

Preface: Shallow lakes from the Central Plains of Argentina

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Published online: 17 February 2015
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This special issue of *Hydrobiologia* is devoted to the shallow lakes of the Central Plains of Argentina. The contributors were invited to submit papers dealing with different ecological topics including physical features, climatic and geological characteristics of the region, as well as studies focusing on aquatic communities (fish, zooplankton, phytoplankton and microbial components).

Most shallow lakes referred to in the present issue are included in an ongoing collaborative effort, the Argentine network for the assessment and monitoring aquatic systems (PAMPA²), which is financed by the CONICET (Consejo Nacional de Investigaciones

Científicas y Técnicas) of Argentina. Lakes were selected across a pronounced climatic gradient within the Pampean plain, encompassing five hydrological systems. Five PAMPA² lakes are equipped with automated buoys for continuous monitoring of their main limnological and weather variables. In addition, all selected lakes are sampled monthly for limnological variables and aquatic communities.

Lakes are increasingly regarded as sentinels of global climate change due to their responsiveness to environmental modifications and their capacity to integrate the variability of the associated watershed (Adrian et al., 2009). Under the current scenarios of global change due to different stressors derived from natural conditions and human activities, the main objective of the PAMPA² project is to anticipate the responses of Pampean shallow lakes to forcing variables such as: climate change, land use change and other anthropic impacts. PAMPA² is conducted by an interdisciplinary team of researchers and students with complementary backgrounds and skills. Interdisciplinary research is becoming increasingly important as the complexity of the ecological problems facing humanity increases (e.g. Goring et al., 2014), and collaborative research teams are particularly necessary in macrosystem ecology, studying broad spatial and temporal scales, and incorporating multiple disciplines and perspectives (e.g. Cheruvilil et al., 2014).

The present issue includes 16 articles. The first one (Diovisalvi et al., 2015a) provides a general

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introduction and review for Pampean shallow lakes. It summarizes the main environmental and ecological characteristics of the shallow lakes of the region, and also includes a comparison of their main limnological features with those of other lakes around the world.

The second article (Lagomarsino et al., 2015) tests the relation of the daily nutrient dynamics with the forcing weather variables in one of the most important shallow lakes of the region.

Five papers deal with different aspects of the phytoplankton communities. Iachetti & Llames (2015) analyse the effect of the light limitation on the phytoplankton assemblages in a highly turbid shallow lake, concluding that the stringent range of light availability promotes the stabilization of the community into a steady-state. The environmental factors that trigger the dominance of phytoplankton species during the warm season in different shallow lakes across the climatic gradient are analyzed by Izaguirre et al. (2015). On the other hand, Sánchez et al. (2015) reports on the changes in the phytoplankton structure over a seven-year period, during the transition from a clear to a turbid regime. Two other papers focus on aspects of the phytoplankton in a particular type of shallow lake of the region, nl. vegetated floodplain lakes. One of them analyses the drivers shaping phytoplankton diversity and composition in these systems (de Tezanos Pinto et al., 2015), whereas the other one constitutes a long term study of bloom-forming Cyanobacteria by means of a morpho-functional approach (ÓFarrell et al., 2015).

The present issue also includes three papers on the planktonic microbial communities and their trophic interactions. One of them (Fermani et al., 2015) analyses the microbial abundance patterns along a transparency gradient, and concludes the existence of a weak coupling between heterotrophic bacteria and flagellates in these eutrophic shallow lakes. Another article (Diovisalvi et al., 2015b) describes the seasonal patterns and the responses of the rotifers community to an extreme climate event. The third paper is a short-term experimental study by means of cross-transplants, where the responses of phytoplankton and related microbial communities in the transition from a clear-vegetated regime to a turbid one and vice versa are analysed (Sinistro et al., 2015).

Four articles deal with different aspects of fish communities. Colautti et al. (2015) highlight the importance of long-term assessments to understand

the influence of climatic factors and the need to maintain or restore natural ecological processes as the basis to support dynamic sustainable fisheries in Pampean shallow lakes. Elisio et al. (2015) evaluate the influence of the thermal conditions of a shallow lake (as a consequence of the climate variations) on the reproductive phenology of pejerrey (*Odontesthes bonariensis*) a highly appreciated, native silverside (Somoza et al., 2008). Moreover, the impact of the increment of water salinity on pejerrey fisheries is analyzed by Berasain et al. (2015). Finally, Chaparro et al. (2015), investigate the effect of the hydrology on the fish predation on zooplankton in a Pampean floodplain lake.

The last two articles of this special issue are related to microbial metabolism and involve different methodological approaches. One paper compares the CDOM and the microbial pelagic metabolism in two shallow lakes with different regime: phytoplankton-turbid and clear-vegetated (Torremorell et al., 2015). The other one (Alfonso et al., 2015) estimates the ecosystem metabolism from a diel oxygen technique in a saline shallow lake of the region employing for the first time in Argentina high-frequency data for a period of over 18 months.

This whole volume, together with the abundant bibliography included in the different articles, provides an up-to-date overview of a set of very important shallow lakes for the Pampean region, which shows peculiar characteristics compared to the more intensively studied shallow lakes in Europe and North America.

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