



•Editorial•

## Strengthen the research on the medicinal and edible substances to advance the development of the comprehensive healthcare industry of TCMs

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Available online 20 Jan., 2019

Traditional Chinese medicines (TCMs) have greatly boosted the prosperity of the Chinese Nation under the direction of TCM theory system, which have centuries of clinical practice. They are not only unique health and economic resources with great potential, but also the valuable sources of new drug development in China. There are approximately 12 000 kinds of traditional Chinese medicinal materials including over 1 200 varieties which are marketable<sup>[1]</sup>. Among TCMs, the medicinal and edible substances (MESs) are very important and special categories, which can be used as both TCMs and foods (homology of medicines and foods). They have been used for a long time and are still constantly consumed by people. They are widely used and generally safe, which form huge industry. 101 species of MESs were issued by National Health Commission of the People's Republic of China, such as the fruit of *Lycium barbarum*, the sclerotium of *Poria cocos*, and the fruit of *Rubus chingii*. The homology of medicines and foods reflected the recognition of ancient Chinese in the homology theory of treatment and healthcare of medicines and foods. The ancients believed that medicines and foods followed the same principles, including four properties and five tastes, meridian tropism, and ascending and descending<sup>[2]</sup>.

In 2015, the industrial output value of TCMs reached ¥786.7 billion, accounting for 28.55% of the pharmaceutical industry<sup>[3]</sup>. The change of disease spectrum, the approaching of aging society, the transformation of lifestyles, and people's constant pursuit for health have created the room for the development and marketing of comprehensive TCM healthcare industry, and hence the role and status of MESs will be more

prominent. However, the foundational research of many MESs still remains inadequate. Taking the fruit of *L. barbarum* (wolfberry) as example, wolfberry, a valuable and traditional MES, has long been used to nourish liver and kidney and brighten eye in China. The main supplying area of wolfberry is northwest China, and the output value of wolfberry in Ningxia Hui Autonomous Region exceeded ¥10 billion in 2015<sup>[4]</sup>. In recent years, wolfberry is one of the fastest-growing export TCMs, which has been exported to many European countries and North America. In 2015, the total export value of wolfberry was 108 million dollars, accounting for 3.84% of the total export value of TCMs<sup>[5]</sup>. Wolfberry is a hot study topic, on which 20 000 papers have been published by 2015. However, the major small-molecule compounds have not been clarified. Recently, a systematic study on the small-molecule compounds of wolfberry was carried out, and a kind of new, characteristic, major, and bioactive constituents (lycibarbarspermidines) were firstly isolated from wolfberry<sup>[6-8]</sup>. The researches on wolfberry have attracted extensive attention of domestic and foreign scholars, and the relevant paper belonged to ESI highly cited paper<sup>[6]</sup>.

In this issue of *Chinese Journal of Natural Medicines (CJNM)*, we are pleased to organize several foundational research papers on MESs and the relevant substances. LIU Hong-Wei *et al.*<sup>[9]</sup> reported that the water insoluble polysaccharide from the sclerotium of *P. cocos* (Fu-Ling) modulates gut microbiota to improve hyperglycemia, hyperlipidemia, and hepatic steatosis in *ob/ob* mice. This result indicated the potential of the water insoluble polysaccharide from Fu-Ling as a prebiotic for the prevention or cure of metabolic diseases. Three protein tyrosine phosphatase 1B (PTP1B) inhibitory ursane-type triterpenoids were isolated from the fruit of *R. chingii* (Fu-Pen-Zi) by LI Wei and WANG Jian *et al.*<sup>[10]</sup>. Combined with five structurally related triterpenoids, the structure-activity relationship was analyzed. SHANG Xiao-Ya and LIN Sheng *et al.*<sup>[11]</sup> reported that four taraxastane-type triterpenoids were obtained from the TNF- $\alpha$  secretion inhibi-

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These authors have no conflict of interest to declare.

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tory active fraction of *Cirsium setosum* (Xiao-Ji), and two new compounds possessed the above activity with the  $IC_{50}$  2.6 and  $3.8 \text{ } \mu\text{mol}\cdot\text{L}^{-1}$ . Two new and ten known triterpenoids were isolated from the flower buds of *Lonicera macranthoides* (Shan-Yin-Hua) by YU Yang and YAO Xin-Sheng et al. [12], and two new compounds exhibited inhibitory effects on iNOS at the concentration of  $30 \mu\text{mol}\cdot\text{L}^{-1}$ .

*Antrodia camphorate* (named Niu-Chang-Chih), a well-known and highly valued edible medicinal mushroom, is considered as a present from heaven in Tai-Wan. To meet the demand of *A. camphorate*, LIN Ting and CHEN Hai-Feng et al. [13] provided a potential substitute, namely the petri-dish cultured *A. camphorate*. The research showed that the petri-dish cultured *A. camphorata* produced a large array of unique and same anthroic acids as those of the wild one, and the petri-dish cultured *A. camphorate* was edible safety and showed hepatoprotective activity towards ethanol induced liver injury mice. Beside the nutrition value, many common foods also possessed healthcare function. SO Kwok-Fai, WONG Nai-Kei and XIAO Jia et al. [14] summarized the up-to-date mechanistic pathways associated with the anti-proliferative, anti-metastatic, and proapoptotic effects of *S*-allylmercaptocysteine (SAMC, a major water-soluble allyl amino acid derivative from aged garlic) in various cancer models. They suggested that SAMC has gained recognition as a promising daily food supplement for cancer prevention and management.

The insufficient foundational research of MESs is incommensurate to their extensive application and huge industry, which has restricted the high-quality development of the comprehensive healthcare industry. The systematic and in-depth foundational research of MESs is in urgent needs, including chemical constituent, pharmaceutical effect, action mechanism, quality standard, and so on. We believe that the systematic and in-depth foundational research of MESs will promote the comprehensive healthcare industry of TCMs.

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**Cite this article as:** GAO Hao, YAO Xin-Sheng. Strengthen the research on the medicinal and edible substances to advance the development of the comprehensive healthcare industry of TCMs [J]. *Chin J Nat Med*, 2019, **17**(1): 1-2.



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