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## Traditional medicine and toxicity in disease biology and therapeutics in Manipur

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### Abstract

Traditional medicines play a great role in the history of disease biology and therapeutics in Manipur. But majority of the preparations of the traditional healers consists of a variety of plants so that any one or the other plant extract may cure the ailment. The modern medicines in the health sector are also originated from traditional medicines. We know plants usually have defensive mechanisms against its enemies like herbivores and animals either by developing thorns and sticky forms or by secreting chemical substances toxic to the animals. Some of the toxic substances have great medicinal value when used in little doses to the human beings whereas others may cause harmful effects even at low doses. Even the vegetables and pulses used at our kitchen daily are reported to have toxic effects in some way or the other. So the importance to identify qualitatively and quantitatively all the elements found in the local plants used by the traditional healers are being discussed so that after removing the toxic or unwanted substances we can use only the useful part of the plant in disease biology and therapeutics to develop into drugs.

**Keywords:** Rofecoxib, artemisinin, and berberine (Compounds in medicinal plants), TCM (Traditional Chinese medicine), THM (Traditional healing methods)

### Introduction

Herbal medicines are the oldest remedies known to mankind. Herbs had been used by all cultures throughout history but India has one of the oldest, richest and most diverse cultural living traditions associated with the use of medicinal plants (N Bhatt, 1998-1999) [6].

Fossil records revealed that the human use of plants as traditional medicine date back to middle Paleolithic age, approximately 60,000 years ago (Solecki *et al.*, 1975) [17]. The plants were used as flavors, foods, insect deterrents, ornamentals, fumigants, spices, and cosmetics (Kunin *et al.*, 1996; Pieroni *et al.*, 2004) [8, 12]. Generally, the medicinally useful plants are sold as commodities in the market, and those that are sold for medicinal purposes dominate the market (Runner *et al.*, 2001) [15]. The World Health Organization estimated that over 80% of the people in developing countries rely on traditional remedies such as herbs for their daily needs (Tripathi *et al.*, 2003) [5], and about 855 traditional medicines include used crude plant extracts. This means that about 3.5 to 4 billion of the global population rely on plants resources for drugs (Farnsworth, 1988) [3].

It is widely accepted that more than 80% of drug substances are either directly derived from natural products or developed from a natural compound (M. Maridass and A. John de Britto, 2008) [11]. And, in fact, around 50% of pharmaceuticals are derived from compounds first identified or isolated from herbs/plants, including organisms, animals, and insects, as active ingredients (S. Krief *et al.*, 2004) [7]. At the same time innumerable reports about toxicity of plants are also reported. Mention may be made of the renal failure reports in Africa after using Chinese herbal medicines (Anthony C Liwa and Hyasinta M Jaka, 2016) [1].

Herbal-induced renal disease constitutes an important etiology of renal diseases in daily clinical practice. As up to 80% of the population in Africa is estimated to use herbal preparations, which are generally perceived as safe and free from adverse effects, this consumption however has been associated with 35% of all cases of acute kidney injury. Consumption of potentially toxic medicinal herbs, incorrect substitution of harmless herbs with toxic herbs, contamination with toxic compounds or interactions with conventional treatments is the major problems. The source, composition and preparations of these herbs vary on the prevalent local healing practices.

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Most herbs contain active compounds, however, they are not tested for efficacy and safety; the ingredients are not well known and the dosage and route of administration are not standardized (Anthony C Liwa and Hyasinta M Jaka, 2016). So the need of proper investigation and clinical trials are being discussed.

### Discussion

We have come across a number of herbal medicines used by local traditional healers of Manipur. And also the treatments of local healers are effective. In Manipur there are a lot of traditional healers from times immemorial. The knowledge is passed from generation to generation through experiences and proofs in the community. But most of the herbal medicines used by the local healers consist of not only a single plant but also of a number of plants or herbs so that by the action of any one or the other plants, the ailment can be cured blindly. Some of the plants might have some adverse effects on other organs and organ systems of the human body. Plants develop structural and chemical defensive mechanisms to protect themselves from their enemies (herbivores and human beings). Some of the chemicals may be useful for some ailments in little doses whereas some other may cause harmful effects to other organs even in low doses. So the traditional medicines need to be investigated properly and tested clinically.

Traditional knowledge and experiential databases derived from clinical practice are instrumental in increasing the success rate of drug discovery by reducing the time consumed, money spent, and toxicity occurrence which are the three main hurdles in drug development, when compared with the conventional approach adopting random screening and chemical synthesis. For example, goldthread (*Coptis chinensis* Franch), a herb being used in TCM and Ayurvedic medicine for the treatment of inflammatory symptoms and various infectious disorders for more than 3,000 years (X. Z. Zhu, X. Y. Li, and J. Liu, 2004) [21], was found to contain berberine, a substance that possesses powerful antibiotic and anti-inflammatory properties. Without the information on the use of goldthread in traditional medicines, it would have been impossible to uncover the antimicrobial and anti-inflammatory activities of berberine by random screening. More importantly, berberine has been found to produce other pharmacological actions that may have implications in clinical conditions such as diabetes, cancer, depression, hypertension, and hypercholesterolemia, all of which have been documented in the literature on goldthread (P.R. Vuddanda *et al.*, 2010) [14].

Artemisinin (Qinghaosu), a new antimalarial drug, was discovered in China in the early 1970s. The discovery of artemisinin is attributed to You-You Tu, at that time a middle-aged phytochemist working in the Institute of Chinese Materia Medica, China Academy of Traditional Chinese Medicine (Tu, Y., 1981) [18]. The discovery of Qinghaosu underlines the importance of traditional knowledge in drug discovery from herbal medicine (F. Liao, 2009) [9].

Hepatitis, an inflammatory disease of the liver, is commonly caused by drug intoxication or viral infection, with the latter being classified into types A, B, C, D, and E. According to WHO, 2 billion people worldwide have been infected by the hepatitis B virus (HBV), and among them 350–400 million are chronic HBV carriers and about 1 million deaths are caused by HBV infection every year (F. M. Lu and H.

Zhuang, 2009) [10]. It is estimated that around 1.2 million and 3.2 million people in the USA are battling chronic hepatitis B and C, respectively, and more than 85,000 new cases of hepatitis are diagnosed each year (Hepatitis, <http://www.mahalo.com/hepatitis/>). In China, there are 93 million HBV carriers, and among them 30 million are patients with chronic hepatitis B (F. M. Lu and H. Zhuang, 2009) [10]. Bicyclol, which was approved in 2001 as a therapeutic agent for hepatitis in China, has obtained patent protection in 15 countries and regions ("Anti-hepatitis new drug bicyclol" (Chinese), <http://www.5my.com/news/gxytj/0931383.html>). The development of bicyclol highlights drug discovery from THM.

Natural products and their derivatives represent more than 50% of all the drugs in modern therapeutics (Si-Yuan Pan *et al.*, 2013) [16]. Despite the protracted time course of development, only one or two in ten thousand of such chemical compounds have proven to be clinically efficacious and safe for approval by regulatory agencies. In fact, about half of all drug candidates fail in the late stages of clinical trials. Furthermore, soon after their approval, some new drugs have to be withdrawn from the market due to severe side effects and clinical risks that are not detected in Phase III trials. For example, Vioxx (rofecoxib), which was launched in 1999, was withdrawn in 2004 due to an increased risk of heart attack in users. As a result, the drug only existed in the market for 5 years (B. Sibbald, 2004) [13].

### Need for regulatory controls on herbal drugs

Most serious side effects originate from overuse or misuse of herbal medicines. The likelihood of side effects increases when the production and sale of such products is largely uncontrolled and or unregulated and the consumer is not adequately informed about their proper uses. While in some countries herbal medicines are regulated through official controls and rigorous manufacturing standards, this is not so everywhere. In Germany, for example, where herbal products are sold as "phytomedicines" they are subject to the same criteria for their safety, efficacy and quality as applicable to other drugs. Regulatory controls are therefore considered necessary to safeguard Drug interactions with herbal drugs. So it is always wise to consult a qualified medical practitioner having clinical herbal experience in case of any doubt about the compatibility of herb and the drugs you intend to take (WHO Reports, 1997, 2002).

### Conclusion

From all the above discussions it is to be concluded that traditional medicines have both good and bad effects on human health. So it is the high time for the researchers to investigate and analyze qualitatively and quantitatively all the elements, chemical substances and compounds present in the medicinal plants of Manipur for developing into safe drugs for successful utilization in disease biology and therapeutics after proper clinical trials.

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