WHAT IS THE FUTURE OF PHYTOTHERAPY?
(COMMENTARY)

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Practically all human societies have utilized plants not only as sources of nutrition but also as therapy against diseases and ailments. Considering the fact that the synthesis of a pharmaceutical requires an enormous investment of research and money, the discovery of useful medicinal plants which have been used for millennia is very appealing. About 25% of all synthesized drugs are derived directly or indirectly from plants [1].

In the USA the market in plants used for medicinal purposes involved $4.8 billion in 2007 and $5 billion in Europe in 2003 (2-3). The increase in the demand for phytotherapeutic products in the USA has resulted in new rules starting in 2008 so that products adhere to Good Manufacturing Practices (2).

The European Union in 2004 passed a law permitting a simplified registration procedure for herbal medicines which have been used for at least 30 years (and 15 years in Europe). These phytotherapeutic products must have adequate documentation of nontoxicity with specific conditions of use (3).

In the 1990s the World Health Organization (WHO) stated that the use of traditional medicines was the only sustainable way to provide primary healthcare to individuals in developing nations [4]. An international meeting of 134 nations at Alma Ata in 1978 established the objective of providing adequate healthcare for all people in the world by the year 2000. In that year, non-governmental organizations from 92 nations met in Savar, Bangladesh to reaffirm the same goal.

Given this global situation, the patenting of plant medicines by pharmaceutical industries can constitute a problem. A pharmaceutical industry would be reluctant to engage in the high economic investment needed to carry out chemical, pharmacological and clinical studies without an economic endpoint or profit. The only reason that a pharmaceutical industry
would be interested in investing in research in the area of herbal medicines would be a public refundability.

Some of the problems involved with the use of herbal medicines can be summarized as follows:

1. Knowledge of the substances comprising the plant and their actions is incomplete and thus there are subsequent problems of standardization. For example, for years the therapeutic activity of St. John’s wort was thought to be due to its content of hypericin but now it appears that its hyperforin content is actually more relevant [5].

2. The composition of an herbal medicine differs according to which part of the plant is utilized, the type of soil in which it grows and the time of the year when it is harvested. For example, the concentration of valerianic acid in *Valeriana officinalis* can vary 100-fold depending on the zone from which it is collected [6].

3. The pharmacological activity of a plant is different from that of its single components. For example, the antioxidant activity of ascorbic acid contained in *Rosa canina* is higher than in ascorbic acid itself due to the presence of carotinoids and flavonoids which potentiate its activity [7].

4. Combinations of plants administered together can modify the bioavailability and therapeutic activity of single active ingredients.

5. Plants can be contaminated by toxic substances (for example heavy metals, aflatoxin, etc.) as well as pathogenic microorganisms.

6. The pharmacological activity of a phytotherapeutic product depends upon the extractive technique used. For example, to treat chronic venous insufficiency, only the triterpenic component of *Centellae asiaticae* is used, as it is comprised principally of asiaticoside (dry extracts) rather than ethanolic extracts, or as powdered Centella herb which has activity on the central nervous system [8].

7. Little attention in the medical history about phytotherapeutic products due to the phenomenon of self-prescribing.

Due to the frequent use of herbal medicines, physicians should always ask their patients if they are taking any phytomedicines to avoid cross reactions with other types of drugs [9]. There are have been two reported cases of acute rejection of heart transplant due to combined use of cyclosporin and hypericin self prescribed in one case and prescribed by a psychiatrist in a second case [10]. Hypericin increases the activity of the isoenzyme CYP3A4 of cytochrome P450 and inhibits the absorption of substances and drugs through its action on the P-glycoprotein drug transporter, thus causing decreased bioavailability of cyclosporin and consequent reduced immunosuppressive action.

Another interaction which can be dangerous is that of co-administration of an anticoagulant and certain herbs such as gingko, papaya, etc. due to risk of hemorrhage. Furthermore, herbal medicines usually do not interfere in the coagulative cascade but on platelet function so with prothrombin and partial thromboplastin times being unmodified, there is a prolonged period of hemorrhage [11].
What is the Future of Phytotherapy?

8. The common idea that “herbs do not harm us because they are not toxic” results in an underestimation of the problems they can create. They are not always “natural and safe” even though many people believe that they are [12]. It is interesting to note the results of a survey conducted in Germany in 2002 on 2172 people ranging in age from 16-90 years: 82% of those interviewed maintained that “natural remedies” are not very toxic [13], whereas 85% of participants in the study believed that chemical drugs were endowed with medium to high toxicity.

9. All of the above makes the carrying out of randomized, controlled studies difficult. Therefore a variation of the CONSORT checklist for the correct use of randomized studies has been proposed [14].

As can be seen by the above mentioned, there are many problems tied to the standardized and scientifically correct use of plant medicines. On the other hand, how can we humans not use this “treasure” which the natural world has made available to us? What is needed is for various national governments and the World Health Organization to sponsor studies on the composition, therapeutic properties and proper use of plant medicines. Up until 2007 there are have been published three volumes of the WHO Monographs on Selected Medicinal Plants, containing 91 monographs. The fourth volume with another 28 monographs is in press now. Even given the breadth of these volumes, there are still thousands of plants which have not been adequately studied!

In conclusion, given the difficulties in the correct use and knowledge of plants, it is a pity that this field sometimes is left to therapeutic improvisation and in the hands of incompetent individuals who are not qualified to determine therapies. Both physicians and pharmacists should be adequately prepared during their academic studies in the field of phytotherapy so that they can properly guide therapy for their patients.

References


