CGCM Regional Report-Shanghai

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Shanghai Institute of Materia Medica
Chinese Academy of Sciences

Major Institutions and Research Field in Shanghai

Major institutions:
- Shanghai Institute of Materia Medica;
- Shanghai University of Chinese Medicine;
- Second Military Medical University;
- Tongji University;
- Fudan University;
- Shanghai Jiaotong University;
- Shanghai TCM Innovation Center.

Research field:
- TCM quality standard, TCM chemistry, TCM pharmacology & Systems Biology and TCM new drug development.
In 2008, “National Engineering Laboratory for TCM Standardization Technology” granted.

Collaborative Institutions:
- Shanghai TCM University;
- Second Military Medical University;
- Chendu Institute of Biology;
- Dalian Institute of Chemical Physics, etc.

National Collaborative Projects lead by Shanghai

1. SATCM Special Fund for TCM: TCM International Suggested Quality Standards Research (Shanghai Institute of Materia Medica, Shanghai TCM University, SATCM Key Lab for Quality, China Pharmaceutical University);

2. National Drug Innovation Project: TCM New Drug Safety Detection Technology and Standard Research (Shanghai Institute of Materia Medica, Shanghai TCM University);


International Conferences Organized

• 2008-present, Shanghai International Conference on TCM and Natural Medicine (S-TCM, held 6 meetings in a row, 7th meeting will be in October 16-17, 2014);
• 2010-present, International Conference on TCM Analysis (5 meetings held, this year in July 18-20).

Major International Collaborations

1. Sino-US TCM Research Center in 2011 with University of Mississippi, USA
2. Collaborative TCM Research Center in 2013 with University of Graz, Austria
National and International TCM Quality Standards Elaborated by Shanghai Team

- Over 100 TCM quality standards were drafted and adopted by Chinese Pharmacopoeia;
- 9 TCM quality standards accepted by United States Pharmacopoeia;
- 3 TCM quality standards submitted for European Pharmacopoeia.

Salvia miltiorrhiza (Danshen)

*Salvia miltiorrhiza*

Function: activating blood circulation to dissipate blood stasis
Indication: coronary heart disease.
Yearly gross sale: ≈30 billion RMB (5 billion Dollars)
IDENTIFICATION

ASSAY

SSDMC
(single standard to determine Multi-components)

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Relative Retention</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryptotanshinone</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>Tanshinone I</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>Tanshinone II_A</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

Result = \( r_u / r_s \) \( \times \) \( C_u / C_s \) \( \times F \) \( \times 100 \)

\( F \) = conversion factor for analytes

1.18 for cryptotanshinone,
1.31 for tanshinone I,
and 1.00 for tanshinone II_A

---USP 37 NF 32

**Drafted Quality Standard of Salvia**

1- salvianolic acid B (RF=0.23)
2- lithospermic acid (RF=0.29)
3- rosmarinic acid (RF=0.34)
4- BRM
5,6,7 sample solution
8- tanshinone II_A (RF=0.76)
9- tanshinone I (RF=0.68)
10- cryptotanshinone (RF=0.50)

**IDENTIFICATION ASSAY**

**IDENTIFICATION**

**Polysaccharides**

**Triterpenoic acids**

**ASSAY**

**Ganoderma lucidum (Lingzhi)**

---USP 38 DSC-HMC

Triterpenes and polysaccharides are two major classes of constituents in *Ganoderma lucidum.*
**Panax notoginseng (Sanqi)**

---USP 38 DSC-HMC

### Identification

![Identification Image]

**A UPLC-SSDMC method**

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>RRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notoginsenoside R1</td>
<td>1.09</td>
<td>0.78</td>
</tr>
<tr>
<td>Ginsenoside Rg1</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Ginsenoside Rb1</td>
<td>1.02</td>
<td>1.06</td>
</tr>
<tr>
<td>Ginsenoside Rb1</td>
<td>1.03</td>
<td>1.76</td>
</tr>
<tr>
<td>Ginsenoside Rd</td>
<td></td>
<td>2.02</td>
</tr>
</tbody>
</table>

Assay finishes within 5min

The quality control of Notoginseng was mainly focused on the major saponins.

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**Uncaria rhyophylla (Gouteng)**

---EP PharmaEuropa

### TLC Identification

![TLC Identification Image]

**ASSAY -content of total alkaloids**

![Assay Content Image]

The quality control was mainly focused on nine Indole alkaloids.

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Globalization of TCM Quality Standards

- **CHP-USP MOU**
  
  **Goal:** 100 TCM monographs in USP Herbal Medicine Compendium.
  
  3 TCM monographs were adopted.

- **SATCM-EDQM MOU**
  
  **Goal:** 200 TCM monographs in EP.
  
  45 TCM herbs were adopted in EP.

National and International Awards

- Second Prize of National Science and Technology Award in 2010 (Wei-dong Zhang, Second Military Medical University);

- Second Prize of National Science and Technology Award in 2010 (Zheng-tao Wang, Shanghai University of Chinese Medicine);

- Second Prize of National Technology Invention Award in 2011 (Li-jaing Xuan, Shanghai Institute of Materia Medica);

- Second Prize of National Natural Science Award in 2012 (De-an Guo, Shanghai Institute of Materia Medica);

- Second Prize of National Natural Science Award in 2013 (Jian-min Yue, Shanghai Institute of Materia Medica);

- Norman Farnsworth Excellence in Botanical Research Award, in 2012, American Botanical Council, the only winner in Asia;

- Outstanding Contribution Award in Natural Product Science, 2013, Oxford, ICSB, the first winner.
New Drug Development-Depside Salt

- Developed by SIMM-Prof. Li-jiang Xuan
- International and Domestic Patents
- New drug license issued in May 2005
- Sales revenue 3.5 billion RMB in 2013

Lyophilized Powder

TCM Future Perspective--Modernization & Globalization

Main route

Phytochemistry + HTP screening = Lead compounds

TCM Modernization

Safety + Efficacy + Quality + Mechanism

Goal: Evidence-based medicine!
Future Inter-Association Cooperation

- To hold joint meetings among different societies;
- To establish a coordination mechanism;
- To make joint efforts for TCM Globalization.

Thank you for your attention!