

## Natural Product Tsunami

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Global rising trends for natural products consumption, establishing traditional medicines, vast propagation, and simple access to legal or illegal natural medications have encountered health systems with a disastrous tsunami, which was not fully predicted and programmed for throughout medical education. For instance, concomitant with establishing traditional system of Iranian medicine, around 700 natural remedies, and thus far 2871 production licenses (natural products, traditional remedies, packages, extracts, and essential oils) are issued in Iran (1). Such a huge bulk of remedies is required for establishing traditional medicines in countries like China, India, Iran, and the rest of the world. Pharmacy shops, supermarkets, malls, health shops (including traditional Attaries), and E-shops are the main sources for accessing such products. Thousands of illegal natural products are daily impounded from such places by the organizations in charge (2). If intact or semisynthetic natural compounds, such as atropine, taxol, digoxin, vinca alkaloids, morphine, etc., are excluded, different legal or illegal types of natural and allied products that cause disasters may be classified as the followings:

1) Phytotherapy products: These are mostly clinically approved as medications that originate from natural sources, like Ginkgo and Senna, in the form of a new dosage form. Such medications are made of single or multiple natural components, which are validated according to at least one active component.

2) Traditional remedies: These are locally approved issues by local Food and Drug Administrations (FDAs), like TCM or TIM remedies, which are derived from approved and well-known traditional texts without any negative reports at least during the past 30 years (3). Such products have been mostly presented up to now as their original dosage forms, such as Maajun, Sanoon, etc.

3) Complementary natural sources and nutraceuticals: These are products that are mainly composed of primary metabolites, including vitamins, salts, fatty acids, amino acids, enzymes, fibers, antioxidants, and extracts from natural resources. Examples are oenothera oil and cod liver oil.

4) Crude drugs: These are medicinal plants or naturally originated raw materials that are traditionally presented in local herbal shops or nowadays in packaged forms in pharmacies.

5) Homeopathy products, whose clinical effects aren't generally approved, are popular in countries that are bearing homeopathic physicians.

6) Adulteration or unauthorized natural products: Such illegal products bear at least an indication in the label that is not introduced in traditional medicines or modern phytotherapy. There are also reports on manually mixing up synthetic drugs with famous natural products with/without any notification on their label (4).

Increasing world access to unauthorized and not fully controlled remedies-which are produced by underground companies- by means of satellite channels or on-line markets, would threaten humans' health.

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The question is: why do physicians and pharmacies have to become familiar with such natural products? In fact, prior to visiting a physician, at least a natural product may be tried by the patient. Therefore, in addition to accidental or well-known toxicities of illegal products, interactions between authorized products with conventional drugs and foods would occur (4). Therefore, prophylactic procedures and confronting strategies for such an uncontrolled tsunami should be discussed.

1) Founding natural intoxication departments in special hospitals for the identification of unknown natural ingredients and consequently detoxification.

2) Establishment of a natural product information center related to FDA in cities.

3) Inclusion of different types of well-known and locally available natural products and crude drugs information in the undergraduate pharmacy and medical texts and training programs.

4) Increasing funds for the research on mechanism of action, pharmacokinetics, interactions, and management of important interactions, as well as studying the toxicity of the world demanded natural remedies

5) Upgrading pharmacopoeias using updated methods for the quality control of tradi-

tional remedies by indicating active components or markers for all products using, for instance, LC/MS/MS.

6) Upgrading real traditional health shops (Attaries) to modern forms and grading the quality of presented products. The critical point is to absolutely inhibit the presence of unknown and unauthorized natural products in the market.

In conclusion, because of global increasing trends for natural sources remedies consumption, the medical system has encountered a tsunami of rising intake of known or unknown products that are not fully investigated by the patients. Among the above-mentioned solutions, the basic and urgent issue is to include information on legal/illegal natural products in the undergraduate courses of medicine, potentiate pharmacy courses, and start special training programs, such as continuing educations for pharmacists and physicians. Consequently, the health systems should be ready for such disasters all the time. By the way, is it a right time for defining a world accepted label similar to radioactive labeling for notification and guaranteeing the presence and quality of natural products by international monitoring?

*Keywords:* Natural products, Adultration, Medical education.

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