

Highlight of Publications on *Chinese Traditional and Herbal Drugs* in 2008

LIU Yan-ze*

McLean Hospital/Harvard Medical School, Belmont, MA 02478, USA

Chinese Traditional and Herbal Drugs (CTHD), also known as *Zhongcaoyao*, was founded in January 1970. There are 40 volumes, near 500 issues including supplemental to 2009 have been published. In 1992 it was awarded national core publication published in Chinese and kept the title to date via four times reevaluations at 1996, 2000, 2004, and 2008. As one of the core publications of Chinese natural science, it ranks number one among Chinese materia medica (CMM) related journals and top 15 of the most cited journals in Chinese scientific publications in recent six years. It has been collected in the *Chemical Abstract* (CA), *International Pharmaceutical Abstract* (IPA), and IM/MEDLINE of the USA, *Abstract Journal* (AJ) of the Russia, *Medical Abstract* (EMBASE) of Holland, and IC of Poland, etc. international renowned searching systems. The range of original paper of research and development covers chemical constituents of Chinese traditional and herbal drugs, pharmaceutical technology, process of crude drugs, quality assurance of herbal products, analytical methods, pharmacological experiments, clinical studies, raising and cultivating of medicinal animals and plants, and survey and sustainable use of medicinal sources. It also publishes the articles in the category of forum of modernization of CMM, review, short report, introduction of manufacture and new product, academic, and other information.

During 2008, there are total 535 scholastic papers published in the four major areas, i.e. chemical constituents (132), pharmaceutics and quality (143), pharmacological studies and clinical observation (134),

and medicinal materials (126). Review is also one of major categories published in the journal. There are total 75 review articles published in this volume, dealing with various aspects related with Chinese herbal medicines, such as research progress of single traditional herbal medicine, standardized extract, active or marker compound, one kind of compounds, botanical family or genus, analytical methods, pharmaceutical and biological technology, and introduction of special area, and so on.

Chemistry and new compounds reported

As a leading area of the modernization of CMM, chemical research of Chinese herbal medicines is always in an important position and attracts more attention nationwide. Among those 132 papers, 120 botanical materials were included and 31 of them are considered as popular medicines, e. g. *Paeonia veitchii* Lynch, *Lonicera japonica* Thunb., *Cornus officinalis* Sieb. et Zucc., *Pinellia ternata* (Thunb.) Breit., *Siraitia grosvenori* (Swingle) C. Jeffrey ex Lu et Z. Y. Zhang, *Codonopsis pilosula* (Franch.) Nannf., gall of *Rhus chinensis* Mill., *Sophora flavescens* Ait., *Fritillaria hupehensis* Hsiao et K. C. Hsia, and *Alisma orientalis* (Sam.) Juzep., etc. Diversity of investigated materials was clearly seen from other objects. New compounds and new finding of known compounds from targeting materials are still priority to be published. The compounds reported during 2008 are summarized as following (Fig. 1).

Analytical and quality control

*Corresponding author: Liu YZ, Tel: 617-855-2061; Fax: 617-855-2040, E-mail: yliu@mclean.harvard.edu
Received: July 29, 2009; Accepted: August 20, 2009

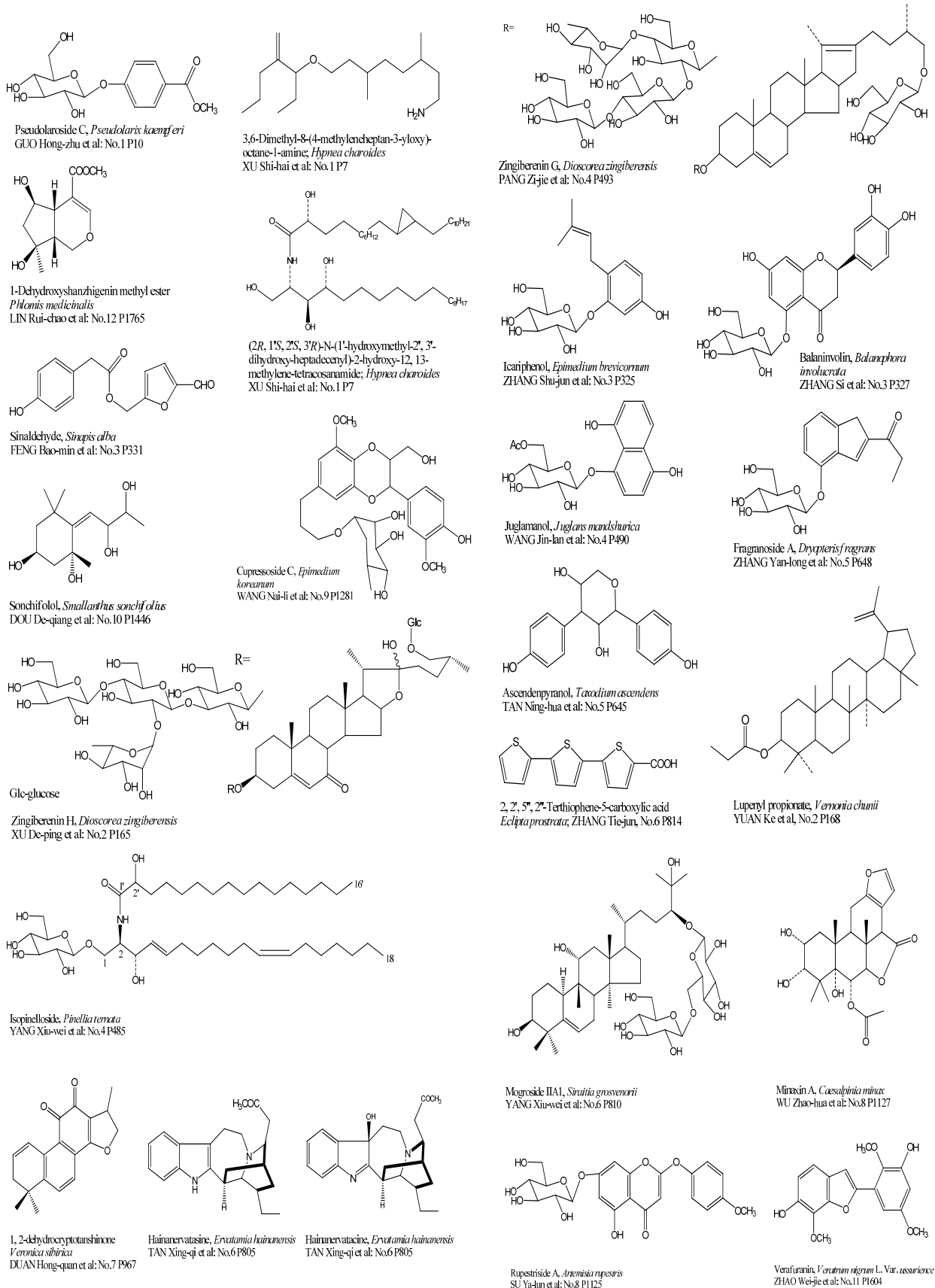


Fig. 1 New compounds published on CTHD in 2008

HPLC fingerprinting method for quality assurance of crude drugs and herbal products is still a strong trend to be applied. Fig. 2 summarized typical HPLC fingerprints of some crude drugs, single extract, and compound extract.

Pharmaceutical and technology

Study on the silymarin and its components silybins is still one of the hottest area in the world. To solve the problem of poor solubility of silybins and improve its

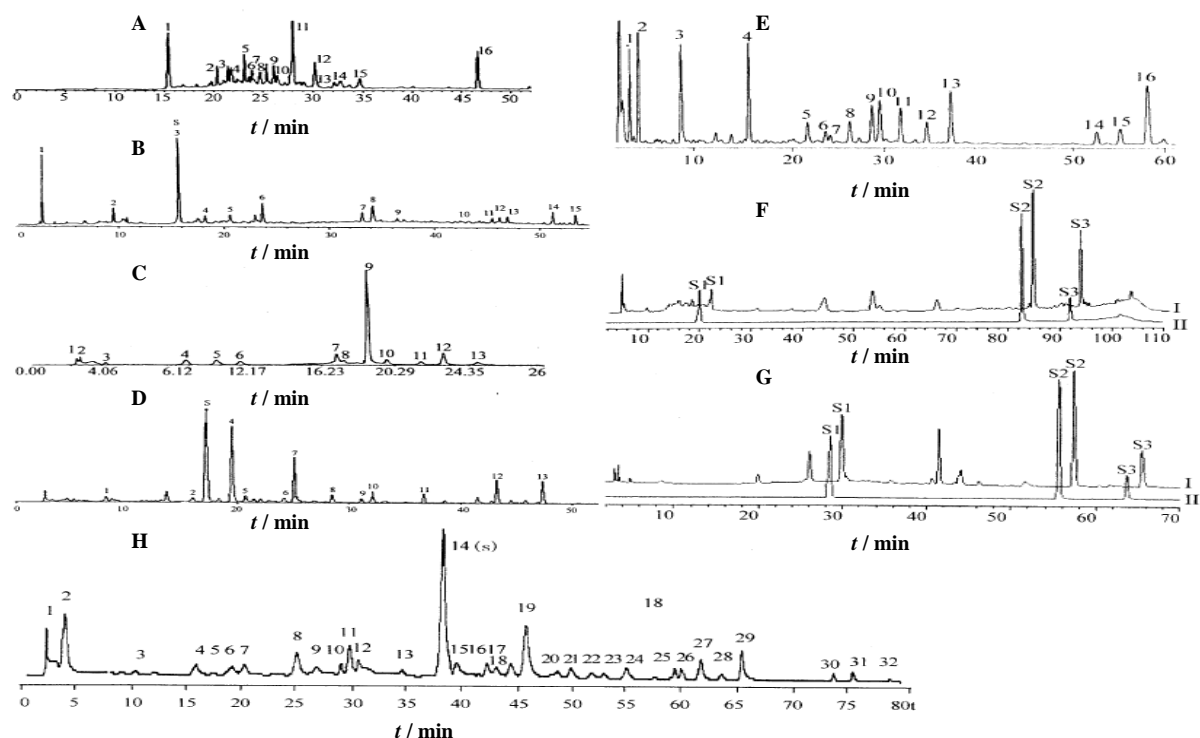


Fig. 2 HPLC fingerprints of some Chinese herbal medicines

A. *Lycium barbarum* L.: Total flavonoids (Ningxia Gouqi, Zhang ZP, *et al.* No.1 P103)

B. *Dendrobium candidum* Wall. ex Lindl.: MeOH ext. (Tiepi Shihu, Lu TL, *et al.* No.3 P433)

C. *Saussurea involucre* Kar. et Kir. 70% MeOH ext. (Tianshan Xuelian, Yuan XF, *et al.* No.1 P105)

D. *Citrus aurantium* L.: MeOH ext. (Suancheng, Luo GM, *et al.* No.3 P430)

E. *Radix Astragali*: 50% MeOH ext. (Huangqi, Zhang QY, *et al.* No.7 P1089)

F. *Radix Polygoni Multiflori*: MeOH ext. (He Shouwu, Zhang LT, *et al.* No.5 P766)

G. *Caulis et Folium Polygoni Multiflori*: EtOAc ext. (Ye Jiaoteng, Zhang LT, *et al.* No.5 P766). F_I, G_I: sample; F_{II}, G_{II}: standard; S1: stilbene glycoside; S2: emodin; S3: physcion

H. *Sanhuang Xiexin* Decoction: MeOH ext. [Composed of *Radix Scutelloria* (Huangqin), *Rhizoma Coptidis* (Huanglian), and *Radix et Rhizoma Rhei* (Dahuang), Ma YL, *et al.* No.4 P524)

bioavailability attracts the attention of chemists and pharmacists. Wang CL, *et al.* (No.1 P51) successfully prepared stable oral microemulsion of silybins by screened optimum technology through the combination of measuring surface tension, drawing pseudo-ternary phase diagram, and orthogonal design. The paper claims that the silybins was provided by Panjin Green Bio-source Company, but it looks like diastereoisomeric silybin A and silybin B, instead of marked

silybin and isosilybin. As paper published (Lee YW and Liu YZ, *J Nat Prod*, 2003), diastereoisomeric silybin A, silybin B, isosilybin A, and isosilybin B each of them has specific stereochemistry and retention time of RP-HPLC by above order. Two pairs of peaks representing silybin A, silybin B, isosilybin A, and isosilybin B should be observed clearly in its RP-HPLC chromatography.

Enzyme or microbial assisted technology for the

extraction of active compounds from herbal medicines is opening an exploring field. He ZM, *et al* (No. 8 P1161) investigated multi-enzyme assisted extraction of Danshensu from *Salvia miltiorrhiza* Bge. By comparing with traditional multistep boiling water extraction, extraction rate was 1.98% less and 3.55% higher than common boiling water extraction. But the time consumption is only 2/3 of traditional extraction, saved energy cost and reduced the decomposition by decreased temperature from 100 °C to 50 °C. The only defect is that Danshensu [(D)-(+)- β -(3, 4-dihydroxyphenyl) lactic acid] used as standard was quantitated with UV₂₈₀ spectrometric method. Because Danshensu is only a structural unit of salvianolic acids which would have similar UV absorption with Danshensu, the result of the content should represent the content of total salvianolic acids.

The buds of *Sophora japonica* L. is the main sourcing material of rutin, a very popular medicinal material for hypertension and other cardiovascular diseases. Efficiency of extraction technology significantly affects the quality of final product and then profits for manufacture. Wang JW, *et al* (No.11 P1637) reported laccase-assisted extraction of rutin from the buds of *S. japonica*. Result of optimized technology shows that the content of rutin (total flavonoids) of extractive solution was 11.4%, which was 28.7% higher than ordinary with water extraction method. The problem of the report was that there was no final product obtained, but only content of total flavonoids instead of rutin. Big volume of water containing enzyme as solvent (40 times of material) and time consumption of over 24 h are also hard to be applied.

Pharmacology and safety

Several species of *Sargassum* (Turn.) Ag. plants were reported to have significant biological activities including antitumor, antioxygen, antibacterial, and anti-HIV. *S. thunbergii* is a popular one distributed in the east coast of China. Wei YX, *et al* (No.1 P93) investigated the antitumor activity of *Sargassum* polyphenol STK1

obtained from 85% ethanol extraction, purified by ether and chloroform, and finally permeation through micro-membrane against A549 and BEL-7402. STK1 ($M_t > 1 \times 10^4$, 3.5 mg/mL) and STK2 ($M_t < 1 \times 10^4$, 13.6 mg/mL) all shows the significant inhibition and STK1 are stronger. Other reports showed that STK1 and STK2 belong to phlorotannins. Further mechanism and chemical studies should be pursued further.

Efficacy and toxicity of *Wutou* (main root or mother root of *Aconitum carmichaeli* Debx.) and *Fuzi* (side root or baby root of *A. carmichaeli*) are always major concern clinically and pharmaceutically. In order to be safe, over processed *Wutou* and *Fuzi* are often observed and more likely to be accepted. But significant lose of diterpenoid alkaloids with double and/or single ester bond which bear activity and toxicity has been attracting researcher's attention for many years. Gong QF, *et al* (No.9 P1413) reported quantitative analysis of three double estering alkaloids aconitine, hypoaconitine, and mesaconitine in *Yan Fuzi* (salt-treated *Fuzi* from Jiangyou, Sichuan Province). The average contents of those three alkaloids in three batches of *Yan Fuzi* are 4.08, 47.75, and 14.32 μ g/g. The total amount of these three alkaloids is less than 1/3 of the limitation of aconitine (0.02%) in *Pharmacopeia of the People's Republic of China* (PPRC), while aconitine is only 2% of the limitation of PPRC. So, the efficacy and toxicity, safety and effectiveness are still serious controversial and needs to pay more attention for extensive and comprehensive research.

Western ginseng (*Panax quinquefolium* L.) contains similar ginseng saponins with *P. ginseng*, which are well known as representative active components from both of the roots and aerial part. Ginseng saponins also show significant antitumor activity for several cancer cell lines and aglycones are stronger than glycosides through the studies on the relationship of structure-activity. Zhao YQ, *et al* (No.9 P1291) isolated a secondary aglycone, called 20 (*R*)-dammarane-3 β , 12 β , 20, 25-tetrol after acid hydrolysis of total saponins from the aerial part of

Western ginseng, which has been previously proved from the aerial part of *P. ginseng*. 20 (*R*)-dammarane-3 β , 12 β , 20, 25-tetrol shows 5–15 times stronger antitumor activities for four tumor cell lines than Rg₃. This is the first report from the aerial part of Eastern ginseng by acid hydrolysis with strong potential for the development of Western ginseng.

Reviews

Review is also one of the main types of the publications on CTHD. Field progress, high-tech introduction, advanced method and instrumentation, comprehensive and systematic knowledge, chemical and biological study of single herb, compound formula, extract, active or marker compound, quality control, etc. are all being included. Yang YF (No.8 P1259) reviewed the application of Ultra Performance Liquid Chromatography (UPLC), Rapid Resolution Liquid Chromatography (RRLC), and Ultra Fast Liquid Chromatography (UFLC) on CMM and its preparations with 32 references cited. All these methods are based on same or similar fundamental principle, i.e. using ultra fine carrier of stationary phase with maximum active surface. Fu XH, *et al* (No.8 P1272) systematically introduced the application of High Speed Counter Current Chromatography (HSCCC) focused on the screening model of solvent conditions in non-polarity or weak polarity system, moderate polarity system, and hydrophilic system with illustration and applied examples. It provides a useful reference for those who work in this area.

Research on functional genes is one of the newest and hottest areas internationally and gradually permeated to the medicinal plants. The technology of Expressed

Sequence Tags (ESTs) is a fast and high performed method to investigate bio-gene and gene group. Chen SL, *et al* (No.5 P778) systematically reviewed the principle, characters, superiority, current status, applied research, and application in the research of medicinal plants of ESTs technique and cautions during research with 39 references.

Reviews on structure-activity relationship of curcuminoids in anti-inflammation and cell-protection (Li XK, *et al*. No.4 P619), advances in studies on antiviral activities of flavonoids (Wu XQ, *et al*. No.4 P623), and advances in studies on iridoids in plants of *Swertia* L. and their pharmacological activity (Zhang TJ, *et al*. No.5 P790) are also very interesting and informative.

The forum of modernization of CMM provides a space and stage for scientists who are willing to demonstrate their vision and perspective for the modernization of CMM. A new professional term, called Modern CMM Processing Piece, a special form of CMM processed by modern technologies, was proposed and expounded in contrast with traditional concept and processed extract by Prof. Zhao TZ, *et al* (No.2 P161). The borderline, workability, and practical value need to be further discussed. Even so, the name of Modern CMM Processing Piece also needs to be further deliberated, because of Processing Piece is obviously not proper to represent what it should be like a “special processed form”.

Authors are very grateful from learning the valuable articles published on the CTHD to present this highlight. Authors also feel sorry for a lot of contributions which couldn't be included in this short article.