

## Phytochemicals in medicine and food

Jianbo Xiao



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From June 26th to 29th of 2015, the Phytochemical Society of Europe (PSE) meeting in collaboration with the Phytochemical Society of Asia (PSA)–International Symposium on Phytochemicals in Medicine and Food (ISPMF2015) will be held in Shanghai, China. It is the first time to organize a PSE–PSA conference in China, jointly organized by Macau University of Science and Technology and Shanghai Normal University. The local organizing and sponsoring institutions contain Beijing Normal University, Yancheng Institute of Technology, Guiyang Medical University, and Fudan University. Over 230 scientists from 50 countries have registered to attend this conference.

The international organizing committee of ISPMF2015 consists of Prof. Simon Gibbons (UK), Prof. Miroslav Strnad (Czech), Dr. Milen I. Georgiev (Bulgaria), Dr. Krystyna Skalicka-Woźniak (Poland), Dr. Amir Reza Jassbi (Iran), Prof. Franz Bucar (Austria), Prof. Satya Sarker (UK), Dr. Jianbo Xiao

(China & Germany, Chairman), and Prof. Zhihong Jiang (Macau, Co-Chairman). The international scientific advisory board is comprised of the representatives from Germany, UK, Italy, Romania, Turkey, Netherlands, China, Pakistan, Botswana, Japan, Canada, Australia and USA. The international organizing committee and scientific advisory board of ISPMF2015 assembled an exciting and diverse program, featuring 10 keynote lectures, 24 invited lectures, 50 short lectures, and about 130 posters, which dedicate to creating a stage for exchanging the latest research results in the phytochemicals for food and human health. The overall objective is to provide a forum for the exchange of wide information on natural bioactive compounds from plants and other natural sources used for medicine and food.

ISPMF2015 also has obtained the supports from several international journals including *Phytochemistry Reviews* (Springer), *Food Chemistry* (Elsevier), *Critical Reviews in Food Science and Nutrition* (Taylor & Francis), *Nutrients* (MDPI), *Current Pharmaceutical Biotechnology* (Bentham), *Comprehensive Reviews in Food Science and Food Safety* (Wiley), and *Journal of Agricultural and Food Chemistry* (ACS).

Scientists have brought an interesting trend in pharmaceutical development since the begin of twenty first century: return to nature as a source of potential drugs (Georgiev 2013; Lanzotti 2014). Various nature-origin phytochemicals, such as polyphenols,

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J. Xiao (✉)  
State Key Laboratory of Quality Research in Chinese  
Medicine, Macau University of Science and Technology,  
Taipa, Macau  
e-mail: jianboxiao@yahoo.com

J. Xiao  
Institut für Pharmazie und Lebensmittelchemie,  
Universität Würzburg, Am Hubland, 97074 Würzburg,  
Germany

flavonoids, alkaloids, polysaccharides, stilbenoids, and essential oils, have received an increased attention due to their considerable biological benefits (Georgiev 2014; Xiao et al. 2014). Evidence based on epidemiological data have showed that the natural bioactive compounds play an important role in preventing and managing of modern diseases such as cancers, diabetes, Alzheimer's diseases and cardiovascular diseases (Andrae-Marobela et al. 2013; Xiao and Shao 2013; Lanzotti and Xiao 2014; Xiao 2015; Xiao and Jiang 2015).

*Thymus* species have been widely used as the medicinal or aromatic herbs in the pharmaceutical and food industries. Zeljković and Maksimović focus on the chemical composition and bioactivity of essential oils from *Thymus* species in Balkan Peninsula (Zeljković and Maksimović, 2015). The authors found that more than 90 % of investigations according to the available literature emphasized on the antimicrobial activities of *Thymus* essential oils. There are still missing data for bioactivities for most investigated plants.

Naturally occurring peptides isolated from buckwheat seeds are prospectively applied in the function food and traditional Chinese medicine. Zhou et al. (2015) reviewed the bioactivities including the antibacterial, inhibition of trypsin, antitumor, hypcholesterol, hypotensive and antidiabetic effects of buckwheat proteins and their enzymatic hydrolysates. The antitumor and trypsin inhibitory activities are related to the special active site of the peptides, while the hypolipidemic and the hypotensive capacities are associated with the unique amino acids composition of buckwheat proteins.

*Calceolaria* spp is regarded as a notorious weed and a popular ornamental garden plant, which has also been used as medicinal herb. Cespedes et al. (2015) summarized the phytochemistry and bioactivities of several *Calceolaria* species. New iridoids, flavonoids and phenylpropanoids for these species have been isolated, identified and tested for their insecticidal, antimicrobial, anticancer, proteinase, tyrosinase, and acetylcholinesterase inhibitory activities. *Calceolaria* flavonoids have been found to be potent insecticides and fungicides phenylpropanoids mixtures and iridoids was found to be antifeedant. Kaempferol and gallic acid showed a strong fungicidal activity against phytopathogenic strains. Naphthoquinones have anticancer activity.

Solanesol mainly occurred in solanaceous crops, such tobacco, tomato, potato, eggplant, and pepper plants. Yan et al. (2015) summarized the resource, derivatives, bioactivities, and medicinal applications of solanesol. Solanesol was widely used as an intermediate for the synthesis of ubiquinone drugs, such as coenzyme Q10 and vitamin K2. Solanesol showed antibacterial, antifungal, antiviral, anticancer, and anti-inflammatory activities. Solanesol derivatives can also be used to treat cardiovascular disease, osteoporosis, and acquired immune deficiency syndrome (AIDS).

Soy isoflavones, such as genistein, daidzein, and glycitein, are important bioactive molecules and considered as antioxidants, antibacterial agents, and free radical-scavengers. Xu et al. (2015) described the potential health benefits of interactions between soy isoflavones and other bioactive components, such as vitamins, trace elements, chemotherapeutics, and phytoestrogens. Raju et al. (2015) summarized the application of LC–MS/MS for the identification and quantification of isoflavonoids reported for various plant extracts and food products. The most suitable and acceptable extraction solvent system for the isoflavonoids is methanol or ethanol in combination with water ranging from 40 to 60 % organic solvent based on the type of tissues and the isoflavonoids to be extracted by different extraction techniques. ESI ionization with Q-TOF MS was the most useful detection system for the characterisation and quantification of the diverse isoflavonoids with molecular insights.

Edible freshwater macrophytes are traditionally used as medicines. Chai et al. (2015) highlighted the phytochemical and pharmacological aspects of the natural products derived from freshwater macrophytes. A promising source of anticancer and antioxidant phytochemicals. The freshwater macrophytes-derived natural products exhibited anticancer and antioxidative bioactivities.

Herbs and spices have been used in retaining and boosting human beauty since time immemorial. Narayanaswamy and Ismail (2015) focused on the cosmetic herbs used in Southeast Asian countries Malaysia, Cambodia, Laos, Myanmar, Thailand, Vietnam, Brunei, East Timor, Indonesia, Philippines and Singapore. Many herbs have been evaluated for their cosmetic potentials such as anti-aging, anti-acne, melanogenic and anti-tyrosinase activities. *Labisia*

*pumila* (Kacip fatimah) and *Ficus deltoidea* (Mas cotek) are proposed to be clinically studied for their safety in cosmetic application aspects. The traditional herbs including *Allium sativum*, *Aloe vera*, *Centella asiatica*, *Curcuma longa*, *Hibiscus rosa-sinensis*, *Lawsonia inermis* and *Tamarindus indica* L. were classified as need of special mention.

Brick dark tea is a unique brick formed tea compressed from the older, coarse and rough leaves and branches of *Camellia sinensis* var. *sinensis* and *C. sinensis* var. *assamica* in China. Zheng et al. (2015) reviewed and discussed the modern manufacturing techniques about different kinds of brick dark tea and their influences on the chemical constituents.

Camptothecin is a kind of terpene indole alkaloid which was firstly isolated from native Chinese happy tree *Camptotheca acuminata* and shows anti-tumor activity. The camptothecin derivatives, irinotecan and topotecan, have been approved by FDA for the treatment of various cancers throughout the world. Hu et al. (2015) focused on different human malignancies with demonstrated clinical efficacy of camptothecin analogues. The modification of different rings of camptothecin will significantly improve its pharmacokinetics and toxicity profiles. Among them, topotecan, irinotecan and belotecan were proved to be the three most effective camptothecin analogues in the treatment of various malignancies. Kai et al. (2015) summarized the recent advances in the biosynthesis pathway, molecular regulations and various biotechnological approaches for improving the production of camptothecin. Biotechnological approaches such as plant cell suspension, hairy root and endophytic fungi have provided effective platforms to produce camptothecin. Transgenic hairy root culture have revolutionized the role of tissue culture of plants in the production of secondary metabolites. Matveeva et al. (2015) summarized the influence of agrobacterium oncogenes on secondary metabolites of plants.

Lotus seeds are currently the oldest known plant seeds, and contain many functional ingredients. Lotus seeds show prospective application in function food area and traditional medicine research. Zhang et al. (2015) reviewed the nutrition composition, physiological functions and processing methods of lotus seeds and described their impact on nutrient preservation. Proteins and carbohydrates are the main nutrients of lotus seeds. Low fat content and good proportion of amino acids confer to lotus seeds unique

nutritional values. The ingredients from lotus seeds exhibited antioxidant activity, hypoglycemic, immunomodulatory, antibacterial, anti-inflammatory, analgesic activities, and gastrointestinal regulation.

*Saussurea medusa* Maxim (snow lotus) is an important traditional herbal medicine with a broad spectrum of therapeutic efficacies. Fan et al. (2015) summarized the traditional uses and current knowledge concerning the botany, phytochemistry, pharmacological effects, toxicology studies and clinical applications of snow lotus. More than 70 phytochemicals have been isolated and identified, including apigenin, quercetin, rutin, arctigenin, saussureoside A, and saussureoside B. Modern pharmacological studies have found that snow lotus has anti-inflammatory, analgesic, antifungal, antitumor, antioxidant, and anti-fatigue effects. This plant also benefits the uterus, cardiovascular system, intestines, tracheal smooth muscle, and immune system.

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