上海中醫藥大學
Shanghai University of Traditional Chinese Medicine

ISSN (Print): 2589-9627
ISSN (Online): 2589-9473

Chinese Medicine and Culture

Volume 1 • Issue 2 • July-September, 2018

www.cmaconweb.org

A Hollow-engraved Ivory Fumigating Vase in the Qing Dynasty

Collected in Shanghai Museum of Traditional Chinese Medicine

Wolters Kluwer

Medknow

First Taiji Health Center Outside China Inaugurated in Greece

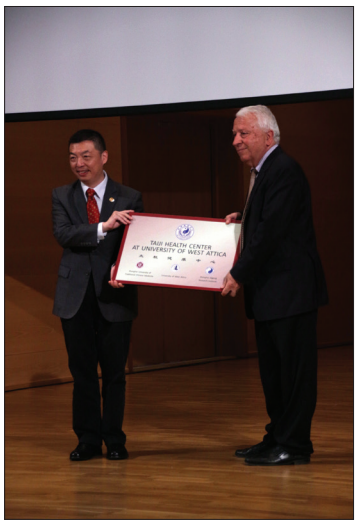
On September 15 local time, the first overseas Taiji Health Center （太极健康中心）opening ceremony and Taiji health academic exchange event were held at the University of West Attica in Greece, which were co-hosted by Shanghai University of Traditional Chinese Medicine and University of West Attica in Athens, Greece and co-organized by Shanghai Qigong Research Institute and Musculoskeletal and Chest Physical Therapy Laboratory of University of West Attica. The theme of event is “Taiji Promote Health”.

The opening ceremony was moderated by Prof. Georgios Georgoudis from University of West Attica. Prof. Konstantinos Moutzouri, President of the University of West Attica, made welcome speech. Prof. Hongyi Hu （胡鸿毅）, Vice President of Shanghai University of Traditional Chinese Medicine, Mr. Qiang Wang （王强）, Political Counselor of the Chinese Embassy in Greece and Mr. Stylianos Vasileiades, Duty Mayor of the Municipality of EGALEO where the University of West Attica is located attended the event and delivered speeches respectively.

The two Presidents, Prof. Jie Li （李洁）, Director of Shanghai Qigong Research Institute （上海市气功研究所） and Prof. Georgios Georgoudis, Director of the Musculoskeletal & Chest Physiotherapy Research Laboratory, University of West Attica jointly awarded certificates to the first batch of 32 students from the West Attica University Branch of Taiji Health Center. The students demonstrated Taijiquan and Baduanjin which were taught during the summer course. The teachers and students from Shanghai University of Traditional Chinese Medicine performed Chinese martial arts (中国武术) and traditional Daduanjin (传统八段锦) and received warm applause from the audience.

Taiji health is a state of life in which people adjust their body and psychology, enhance their morality and sentiment, and promote harmony and balance between individuals and groups, society and even the natural world under the guidance of Chinese Taiji theory and by means of Taijiquan, guidance, acupuncture, massage, Qigong, meditation and so on. Taiji health is the wisdom and technology from ancient China. It has a very long history and cultural tradition as well as ancient Greek medicine and Indian yoga. Shanghai University of Traditional Chinese Medicine and West Attica University of Greece both said that the formal operation of Taiji Health Center University of West Attica Branch would further strengthen the cooperation between the two universities in the fields of health, medicine and culture, and contribute to the cause of human health of the two countries.

(Shanghai Qigong Research Institute)



Chinese Medicine and Culture

Editorial Board

Publishing Date: July 2018
Sponsor: Shanghai University of Traditional Chinese Medicine
Publisher: Magazine Publisher of Shanghai Journal of Traditional Chinese Medicine
Tel: 86-21-51322541
Add: P.O.B 114, 1200 Cailun Road, Pudong New Area, Shanghai, 201203, China.
E-mail: tcmoverseas@126.com
Web:
Official Website: http://www.cmaconweb.org
Manuscript Submission Website: https://mc03.manuscriptcentral.com/cmac
Notes:
This magazine can be downloaded through **iBooks and Amazon Global**.

Chinese Medicine and Culture

Volume 1 ¦ Issue 2 ¦ July-September 2018

Contents

Chinese Medicine and Culture on Web

http://www.journalonweb.com/CMAC

The Chinese Medicine and Culture now accepts articles electronically. It is easy, convenient and fast. Check following steps:

1 Registration

- Register from http://www.journalonweb.com/CMAC as a new author (Signup as author)
- Two-step self-explanatory process

2 New article submission

- Read instructions on the journal website or download the same from manuscript management site
- Prepare your files (Article file, First page file and Images, Copyright form & Other forms, if any)
- Login as an author
- Click on 'Submit new article' under 'Submissions'
- Follow the steps (guidelines provided while submitting the article)
- On successful submission you will receive an acknowledgement quoting the manuscript ID

3 Tracking the progress

- Login as an author
- The report on the main page gives status of the articles and its due date to move to next phase
- More details can be obtained by clicking on the ManuscriptID
- Comments sent by the editor and reviewer will be available from these pages

4 Submitting a revised article

- Login as an author
- On the main page click on 'Articles for Revision'
- Click on the link "Click here to revise your article" against the required manuscript ID
- Follow the steps (guidelines provided while revising the article)
- Include the reviewers' comments along with the point to point clarifications at the beginning of the revised article file.
- Do not include authors' name in the article file.
- Upload the revised article file against New Article File - Browse, choose your file and then click "Upload" OR Click "Finish"
- On completion of revision process you will be able to check the latest file uploaded from Article Cycle (In Review Articles-> Click on manuscript id -> Latest file will have a number with 'R', for example XXXX_100_15R3.docx)

Facilities

- Submission of new articles with images
- Submission of revised articles
- Checking of proofs
- Track the progress of article until published

Advantages

- Any-time, any-where access
- Faster review
- Cost saving on postage
- No need for hard-copy submission
- Ability to track the progress
- Ease of contacting the journal

Requirements for usage

- Computer and internet connection
- Web-browser (Latest versions - IE, Chrome, Safari, FireFox, Opera)
- Cookies and javascript to be enabled in web-browser

Online submission checklist

- First Page File (rtf/doc/docx file) with title page, covering letter, acknowledgement, etc.
- Article File (rtf/doc/docx file) - text of the article, beginning from Title, Abstract till References (including tables). File size limit 4 MB. Do not include images in this file.
- Images (jpg/jpeg/png/gif/tif/tiff): Submit good quality colour images. Each image should be less than 10 MB) in size
- Upload copyright form in .doc / .docx / .pdf / .jpg / .png / .gif format, duly signed by all authors, during the time mentioned in the instructions.

Help

- Check Frequently Asked Questions (FAQs) on the site
- In case of any difficulty contact the editor

Review Article

Adoption of Traditional Chinese Medicine in a Central Mediterranean Island Community

Charles Savona-Ventura
Centre for Traditional Chinese Medicine, University of Malta, Malta

Abstract

The Maltese Islands in the central Mediterranean was one of the earliest European countries to initiate political relationships with the People's Republic of China. The political interaction translated eventually to a better appreciation of the cultural diversity of the respective countries. This appreciation led to an early adoption of traditional Chinese medicine (TCM) services and their incorporation within the mainline western-based contemporary medicine generally practiced on the Islands. TCM clinical services were formally introduced in the public government-managed hospital in 1994 after a bilateral agreement was signed between the health ministries of the two respective countries. This service has now extended into the private health sector. The adoption of TCM clinical services, in the light of a greater acceptance of TCM by the patients, necessitated specific legislation to regulate the practice of TCM within the legal framework of the Maltese Healthcare Professions Act. In more recent years, since 2015, the University of Malta in collaboration with Shanghai University of TCM, have provided a postgraduate master program in TCM aimed at graduates holding a primary degree in a western-oriented health-care science.

Keywords: Education, legislation, Maltese Islands, registration

Introduction

The Maltese archipelago is made up of a group of islands located in the Central Mediterranean. It has been an independent state since 1964 after it obtained its independence from the United Kingdom and was declared a Republic in 1974. Its central Mediterranean position had throughout the centuries exposed the population to a wide range of cultures – an influence that becomes evident in its medical folklore beliefs that exhibit elements of European and North African folklore practices.[1,2]

The current medical practice is primarily a westernized one strongly influenced by the British School of Medical thought since many of the medical professionals go to expand their specialist training in hospitals throughout the United Kingdom. The health-care provision on the Islands is based on a free-at-source government medical service that ranges from primary health care within health-care facilities scattered around the islands to tertiary specialized care within the government hospital and specialized centers. There is also a generally affordable private-care sector covering primary health care and hospital health-care services. Medical education is managed by the University of Malta (UM) under the auspices of three faculties as follows: Faculty of Medicine and Surgery, Faculty of Dentistry, and Faculty of Health Care Sciences. Equitable standards of care in the various health-care professional fields are maintained through the various councils set up through the health-care professions Act that requires formal registration of all health-care providers in respective registries before being able to practice their profession.[3]

Despite the absolute reliance of the Maltese community to westernized medical care, the Maltese Government was an early proponent for introducing services to provide traditional Chinese medicine (TCM) within the government medical service. Diplomatic and political relations between Malta and China were formally set up on January 31, 1972. These relations served primarily as a means of boosting the Maltese economy at a time when Malta was attempting to develop

Address for correspondence: Prof. Charles Savona-Ventura, Centre for Traditional Chinese Medicine, University of Malta.
E-mail: charles.savona-ventura@um.edu.mt

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_18_18

How to cite this article: Savona-Ventura C. Adoption of traditional Chinese medicine in a central Mediterranean island community. Chin Med Cult 2018;XX:XX-XX.

a stand-alone economic base without relying on the islands being used as a military base for the British or NATO Services. The interrelationship also served to promote Chinese culture among the Maltese population through the opening of the Chinese Cultural Institute and the setting up of the Malta-China Friendship Society in 1973 with membership to the Chinese People's Association for Friendship with Foreign Countries.[4] An aspect of this Chinese cultural exposure was TCM.

Introduction of traditional Chinese medicine services

TCM has its own unique concepts regarding disease diagnosis, classification, and management. It relies on various modalities of treatment including dietary-lifestyle interventions, physical intervention methods such as acupuncture-moxibustion-cupping, message such as Tui Na and Gua Sha, and Chinese herbal medicine [Figure 1].

TCM in Malta started being made available in the Malta Government Health Service in 1994 when a Memorandum of Understanding was signed between the two respective Ministries of Health.[4] This MoU provided for service facilities provided by the Maltese Medical and Health Department within the government hospital – originally St Luke's Hospital but transferred to new premises in Mater Dei Hospital in 2007. The Chinese Ministry of Health provided the services of teams of Chinese professionals from the Nanjing University of TCM. These services involve a daily clinic providing TCM services in the hospital in Malta and a weekly service in the hospital on the sister island of Gozo. All service costs are covered by the Maltese National Health Service. These service facilities today deal with about 400 consultations per week. In addition, it provided for the development of resource facilities to establish a Mediterranean Regional Centre for TCM (MRCTCM) at Corradino in Malta. This provides TCM services by Chinese professionals against a consultation fee. On June 28, 2011, a further MoU between representatives of the Ministry of Health of the People's Republic of China and the Ministry of Health, the Elderly and Community Care of the Republic of Malta provided to upgrade the resource facilities at the MRCTCM.[5] In addition, there are also registered acupuncturists providing acupuncture services in the private sector – some managing dedicated clinics.

Further TCM clinical provision services were established by the UM in 2016 after a Memorandum of Understanding was signed between the UM and Shanghai University for TCM (SHUTCM) and its affiliate hospital Longhua Hospital. The MoU provided for the setting up of a center for TCM by the UM to provide professional clinical services against a consultation fee. The clinical services, which aimed at supporting an academic program, were managed by Chinese professionals seconded to the Centre from Longhua Hospital.[6] On May 31, 2018, the TCM services were incorporated as an integral part of the health and wellness center established by the university to provide psychological and mental health support, health educational in regard to sexual health, drug abuse and nutrition, and of course TCM services.[7,8] The integration of TCM services within the wellbeing support services emphasizes the belief that eastern and western medical systems can be integrated to support one another to the benefit of those who need help in maintaining their overall wellbeing.

Introduction of traditional Chinese medicine education

In 2012, the Memorandum of Understanding between the two respective governments was revised to include provisions for making available training courses for doctors, nurses, and paramedical professionals with 2–3-year postgraduate experience. Certification of attendance to these courses was to be issued jointly by the MRCTCM and Nanjing University of TCM. The MoU also provided for the MRCTCM to run short-term and familiarization courses aimed at previously trained acupuncturists wishing to improve their clinical experience. Certification of attendance to these was to be issued by the MRCTCM.[9] Further than providing short-term courses, no provision was made by the MRCTCM to provide a formal program of studies.

In 2010, the contact was established between the Malta-China Friendship Association and the Shanghai branch of the Chinese People's Association for Friendship with Foreign Countries to seek potential collaboration in the educational field of TCM. This led to a bridge being built between the UM, the Shanghai Directorate of Health, and the SHUTCM leading to a Memorandum of Understanding being signed in 2016 between the two institutions.[10] This MoU provided for the setting up of a 1-year full-time taught Level 7 Masters in TCM by the UM with the teaching program being covered by professionals from the UM and SHUTCM. The course targets postgraduate students who have a primary professional degree in a western-based health-care science (i.e., doctors, physiotherapists, nurses, midwives, and dentists) thus ensuring that TCM techniques will be incorporated as an integral part of standard mainline medical practice. The masters in TCM is designed to conform with the European Credit Transfer System (ECTS) widely used throughout higher education institutions in Europe and is composed of 8 study units with a total ECTS value of 90 [Figure 2].[11]

In the development of this course of studies, attention was taken to ensure that the course confirmed with the educational targets identified by the World Health Organisation (WHO) for the training of qualified physicians from schools of modern Western medicine who wish to include acupuncture as a technique in their clinical work; and also provide training of other health personnel of modern Western medicine working in the primary health-care system of their country.[12,13] To date, the course has been run twice during academic years 2015/2016 and 2016/2017 with eleven students graduating. The student profiles have included nurses (x4 students), midwives (x2 students), physiotherapists (x2 students), and medical doctors (x3 students). The small student groups facilitate reliance on a more interactive type of teaching rather than simply resorting to a didactic educational process. Some of the graduates have also availed themselves of the opportunity

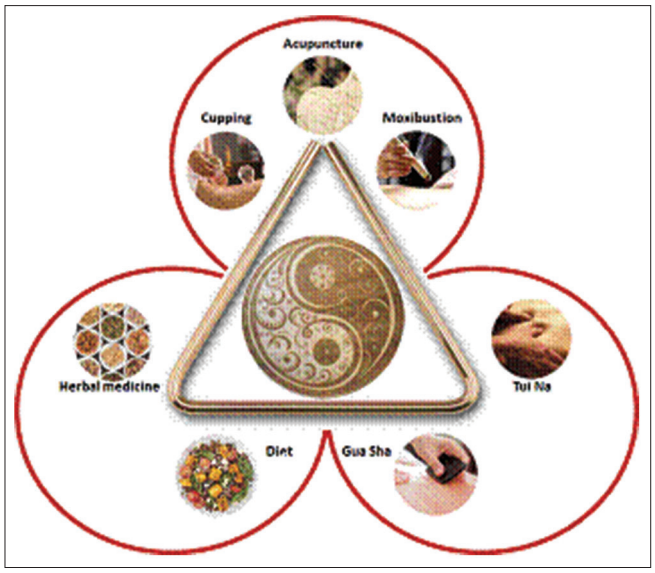


Figure 1: Modalities of Traditional Chinese Medicine management

Figure 3: Teaching sessions at the University of Malta Centre

Figure 2: Inauguration of the University Centre for Traditional Chinese Medicine on 17th November 2015[15]

Figure 4: Traditional Chinese Medicine books donated by the Shanghai Education Commission to the University of Malta Library presented by the Ambassador of the Peopleæs Republic of China in the Republic of Malta[17]

to have partly sponsored elective visits to SHUTCM to further their clinical experience in the field. After following the Master in TCM course, the graduates can continue studies with SHUTCM to obtain a doctorate in TCM awarded by that university [Figure 3].[14,15]

The need for dissemination of evidence-based information relating to TCM among the medical profession is evident in a pilot internet-based survey commissioned by the UM Centre for TCM. This pilot survey showed that whereas 40% of respondents were interested in adopting TCM practice as part of their western-based medical practice, 83% of respondents felt that they need to gain additional knowledge about TCM to properly counsel their patients. Only 3.3% of respondents stated that TCM methods were addressed during their undergraduate medical education; none reported TCM being addressed during their post-qualification hospital-based clinical training. A large proportion of respondents (43.3%) felt that TCM training should be a component of undergraduate studies or offered as an elective component of the curriculum; 33.3% felt that TCM should be formally taught as a dedicated postgraduate specialty.[16] Since in the survey, only 6.7% reported having adequate TCM reference facilities, the UM has, with the help of the Shanghai Education Commission, augmented its Health Care Library with a significant number of books on facets of TCM in the English language [Figure 4].[17]

The UM-SHUTCM partnership has during the academic year 2017/2018 also provided for a 4 ECTS certificate course of studies forming part of the Bachelorate in Liberal Arts run by the UM. The course of studies centered on Herbal Medicine in Western and Chinese Culture.[18] This certificate evening course was very well received with 19 students subscribing to it. The UM-SHUTCM partnership has also embarked on an outreach program to promote TCM among the health-care professions and the public in Malta. The UM Centre for TCM has thus organized day workshops for members of the health-care professions that have included nurses, nursing students, physiotherapists, and family doctors. The center

Figure 5: Exhibition stand during Temple Fair organized by the Chinese Cultural Centre

has also provided a series of lectures aimed at introducing the overall principles of TCM to the professionals and the general public. These dealt with topics such as Kung Fu for Health (five lectures) and TCM Art of Health Living (six lectures). In collaboration with the Department of Obstetrics and Gynaecology of the UM, the center for TCM also hosted an invited guest professional to address the specialist staff about the value of TCM in assisting infertility management.

The UM Centre for TCM and the MRCTCM have further collaborated with the Chinese Cultural Institute promoting TCM aimed at the general public through lectures delivered by the respective professional staff and through participation in fairs organized by the institute [Figure 5].

Introduction of traditional Chinese medicine registration of professionals

The Maltese Health Care Professions Act requires the formal registration of all health-care professions with specific dedicated councils before being allowed to practice their profession.[19] The 2009 WHO Resolution WHA62.13 encouraged the Member States to consider the inclusion of traditional medicine within the respective national health-care systems, and to establish systems of qualification, accreditation or licensing of practitioners of traditional medicine on established benchmarks.[12]

Long before the WHO Resolution, the Maltese legal system had incorporated TCM within the overall framework of Maltese health-care system. Registration in respect to TCM is currently restricted to registering as an ACUPUNCTURIST with the Council for Professions Complimentary to Medicine (CPCM) being responsible for the register. In 1997, the CPCM prepared a Document paper defining the guidelines for criteria for the examination of the prospective registrant based on 1990 Forum on Non-Conventional Medicines and the Acupuncture European Workshop cosponsored by the Council of Europe and the WHO. This document identified three levels of TCM practitioners are as follows:

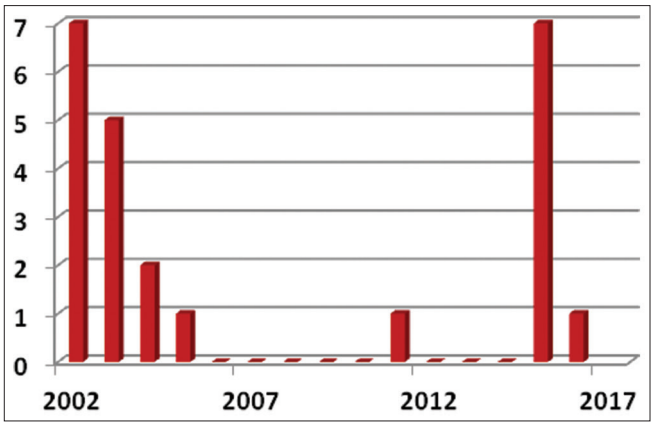


Figure 6: Council for Professions Complimentary to Medicine Acupuncturist Registrations

- Medical doctors trained in TCM
- Allied health professions trained in TCM; and
- Non-professionals individuals trained in TCM.

The CPCM document proposed that registration as an ACUPUNCTURIST should be limited to health-care professionals (i.e., medical doctors, physiotherapists, nurses, or other health professional) who have completed a minimum of the 3-year full-time educational program in western-based medicine supplemented by a postgraduate certification in TCM. The CPCM requirement for a level 1 registration as Acupuncturist included a certification attesting to a minimum of 250–500 h of theory and clinical training concluded by an examination. A syllabus of the essential study was also outlined.[20] This has been subsequently modified to 660 h of theory and 140 h of clinical training in acupuncture. The theory component should ideally cover Chinese medicine-basic concepts (140 h), acupuncture (240 h), and a Tuina and TCM course (280 h).[21]

The current Acupuncturist CPCM Register as on the July 1, 2017 includes a total of five Maltese individuals, seven individuals from the remaining countries of the European Union, three individuals listed as Commonwealth or foreign, and 19 Chinese individuals the majority of whom include the staff working in the UM Centre for TCM and the MRCTCM [Figure 6].[22]

The Health Care Professions Act was revised in 2002. The revision gives a full list the professions complementary to medicine. The list includes the profession of ACUPUNCTURIST at a level 1 registration only. After 2004, when Malta formally joined the European Union, the CPCM is legally obliged to maintain a register of recognized practitioners who have recognized qualifications obtained from the UM, or a training institution in Malta recognized by the CPCM; obtained from a recognized institution in any European Union member state; or obtained from any other institution outside the EU if recognized by CPCM.

A Code of Practice for Acupuncturists was published by the CPCM in 2006.[23] The Health Care Professions Act is

presently being reviewed. It is hoped that the review will establish different levels of registration differentiating the Acupuncturist Practitioner namely a health-care professional with dedicated basic training in the physical methods of TCM; the Acupuncturist Physician namely a Doctor of Medicine with postgraduate dedicated basic training in the physical methods of TCM; and Doctor in TCM formally trained in the full breath of TCM practice. Representations have been made by the relevant players in the field to the Malta Competition and Consumer Affairs Authority to establish a working group aiming to bring standardization in the educational standards in TCM within the context of the European Higher Education Area criteria.[24]

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Savona-Ventura C. Malta (Republic of). In: Erickson d'Avanzo C, editor. Pocket Guide to Cultural Health Assessment. 4th ed. USA: Mosby; 2008. p. 465-9.
2. Savona-Ventura C. Traditional Maltese Medicine. Chinese Medical Culture Summer; 2016. p. 50-7.
3. Government of the Republic of Malta. Health Care Professions Act. To Regulate the Practice of Health Care Professions in Malta. Act XII of 21st November 2003 and Supplemented by Subsequent Legal Notices. Ch. 464. Government of the Republic of Malta; 2003.
4. Embassy of the People's Republic of China in the Republic of Malta. Brief on Sino-Maltese Relations (2004/06/12). People's Republic of China, Malta; 2018. Available from: http://www.mt.china-embassy.org/eng/zmgx/t132190.htm. [Last accessed on 2018 Aug 22].
5. People's Republic of China – Republic of Malta. Memorandum of Understanding on cooperation between the Ministry of Health of the People's Republic of China and the Ministry for Health, the Elderly and Community Care of the Republic of Malta dated 28th June 2011. People's Republic of China – Republic of Malta. Malta; 28 June, 2011.
6. SHUTCM – UM. Collaborative Agreement between the College for International Education, Shanghai University of Traditional Chinese Medicine and the University of Malta dated 2016. Shanghai University of Traditional Chinese Medicine. Malta: University of Malta; 2016.
7. University of Malta. University of Malta Opens New Health and Wellness Centre. News Point; 31 May, 2018. Available from: https://www.um.edu.mt/newspoint/news/features/2018/05/umopensnewhealthandwellnesscentre. [Last accessed on 2018 Aug 22].
8. University of Malta. Centre for Traditional Chinese Medicine. Malta: University of Malta; 2018. Available from: https://www.um.edu.mt/tcm/tcmclinic. [Last accessed on 2018 Aug 22].
9. People's Republic of China – Republic of Malta. Protocol between the Ministry for Health, the Elderly and Community Care of Malta and the Ministry of Health of the People's Republic of China on Cooperation in the field of Traditional Chinese Medicine dated 25th September 2012. People's Republic of China – Republic of Malta; 25 September, 2012.
10. TVM News. Centre for Traditional Chinese Medicine inaugurated at University. TVM News – Malta; 17 November, 2015. Available from: https://www.tvm.com.mt/en/news/centre-for-traditional-chinese-medicine-inaugurated-at-university/. [Last accessed on 2018 Aug 22].
11. University of Malta. Master in Traditional Chinese Medicine and Culture [M.TCM (Melit.)] – Course Code PMTCMFTT5. Malta: University of Malta; 2018. Available from: https://www.um.edu.mt/courses/overview/PMTCMFTT5-2018-9-O. [Last accessed on 2018 Aug 22].
12. World Health Organization. Guidelines on Basic Training and Safety in Acupuncture. Geneva; World Health Organization; 1999.
13. World Health Organization. Benchmarks for Training in Traditional Chinese Medicine. Geneva: World Health Organization; 2010.
14. Savona-Ventura C. Centre for TCM – Annual Report Academic Year 2015/16. Malta: University of Malta Centre for TCM; 2016.
15. Savona-Ventura C. Centre for TCM – Annual Report Academic Year 2016/17. Malta: University of Malta Centre for TCM; 2017.
16. Savona-Ventura C. Survey: Attitudes about Traditional Chinese Medicine among Maltese Medical professionals. Survey Monkey Questionnaire Survey dated November 2017. Malta: University of Malta Centre for TCM; 2018.
17. UM. Collection of Traditional Chinese Medicine Books Donated to University of Malta. UM News Point; 16 February, 2017. Available from: https://www.um.edu.mt/newspoint/news/features/2017/02/collectionoftraditionalchinesemedicinebooksdonatedtouniversityofmalta?utm_source=update&utm_campaign=update&utm_medium=email&utm_content=top. [Last accessed on 2018 Aug 22].
18. University of Malta. LAS1058: Herbal Medicine in Western and Chinese Culture – Centre for the Liberal Arts and Sciences. Malta: University of Malta; 2018. Available from: https://www.um.edu.mt/courses/studyunit/las1058. [Last accessed on 2018 Aug 22].
19. Government of the Republic of Malta. Health Care Professions Act. To regulate the Practice of Health Care Professions in Malta. Act XII of 21st November 2003 and Supplemented by Subsequent Legal Notice 3i4 of 2006 – Subsidiary Legislation 464. 10 Council for Professions Complementary to Medicine (Standing Orders). Ch. 464. Regulations dated 12th December 2006 and Legal Notice L.N. 277 of 2008: Professions Complementary to Medicine (Licence to Practise) Regulations, 2008. Government of the Republic of Malta; 2003-2008.
20. Attard Previ R, Cali Corleo S. Acupuncture-Moxibustion: A Profession or a specialisation. Issued by the CPCM subcommittee on Acupuncture. Council for the Professions Complementary to Medicine – Malta; 16 June, 1997.
21. Council for the Professions Complementary to Medicine. Criteria for Registration as Acupuncturist. Malta: Council for the Professions Complementary to Medicine; 2015.
22. Council for the Professions Complementary to Medicine. Council for the Professions Complementary to Medicine – Malta Acupuncturist Register. Malta: Council for the Professions Complementary to Medicine; 1 July, 2017. Available from: https://www.deputyprimeminister.gov.mt/en/regcounc/cpcm/Documents/Acupuncture%20Register.pdf. [Last accessed on 2018 Aug 22].
23. Council for the Professions Complementary to Medicine. Code of Practice – Acupuncture. Malta: Council for the Professions Complementary to Medicine; April, 2006. Available from: https://www.deputyprimeminister.gov.mt/en/regcounc/cpcm/Documents/copacupuncture.pdf. [Last accessed on 2018 Aug 22].
24. European Community. ECTS User Guide. Luxembourg: Office for Official Publications of the European Communities; 2009.

Review Article

Modernization of Medical Traditions: Indian and Chinese Approaches to Health and Well-being

Ved Baruah
University of Strathclyde, UK and Shanghai University, China

Abstract

The provisioning of health and well-being for every human being on the planet calls for a rethink of conventional medical practices. In both the developed as well as developing world contexts, there is a growing need to rejuvenate alternative medical systems, but they have to be modernized to have cross-cultural appeal and acceptance. This paper explores the clash between Western medicine and Indian traditional medicine in 19th century colonial India which offers a historical precedent that could hold key lessons to the spread of traditional medicine across the world. The paper argues that the British government used biomedicine as a political tool to dominate Indians and resistance from Indian practitioners of traditional systems of medicines (TSMs) was systematically put down through policy measures. However, it was the clash between the medical modalities that transformed Indian TSMs forever as systems such as Ayurveda (the science of life) and Yoga took on the challenge and modernized and continue to have global appeal. The paper compares Indian and Chinese medical systems and argues that similarities in theory and practice in two different historical contexts, 19th century India and modern-day China, enable us to understand the relevance of modernization practices in our contemporary world.

Keywords: Ayurveda, biomedicine, colonial India, ethnomedicine, health and health-care, medical traditions, modernization, social history of medicine

Introduction

As ancient sources of medical knowledge, both Chinese and Indian traditional medicine date back to at least 2000 BCE. The theoretical roots as well as practices connected with these two systems of medicine share a number of commonalities. At their core, the idea of balance that outlines the basis of the two modalities hold the key to a number of other connections. In the last decade or so, there has been a resurgence of interest in alternative medical practices that stem from a sense of cynicism about the efficacy of allopathic or Western medicine. This is especially true with the failure of effective treatment protocols to tackle the rise of chronic diseases like diabetes as well as lifestyle-based disorders such as obesity. The rise in global demand for holistic medicine means that traditional systems of medicine (TSM) are bound to become central to health and well-being strategies of governments across the world. A positive development in this regard is the inclusion of "Goal 3: Ensure healthy lives and promote well-being for all at all ages" as part of the the United Nations Sustainable Development Goals (popularly called Agenda 2030).[1] The provisioning of health and well-being for every human being on the planet calls for a rethink of conventional medical practices and strategies that have failed in both the developed as well as developing world contexts.

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_19_18

From Traditional Systems of Medicine to Modern Western Medicine: The Case of 19th Century India

Exploring the history behind the upsurge in the adoption of Western medicine in the 19th century in India makes three things clear. First, there was a championing of modern medicine by the colonial British government as a political tool of domination. Second, the resistance from Indian practitioners of TSMs was systematically put down through

Address for correspondence: Dr. Ved Baruah, David F Musto Centre for Drug Policy Studies, College of Liberal Arts, Shanghai University, Shanghai - 200444, China.
E-mail: ved.baruah@strath.ac.uk

How to cite this article: Baruah V. Modernization of medical traditions: Indian and Chinese approaches to health and well-being. Chin Med Cult 2018;XX:XX-XX.

policy measures and the adoption of Western medicine in public health schemes.[2] Third, the clash between the medical modalities transformed Indian TSMs forever as systems like Ayurveda (the science of life) and Yoga took on the challenge and modernized.

The push toward allopathic medicine, armed with its arsenal of vaccines, tablets, and compounds, resulted in the marginalization of Indian TSMs that were based on therapeutic principles. This prompted the modernization of Indian TSMs as Ayurveda became formalized and practitioners adopted modern technology and protocols. The paper hints that the trend in India mirrors that of a global shift from ethnomedicine toward biomedicine resulting in the establishment of modern Western medical knowledge and practices across the world. It needs to be stressed here that in the long sweep of human history, this is a relatively recent phenomenon and therefore the dogma against alternative systems of medicine needs to be reexamined critically. Using this as the point of inquiry, this paper will engage with the larger economic, social, and political implications of the shift toward adoption of health and well-being practices on a global scale.

Traditional Indian Medicine and Traditional Chinese Medicine: Similarities and Divergence

A number of medical practitioners as well as historians have commented on the similarities in the approach to health and well-being that bind Indian and Chinese Traditional medicine. I will first briefly explain Ayurveda – its philosophy and principles, methods of diagnosis, and treatment practices. I will then draw out some common features between TIM and TCM in order to make a few larger observations about TSMs.

Ayurveda is one of the oldest traditional medical systems in the world. It originated in South Asia and textual records date back to the time of the Buddha, that is, 5th century BCE. Although religious scriptures indicate that the practice goes back even further back in time, textual evidence from that era has not yet been discovered. Ayurveda is a structured method of theorizing the human body, the illnesses that afflict it and provides regimens of therapy through remedies (herbal, mineral/chemical, and animal based) along with advocating a healthy lifestyle built on the principle of balance. Over the last two millennia, thousands of authors in South Asia produced a very extensive literature on Ayurveda. As Dominik Wujastyk argues, this knowledge system was transmitted from one generation to another in manuscript form until printing of Sanskrit texts became common in the 19th century.[3] This medical tradition is primarily accessible to us through the hundreds of thousands of Sanskrit medical manuscripts that have been preserved but also through oral transmittal of knowledge from one generation to another.

Nearly half of the most commonly used herbs in both Indian and Chinese traditional medicine are almost identical and the ways in which the actions of these substances are described are very similar. In both systems, herbs are described according to the symptoms they treat, their warming or cooling nature, and their influence on the body humors. What differs is the basic set of categories of disharmony: the diagnostic and therapeutic groupings. In traditional Chinese medicine, the correspondence systems of Yin and Yang and the five elements have a strong influence, as do the depictions of certain bodily humors (qi, blood, moisture, and essence), and the internal organ systems (*zangfu*). In Ayurvedic medicine, although the total system is quite complex, there is a dominance of the three *dosha* (*tridosha*) system: *kapha*, *pitta*, and *vata* (also called *vayu*). These three function within a body that is described primarily in terms of stages of transformation (following the path of ingested food as it is converted into essential substances that comprise the body) rather than by physical structures and functional organs.[4]

Despite these similarities, it is surprising that there is virtually no research to document systematically the knowledge systems in order to benefit mutually from each other's ancient traditions. Similarly, it is noteworthy that there is very little exchange between India and China on their medical heritage, despite these systems being popular in both the countries as well as globally. There needs to be more done in this regard so as to build connections between India and China as well as contribute to the emerging challenges to global health and well-being.

Modernization of Ayurveda: Social, Political, and Economic Contexts

The modernization of the Ayurveda texts was also accompanied by the introduction of new methods of diagnosis and drug dispensing as well as reimagining of the system through visual means. A unique example of this development in Ayurveda in the precolonial context in India is the "Ayurveda Anatomical Man," a c.1700 CE pen and ink drawing using the gouache technique [Figure 1]. Although the image seems similar to Western anatomical studies, it is entirely drawn from the Ayurvedic understanding of the human body.

The channels and "organs" drawn on the torso are specified as in Ayurvedic literature, with "organs" named as receptacles for one or other of the organic fluids. It is noteworthy that in Ayurveda, the "organs" are not understood as engaged in the kind of processing which modern Western biomedicine assumes but rather as the seats of the humors (wind, bile, and phlegm). Despite extensive cataloging and study of Ayurveda manuscripts, the existence of no other premodern image has been discovered. Wujastyk asserts that although "the medical texts discuss and describe many topics that would lend themselves to illustration, such as intricate surgery, human anatomy, and medical botany, no images related to these or any other subjects are to be found in the manuscripts of these works."[5] The modernization of the Ayurveda texts was also accompanied by the introduction of new methods of diagnosis and drug dispensing which

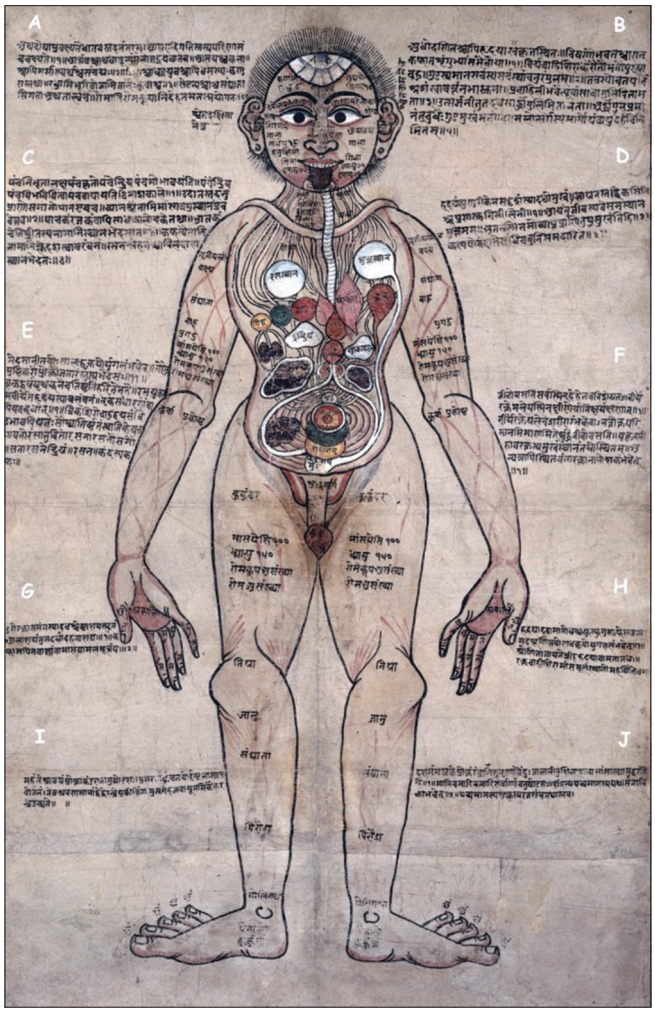


Figure 1: Ayurveda Anatomical Man, c.1700 CE. The text captions are extracts from the Bhāvaprakāśaḥ, written between 1550 and 1590 by Bhāvamiśra. Courtesy: Wellcome Collection

will be discussed later.

The forces that modernized Ayurveda before the 19th century were vastly different from earlier. By the mid-19th century, Ayurveda faced intense competition from modern Western biomedicine. Changes in social, economic, and most importantly political climate, in India, meant that traditional knowledge was based on ritual, faith, and superstition rather than scientific know-how or evidence. The discovery of penicillin and other "wonder" drugs, the invention of medical instruments to measure and diagnose the human body as well the extraction of active compounds from plant and mineral sources meant that modern medicine was regarded as a system that was replicable and effective in all conditions. The move toward suppression of symptoms across population groups rather than personalized therapy that was the hallmark of TSMs was also regarded as proof of the efficacy of modern medicine. In the face of challenge from modern Western medicine, Ayurveda incorporated modern technology and embraced medical instruments like the thermometer and the sphygmomanometer. This period also witnessed the rise of Ayurveda brands where medicines and compounds were produced in factories in the form of tablets and syrups, packaged in glass bottles and vials, and marketed around the through contemporary means like newspaper and radio advertisements.[6]

Current Outlook of Traditional Systems of Medicine: Heritage Preservation and Knowledge Transmission to Future Generations

The way in which Indian medicine modernized in the late 19th and early 20th century transformed the system forever. From an arrangement where knowledge was transferred from one generation of *vaids* (Ayurveda practitioners) to another, mostly in a family line, the modernization of Ayurveda was accompanied by institutionalization as well as codification as a system of knowledge with distinct protocols and practices.

In the 21st century, Ayurveda faces a new challenge from globalization and the accompanying threat to indigenous knowledge (IK). In the wake of intellectual property and trademark regimes, traditional knowledge has become a contested ground, primarily due to the growing economic potential from herbal cures. In the context of the developing world and the health-care needs of these populations, it is pertinent that governments and nongovernmental actors do their utmost to protect and promote TSMs in a concerted manner.

There are two main issues in this regard. First is the question of sustainability and ecological protections that need to be ensured so that TSMs can survive and flourish for generations to come. Second, the argument that "ethnomedical tourism" or the selling of place-based heritage to global audiences is the best way to revive these practices in the 21st century needs to be critically evaluated. In both the above issues, as Sita Reddy argues "the underlying subtext was that the global market would save this tradition from loss, not nationalist revivals of practice or institutionalized reform of Ayurvedic education, which had been judged a professionalizing failure."[7] A solution to this could be that the knowledge of the value and potential of indigenous plants with medicinal properties can be used to incentivise local populations to take care and tend to local ecosystems as these herbs, barks, and roots would be seen as resources that need careful management.

There have been a number of initiatives in this regard and one such project was the creation of a database by the Indian government which involved the documentation of Indian IK regarding medicinal plants and their uses. This is a significant development as nearly half of the world's 300 million indigenous people (ethnic minorities) live in Asia, mostly in China and India. These communities still live in forests or in their original homelands and have profound knowledge about the uses of bioresources, and this IK is especially rich in medicinal plants for curing various diseases. As Mukherjee *et al.* have argues, the medical knowledge has

economic potential that "has raised the interest of the corporate world for profitable acquisition and given a jolt to India to arouse consciousness about her own knowledge wealth." It is essential to document this knowledge as it survives in an oral tradition can is open to "becoming either victim of biopiracy or becoming extinct."[8]

Indian government agencies have been set up a database that covers more than 230,000 formulations from ancient texts on Indian systems of medicine (Ayurveda, Unani, Siddha, and Yoga), in Hindi, Sanskrit, Arabic, Persian, and Urdu. The database has been made available to the public in a number of languages including Japanese, French, German, and Spanish and is aimed to dissuade foreign companies from patenting traditional medicines. A number of other initiatives have also been launched to ensure that the IK is preserved and protected as well as adequate research is undertaken to develop a scientific approach to encourage compatibility with biomedicine and modern medical practices.

Conclusion

In the encounter between ethnomedicine and biomedicine, it is still too early to guess which system comes out on top or even conjecture if these systems would be used in a symbiotic manner to attend to the health and well-being of everyone. However, what is evident is that IK needs to be protected from the threat of obliteration and the global community needs to act as one to preserve the knowledge of ancients.

Yoga is currently the most widespread Indian approach to promoting the health of the body. It has started received financial backing from the Indian government and a number of research centers have been envisioned. In 2015, the United Nations declared 21 June as World Yoga Day giving a new fillip to the spread of yoga beyond countries, especially in the West, where it has already become popular in the last couple of decades. A very good example is China where the popularity of yoga, especially among the youth, is on the rise. Millions across the world affirm that yoga makes them feel better in body and mind and it is noteworthy that Ayurvedic concepts such as diet and balance are increasingly being adopted as integral to a yoga lifestyle.

It is important to note that globally the shift from singularity to plurality is taking place. This has been driven primarily by the fact that it is becoming increasingly evident that no single modality of health science has the capacity to contribute solutions to all the health needs of the population. In the era of medical pluralism, countries like China and India have a strong advantage because of their strong foundations in evidence-based biomedical sciences as well as an immensely rich and complex indigenous medical heritage. There is definitely a scope for greater cooperation between the two nations as evidenced by the similarities between TCM and TIM both in terms of the Material Medica as well as the philosophical and sociocultural understanding of health and well-being.

Financial support and sponsorship

Wellcome Trust, UK and CSHHH Glasgow.

Conflicts of interest

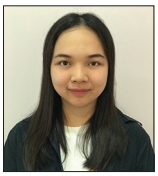
There are no conflicts of interest.

References

1. United Nations, 'Transforming our World: The 2030 Agenda for Sustainable Development', A/RES/70/1,. Available from: https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf,. [Last retrieved on 2018 Apr 18].
2. Bala P. Imperialism and Medicine in Bengal: A Socio-Historical Perspective (New Delhi) 1992.
3. Wujastyk D. A Body of Knowledge: The Wellcome Ayurvedic Anatomical Man and his Sanskrit Context. Asian Medicine 2008;4: 202.
4. Gasseholm PM. A Comprehensive Study of Ayurveda, Traditional Chinese Medicine and Comparison, unpublished dissertation, California Polytechnic State University 2012. p. 49-53.
5. Wujastyk D. 'A Body of Knowledge: The Wellcome Ayurvedic Anatomical Man and his Sanskrit Context'. Asian Medicine 2008;4:202.
6. Mukherjee PB. Doctoring Traditions: Ayurveda, Small Technologies, and Braided Sciences (Chicago), Introduction. 2016.
7. Reddy S. Making Heritage Legible: Who Owns Traditional Medical Knowledge?. International Journal of Cultural Property 2006;(13):166.
8. Mukherjee A, Banerjee M, Mandal V, Shukla AC, Mandal SC. Modernization of Ayurveda: A Brief Overview of Indian Initiatives. Natural Product Communications 2014;9:288.

Review Article

Traditional Chinese Medicine in Malaysia: A Brief Historical Overview of the Interactions between China and Malay Peninsula



Wen Tien Tan[1], Hon Foong Wong[1,2], Shih Chau Ng[1,2], Si Woei Goh[1], Jun Liu[1], Bao Ling Hoo[1], Chyong En Chai[1], Xun Lin[1]

[1]Department of Golden Cabinet, International Education College, Shanghai University of Traditional Chinese Medicine, Shanghai, China,
[2]Department of Chinese Medicine, Centre for Complementary and Alternative Medicine, International Medical University, Kuala Lumpur, Malaysia

Abstract

Chinese Medicine was introduced to the Malay Peninsula during the colonial era circa 18th to 19th century. The British imported Chinese immigrants mainly for tin mining. The early Chinese settlers had brought with them the knowledge of Traditional Chinese Medicine (TCM) to Malaya. As time goes by, TCM becomes one of the popular traditional medicines that are accepted by other ethnicities. TCM has thus contributed to the welfare of Malaysians. In 2016, a Traditional and Complementary Medicine (T and CM) Act was passed by the Malaysia Parliament. TCM is one of the T and CM practices that fall under the regulation. TCM services are now offered in Malaysia's public hospitals in addition to private practices. This article aims to provide a brief overview on the development of TCM in the precolonial and postindependent Malaysia.

Keywords: Development, history, Malaysia, Traditional Chinese Medicine

Introduction

Malaysia is a melting pot where multiple races and ethnics live in the same country. Its various geological topological features and historical development resulted in many unique medicinal characteristics that nowhere else exists.

Chinese Medicine was introduced to the Malay Peninsula during the colonial era circa 18th to 19th century. Before 1963, Singapore was part of the British colony same as the Malay Peninsula. The British imported Chinese immigrants mainly for tin mining. Owing to this importation, the Chinese rose and became the second largest community in Malay Peninsula, and with large community comes the need for maintaining health and well-being. The early Chinese settlers had thus brought with them the knowledge of Traditional Chinese medicine (TCM) to Malaya.

In the early 20th century, TCM services were still mainly frequented by the Chinese people. However, as time goes by, TCM becomes one of the popular traditional medicines that are accepted by other ethnicities. In 2015, the Ministry of Health conducted a survey regarding the use of traditional medicine in Malaysia. The survey revealed that 29.25% of Malaysians have used traditional medicine. Chinese herb was the second most (13.69%) sought after treatment modalities, while the highest use was Malay Massage (41.92%).[1] TCM has thus contributed to the welfare of Malaysians. A separate voluntary registration by the Ministry of Health in 2008–2015 found that up to 60.73% of the total 13,846 registered traditional medicine and complementary medicine practitioners are TCM practitioners.[2]

In 2016, a T and CM Act was passed by the Malaysia Parliament to establish the T and CM Council and to regulate the T and CM services in Malaysia. TCM is one of the T and CM practices that fall under the regulation of the T and CM Council. With the approval from the Ministry of Health, TCM services are now been offered in Malaysia's public hospitals. This article aims to provide a brief overview on the

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_17_18

Address for correspondence: Prof. Xun Lin, Dean, International Education College, Shanghai University of Traditional Chinese Medicine, No. 1200, Cailun Road, Zhangjiang Hi-Tech Park, Pudong New District, Shanghai, P. R. China, 201203.
E-mail: linxund@hotmail.com

How to cite this article: Tan W, Wong H, Ng S, Goh S, Liu J, Hoo B, *et al*. Traditional Chinese Medicine in Malaysia: A brief historical overview of the interactions between China and Malay Peninsula. Chin Med Cult 2018;XX:XX-XX.

development of TCM in the precolonial and postindependent Malaysia.

The Interactions between China and Malay Peninsula

The interactions between China and Malay Peninsula can be traced back to the Han Dynasty (汉朝 202 B.C.-220 A.D.). Between 111 B.C.E. and 87BCE, Gu Ban (班固,32-92) recorded a small fleet stopped over in Malay Peninsula.[3] This is probably the earliest known record of the sea voyage. The Malay Peninsula continued to be a stopover place for the Chinese traders to the West for the coming centuries. The trading route soon reached its heyday in the Tang Dynasty (唐朝618-907) and was later referred as the Maritime Silk Route. Although trading happened abundantly during this period, there were no official connections between China and Malay Peninsula.

The diplomatic relation between Malay Peninsula and China started in Ming dynasty (明朝 1368-1644). During the time of the Emperor YongLe (永乐大帝 1402-1424), Zheng He (郑和 1371-1433) was sent on several missions to scout the Western Ocean (Southeast Asia, Indian Ocean, Middle East, and Africa). It was during this time that interactions and exchanges started to flourish in the Malacca (满剌加) entrepôt.[4] The interactions between the two countries do not stop at mere trading. Instead, Chinese medicine was introduced to Malay Peninsula as part of cultural exchange, and in return, local specialties of Malay Peninsula were introduced to China. Historical records of the Ming Dynasty suggested that during Admiral Zheng's sea voyages, he was accompanied with a Chinese physician named Yu Kuang (匡愚) in his fleet. Kuang Yu recorded his experience in a book named Hua Yi Sheng Lan (《华夷胜览》*The Overall Survey of Chinese and Foreign Encounters*). Unfortunately, the book was lost, but the preface preserved by Hong Zhang (张洪) showed that he had visited Malacca three times.[5] Rhinoceros horn, ivory, tortoise shell, pearl, agate, coral beads, nutmeg, agarwood, styrax, sandalwood, clove, black bear, gibbon, and other exotic plants, spices, and animals totaling 40 kinds were brought back to China between 1405 and 1432.[6] Some of them such as clove (丁香), nutmeg (肉头蔻), agarwood (沉香木), styrax (玉铃花), and sandalwood (檀香木) which are native to Malay Peninsula have even become common TCMs that are widely used until today.

In an age without engine, the Chinese traders who came along with Zheng He on the sea voyages would depend on the wind to return to China. While waiting for the change of monsoon, some of these Chinese traders married with local women and formed families. This gave rise to a hybrid form of community called Baba and Nyonya. An example was the first Kapitan or the community leader of Malacca, Kapitan Tay Hong Yong @ Tay Kap (鄭甲, 1572-1617). He was one of the early Chinese settlers from Fujian (福建).[7] The Baba and Nyonya incorporated the Chinese cooking techniques and ingredients with Malay spices and flavors.[8] While some of these spices, such as pepper, cardamom, and star anise, were imported to China and become common TCMs, the complexity of marrying them in food had also resulted in the special Nyonya cuisine seen only in Malaysia.

Although many Chinese traders would still leave for China, some had settled in Malacca.[9] The Chinese had also settled in Singapore even before the arrival of Sir Thomas Stamford Raffles, the founder of modern Singapore in 1819.[10] However, the massive influx of Chinese immigration did not take place until 17th Century. Internally, the Chinese encountered continuous wars between the resistance of the Ming loyalists and the Manchurian who later established the Qing Dynasty (清朝 1636–1912). Externally, the British required massive workforce for the development of the Malaya. Owing to such social circumstances, many Chinese living along the coastal areas of Fujian and Guangdong (广东) left their home and sailed down south. The Hokkien clan arrived early and worked mainly as merchants in the Penang, Singapore, and Malacca Straits whereas the Cantonese and Hakka clans came later and worked mainly as coolies or laborers in mining tin ore in the cities of Ipoh, Kampar, Gopeng, Kuala Lumpur, and Seremban.[11] Although they were called Chinese settlers, most of these men came with the intention to work in Malaya for a specific period, and then return to China enjoying a supposedly comfortable life. Unfortunately, the intention was never materialized. Many of these Chinese men ended residing permanently in Malaya. Nevertheless, the strong intention had resulted in the flourishing of Chinese education and the preservation of much Chinese heritage seen today.[12]

The Chinese settlers, both the rich merchants and poor laborers, brought with them the Chinese cultures to Malaya. The hot and humid tropical climate in Malaya was challenging to them. To maintain health and well-being, they resorted to the TCM that they are familiar with. The wealthy Chinese merchants would import Chinese medicines such as chrysanthemum flower, honeysuckle flower, coix, and lotus leaf from China and incorporate these medicines into their diets to clear internal heat and damp. The poor Chinese laborers were not so fortunate. Many suffered in agony because the British colonial government could not provide them with the necessary medical support. On seeing the sufferings, the rich Chinese merchants pooled together to help the community. They set up charity clinics and hired TCM practitioners directly from China to provide consultation to the needy countrymen.[13,14] This was the beginning of TCM in Malaya. The strong cultural identity is an important factor in the development of TCM.

In 1929, a British botanist named David Hooper published a book "On Chinese Medicine: Drugs of Chinese Pharmacies In Malaya." Hooper collected 456 types of Chinese medicine samples including 29 kinds of animal products and 12 kinds of mineral medicines from local Chinese medical hall. He then detailed their Chinese, English, and Malay names, as well as classified them by their taxonomy, origin, and function.[15] An analysis of his samples shows that a total of 49 products were

Figure 1: Mundu (爪哇凤果*Garcinia dulcis* Kurz.)

Figure 2: Kembang Semangkok (胖大海*Sterculia lychnophora* Hance.)

recorded as drugs used in Chinese medicine, but they were neither imported from China nor were they used in China. An example is *Biji Mundu* (爪哇凤果 *Garcinia dulcis)*[Figure 1], a tropical fruit tree native to Indonesia.[20] Their fruits are widely used in traditional Malay medicine for the treatment of wounds or scurvy.[16] Another example is *Kembang Semangkok* (胖大海 *Sterculia lychnophora*) [Figure 2], an evergreen tropical tree native to Southeast Asia.[21] Although tasteless, a drink made with the gelatinous mucilage from the soaked seed is said to be demulcent, febrifuge, and stomachic. It is thus used to treat diarrhea, dysentery, and fever.[17,18] These two examples provided clues that TCM in the British colonial Malaya has evolved. It absorbed some of the local products and is used to treat illness. This movement of "locally grown medicinal plants for the local needs" is a phenomenon popular in the ethnobotanical study that could be explored further for future drug discovery.[19]

While some products are known to be used locally within the Malaya region, some traditional Malay medicines have even been exported to China and became an important part of TCM. An example is Lakawood (降香*Dalbergia parviflora*), an aromatic heartwood found throughout Malaya. It was a highly prized commodity in China. Not only can lakawood be made into incense but also used in TCM as a regulator of the flow of *Qi*.[22] Other examples include cloves (丁香 *Eugenia caryophyllata*) and nutmeg (肉豆蔻 *Myristica fragrans*) which are known as spices and medicines in China for their warm, carminative, stomachic, analgesic, and anti-inflammatory functions.[23] They were native plants of the Malay Peninsula but owing to the medicinal values, they were also the trading commodities of the British colonial Malaya to China.

Traditional Malay medicine has also absorbed some of the medicinal knowledge from TCM. For instance, the Chinese liquorice (甘草 *Glycyrrhiza uralensis*) was called *Akar Kayu Manis Cina,* literally means sweet root from China in Malay.[24] Unlike the TCM usage which emphasizes it as tonic, the indigenous Malay people use it as an anti-inflammatory medication. In Indonesia, Chinese liquorice is said to protect the heart.[25]

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Institute for Public Health. National Health and Morbidity Survey 2015: Traditional and Complementary Medicine. Vol. 4. Putrajaya: Ministry of Health; 2015. Available from: http://www.iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2015-VolumeIV.pdf. [Last accessed on 2018 Apr 24].
2. Traditional and Complementary Medicine Division. Traditional and Complementary Medicine (T&CM) Act: What Should You Know? Genting: National Regulatory Conference; 2015. Available from: http://npra.moh.gov.my/images/Announcement/2015/NRC-2015-day2/TMHS08-P-Ms-TehLiYin-31-07-15.pdf. [Last accessed on 2018 Apr 24].
3. Feng B. One Belt and One Road: The Chinese Logic for Global Development. Beijing: China Democracy and Legal System Publishing House. 2016.
4. Cheng Ho Cultural Museum. History of Cheng Ho. Melaka; 2006. Available from: http://www.chengho.org/museum/web/history.html. [Last accessed on 2018 Apr 24].
5. Bai SY. The General History of China. Shanghai: Shanghai People's Publishing House. 2004.
6. Zhang YJ. Malacca and Its Chinese Community-- A Discussion Surrounding Literature in Ming and Qing Dynasty (1405-1911). Kampar: Universiti Tunku Abdul Rahman. 2011. Available from: http://eprints.utar.edu.my/170/1/CH-2011-0802991.pdf [Last accessed on 2018 Apr 24].
7. Kapitan Cina of Malacca; 2018. Available from: https://en.wikipedia.org/wiki/Kapitan_Cina#Kapitans_of_Malacca. [Last accessed on 2018 Apr 24].
8. Ng C, Karim SA. Historical and Contemporary perspectives of the Nyonya food culture in Malaysia. J Ethnic Foods 2016;3:93-106.
9. Khor NJ. Malaysia's Melting Pot. Malaysia History Critique Group; 2012. Available from: http://www.malaysiahistory.net/v2/?p=97. [Last accessed on 2018 Apr 24].
10. Rahim LZ. Singapore in the Malay World: Building and Breaching Regional Bridges. Oxford: Taylor and Francis; 2009. p. 24.
11. Hays J. Chinese in Malaysia. Facts and Details; 2013. Available from: http://www.factsanddetails.com/southeast-asia/Malaysia/sub5_4c/entry-3645.html. [Last accessed on 2018 Apr 24].
12. Tye T. Arrivals of the Chinese in the Malay Peninsula. Penang Travel Tips; 2003. Available from: http://www.penang-traveltips.com/

arrivals-of-the-chinese-in-the-malay-peninsula.htm. [Last accessed on 2018 Apr 24].
13. Selangor and Federal Territory Char Yong Association. History of Char Yong Fay Choon Kuan. Kuala Lumpur; 2017. Available from: http://www.charyong.org.my. [Last accessed on 2018 Apr 24].
14. Malaysian Chinese Medical Association. History of Chinese Medical Aid Department. Kuala Lumpur; 2014. Available from: http://www.mcma.com.my/mcma-chinese-hospital.php. [Last accessed on 2018 Apr 24].
15. Hooper D, Burkill IH. On Chinese medicine: Drugs of Chinese pharmacies in Malaya. Garden's Bull Straits Settlements 1929;6:1-80.
16. Hariana HA. 262 Tumbuhan Obat dan Khasiatnya. Jakarta: Penebar Swadaya; 2013. p. 245-6.
17. Smith FP, Stuart GA. Chinese Materia Medica: Vegetable Kingdom. Shanghai: American Presbyterian Mission Press; 1911.
18. Fern K. Useful Tropical Plants Database; 2014. Available from: http://www.tropical.theferns.info/viewtropical.php?id=Scaphium+scaphigerum. [Last accessed on 2018 Apr 24].
19. Siew YY, Zareisedehizadeh S, Seetoh WG, Neo SY, Tan CH, Koh HL, *et al.* Ethnobotanical survey of usage of fresh medicinal plants in Singapore. J Ethnopharmacol 2014;155:1450-66.
20. Sotyati ED. Mundu, Si Apel Jawa Multikhasiat Menunggu Perhatian. Jakarta: Satu Harapan; 2016. Available from: http://www.satuharapan.com/read-detail/read/mundu-si-apel-jawa-multikhasiat-menunggu-perhatian. [Last accessed on 2018 Apr 24].
21. Picture Courtesy of Alchetron; 2018. Available from: https://www.alchetron.com/Sterculia-lychnophora.[Last accessed on 2018 Apr 24].
22. Soon, D. The trade in Lakawood products between South China and the Malay world from the twelfth to fifteenth centuries AD. J Southeast Asian Stud 2011;32:133-49. Available from: http://www.jstor.org/stable/20072321. [Last accessed on 2018 Apr 24].
23. Bown D. Encyclopaedia of Herbs and their Uses. London: Dorling Kindersley; 1995.
24. Madjid MD. A Side Record of Aceh History: Business, Diplomacy and The Fight of People. Jakarta: Yayasan Pustaka Obor Indonesia; 2014.
25. Direktorat Obat Aslia Indonesia. Acuan Sediaan Herbal. Vol. 3. Jakarta, Indonesia; 2007.

Review Article

A View of Ancient Aroma Culture through Museum-Collected Aroma Utensils

Hong Qin

Shanghai Museum of Traditional Chinese Medicine, Shanghai University of Traditional Chinese Medicine, Pudong, Shanghai, China

Abstract

Aroma fumigation is one of the traditional Chinese fumigating therapies. Moreover, the aroma culture is a combination of traditional Chinese medicine culture with Confucian and folk cultures. As historical marks, medical relics such as aroma utensils, herbs, and books can reflect the development and prosperity of aroma culture in history.

Keywords: Aroma culture, aroma utensils, fumigating censer

Utensils for burning incense are called fumigating censers which function as sanitary appliances to create fragrance and warmth, kill insects, and clean rooms, clothes, and beddings by ancient people. The censers can be made of various materials such as gold, silver, bronze, porcelain, and pottery, with delicate design and crafts.

Now, please join me on a journey to ancient aroma utensils collected in the Shanghai Museum of Traditional Chinese Medicine (TCM), to have a taste of aroma culture in ancient China.

The boshan censers unearthed from Han tombs [Figure 1] can be deemed as the earliest ancestors of Chinese censers.[1] When in use, the censer is filled with lighted spices, and the smoke will roll up and flow out of the holes in the lid. The cloud and mist created can make one feel like in a wonderland. The gilded bronze censers [Figure 2] are more valuable because they may be the possessions of the royals and noble class in the Han dynasty.

The bronze ball-shaped censer in the Ming dynasty [Figure 3] is also called bedding censer, equipped with two annular dynamic axles inside. Moreover, a receptacle is installed in the axles to hold charcoal and incense. However, the censer rolls and the receptacle remains at a horizontal position, so the incense will never come off to burn the beddings.[2]

Xie Zhi [Figure 4] is a divine beast recorded in ancient literature. In traditional Chinese culture, it is regarded as a righteous beast and a symbol of justice and law. The charcoals and spices are lighted inside the censer in need of use.

The Bronze Kylin Censer in Xuande years (1426–1435 A. D.) of the Ming dynasty [Figure 5] is one of the large-scale fumigating utensils, with four characters of "大明宣德 (Da Ming Xuan De)" cast in the edges of the censer body. The censer can be separated into the upper part of the lid with hollow engraving of clouding stripes and the lower part of body symmetrically engraved with four mini-sized kylins. Its two handles are in the peculiar shape of an annular dragon.

The bronze cap censers in the Ming dynasty [Figure 6] are used to fumigate and sterilize caps.

It was drawn by 陈洪绶 (Honshou Chen 1588–1652 A. D.), a prominent painter in the Ming dynasty. There was a fair lady sitting in her bed, holding a censer in her arms. The aroma censers can be used to relieve nerves, sterilize air, and treat certain gynecological diseases as well.

It was quite prevalent to use aroma censers [Figures 7 and 8] in the Qing dynasty.[3] In cold winter, the folk people tend to use bronze hand and foot censers to keep warm. The burning

Address for correspondence: Prof. Hong Qin,
Shanghai Museum of Traditional Chinese Medicine,
Pudong, Shanghai, China.
E-mail: 13918162021@163.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_27_18

How to cite this article: Qin H. A view of ancient aroma culture through museum-collected aroma utensils. Chin Med Cult 2018;XX:XX-XX.

of charcoal and spices can both bring warmth and refreshment.

The vase [Figure 9] is exquisitely engraved, and the smallest gridding is no wider than a millimeter. The calabash-shaped body is engraved with blossoms of peony, large and leafy, the grace of which is in perfect and natural harmony with the elegance of ivory. The pedestal is made of rosewood with fine crafts. The spices can be placed inside the vase, and the fragrance will send by itself to sterilize and clean air.

According to TCM, the human body is a dynamic equilibrium of yin and yang, and a balanced yin and yang reflect a perfect state of health. The theory of fumigation is to use the clear and rightful qi of fragrant herbs to dispel evil qi out of the human body and thus to prevent disease and strengthen the body. For instance, during the dragon boat festival, when the climate turns warm and poisonous animals such as snake, scorpion, gecko, centipede, and toad gradually emerge, the Chinese people will wear sachets, drink realgar wine, decorate the doors and windows with calamus and moxa leaves, and bathe in water boiled with moxa leaves. In addition to dispelling evils with fragrant herbs, they also make good use of the moxa leaf water to treat or prevent skin diseases such as eczema. 艾叶 (Ai Ye *Folium Artemisia Argyi*), with pungent and bitter flavor, warm proper and slight toxin, can function to warm meridians and stop bleeding, dissipate coldness and relieve pain, and descend dampness and kill insects. It is generally in external use. After drying, the moxa leaves can be made into moxa sticks, which are easy to burn yet without flame, with fragrance and suitable for moxibustion. The moxibustion is to dredge meridians and collaterals through warming. Moxa

Figure 1: A bronze boshan censer in the Han dynasty (汉代铜博山炉)

Figure 2: A gilded bronze censer (鎏金铜薰炉)

Figure 3: A bronze ball-shaped censer in the Ming dynasty (明代铜球熏)

Figure 4: A bronze Xie Zhi censer in the Ming dynasty (明代铜獬豸熏)

Figure 5: A xuande bronze Kylin censer in the Ming dynasty (明代宣德铜麒麟炉)

Figure 6: The drawing of aroma in the Ming dynasty (明代《香薰图》) (imitation)

Figure 7: An octagon bronze hand censer (清代八角铜手炉)

Figure 8: Square bronze foot censer in the Qing dynasty (方形铜脚炉)

sticks are effective in warming meridians, dissipating coldness and expelling dampness and thus are frequently used as the fragrant herb for moxibustion.

The aroma culture also plays an important role in social etiquette. When they worship the Buddha, the ancient people embody their devotion and respect in the ceremony of bathing and fumigating aroma. The ancient emperors often award the favored officials fragrant herbs and spices to show their graciousness, and the officials then submit a statement to show their gratitude.[1]

The fragrant spices for fumigation include herbal species such as 藿香 (Huo Xiang *Agastache rugosus*), 木香 (Mu Xiang *Aucklandiae*), 茴香 (Hui Xiang *Foeniculum vulgare*), 佩兰 (Pei Lan *Herba Eupatorii*), 迷迭香 (Midie Xiang *Rosmarinus officinalis*), jasmine flower, tulip, and rose; woody species such as agilawood, styrax, frankincense, Sichuan pepper, 丁香 (Ding Xiang *Syzygium aromaticum*), and sandalwood; and the animal species such as musk, ambergris, and civetta. These fragrant spices possess efficacies of dispelling foulness, moving qi, and relieving pain, of which musk and agilawood are especially well-known.

Musk is of pungent flavor and warm proper, about heart and spleen meridians, with strong fragrance and can function to open orifices to refresh spirit, activate blood and dissipate stasis, relieve pain and resolve swelling, and promote fetal delivery. It is the main constituent of commonly used TCM patent medicines such as 苏合香丸 (Styrax Pill), 麝香保心丸 (Musk Heart-saving Pill), and 六神丸 (six miraculous-ingredient Pill).

The agilawood is one of the valuable fragrant spices the Chinese people are fond of, with pungent and bitter flavor, and slightly warm proper, about spleen, stomach and kidney meridians, and functioning to move qi and relieve pain, warm the middle and stop vomiting, and receive qi to tranquilize panting. It is mainly used to treat symptoms of distention and pain in the chest and abdomen and vomiting due to stomach coldness. The fragrance of agilawood is fine and gentle with lingering aftertaste and is thus among the top grade of spices for fumigation. During the prime period of Tang dynasty,

Figure 9: A hollow-engraved ivory fumigating vase in the Qing dynasty (清代透雕镂空象牙熏瓶)

Emperor of 玄宗 (Xuan Zong) ordered the construction of 沉香亭 (Chen Xiang Pavilion) with precious woods such as agilawood and sandalwood for his beloved 杨贵妃 (Consort Yang). The great poet of 李白 (Bai Li) once created a poem named 清平调 (*Qing Ping Diao*) to retell the wonderful story.

The valuable flower and gorgeous beauty smiling at each other, 名花倾国两相欢 which entertained the Emperor with constant joy and laughter. 长得君王带笑看。

Clearing up infinite unhappiness against the spring wind tender, 解释春风无限恨 on north of Chen Xiang Pavilion did they lean on handrails softer. 沉香亭北倚阑干。

In the Song dynasty, the seaborne trade between China and Southeastern Asian countries was prosperous, and there were frequent imports of fragrant herbs and spices overseas. In August of 1973, a song sea ship was excavated in the Houzhu Harbor in Quanzhou of Fujian Province. Fragrant wood and peppers are most abundant in quantity among all the unearthed relics in the cabins. They are real evidence of exchange of aroma spices between China and foreign countries.

(Qin Ding Si Ku Quan Shu) (《钦定四库全书》 *Imperial Collection of Complete Library in the Four Branches of Literature*) in the Qing dynasty contains the 香乘 (*Xiang Sheng*, *History of Aroma*) by 周嘉胄 (Zhou Jiazhou) of Ming dynasty, with full 28 volumes. It is a pandect of aroma culture involving previous dynasties before Ming and can thus be deemed as the encyclopedia of ancient Chinese aroma culture.

Translator: Yingshuai Duan (段英帅)

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. Qin H. A view of aroma culture through aroma utensils. Shanghai Art Crafts 2009;1:112.
2. PowerPoint on Chinese Medical History. Museum of Medical History of Shanghai Institute of Traditional Chinese Medicine and Shanghai Film Subsidiary Factory. Vol. 12. 1986. p. 5.
3. Shanghai Museum of Traditional Chinese Medicine. Collection Treasures of Shanghai Museum of Traditional Chinese Medicine. Vol. 4. Shanghai: Shanghai Science and Technology Press; 2013. p. 35-7.

Original Article

The Silk Road and Sources of Chinese Medicine Expansion: Part 2 – Formularies

Sean Bradley
Department of Asian Languages and Literature, University of Washington, Seattle, WA, USA

Abstract

Medicines have been traded along the Silk Road from antiquity until modern times. These products and their associated knowledge have been transferred over the land and sea between Asia, Europe, and Africa. Numerous texts that contain formulas and treatments passed along the Silk Road. Collections of these formulas and treatment methods called formularies contain unique information that informs this transfer of medicine. The texts and information flowed in both directions along these routes and while Chinese medicine influenced foreign medical practices both in history, and today, the incorporation of non-Chinese medicine and information also continues to influence Chinese medicine.

Keywords: Chinese medicine, formulary, history, *Materia medica,* Silk Road

Introduction

Imported medicines are often looked at through the *Materia medica* texts that were discussed in the first part of this series; however, one of the most important sources of the actual applications and integration of foreign medicines are the formularies.[1,2] The majority of formularies are divided into disease categories such as gynecology, pediatrics, traumatology, and ophthalmology. The earliest received text is the Zhou Hou Beiji Fang (《肘后备急方》*Emergency Formulas to Keep on Hand*) attributed to the 4th century scholar Hong Ge 葛洪 (283-343 C.E.). There are also discovered formularies from the Han Dynasty 汉代 (209 B.C.E–220 C.E.) such as Wushier Bing Fang (《五十二病方 》) found at Mawangdui 马王堆, and the Liushi Bing Fang (《六十病方》) found at Tian hui 天回 or Laoguanshan 老官山. Not only these formularies provide information about treatments for illness and disease but also often list ingredients. By examining these lists, we can further study the potential exchange of medicines.

Formularies are the second group of source materials and the second part in this series. The first part of this source text series was on *Materia medica,* and parts three and four will be miscellaneous texts and histories, respectively.

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_20_18

Formularies

The spread of religion is often joined by the spread of medicine. The expansion of Buddhism and Islam into China were certainly no exceptions. Both of these religions, one from South Asia, and the other from Central Asia, brought with them new ideas, physicians, prescriptions, texts, and exotic medicines.

South Asian Medicines

Early formularies often show influence from Indian medicine of South Asia. Simiao Sun 孙思邈 (581-670 C.E.), the proclaimed Yao Wang 药王 (King of Medicine) in China, incorporates a number of foreign elements in his formulas. His Beiji Qian Jin Yao Fang (《备急千金要方》*Priceless and Essential Formulas for Emergencies*), printed in 652 C.E., includes quotes and prescriptions from the renowned Indian physician, Jīvaka.[3] Jīvaka is mentioned in references and formulas such as Qipo Wan Tong Wan Fang (《耆婆万病丸方》*Jīvaka's Pill Formula for One Thousand Diseases*). A study of Sun Simiao's formulas was done by Professor Ming Chen 陈明 of Beijing University in 2003.[4]

Address for correspondence: Dr. Sean Bradley, Department of Asian Languages and Literature, University of Washington, Seattle, WA, USA.
E-mail: drbradleynd@gmail.com

How to cite this article: Bradley S. The Silk Road and sources of Chinese medicine expansion: Part 2 – formularies. Chin Med Cult 2018;XX:XX-XX.

Sun Simiao's references to South Asian practitioners and use of Indian medicines are not surprising given his interest and study of Buddhism. He was by no means alone, and as Buddhism continued to spread in China through major cities such as Dunhuang (敦煌) and Lanzhou (蘭州), medicine from South Asia further influenced Chinese medicine [Figures 1 and 2].

Buddhist influence and references to Jīvaka continue into the 10th century where the Japanese text, *Ishinpo* (《医心方》*Formulas at the Heart of Medicine*) cites Qipo Fang (《耆婆方》*Jīvaka's Formula*), Qipo Fu Ru Fang (《耆婆服乳方》*Jīvaka's Taking of Stalactite Formulas*), and Qipo Mai Jue Jing (《耆婆脉决经》*Jīvaka's Classic on Pulse Diagnosis*). Several other Chinese medicine texts associated with Jīvaka were composed during the Song dynasty 宋代 (960-1279 C. E.) and can be found listed in the dynastic histories which will be discussed in Part 4 of this series.[5]

Waitai Bi yao (《外台秘要》*Arcane Essentials from the Imperial Library*) [Figure 3] written by Tao Wang 王焘 (670-755 C. E.) lists close to 7000 formulas and also has a number of references to Indian medicines. In *juan* 21, Wang Tao references the Tianzhu Jing Lun Yan (《天竺经论眼》*Indian Classic Discussing the Eye*) which he attributes to Taoist Long shang 龙上道人.[6] Taoist Long Shang has an extensive discussion on ophthalmology from an Indian perspective and elaborates on how eye disorders can be effectively treated.[7] Wang also references other Indian sources including ones copied from the works of Sun Simiao.

Figure 1: The Buddhist caves at Dunhuang show the influence of Buddhism along the Silk Road

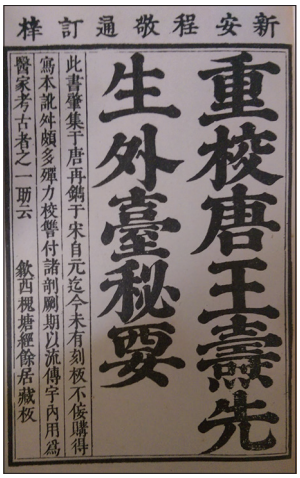


Figure 3: The *Wai tai bi yao* has numerous formulas from Indian and Buddhist origins

Arabic and Persian (Unani) Medicines

In addition to the South Asian exchange, Arabic and Persian medical knowledge, commonly referred to as *Unani* medicine were also being transferred along the Silk Road as seen in the *Materia medica*.[5] With works such as the *al-Qānūn fī al-Ṭibb* القانون في الطب (*Canon of Medicine*) by Avicenna (980-1037 C.E.) completed in 1025, just as Buddhism helped spread South Asian medicine, so did Islam help spread medicine from the Middle East.

A major work that demonstrates the influence of Islamic medicine is a formulary of the Yuan dynasty 元朝 (1271-1368 C.E.), the Huihui Yao Fang (《回回药方》) [Figure 4]. This

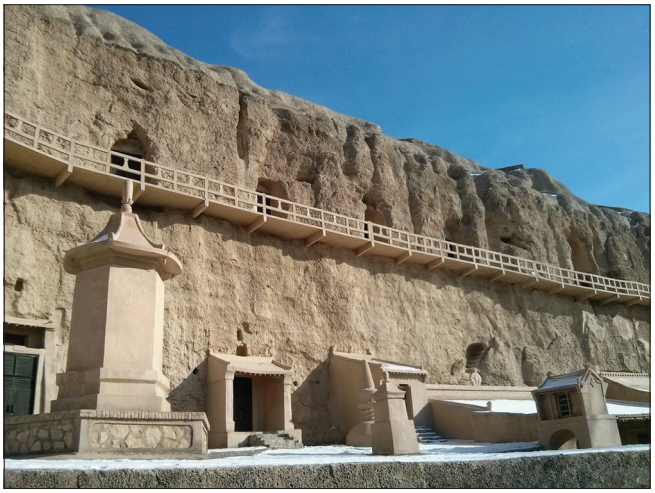


Figure 2: The Hui Medicine Culture Museum in Ningxia province

Figure 4: The *Hui hui yao fang* or Islamic Formulary

work was originally over 3000 pages long, but only 484 remain. In the chapters that survive, there are 517 Islamic medicines with their Persian or Arabic name and Chinese transliteration, 58 medicines with transliterated names with Chinese equivalents, and also 128 with only Chinese names.[8] Some examples of imported medicines mentioned in this text are the senna (*fanxieye* 番泻叶 *Cassia acutifolia* Del.), fennel (*huixiang* 茴香*Foeniculum vulgare* Mill.) and even some medicines commonly used in European herbal medicine such as lavender (*xunyicao* 熏衣草 *Lavendula stoechas* L.), rosemary (*midiexiang* 迷迭香 *Rosmarinus officinalis* L.), and St. John's wort (*jinsitao* 金丝桃 *Hypericum perforatum* L.).[9]

Conclusion

These formularies show how some geographically foreign medicines made their way into China but also shed insight onto the types of disease and injuries the formulas within these texts were used to treat. While two traditions that came into China alongside major religions are mentioned above, it is likely that other foreign sources of medicine also made their way into Chinese medicine. A greater in-depth study of the specific formularies and comparison to other traditions is the only way to better understand the exchange of these formulas.

While the examples above only give a brief introduction to how these formulas may have impacted Chinese medicine they do give a glimpse into how practitioners, such as Sun Simiao, may have incorporated these new substances into their treatment protocols and formula writing.

Over thousands of years China and its neighbors, both near and far, exchanged medicines along the Silk Road. The addition of exotic elements shows the dynamic nature of Chinese medicine in its ability to grow and expand. Even to this day, Chinese medicine continues to grow and adapts foreign substances to its principles and practice. Better understanding how these formularies were compiled will allow practitioners to better apply those principles to approaching new medical formulas today.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Qinglu X. Zhongguo zhongyi guji zongmu. Shanghai: Shanghai cishu chubanshe; 2007. p. 1.
2. Peiran Q (ed.). Zhongyi ji da cidian. Shanghai: Shanghai kexue jishu chubanshe; 2002. p. 40-66.
3. Simiao S. Beiji qianjin yao fang 备急千金要方. Beijing: Renmin Weisheng Chubanshe; 1955. p. 225-2.
4. Ming C. Qianjingfang zhong deQipo yiyao fang (The Jīvaka's Prescriptions in Qianjingfang). Beijing Ligong Daxue Xuebao 2003;2:91-6.
5. Salguero CP. The Buddhist medicine king in literary context: Reconsidering an early example of Indian influence on Chinese medicine and surgery. History of Religions 2009;48:210.
6. Tao W. Taoist Long Shang has the Family Name Xie. He Livedin Qizhou, but Received his Knowledge from Foreign Priests of the Western Countries. This is Likely Referring to India. Waitai Miyao外台秘要. Taipei: National Institute of Chinese Medicine Press; 1976.p. 562.
7. Kovacs J, Unschuld P. Discuss this more in depth in their translation ofthe Yinhai jingwei (Essential subtleties of the Silver Sea). While the textis attributed to Sun Simiao, it is more likely a compilation of sourcescompleted in the fourteenth or fifteenth century. Essential Subtletieson the Silver Sea. Berkeley: University of California Press; 1998. p. 4,38-42.
8. Kong YC, Chen DS. Elucidation of Islamic drugs in Hui Hui Yao Fang: A linguistic and pharmaceutical approach. J Ethnopharmacol 1996;54:85-102.
9. Kong YC, Chen DS. Elucidation of Islamic drugs in Hui Hui Yao Fang: Alinguistic and pharmaceutical approach. J Ethnopharmacol 1996;54:90-3.

Original Article

A Glimpse into Lu Xun and Chinese Medicine

Jin Ye

School of Basic Medical Sciences, Shanghai University of Traditional Chinese Medicine, Shanghai, China

Abstract

The criticism against Chinese medicine by Lu Xun at the early stage is often taken as a sharp weapon to attack Chinese medicine. However, through a horizontal and sequential analysis of the relevant material, it can be seen that Lu has experienced a process of learning, practicing, and objectively assessing Chinese medicine, which is closely related to the social background of the period, personal experience, and changes of thoughts.

Keywords: Assessment, Chinese medicine, Lu Xun (鲁迅)

People who are against Chinese medicine always bring up Lu Xun to deny Chinese medicine. They often quote sentences from Lu that Chinese medicine doctors are no more than liars. There is no harm looking into Lu's understanding of Chinese medicine.

Lu's attitudes toward Chinese medicine can be divided into two phases.

Strong Criticism and Research Application

Before the year 1926, the characters of Chinese medicine doctors in Lu's work were often depicted with sarcasm and hatred. He once said in the book Hu Ran Xiang Dao (《忽然想到》) that Chinese medicine doctors were no more than intentional or unintentional liars.[1] Looking back to the social background, Lu was a pioneer against the feudalism and determined to criticize old traditions. In 1925, Lu stated in the book Hu Ran Xiang Dao (《忽然想到》) that the urgent issues at the moment were to survive, to be full, and to develop. All the barriers that block the development—regardless of ancient or modern, human or ghosts, San Fen (《三坟》), Wu Dian (《五典》), gold or jade sculptures, and family-inherited pills or secret plaster—should be abandoned.[2] As part of traditional culture, Chinese medicine was no exception. Lu's father died as there were no treatment methods by Chinese medicine. Lu described in the book that he himself was made messy and the economic conditions of the family was slumped all of a sudden. All the miserable memories and heavy burden cannot fade away.[3] Lu also expressed his dissatisfaction to Chinese medicine in the book called Fen·Cong Hu Xu Shuo Dao Ya Chi (《坟 从胡须说到牙齿》), as it worsened his father's diseases and aroused his hatred toward Chinese medicine.[4] It was not unusual to witness the sarcasm in Lu's work.

Despite his criticism against Chinese medicine, Lu was still connected with Chinese medicine and was involved in its use and research. From Lu Xun Ri Ji (《鲁迅日记》*Lu Xun's Diary*), Lu was applying the therapies of Chinese medicine to treat diseases. On November 10, 1912, Lu cured his stomach pain with ginger juice.[5] On November 23, Lu used ginger juice to treat his abdominal pain.[5] On January 22, 1961, Lu took *Wu Jia Pi* wine to treat his shoulder pain.[5]

From 1912 onward, medical records as such can be viewed in the diary, which were closely related with his health conditions. Xu Guangping recalled that Lu in his early 30s was in a poor health condition, and suffered from stomachache, dizziness, toothache, headache and fever, and cough. Take the year 1913, for an example, there were records of his illness in January, February, March, May, August, October, November, and

Address for correspondence: Dr. Jin Ye,
School of Basic Medical Sciences, Shanghai University of Traditional Chinese Medicine, Shanghai, China.
E-mail: yjdjzfy@sina.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_26_18

How to cite this article: Ye J. A glimpse into Lu Xun and Chinese medicine. Chin Med Cult 2018;XX:XX-XX.

Lu Xun (鲁迅)

December. It can be seen that Lu still sought for solutions in Chinese medicine and showed that he was not entirely against Chinese medicine.

Despite the sarcasm and criticism against Chinese medicine, Lu also read Chinese medical classics and conducted relevant research. *Lu Xun's diary* described that on September 12, 1914, Lu bought two volumes of the books Bei Ji Jiu Fang Fu Zhen Jiu Ze Ri (《备急灸方附针灸择日》*Acupuncture Therapies for Emergencies*), which was used to treat acute diseases with acupuncture. On February 21, 1951, Lu bought eight volumes of Mao Shi Ji Gu Bian (《毛诗稽古编》), and four volumes of Mai Jing (《脉经》*Pulse Classics*), which was the earliest monograph on pulses. On February 2, 1923, Lu bought two volumes of Ben Cao Yan Yi (《本草衍义》) by Jing Yuan, which was of the highest academic value of herbal medicine.[5] On February 26, 1923, Lu bought ten volumes of Chao Shi Zhu Bing Yuan Hou Lun (《巢氏诸病源候论》*Chao styled General Treatise on the Cause and Symptoms of Diseases*), which was the earliest monograph describing pathogenesis and symptoms. On April 27, 1923, on the way to teaching, he bought two volumes of Tong Ren Shu Xue Zhen Jiu Tu Jing (《铜人腧穴针灸图经》*Illustrations of Acupuncture Chart of Bronze Figure*), which was a precious reference of acupuncture. On August 2, 1927, he bought 22 volumes of medical monograph Liu Li Zhai Yi Shu (《六醴斋医书》). Besides going to the bookstore for many times, Lu also tried to fix his own medical books. As it was written in the diary on August 12, 1927, that Lu was fixing his Liu Li Zhai Yi Shu (《六醴斋医书》), and he finished fixing the book on August 17. Lu also shared his Chinese medical classics with his younger brother,[5] as it was written on July 19, 1915, that the four volumes of Mai Jing (《脉经》*Pulse Classics*) were sent to his younger brother together with his supportive money for the family.[5]

As stated above, Lu has been involved in etiology, pulse studies, acupuncture, Chinese *Compendium of Materia Medica*, and it might worth a second thought that his purchase for the Chinese classics was not for criticism.

Gradual Changes and Objective Assessment

After 1930, Lu's attitude toward Chinese medicine was objective rather than mere criticism. He even used Chinese medicine to treat his family and recommended the effective methods to his relatives.

During the 8 days between August 30 and September 6, 1930, Lu described in his diary that he went to the pharmacy called *Ren Ji Tang* to buy medicine for his son for 4 times.[5] Zhou Haiying mentioned the stories how Lu treated his diseases in the book Lu Xun Yu Wo Qi Shi Nian (《鲁迅与我七十年》*The 70 Years with Lu Xun*). Lu used mint-flavored Anfu anti-inflammatory cream and mustard plaster to apply to the back to treat asthma. The mustard plaster was his flagship formula that helped him to breathe with an excellent efficacy.[6]

The article named Zhui Yi Xiao Hong (《追忆萧红》*The Memory of Xiao Hong*) written by Xu Guangping once recorded how Xu used valpromide tablets to cure the leukorrheal diseases torturing her for months without telling Lu. It was said in the book that Lu's bias against the empirical Chinese medicine had disappeared, and the experience had been shared with his friends and proved to be effective, which had been told to Xiao.[7] Xu also recalled in the book Lue Tan Lu Xun Dui Zu Guo Wen Hua Yi Chan De Yi Er Shi (《略谈鲁迅对祖国文化遗产的一、二事》*Lu Xun's viewpoints on China's cultural heritage*) that the herbal medicine prescriptions and the efficacies of Ben Cao Gang Mu (《本草纲目》*The Compendium of Materia Medica*) were often referred to during the conversations between Lu and his brothers. Lu thought highly of the herbal prescriptions of the book Yan Fang Xin Bian (《验方新编》*Newly Revised Empirical Herbal Formula*) and introduced the effective therapies to treat hernia to his friend's children. Lu once suffered from Herpes Zoster and was treated by a simple herb in the countryside. He also summarized the effective therapies and published them in the medical journal.[3] He often introduced the therapies of the local doctors of using some simple herbal medicine but with great efficacies, which has not been attached great importance to. He thought that it was a great pity that no one has conducted systematic research on the formula.[3]

As time and experience grew, Lu's understanding of Chinese medicine became more comprehensive and objective. He translated the book Yao Yong Zhi Wu (《药用植物》*The Medicinal Plant*) in 1930 and had no bias against Chinese medicine and the local herbal formula. What worth mentioning was that the book *Medicinal Plant* was among Zhong Xue Sheng Zi Ran Yan Jiu Cong Shu (《中学生自然研究丛书》*The Series Book of Natural Sciences Research for High School*) and targeted at teenagers for high school students. The translation of the book was a precious gift for the teenagers, which was directly related to the shift in attitude of Chinese medicine.[8] In 1933, Lu once said in Jing Yan (《经验》*Experience*) that it occurred to him by reading *The Compendium of Materia Medica* that the experience inherited from the ancestors were extremely precious and would benefit the later generations. Simple as it is, it contained abundant

treasure that accumulated through the experience of the use of medicine over long term. People should be aware of the fact that all the cultural relics were all made by the anonymous, including architecture, cooking, fishing, planting, and medicine.[9]

At the early stage, Lu did criticize Chinese medicine, but with a main focus on the shortcomings of Chinese medicine, and unethical behaviors of Chinese medicine doctors. There were two reasons for that, one was under the historical background of the new culture revolution, as a part of the Chinese culture, Chinese medicine was the main subject to blame. The other reason was that it cost Lu a great deal of fortune to save his father by Chinese medicine with no efficacy, which resulted in a very poor condition. It can be seen that Lu only criticized the wrongdoings of Chinese medicine. Lu's son Zhou Hai Ying also pointed out that Lu's comments on Chinese medicine was only based on his own personal experience instead of the general situation. What Lu resented were the incapable Chinese medicine doctors that he went through. It was unreasonable to quote Lu's words against Chinese medicine. Zhou also mentioned that his family has never turned down Chinese medicine and was always believed in Chinese medicine.[10] Lu gradually understood the true value and contribution of Chinese medicine as time and experience grew.

Translator: Kun Long (龙堃)

Financial support and sponsorship

Nil.

Conflicts of interest

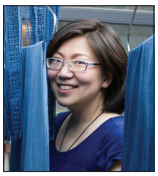
There are no conflicts of interest.

References

1. Lu X. Selected Essays by Lu Xun Novels. Hu Bei: Hua Zhong University of Science and Technology Publisher; 2014. p. 2-30.
2. Lu X. Selected Essays by Lu Xun Hua Gai. Beijing: Bei Xin Book Store; 1926. p. 43.
3. Xu GP. The Memories of Lu Xun by Xu Guangping. Guangdong: Guangdong People's Publisher; 1979. p. 375-614.
4. Lu X. Tomb·from Beard to Teeth. Beijing: People Literature Publisher; 1973. p. 205-7.
5. Lu X. Selections of Lu Xun.·2nd ed., Vol. 11. Beijing: China Literature Publisher; 2005. p. 19-522.
6. Zhou HY. The 70 Years Spent with Lu Xun. Hainan: South Sea Publisher; 2001. p. 24.
7. Xu GP. Selected Essays by Xu Guangping.·Vol. 1. Jiangsu: Jiangsu Arts Publisher; 1998. p. 191.
8. Li J. Lu Xun and the Translation of Medicinal Plant. Shanghai: China Modern Literature Research Publisher; 2011. p. 192-3.
9. Lu X. Nan Qiang Bei Diao·Experience. Beijing: People Arts Publisher; 1973. p. 104.
10. Chai Y, Ju F, Zhou HY. Unreasonable to quote from Lu Xun to go against Chinese medicine. China Chinese Medicine Paper; 2008.

Original Article

Looking for Chinese Red: Materia Medica Trade along the Silk Road and Development of Chinese Red Dyestuff



Min Shao
Shanghai Theatre Academy, Shanghai, China

Abstract

In thousands of years from the Pre-Qin Dynasty to the Qing Dynasty, crimson represents sacredness and good fortune in several dynasties and is honored in the hierarchy of colors. Meanwhile, introduction to the exotic Materia Medica for dyeing from the Silk Road trade greatly expands the dyeing category of red color. The exotic red dyestuff is eventually integrated into the red culture of the Central Plains through the localization process. Therefore, it becomes the color symbol on behalf of Chinese nation.

Keywords: Materia medica trade, red dyestuff, Silk Road

Red Color: The Most Ceremonious Traditional Chinese Auspicious Color

The original meaning of "Red" in ancient China refers to the light red color (縓) , namely the secondary color composed of crimson and white. Both red and light red can be obtained from dyeing with madder (Radix et Rhizoma Rubiae), showing a little yellow in the light red color. However, since the late Ming and early Qing Period, the semantics of red has changed gradually, which is progressively equal to vermilion (朱). It can be found out from Xiu Pu (《绣谱》*Book of Embroidery*) – literature in the Qing Dynasty, that at that time, vermilion, crimson (赤), and red are all collectively known as the red color up to date. Therefore, the red color nowadays refers to crimson in ancient China.

Five elements refer to the movement changes of five elementary substances – water, fire, wood, metal, and earth [Figure 1]. If they are manifested in the celestial phenomena, they appear as the five stars; if on the earth, they appear as the five positions; if in the four seasons, they appear as the five virtues; and if they are manifested in complicated patterns, they appear as the five colors. Founding emperor of each dynasty decided the color of the official costumes which they were fond of according to the movement of the five elements and worship of the five virtues. Red belongs to one of the five orthodox colors, representing the South. Traditional has it that Yao (尧) got the essence of Yan Emperor (赤帝) and worshiped the fire virtues; therefore, crimson represented its sacredness. Afterward, crimson represented the sacredness of the Han Dynasty. In the Tang Dynasty, yellow and crimson stood for the sacredness of its costumes and flags, respectively. When it came to the Ming Dynasty, as stated in Ming Shi (《明史》*History of the Ming Dynasty*), it is said that in different dynasties, people worshiped different colors. In the Xia Dynasty, people worshiped the black color, while in the Shang Dynasty, people worshiped the white color. At present, after we have replaced the rules of the Yuan Dynasty, we follow the worship of costume colors of the Zhou, Han, Tang, and Song Dynasties and choose the crimson properly.

In the Ming Dynasty, they had strict hierarchy of costume colors, which could differentiate position levels of emperor from ministers, superiors from subordinates, and the young from the old of family members. They had rigid restriction on costume colors people would wear due to different social classes and social occasions [Figure 2]. Crimson is on behalf of the color of auspicious suits, which is not only the honorable color of the court but also the most joyous and solemn color

Address for correspondence: Dr. Min Shao,
Stage Art Department, Shanghai Theatre Academy, Shanghai, China.
E-mail: Shtengsheng@126.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_24_18

How to cite this article: Shao M. Looking for Chinese red: Materia Medica trade along the Silk Road and development of Chinese red dyestuff. Chin Med Cult 2018;XX:XX-XX.

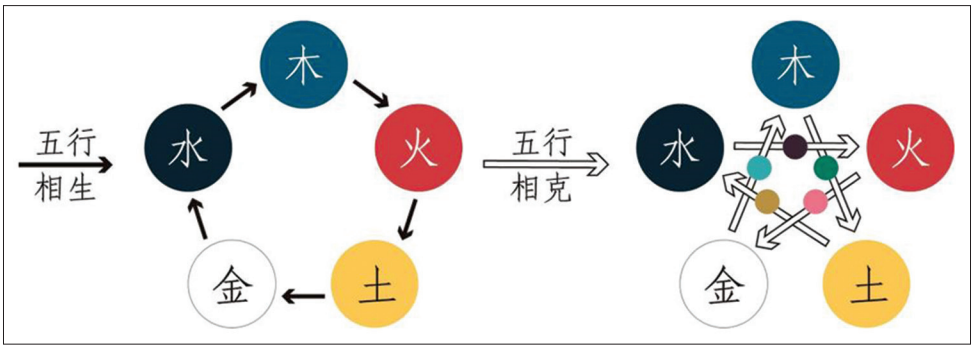


Figure 1: Relationship between the five elements and five colors

Figure 2: Official uniform from the Ming Dynasty, officers from the first to the fourth degree wearing the red official costumes

Figure 3: Mercuric sulfide

for folk marriage. This color culture and custom continue from the Ming Dynasty to the present, and crimson have become the national color of China showing happiness and pleasure.

Red Dyestuff: Luxuries of Eastern and Western Nobilities

In the late 19th century, before the discovery and application of chemical dyestuff, regardless of the East or the West, colorful costumes wore by the nobilities were all made up of natural dyestuff. Natural dyestuff can be divided into three types: mineral dyestuff, vegetative dyestuff, and creatural dyestuff, among which vegetative dyestuff is the most widely used. Around the whole world, major natural dyestuff is as follows:

Cinnabar (朱砂) and vermilion (银朱)

Major constituent of both cinnabar and vermilion is mercuric sulfide (HgS), the typical mineral red dyestuff in ancient China [Figure 3]. They are originally the same substance, while they are given different names due to different production process. Cinnabar, refined from mercury which is refined from mercuric sulfide, has the trait of regeneration. It is regarded as the symbol of getting away from earthliness and is the important constituent to refine elixir from ancient times. As dyestuff, the production process is extremely complicated. Except for a small amount of usage, it is commonly replaced by vegetative dyestuff.

Madder (*Radix et Rhizoma Rubiae*)

Madder belongs to Rubiae genus, Rubiae species, also named as Mao Sou (茅蒐). Qian Qian (蒨茜), Di Xue (地血), Teucrium Viscidum (血见愁), *Lycopodium cernuum* L. (过山龙) as well as Niu Man (牛蔓). Its root can be used for coloration of dark red (绛), which is also known as Ran Fei Cao (染绯草) [Figure 4]. Madder pertains to traditional Chinese vegetative crimson dyestuff. Since the Qin and Han Dynasties, it is the major dyestuff for coloration of emperor's clothes. Madder belongs to dyestuff with mordant dyeing property. Red colored from madder shows warmth with a little yellow color. Stained for the first time, the color is light red (縓); for the second time, the color becomes yellow combined with red (纁); for the third time, the color changes into dark red, while for the fourth time, the color transforms to vermilion. Madder is widely distributed globally. Compared with traditional Chinese dark red color, occidental dark red color is rather brighter.

Safflower (Flos Carthami)

Safflower pertains to the composite family. At first, the flowers are yellow; afterward, they change into red. The leaves seem quite blue; therefore, it is also named as *Carthamus tinctorius* (红蓝花) [Figure 5]. Safflower was originally produced in Liang Han (梁汉) and Western Regions. Seeds were obtained by Zhang Qian (张骞, a famous diplomat in the Han Dynasty) from the Western regions and then were extensively planted in the northern part of China. Safflower is the main vegetative source of red dyestuff. It can be used

for coloration of scarlet red and real red. For the bright color, it can be used to make blusher.

Sappan wood (Lignum Sappan) and Brazilian rosewood

Sappan wood belongs to *Leguminosae*, also named as sapan wood (苏方), Su (樕, a kind of wood for coloration in ancient Chinese book), and Fang (枋). It is similar to locust tree and is produced in ancient Dan Dan Guo (丹丹国 ancient Chinese name for region near Malaysia or Singapore), which can be used for coloration of dark red and black red. The earliest record of it was written in Nan Fang Cao Mu Zhuang (《南方草木状》*Description of Vegetation in South China*) in the Jin Dynasty. When it came to the Ming Dynasty, sappan wood became the most important dyestuff for red color [Figure 6].

Brazilian rosewood is also known as *Caesalpinia echinata* (巴西苏木), pertaining to *Leguminosae*. It was originally abound in Brazil, then was transported to Europe because of mass deforestation, and became the red dyestuff exclusive to European aristocracy during the Renaissance Period.

Laccifer Lacca and cochineal insect

Bengal kino (紫鉚), also known as lac (赤胶) and lac encrusted twig (紫梗), belongs to the natural colloid secreted by laccifer lacca – a typical kind of parasitic insect in the south subtropical zone. Bengal kino is the main creatural dyestuff source for coloration of scarlet red (大红) in ancient China. It is referred to as "Ant Paint and Red Floc" (蚁漆赤絮 the excretion secreted by ant to dye the cotton material), which is pretty precious.

Cochineal insect was originally produced in Mexico as well as Central America, which is the scale insect parasitizing in *Cactus*. Polypide includes a large amount of carmine acid, referring to the absolutely perfect natural red dyestuff. After the discovery of the New World, cochineal insect was once monopolized by Spaniard as the secret commodities to transport to Europe with the pretty expensive price.

Red Color: Splendid Color in Materia Medica Trade Along the Silk Road

China is one of the earliest ancient civilizations to conduct natural coloration. As early as in the palaeoid literature – Shang Hai Jing (《山海经》*The Classic of Mountains and Rivers*), it had already recorded many minerals and plants for coloration. In thousands of years from the Pre-Qin Dynasty to the Qing Dynasty, on the one hand, crimson represents sacredness and good fortune in several dynasties and is honored in the hierarchy of colors. On the other hand, introduction to the exotic Materia Medica for dyeing from the Silk Road trade

Figure 4: Madder root

Figure 5: Safflower

Figure 6: Sappan wood

Figure 7: Production of safflower paste

Figure 8: Safflower for Drying in the Sun

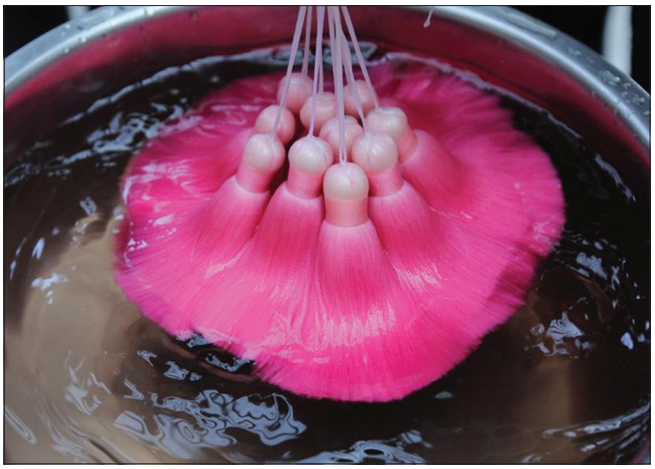


Figure 9: Silk tassel dyed from safflower

Figure 10: Sappan wood the most important red dyestuff in the Ming Dynasty

Figure 11: Red colors dyed from sappan wood

expands the dyeing category of red greatly. Color system of red becomes increasingly delicate with far richer gradation.

We have quite rich literal expression of red color system in ancient Chinese literature. In the first place, it refers to root for individual characters, such as light red (緼， 赧), red (红), yellow combined with red (纁), dark red (绛), deep red (绯), crimson (赤), vermilion (朱), and cinnabar (丹). In the second place, it relates to tertiary color composed of degree terms and root, such as scarlet red (大红), pure red (纯红), and real red (真红). In the third place, it means tertiary color consisted of item color and root; for example, bright pink (水红), pink (桃红), pinkish red (肉红), wood red (木红), alum red (丹矾红), and purplish red (枣红). From ancient Chinese literature, such as Tian Gong Kai Wu (《天工开物》*Exploitation of the Works of Nature*), Ben Cao Gang Mu (《本草纲目》*Compendium of Materia Medica*), Duo Neng Bi Shi (《多能鄙事》*Capable of Doing All Sorts of Vulgar Things*), Wu Li Xiao Zhi (《物理小识》*Basic Knowledge of Physics*), and Qi Min Yao Shu (《齐民要术》*Important Arts for the People's Welfare*), it can be found out that the delicate and rich color system of red is mostly stained by safflower and sappan wood. Application of these two types of Material Medica for coloration, which were introduced to China through the Silk Road, was far more than the localized madder. For instance, in Yun Lu Man Chao (《云麓漫钞》*Historical Notes in the Tang and Song Dynasties*), the record of red color is as follows: "Previously it was believed that red refers to the secondary color composed of crimson and white, namely the color of red combined with blue nowadays."

The earliest record of madder was written in Shang Hai Jing (《山海经》*The Classic of Mountains and Rivers*). Application of madder for coloration had a long history in the whole history of Chinese clothing color. During the whole period of Pre-Qin as well as Qin and Han Dynasties, madder was extensively planted for dyeing. As written in Han Guan Yi (《汉官仪》*Ancient Laws and Regulations in the Han Dynasty*), "we planted herbs in the dyeing garden for the coloration of emperor's clothes, which is known as madder." The warm red color dyed from madder belongs to the crimson color combined with yellow. For the coloration of strong crimson, it needs repeatedly impregnation, leading to the color change that stained for the first time, the color

is light red, while for the fourth time, the color transforms to vermilion.

Safflower was originally produced in Central Asia and West Asia, a type of traditional dyestuff with a long history. It was recorded in Bo Wu Zhi (《博物志》*Natural History*) that Zhang Qian (张骞) obtained the seeds of safflower from the Western Regions and at present we plant safflower in Wei Area (nowadays the region of Hebei Province). Safflower contains yellow pigment and red pigment and was widely planted due to being introduced to Central Plains via the Silk Road. As first, the color stained by safflower was helvolus. Laterm yellow pigment was eliminated with the gradual adoption of killing-flower method (the method to extract red pigment) to obtain the pink color with fluorescent effect, thereby which can be used for coloration of red (红), scarlet red (大红), carmine (莲红), pink (桃红), pale rose color (银红), bright red (水红) m and real red (真红). Ancient Chinese also dried safflower in the sun or made it into flower paste [Figure 7]. This technique was not limited by the flowering phase. It could preserve the red pigment and be used to make blusher, which is the indispensable beauty applications for makeup and adornment of ancient Chinese women [Figures 8 and 9].

Sappan wood was originally produced in India, Myanmar, Vietnam, and Malaysia. In local area, sappan wood belongs to the red dyestuff of great importance [Figure 10]. The earliest record about sappan wood was written in Nan Fang Cao Mu Zhuang (《南方草木状》*Description of Vegetation in South China*) in the Jin Dynasty, saying that sappan wood was similar to sophora flower with black seeds, which was produced in Jiu Zhen (nowadays, the central area of Vietnam). Southerner applied it for coloration of dark red. If it was soaked in water from Da Yu (located in Guangdong Province), the color would be deeper. Coloration process by sappan wood is simple with strong color. It can be used for tintage of wood red (木红), alum red (丹矾红), little red (小红), and black red (乌红), referring to as the significant dyestuff for official uniforms [Figure 11]. The widespread application of sappan wood in the Ming Dynasty got benefit from the commodity trade of the Maritime Silk Road. Fleet of Zheng He (郑和, the famous navigator and diplomat in the Ming Dynasty) transported large amounts of sappan-wood from Southeast Asia to the Central Plains, which not only met the needs of red color for the royal court but also continued and developed the red culture, making it exists not only in the imperial court but also in the lives of common people. Eventually, it became the color symbol on behalf of Chinese nation.

As stated above, due to the terrestrial Silk Road and maritime silk trade, brand new type of red dyestuff had been introduced, cultivated, applied, and integrated into Chinese red culture, becoming an indispensable part eventually.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Original Article

Chinese Idioms and Traditional Chinese Medicine

Anwen Zheng

Postgraduate English Teaching Department, Foreign Language School, Anhui University of Technology, Maanshan, Anhui, China

Abstract

Like traditional Chinese medicine, Cheng Yu can also be viewed as a brilliant facet of traditional Chinese culture. In the essay, the author attempts to illustrate the close link between the two through some examples.

Keywords: Chinese characters, Chinese idioms, traditional Chinese medicine

Introduction

Chinese idioms, or Cheng Yu (成语), normally composed of four Chinese characters, are widely viewed as the essence of the nation's language, which is partly due to their strong ideographic function with such a concise form and partly to the profundity of the cultural origins, involving ancient literatures, fables, historical anecdotes,[1] as well as the traditional Chinese medicine (TCM). Quite a number of Chinese idioms, in fact, originated directly from the practice of TCM, which had dominated the medical care for more than 2000 years in this oriental country until Chinese contacted and gradually accepted western medicine in the 19th century.

Today, idioms related to TCM have gone far beyond the medical community and entered into the daily utterances among average people. Normally, such idioms depict one particular facet of TCM: some give a vivid account of the magic curative effect of TCM, such as qǐ sǐ huí shēng (起死回生) and yào dào bìng chú (药到病除); some reveal the fundamentals of TCM, such as yīn dì zhì yí（因地制宜）, yīn rén zhì yí(因人制宜), and yīn shí zhì yí (因时制宜); and still others sing high praise for the work ethics and the affirmative attitudes, held by many, toward the TCM profession itself, such as xuán hú jì shì (悬壶济世).[2]

This essay attempts to deal with the origins and usages of the above-mentioned idioms, respectively. Definitely, the six idioms chosen at random merely constitute a small fraction of the total; however, a sound knowledge of their formation may help us further understand TCM, which is closely related to the Chinese ancient culture.

Qǐ Sǐ Huí Shēng (起死回生): Bring the Dying Back to Life

The source of the idiom can be traced back to a legend of Bian Que (扁鹊), a famous and exceptionally talented physician living in the Spring and Autumn period (770–476 BC), who learned his medical skills and expertise from Chang Sang Jun (长桑君), a famous teacher of medicine. It is said that Dr. Chang trusted Bian Que to such a degree that finally, he imparted all his secret prescriptions to the young man, with which the young man also made his fame in medical circle.

One day, the legend goes, Bian Que traveled to a kingdom named GuoGuo (虢国), where the prince just breathed his last breath, and no one believed that the prince could be brought back to life. Bian Que, however, claimed that the prince was still alive and should be given first aid immediately with acupuncture. Despite his disbelief, the official who was in charge of the matter allowed Bian Que to have a try, and he really made it. With the spread of the story, people came to believe that Bian Que was able to bring the dying back to life.

Address for correspondence: Prof. Anwen Zheng,
Postgraduate English Teaching Department, Foreign Language School,
Anhui University of Technology, Maanshan, Anhui, China.
E-mail: zhenganwen@ahut.edu.cn

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_15_18

How to cite this article: Zheng A. Chinese idioms and traditional Chinese medicine. Chin Med Cult 2018;XX:XX-XX.

Yào Dào Bìng Chú(药到病除): Pills Work Like a Charm

Unlike qǐ sǐ huí shēng, the idiom yào dào bìng chú was not borrowed from a legend but from a medical book, composed by Xichun Zhang (1860–1963), a famous medical scientist in China's modern history. The complete quotation from the book is "yào dào bìng chú, xiào rú fú gǔ"(药到病除 效如桴鼓), which means no sooner had the medicine taken effect than the illness vanished, just as someone beat the drum, and he could hear the drum simultaneously. Today, this idiom is mainly uttered to praise the efficacy of a certain medicine, but sometimes, the extended meaning of this idiom is also used to express someone's happiness when he finds a quick solution to a tough problem.

Yīn Dì Zhì Yí (因地制宜): Adaptation to Local Conditions

The idiom yīn dì zhì yí is frequently used in contexts like, say, before a new policy is going to be implemented or a new measure to be taken. The purpose is to stress the compatibility between the environment and the new policy or measure, which, in turn, may determine whether the policy or measure can be successfully carried out.

As for the origin of the idiom, it has much to do with the so-called holism principle, a fundamental principle of diagnosis in TCM, which holds that, in his medical diagnosis, a doctor cannot jump to a conclusion, just by analyzing a patient's symptoms; other factors, however, including the region where the patient inhabits, the season when he got sick and the unique physical conditions of the patient also should be taken into account before a correct prescription can be made, for ancient Chinese doctors believed that physical health of human being depended heavily on the harmony between human and nature itself. Hence, two other synonymous idioms yīn rén zhì yí (因人制宜) and yīn shí zhì yí (因时制宜) arise and are frequently quoted in the similar contexts as well, with an emphasis on individual uniqueness and the time when he got ill, respectively.

The three idioms constitute an important concept, that is, the so-called three yīn, which, to a large extent, reflects the attitudes adopted by most TCM doctors toward their diagnosis. An individual's physical condition, which is anything but constant according to TCM, varies not only from region to region but also from season to season. In other words, in addition to dietary habits and lifestyles, China's geography, which is characterized by the coastal East, sandy West, foggy South, cold North, and humid Central area, also plays a critical role that gives rise to different diseases. Therefore, it is no wonder that a comprehensive perspective is of the greatest significance in a TCM diagnosis.

Xuán Hú Jì Shì (悬壶济世): Practice the Medicine to Help the People

Confucianism, as we know, had been the dominant ideology in ancient China for over 2000 years, which exerted an important influence on all walks of life, including medical work. rén (仁), one of the fundamental values harbored by Confucianism, which means benevolence or kindness, can be best embodied in the idiom xuán hú jì shì. Xuán hú means a hung calabash, which was used to contain drugs and usually hung near the doctor's doorstep to convey the message to the public: I am a doctor, and what can I do for you? A hung calabash, in ancient China, used to be an emblem of the medical profession, similar to the emblem with a snake coiling around a cane for the WHO. jì shì means "benefit mankind" or "do good to society", which can be regarded as the top working ethic of TCM doctors, and conventionally, Chinese trust their unique medicine and respect the TCM doctors on the whole.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Bin Z. Modern Chinese Language. Shanghai: East China Normal University Press; 2006. p. 158.
2. Xu Z. Xin Hua Cheng Yu Ci Dian. Beijing: The Commercial Press; 2012. p. 900, 901.

Original Article

Styrax, Emperor's Cream from the Western Regions

Tianwen Yao, Baican Yang[1]

Department of Nephrology, Yueyang Hospital of Integrated Chinese and Western Medicine Affiliated to Shanghai University of Traditional Chinese Medicine, [1]Department of Chinese Materia Medica, Shanghai University of Traditional Chinese Medicine, Shanghai, China

Abstract

Styrax is also called "emperor's cream" and "consciousness-regaining spice." The alias "emperor's cream" shows its rarity and preciousness with a strong aroma, and another name of "consciousness-regaining spice" implies its functions of active brain and regaining consciousness, dispelling filth with aroma, and relieving pain. The name of "*Styrax*" displays its complex productive progress and place of origin. With thick quality, heavyweight, and fragrant smell, *Styrax* gets further application in beauty, skin care, clothes fumigating, and health keeping after introduced into the Central Plains (central China) from the Western Regions. The name of *Styrax* not only embodies the mellow appeal of spice culture in the Western Regions but also suggests the history of relationship between foreign culture and traditional Chinese medicine. Furthermore, it indicates the broad mind of "all rivers running into sea" and inclusiveness of Chinese culture.

Keywords: Consciousness-regaining spice, emperor's cream, functions, spice culture in the Western Regions, *Styrax*

Styrax, sweet in flavor, warm in nature and non-toxic, can ward off evil, kill ghost, malaria, poison and get rid of three worms. In addition, it can clear away pathogen, and dispel nightmares. People who take it for a long time can thoroughly understand the law of nature, and even keep comfortable and longevity.

Ming Yi Bie Lu[1] (《名医别录》*Supplementary Records of Famous Physicians*)

Along the Silk Road, spices including *Styrax* are introduced from the Western Region to China with tributary system and trade. They become an essential part of people's lives because of their unique functions, such as cleaning environment, repelling insects, making wine, and sacrificing to ancestors. As a foreign medicine, the name of *Styrax* not only shows the influences of the Western Region on traditional Chinese medicine but also reflects the connotation of spice culture in the Western Regions.

Interpretation of Medical Name

Styrax is one of the resin-composed spices first introduced to China. It was widely used in the Eastern Han Dynasty and well respected during that period. *Styrax* as a medicine can trace back to Wei, Jin, the Northern and Southern dynasties, first emerged in the medical book Ming Yi Bie Lu (《名医别录》*Supplementary Records of Famous Physicians*).[2] For thousands of years, *Styrax* has been famous not only for its wide ranges of applications but also for its particular morphologic characteristics and efficacy. Consequently, some interesting alias names are generated such as "emperor's cream" and "consciousness-regaining spice."

Interpretation of alias

The alias "emperor's cream" [Figure 1] vividly displays the characteristics of *Styrax*. Cream originally means melted animal oil, with features of thick quality, heavyweight, and strong fragrance that can move freely. Emperor is on half of power and rule. On the one hand, most of spices including *Styrax* are produced from many distant countries in the Western Regions. As a result, *Styrax* is getting rare and precious, which gradually becomes luxuries of the noble. On the other hand, *Styrax* can emit a strong aroma called "the emperor of spices."

The name of "consciousness-regaining spice" visually describes the strong efficacy of *Styrax*, which is usually used in emergency and severe illness because it can keep the brain active, regain consciousness, and resurrect the dead. Dongfang Shuo (东方朔) in Han dynasty once recorded a legend in Hai Nei Shi Zhou Ji (《海内十洲记》*Introductions of Ten Regions*)

Address for correspondence: Dr. Tianwen Yao, Department of Nephrology, Yueyang Hospital of Integrated Chinese and Western Medicine Affiliated to Shanghai University of Traditional Chinese Medicine, Shanghai, China.
E-mail: yaotianwendc@126.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_25_18

How to cite this article: Yao T, Yang B. *Styrax*, emperor's cream from the Western Regions. Chin Med Cult 2018;XX:XX-XX.

that "near 88 BC, hundreds of people living in Chang'an suffered from a rarely-seen disease, and the most of them didn't make it. The Emperor made an attempt to burn the tributary spice from Yuezhi in the city. It was amazing that people with unconsciousness for less than three months all came back to consciousness and the fragrance lasted for three months."[3] In fact, what the Emperor burned was *Styrax* precisely [Figure 2].

Interpretation of *Styrax*

In Chinese characters, *Styrax* names after spice which originally describes the sweetness and fragrance of cereals.[4] As one of the spices used in China, *Styrax* was recorded firstly in Hou Han Shu Xi Yu Zhuan (《后汉书·西域传》*History of the Later Han Dynasty·Records on Western Regions*) that "home to the Kingdom of Daqin (大秦), *Styrax* was made of different spices." The Kingdom of Daqin was the Roman Empire. Hence, *Styrax* was originally native only to the Roman Empire and was decocted by numerous mixed spices. Then, it was introduced to China along the great Silk Road. However, Shizhen Li (李时珍) had different opinions on the names of *Styrax*. He considered that this spice was from the Kingdom of Shuhe, which is Iran nowadays. As a matter of fact, *Styrax* is the resin of a local tree. Usually, local people will cut into the barks deeply with a knife in early summer to improve the secretion of resins. When the autumn comes, the barks are removed and ground to generate the resins. The purity of resins relies on technology [Figure 3]. If people just remove impurities, only crude products can be obtained. After crude products are dissolved in alcohol and filtered for distillation, the refined product will be acquired.[5] To some extent, the complex productive progress endows *Styrax* with a stronger fragrance.

Emperor's cream, consciousness-regaining spice, or *Styrax* describes its particular morphologic characteristics and fragrance, making *Styrax* a significant part of spice culture in the Western Regions.

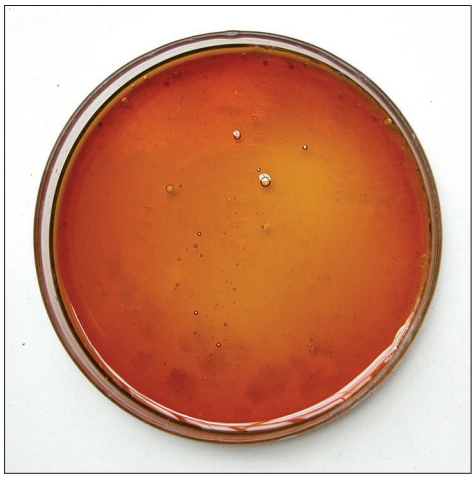


Figure 1: *Styrax* has the alias of "emperor's cream"

Figure 3: Local people will cut into the barks deeply improve the secretion of resins

Styrax and Spice Culture in the Western Regions

It is well known that spices are daily necessities for people living in the Western Regions. Spices are not only used widely in cosmetics, seasoning, and antiseptic but also play an important role in warding off diseases, keeping personal and public hygiene. Zhang Qian (张骞) in Han dynasty served as an envoy to the Western Regions [Figure 4]. As a result, the Silk Road, a significant trade route throughout the Middle Asia, was carved out. With frequent trade transactions, exotic spices were spread to the Central Plains and gradually influence daily life and medical activity. For instance, the princes and aristocrats used spices in burning incense, fumigating clothes, carrying sachets, and so on. Based on the repeated practice and deep understanding about different exotic spices, ancient doctors integrated them into the treasure house of traditional Chinese medicine and made them one part of the family.

Figure 2: The emperor burned *Styrax* to save people's lives

Figure 4: Qian Zhang (张骞) in Han dynasty served as an envoy to the Western Regions

The wide application of spices in Western Regions and Western China is closely related to the living habits and environment in this area. People living in Central Asia, Western Asia, and the Western China feed on beef, mutton, and milk and wear heavy clothes mostly made of animal fur. Particularly, businessmen walking along the Silk Road spend the most time with camels and horses [Figure 5], facing water scarcity. Due to less frequent showering, they are inevitably smelly. Animals and plants that can secrete toxins live in the Western Regions because of the natural ecosystems, biodiversity, isolated geographic environment, and extreme hot and cold climate. Those toxins produced by different animals and plants when they grow or die can easily spread in hot, dry, or cold conditions, ultimately resulting in unbearable odor. At this point, some spices including *Styrax* were inevitably introduced and applied. They became the favorites along the Silk Road and gradually introduced to central plain.

With fragrances, those spices can give body an agreeable scent, lift spirits, and relieve symptoms such as nausea, vomiting, abdomen pain, diarrhea, headache, dizziness, drowsiness, dyspnea, and fatigue. Finally, people's helplessness and panic are reduced by their balmy smell.[6] Undoubtedly, spices such as *Styrax* are warmly welcomed in exotic areas, which get further application in beauty, skin care, fumigating clothes, and health keeping after introduced into the central plains. Gu Ban (班固), the author of Han Shu (《汉书》*Histories of Han Dynasties*), once wrote to his brother Chao Ban (班超), "I wanted to buy horses of Yuezhi (月支) and *Styrax* at the cost of three hundred white silk". At this moment, Ban Chao was busy in unifying the Western Regions in Shule (疏勒) area where was the communications hub on the Silk Road and an important trade market between the West and East. Ban Gu was willing to exchange silk made in the Central Plains for *Styrax*, suggesting the high value of *Styrax*.

Functions of *Styrax*

Styrax is featured with unique effects, including diverging, spreading, and moving because of its typical pungent aromas. Its major functions are listed below.

Active brain and regain consciousness

Spiritual activities, consciousness, and thoughts are determined by the heart. If cold-dampness and turbid-phlegm block the heart, people may faint suddenly in the place with trismus, unconsciousness, stiff and cold limbs, and dim face and lips. Symptoms mentioned above are what we call "yin blocked syndrome" or "cold blocked syndrome." *Styrax* is pungent, warm, and moving in nature. Hence, it can open every viscera, especially active brain and regain consciousness. As a result, *Styrax* is known for treating cold blocked syndrome. In clinical practice, *Styrax* is often used along with musk, benzoin, sandalwood, and agarwood, for example, *Styrax* Pills. Meanwhile, *Styrax* can also be used in rescuing the patients with emergencies, such as heatstroke and faint caused by mountainous evil air.

Figure 5: Businessmen walking along the Silk Road spend the most time with camels and horses

Dispel filth with aroma and relieve pain

With pungent and warming properties, *Styrax* has the functions of eliminating turbid pathogen with aromatics, removing coldness, and relieving pain. Therefore, it is widely applied to stop pains caused by cold coagulating and qi stagnation, especially the abdominal distention and cold pain due to cold and dampness stasis. Kuo Shen (沈括), one of the most outstanding figures in the scientific history of China, once recorded a medical case in Meng Xi Bi Tan (《梦溪笔谈》*Notes by Mengxi*) that "Wang Wenzheng, the Grand Commandant of Northern Song Dynasty, suffered from abdominal distention and cold pain. The Emperor took pity on the minister and sent him with a bottle of medicinal liquor, telling him to take it on an empty stomach. After taking the mysterious liquor, the Grand Commandant was in high spirits and expressed his gratitude to the Emperor the following day. The Emperor told all the civil officials that this liquor was called "*Styrax* Wine," which could regulate and harmonize the five internal organs to get rid of abdominal disease. So, just one glass of wine can keep you away from exogenous wind-cold. Besides, *Styrax* is usually used with borneol and aucklandiae radix to improve its effects of regulating Qi, widening chest, and relieving pain.

Spices have been the important items for tributary system and trade on various ancient roads of east-west communications, such as the Silk Road. *Styrax* that comes from the Western Regions is used to remove the unfavorable taste in life and also plays a significant role in medical care based on its pungent, warm, and moving features. Undoubtedly, it becomes one of the most popular spices in both eastern and western.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Tao HG. Ming Yi Bie Lu. Beijing: People's Medical Publishing House; 1986.
2. Wang Y, Xu ZP, Wang J, Zou QF, Zhang XL, Liu Y. The overview of styrax. Pharm Clin Chin Mater Med 2013;4:49-52.
3. Shi YT. The Silk Road and import of spices in Han Dynasty. Cent Plains Cult Res 2014;6:59-65.
4. Xu S. Shuo Wen Jie Zi. Beijing: China Drama Publishing House; 2010.
5. Liu P, Yu SS, He XR. The research progress on styrax. Chin J Drug Appl Monit 2010;7:315-7.
6. He W. The custom and tool of burning incense from the pre-Qin period to Qin and Han Dynasty. Cult Relics Cent China 2013;6:51-3.

Research Article

Structure and Distribution of the San Jiao and Cou Li – Recognized Interstitium in Human Tissues

Lifang Qu

School of Basic Medicine, Shanghai University of Traditional Chinese Medicine, Shanghai, China

Abstract

Since the *Yellow Emperor's Inner Canon* (c. 200 bce), Traditional Chinese Medicine (TCM) has held that the san jiao system is the largest anatomical structure in the human body, and that it consists of a network comprising the large cavities in the body trunk and the small interstitial spaces between the tissues and cells throughout the body. More than 2000 years later, and according to recent scientific reports in America, this network of structures has been recognized by modern medicine. The two theories, TCM's san jiao and its system of spaces(腠còu), and the recent scientific discovery of an interstitial network in the human body, are quite similar in structure, distribution and function.

Keywords: Cavity, Cou li (腠理), interstitial, San jiao (三焦), TCM

Introduction

Recently, scientific reports[1] have been published on the structure and distribution of an unrecognized interstitium in the human body. The content is highly related to the structure and distribution of the San Jiao (三焦 *sān jiāo*) and Cou Li (腠理*còu lǐ*) in Traditional Chinese Medicine (TCM), especially, cou-interstitial spaces (腠*còu*) between the cells and tissues. It is time for TCM practitioners to recognize the partition and composition of the San Jiao-Cou Li system and their four main functions and features of the waterways (气道*qì dào*), the pathway of qi (水道*shuǐ dào*), the site of qi transformations **(**气化场所*qì huà chǎng suǒ*), and the transmission of transformed substances/metabolin (转输化物 *zhuǎn shū huà wù*).

It is well known that the San Jiao is the largest, isolated, and most unique fu in TCM, and is translated as "triple burner," "triple energizer," "the three warmer," and "triple jiao" in English. Chapter 8 in the *Elementary Questions* described San Jiao as "holds the office of the sluices, and manifests as the waterways."

Throughout history, there have been many debates about the San Jiao. Here, we discuss this unique fu system as presented in TCM's early classics. From the Ling Shu *(*灵枢 *Divine Pivot)*, Chapter 18:

"The upper jiao starts above the upper opening of the stomach, and flows upward along the throat. It penetrates through the diaphragm, spreads through the chest, runs to armpit and descends along the (lung channel) taiyin to the (large intestine channel) yangming.… The middle jiao also starts from the stomach. It is underneath the upper jiao.… The lower jiao emerges from the ileum, and infuses into the bladder, …food waste is transmitted to the large intestine. …I have heard that the upper jiao is like a mist, the middle jiao is like foam and the lower jiao is like a drainage ditch [Figure 1]."

And from the Jīn Guì Yào Lüè (金匱要略 *Essential Prescriptions of the Golden Babinet*) as:

"The interstices (腠*còu* – the interstitial and intercellular spaces) are the place of the San Jiao where initiating (元气*yuán qì*) and true (真气*zhēn qì*) circulate and converge; they are filled and suffused with the blood (nutrients) and qi (clear qi, oxygen). The li (理*lǐ*) are the textures of the skin and viscera."

From the above, we know clearly that the San Jiao system consists of two parts of cavities in trunk and interstices between the tissues and cells from skin to zang fu,[2] which make us

Address for correspondence: Prof. Lifang Qu, School of Basic Medicine, Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China.
E-mail: lifang_qu@163.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_23_18

How to cite this article: Qu L. Structure and distribution of the San Jiao and Cou Li – Recognized interstitium in human tissues. Chin Med Cult 2018;XX:XX-XX.

confirm San Jiao theory in terms of its location and features and its partitions and functions.

The Partition and Composition of San Jiao

Three big cavities in the trunk

Conventionally, San Jiao consists of three partitioned regions: the upper jiao, middle jiao, and lower jiao [Figure 1]. The partitioning of San Jiao is given in The *Divine Pivot*, Chapter 18: "The upper jiao starts above the upper opening of the stomach, and flows upward along the throat. It penetrates through the diaphragm, spreads through the chest, runs to armpit… up to tongue." The middle jiao also starts from the stomach. It is underneath the upper jiao….. The lower jiao emerges from the ileum, and infuses into the bladder."

Every organ and tissue have their own name and function. What remained, except they contain organs and tissues, are related to the San Jiao. For example, when the heart and lung are removed from the chest, a thoracic cavity remains, which clearly shows that the upper jiao, similar to middle and lower jiao, mainly refers to the thoracic, as well as abdominal and pelvic cavities.

Within the three large cavities in the body trunk, the San Jiao's qi-functions are carried out by the viscera located within them. However, the thoracic, abdominal, and pelvic cavities are only a part of the San Jiao system, and the *Divine Pivot*'s description of the upper Jiao clearly includes all of the body above the diaphragm – the chest, heart, lungs, head, arms, and so on.

The upper jiao's qi-functions are to disperse and distribute transformed pure food essence, the clear body fluids, qi and blood, throughout the body. Thus, the upper jiao is described as a "mist" (雾*wù*). Together, the qi-functions of the heart and lung achieve the upper jiao's dispersing and distribution activities, and because they are situated in the thoracic cavity, the chest region tends to represent the upper jiao. But in fact, not only the large chest cavity but also all the small interstitial gaps and intercellular spaces above the diaphragm belong to the upper jiao.

The middle jiao is the area under the diaphragm and above the navel, and in TCM, this region contains the spleen and stomach. When the spleen and stomach are removed, there mainly remains abdominal cavity. It is the function of the middle jiao, the spleen and stomach, to ferment, decompose, and transform our dietary intake into nutrient substances, and so the middle jiao is said to be like a "retting" (沤*ōu*). Like the upper jiao, the middle jiao is the abdominal cavity containing not only the spleen and stomach but also all the abdominal region cavities.

The lower jiao is the area below the navel. In TCM, it contains the kidney and liver (functionally), urinary bladder, large intestine, small intestine, uterus, legs, and feet. Because the lower jiao discharges waste from the body, it is described as the "drainage" (渎*dú*). The large pelvic cavity in particular, including all the small spaces throughout the lower body, is regarded as the lower jiao. Therefore, the functional states of san jiao are described as that the upper jiao is like a mist, the middle jiao is like foam, and the lower jiao is like a drainage ditch.

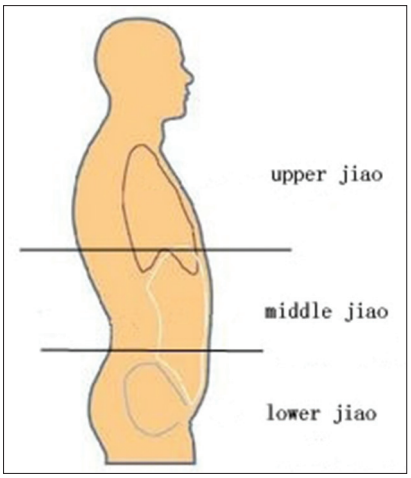


Figure 1: San Jiao

Interstitium between the tissues and cells

The Jīn Guì Yào Lüè (金匱要略), written by Zhongjing Zhang [Figure 2] (pp. 152–219), explains this aspect of the San Jiao system in more detail. In Chapter 1, Zhang Zhongjing describes this other indispensable structure of the San Jiao system: "The interstices are the place of the san jiao where initiating and true (真气*zhēn qì*) circulate and converge; they are filled and suffused with the blood (nutrients) and qi (clear qi, oxygen). The li (理*lǐ*) are the textures of the skin and viscera."

The spaces and textures (腠理*còu lǐ*) are often mentioned together and individually in the *Inner Canon*. It is well known that the textures are arranged by the different cells and tissues to form the viscera, where there must be spaces, gaps, and interstices. It is Zhang Zhongjing who concluded that the San Jiao system consists of two parts of the large cavities in trunk that are connected to all the small spaces between the cells, tissues, and viscera throughout the rest of the body.

Kun Wu (吳崑Wú kūn 1552–1620) explained that the "cou" (腠*còu*) are the sweat pores, and li (理*lǐ*) are the textures of the muscles. According to Jingyue Zhang (张景岳 Zhāng Jǐngyuè, 1563–1640), "The cou are the body spaces, the place where the blood and qi are coming and going; they are the road where the San Jiao circulates and the initiating qi and true qi converge. The li are the orderly textures from the skin to the viscera."

It is very clear that the li-textures are the textures and striations of body tissues and structures from the viscera internally right out to the skin and fine body hair externally. Every texture is formed by the orderly arrangement of cells and tissues according to their place and function. They are part of the San Jiao's network of cavities and spaces because they define and characterize the cou-interstitial spaces between the cells and

tissues. Where there are certain textures of cells and tissues, there must be a space between them. This is why the inner canon often mentions the 腠理*(còu lǐ)*together. Thus, the Golden Cabinet describes clearly that cou-interstitial spaces (腠*còu)* between the cells and tissues affiliate San Jiao.

While there have been many viewpoints about the San Jiao over the years, opinions on its physiological functions are coincident. For students of TCM today, it is important to understand, not only the San Jiao's physiological functions, but the actual partitioning structures and locations of the San Jiao that carry out those functions. In TCM's ancient classics, these features are very clear: the location and structure of the San Jiao system consists of the three partitioned regions that are the large cavities in the body trunk, and all the small interstitial, small gaps, and spaces between the cells, tissues, and viscera throughout those regions and the whole body.

The Functions of San Jiao (Cou Li)

The San Jiao has four main functions and features:[3] it is the waterways, the pathway of qi, the site of qi transformations, and the transmission of transformed substances/metabolin (转输化物 *zhuǎn shū huà wù*).

The qi pathway (气道*qi dào*)

In the Nan Jing (难经 *Classic of Difficult Issues* 100 ce), Issue 31 says that, "The san jiao is the end and the start of (the course of) the qi." In TCM, the San Jiao's qi pathway is the place where the three qi converge. Different interpretations of the "three qi" emphasize their different activities; however, the three qi refer mainly to the source qi (原气*yuán qì*), initiating qi, and the defense qi (卫气*wèi qì*).

The source qi, also called the "original qi, the primary qi, arises from the life gate (命门*mìng mén*) and pours into the viscera via San Jiao's network of cavities and spaces that are distributed throughout the body. The Classic Difficulties, Issue 38 says, "The san jiao is another route of the source qi, and in charge of all kinds of qi." It means that all kinds of qi are transformed by source qi. The initiating qi also derives from life gate. It is the first power to instigating life process and main energy to keep life activities. One part of the defense qi derives from the life gate in the low jiao. The *Divine Pivot*, Chapter 18 says: "Defense comes from the low jiao." Defense qi is distributed to all the interstitial spaces and textures between the cells and tissues, the muscles and viscera, in order to protect them from evils. (For more details, see Section 1 in Chapter 2. and the qi, blood, and body fluids in Chapter 4.)

In this way, the San Jiao's qi passageway function stimulates visceral physiology and maintains orderly and harmonious life processes. The three kinds of qi together fill the spaces and cavities of the San Jiao to maintain normal visceral functions and maintain the conditions for good health. The San Jiao's qi pathway must be kept clear and open to assist orderly qi movement, the ascending–descending, and floating–sinking qi dynamic that is essential for orderly qi activities and life processes.

The waterways (水道*shuǐ dào*)

In TCM theory, San Jiao is regarded as the place where the fluids pass through. The *Elementary Questions*, Chapter 8 says: "The san jiao is the officer who is in charge of drains and irrigation; it is the place from which the water pathways emerge." This means that the San Jiao's system of cavities and spaces is an important site for fluid metabolism because it enables the orderly ascending, descending, moving inward, and moving outward (discharge) of fluids.

The retention of excessive water in the spaces between the cells and tissues (edema) and the retention of fluid in the abdominal cavity (ascites) are well-known disorders of fluid metabolism. Both clearly remind us that the spaces between the cells and tissues and the body cavities are part of the San Jiao's structure that serves as the place for the movement and transformation of fluids – the waterways. The main functions of the San Jiao waterways are actually carried out by three of the zang, the spleen, lung, and kidney, and two of the fu, the San Jiao itself, and the urinary bladder.

The site of qi-transformation (气化场所*qì huà chǎng suǒ*)

The "site of the qi-transformation" [Figure 3] refers mainly to the physiological processes that take place in the San Jiao's network of spaces and textures. The theory is taken from the *Golden Cabinet*, Chapter 1.

Figure 2: Zhongjing Zhang (张仲景)

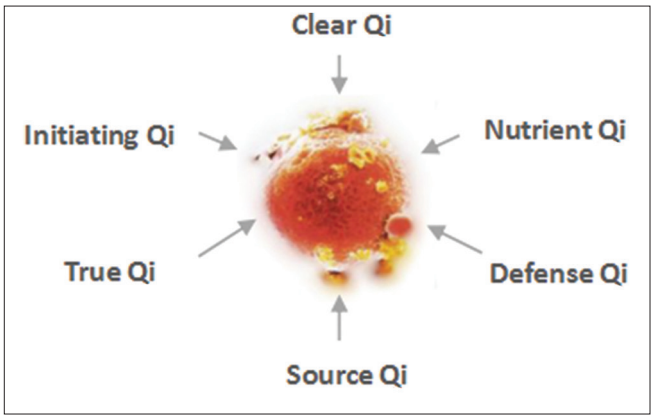


Figure 3: The site of qi-transformation

In TCM, qi is like a kind of very small, very fine substance, and generally speaking, we divide the body's transformations (化*huà* means change and transformation) into two kinds of processes, one governed by the spleen and the other by the kidney. The former is called transportation and transformation (运化*yùn huà*). These are first-stage digestion and absorption metabolic processes. The latter is called qi-transformation (气化*qì huà*), second-stage and more refined set of transformations, which are similar to the modern medicine's catabolic and anabolic processes.

The kidney's qi hua functions are the transformations of these very fine qi-substances that take place in microscopic tissue structures and cells. For all the cells and tissues to carry out their work correctly, they need the stimulus and drive of the initiating qi, and the real-life information of the true qi (真气 *zhēn qì*), which the San Jiao supplies from the life gate.

In addition, the nutrient qi (营气*yíng qì*) from the spleen, clear qi (清气*qīng qì*, or oxygen) from the lung, and defense qi from the San Jiao's upper, middle, and lower regions protect the viscera, tissues, and cells from disturbance and disruption by various evils.

Transmitting transformed substances (转输化物 *zhuǎn shū huà wù*)

Another important function of the San Jiao system is its transmission of the substances transformed by the cells, tissues, and viscera and absorbed into the spaces between them. It is called transmitting transformed substances (转输化物 *zhuǎn shū huà wù*) in the *Yellow Emperor's Inner Canon*, Chapter 11: "The stomach, large intestine, small intestine, san jiao and bladder … receive turbid qi from the five zang. They are called the fu of transmission and transformation." The San Jiao's network of spaces is an especially important site for metabolic activities at the cellular level. All the metabolic products from all kinds of cells are carried away by the body fluids surrounding them and the San Jiao's network of interstitial and intercellular spaces, and are finally discharged with the urine and sweat.

In short, it is very important to understand San Jiao's partitioned structure and functions. The partitioning of San Jiao defines its network of large cavities in the body trunk, and all the smaller interstitial, gaps, crevices, and spaces that exist between the viscera, tissues, and cells that extend out to the limbs and body surface. Collectively, the body's network of cavities, gaps, crevices, interstitial spaces are the San Jiao fu, and this explains the uniqueness of the sixth fu system. This is why the San Jiao is the largest of the viscera, how it contains all the other viscera, and why the San Jiao's functions cannot be achieved without the zang fu organs enclosed within it.

The San Jiao is also said to be isolated and unique among the fu because, unlike other viscera, it has no yin (internal–external) partner. However, it is governed by the kidney, and the kidney governs water; it corresponds to the urinary bladder internally, and to the cou li-spaces and textures of the skin cells and soft body hair externally. Chapter 47 in the *Divine Pivot* says, "The kidney responds to the san jiao and the bladder, which respond to the cou li and soft hair."

Functionally, the San Jiao system of cavities and interstitial spaces is an important site for metabolic functions. It serves as the qi pathway and the waterways, the place for their convergence, and serves as the place for qi transformations and for the transmission of transformed substances from cell metabolism. The San Jiao's network is comprised of all kinds of cavities and spaces that must be kept clear of obstructions so that qi influences and substances, water, and body fluids can pass through smoothly. Unobstructed movement facilitates physiology and ensures that the substances produced by tissues and cells are transported and cleaned away efficiently. Uremia is a disease example that illustrates the importance of these movements and transformations.

The San Jiao is also a model for syndrome differentiation for TCM's School of Warm Diseases and its analysis of external pathogens. To diagnose all kinds of warm diseases, this method identifies signs and symptom clusters according to whether they affect the upper, middle, or lower jiao. The principles of treatment for the San Jiao model of warm diseases and patterns are described as mist like for the upper jiao, balanced and harmonizing for the middle jiao, and downbearing for the lower jiao.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Benias PC, Wells RG, Sackey-Aboagye B, Klavan H, Reidy J, Buonocore D, *et al*. Structure and distribution of an unrecognized interstitium in human tissues. Sci Rep 2018;8:4947.
2. Lifang Q, Garvey M. The location and function of the Sanjiao. J Chin Med Engl 2001;65:26-32.
3. Lifang Q, Garvey M. Traditional Chinese Medicine Basic Theory: Shanghai World Publishing Corporation; 2018.

Research Article

Benefits of Gum Arabic, for a Solitary Kidney Under Adverse Conditions: A Case Study

Mehrab Dashtdar, Karima Kardi

Department of Integrative Medicine, Dubai Specialized Medical Center and Medical Research Lab, Affiliated with Dubai Medical College and Dubai Pharmacy College, Dubai, United Arab Emirates

Abstract

Gum Arabic (GA, called E-414 in the EU food industry), a natural biopolymer resin is a dried exudation obtained from the stems and branches of natural strains of Acacia Senegal (L) Willdenow. It consists mainly of high molecular weight polysaccharides and their calcium, potassium, and magnesium, which on hydrolysis yield arabinose, galactose, rhamnose, and glucuronic acid. Fermentable natural fiber of gum Arabic act as probiotics improves the absorption of minerals, especially calcium and helps to maintain a healthy balance of bacteria in the gastrointestinal (GI) tract. Extraction, transformation, or reprocessing of nitrogenous wastes (ammonia, urea, and uric acid) by the GI tract is a potentially low-cost means of switching for missing renal function. Binding of nitrogen compounds to be inert orally by administration of gum Arabic is the safe solution either in normal renal function or renal failures. In this study, clinically, we observed a case of solitary kidney under adverse condition long-term treating with gum Arabic the vast potential of bioactive phytochemicals as a nontoxic, efficient with uric acid and bilirubin lowering agent and anti-inflammatory effects, considering the gum Arabic as a potential therapeutic supplement, beneficial in chronic renal failure, cardiovascular disease, pain management, and dental health. Despite the nonexistent background concerning the benefits of gum Arabic, for a solitary kidney under adverse conditions, our study has confirmed that long-term consumption of gum Arabic not only has no side effect but also protects multi-organs damage from drug adverse reactions and consequences of baseline disease, including renal, vascular, dental and inflammatory diseases.

Keywords: *Acacia* Senegal, chronic renal failure, emulsifier, gum Arabic, natural fiber, probiotics, solitary kidney

Introduction

In the absence of this emulsifier, the black-colored goes back to the bottle surface. We could not drink soft drinks. Either consume sweets and medicines, including fixed gum coating or eat yogurt, which it does not thicken the texture, nor to drink wine, which reduces the aggressive tannins or print newspapers, on which it secures the ink. Gum Arabic (GA, called E-414 in the food industry within the E numbers and *Acacia* gum according to the list of additives in the European Union) is a dietary fiber extracted from the dried oozing of *Acacia* Senegal. The newly secreted gum is pale golden yellow, semi-liquid consistency, odorless, and generally tasteless material. As it solidifies takes different colorations, until a reddish yellow with the fullness of its consistency, in which it is difficult to pulverize. Gum Arabic which is extracted from the bark of the *Acacia* Senegal had been a trade for over four thousand years, i.e., its importance to the African people, since it is the source major revenue. The substance is commercially produced throughout the Sahel, from Senegal to the Sudan and Somaliland. While the extract is applied for its curative properties and especially its use is in the pharmacological industry (binder, emulsifier) in food (gelling agent and emulsifier), cosmetology and textiles (solidification), some medicinal properties of the same have as well as emerged recently.[1-3] It is moreover, used in confectionery as a basis for the production of marshmallows and chewing gum. Gum Arabic is also authorized as protective colloid young wines to improve stability in the bottle, to avoid precipitating the matter unstable coloring (pigments and

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_22_18

Address for correspondence: Dr. Mehrab Dashtdar, Department of Integrative Medicine, Dubai Specialized Medical Center and Medical Research Lab, Affiliated with Dubai Medical College and Dubai Pharmacy College, Dubai, United Arab Emirates.
E-mail: dr.mehrab@gmail.com

How to cite this article: Dashtdar M, Kardi K. Benefits of gum Arabic, for a solitary kidney under adverse conditions: A case study. Chin Med Cult 2018;XX:XX-XX.

tartrates) and increase balance and organoleptic characteristics of the wine, reducing bitterness and astringency, increasing the smoothness, and improving sensation of the wine.[4]

Gum Arabic is a natural resin consisting of polysaccharides, and glycoprotein is extracted from two species of *Acacia* sub-Saharan Africa, more specifically the species *Acacia* Senegal and *Acacia* seyal. *Acacia* Senegal is part of the African healing plants. Egyptians used it in the mummification process and the development of some cosmetics and perfumes. The use of this plant for its medicinal properties is lost gradually and dark into oblivion, but its advantage was rediscovered by European navigators in the fifteenth century in sub-Saharan Africa. Its commercial importance was such that in the seventeenth, century gave rise to the War of gum, opposing French, Dutch, Portuguese, and British in the struggle for control of the coastal region of the current Mauritania and Senegal. This conflict resulted in the establishment of a true French monopoly on the gum Arabic trade for the European market. Gum Arabic had been the cause civil war in Sudan and other African countries over the time.[5] In Africa, only its flowers, leaves, and bark are still used for their therapeutic properties astringent and emollient, calming, antipyretic, and antitussive. It is administered for the treatment against diarrhea and bronchitis, to stop bleeding, respiratory tract infections and sore throats, to reduce fevers and soothe burns. Research reveals no clinical data or report on a solitary kidney under adverse conditions throughout the world.

The benefits of oral consumption of gum Arabic in human health

The special natural hallmark of gum Arabic helps it to be the best claimant as a natural prebiotic. It can combat the acidic effect inside the stomach and resist the alkaline effect of bile salts and other digestive enzymes inside the large intestine. It is considered to be a full-spectrum probiotic, which complete ferments inside the entire large intestine, selectively motivates the growth and/or activity of intestinal bacteria for elimination of pathogenic bacteria, which significantly contributes to mucosal barrier preventing pathogenic bacteria invade the gastrointestinal (GI),[6] thus can impact in developing the immune system of the body. Studies have shown that no *Acacia* gum is found in human and rat feces fed with *Acacia* gum, indicating that this is completely fermented by flora human gut.

Probiotics are live microorganisms found in some food products or supplements, and whose consumption in sufficient amounts can be beneficial for health. Probiotics help to maintain a healthy balance of bacteria in the GI tract. The most common types of probiotic bacteria are strains of *Lactobacillus* and *Bifidobacterium*, sometimes combined with *Streptococcus thermophilus*.[7,8] Probiotics are often commonly found in fermented dairy products. Fermentable fiber sources could improve the absorption of minerals, especially calcium. There are several potential mechanisms that may explain the favorable effect of prebiotic oligosaccharides in the absorption of minerals.[9]

- It could significantly alleviate adverse effects of CRF[10]
- Offers more protection in the digestive tract, when dissolved and forms a sticky gel that acts as a protective cover and prevents harmful substances; It can absorb water, increasing the volume of stool, have affinities' specific adsorption of ammonia, urea, creatinine, bile acids, and phosphate bond agent[10,11]
- Fermentable natural fiber of gum Arabic act as probiotics improves the absorption of minerals, especially calcium and helps to maintain a healthy balance of bacteria in the GI tract
- Epidemiological studies suggest that adequate intake of fiber constantly reduces the risk of cardiovascular disease and coronary heart disease, mainly through a reduction in levels of low-density lipoprotein. The results of randomized clinical trials are inconsistent, but suggest that fiber may play a beneficial role in reducing levels of C-reactive protein, Apolipoprotein levels and blood pressure, all of which are biomarkers for heart disease[12,13]
- Gum Arabic is the richest source of essential amino acids
- Gum Arabic has attractive antioxidant properties. Experimental evidence shows that there is an association between the antioxidant and protein fraction, mainly by amino acid residues such as histidine, tyrosine and lysine, which are generally considered as antioxidant molecules.[14]

Nutritionally beneficial

Gum Arabic is a 100% vegetable and natural, nongenetically modified, classified as a food additive in the list of permitted additives in Europe without quantitative limitations swallowed. It also has the approval of the US Food and Drug administration organization. The *Acacia* gum has a great advantage in the international fight against obesity, by providing only 1.5 kcal/g. It is considered as noncariogenic additive due to its low carbohydrate content. On the contrary, the *Acacia* gum is very rich in vegetables and water-soluble fibers (85% according to the Association of Official Agricultural Chemists method), which adds to its nutritional and functional value that contributes to a balanced diet in the consumption of liquid food.

Side effects

Gum Arabic causes allergies both by ingestion and by inhalation. This is used during the manufacture of confectionery, butter, chewing gum, baked goods, salad dressings, laxatives, toothpaste, and even in some medication's additives. When using orally, *Acacia* is not harmful but if you are allergic to dust, you can develop injuries or suffer asthma attacks when you start taking *Acacia*. Gum *Acacia* produces some unpleasant side effects. During the 1st week, the supplement created an irritating sensation of the mouth, nausea and mild diarrhea, and swelling. In a study, gum Arabic-specific immunoglobulin E (IgE) antibodies of a patient were directed mainly against the carbohydrate fraction of the material; due to the repetitive polysaccharide sequence of gum Arabic, several epitopes for the cross-linking of IgE should exist.[15-17]

In our case study except some minor skin rashes, we did not observe any other noxious reactions.

Composition and properties of gum Arabic

Gum Arabic is edible; readily soluble in water, homogeneous, viscous, and clear solution. It is insoluble in organic solvents. This gum is the acidic salt of a complex mixture of glycoproteins and polysaccharide that contains polyphenols, calcium, magnesium, and potassium. The complexity of gum Arabic makes it impossible to describe it structurally; however, its hydrolysis yields L-arabinose, L-rhamnose, D-galactose, and D-glucuronic acid [Table 1]. It is a substance yellowish to brown, but a flammable high flash point (>250°C), very soluble in water (approximately 500 g/L) and an lethal dose (LD) (median LD_{50}) >16,000 mg/kg. The active ingredients of chemically vary depending on weather conditions, the age of the tree, the soil environment and the type of tree species. Chemically, gum Arabic is a carbohydrate polymer, which during digestion, is partly degraded in the large intestine.[18-21] Water solutions of gum Arabic are slightly acidic and have a pH of 4.5–5.5. It's gum lower viscosity even at high concentrations. It has a neutral taste and is odorless. Gum Arabic is highly soluble in water, concentrations up to 40% are feasible without a major impact on viscosity[22] rendering it an attractive candidate compound for various applications, like beverages. The results achieved with gum Arabic in murky drinks are excellent. In the case of flavored milk drinks, gum *Acacia* stabilizes the aromatic particles in milk, preventing their precipitation in the background, which favors a homogeneous structure and a pleasant mouth feel. Gum Arabic has a totally neutral odor and taste, allowing a perfect release of the own scent of emulsions or flavorings in atomized powder.

Case Presentation

A 56-year-old, Mr. M.D, Persian, has been a patient of the DSMC with chief complaint of unexplained hip joint pain (limit hip lateral rotation and abduction), history of claudication on exercise, and fatigue for 6 years.

Past history

Right side radical nephrectomy due to nephroblastoma (Wilms' tumor) in childhood, History of renal calculi 15 years ago, well-established of type 2 diabetes since 19 years ago, history of Proteinuria (± to +++) since childhood, beta-thalassemia minor.

Family history

His family history reveals that his mother had type 2 diabetes mellitus; four siblings has beta thalassemia minor.

Past and present medication

Diabetic medicine and angiotensin converting enzyme inhibitors for prophylaxis of hypertension. No other medication due to solitary kidney.

Presentation and examination

Well-established diabetes, present with unexplained hip joint pain (limit hip lateral rotation and abduction), history of claudication on exercise and fatigue since 2 years. Multiple lesions of syringoma on the upper cheeks and lower eyelids, puffy tongue with teeth marks along the side (scalloped tongue), tongue coating thick and white, and bilateral leg pitting edema.

Abdominal ultrasound

Right side radical nephrectomy, left kidney 10 mm simple cyst.

Hip joint magnetic resonance imaging

Normal imaging.

All signs and symptoms of the disease in this patient were severely under close observation during treatment. All significant changes and theirs duration's show the signs and symptoms which observed during treatment [Table 2].

Supplement appearance and notice

Gum Arabic is conventionally presented in pieces and grainy, but there is also a gum *Acacia* instant powder, which we use in our study [Figures 1-3]. *Acacia* Senegal powder-like all

Table 1: Amino acids content in gum Arabic taken from *Acacia Senegal* (Mahendran *et al*., 2008)

Amino acid	(nmol/mg) Gum Arabic	% Amino acid
Hydroxyproline	54.200	0.711
Serine	28.700	0.302
Threonine	15.900	0.208
Proline	15.600	0.180
Leucine	15.100	0.198
Histidine	10.700	0.166
Aspartic acid	10.600	0.141
Glutamic acid	8.290	0.122
Valine	7.290	0.085
Phenylalanine	6.330	0.105
Lysine	5.130	0.075
Alanine	5.070	0.045
Isoleucine	2.380	0.031
Tyrosine	2.300	0.042
Arginine	2.120	0.037
Methionine	0.110	0.002
Cysteine	0.000	0.000
Tryptophan	0.000	0.000

Table 2: The sign and symptom which observed during treatment

Sign and symptom	Duration of significant changes
Claudication on exercise	3 month
Unexplained hip joint pain	6 month
Smell of ammonia in sweat	3 month
Hyperuricemia	6 month
legs pitting edema	3 month
Tongue teeth marks	6 month
Bilirubin level	3 month
Night sweating and gustatory hyperhidrosis	6 month
Teeth color and calculus formation	3 month
Unexplained phantosmia	3 month

Figure 1: Raw material amber-colored gum Arabic. Natural gum Arabic (raw material) is in chunks crystals, roughly pulverized product, granulated, it is possible to obtain grain-like, or powdery form. Gum Arabic has a bland taste and is odorless

Table 3: Various parameters changes before and 1 year after consumption of gum Arabic

Test index	Before treatment (baseline)	After treatment
Uric acid	8.6	3.9
Creatinine levels	0.98	0.96
BUN	18.1	14.9
Proteinuria dipstick	5-10mg/dL to 300 mg/dL	Negative
Bilirubin total	1.0	0.6
ALT	18	17
AST	14	12
ALP	74	93

BUN: Blood urea nitrogen, ALT: Alanine aminotransferase, AST: Aspartate transaminase, ALP: Alkaline phosphatase

soluble fiber supplements needs plenty of water into the gut to work properly. However, this powder does not condense in a regular glass and thus has no obstructing risk, so you do not need to take a large glass of water with therapeutic dose.

Dosage

A total of 12.5 g of *Acacia* Senegal powder [Figures 2 and 3] (one table spoon), dissolved in 250 ml warm milk or water and had it with breakfast and dinner for first 3 months, then continued once a day for 1 year.

Results

The results of the present study shows in Table 3.

Discussion

Diabetes is the most common cause of kidney failure and constitutes >44% of new cases.[23] Even when diabetes is controlled; the disease can lead to chronic kidney

Figure 2: Processed powder form

disease (CKD) and kidney failure. Most people with diabetes suffer from CKD not severe enough to develop into renal failure. Drug adverse reactions are considered as one of the main problems of drug therapy. They are associated with morbidity, mortality, decreased compliance and success of therapy, as well as directly and indirectly with high medical costs. When there are the side effects of hypoglycemic drugs along with consequences of diabetes; like diabetic nephropathy potentially increasing the risk of death from cardiovascular disease and other complications. Increased serum phosphorus has been considered an independent risk factor for death in patients with CKD and end-stage nephritic disease on dialysis. As renal function decreases, the change of serum phosphorus diet, although it is important, it is increasingly difficult to make without simultaneously occurring protein deficiency. Accordingly, it is necessary to reduce selectively the intestinal absorption of phosphorus. This requires use of phosphorus-binding agents. Patients with CKD are at increased risk of dying from a cardiovascular event than to require dialysis for end-stage renal disease (ESRD) if they survive. The network of intestinal phosphate absorption is approximately 70%–80% of intake but may be somewhat lower in patients with ESRD. Phosphorus is not absorbed in the stomach. PH 1–3.5, phosphorus exists as weak acid (H_3PO_4) and ion H_2PO_4-monobasic (pK = 2.1). In the duodenum, the pH level is 2–6.4; in the jejunum is 6 and 7. Ileum phosphorus exists in various proportions as H_2PO_4-monobasic and dibasic ion HPO_4 2-(pK = 6.8). About 35% of the phosphorus is absorbed in the duodenum, 25% in the jejunum and 40% in the ileum.[10] Aluminum compounds are effective trapping agent's phosphor is still used when a rapid reduction in serum phosphorus is required, while other agents have failed in this function. Unfortunately, their high toxicity prevents their long-term use. Studies have revealed the superiority of calcium acetate on calcium carbonate. However, the use of both agents is accompanied by a significant incidence of hypercalcemia.[24] Relevant incidence of toxicity of phosphorus-binding agents and difficult accessibility prevents their long-term use in undeveloped countries. Gum Arabic acts as phosphate

Figure 3: Gum Arabic was provided in a powder form purchased from Dubai market

binding agents, is a safe treatment of hyperphosphatemia in the intestinal tract. The goal of herbal medicine therapy is to obtain certain healing achievements that improve the quality of life of patients and ensure minimal risks. There are inherent to botanical remedy risks, both known and unknown, associated with the therapeutic use of herbs. As shown in previously published work,[25-28] and despite the nonexistent background concerning the benefits of gum Arabic, for a solitary kidney under adverse conditions, our study has confirmed the safety of long-term consumption of gum Arabic. Using it not only has no side effect but also protects multi-organs damage from drug adverse reactions and consequences of baseline disease, including renal, vascular, dental, and inflammatory diseases, we could confirm here the previously reported effects. In this study we observed, by the end of the 3 months of treatment, serum urea levels, serum creatinine and uric acid levels, urine protein significantly decreased by compared against the baseline.

Consequents of hyperuricemia; cardiovascular and renal diseases

The uric acid is a by-product of the chemical decomposition of compounds called purines, which exist in the cells of our body and in our food. The two purines, adenine and guanine, they are in the body, mainly as components of acid nucleic, ribonucleic acid, and deoxyribonucleic acid. Excessive intakes of foods rich in purines in the metabolic process are transformed into uric acid are the most important cause of hyperuricemia. Purines are natural elements present in red meat, organ meats, game fish (anchovies, sardines, herring, trout, and salmon), shellfish, cold cuts of pork, and some vegetables such as celery, watercress, asparagus, peas, green beans and white, lentils, radishes, cauliflower, spinach, and coffee. The most common cause of hyperuricemia is a decreased renal clearance of uric acid. Another usual cause of hyperuricemia is the intake of medications such as diuretics, regular in the elderly, and should always be suspected the possibility of kidney failure is also cause hyperuricemia. Only a small percentage of patients estimated <10%, hyperuricemia results from an increase in the intrinsic production of uric acid, either by some rare enzyme defects or increased catabolism of purine's internal source in situations such as hemolytic anemia, polycythemia vera, or accompanying various neoplasms or treatment. Gout is a disease that results from the deposit of monosodium urate crystals caused by overproduction or uric acid hypo excretion. Usually but not always, the disease is associated with elevated levels of uric acid in plasma. Serum urate is higher in men than in women. It thus is defined as hyperuricemia, in the first, the existence of higher values to seven mg/dl and in the latter, which exceed 6 mg/dl. Urate excreted into the urine is approximately 70% of daily production. The remainder is excreted in feces.[29] Clinical manifestations include acute arthritis and chronic, tophi, interstitial renal disease and nephrolithiasis uric acid. The diagnosis is based on the identification of urate crystals in the joints or body tissues. Hyperuricemia is the critical factor in the occurrence of gouty arthritis.[30,31] This is because a majority of a defect in the urinary excretion of uric acid, but approximately 20% of cases the cause is an overproduction of uric acid, which crystallizes as monosodium salt in over saturated periarticular synovial fluid environment. In gouty arthritis, monosodium urate crystals are the stimulus that initiates the inflammatory response and extends through the inflammasome and route of interleukin 1 β.[32,33] The acute inflammatory process usually occurs in the articular or periarticular structures, including bursa and tendons. Several epidemiological studies show the relationship between elevated levels of uric acid in blood and the future development of renal failure, loss of nephritic function, hypertension, cardiovascular events and cardiovascular and overall mortality, being the pathogenic mechanism proposed endothelial injury. Initially, it was believed that uric acid was the only pathogen as extracellular molecules, and the reservoir forming crystals would be the pathogenic mechanism. However, it has been found that the lesion is intracellular, more specifically the endothelium. In this sense, studies in animals (rats) who find that there is a relationship between elevated uric acid and endothelial damage.[34-40] One of the main roles of the normal, healthy kidney, besides its regulatory, endocrine, and metabolic functions, is the removal of waste products. Any impairment of excretory function can lead to the agglomeration of a combination of nitrogenous waste materials including, urea, creatinine, and uric acid. High concentrations of waste products in the blood stream can aggravate renal failure and promote kidney stones. Moreover, nitrogen-bearing solutes in the blood stream promote osmotic diffusion into the lumen of intestine

because of the concentration gradient across the intestinal wall. This diffusion mechanism conducted to the concept of oral sorbents to augment gut-based clearance of nitrogen-bearing waste products. This study shows oral consumption of gum Arabic reduced blood concentration of urea, creatinine, and uric acid. We achieved the treatment goals include completion acute attack, prevention of recurrence, and the prevention of complications associated with the deposition of uric acid crystals in tissues.

Vascular pain in diabetes respects all the vessels of the body, regardless of their size and the tissues they irrigate. This pain sometimes has clinical translation: conventionally, distinguishes microvascular complications (kidney, eye, and nerve) of macrovascular complications, which consist of accelerated atherosclerosis, with some specifics. The presence of diabetes significantly increases the risk of more occlusive arterial disease (increased 6–10 times) than that of coronary artery disease (increased 2–4 times) or ischemic stroke (2 times). Pathological alteration of the coronary arteries characterized by abnormal deposition of lipids and fibrous tissue in the arterial wall, which disrupts the architecture, the function of the vessels and reduces variably, blood flow to the myocardium.

Vascular calcification in the calcium phosphate deposition in the form of crystals bio apatite (similar to bone) can occur in blood vessels and heart valves.[41] Thus, arterial calcification has been divided into calcification of the intima (ally with atheromatous plaques),[42] and Mönckeberg's arteriosclerosis or medial calcification, where calcium deposits are found in the muscular middle layer of the walls of arteries (the tunica media), linked to the vascular stiffness by mineralization of elastic fibers and arteriosclerosis. This condition occurs as an age-related degenerative process, diabetes and CKD.[43]

Some studies show that there is a relationship between calcification of blood vessels and bone loss that occurs with osteoporosis. That is, the decalcification of the bones involved age could occur in parallel to the process of calcification of blood vessels.[44,45] Over the years, the bones become demineralizing. It will be less resistant, reduce flexibility and increase its fragility, which leads to osteoporosis, a disease now known as a silent epidemic, is the cause of one in three women and one in five men suffer bone fractures. Until now, it was believed to be separate processes, but this group of researchers has proven that there is a relationship. In one study, researchers found that increased vascular calcification that enhances with age, are simultaneously associated with an increased incidence of vertebral fractures due to bone loss. During those 4 years, through different tests they found that patients in which the aortic calcifications were increasing, also lost more bones and suffered more fractures. "This suggests that these two phenomena, increasing calcifications in the vessels and bone loss could be interrelated," they conclude. They also conducted a second study in patients with chronic renal failure (CRF) on hemodialysis since because of their underlying disease as well suffer bone decalcification. They found similar results: four out of five patients on hemodialysis had some types of calcification in the cups. Moreover, those with more vascular calcifications were at increased risk of vertebral fractures. The objective was to identify molecular mechanisms occur in our body to vascular calcification and bone loss are so closely related. It seems that the mechanism is triggered in these animals goes beyond the simple deposition of calcium. In these animals, the cells in the wall of blood vessels stop behaving-like muscle cells to acquire properties of the cells that form bone, osteoblasts. The authors have renamed vascular osteoblasts, able to mineralize the walls of the arteries. As above numerous studies with dietary fiber in which it is found a reduced risk of vascular pain in diabetes, atherosclerotic disease in men and women, especially coronary disease and cerebrovascular and possibly peripheral artery disease. In this study, patient who suffering from claudication on exercise was relieved after 3 months of gum Arabic consumption, which strongly confirmed previous reports.

Dental calculus

Tooth decay is a disease of bacterial etiology more common among humans, and it is still regarded as a problem public health in many parts of the world, because it affects the quality life and personality of individuals affected also requires a staff and important government investment is incalculable the number of man hours lost in work, study and housework to result of dental disease and its treatment.

In odontology, calculus or tartar is a form of hardened dental plaque. It is caused by precipitation of minerals from saliva and gingival crevicular fluid in plaque on the teeth. It also contains waste products of bacteria as an invisible film formed that extends continuously around the teeth and dentures in the mouth. It is a sticky, almost imperceptible film formed by the bacteria in the oral cavity that extends constantly around the teeth and dentures in the mouth. Toxins not only affect the gum, but also destroy the underlying bone supporting the teeth causing periodontitis, damage tooth enamel and lead to cavities. Chronic inflammation of the gums by the accumulation of plaque often causes the formation of periodontal pockets. Plaque becomes dental calculus or tartar through a mineralization process thereof. A balanced demineralization and remineralization process has considered as the only way to maintain healthy and strong natural teeth, generating embryonic stem cells to a very significant impact on prevention of dental caries. The proportion or relationship that is saved between demineralization and remineralization is the difference between the development and prevention the process of decay. Tooth decay is the result of a series of changes triggered by bacteria specific, including *Streptococcus* mutans present in the biofilm of supragingival plaque. These bacteria by their virulence factors are capable of causing mineral loss and subsequent formation of a cavity due to the ion imbalance in the process mineralization and demineralization of hard tissues of the tooth resulting carbohydrate metabolism by these bacteria. *Streptococcus* mutans, bacterial species belonging to

the group mutans streptococci and widely distributed in the world's population, has it has been implicated as the major causative agent of dental caries. Some studies suggested that gum Arabic could inhibit the formation of plaque and enhance dental remineralization, performing as a potential preventive agent in the formation of caries. Such properties are associated to the high salt component of Ca^{2+}, Mg^{2+}, and K of polysaccharides in gum Arabic, and the effect of the gum in the metabolism of calcium and phosphate.[46,47]

Factors involved in the process of dental caries

Dental caries are a multifactorial disease of origin where there is an interaction of three main factors: the host (oral hygiene, saliva, and teeth), the micro flora (bacterial infections) and substrate (cariogenic diet). In addition to these factors, it should take into account one more time. For a cavity is formed it is necessary that the conditions of each factor are favorable; i.e. a susceptible host, a cariogenic oral flora and an appropriate substrate that must be present for a certain period.[48-51]

Germ's plates are encompassed in a rich organic matrix protein and polysaccharides, with some lipids and inorganic constituents such as potassium, sodium, phosphate, magnesium, and calcium fluoride. The matrix proteins originate mainly in saliva and to a lesser extent, in their own plaque bacteria. Saliva is supersaturated solution in calcium and fluorine-containing phosphate, proteins, and enzymes, buffering agents, immunoglobulins and glycoproteins, among other elements important to prevent the formation of cavities.[4] The mineralization of plaque starts with substances chelation between the organic matrix and mineral salts present in saliva. In turn, degrade filamentous bacteria and salivary glycoproteins originating sucrose and chelating compounds such as saccharate glycinate and lactates. Then, primary crystal nuclei are formed , in the presence of basic pH, chelating agents react with inorganic ions such as calcium, from the crevicular fluid, phosphate, from hydrolysis of the phosphoric esters of saliva. These initial crystal nuclei bind phosphate ions, originating amorphous calcium phosphate. Finally, they are incorporated carbonates, mucopolysaccharides and calcium apatite forming compounds, with the result of a completely intermicrobial mineralized matrix. More concerning about oral hygiene, halitosis is defined as an unpleasant or offensive odor emitted from the mouth, usually it has a mouth cause, particularly derived from bacterial metabolism on the substrates and sulfur containing amino acids. The findings of the various investigations documented that the vast majority of the causes of halitosis are related to the oral cavity 2, with a prevalence ranging between 85% and 90%.[52-57] For a long time, was conceived as a consequence of periodontal disease. The American Dental Association advises cleaning between the teeth once a day. This is important because plaque that is not detached by brushing and flossing can subsequently harden into calculus or tartar. According to this study, we suggest instead of flossing, use Gum Arabic for cleaning, shining, decolorizing the teeth and removing malodor (caused by periodontal or metabolic disease) along with many other physiological benefits.

Syringoma

Syringoma, usually multiple, is yellowish or covered by normal skin, popular lesions. Most often affect women from puberty. They are located in eyelids and cheeks fundamentally. They may also appear in abdomen, armpit, penis, and vulva. It affects 20% of patients carrying female Down syndrome. It described a variant of linear distribution; and another in which abruptly, multiple lesions appear on the trunk of young people called "Hidradenoma eruptive Darier-Jaquet." Dermatopathology shown in the thickness of a fibrous stroma multiple ductal formations limited by two layers of epithelial cells, peripheral thin epithelial cords described as "tadpole tail" project. There is a histological variety called "syringoma clear cell" composed of clear cell lobes. This appearance is due to the accumulation of glycogen and therefore stains with PAS staining. It may be associated with diabetes. They have been treated with electrocoagulation and cryotherapy. Today, lasers can be applied to remove these lesions, but according to this study, using gum Arabic is affordable and effective for Universal access.[58-62]

Diabetes

Since this patient using allopathic medicine for lowering blood sugar simultaneously, we could not be able to evaluate the effects of gum Arabic on HbA1c and fasting blood sugar, so these results, we cannot take into account. For this reason, more clinical study will reveal the fact.

Conclusion

The high prevalence diabetes mellitus type 2 and other chronic noncommunicable diseases observed in all poor and underdeveloped countries which affect people with a lower education and economy level, what shows that the poorest people bear the brunt. Diabetes results in various microvascular complications, making it one of the leading causes of amaurosis, nontraumatic amputation, and ESRD. In addition, diabetes increases to more than double the risk of coronary heart disease, stroke and peripheral vascular disease. Clinically, we observed a case of solitary kidney under adverse conditions long term treating with gum Arabic the vast potential of bioactive phytochemicals as a non-toxic, efficient with uric acid and bilirubin lowering agent and anti-inflammatory effects, considering the gum Arabic as a potential therapeutic supplement, beneficial in CRF, cardio-vascular disease, pain management, and dental health. Despite the nonexistent background concerning the benefits of gum Arabic, for a solitary kidney under adverse conditions, our study has confirmed that long term consumption of gum Arabic not only has no side effect but also protects multi-organs damage from drug adverse reactions and consequences of baseline disease, including renal, vascular, dental and inflammatory diseases. Finally, it is advisable to continue further studies continue to be performed.

Financial support and sponsorship
Nil.

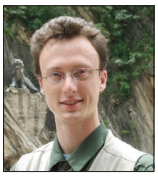
Conflicts of interest
There are no conflicts of interest.

References
1. Phillips GO. Giving nature a helping hand, in Gums and Stabilisers for the Food Industry 14. Williams PA, Phillips GO, editors. (RSC Special publication 316, Cambridge, 2008). pp. 3-28.
2. Jayme ML, Dunstan DE, Gee ML. Zeta potentials of gum Arabic stabilized oil in water emulsions. Food Hydrocoll 1999;13:459-65.
3. Marwah RG, Fatope MO, Al Mahrooqi R, Varma GB, Al Abadi H, Al-Burtamani SK. Antioxidant capacity of some edible and wound healing plants in Oman. Food Chem 2007;101:465-70.
4. Vivas N, Vivas de Gaulejac N, Nonier MF, Nedjma M. Effect of gum Arabic on wine astringency and colloidal stability. Prog Agricole Viticole 2001;118:175-6.
5. Available from: https://www.reuters.com/article/us-sudan-darfur/darfur-tribes-clash-over-gum-arabic-production-64-killed-idUSBRE94T0NN20130530.
6. McLean Ross AH, Eastwood MA, Brydon WG, Busuttil A, Mckay LF, Anderson DM. A study of the effects of dietary gum Arabic in the rat. Br J Nutr 1984;51:47-56.2.
7. Calame W, Weseler AR, Viebke C, Flynn C, Siemensma AD. Gum Arabic establishes prebiotic functionality in healthy human volunteers in a dose-dependent manner. Br J Nutr 2008;100:1269-75.
8. Cherbut C, Michel C, Raison V, Kravtchenko T, Severine M. Acacia Gum is a Bifidogenic Dietary Fibre with High Digestive Tolerance in Healthy Humans. Microb Ecol Health Dis 2003;15:43-50.
9. Bongers A, van den Heuvel. Prebiotics and the bioavailability of minerals and trace elements. Food Rev Int 2003;4:397-422.
10. Bliss DZ, Stein TP, Schleifer CR, Settle RG. Supplementation with gum Arabic fiber increases fecal nitrogen excretion and lowers serum urea nitrogen concentration in chronic renal failure patients consuming a low-protein diet. Am J Clin Nutr 1996;63:392-8.
11. Al-Mosawi AJ. Acacia gum therapeutic potential: Possible role in the management of uremia – A new potential medicine. Therapy 2006;2:299-300.
12. Glover DA, Ushida K, Phillips AO, Riley SG. *Acacia* (sen) SUPERGUM (Gum Arabic): An evaluation of potential health benefits in human subjects. Food Hydrocoll 2009;8:2410-5.
13. Tiss A, Carrière F, Verger R. Effects of gum Arabic on lipase interfacial binding and activity. Anal Biochem 2001;294:36-43.
14. Marcuse R. Antioxidative effect of amino-acids. Nature 1960;186:886-7.
15. Fötisch K, Fäh J, Wüthrich B, Altmann F, Haustein D, Vieths S, *et al.* IgE antibodies specific for carbohydrates in a patient allergic to gum Arabic (*Acacia senegal*). Allergy 1998;53:1043-51.
16. Kilpiö K, Kallas T, Hupli K, Malanin K. Allergic rhinitis, asthma and eczema caused by gum Arabic in a candy factory worker. Duodecim 2000;116:2507-9.
17. van Ketel WG. Simultaneous sensitization to gum Arabic and cobalt. Contact Dermatitis 1984;10:180.
18. Goodrum LJ, Patel A, Leykam JF, Kieliszewski MJ. Gum Arabic glycoprotein contains glycomodules of both extensin and arabinogalactan-glycoproteins. Phytochemistry 2000;54:99-106.
19. Renard D, Lavenant-Gourgeon L, Ralet MC, Sanchez C. *Acacia senegal* gum: Continuum of molecular species differing by their protein to sugar ratio, molecular weight, and charges. Biomacromolecules 2006;7:2637-49.
20. Lopez-Torrez L, Nigen M, Williams P, Doco T, Sanchez C. *Acacia senegal* vs. *Acacia seyal* gums-Part 1: Composition and structure of hyperbranched plant exudates, Food Hydrocoll 2015;51:41-53.
21. Martínez M, Beltrán O, Rincón F, León de Pinto G, Igartuburu JM. New structural features of acacia tortuosa gum exudate. Food Chem 2015;182:105-10.
22. Williams PA, Philips GO. Gum Arabic. In: Philips GO, Williams PA, editors. Handbook of hydrocolloids. New York: Woodhead Publishing Limited; 2000. pp. 155-168.
23. United States Renal Data System 2007 Annual Data Report USRDS. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, US Department of Health and Human Services; 2007.
24. Kaye M, Turner M, Ardila M, Wiegmann T, Hodsman A. Aluminum and phosphate. Kidney Int Suppl 1988;24:S172-4.
25. Wills MR, Savory J. Aluminum and chronic renal failure: Sources, absorption, transport, and toxicity. Crit Rev Clin Lab Sci 1989;27:59-107.
26. Al-Mosawi AJ. Acacia gum supplementation of a low-protein diet in children with end-stage renal disease. Pediatr Nephrol 2004;19:1156-9.
27. Nasir O. Renal and extrarenal effects of gum Arabic (*Acacia senegal*) – What can be learned from animal experiments? Kidney Blood Press Res 2013;37:269-79.
28. Al-Majed AA, Mostafa AM, Al-Rikabi AC, Al-Shabanah OA. Protective effects of oral Arabic gum administration on gentamicin-induced nephrotoxicity in rats. Pharmacol Res 2002;46:445-51.
29. Hyndman D, Liu S, Miner JN. Urate handling in the human body. Curr Rheumatol Rep 2016;18:34.
30. Mahomed FA. On Bright's chronic disease, and its essential symptoms. Lancet 1879;113:399-401.
31. Campion EW, Glynn RJ, DeLabry LO. Asymptomatic hyperuricemia. Risks and consequences in the normative aging study. Am J Med 1987;82:421-6.
32. Martinon F, Glimcher LH. Gout: New insights into an old disease. J Clin Invest 2006;116:2073-5.
33. Gabay C, Lamacchia C, Palmer G. IL-1 pathways in inflammation and human diseases. Nat Rev Rheumatol 2010;6:232-41.
34. Kok VC, Horng JT, Lin HL, Chen YC, Chen YJ, Cheng KF, *et al.* Gout and subsequent increased risk of cardiovascular mortality in non-diabetics aged 50 and above: A population-based cohort study in Taiwan. BMC Cardiovasc Disord 2012;12:108.
35. Edwards NL. The role of hyperuricemia in vascular disorders. Curr Opin Rheumatol 2009;21:132-7.
36. Ohta T, Sakano T, Igarashi T, Itami N, Ogawa T; ARF Assocoated with Renal Hypouricemia Research Group. Exercise-induced acute renal failure associated with renal hypouricaemia: Results of a questionnaire-based survey in Japan. Nephrol Dial Transplant 2004;19:1447-53.
37. Iseki K, Ikemiya Y, Inoue T, Iseki C, Kinjo K, Takishita S, *et al.* Significance of hyperuricemia as a risk factor for developing ESRD in a screened cohort. Am J Kidney Dis 2004;44:642-50.
38. Perlstein TS, Gumieniak O, Williams GH, Sparrow D, Vokonas PS, Gaziano M, *et al.* Uric acid and the development of hypertension: The normative aging study. Hypertension 2006;48:1031-6.
39. Krishnan E, Svendsen K, Neaton JD, Grandits G, Kuller LH; MRFIT Research Group. Long-term cardiovascular mortality among middle-aged men with gout. Arch Intern Med 2008;168:1104-10.
40. George J, Carr E, Davies J, Belch JJ, Struthers A. High-dose allopurinol improves endothelial function by profoundly reducing vascular oxidative stress and not by lowering uric acid. Circulation 2006;114:2508-16.
41. Giachelli CM. Vascular calcification mechanisms. J Am Soc Nephrol 2004;15:2959-64.
42. Burke AP, Taylor A, Farb A, Malcom GT, Virmani R. Coronary calcification: Insights from sudden coronary death victims. Z Kardiol 2000;89 Suppl 2:49-53.
43. Edmonds ME, Morrison N, Laws JW, Watkins PJ. Medial arterial calcification and diabetic neuropathy. Br Med J (Clin Res Ed) 1982;284:928-30.
44. Matias PJ, Ferreira C, Jorge C, Borges M, Aires I, Amaral T, *et al.* 25-hydroxyvitamin D3, arterial calcifications and cardiovascular risk markers in haemodialysis patients. Nephrol Dial Transplant 2009;24:611-8.
45. London GM, Marty C, Marchais SJ, Guerin AP, Metivier F, de Vernejoul MC, *et al.* Arterial calcifications and bone histomorphometry in end-stage renal disease. J Am Soc Nephrol 2004;15:1943-51.
46. Onishi T, Umemura S, Yanagawa M, Matsumura M, Sasaki Y, Ogasawara T, *et al.* Remineralization effects of gum Arabic on caries-like enamel lesions. Arch Oral Biol 2008;53:257-60.
47. Aoba T. Solubility properties of human tooth mineral and pathogenesis of dental caries. Oral Dis 2004;10:249-57.

48. Gomez J. Detection and diagnosis of the early caries lesion. BMC Oral Health 2015;15 Suppl 1:S3.
49. Gonzalez M, Balda R, Gozalez Solorzano AO, Loyo K. Comparative study of three methods of caries diagnosis. Acta Odontol Venez 1999;3:15-25.
50. Hidalgo I, Estrada JD, Perez JA. Tooth decay. Some of the factors related to their training in children. Rev Cub Stomatol 2007;3:56-61.
51. Estrada JD, Perez JA, Hidalgo I. Dental caries and oral ecology, important aspects to consider. Rev Cub Stomatol 2006;1:16-25.
52. Rosenberg M. The science of bad breath. Sci Am 2002;286:72-9.
53. Bogdasarian RS. Halitosis. Otolaryngol Clin North Am 1986;19:111-7.
54. Lee CH, Kho HS, Chung SC, Lee SW, Kim YK. The relationship between volatile sulfur compounds and major halitosis-inducing factors. J Periodontol 2003;74:32-7.
55. Morita M, Wang HL. Association between oral malodor and adult periodontitis: A review. J Clin Periodontol 2001;28:813-9.
56. Veeresha KL, Bansal M, Bansal V. Halitosis: A frequently ignored social condition. J Int Soc Prev Community Dent 2011;1:9-13.
57. Machado NA, Strini PJ, Carneiro MO, RobertoBernardino Júnior, Neto AJ. Halitosis: A review of basic principles. Braz J Oral Sci 2008;7:1627-9.
58. Patrizi A, Neri I, Marzaduri S, Varotti E, Passarini B. Syringoma: A review of twenty-nine cases. Acta Derm Venereol 1998;78:460-2.
59. Rongioletti F, Semino MT, Rebora A. Unilateral multiple plaque-like syringomas. Br J Dermatol 1996;135:623-5.
60. Friedman SJ, Butler DF. Syringoma presenting as milia. J Am Acad Dermatol 1987;16:310-4.
61. Wang JI, Roenigk HH Jr. Treatment of multiple facial syringomas with the carbon dioxide (CO2) laser. Dermatol Surg 1999;25:136-9.
62. Kang WH, Kim NS, Kim YB, Shim WC. A new treatment for syringoma. Combination of carbon dioxide laser and trichloroacetic acid. Dermatol Surg 1998;24:1370-4.

Idea Paper

Traditional Chinese Medicine's Challenge to Clinical Science and Health Policy



Justin Thomas Maher

Department of Foreign Languages, International Education College, Shanghai University of Traditional Chinese Medicine, Shanghai, China

Abstract

Traditional Chinese medicine (TCM) has been improving human health for millennia. And for that, it has gradually gained the attention of the global scientific community. TCM clinical research progresses, but slowly. I see it as being held back by perverse incentive structures in science and regulatory politics.

Keywords: Clinical research, policy, principal–agent problem, statistical significance, traditional Chinese medicine

Introduction

The reward structure of academia emphasizes researchers producing a steady stream of publications based on statistically significant data. Due, in large part, to their gradual and holistic natures, it is generally not easy to get good data on traditional Chinese medicine (TCM) therapies, and it is even less easy to get statistically significant data that are free of confounding variables. Thus, the publish-or-perish nature of modern academia disincentivizes the scientific study of TCM by making choosing it as one's subject matter a dubious career move for the scientist who aspires to reliable professional success. Maybe we should rethink our scientific values and academic reward structures.

The second thing holding TCM clinical progress back is not strictly scientific but regulatory. Just as the last thing that a scientist wants to do is to publish a finding that is false, the last thing that a regulatory agency wants to do is to approve a medicine that is harmful. These are good goals, but myopic attention to them can have the unintended consequence of narrow-mindedness: scientists operating as if anything that is not "*definitely there*" is "*definitely not there"* and regulators avoiding sins of commission (*approving harmful therapies*) by committing sins of omission (*being slow to approve useful therapies*).

Which type of error is worse, for a patient, varies wildly on each case-by-case basis, but academia and governance (*resorting to naysaying to stave off naivety*) appear to have a clear and consistent preference for type-2 errors over type-1s (*preferring false negatives to false positives*). Hence, there seems to be a difference between the interests of "the principals:" (*the health of*) the patients, and "the agents:" (*the career interests of*) the scientists and regulators, who (*at least try to, at least ultimately*) act on behalf of public health. Becoming more aware of them may help us to correct for such misalignments between different stakeholders' incentives.

Will we Study What is Easy or What is Important?

At the end result, patient satisfaction level, TCM seems to generally be fairly safe and effective. However in herbal concoctions, there can be hundreds of molecules in play; in acupuncture, the individual practitioner's fine motor skills and intuitive perception of the patient's reactions are quite important, and the effects of exercise and massage, while certainly not nonexistent, are metabolically very diverse and indirect.

And, TCM prescriptions, being multicomponent, are supposed to be highly individualized. Hence, if, for the sake of clarity, you standardize the interventions, then no one should be surprised when the therapeutic effect of TCM, under those

Address for correspondence: Dr. Justin Thomas Maher, Department of Foreign Languages, International Education College, Shanghai University of Traditional Chinese Medicine, Shanghai, China.
E-mail: justinmaher1@gmail.com

Access this article online

Quick Response Code:

Website: www.cmaconweb.org

DOI: 10.4103/CMAC.CMAC_29_18

How to cite this article: Maher JT. Traditional Chinese medicine's challenge to clinical science and health policy. Chin Med Cult 2018;XX:XX-XX.

more tightly controlled conditions, is a lot less than what it seems to be in the clinic, where the clinician's artistic license to tailor the therapy to the patient is far less inhibited.

To use a commercial metaphor, trying to measure patient outcomes from TCM is like trying to measure customer satisfaction with a certain brand of suit. If, to eliminate some potential confounding variables, we were to give customers (*patients*) of all shapes and sizes the same size suit (*the exact same, nonindividualized medical intervention*), and ask them how much they like it, customer satisfaction (*therapeutic effect*) with the suit (*medical intervention*) in that experimental setup would surely be much lower than customer/patient satisfaction in the real world (*analogous to the clinic*) where tailors (*clinicians*) tailor suits (*medical interventions*) to precisely fit the unique body of the individual consumer (*whether of clothes or of healthcare*).

Such artistic license undergirds and fortifies TCM's various therapeutic mechanisms. And when you control for the independent variable (*the starting conditions that you change from trial to trial*), it is logically impossible for there to be significant change in the dependent variable (*the outcome that you measure in each trial*). Yet controlling for the mechanism of action is sort of what happens when one overly aggressively standardizes a TCM therapy for the sake of experimental convenience and clarity.

Admittedly, highly individualized, holistically focused, multipronged traditional medicine is not a very cooperative subject for experimental investigation. However, as Neil DeGrasse Tyson once explained to Conan O'Brien, "*the universe is under no obligation to make sense to you....Deal with it*."

Hence, we have a constellation of therapies that, at the broad level, correlate well with long, healthy lives, but the variables are the complete opposite of isolated. TCM provides modern science with a test: will scientists choose to study what is easy to study, or what seems to be important?

Behaviorist psychologists of the mid-20th century ignored the mind in psychology. "*Psyche*" – "*logy"* is, literally, (*Greek for*) *"mind-study*," and so – *at least linguistically* – to ignore consciousness, in psychology, is oxymoronic. So, again, they were sort of "*controlling for the independent variable – and then wondering why their data on the dependent variable kept turning out boring*." American psychology did not make much progress in the behaviorist decades of the mid-20th century. Ignoring whatever is difficult to conduct experiments on (*such as the mind, or herbal medicines that contain hundreds of compounds*) is a sure way to stall the engine of scientific progress, which is not what anyone wants.

The field of American psychology once spent half a century wandering a fruitless desert of behaviorism. Why did we do it? Because thoughts are difficult to physically measure. Since they were (*at least at that time*) impossible (*or at least prohibitively difficult*) to measure, academia decided that they fell outside the realm of (*"real"*) science. And so, generations of American researchers spent their careers in the futile task of trying to do psychology while ignoring the psyche. Tragic.

Now, let's imagine the logical inverse: if something is easy to measure, then is it important? Actually, I see no logical reason why just because a thing is easy to measure, it should necessarily be important.

But, scientists are paid to do studies, so it is natural to study what is easily studied. This norm is not a quirk specific to academia; it is also pervasive in sports. Golfers tend to obsess about the mechanical details of their backswings. The funny thing is, even within proficient golfers, there is a lot of variation in all but a few core principles of backswing mechanics. A few things are essential to a good golf-swing, but many other details have very little effect on the outcome of how the ball flies. That does not stop most golfers from obsessing about mechanical minutiae though. In scientific culture, as in sports culture, measurement comes first. Whether or not what you are measuring is causally important to what you are trying to achieve tends to be an afterthought, if it is thought of at all. Measurement is fundamental to science. But, however necessary, it is not sufficient; like fire, it makes a great servant, but a poor master. I see the scientific community often acting like the golfing community: both tend to focus on studying whatever is easy to measure, rather than keeping their eyes on lofty prizes, studying what is interesting or important.

At one level, this is a matter of deficiencies of planning and critical thinking – a little more of such imagination at the outset would aid researchers (*both on the golf-course and in the lab*), but, I see this approach to science as not being just shortsightedness on the part of individual investigators, but as a pernicious effect of the "*publish or perish"* culture. (*While still not exactly being desirable*), publishing a lot of "*duh research"* or "*so what? research"* is much less deleterious to an academic career than not publishing much at all. Insofar as the scientist's livelihood depends on producing a steady stream of publications, then for keeping his/her job and feeding his family, the rational thing for the researcher to do is to study what is easy to study and publish whatever is expedient to publish.

This incentive structure does not bode well for the future of (*anything but the verbosity and vacuity of*) scientific research – on TCM, especially, as it is not the most cooperative experimental subject matter, despite having a good clinical track record that is millennia long. Thereby (*beyond offering to improve the health of the Modern West*), TCM presents a challenge to our scientific culture: will we study what is easy to investigate, or what is baffling and important? TCM provides a test for our scientific soul.

While, from both scientific and medical perspectives, TCM merits investigation, the current remuneration structures of the professional scientific establishment do not sufficiently reward the risks (*of failure*) that are inherent to studying things that are hard to study. This brings us to a crossroad. Yes, TCM can (*continue to*) benefit from making itself more scientific. But also, TCM could do a service to science by exposing a contradiction within

the establishment's reward system. To study a vague, difficult subject such as the biochemical basis of TCM mechanisms of action entails significant risk of failure. Taking such big risks is not currently well incentivized in the economy of scientific careers.

So, I predict that the scientific study of TCM will continue to progress but slowly unless we confront the reward structure issues within the culture of the scientific establishment itself. Herein, TCM will (*challenge it, and thereby potentially*) do a service to modern science. I predict that the pace of scientific progress (*in all fields, not just TCM pharmacology*) would slow (*in all but name*) were science to (*continue to*) become a game of racking-up publications, citations, and impact factor ratings, as researchers research what is easy to get (*statistically significant*) data on, and publish about; rather than focus on precisely where scientific understanding is weakest, aiming at baffling phenomena (*of which, TCM contains many*). Where are our age's Aristarchus of Samos and Eratosthenes of Cyrene? They spent their careers on out-of-the-box projects, like measuring the circumference of a sun-orbiting sphere that everyone else thought to be the flat center of the universe? 1500 years after Ptolemaic Alexandria, modern science was born as a reaction to an intervening millennium of intellectual timidity, which seems to have been reborn, now amounting to a serious disease within the culture of science. TCM presents a good test-case, that, hopefully, will serve to make this malady patent – which (*though not being, in itself, sufficient to do so*) may well be necessary in order to cure it. For effects that have plausible clinical significance, will scientific insight dare to hunt in fields where unconfounded data and statistical significance might not be facile to obtain? Many TCM-related public health improvements may depend on it. May we together rise to the occasion of this test (*provided by TCM*) of the agility of 21st-century clinical science.

Pick Your Poison: Type-1 or Type-2

Doing true experiments on TCM therapies is difficult. As their effects tend to be gradual, and involve synergistic effects from disparate mechanisms, and coming from diverse, simultaneous, individualized, and progressive interventions, it is almost like TCM therapies are *designed* to yield statistically insignificant biomarker results. At the correlational, epidemiological level though, the gestalt picture of TCM's efficacy is far less dismal. Hence, there is reasonable suspicion that there are a lot of type-II errors (*failure to notice a true positive; overlooking something that really is there*) in TCM clinical experiments. Assuming that TCM therapies are, for the most part, benign, and at least mildly effective, then such type-II errors would have large (*if diffuse*) public health implications.

As Newt Gingrich, a witty American politician, put it, in the early 1990s, when speaking of our Food and Drug Administration (FDA), much of whose (*admittedly giant, complex, and awkwardly underfunded*) job is to enforce bans on the advertisement, and often even the sale or use, in America, of any claimed-"*medicine"* that the agency has not approved:

"*If a murderer kills you, it's homicide*

If a drunk driver kills you, it's manslaughter

If the FDA kills you, it's just being cautious."[1]

In light of that preference for (*attempted*) caution, one could view TCM as presenting a challenge to clinical science – and to medical regulatory policy. Culturally, scientists – *and more so, legislators* – seem to be a lot more frightened by the prospect of making type-I errors (*publishing a finding that is false; seeing something when nothing is really there; approving something that the shouldn't have*) than they are of making type-II errors (*having a finding staring them in the face, but not publishing, or, not approving something that they should have approved*). Both type-1s and type-2s are indeed errors; neither of them are *good*, but the direness of the consequences of each type is not always equal.

Epidemiologists pay attention to the relative magnitudes of the consequences of each type of error, and they adjust their behavior according to the situation. For example, being told that you have (*tested positive on a [screening] test for*) cancer is frightening. And so, we would like to minimize how often people who don't have it get told that they (*might*) have cancer. However, on the flipside, not telling someone that they have cancer, when they actually do have it, hurts a lot more than just feelings; it is a potentially fatal error. Hence, in a cancer screening, false positives (*type-1 errors*) are much more tolerable than are false negatives (*type-2 errors*). So, when designing diagnostic tests, clinicians and epidemiologists actively craft their tests to produce fewer of the more serious kind of error, often accepting (*the undesirable consequence of*) producing more of the less serious type of error. And so, screening tests for cancer (*are purposely designed to*) produce far more type-I errors (*false positives*) than type-II errors (*false negatives*).

Within clinical practice, every situation is different, but, I have given one clear and typical example of a situation where false positives are to be preferred over false negatives.

Should the risk analysis landscape be the same (*or different*) when we move from clinical practice to basic science or to the regulatory sphere? In an abstract, philosophical sense, I have no idea. But regarding a realistic description of how the world today really works, the type-1/type-2 error preference balance is not at all the same in the scientific and regulatory worlds as it is in clinical practice.

In the clinic and in the courtroom, type-I/type-II error balancing is actively paid attention to, and choices regarding which side to err on are tweaked on a situation-by-situation basis. However, in science and regulatory law, I feel that they paint with a much broader brush, relying more on convention than on active analysis. I contend that this is suboptimal.

In science, results are general considered statistically insignificant if they come with a P value of > 0.05, which means that the experimenters (*at least in what they officially and finally write in their paper*) chalk their results up to

chance if they feel that there is a greater than 1 in 20 chance of randomness producing results that match the ones that they saw. *P* value significance thresholds are necessarily arbitrary: set by personal preference and societal convention; information is only actually lost when statistically insignificant results are not "*reported as being statistically insignificant*," but (*as is frequently the case*) are "*not reported at all*."

In the US courtrooms, people are conscious of *P* values (*even if lawyers don't call them by that name*). In American criminal cases, a guilty verdict is only delivered if the jury is confident "*beyond a reasonable doubt"* ($P < low$) that the defendant is indeed guilty. If the jury is "*only moderately confident*" that the defendant is guilty, then the jury is obligated to deliver a "*not guilty*" verdict. The Scottish and Italian criminal law systems are more nuanced; in such a "*probably guilty*" case, their juries would deliver a verdict of "*not proven*," as in:

"*The defendant probably did commit the crime, but the prosecution was not able to do a great job of proving it, and so, simply because we really, really dislike imprisoning people who are innocent, we are going to let this guy walk free, even though, honestly, we think that there is a greater than 50% chance that he did commit the crime. We are going to say he is 'innocent' simply because we are not sure that he is guilty.*"

So, in a criminal case, an "*innocent*" verdict is delivered unless "$P_{innocence} < low$" (*for example*, $P < 0.05$); in a criminal case, type-2 errors (*letting a guilty person go free*) are strongly preferred over type-1 errors (*imprisoning an innocent person*).

However, in a civil case, things are different. A civil case is basically an argument between two people, and the court has to side with whichever side seems to be more right, even if it's a narrow, 51%:49% split. So, civil cases operate with a *P* value threshold of 0.5; *unlike in a criminal case, in a civil trial,* type-1 and type-2 errors are weighed equally.

In the courtroom, like in designing clinical tests (*such as cancer screens*), people are conscious of the relative direness of each type of error, and so carefully tailor their questions and decisions to match that changing landscape.

Science, however, tends to make one blanket decision that findings are only significant if the researcher is >95% sure that they were not produced by chance, and almost never is one criticized for choosing not to publish a finding that was not statistically significant. It could be the discovery of the century, but, if it is not statistically significant, few journals would publish it even if an author wanted them to. Knowing that, few researchers would even try to get it published. And, even if they could get it published, few would want to take such a risk to their reputation for scientific rigor.

I'm not arguing that scientific culture has chosen the wrong *P* value threshold; rather, I am pointing out that it is curious how – *whereas in the clinic and in the courtroom, the consequences of false positives versus false negatives are carefully weighed on a situation-by-situation basis* – in scientific culture, we have a nearly monolithic one-size-fits-all standard for all the diverse experimental designs, fields, and applications that science encompasses.

For example, in a study of acupuncture's efficacy:

A) * Should we say "*acupuncture doesn't work*" unless we are 95% sure that it does?
   ~ Should we be mostly afraid of being seen as gullible by our scientific colleagues, and so seek mainly to avoid being caught saying that something works when it really doesn't?
   # This is basically what one is doing (*especially when statistically insignificant results go unreported*) when one uses a (*reject the null hypothesis*) *P* value threshold of 0.05.

or

B) * Should we say "*acupuncture works*" if we are even just 51% sure that it is effective?
   ~ Should a scientist just be afraid of being wrong in general, and therefore weigh false positives and false negatives equally?
   # That would amount to using a *P* value of *not 0.05 but of* 0.5 (*50:50 chance threshold*).

or

C) * Should we say, "*Hey, acupuncture is basically safe and low cost. So, if I were sick, I would still try it even if there were only a slight chance of it actually being effective*."
~ In such a case, the experimental design would be flipped, and one would say "*acupuncture doesn't work*" only if one is, say, 95% sure that it does *not*.
# In other words, a *P* value threshold of 0.05 could still be used, but the "*null*" and "*experimental*" hypotheses would be flipped. Or, to operate without making that switch, we could simply adopt a *P* value significance threshold not of 0.05 but of 0.95, which would mean that a result is still worth reporting even if there is deemed to be up to a 19 in 20 chance that the finding was a mirage that had been generated by statistical chance.

After all, who would want to be the guy who discovered penicillin – but the data was not statistically significant, and so you did not publish, and so Alexander Fleming gets all the credit when, years later, he (*re-*) discovers penicillin, and after, in the intervening years, maybe a million people have died from bacterial infections that could have been successfully treated with the new therapy?… But you were only 90% sure that you had discovered some new miracle drug, and so, you did not even bother trying to get your data published.

Is that the kind of scientific instinct that we want to be teaching?

For some (*presumably cultural*) reason, modern scientific culture is most scared of being on the wrong side of scenario-A; scientists are deathly afraid of putting themselves on record as believing in something that is untrue. And so, scientists have earned themselves the reputation of believing in the nonexistence of

everything that is not (*yet*) (*clearly*) proven, whether that be aliens, telepathy, or even acupuncture. Being gullible and credulous is not good, but nor would I feel good, were I to make some amazing discovery, not tell anyone because my findings lacked statistical significance, and then let the Nobel Prize go to someone who – with a high-powered study – independently (*re-*) discovers my findings. The delay incurred by waiting for a more robust study to be conducted could mean that technological progress gets delayed because the initial discovery was not published, and so no one else could work on developing it in the intervening years before its rediscovery. The lost opportunity risks of overlooking a discovery (*type-2 error*) are much less emphasized in modern scientific culture than are the embarrassment risks of falsely claiming a discovery (*type-1 error*).

Overall, I am not sure which type of error is more dangerous, but surely, the risk balance is different for every field and every scenario. Therefore, I'm a little perplexed by the uniformity of the standard across the wide world of science. I suspect that such a norm is cultural and professional group–think more than a response tailored to the specific realities on the unique ground on which each study treads.

To some degree, I feel that the preference for erring on the side of type-2's (*false negatives*), which is pervasive across the general culture of scientific publication, is an unexamined habit. And insofar as it is examined, it is calculated to advance (*or rather avoid embarrassing missteps in*) researchers' careers. That is a conflict of interest. *The current culture of* scientific research, being geared to err on the side of type-2s, does not necessarily match the risk profile (*of the relative direness of type-1 errors vs. type-2s*) from a public health perspective.

Surely, such a mismatch is suboptimal for public health. What *P* value should we use for, say, evaluating chemotherapy? Well, since it involves injections of what are basically poisons, we can be pretty sure that it will hurt the patient, and so, do not use chemo drugs unless you are very sure that you indeed really need them; you would want a rigorous *P* value threshold when investigating whether or not to undergo chemotherapy. …Or, if you already have late-stage cancer, and therefore pretty much know that the unknown side effects of an unproven drug cannot be worse than the natural course of the disease (*death*), then maybe you should adopt a loose *P* value threshold and try any new chemotherapy drug that looks even slightly promising. As I have convincingly argued both sides in this chemotherapy example, it is clear that risk analysis requires a bit of thinking.

What *P* value should we use for, say, tai chi? Its effects may be subtle, diverse, and gradual (*good luck seeing them, clearly, in the data*), but, tai chi is safe and low cost. There is very little downside to it, so, what is the harm in using it, even were it to be ineffective? When evaluating tai chi, we should probably adopt a loose significance threshold; maybe $P < 0.95$; in other words, tai chi is recommended unless the data were to strongly suggest that this therapy is definitely absolutely nothing but a waste of time.

There are some risky acupoints and dangerous herbs within the world of TCM, but overall, its therapies are more like tai chi than like chemotherapy: more safe than potently effective. I think that safety and cost factors should be taken into account when choosing a *P* value statistical significance threshold; for obvious reasons, one needs to be more careful about electing open-heart surgery than about trying green tea; the prudent levels of skepticism are not equal across these two medical interventions.

Using one uniform significance threshold is likely to bias in favor of drastic therapeutics – their effects are narrower and more obvious, and so it is easier to see them, in a statistically significant way, with small, short (*cost-effective and feasible*) studies. On the other hand, a therapy that slowly increases overall health is not so easy to significantly substantiate with anything short of a lengthy and grandiose study. Thereby, uniform statistical thresholds bias in favor of dramatic interventions – and, as a predictable consequence, Western medicine has never really shaken off its image of being "*heroic medicine*" (*which was Modern Medicine's famously invasive 18th and 19th century forerunner*).

Of course, I see no objective reason why drastic therapeutics should, across the board, be more clinically useful than subtle ones. So, scientific practices that favor dramatic interventions are probably doing submaximal service to human health by undeservedly deemphasizing gradual therapies (*which fill most of the TCM therapeutic toolbox*).

Is This a Scientific Problem or a Legal Problem?

In fact, scientists are generally smart people; the above problem would not necessarily be too difficult to fix. Basically, I'm suggesting that, instead of adopting significance thresholds by unthinking convention, researchers should add a subsection to the "*methods*" or "*analysis*" section, wherein they analyze the landscape of their research's applications, and from that, build and articulate a case for their choice of significance thresholds. I also suggest that, within scientific debate, such significance threshold decisions should be a prominent point of contention, since around them, the conclusions drawn from the data may inflect. "*Should significance be set at a threshold of* $P = 0.05$*, 0.5, or 0.95?*" should often be a serious question, addressed on a case-by-case basis.

In reality, changing a culture can be difficult and slow, but, at least in theory, science itself can easily be fixed; all I'm asking anyone to do is re-run an analysis or two with different *P* values, based on a few minutes of thinking about real-world implications rather than just adopting significance thresholds by convention.

The meat of the problem lies in the regulatory sphere – which might be counterintuitive, since one of my examples of actively and consciously choosing significance thresholds was the courtroom, where criminal cases (*"beyond a reasonable doubt"*) and civil cases (*50:50*) are analyzed very differently. The judicial world may get it, but, the legislative world, at least in the United States, generally does not – hence the saying, from one of our wittier politicians in recent decades, "*when the FDA kills you, they're just being careful*."

Back in the early 1990s, our Food and Drug Administration was being very careful about approving new AIDS drugs – heaven forbid that a new medicine hurt a patient. For this careful protection, AIDS patients were anything but thankful toward the FDA. The natural course of their disease is certain death. So, for the patients, if a medication were to kill them, they would be no worse off than they would have been had they done nothing (*or even just nothing new*) to treat their disease. *"Don't try that new chemical; stick with the medicines that are tried, true, approved" (and not the life saver that you want)* was not a FDA stance that satisfied most AIDS patients. When facing certain death, type-1 errors (*trying something that is actually useless*) are a moot point; the most dangerous and ineffective therapy could not be much worse than the natural course of the disease. Patients wanted to avoid type-2 errors (*not getting useful new medicines*), whereas the government wanted to avoid (*getting blamed for*) type-1 errors (*giving people bad new medicines*). In this instance, public health and public policy were misaligned.

Committing a type-1 error (*advocating a therapy that actually is dangerous and ineffective*) is obviously bad. And the political fallout from (*anything that looks remotely like*) it is often vigorous and swift. Neglecting to advocate a useful therapy may have equally large public health consequences; however, in the realms of public policy and scientific careers, such sins of omission are rarely even noticed, never mind punished. Should this be the case? Or is this difference an unconscious, and possibly even unfortunate, bias in (*scientific research and*) public policy?

To paraphrase Gingrich: "*when they don't recommend TCM, they're just being careful*." TCM presents a challenge to clinical science. Most obviously, it dares researchers to run sufficiently powered, and well-designed, experiments that indeed pick up the truths that are out there. However, some truths' details are way out there. TCM raises the question of whether public health should wait for all the mechanistic details to be ironed out before taking action; after all, sins of omission can be as lethal as ones of commission. Just as action against tobacco companies was delayed for years because of an undue skepticism of epidemiological data (*or, in Legalese, "circumstantial evidence"*), the epidemiological evidence in favor of TCM (*if low powered*) is much more voluminous than is the favorable randomized controlled experimental evidence or the mechanistic biomarker evidence.

Such was once the case with cigarettes and lung cancer. At some point in the 20th century, people started noticing that smokers get lung cancer more often than do nonsmokers. Suspecting that cigarettes cause lung cancer, lawsuits were brought against cigarette manufacturers. The cigarette companies argued that simply showing that smokers get more lung cancer failed to prove that cigarettes cause lung cancer (*maybe some genetic predisposition causes certain people to both enjoy smoking and to spontaneously develop lung cancer. Or maybe, people who have latent, early-stage, undetected lung cancer find mild relief from the subclinical symptoms via smoking; we don't say that aspirin causes headaches simply because people who have headaches tend to take aspirin; the arrow of causality, in that case, points the other way*). So, until we were to know exactly how cigarettes caused cancer, cigarettes did not (*in an official, legal sense*) cause cancer. This was a legal ruling, based on society's choices about standards of evidence ("*innocent until proven, beyond a reasonable doubt, to be guilty"*). Because the courts were SO very wary of mere correlational evidence, necessary legal action against cigarette companies was delayed for years, and, as many more people continued smoking and getting lung cancer, American public health suffered due to our excessive skepticism toward correlational evidence.

Regarding TCM, we risk a mirror image of that public health tragedy. If TCM works but the scientific/medical community refuses to recognize it simply because the evidence in favor is less than crystal clear, then an opportunity to extend many healthy lifespans will be missed. Missteps of omission (*rather than of commission*) can nonetheless be public health tragedies (*missed opportunities, rather than murders*). If correlational evidence is to be again deemed inadmissible, then we risk passively committing another crime against public health, this time failing to advocate useful therapeutics (*rather than failing to censure a pernicious product, as in the tobacco example*). The case of TCM challenges science and public policy to give epidemiological data and correlational evidence their full due.

More broadly, TCM raises again to public discourse Newt Gingrich's risk analysis theme: whether a preference for type-2 errors (*the late adopter's excessive skepticism*) in science – and more so, in public policy – over type-1s (*the early adopter's gullibility*) truly benefits public health. Does it benefit the health of the people, whom science and governance seek to serve? Or does it serve to decrease the likelihoods of government agencies finding themselves in hot water and of scientific researchers looking more credulous than credible? (*Ideally, the answers would be "yes" and "yes," but*) if the former answer is "*no*," and the latter is "*yes*," then there is misalignment between the "*principal*" of public health and the "*agents*" of science and governance. In addition to providing much fertile ground for many real experiments, TCM provides a thought experiment that should spur us to reevaluate the metrics by which we judge the careers of our scientists and the services of our regulators.

Financial support and sponsorship

Nil.

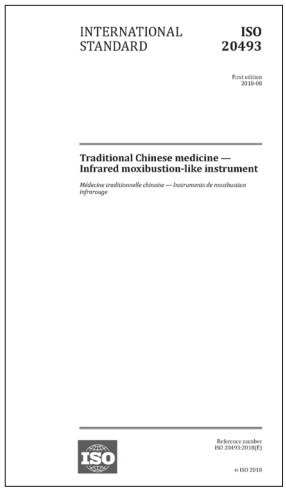
Conflicts of interest

There are no conflicts of interest.

Reference

1. Applebaum A. The Drug Approval Pendulum." The Washington Post; 13 April, 2005. p. A17. Available from: http://www.washingtonpost.com/wp-dyn/articles/A48135-2005Apr12.html?noredirect=on. [Last accessed on 2018 Jul 09].

The First ISO Standard of Traditional Chinese Medicine Led by Shanghai University of Traditional Chinese Medicine Has been Published


INTERNATIONAL STANDARD

ISO 20493

First edition 2018-08

Traditional Chinese medicine — Infrared moxibustion-like instrument

Médecine traditionnelle chinoise — Instruments de moxibustion infrarouge

Reference number ISO 20493:2018(E)

© ISO 2018

At the beginning of August 2018, the International Organization for Standardization (ISO) published ISO 20493: *2018 Traditional Chinese medicine – Infrared moxibustion-like instrument*. The website of ISO reported it in detail on August 29. This is the first time the ISO website has reported on the international standards of traditional Chinese medicine (TCM). The standard was developed by the team led Professor Huayuan Yang who works for the Institute of Chinese Medicine Engineering of Shanghai University of Traditional Chinese Medicine (SHUTCM). It is the first ISO international standard established and published by Shanghai University of Traditional Chinese Medicine.

Due to the large number of treatment devices of infrared radiation used in the international market, in order to distinguish an infrared moxibustion-like instrument with specific wavelengths used in traditional Chinese medicine from others, Professor Huayuan Yang submitted the proposal of establishing an international standard of the infrared moxibustion-like instrument to ISO/TC 249 in 2014, which was discussed and approved by the committee in 2015 to be made. According to the ISO international standard-setting procedure, the development of an international standard generally needs 36 to 48 months with seven stages. During the 41 months of making this standard, experts from five countries including Australia, China, Canada, South Africa and Thailand participated in the project team. The team also consulted and discussed with the International Electrotechnical Commission (IEC) which gave the approval.

The ISO 20493 stipulates basic requirements of the terms and definitions, structure and composition, technical requirements, test methods, labels, instructions, packaging, transportation and storage of the infrared moxibustion-like apparatus used in traditional Chinese medicine. The standard specifies the name of the infrared moxibustion-like apparatus used in traditional Chinese medicine and clearly defines the scope and the wavelength of the infrared spectrum. It plays a crucial role in regulating the market, promoting the international trade and improving the clinical application in the globe.

ISO is the world's most authoritative non-governmental international standardization organization, and is known as the "United Nations in the field of technology". Under the impetus of the internationalization of traditional Chinese medicine, China submitted an application for establishing a technical committee of traditional Chinese medicine to ISO in 2009, and it was approved at the 46th ISO Technical Management Board (TMB) Conference in September of the same year. ISO/TC249 is the code name for the technical committee of traditional Chinese medicine, and SHUTCM undertakes the work of the secretariat. ISO/TC249 has developed to 39 member countries and has 7 working groups, mainly engaged in the international standardization of product quality and safety control in traditional Chinese medicine including raw materials and traditional processing, manufactured TCM products, TCM facilities and TCM terminology and informatics. ISO/TC 249 has already published 31 TCM international standards and there are 44 standards are under the production.

In order to achieve the goal of establishing a high-quality university and being a pioneer of international standardization of traditional Chinese medicine, experts of SHUTCM actively participate in the development of the standards. They have put forward 14 proposals of ISO standards involving Chinese herbal medicine, TCM diagnosis and treatment facilities and terminology. Four of them have been in the voting process and three new projects have been listed as preparatory projects by ISO/TC249.

(ISO/TC 249 Secretariat)

中医文化 东方智慧

Healthcare Wisdom in Traditional Chinese Medicine

中醫藥文化

海外版

CHINESE MEDICINE AND CULTURE