

A photograph of a modern, multi-story building with a curved facade and large glass windows, identified as the Shanghai University of TCM. The building is surrounded by green trees and landscaping. The text "REGIONAL REPORT (SHANGHAI)" is overlaid in large, bold, red capital letters.

REGIONAL REPORT (SHANGHAI)

Zijia Zhang

Shanghai University of TCM

20th CGCM Meeting, Hengqin, 2024

10 CGCM Member Institutes in Shanghai

- Shanghai University of TCM / Shanghai Academy of TCM 上海中医药大学/上海市中医药研究院(SHUTCM)
- Shanghai R&D Center for Standardization of Chinese Medicines 上海中药标准化研究中心(SHCSCM)
- School of Pharmacy, Fudan University 复旦大学药学院(FUDAN)
- School of Pharmacy, Shanghai JiaoTong University 上海交通大学药学院(SJTU)
- School of Sciences and Technology, Tongji University 同济大学生命科学与技术学院(TONGJI)
- School of Pharmacy, East China University of Science and Technology 华东理工大学药学院(ECUST)
- Modern Research Center for TCM, Second Military Medical University 第二军医大学现代中药研究中心(SMMU)
- Shanghai Research Center for TCM Modernization, Shanghai Institute of Materia Medica 中国科学院上海药物研究所, 上海中药现代化研究中心(SIMM)
- Institute Pasteur of Shanghai, Chinese Academy of Sciences 中国科学院, 上海巴斯德研究所
- Shanghai PharmValley Innovation Institute of Biomedicine 上海药谷生物医药创新研究院



Major Research Fields in TCM

- **Quality Evaluation and Standardization of Chinese Medicines**
- **Natural Products Chemistry**
- **Pharmacological activities of TCM compounds, herbs and formula**
- **Pharmaceutics of TCMs**
- **Biotechnology of medicinal plants and natural products**
- **Innovative medicines development and preclinical studies**
- **TCM informatics (databases, target prediction, etc)**
- **healthcare products**
- **Technical service**

Quality Grade Standards of Prepared Slices of Chinese Crude Drugs

High Price for High Quality

**Funded by the Three-year Action Plan for the Development of
Traditional Chinese Medicine of Shanghai (2021-2023)
上海市中医药传承创新发展三年行动计划**

Selection of Prepared Slices

Twenty Commonly used and bulk Prepared slices were selected:

GINSENG RADIX ET RHIZOMA 人参

CODONOPSIS RADIX 党参

SCROPHULARIAE RADIX 玄参

SALVIAE MILTIORRHIZAE RADIX ET RHIZOMA 丹参

ASTRAGALI RADIX 黄芪

NOTOGINSENG RADIX ET RHIZOMA 三七

REHMANNIAE RADIX 生地黄

REHMANNIAE RADIX PRAEPARATA 熟地黄

DIOSCOREAE RHIZOMA 山药

PAEONIAE RADIX ALBA 白芍

EUCOMMIAE CORTEX 杜仲

PLANTAGINIS SEMEN 车前子

ISATIDIS RADIX 板蓝根

LYCHII FRUCTUS 枸杞子

GARDENIAE FRUCTUS 栀子

MORINDAE OFFICINALIS RADIX 巴戟天

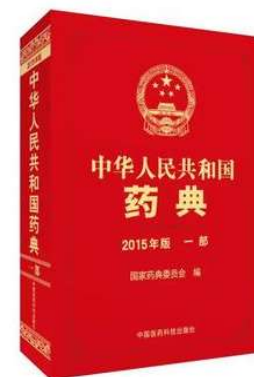
GENTIANAE MACROPHYLLAE RADIX 秦艽

PHELLODENDRI CHINENSIS CORTEX 黄柏

ANEMARRHENAE RHIZOMA 知母

SCHISANDRAE CHINENSIS FRUCTUS 五味子

DENDROBII CAULIS 石斛



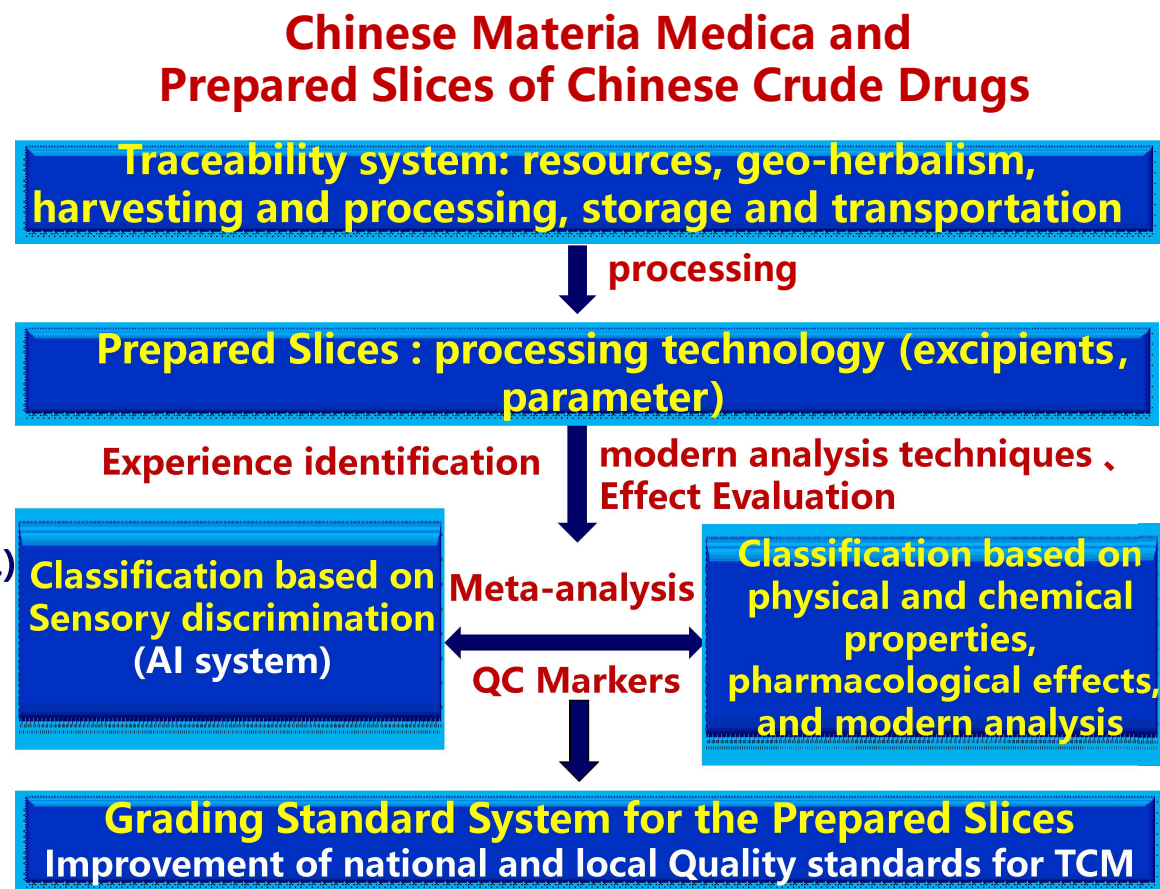
Some with characteristic processing method of Shanghai:

Codonopsis Radix (stir-baked with honey and bran) 蜜麸炒党参

Dioscoreae Rhizoma (stir-baked with honey and bran) 蜜麸炒山药

Research Content and Technical Route

1. Sample collection, Identification and preliminary grading
2. Processing and preliminary grading
3. Identification (macroscopic and microscopic identification)
4. Identification (TLC and characteristic chromatogram)
5. Test (Pesticide residues, heavy metals and harmful elements, plant growth regulators, etc.)
6. Assay (principal component, Total composition)
7. Chemical constituents、 pharmacodynamics
8. Bioassay (Development and Application)
9. Comprehensive evaluation



NOTOGINSENG RADIX ET RHIZOMA 三七 (Sanqi)

Market Investigation and Sample collection

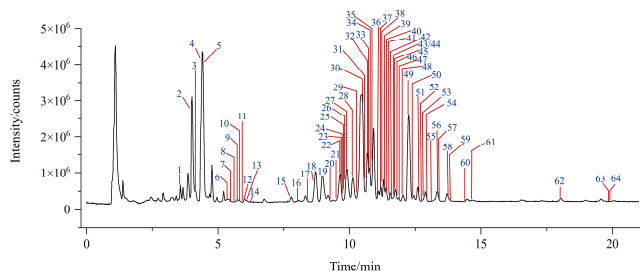
Current commercial specification grade
("Tou" , by weight and size)

On the market, Sanqi is powdered with a specified number of "Tou"



10 batches per "Tou", for a total of 70 batches

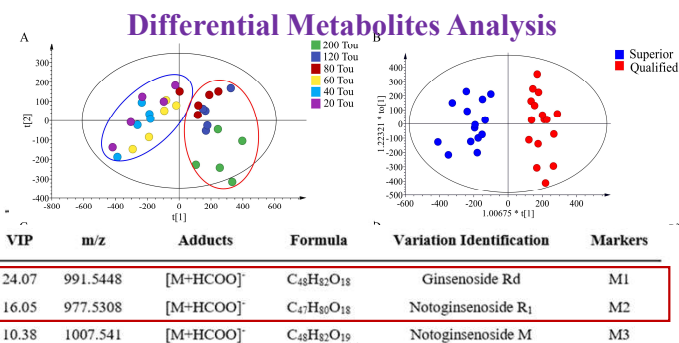
Identification and characterization of saponins



No.	Rt (min)	Measured m/z	Theory m/z	Proposed formula	Mass error (ppm)	MS/MS fragments	Identification
1	3.56	1007.5457	1007.5427	$C_{48}H_{82}O_{19}$	2.98	961.544 3; 799.490 0; 637.434 5; 475.379 2; 323.097 7; 221.068 6; 119.033 6	Notoginsenoside M
2	4.03	977.5367	977.5322	$C_{47}H_{80}O_{18}$	4.60	931.529 1; 799.486 9; 637.433 5; 619.424 3; 475.380 0; 179.056 9; 161.046 3	Notoginsenoside R ₁
3	4.19	979.5439	979.5478	$C_{48}H_{82}O_{18}$	-3.98	933.544 1; 801.506 9; 638.452 2; 475.391 5	Notoginsenoside F ₁

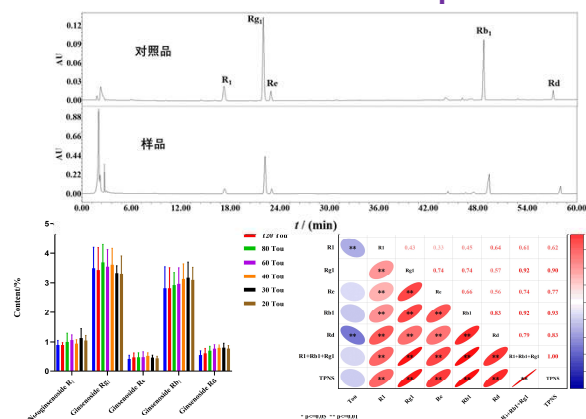
64 ginsenosides were identified ...

Correlation analysis of Morphological characteristic and intrinsic components



21 Differential compounds were found
VIP Value: Notoginsenoside R₁, Ginsenoside Rd

Content Determination of saponins



The content of Notoginsenoside R1 and Ginsenoside Rd are positively correlated with the size of Panax notoginseng

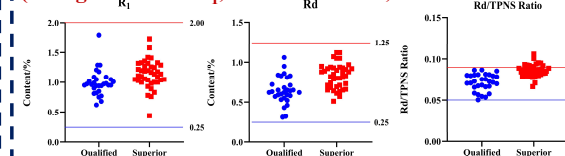
Grading Indicators

Grading indicator based on
Morphological characteristic

Selected slices : 20~60 "Tou" ,
Gradeless and uniformly-priced slices:
80~200 "Tou"

Chemical Markers

(Notoginsenoside R₁, Ginsenoside Rd, Ginsenoside Rd/TPNS)



Grading scale

Item		Grade	
		Selected	Gradeless and uniformly-priced
Description	Powder color	Greyish-yellow to yellow	Greyish-yellow
	Single weight	14g~25.0g (20~60 Tou)	1.6g~14g (80~200 Tou)
	Texture	Text heavy and compact.	Text heavy and less compact.
Assay	R1+Rg1+Rb1+Re+Rd	6.0%	
	Notoginsenoside R ₁	≥ 0.60%	0.50%
	Ginsenoside Rd	≥ 0.50%	0.40%
	Rd/TPNS	≥ 0.08	0.05~0.08

Selected : 32; Unselected : 28; unqualified: 10

Achievements

Research and Publication of the National and Local quality Standards

Local quality Standards

- 20 Prepared Slices Grade Quality Standards (Draft) were submitted to Shanghai Association of Traditional Chinese Medicine Industry.

ChP (2020, English Ed 2020, Vol I)

- Wang ZT, Guo DA. Pharmacopoeia of the People' s Republic of China (English Ed 2020, Vol I), China Medical Science Press, 2022

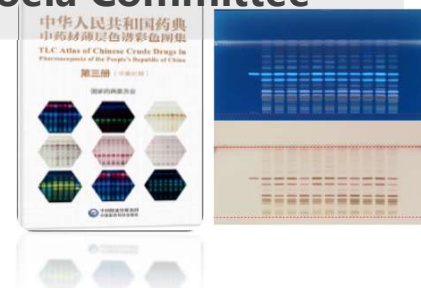


ChP (2025, Vol I)

- 9 monographs have been announced publicly
- Another 8 monographs were submitted to the Chinese Pharmacopoeia Committee

TLC Atlas of Chinese Crude Drugs in ChP (Volumes 4) (in progress)

- 100 monographs (85 were finished)



Achievements

Research and Publication of the international Quality Standards

➤ Published ISO standards (4)



ISO 7450: 2023 (半夏)



ISO 9109:2024 (地黄)



ISO 13619:2024 (栀子)



ISO/TR 18986:2024 (人参产业与标准化需求)

➤ Underdevelopment ISO standards (8)

1. ISO/DIS 19047 Traditional Chinese Medicine– *Polygonum multiflorum* root (何首乌)
2. ISO/DIS 19842 Traditional Chinese Medicine– *Dioscorea opposita* rhizome (山药)
3. ISO/DIS 19851 Traditional Chinese Medicine– *Cinnamomum cassia* branch (桂枝)
4. ISO/CD 25003 Traditional Chinese medicine– *Gentiana manshurica*, *Gentiana scabra* and *Gentiana triflora* root and rhizome (龙胆)
5. ISO/AWI 25187 Traditional Chinese medicine– Minimum requirement for robust TLC identification methods applicable analysis for medicinal herbs and natural products (适用于草药和天然产品分析的可靠TLC鉴别方法的最低要求)
6. ISO/PWI Traditional Chinese Medicine– *Plantago asiatica* and *Plantago depressa* seed (车前子)
7. ISO/PWI Traditional Chinese Medicine– *Perilla frutescens* leaf (紫苏叶)
8. ISO/PWI Traditional Chinese Medicine– *Curculigo orchioides* rhizome (仙茅)

Work experiences of our team on ISO/TC 249 platform (2023~2024)

Achievements

Publications

>30 (IF > 5.0 **15**)

Student training

20 graduate student;

2 post-doctoral fellows, and one is awarded the China National Postdoctoral Program for Innovative Talents.

Awards

1st Prize for Science and Technology Advancement Award,
Shanghai Municipality, 2023





Thanks and welcome to visit our institute !

**Institute of Chinese Meteria Medica,
Shanghai University of Traditional Chinese Medicine**

