van Tongeren, O.F.R., and Blom, C.W.P.M., 1988. Growth and reproduction of *Rumex maritimus* and *Chenopodium rubrum* under different waterlogging regimes, *Acta Bot. Neerl.* **37**: 439-450.
- Van der Valk, A.G., and Bliss, L.C., 1971. Hydrarch succession and net primary production of oxbow lakes in central Alberta, *Can. J. Bot.* **49**: 1177-1199.

- Van der Valk, A.G., and Davis, C.B., 1978. Primary production of prairie glacial marshes, In: *Freshwater Wetlands: Ecological Processes and Management Potential*, R.E. Good, D.F. Whigham and R.L. Simpson, eds., Academic Press, New York, New York, pp. 21-37.
- Vadevenne, L., 1995. An operational survey of a natural lagoon treatment plant combining macrophytes and microphytes basins, *Wat. Sci. Tech.* **32**(3): 79-86.
- Van Oostrom, A. J., 1995. Nitrogen removal in constructed wetlands treating nitrified meat processing effluent, *Wat. Sci. Tech.* **32**(3): 137-148.
- Van Oostrom, A. J., and Cooper, R. N., 1990. Meat processing effluent treatment in surface-flow and gravel-bed constructed wastewater wetlands, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper, and B.C. Findlater, eds., Pergamon Press, Oxford, U.K. pp 321-332.
- Van Oostrom, A.J., and Russell, J.M., 1992. Denitrification in constructed wastewater wetlands receiving high concentrations of nitrate, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of New South Wales, Sydney, Australia. pp. 2.1-2.8.
- Van Raalte, M.H., 1940. On the oxygen supply of rice roots, *Ann. Jard. Bot. Buitenzorg.* **50**: 99-113.
- Van der Toorn, J., and Mook, J.H., 1982. Influence of environmental factors and management on stands of *Phragmites australis*. I. Effect of burning, frost and insect damage on shoot density and shoot size, *J. Appl. Ecol.* **19**: 477-499.
- Van Veen, W.L., Mulder, E.G., and Deinema, M.H., 1978. The *Sphaerotilus-Leptothrix* group of bacteria, *Microbiol. Rev.* **42**: 329-356.
- Van Wijk, R.J., 1988: Ecological studies on *Potamogeton pectinatus* L. I. General characteristics, biomass production and life cycles under field conditions, *Aquat. Bot.* **31**: 211-223.
- Vargas, M., Kashefi, K., Blunt-Harris, E.L., and Lovley, D.R., 1998. Microbiological evidence for Fe(III) reduction on early Earth, *Nature* **395**: 65-67.
- Vartapetian, B.B., 1978. Life without oxygen, in: *Plant Life in Anaerobic Environments*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci Publ., Ann Arbor, Michigan, pp. 1-11.
- Vartapetian, B.B., Andreeva, I.N., and Nuritdinov, N., 1978. Plant cells under oxygen stress, in: *Plant Life in Anaerobic Environments*, D.D. Hook and R.M.M. Crawford, eds., Ann Arbor Sci. Publ., Ann Arbor, Michigan, pp. 13-88.
- Véber, K., 1978. Propagation, cultivation and exploitation of Common Reed in Czechoslovakia, in: *Pond Littoral Ecosystems. Structure and Functioning*, D. Dykyjová and J. Květ, eds., Springer Verlag, Berlin, pp. 416-425.
- Véber, K., and Zahradník, J., 1986. *Tertiary Treatment by Means of Autotrophic Microorganisms and Macrophytes*, Academia Praha, Czech Republic (in Czech).
- Veenstra, S., 1998. The Netherlands. in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, B. Green and Haberl, R. (eds.), Backhuys Publishers, Leiden, The Netherlands, pp. 289-314.
- Vega, E., Lesikar, B., and Pillai, S.D., 2003. Transport and survival of bacteria and viral tracers through submerged-flow constructed wetland and sand-filter system, *Bioresour. Technol.* **89**: 49-56.
- Velayos, G., Turon, C., Comas, J., and Poch, M., 2006. Experience with constructed wetlands in Catalonia – state of the art, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 37-45.
- Vera, L., Gutiérrez, J., Martel, G., Márquez, M., Salas, J.J., and Sardón, N., 2006. Depurant project: monitoring of constructed wetlands in Canary Islands and Andalusia (Spain), in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1315-1322.
- Verhoeven, J.T.A., 1986. Nutrient dynamics in minerotrophic peat mires, *Aquat. Bot.* **25**: 117-137.

- Verhoeven, J.T.A., Koerselman, W., and Meuleman, A.F.M., 1996. Nitrogen- or phosphorus-limited growth in herbaceous, wet vegetation: relations with atmospheric inputs and management regimes, *Trend Ecol. Evol.* **11**: 495-497.
- Verhoeven, W., 1952. Aerobic spore-forming nitrate-reducing bacteria, Ph.D. Thesis, University of Delft, Delft, The Netherlands.
- Verhoeven, W., 1956. Studies on true dissimilatory nitrate reduction V. Nitric oxide production and consumption by microorganisms, *Antonie van Leeuwenhoek* **22**: 385-406.
- Verlicchi, P., De Agostini, S., and Masotti, L., 2004. High efficiency disinfection treatment for reuse by a combination of conventional and natural systems: an experimental investigations, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 451-458.
- Verloo, M., and Cottenie, A., 1972. Stability and behavior of complexes of Cu, Fe, Mn, and Pb with humic substances in soil, *Pedologie* **22**: 174-184.
- Vermaak, J.F., Swanepoel, J.H., and Schoonbee, H.J., 1982. The phosphorus cycle in Germiston Lake. III. Seasonal patterns in the absorption, translocation and release of phosphorus by *Potamogeton pectinatus* L., *Water SA* **8**: 138-141.
- Verstraete, W., 1975. Heterotrophic nitrification in soils and aqueous media, *Izvestija Akad. Nauk SSSR Ser. Biol.* **4**: 541-558.
- Verstraete, W., and Philips, S., 1998. Nitrification-denitrification processes and technologies in new contexts, *Environ. Poll.* **102**, **S1**: 717-726.
- Vigneault, B., Campbell, G.C., Tessier, A., and De Vitre, R., 2000. Geochemical changes in sulfidic mine tailings stored under a shallow water cover, *Water Res.* **35**: 1066-1076.
- Vincent, G., 1992. Use of artificial wetlands for the treatment of recreational wastewater, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of New South Wales, Sydney, Australia, pp. 28.1-28.4.
- Vincent, G., Dallaire, S., and Lauzer, D., 1994. Antimicrobial properties of roots exudate of three macrophytes: *Mentha aquatica* L., *Phragmites australis* (Cav.) Trin. and *Scirpus lacustris* L., in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, ICWS '94 Secretariat, pp. 290-296.
- Vigneault, B., Campbell, G.C., Tessier, A., De Vitre, R., 2001. Geochemical changes in sulfidic mine tailings stored under a shallow water cover, *Wat. Res.* **35**: 1066-1076.
- Visscher, P.T., Gritzer, R.F., and Leadbetter, E.R., 1999. Low-molecular-weight sulfonates, a major substrate for sulfate reducers in marine microbial mats, *Appl. Environ. Microbiol.* **65**: 3272-3278.
- VMM, 2002. Krachtlijnen voor een geïntegreerd rioleringsbeleid in Vlaanderen. Vlaamse Milieumaatschappij.
- VMM, 2006. Database with results of the wastewater monitoring network (<http://www.vmm.be>).
- Voeselek, L.A.C.J., Banga, M., Rijnders, J.G.H.M., Wisser, E.J.W., and Blom, C.W.P.M., 1996. Hormone sensitivity and plant adaptations to flooding, *Folia Geobot. Phytotax.* **31**: 47-56.
- Vögeli-Lange, R., and Wagner, G.J., 1990. Subcellular localization of cadmium and cadmium-binding peptides in tobacco leaves. Implication of a transport function for cadmium-binding peptides, *Plant Physiol.* **92**: 1086-1093.
- Vogt, C., Alfreider, A., Lorbeer, H., Ahlheim, J., Feist, B., Boehme, O., Weiss, H., Babel, W., and Wuensche, L., 2002. Two pilot plant reactors designed for the *in situ* bioremediation of chlorobenzene-contaminated ground water: Hydrogeological and chemical characteristics and bacterial consortia, *Water Air Soil Pollut.* **2**: 161-170.
- Vohla, C., Pöldvere, E., Noorvee, A., Kuusemets, V., and Mander, Ü., 2005a. Alternative filter media for phosphorous removal in a horizontal subsurface flow constructed wetland, *J. Environ. Sci. Health A* **40**: 1251-1264.

- Vohla, C., Alas, R., Nurk, K., and Mander, Ü., 2005b. Phosphorus retention capacity in a horizontal subsurface flow constructed wetland, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 196-197.
- Vonwiren, N., Mori, S., Marschner, H., and Römheld, V., 1994. Iron inefficiency in maize *ys1* (*Zea mays* L. cv Yellow-Strip) is caused by a defect in uptake of iron phytosiderophores, *Plant Physiol.* 106: 71-77.
- Vonwiren, N., Marshner, H., and Römheld, V., 1995. Uptake kinetics of iron-phytosiderophores in two maize genotypes differing in iron efficiency, *Physiol. Plant.* 93: 611-616.
- Vonwiren, N., Marshner, H., and Römheld, V., 1996. Roots of iron-efficient maize also absorb phytosiderophore-chelated zinc, *Plant Physiol.* 111: 1119-1125.
- Vonwiren, N., Mori, S., Marshner, H., and Römheld, V., 1994. Iron inefficiency in maize *ys 1* (*Zea mays* L. cv Yellow-Strip) is caused by a defect uptake of iron phytosiderophores, *Plant Physiol.* 106: 71-77.
- Vose, P.B., 1959. The agronomic potentialities and problems of the canarygrass *Phalaris arundinacea* L. and *Phalaris tuberosa* L., *Herb. Abstracts* 29: 77-83.
- Vose, P.B., 1962. Delayed germination in reed canary-grass *Phalaris arundinacea* L., *Ann. Botany* 26: 197-206.
- Vose, P.B., 1982. Iron nutrition in plants: a world overview, *J. Plant Nutr.* 5: 233-249.
- Vrhovšek, D., Kukanja, V., and Bulc, T., 1996. Constructed wetland (CW) for industrial waste water treatment, *Wat. Res.* 30: 2287-2292.
- Vuillot, M., and Boutin, C., 1987. Les systèmes rustiques d'épuration: aspects de l'expérience française; possibilités d'application aux pays en voie de développement, *Trib. Cebedeau No. 518, 40*: 24-31.
- Vyas, L.N., Sharma, K.P., Sankhla, S.K., and Gopal, B., 1990. Primary production and energetics, in: *Ecology and Management of Aquatic Vegetation in the Indian Subcontinent*, B. Gopal., ed., Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 149-170.
- Vymazal, J. 1990. Use of reed-bed system for the treatment of concentrated wastes from agriculture, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper, and B.C. Findlater, eds., Pergamon Press, Oxford, pp. 347-358.
- Vymazal, J., 1993. Constructed wetlands for wastewater treatment in Czechoslovakia: State of the art, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp.255-260.
- Vymazal, J. 1994. Constructed wetlands for wastewater treatment in the Czech Republic - state of the art, in: *Proc. 4th Internat. Conf. on Wetland Systems for Water Pollution Control*, ICWS, Guangzhou, P.R. China. pp. 129-137.
- Vymazal, J. 1995a. *Algae and Element Cycling in Wetlands*, Lewis Publishers, Chelsea, Michigan.
- Vymazal, J. 1995b. Constructed wetlands for wastewater treatment in the Czech Republic-state of the art, *Wat. Sci. Tech.* 32(2): 357-364.
- Vymazal, J. 1996. The use of subsurface-flow constructed wetlands for wastewater treatment in the Czech Republic, *Ecol. Eng.* 7: 1-14.
- Vymazal, J. 1998. Czech Republic, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 95-121.
- Vymazal, J. 1999a. Removal of phosphorus in constructed wetlands with horizontal subsurface flow in the Czech Republic, in: *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 73-83.
- Vymazal, J., ed., 1999b. *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, Backhuys Publishers, Leiden, The Netherlands.
- Vymazal, J., 1999c. Nitrogen removal in constructed wetlands with horizontal sub-surface flow - can we determine the key process? in: *Nutrient Cycling and Retention in Natural*

- and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 1-17.
- Vymazal, J., ed., 2001a. *Transformations of Nutrients in Natural and Constructed Wetlands*, Backhuys Publishers, Leiden, The Netherlands.
- Vymazal, J., 2001b. Types of constructed wetlands for wastewater treatment: their potential for nutrient removal, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 1-93.
- Vymazal, J., 2001c. Removal of organics in Czech constructed wetlands with horizontal sub-surface flow, in: *Transformations of Nutrients in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 305-327.
- Vymazal, J. 2001d. Constructed wetlands for wastewater treatment in the Czech Republic. *Wat. Sci. Tech.* **44**(11-12): 369-374.
- Vymazal, J., 2002. Constructed wetlands for wastewater treatment in the Czech Republic: two case studies, in: *Treatment Wetlands for Water Quality Improvement*, J. Pries, ed., CH2M Hill Canada, Waterloo, Ontario, pp. 107-114.
- Vymazal, J. 2002b. The use of sub-surface constructed wetlands for wastewater treatment in the Czech Republic: 10 years experience, *Ecol. Eng.* **18**: 633-646.
- Vymazal, J., ed., 2003a. *Wetlands – Nutrients, Metals and Mass Cycling*, Backhuys Publishers, Leiden, The Netherlands.
- Vymazal, J., 2003b. Distribution of iron, cadmium, nickel and lead in a constructed wetland receiving municipal sewage, in: *Wetlands – Nutrients, Metals and Mass Cycling*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 341-363.
- Vymazal, J. 2004a. Élimination du phosphore par faucardage de la fraction aérienne de la végétation dans les marais artificiels pour le traitement des eaux usées, *Ingénieries eau agriculture territoires*, Special issue : 13-21.
- Vymazal, J., 2004b. Removal of phosphorus in constructed wetlands with sub-surface flow in the Czech Republic. *Water, Air, and Soil Pollution: Focus* **4**, 657-670.
- Vymazal, J., 2005a. Removal of nitrogen via harvesting of emergent vegetation in constructed wetlands for wastewater treatment, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 209-221.
- Vymazal, J., 2005b. Constructed wetlands for wastewater treatment in Europe, in: *Nutrient Management in Agricultural Watersheds: A Wetland Solution*, E.J. Dunne, K.R. Reddy and O.T. Carton, eds., Wageningen Academic Publishers, Wageningen, The Netherlands, pp. 230-244.
- Vymazal, J., ed., 2005c. *Natural and Constructed Wetlands: Nutrients, Metals and Management*, Backhuys Publishers, Leiden, The Netherlands.
- Vymazal, J., 2005d. Removal of enteric bacteria in constructed treatment wetlands with emergent macrophytes: a review, *J. Environ. Sci. Health* **40A**: 1355-1367.
- Vymazal, J., 2005e. Removal of heavy metals in a horizontal sub-surface flow constructed wetland, *J. Environ. Sci. Health* **40A**: 1369-1379.
- Vymazal, J., 2006a. The use of constructed wetlands for wastewater treatment in the Czech Republic, in: *Focus on Ecology Research*, A.R. Burk, ed., Nova Science Publishers, Inc., New York, New York, pp. 175-196.
- Vymazal, J., 2006b. Constructed wetlands with emergent macrophytes: from experiments to a high quality treatment technology, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 3-27.
- Vymazal, J., 2007. Removal of nutrients in various types of constructed wetlands, *Sci. Tot. Environ.* **380**: 48-65.
- Vymazal, J., and Krása, P. 2003. Distribution of Mn, Al, Cu and Zn in a constructed wetland receiving municipal sewage, *Wat. Sci. Tech.* **46**(5): 299-305.
- Vymazal, J., and Maša, M., 2003. Horizontal sub-surface flow constructed wetland with pulsing water level., *Wat. Sci. Tech.* **48**(5): 143-148.

- Vymazal, J., and Krása, P., 2005. Heavy metals budget for a constructed wetland treating municipal sewage, in: *Natural and Constructed Wetlands: Nutrients, Metals and Management*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 135-142.
- Vymazal, J. and Kröpfelová, L., 2005. Growth of *Phragmites australis* and *Phalaris arundinacea* in constructed wetlands for wastewater treatment in the Czech Republic, *Ecol. Eng.* **25**: 606-621.
- Vymazal, J., and Kröpfelová, L., 2006. Can we predict processes in the filtration bed of horizontal-flow constructed wetlands according to dissolved oxygen concentrations at the outflow? in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 549-557.
- Vymazal, J., Brix, H., Cooper, P. F., Green, M. B., and Haberl, R., eds., 1998a. *Constructed Wetlands for Wastewater Treatment in Europe*, Backhuys Publishers, Leiden, The Netherlands.
- Vymazal, J., Brix, H., Cooper, P.F., Haberl, R., Perfler, R., and Laber, J., 1998b. Removal mechanisms and types of constructed wetlands, in: *Constructed Wetlands for Wastewater Treatment in Europe*, J. Vymazal, H. Brix, P.F. Cooper, M.B. Green and R. Haberl, eds., Backhuys Publishers, Leiden, The Netherlands, pp. 17-66.
- Vymazal, J., Dušek, J., and Květ, J. 1999. Nutrient uptake and storage by plants in constructed wetlands with horizontal sub-surface flow: a comparative study, in: *Nutrient Cycling and Retention in Natural and Constructed Wetlands*, J. Vymazal, ed., Backhuys Publishers, Leiden, The Netherlands, pp. 85-100.
- Vymazal, J., Sládeček, V., and Stach, J., 2001. Biota participating in wastewater treatment in a horizontal flow constructed wetland, *Wat. Sci. Tech.* **44**(11-12): 211-214.
- Vymazal, J., Ottová, V., Balcarová, J., and Doušová, H., 2003. Seasonal variation in fecal indicators removal in constructed wetlands with horizontal subsurface flow, in: *Constructed Wetlands for Wastewater treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 237-258.
- Vymazal, J., Greenway, M., Tonderski, K., Brix, H. and Mander, Ü., 2006a. Constructed wetlands for wastewater treatment, in: *Wetlands and Natural Resource Management*, Ecological Studies Vol. 190, J.T.A. Verhoeven, B. Beltman, R. Bobbink and D.F. Whigham, eds., Springer Verlag, Berlin, Heidelberg, pp. 69-94.
- Vymazal, J., Kröpfelová, L., Švehla, J., and Chrástný, V., 2006b. Heavy metals and some risk elements in plants growing in a constructed wetland receiving municipal wastewater, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 459-467.
- Wainwright, M., 1984. Sulfur oxidation in soils, *Adv. Agron.* **37**: 349-396.
- Waite, T.D. and Morel, F.M.M., 1984. Photoreductive dissolution of colloidal iron oxides in natural waters, *Environ. Sci. Tech.* **19**: 860-868.
- Walbridge, M.R., and Struthers, J.P., 1993. Phosphorus retention in non-tidal palustrine forested wetlands of the Mid-Atlantic region, *Wetlands* **13**: 84-94.
- Walbridge, M.R., Richardson, C.J., and Swank, W.T., 1991. Vertical distribution of biological and geochemical phosphorus subcycles in two southern Appalachian forest soils, *Biogeochemistry* **21**: 61-85.
- Walker, D.J., 1998. Modelling residence time in stormwater ponds, *Ecol. Eng.* **10**: 247-262.
- Walker, D.J., 2001. Modelling sedimentation processes in a constructed stormwater wetland, *Sci. Tot. Environ.* **266**: 61-68.
- Walker, D.J., and Hurl, S., 2002. The reduction of heavy metals in a stormwater wetland, *Ecol. Eng.* **18**: 407-414.
- Wallace, S.D., 2001. United States Patent 6,200,469 B1, United States Patent Office, Washington, D.C.

- Wallace, S.D., 2002a. On-site remediation of petroleum contact wastes using subsurface-flow wetlands, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 125-132.
- Wallace, S.D., 2002b. Treatment of cheese-processing waste using subsurface-flow wetlands, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 197-203.
- Wallace, S.D., and Knight, R.L., 2006. *Small Scale Constructed Wetland Treatment Systems. Feasibility, Design Criteria, and O&M Requirements*, Water Environ. Res. Foundation, Alexandria, Virginia.
- Wallace, S., Parkin, G., and Gross, C., 2001. Cold climate wetlands: design and performance, *Wat. Sci. Tech.* **44**(11-12): 259-265.
- Wallace, S., Higgins, J., Liner, M., and Diebold, J., 2007. Degradation of aircraft deicing runoff in aerated engineered wetlands, in: *Proc. Internat. Conf. Multi Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 32-33.
- Wample, R.L., and Reid, D.M., 1975. Effect of aeration on the flood-induced formation of adventitious roots and other changes in sunflower (*Helianthus annuus*), *Planta* **127**: 263-270.
- Wang, J., Cai, X., Chen, Y., Yang, Y., Liang, M., Zhang, Y., Wang, Z., Li, Q., and Liao, X., 1994. Analysis of the configuration and the treatment effect of constructed wetland wastewater treatment system for different wastewaters in South China, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 114-120.
- Warington, R., 1878. Nitrification, *J. Chem. Soc.* **33**: 44-51.
- Warming, E., 1909. *Oecology of Plants. An Introduction to the Study of Plant-Communities*, Clarendon Press, Oxford, UK.
- Warren, A., Decamp, O., and Ramirez, E., 2000. Removal kinetics and viability of bacteria in horizontal subsurface flow constructed wetland, in: *Proc. 7<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Florida, Gainesville, p. 493-500.
- Warthmann, R., and Cypionk, H., 1996. Characteristics of assimilatory sulfate transport in *Rhodobacter sulphidophilus*, *FEMS Microbiol. Lett.* **142**: 243-246.
- Watanabe, I., and Furusaka, C., 1980. Microbial ecology of flooded rice soils, *Adv. Microb. Ecol.* **4**: 125-168.
- Watson, J.T., 1990. Design and performance of the constructed wetland wastewater treatment system at Phillips High School, Bear Creek, Alabama, Tennessee Valley Authority Technical report TVA/WR/WQ-90/5, Chattanooga, Tennessee.
- Watson, J.T., Reed, S.C., Kadlec, R.H., Knight, R.L., and Whitehouse, A.E., 1989. Performance expectations and loading rates for constructed wetlands, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 319-358.
- Watson, J.T., Choate, K.D., and Steiner, G.R., 1990. Performance of constructed wetland treatment systems at Benton, Hardin, and Pembroke, Kentucky, during the early vegetation establishment phase, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 171-182.
- Watson, S.W., Bock, E., Harms, H., Koops, H.-P., and Hooper, A.B., 1989. Nitrifying bacteria, in: *Bergey's Manual of Systematic Bacteriology*, J.T. Stanley, M.P. Bryant, N. Pfennig, and J.T. Holt, eds., Williams and Wilkins, Baltimore, Maryland, pp. 1808-1834.
- Watts, S.F., 2000. The mass budgets of carbonyl sulfide, dimethyl sulfide, carbon disulfide and hydrogen sulfide, *Atmospheric Environ.* **34**: 761-779.
- Weaver, J.E., and Clements, F.E., 1929. *Plant Ecology*, McGraw-Hill, New York.
- Weaver, J.E., and Himmell, W.J., 1930. Relations of increased water content and decreased aeration to root development in hydrophytes, *Plant Physiol.* **5**: 69-92.



- Weaver, M.A., Zablutowicz, R.M., and Locke, M.A., 2004. Laboratory assessment of atrazine and fluometuron degradation in soils from a constructed wetland, *Chemosphere* **57**: 853-862.
- Weber, D., Drizo, A., Twohig, E., Bird, S., and Ross, D., 2006. Upgrading constructed wetlands phosphorus reduction from a dairy effluent using EAF steel slag filters, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 241-253.
- Weedon, C.N., 2001. Compact vertical flow reed beds: design rationale and early performance, *Spec. Group on Use of Macrophytes in Water Pollution Control Newsletter* **23**: 12-20.
- Weedon, C.N., 2003. Compact vertical flow reed bed system – first two years performance, *Wat. Sci. Tech.* **48**(5): 15-23.
- Weis, J.S., and Weis, P., 2004. Uptake, transport and release by wetland plants: implications for phytoremediation and restoration, *Environ. Internat.* **30**: 685-700.
- Weisner, S.E.B., Granéli, W., and Ekstam, B., 1993. Influence of submergence on growth of seedlings of *Scirpus lacustris* and *Phragmites australis*, *Freshwater Biol.* **29**: 271-375.
- Welsh, R.P.H., and Denny, P., 1979. The translocation of <sup>32</sup>P in two submerged angiosperm species, *New Phytol.* **82**: 645-656.
- Wenkert, W., Fausey, N.R., and Watters, H.D., 1981. Flooding responses in *Zea mays* L., *Plant Soil* **62**: 351-366.
- Wentz, W.A., 1987. Ecological/environmental perspectives on the use of wetlands in water treatment, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R.Reddy and W.H. Smith, eds., Magnolia Publishing: Orlando, Florida, pp. 17-25.
- Werner, T.M., and Kadlec, R.H., 1996. Application of residence time distribution to stormwater treatment systems, *Ecol. Eng.* **7**: 213-234.
- Westall, J., and Stumm, W., 1980. The hydrosphere, in: *The Handbook of Environmental Chemistry*, Volume 1, Part A, *The Natural Environment and the Biogeochemical Cycles*, O. Hutzinger, ed., Springer Verlag, Berlin, pp. 17-49.
- Westholm, L.J., 2006. Substrates for phosphorus removal - Potential benefits for on-site wastewater treatment? *Wat. Res.* **40**: 23-36.
- Westlake, D.F., 1963. Comparisons of plant productivity, *Biol. Rev.* **38**: 385-425.
- Westlake, D.F., 1965. Some basic data for investigations of the production data, *Mem. Ist. Ital. Idrobiol.* **18** (Suppl): 229-248.
- Westlake, D.F., 1966. The biomass and productivity of *Glyceria maxima*. I. Seasonal changes in biomass, *J. Ecol.* **54**: 745-753.
- Westlake, D.F., 1968. Methods used to determine the annual production of reedswamp plants with extensive rhizomes, in: *Methods of Productivity Studies in Root Systems and Rhizosphere Organisms*, M.S. Ghilarov, V.S. Kovda, L.N. Novichkova-Ivanova, L.E. Rodin, and V.M. Sveshnikova, eds., Nauka, Leningrad, Russia, pp. 226-234.
- Westlake, D.F., 1969. Macrophytes, in: *A Manual on Methods for Measuring Primary Production in Aquatic Environments*, R.A. Vollenweider, ed., International Biological Program Handbook 12, Blackwell, Oxford, UK, pp. 103-107.
- Westlake, D.F., 1975. Primary production of freshwater macrophytes, in: *Photosynthesis and Productivity of Different Environments*, J.P. Cooper, ed., Cambridge University Press, London, pp. 189-206.
- Westlake, D.F., 1981. Temporal changes in aquatic macrophytes and their environment, *Dynamique de populations et qualite de l'eau. Table ronde animee par. S. Villeret*: 110-138.
- Wetzel, R.G., 1964. A comparative study of the primary productivity of higher aquatic plants, periphyton, and phytoplankton in a large, shallow lake, *Int. Rev. ges. Hydrobiol.* **49**: 1-64.
- Wetzel, R.G., 2001. *Limnology. Lake and River Ecosystems*, 3<sup>rd</sup> edition, Academic Press, San Diego, California.

- Wetzel, R.G., and Manny, B.A., 1972a. Secretion of dissolved organic carbon and nitrogen by aquatic macrophytes, *Verh. Internat. Verein. Limnol.* **18**: 162-170.
- Wetzel, R.G., and Manny, B.A. 1972b. Decomposition of dissolved organic carbon and nitrogen compounds from leaves in an experimental hard-water stream, *Limnol. Oceanogr.* **17**: 927-931.
- Wetzel, R.G., and van der Valk, A.G., 1998. Effects of nutrient and soil moisture on competition between *Carex stricta*, *Phalaris arundinacea* and *Typha latifolia*, *Plant Ecol.* **138**: 179-190.
- Wetzel, R.G., Brammer, E.S., Lindstrom, K., and Forsberg, C., 1985. Photosynthesis of submersed macrophytes in acidified lakes. II. Carbon limitation and utilization of benthic CO<sub>2</sub> sources, *Aquat. Bot.* **22**: 107-120.
- Whigham, D.F., and Simpson, R.L., 1975. Ecological studies in the Hamilton Marshes. Progress Report for the period June 1974 – January 1975, Rider College, Biology Department, Lawrenceville, New Jersey.
- Whigham, D.F., and Simpson, R.L., 1978. The relationship between aboveground and belowground biomass of freshwater tidal wetland macrophytes, *Aquat. Bot.* **5**: 355-364.
- Whigham, D.F., and Brinson, M.M., 1990. Wetland value impacts, in: *Wetlands and Shallow Continental Water Bodies*, Vol. 1., B.C. Patten, ed., SPB Academic Publishing, The Hague, The Netherlands, pp. 401-421.
- Whitcomb, J.H., DeLaune, R.D., and Patrick, W.H.Jr., 1989. Chemical oxidation of sulfide to elemental sulfur: its possible role in marsh energy flow, *Mar. Chem.* **26**: 205-214.
- White, C.W., Baker, F.D., Chaney, R.L., Decker, A.M., 1981. Metal complexation in xylem fluid. II. Theoretical equilibrium model and computation computer program. *Plant Physiol.* **67**: 301-310.
- White, K.D., 1994. Enhancement of nitrogen removal in subsurface-flow constructed wetlands by employing a 2-stage configuration, an unsaturated zone, and recirculation, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 219-229.
- Whitehead, P.G., and Prior, H., 2005. Bioremediation of acid mine drainage: an introduction to the Wheal Jane wetlands project, *Sci. Tot. Environ.* **338**: 15-21.
- Whiting, G.J., Gandy, E.L., and Yoch, D.C., 1986. Tight coupling of root-associated nitrogen fixation and plant photosynthesis in the salt marsh grass *Spartina alterniflora* and carbon dioxide enhancement of nitrogenase activity, *Appl. Environ. Microbiol.* **52**: 108-113.
- Whitlow, T.H., and Harris, R.W., 1979. Flood tolerance in plants: A state-of-the-art review, Tech. Rep. E-79-2, U.S. Army Engineers Waterways Exp. Station, Vicksburg, Mississippi.
- Whitney, D., Rossman, A., and Hayden, N., 2003. Evaluating an existing subsurface flow constructed wetland in Akumal, Mexico, *Ecol. Eng.* **20**: 105-111.
- Whitney, D.E., Woodwell, G.M., Howarth, R.W., 1975. Nitrogen fixation in Flax Pond: A Long Island salt marsh, *Limnol. Oceanogr.* **20**: 640-643.
- WHO, 1989. Health guidelines for the use of wastewater in agriculture and aquaculture, Technical report series 778.
- Widdel, F., 1980. Anaerobe Abbau von Fettsäuren und Benzoesäure durch neu isolierte Arten sulfat-reduzierender Bakterien, Ph.D. Thesis, Georg-August Universität, Göttingen.
- Widdel, F., and Hansen, T.A. 1992. The dissimilatory sulfate- and sulfur-reducing bacteria, in: *The Prokaryotes*, 2<sup>nd</sup>, A., Barlows, H.G. Trüper, M. Dworkin, W. Harder, and H.K. Schliefer, eds, Springer, New York, pp. 583-624.
- Widdel, F., Schnell, S., Heising, S., Ehrenreich, A., Assmus, B., and Schink, B., 1993. Ferrous iron oxidation by anoxygenic phototrophic bacteria, *Nature* **362**: 834-836.
- Widyanto, L.S., 1975. The effect of industrial pollutants on the growth of water hyacinth (*Eichhornia crassipes*) tropical pest biology program BIOTROP, *Proc. Indonesian Weed Sci. Conf.* **3**: 328-329.
- Wieder, R.K., 1989. A survey of constructed wetlands for acid coal mine drainage treatment in the eastern United States, *Wetlands* **9**: 299-315.

- Wiegert, R.H., and Evans, F.C., 1964. Primary production and the disappearance of dead vegetation on an old field in southeastern Michigan, *Ecology* **45**: 49-63.
- Wiessner, A., Kuschik, P., Sottmeister, U., Struckmann, D., and Jank, M., 1999. Treating a lignite pyrolysis wastewater in a constructed subsurface flow wetland, *Water Research* **33**: 1296-1302.
- Wildeman, T., Dietz, J., Gusek, J., and Morea, S., 1993. Handbook for Constructed Wetlands Receiving Acid Mine Drainage. EPA/540/SR-93/523, Report to Risk Reduction Engineering Laboratory, USEPA, Cincinnati, OH.
- Wildung, R.E., Schmidt, R.E., and Routson, C.E., 1977. The phosphorus status of eutrophic lake sediments as related to changes in limnological conditions – Phosphorus mineral components, *J. Environ. Qual.* **6**: 100-104.
- Wiljer, R., and Delwiche, C.C., 1954. Investigations on the denitrifying process in soil, *Plant Soil* **5**: 155-169.
- Willadsen, C.T., Riger-Kusk, O., and Qvist, B., 1990. Removal of nutritive salts from two Danish root zone systems, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 115-126.
- Williams, B.G., and Patrick, W.H., Jr., 1973. The dissolution of complex ferric phosphates under controlled Eh and pH conditions, *Soil Sci. Soc. Am. Proc.* **37**: 33-36.
- Williams, J., Bahgat, M., May, E., Ford, M., and Butler, J., 1994. The removal of pathogenic microorganisms during sewage treatment in gravel bed hydroponic constructed wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 200-209.
- Williams, J.B., Zambrano, D., Ford, M.G., May, E., and Butler, J.E., 1999. Constructed wetlands for wastewater treatment in Colombia, *Wat. Sci. Tech.* **40**(3): 217-223.
- Williams, J.D.H., Syers, J.K., Shukla, S.S., Harris, R.F., and Armstrong, D.E., 1971. Levels of inorganic and total phosphorus in lake sediments as related to other sediment parameters, *Environ. Sci. Technol.* **5**: 1113-1120.
- Williams, M., 1990. Understanding wetlands, in: M. Williams, ed., *Wetlands: A Threatened Landscape*, Basil Blackwell, Oxford, UK, pp. 1-41.
- Williams, S.T., and Gray T.R.G., 1974. Decomposition of litter on the soil surface, in: *Biology of Plant Litter Decomposition*, C.H. Dickinson and G.J.F. Pugh, eds., Academic Press, New York, pp. 611-625.
- Williams, W.T., and Barber, D.A., 1961. The functional significance of aerenchyma in plants, *Soc. Exp. Biol. Symp.* **15**: 132-144.
- Williamson, R.E., and Splinter, W.E., 1968. Effect of gaseous composition of root environment upon root development and growth of *Nicotiana tabacum* L., *Agron. J.* **60**: 365-368.
- Willoughby, L.G., 1974. Decomposition of litter in fresh water, in: *Biology of Plant Litter Decomposition*, 2, C.H. Dickinson and G.J.F. Pugh, eds., Academic Press, London, pp. 659-721.
- Winogradski, S., 1887. Über Schwefelbakterien, *Bot. Zeitung* **45** : 489-610.
- Winogradski, S., 1888. *Beiträge zur Morphologie und Physiologie der Bakterien*, Heft I. *Zur Morphologie und Physiologie der Schwefelbakterien*, Arthur Felix, Leipzig, Germany.
- Winogradsky, S., 1890. Recherches sur les organismes de la nitrification, *Ann. Inst. Pasteur* **4** : 213-231, 257-275, 760-771.
- Winter, H.C., and Burris, R.H., 1976. Nitrogenase, *Ann. Rev. Biochem.* **45**: 409-430.
- Winter, K.-J., and Goetz, D., 2003. The impact of sewage composition on the soil clogging phenomena of vertical flow constructed wetlands, *Wat. Sci. Tech.* **48**(5): 9-14.
- Winter, M., and Kickuth, R., 1989. Elimination of sulphur compounds from wastewater by the root zone process. I. Performance of a large-scale purification plant at a textile finishing industry, *Wat. Res.* **23**: 535-546.
- Wissing, F., 1995. *Wasserreinigung mit Pflanzen*, Ulmer Verlag, Stuttgart.

- Wisur, H., Sjöberg, L.-A., and Ahlgren, P., 1993. Selecting a potential Swedish fibre crop: fibres and fines in different crops as an indication of their usefulness in pulp and paper production, *Industr. Crops Prod.* **2**: 39-45.
- Wohler, J.R., 1966. Productivity of the duckweeds, M.Sc. Thesis, University of Pittsburgh, Pittsburgh, Pennsylvania.
- Wolk, C.P., 1973. Physiology and cytological chemistry of blue-green algae, *Bacteriol. Rev.* **37**: 32-101.
- Wolverton, B. C., 1979. Engineering design data for small vascular aquatic plant wastewater treatment systems, in: *Aquaculture Systems for Wastewater Treatment: Seminar Proceedings and Engineering Assessment*, R.K. Bastian, and S.C. Reed, S.C., eds., EPA 430/9-80-006, U.S. EPA, Washington, D.C., pp. 179-192.
- Wolverton, B.C., 1982. Hybrid wastewater treatment system using anaerobic microorganisms and reed (*Phragmites communis*), *Econ. Bot.* **36**: 373-380.
- Wolverton, B.C., 1986. Microbial-plant filters (artificial marshes) for treating domestic sewage and industrial wastewater, in: *Proc. Louisiana Department of Environmental Quality Seminar*, Baton Rouge, Louisiana, pp. 1-19.
- Wolverton, B.C., 1987. Aquatic plants for wastewater treatment: an overview, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing: Orlando, Florida, pp. 3-16.
- Wolverton, B.C., 1989. Aquatic plant/microbial filters for treating septic tank effluent, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 173-178.
- Wolverton, B.C., and McDonald, R.C. 1976. Water hyacinths (*Eichhornia crassipes*) for removing chemical and photographic pollutants from laboratory wastewaters. NASA Tech. Memorandum TM-X-72731, Natl. Space Technol. Labs., Bay St. Louis, Mississippi.
- Wolverton, B.C., and McKown, M.M., 1976. Water hyacinth for removal of phenols from polluted waters, *Aquat. Bot.* **2**: 191-201.
- Wolverton, B.C., and McDonald, R.C., 1979. Upgrading facultative wastewater lagoons with vascular aquatic plants, *J. Water Pollut. Control Fed.* **51**: 305-313.
- Wolverton, B.C., and McDonald, R.C., 1981. Natural processes for treatment of organic chemical waste, *The Environmental Professionals* **3**: 99-104.
- Wolverton, B.C., and McCaleb, R.C., 1987. Pennywort and duckweed marsh system for upgrading wastewater effluent from a mechanical package plant, in: *Aquatic Plants for Water Treatment and Resource Recovery*, K.R. Reddy and W.H. Smith, eds., Magnolia Publishing, Orlando, Florida, pp. 289- 294.
- Wolverton, B.C., and Bounds, B.K., 1988. Aquatic plants for pH adjustment and removal of toxic chemicals and dissolved minerals from waste supplies, *J. Miss. Acad. Sci.* **33**: 71-80.
- Wolverton, B.C., McDonald, R.C., and Duffer, W.R., 1983. Microorganisms and higher plants for waste water treatment, *J. Environ. Qual.* **12**: 236-242.
- Wolverton, B.C., McDonald, R.C., and Marble, L.K., 1984a. Removal of benzene and its derivatives from polluted water using the reed/microbial filter technique, *J. Miss. Acad. Sci.* **29**: 119-127.
- Wolverton, B.C., Myrick, C.C., and Johnson, K.M., 1984b. Upgrading septic tanks using microbial/plant filters, *J. Miss. Acad. Sci.* **29**: 19-25.
- Wood, A., 1990. The application of artificial wetlands in South Africa, in: *Constructed Wetlands in Water Pollution Control*, P.F. Cooper and B.C. Findlater, eds., Pergamon Press, Oxford, U.K., pp. 235-244.
- Wood, A., 1994. Constructed wetlands in water pollution control – fundamentals to their understanding, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 25-34.
- Wood, A., 1995. Constructed wetlands in water pollution control – fundamentals to their understanding, *Wat. Sci. Tech.* **32**(3): 21-29.

- Wood, A., and Hensman, L.C., 1989. Research to develop engineering guidelines for implementation of constructed wetlands for wastewater treatment in Southern Africa, in: *Constructed Wetlands for Wastewater Treatment*, D.A. Hammer, ed., Lewis Publishers, Chelsea, Michigan, pp. 581-589.
- Wood, A., and Pybus, P., 1992. Artificial wetland use for wastewater treatment theory. Practice and Economic Review, Report to the Water Research Commission, WRC Report No. 232/1/93.
- Wood, A., and Cook, B., 1992. Artificial wetlands in the amelioration of acid mine drainage, in: *Proc. 3<sup>rd</sup> Internat. Conf. Wetland Systems in Water Pollution Control*, University of South Wales, Sydney, Australia, pp. 52.1- 52.10.
- Wood, J.M., 1974. Biological cycles for toxic elements in the environment, *Science* **183**: 1049-1052.
- Wood, T.S., and Shelley, M.L., 1999. A dynamic model of bioavailability of metals in constructed wetland sediments, *Ecol. Eng.* **12**: 231-252.
- Wooten, J.W., and Dodd, J.D., 1976. Growth of water hyacinth in treated sewage effluent, *Econ. Bot.* **30**: 29-37.
- Worrall, P., 1995. Reed bed for glycol treatment, *Spec. Group on the Use of Macrophytes in Water Pollution Control Newsletter* **12**: 13-14.
- Worrall, P., 2006. The role of ecology in sustainable drainage wetlands, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR, Lisbon, Portugal, pp. 787-796.
- Worrall, P., Peberdy, K.J., and Millett, M.C., 1996. Constructed wetlands and nature conservation, in: *Proc. 5<sup>th</sup> Internat. Conf. Wetland Systems for Water pollution Control*, Universität für Bodenkultur, Vienna, Austria, Chapter V/I.
- Worrall, P., Revitt, D.M., Prickett, G., and Brewer, D., 2002. Constructed wetlands for airport runoff – the London Heathrow experience, in: *Wetlands and Remediation II*, K.W. Nehring and S.E. Brauning, eds., Battelle Press, Columbus, Ohio, pp. 177-186.
- Woulds, C., and Ngwenya, B.T., 2004. Geochemical processes governing the performance of a constructed wetland treating acid mine drainage, Central Scotland, *Appl. Geochem.* **19**: 1773-1783.
- Wrigley, T.J., and Toerien, D.F., 1988. The ability of an artificially established wetland system to upgrade oxidation pond effluent to meet water quality criteria, *Water SA* **14**: 171-178.
- Wurtsbaugh, W.A., Vincent, W.F., Tapia, R.A., Vincent, C.L., and Richerson, P.J., 1985. Nutrient limitation in algal growth and nitrogen fixation in a tropical alpine lake, Lake Titicaca (Peru/Bolivia), *Freshwater Biol.* **15**: 185-195.
- Wynn, T.M., and Liehr, S.K., 2001. Development of a constructed subsurface-flow wetland simulation model, *Ecol. Eng.* **16**: 519-536.
- Xanthoulis, D., Fonder, N., and Wauthélet, M., 2006. Small-scale constructed wetlands for onsite treatment of household wastewater in Belgium, in: *Proc. 10<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, MAOTDR 2006, Lisbon, Portugal, pp. 1901-1908.
- Xianfa, L., and Chuncai, J., 1994. The constructed wetland systems for water pollution control in north China, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, Guangzhou, China, pp. 121-128.
- Xu, D., Xu, J., Wu, J., and Muhammad, A., 2006. Studies on the phosphorus sorption capacity of substrates used in constructed wetland systems *Chemosphere* **63**: 344-352.
- Yang, Y., Zhencheng, X., Kangping, H., Junsan, W., and Guizhi, W., 1994. Removal efficiency of the constructed wetland wastewater treatment system at Bainikeng, Shenzhen, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 94-103.
- Yang, L., and Hu, C.C., 2005. Treatments of oil-refinery and steel-mill wastewaters by mesocosm constructed wetland systems, *Wat. Sci. Tech.* **51**(9): 157-164.

- Yang, L., Lin, H.Y., and Shih, P.Y., 2002. Feasibility of constructed wetlands applied to industrial wastewater recirculating treatment systems, in: *Proc. 8<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, University of Dar es Salaam and IWA, pp. 460-471.
- Yates, M., and Yates, S.R., 1988. Modeling microbial fate in the subsurface environment, *Crit. Rev. Environ. Control* **17**: 307-344.
- Ye, P.T., Stolzy, L.H., and Letey, J., 1969. Survival of plants under prolonged flooded conditions, *Agron. J.* **61**: 844-847.
- Ye, Z., Baker, A.J.M., Wong, M.H., and Willis, A.J., 1997. Copper and nickel uptake, accumulation and tolerance in *Typha latifolia* with and without iron plaque on the root surface, *New Phytol.* **136**: 481-488.
- Ye, Z.H., Baker, A.J.M., Wong, M.H., and Willis, A.J., 1998. Zinc, lead and cadmium accumulation and tolerance in *Typha latifolia* as affected by iron plaque on the root surface, *Aquat. Bot.* **61**: 55-67.
- Ye, Z.H., Lin, Z.-Q., Whiting, S.N., de Souza, M.P., and Terry, N., 2003. Possible use of constructed wetland to remove selenocyanate, arsenic, and boron from electric utility wastewater, *Chemosphere* **52**: 1571-1579.
- Yeo, R.R., 1964. Life history of common cattail, *Weeds* **12**: 284.
- Yeoh, B.G., 1983. Use of water hyacinth in wastewater treatment. Terminal Report, Standard and Industrial Res. Inst. of Malaysia.
- Yildiz, C., Korkusuz, E.A., Arıkan, Y., and Demirel, G.N., 2004. Constructed wetlands for municipal wastewater treatment: a study from Turkey, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE Lyon, France, pp. 193-200.
- Yoon, C.G., Kwun, S.K., and Ham, J.H., 2001. Feasibility study of a constructed wetland for sewage treatment in a Korean rural community, *J. Environ. Sci. Health* **A36**: 1101-1112.
- Yoshida, T., and Ancajas, R.R., 1973. Nitrogen-fixing activity in upland and flooded rice fields, *Soil Sci. Soc. Amer. Proc.* **37**: 42-46.
- Young, T.C., Collins, A.G., and Theis, T.L., 2000. Subsurface flow wetland for wastewater treatment at Minoa, NY, Report to NYSERDA and US EPA, Clarkson University, New York.
- Younger, P.L., Banwart, S.A., and Hedin, R.S., 2002. *Mine Water: Hydrology, Pollution, Remediation*, Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Yount, J.L., and Crossman, R.A., 1970. Eutrophication control by plant harvesting, *J. Water Pollut. Control Fed.* **42**: 173-183.
- Yu, P.T., Stolzy, L.H., and Letey, J., 1969. Survival of plants under prolonged flooded conditions, *Agron. J.* **61**: 844-847.
- Zabel, T., Milne, I., and Mackay, G., 2001. Approaches adopted by the European Union and selected Member States for control of urban pollution, *Urban Water* **3**: 25-32.
- Zachritz, W.H., II., and Jacquez, R.B., 1993. Treating intensive aquaculture recycled water with a constructed wetlands filter system, in: *Constructed Wetlands for Water Quality Improvement*, G.A. Moshiri, ed., CRC Press/Lewis Publishers, Boca Raton, Florida, pp. 609-614.
- Zachritz, W.H., Lundie, L.L., and Wang, H., 1996. Benzoic acid degradation by small, pilot-scale artificial wetlands filter (AWF) systems, *Ecol. Eng.* **7**: 105-116.
- Žáková, Z., Palát, M., Kočková, E., and Toufar, J., 1994. Is it realistic to use water hyacinth for wastewater treatment and nutrient removal in Central Europe? *Water Sci. Tech.* **30**(8): 303-311.
- Zart, D., and Bock, E., 1998. High rate of aerobic nitrification and denitrification by *Nitrosomonas europaea* grown in a fermentor with complete biomass retention in the presence of gaseous NO<sub>2</sub> or NO, *Arch. Microbiol.* **49**: 1134-1141.
- Zawislanski, P.T., Chau, S., Mountford, H., Wong, H., and Sears, T.C. 2001. Accumulation of selenium and trace metals on plant litter in a tidal marsh, *Estuar. Coast. Shelf. Sci.* **52**: 589-603.

- Zdragas, A., Zalidis, G.C., Takavakoglou, V., Katsavouni, S., Anastasiadis, E.T., and Eskridge, K., 2002. The effect of environmental conditions on the ability of a constructed wetland to disinfect municipal wastewaters, *Environ. Management* **29**: 510-515.
- Zehnder, A.J.B., 1980. The carbon cycle, in: *The Handbook of Environmental Chemistry*, Volume 1, Part B, *The Natural Environment and the Biogeochemical Cycles*, O. Hutzinger, ed., Springer Verlag, Berlin, pp. 83-110.
- Zehnder, A.J., and Brock, T.D., 1979. Anaerobic methane oxidation: occurrence and ecology, *Appl. Environ. Microbiol.* **39**: 194-204.
- Zehnder, A.J.B., and Zinder, S.H., 1980. The sulfur cycle, in: *The Handbook of Environmental Chemistry*, Volume 1, Part A, *The Natural Environment and the Biogeochemical Cycles*, O. Hutzinger, ed., Springer Verlag, Berlin, pp. 105-145.
- Zemlin, R., Kühl, H., and Kohl, J.-G., 2000. Effects of seasonal temperature on shoot growth dynamics and shoot morphology of common reed (*Phragmites australis*), *Wetlands Ecol. Manage.* **8**: 447-457.
- Zhang, T.C., and Lampe, D.G., 1999. Sulfur:limestone autotrophic denitrification processes for treatment of nitrate-contaminated water: batch experiments, *Wat. Res.* **33**: 599-608.
- Zhang, X., Zhang, F., and Mao, D., 1998. Effect of iron plaque outside roots on nutrient uptake by rice (*Oryza sativa* L.). Zinc uptake by Fe-deficient rice, *Plant Soil.* **202**: 33-39.
- Zhao, Y.Q., Sun, G., and Allen, S.J., 2004a. Purification capacity of a highly loaded laboratory scale tidal flow reed bed system with effluent recirculation, *Sci. Tot. Environ.* **330**: 1-8.
- Zhao, Y.Q., Sun, G., and Allen, S.J., 2004b. Anti-sized reed bed system for animal wastewater treatment: a comparative study, *Wat. Res.* **38**: 2907-2917.
- Zhao, Y.Q., O'Neill, M., and O'Sullivan, B., 2005. Constructed wetlands for wastewater treatment in Ireland: research and practice, in: *Book of Abstracts of the Internat. Symp. Wetland Pollutant Dynamics and Control*, Ghent University, Belgium, pp. 210-211.
- Zhou, M., Rhue, R.D., and Harris, W.G., 1997. Phosphorus sorption characteristics of Bh and Bt horizons from sandy coastal plain soils, *Soil Sci. Soc. Am. J.* **61**: 1364-1369.
- Zhou, Q., Zhang, R., Shi, Y., Li, Y., Paing, J., and Picot, B., 2004. Nitrogen and phosphorus removal in subsurface constructed wetland treating agriculture stormwater runoff, in: *Proc. 9<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ASTEE 2004 and Cemagref, Lyon, France, pp. 75-82.
- Zhou, Q.H., Wu, Z.B., Cheng, S.P., He, F., and Fu, G.P., 2005. Enzymatic activities in constructed wetlands and di-*n*-butyl phthalate (DBP) biodegradation, *Soil Biol. Biochem.* **37**: 1454-1459.
- Zhu, T., and Sikora, F.J., 1994. Ammonium and nitrate removal in vegetated and unvegetated gravel bed microcosm wetlands, in: *Proc. 4<sup>th</sup> Internat. Conf. Wetland Systems for Water Pollution Control*, ICWS'94 Secretariat, Guangzhou, P.R. China, pp. 355-366.
- Zhu, T., Jenssen, P., Mæhlum, T., and Krogstad, T., 1997. Phosphorus sorption and chemical characteristics of lightweight aggregates (LWA): potential filter media in treatment wetlands, *Wat. Sci. Tech.* **35**(5): 103-108.
- Zhu, T., Mæhlum, T., Jenssen, P.D., and Krogstad, T., 2003. Phosphorus sorption characteristics of a light-weight aggregate, *Wat. Sci. Tech.* **48**(5): 93-100.
- Ziemkiewicz, P.F., Skousen, J.G., and Simmons, J., 2003. Long-term performance of passive acid mine drainage treatment systems, *Mine Water Environ.* **22**: 118-129.
- Zirschky, J., and Reed, S.C., 1988. The use of duckweed for wastewater treatment, *J. Water Pollut. Control Fed.* **60**: 1253-1258.
- Zuberer, D.A., and Silver, W.S., 1978. Biological denitrogen fixation (acetylene reduction) associated with Florida mangroves. *Appl. Environ. Microbiol.* **35**: 567-575.
- Zupančič Justin, M., Zupančič, M., Griessler Bulc, T., Zrimec, A., Simon Šelih, V., Bukovec, P., and Vrhovšek, D., 2007. Combined purification and reuse of landfill leachate by constructed wetland and irrigation of grass and willows, in: *Proc. Internat. Conf. Multi*

- Functions of Wetland Systems*, M. Borin and S. Bacelle, eds., P.A.N. s.r.l., Padova, Italy, pp. 118-119.
- Züst, B., and Schönborn, A., 2003. Constructed wetlands for wastewater treatment in cold climates: Planted soil filter Schattweid – 13 years' experience, in: *Constructed Wetlands for Wastewater Treatment in Cold Climates*, Ü. Mander and P. Jenssen, eds., WIT Press, Southampton, UK, pp. 53-68.

### Suggested Reading

- Cooper, P.F., Job, G.D., Green, M.B., and Shutes, R.B.E. 1996. *Reed Beds and Constructed Wetlands for Wastewater Treatment*, WRc Publications, Medmenham, Marlow, UK.
- Kadlec, R.H., and Knight, R.L., 1996. *Treatment Wetlands*, CRC Press, Boca Raton, Florida.
- Kadlec, R.H., and Wallace, S.R., 2008. *Treatment Wetlands*, 2<sup>nd</sup> edition, CRC Press, Boca Raton, Florida.
- Kadlec, R.H., Knight, R.L., Vymazal, J., Brix, H., Cooper, P. F., and Haberl, R., 2000. *Constructed Wetlands for Water Pollution Control: Processes, Performance, Design and Operation*, IWA Scientific and Technical Report No. 8, London.
- U.S. EPA, 2000. Constructed wetlands treatment of municipal wastewater. Manual. EPA 625/R-99/010, U.S. Environmental Protection Agency, Cincinnati, Ohio.
- Vymazal, J., Brix, H., Cooper, P. F., Green, M. B., and Haberl, R., eds., 1998. *Constructed Wetlands for Wastewater Treatment in Europe*, Backhuys Publishers, Leiden, The Netherlands.
- Wallace, S.D., and Knight, R.L., 2006. *Small Scale Constructed Wetland Treatment Systems. Feasibility, Design Criteria, and O&M Requirements*, Water Environ. Res. Foundation, Alexandria, Virginia.
- Wissing, F., 1995. *Wasserreinigung mit Pflanzen*, Ulmer Verlag, Stuttgart.



## SUBJECT INDEX

### A

Acid  
  acetic, 21  
  amino, 70, 120  
  benzoic, 353  
  butyric, 21  
  chemotrophic, 71  
  citric, 64  
  dicarboxylic, 70  
  fatty, 21, 69, 349  
  fulvic, 56  
  lactic, 21  
  humic, 11, 56, 80, 85  
  malic, 79  
  mine drainage, 9, 167, 310  
  organic, 69, 88  
  oxalic, 80  
  phototrophic, 71  
  piscidic, 64  
  pyruvic, 80  
  tartaric, 64  
*Acorus calamus*, 49, 96, 180, 188, 400  
Actinomycetes, 42  
Adsorption, 305  
  isotherms, 52, 59  
  phosphorus, 59  
Aerenchyma, 103, 179, 247  
*Aerobacter*, 31  
Aeromonas, 34  
Algae, 63  
Allelopathy, 119  
*Alnus glutinosa*, 42, 199  
Aluminum, 60, 84, 297, 311  
Ammonia  
  adsorption, 52  
  assimilation, 47, 48  
  removal, 292, 295, 316, 318  
  volatilization, 24, 27, 123, 131, 152,  
  177, 289, 425  
Anammox, 24, 31-34  
*Anabaena*, 44  
Apatite, 298, 299  
aquaculture, 277, 428  
Arsenic, 81, 311  
*Aspergillus*, 31  
*Azotobacter*, 42, 43

### B

*Bacillus*, 34, 37, 42, 62, 79  
Bacteria  
  acetogenic, 349  
  activity, 61  
  aerobic, 28, 86, 320  
  anaerobic, 30, 76, 79, 86, 113, 320  
  autotrophic, 28  
  chemoautotrophic, 20  
  chemolitho-autotrophic, 33  
  coliform, 153, 320, 373  
  colorless-sulfur, 73  
  denitrifying, 34, 37  
  facultative anaerobic, 37, 113  
  facultative autotrophic, 30  
  fecal coliform, 159, 162, 306-309,  
  319, 320, 373, 414, 419  
  fecal streptococci, 306, 373  
  free-living, 43  
  gliding, 73  
  green sulfur, 74  
  heterotrophic, 38, 45, 79  
  iron-depositing, 74  
  iron-oxidizing, 74  
  methanogenic, 19, 349  
  mixotrophic, 28  
  N<sub>2</sub>-fixing, 42, 45  
  nitrate-ammonifying, 34  
  nitrifying, 28-30, 38, 95, 320  
  photoautotrophic, 20  
  purple sulfur, 74  
  sulfate-reducing, 76  
  sulfite-producing, 76  
  sulfur-oxidizing, 67  
  sulfur-reducing, 21, 67-69  
*Baumea articulata*, 96, 165, 251  
*Beggiatoa*, 71, 73  
Biomat, 225  
Biomethylation, 86  
*Bolboschoenus fluviatilis*, 148, 158, 166,  
  414  
BTEX, 354, 393  

### C

Cadmium, 80, 85, 86, 89, 312  
Calcite, 297, 299

- Campylobacter*, 306  
 Carbohydrates, 47  
 Carbon  
   organic, 234  
   transformations, 19-23  
*Carex* sp., 255, 343, 357  
*Carex gracilis*, 255, 332, 382  
*Carex rostrata*, 319  
*Ceratophyllum*, 109, 143-147  
*Chlorobium*, 44, 71  
*Chromatium*, 44, 71  
 Chromium, 82-83, 312, 344  
*Citrobacter*, 34, 306  
 Clogging, 183, 223, 225, 305  
*Clostridium*, 35, 42, 79  
 cobalt recovery plant, 421  
 Cold climate, 262, 319  
*Colocasia esculenta*, 255, 316  
 Constructed wetlands  
   floating mats, 172  
   free water surface, 6  
   hybrid, 189  
   sub-surface flow, 175  
   surface flow, 122, 148-175  
   vertical flow, 6, 7, 178  
 Copper, 80, 85, 89, 312, 344  
*Cryptosporidium*, 309  
 Cyanobacteria, 44  
   diazotrophic, 44  
   free-living, 42  
   symbiotic, 42  
   unicellular, 44  
*Cyperus* spp., 318, 423  
*Cyperus involucratu*s, 253, 417  
*Cyperus papyrus*, 48, 96, 109, 129,  
   173-175, 252, 303, 418, 421
- D**  
 Decomposition, 17, 20, 50, 65, 95, 112-  
   114, 123, 142, 177, 227, 234, 330, 348  
 De-icing compounds, 345  
 Denitrification, 18, 24, 32, 34-41, 65,  
   123, 131, 141, 151, 173, 177, 191,  
   234, 289  
   aerobic, 41  
*Desulfovibrio*, 69  
 Dolomite, 297, 299  
 Duckweed, 98, 109, 123, 129-135
- E**  
*Eichhornia crassipes*, 86, 98, 110, 112,  
   119, 123-129, 146  
*Eleocharis* sp., 169, 332  
*Elodea*, 143-148, 197  
*Enterobacter*, 43  
*Escherichia coli*, 35, 306, 308, 309, 418  
 Estrogens, 352  
 Evapotranspiration, 114-116, 200, 201,  
   429  
 Explosives, 354
- F**  
 Fermentation, 18, 21, 37  
 Filtration  
   Beds, 220  
   materials 219  
 Fish farm, 277, 318  
 Flooding, 263  
 Fly ash, 299  
 Freundlich izoterm, 52  
 Furnace slag, 298, 299, 430
- G**  
*Galionella*, 74  
*Geobacter*, 77-78  
*Girardia*, 309  
*Glyceria maxima*, 47, 49, 96, 109, 172,  
   246, 260, 415  
 Grasslands, 64  
 Grit chamber, 213-216
- H**  
 Heavy metals, 84, 310 (see also Trace  
   metals), 405  
   accumulation, 90  
   cycling, 120  
   precipitation, 167  
   removal, 310, 422  
 Helophytes, 93, 154, 203  
 Herbicides, 186, 353  
 Heterocysts, 44  
 Humic substances (see humic acids)  
 Hydraulic conductivity, 221, 227, 286  
*Hydrocotyle umbellata*, 137  
 Hydrophytes, 93, 203
- I**  
 Imhoff tank, 211, 217  
 Insulation, 321  
*Iris pseudacorus*, 120, 180, 192, 254,  
   317, 357, 368, 379  
*Iris* sp., 254  
 Irrigation, 413, 427  
 Iron, 11, 60, 84, 85, 297, 313  
   immobilization, 87  
   oxidation, 74-76  
   plaque, 75, 87, 310  
   precipitation, 75

reduction, 18, 76-78

transformations, 74-78

## J

*Juncus effusus*, 302, 309, 360, 380, 382, 393

## L

Lagoons, 412

Landfill leachate, 9, 170, 171, 186, 277, 295-301, 323, 347, 378, 394, 402

LAS, 324, 374, 385

Lead, 86, 313

Lemnaceae (see Duckweed)

Light weight aggregate, 298, 299, 375

Limestone, 297

Litter, 65, 95, 152  
standing, 108

## M

Macrophytes (see also Plants), 64, 208

biomass, 108-111, 320

emergent, 8, 48, 94-96, 109, 115

floating-leaved, 48, 97-99, 139-140, 423

free-floating, 14, 97-98, 109, 110, 115, 117, 123-138, 423

harvesting, 131, 154, 177, 261, 290

locally used for constructed wetlands, 255

planting, 255

productivity, 111-112

role in constructed wetlands, 116-120

submerged, 14, 48, 96-97, 109, 110, 142-148

Manganese, 11, 78-80, 84, 89, 313  
81,

oxidation, 79

reduction, 18, 79

Mangrove, 108

Mercury, 86, 314

Metabolism

aerobic, 16

anaerobic, 16

Methane, 21-23, 349

ebullition, 22

emission, 22

formation, 18, 19

Methylmercury, 86

Microorganisms

attached, 234

Microbial

activity, 15, 16

biofilm, 225

biomass, 286

density, 315

metabolism, 16

pollution, 304-310, 315

respiration, 12, 286

uptake, 62

*Micrococcus denitrificans*, 35, 40

Mine drainage, 167-169, 174

Mosquito, 223

*Mycobacterium*, 31

*Myriophyllum*, 97, 109, 143-148

## N

Naphthalene, 352

Nickel, 84, 85, 89, 314, 344

Nitrate

ammonification, 34

reduction, 82 (see also denitrification)

Nitrification, 24, 27-31, 119, 123, 141,

152, 191, 289, 295, 375, 420

heterotrophic, 31

Nitrogen

ammonification, 18, 24-27, 289

assimilation, 46-52, 291

burial, 53, 289

emission, 290

fixation, 24, 41-45

immobilization, 290

removal, 152, **289**, 315, 321

standing stock, 50, 289

transformations, 23-54

uptake, 24, 177

volatilization, 24, 27

*Nitrobacter*, 29, 30

*Nitrococcus*, 29, 30

*Nitrospira*, 29, 30

*Nitrosococcus*, 29

*Nitrosolobus*, 29

*Nitrosomonas*, 28, 29

*Nitrospira*, 29

*Nuphar*, 99, 119, 139

Nutrient

standing stock, 50, 119

translocation, 49, 65, 95

*Nymphaea*, 99, 139

## O

Oil shale, 298

Organic

matter

decomposition, 17

removal, 184, **278**, 316

loading, 225, 282

- Oryza sativa*, 87, 187, 404  
Oxidation-reduction potential (see Redox potential)  
Oxygen  
  radial loss (leakage, release), 14, 75, 87, 119, 176, 247, 315  
  release rate, 14  
  transfer, 179  
  transport in plants, 105-108, 177
- P**  
PAHs, 352  
*Panicum maximum*, 407  
Papyrus (see also *Cyperus papyrus*), 2  
*Paracoccus denitrificans*, 40  
Pathogens, 152, 305  
PCBs, 352  
Peat accumulation, 57  
Peatland, 53  
*Penicillium*, 31  
*Pennisetum purpureum*, 255, 407, 408  
Periphyton, 55, 143, 151  
Pesticides, 170, 352, 353  
*Phalaris arundinacea*, 51, 66, 96, 109, 192, **239**, 258, 263, 289, 302, 310, 357, 411  
Pharmaceuticals, 327  
Phenolics, 64, 119, 126, 330, 405, 418  
Phosphatases, 64  
Phosphorus  
  absorption, 97, 141  
  accumulation, 300  
  cycling, 57  
  forms in wetlands, 54  
  precipitation, 58, 124  
  removal, 186, **297**, 315, 375, 386  
  retention, 56  
  soil cycle, 54  
  sorption, 58, 59, 297, 299  
  standing stock, 66, 302, 303  
  storage, 65  
  transformations, 54-66  
  uptake, 62, 63-66, 124, 303  
Photosynthesis, 61  
*Phragmites australis*, 14, 15, 47-51, 66, 87, 94, 96, 106-109, 112, 117, 119, 147, 148, 165, 173, 180, 192, 197, **234**, 256, 289, 302, 308, 310, 316, 317, 328, 331, 334, 335, 340-347, 353, 357, 359, 364, 368-370, 376, 379-383, 394, 397, 410, 411, 414, 418-426, 430  
*Phragmites karka*, 237, 318, 425, 428  
*Phragmites mauritianus*, 237, 310, 318, 418, 421, 422  
Phytochelatin, 119, 120  
Phytometallophores, 89, 119, 120  
Phytoplankton, 117  
Phytotoxins, 104  
*Pistia stratiotes*, 98, 123, 135-139, 429  
Plankton, 63, 151  
Plants (see also Macrophytes)  
  adaptations to flooding, 100  
  terrestrial, 95  
Plaque, 75, 87, 310  
Pollution  
  microbial, 153  
*Potamogeton*, 109, 143-148  
Precipitation, 75, 81, 225  
Pretreatment, 210-218, 285  
Primary production (productivity), 20  
*Pseudomonas*, 19, 37, 40, 62, 79  
Pyrite, 71
- R**  
Redox potential, 11, 12-19, 61, 80-81, 86  
Respiration, 61, 65  
  aerobic, 17-20, 37, 100, 104  
  anaerobic, 17, 19, 20, 37  
  facultative anaerobic, 17  
*Rhizobium*, 42  
Rhizome, 234-251, 256  
Rhizosphere (see also Root zone), 75, 86, 88, 94, 100, 177, 234, 247, 315  
Root, 118  
  adventitious, 98  
  exudates, 79, 88, 120, 315  
  zone, 14, 40, 45  
Runoff (see also Stormwater runoff)  
  agricultural, 7, 155, 347  
  de-icing airport, 174, 186, 345  
  greenhouse, 346  
  highway, 344  
  nursery, 346, 415  
  pasture, 155  
  urban, 347
- S**  
*Sagittaria latifolia*, 138, 165  
*Salix viminalis*, 200, 376  
*Salmonella*, 306  
Sand, 298, 299  
*Scirpus* spp. 106, 138, 146-148, **249**, 309, 341, 369, 400  
  *cyperinus*, 316

- lacustris* (*Schoenoplectus*), 109, 119, 180, 192, 197, 249, 426  
*pungens*, 317  
*tabernaemontani*, 148, 166, 250, 290, 332  
*validus*, 249-251, 315, 317, 339, 353, 396, 397, 415
- Screens, 210-213
- Sediments  
 anaerobic, 71, 72, 94  
 estuary, 85  
 marsh, 71  
 sulfide-rich, 87  
 wetland, 85
- Septic tank, 211, 217
- Soil  
 aerated, 78  
 aerobic, 16  
 anaerobic, 40, 103  
 anoxic, 103  
 flooded, 46  
 microorganisms, 62, 100  
 mineral, 11, 53  
 organic, 11, 53, 58, 60  
 sulfate-dominated, 61  
 well-drained, 100  
 wetland, 53
- Solar radiation, 305
- Somatic coliphages, 307
- Spartina alterniflora*, 89, 334
- Sphagnum*, 167
- Spirodela*, 129-135
- Stabilization pond, 135, 357, 395, 420, 424
- Standing crop (see also Biomass), 51, 108
- Standing stock, 50, 66, 289, 302
- Steel slags, 298, 299
- Stormwater runoff, 7, 155, 163-165, 323, 413, 429
- Straining, 305
- Sulfate  
 assimilatory reduction, 67  
 dissimilatory reduction, 68  
 reduction, 18, 81
- Sulfide, 70, 72, 81, 167, 225
- Sulfur  
 transformations, 66-74
- Suspended solids, 151, 184, 285, 317
- T**
- Tannins, 421
- Thiobacillus*, 38, 72, 75
- Thiosphaera*, 41
- Thiothrix*, 73
- Trace elements (see also Heavy metals), 80-91  
 adsorption, 84  
 forms in wetlands, 83-86  
 precipitation, 84, 167  
 remobilization, 84
- Typha* spp., 49, 60, 94, 96, 106, 172, **244**, 316, 332, 339, 383, 414, 418
- Typha angustifolia*, 109, 245, 395, 405
- Typha latifolia*, 87, 109, 146, 158, 165, 192, 197, 199, 245, 309, 316, 317, 341, 344, 353, 357, 364, 368-370, 379, 380, 382, 393, 394, 418, 421, 425, 426
- U**
- Uniformity coefficient, 221, 370
- Uptake  
 nitrogen, 46, 289  
 phosphorus, 62, 303
- Urtica dioica*, 261
- V**
- Vallisneria americana*, 146, 147
- Vegetation (see also Macrophytes, Plants)  
 emergent, 151, 234  
 herbaceous, 51
- Vibrio*, 37
- Volcanic gravel, 410
- W**
- Wastewater  
 abattoir, 172, 186, 332, 360, 396, 405, 407, 413  
 agricultural, 8, 155, 160-162, 170, 208, 277-301, 323, 339-344  
 agroindustrial, 323  
 aquaculture, 208  
 bakery, 360  
 cheese production, 333, 334, 277  
 chemical industry, 328  
 combined sewer overflows, 324  
 dairy (farm), 7, 9, 162, 320, 342, 360, 365, 381, 402, 405, 415, 426  
 de-icing, 174, 402  
 distillery, 336, 425  
 domestic, 8, 157, 277, 323, 325  
 electroplating, 311  
 fish farm, 277, 341, 394  
 food processing, 170, 332  
 greenhouse, 369, 394

- hospital, 427
  - industrial, 8, 125, 155, 170, 208, 277-301, 327-339, 372, 378, 419
  - laundry, 339, 414
  - meat processing, 173, 277, 412, 415
  - mining, 208, 338, 402
  - municipal, 6, 8, 155-159, 208, 277-301, 323, 325, 381
  - oil drilling, 405, 428
  - oil refinery (petrochemical), 9, 186, 328, 401, 424, 429
  - pig farm, 162, 277, 339, 405, 413, 424, 430
  - pulp and paper, 170, 329, 402, 405
  - steel mill, 429
  - tannery, 277, 330, 430
  - textile, 9, 311, 331
  - winery, 199, 336, 374, 405
- Water
- collection, 231
  - distribution, 228
- hyacinth (see also *Eichhornia crassipes*), 7, 8
- Weeds, 262
- Wetland
- created, 121
  - functions, 1
  - natural, 3-6, 57
    - cypress, 6
  - plants, 93-120
  - restored, 121
  - values, 1
- Wildlife habitat, 315
- Willow, 200
- Z**
- Zinc, 80, 85, 89, 314
  - Zizaniopsis bonariensis*, 255, 404