

Traditional Medicine with Plants – Present and Past

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Definitions

Traditional medicine represents the knowledge gained in most if not all human societies during history of manhood before the rise of modern medicine. The World Health Organization (WHO) defines traditional medicine as: “Traditional medicine is the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness” [1]. Traditional medicines comprises of formalized forms with well-documented remedies practiced by lay people (e.g. European cloister medicine, Ayurveda, ancient Iranian medicine, Islamic medicine, traditional Chinese medicine etc.) as well as more informal practices orally handed down from generation to generation. Practices of traditional practices include herbal remedies, reflex therapies like acupuncture, manual therapies, dietetics, spiritual therapies and others. Herbal remedies are herbs (leaves, flowers, seeds, fruits, roots etc.), materials derived from herbs (essential oils, fresh juices, gums and resins etc.) and plant preparations (fluid or dry extracts, tinctures, decoctions and infusions, oils etc.). Herbal remedies exert therapeutic activity because of their active constituents that act either alone or in combination.

Knowledge about traditional medicines in modern sciences is being created by different disciplines, e.g.:

Medical anthropology

Study the inter-relationships of traditional medicines for the culture of indigenous societies.

Ethnobotany

Investigates the cultural use of plants by ethnic societies. This includes not only how plants served for medicinal purposes, but also how plants have been used as foods, for the preparation of cloths, cosmetics, construction, currency, rituals etc.

Ethnopharmacy

Focuses on the use of medicines in ethnic groups. This includes mainly traditional medicines, but may also consider the use of modern pharmaceuticals in indigenous tribes.

Ethnopharmacology

As a subdiscipline of ethnopharmacy aims to elucidate the modes of action of active ingredients of medicinal plants. The isolation of these ingredients is the subject of phytochemistry.

Modern drug discovery research takes advantage of the fact that many pharmacologically compounds can be isolated from medicinal plant. These phytochemicals may serve as lead compounds for chemical derivatization and drug development. This field is related to but not part of traditional medicine.

Complementary and Alternative Medicine (CAM)

According to WHO, up to 80% primary health care in some

developing countries depends on traditional medicine [1]. Frequently, traditional remedies are the only options for poor people to get medicines at affordable prices. In industrialized countries where modern academic medicine mostly replaced ancient traditional medicines, an increasing interest of the general public on traditional medicine was noted during the past decades. Here, natural medicines are sometimes called Complementary and Alternative medicine (CAM). In contrast to the situation in developing countries, the CAM attracts more middle class people with better education and more income [2] (Figure 1).

The demand for “green medicine” with natural and well-tolerable drugs seems to be at least partly related to the reluctance of parts of patients towards synthetic chemical drugs and hi-tech, machine-driven medicine. Medical establishment is frequently sceptic towards CAM and claims that the scientific basis of CAM therapies would be smaller. The popularity of CAM in the public was taken up by some governments of industrialized country to establish research institutes focusing on investigating the scientific efficacy of CAM therapies. The National Center for Complementary and Alternative Medicine (NCCAM) has been established in USA in 1991 for this purpose [3].

Prehistoric and Historic Medicine

During evolution of life, *Homo sapiens* appeared around 100,000 years ago on this globe. Since their very early days, human beings depend on the use of traditional medicine to survive and there is no doubt about that they did well. While the impressive successes of modern medicine are not to be questioned at all, it should not be forgotten that manhood successfully used traditional medicine for the past 100,000 years, while medical chemistry is younger than two centuries. This is certainly a strong argument in favor of the efficacy of traditional medicines worldwide.

Medicinal plants were used for treatment of diseases since prehistoric times. Prehistoric medicine relates to the use of medicine before the invention of writing of the corresponding human societies [4].

Furthermore, organic materials rot over time and it is difficult to reconcile the exact use of plants as foods, spices, or medicinal plants – if any plants can be found at all [5]. Therefore, research on prehistoric medicine is mainly dependent on the existence of human artifacts (e.g. stone paintings and remainders). Anthropology attempts to reconstruct prehistoric medicinal practices by studying still traditionally living

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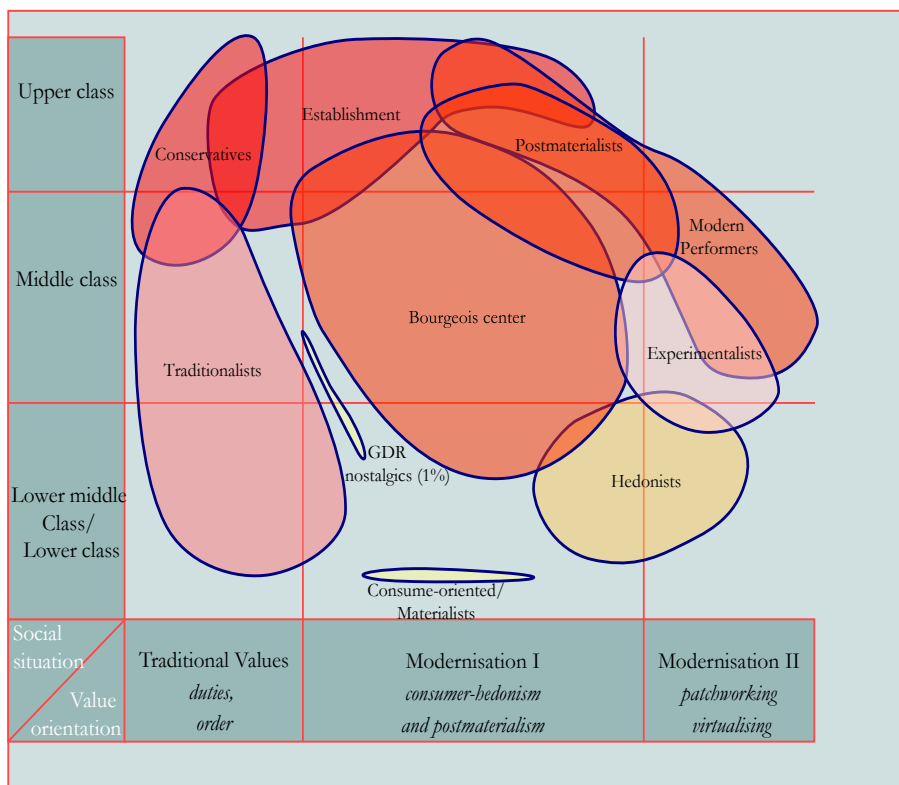


Figure 1: Wealthy, educated and conservatives are the typical TCM clients [2].

indigenous tribes without contact to the outer world [1]. The search for prehistoric medicinal practices is further hampered by the fact that early human beings lived in nomadic tribes that may have used a greater variety of medicinal plants in the course of their migrations as compared to sessile societies in later ages. The first archaeological evidence of the use of medicinal plants dates back to the paleolithic era, approximately 60,000 years ago, whereas the first written evidence represents a 5000 year-old plant list of the Sumerians.

Archaeological knowledge on ancient Egyptian medicine comes from Egyptian medical papyri and from traces of organic herb material found in medical jars 1000 BC [6]. The cultivation and use of herbs in Kashrut have been mentioned in the Old Testament. A number of ancient cultures wrote on plants and their medical uses. In ancient Egypt, herbs are mentioned.

The earliest known Greek herbals were those of Diocles of Carystus, written during the 3rd century B.C, and one by Krateuas from the 1st century B.C. Only a few fragments of these works have survived intact, but from what remains scholars have noted that there is a large amount of overlap with the Egyptian herbals [7]. In the classical Greek and Roman era, the use of medicinal herbs is well documented by famous physicians and authors (Hippocrates, Aristotle, Theophrastus, Dioscorides, Galen and others). Outside Europe, ancient Ayurvedic physicians (Charaka, Sushruta) documented the use of herbs and minerals in India during the 1st millennium BC. Traditional Chinese medicine is also famous for its millennia-old history. The first Chinese herbal book was the *Shennong Bencao Jing*, compiled during the Han Dynasty but dating back to a much earlier date, which was later augmented as the *Yaoxing Lun* (Treatise on the Nature of Medicinal Herbs) during the Tang Dynasty.

Traditional Medicine Today

The demand for traditional medicines both in developing as well as industrialized countries makes it mandatory to investigate the scientific basis of herbal remedies [8-13]. Evidence-based medicine is thought to be a standard for modern academic medicine, although the use of not few western-style drugs is more experience-based than evidence-based. Nevertheless, the principles of science-based medicine should also be applied for traditional medicines. Herbal remedies should meet stringent criteria of quality control, elucidation of modes of action, as well as clinical safety and efficacy [14].

The WHO stated that “inappropriate use of traditional medicines or practices can have negative or dangerous effects” and that “further research is needed to ascertain the efficacy and safety” of several of the practices and medicinal plants used by traditional medicine systems [1].

Reports of contaminations of herbal drugs with heavy metals, organic solvents, microbial toxins, radioactivity as well as intentional adulterations are alarming and high quality standards have urgently to be realized [15,16]. International regulations for quality control of herbal products will improve the reliable use of traditional medicines. The WHO issued quality control methods for medicinal plant materials to establish quality standards and specifications for herbal materials [17]. European Union (EU) regulated the production and distribution herbal medicines under the European Directive on Traditional Herbal Medicinal Products [18]. In the United States, herbal remedies frequently regulated as dietary supplements by the Food and Drug Administration. Herbal products falling into this category have not to be proven for safety or efficacy. They are freely available as “over-the-

counter” products [19], although FDA may withdraw such products from the market in case of evidence for harmful effects.

Many well-established drugs in modern academic medicine originate from medicinal herbs, *e.g.* opium, aspirin, digitalis, quinine and many others. Facts and figures from WHO demonstrate that one quarter of all modern drugs used in the USA have been derived from plants [20]. Even more thriving, the more, 80% of active compounds isolated from higher plants and established in modern medicine today show a positive correlation between their modern therapeutic use and the traditional use of the plants from which they are derived [21]. These results underpin once more the importance of medicinal herbs for modern pharmacotherapy. Therefore, plant-based drug development processes should also consider the proprietary rights of indigenous medical knowledge. Illegal use of this knowledge has been termed “biopiracy”. The Convention on Biological Diversity (in particular Article 8j and the Nagoya Protocol) regulates the commercialization of indigenous knowledge.

The final aim of research on traditional medicines is to modernize them and to make them globally available [22]. Scientifically proven efficient and safe traditional remedies ought to be integrated into western modern medicine [23-25]. The best of both worlds – of traditional phytotherapy and of modern medicine should be amalgamated to a “one-world-medicine” for the sake of all patients on this globe.

References

1. <http://www.who.int/medicines/areas/traditional/definitions/en/>
2. Greten HJ (2005) Erhebung im Daomed Network. Gesundheitswirtschaftskongress Hamburg.
3. <http://nccam.nih.gov/about>
4. Kelly N, Rees B, Shuter P (2003) *Medicine through time*. Heinemann. (2nd edn).
5. Grienke U, Zöll M, Peintner U, Rollinger JM (2014) European medicinal polypores - A modern view on traditional uses. *J Ethnopharmacol* 154: 564-583
6. McGovern PE, Mirzoian A, Hall GR (2009) Ancient Egyptian herbal wines. *Proc Natl Acad Sci* 106: 7361-7366.
7. <http://www.localhistories.org/medicine.html>
8. Efferth T (2010) Personalized Cancer Medicine: From molecular diagnostics to targeted therapy with natural products. *Planta Medica* 76: 1-12.
9. Efferth T (2012) Stem cells, cancer stem-like cells, and natural products. *Planta Med* 78: 935-942.
10. Efferth T, Koch E (2011) Complex interactions between phytochemicals. The multi-target therapeutic concept of phytotherapy. *Current Drug Targets* 12: 122-132.
11. Efferth T, Greten HJ (2012a) Medicinal and aromatic plant research in the 21st century. *Medicinal and Aromatic Plants* 1: e110.
12. Efferth T, Fu YJ, Zu YG, Schwarz G, Konkimalla VS, et al. (2007a) Molecular target-guided tumor therapy with natural products derived from traditional Chinese medicine. *Curr Med Chem* 14: 2024-2032.
13. Efferth T, Li PC, Konkimalla VS, Kaina B (2007b) From traditional Chinese medicine to rational cancer therapy. *Trends Mol Med* 13: 353-361.
14. Efferth T, Greten HJ (2012b) Autophagy by natural products in cancer cells. *Biochem Anal Biochem* 1: 8.
15. Efferth T, Kaina B (2011) Toxicities by herbal medicines with emphasis to traditional Chinese medicine. *Current Drug Metab* 12: 989-996.
16. Efferth T, Greten HJ (2012c) Quality control for medicinal plants. *Med Aromat Plants* 1: 7.
17. Allard T, Wenner T, Greten HJ, Efferth T (2013) Mechanisms of herb-induced nephrotoxicity. *Curr Med Chem* 20: 2812-2819.
18. World Health Organization (1998) WHO quality control methods for herbal materials.
19. Efferth T, Greten HJ (2012b) The European directive on traditional herbal medicinal products: friend or foe for plant-based therapies? *Journal of Chinese Integrative Medicine* 10: 357-361.
20. Eichhorn T, Greten HJ, Efferth T (2011) Self-medication with nutritional supplements and herbal over-the-counter products. *Natural Products and Bioprospecting* 1: 62-70.
21. Askew MF (2002) Interactive European network for industrial crops and their applications. In: J. Janick and A. Whipkey (Eds.), *Trends in new crops and new uses*. ASHS Press, Alexandria, VA: 55-61.
22. Fabricant DS, Farnsworth NR (2001) The value of plants used in traditional medicine for drug discovery. *Environ. Health Perspect* 109 Suppl 1 (Suppl 1): 69-75.
23. Efferth T (2011) Perspectives for globalized natural medicines in the 21st century. *Chinese Journal of Natural Medicines* 9: 1-6.
24. Meyer-Hamme G, Beckmann K, Radtke J, Efferth T, Greten HJ, et al. (2013) A survey of Chinese medicinal herbal treatment for chemotherapy-induced oral mucositis. *Evid Based Complement Alternat Med*: 284959.
25. Schröder S, Beckmann K, Franconi G, Meyer-Hamme G, Friedemann T, et al. (2013) Can medical herbs stimulate regeneration or neuroprotection and treat neuropathic pain in chemotherapy-induced peripheral neuropathy? *Evid Based Complement Alternat*: 423713.