

## Opinion

# Herbal Medicines and Other Traditional Remedies in Iran – A Tragedy Unfolds

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## Introduction

Various parts of plants, including seeds, berries, roots, leaves, bark or flowers have been used for medicinal purposes from prehistoric times throughout the world. In recorded history, herbal medications are mentioned in Egyptian papyri, traditional Chinese and Indian Ayurvedic as well as ancient Iranian Avestan texts. The North American medicine men, the African witch doctors and the Siberian Shamans, whose descendants may have been the Median Magi tribes of Iranian Zoroastrian healers, were all adept at magical rites, reading of sacred mantras as well as herbal remedies.

All plants and herbs that have been traditionally used as medications contain several alkaloids and other chemicals with different pharmacological properties and different amounts of the active ingredients. The property of each plant is dependent on the species and variety as well as the environment, including the type of soil on which it has been grown. The resurgence of the popularity of medicinal plants in recent decades throughout the world has multiple reasons. In the first place, it is a misconception that plants are ‘natural’ and can therefore have very few complications or side effects as compared to synthetic pharmaceutical preparations, as well as the fact that they have been used for millennia and thus have a historical tradition of safety; nothing can be further from the truth as this assumption. Some of the most potent poisons known to man are derived from common and popular plants.

## Medicinal Plants

Although plants have been used for millennia as medications, it was not until the 19th century when analytical chemistry became available and scientists began to extract and modify the active ingredients from plants in a pure form and later chemists learned to synthesize

those ingredients in the laboratory. Almost one-fourth of modern pharmaceutical drugs are derived from plant extracts and pharmacists are searching mountains, forests and oceans in search of new medicinally effective plants.

*Papaver somniferum*, from which opium is extracted and has been known for millennia, contains many alkaloids with various properties including morphine, heroin and codeine which are the most potent analgesics known to man. History of Aspirin, originally extracted from the leaves of the Willow tree as *Sodium salicylate* to treat pain, fever and inflammation has been known for several thousand years until it was synthesized as *Acetylsalicylic acid* in the 19th century by the chemist Charles Frederic Gerhardt. Other well-known herbal remedies include Quinine, extracted from the bark of the *Cinchona* tree to treat malaria and Digitalis, extracted from the common Foxglove plant or *Digitalis purpurea* to control cardiac arrhythmias. More recently, the production of *Paclitaxel* (brand name *Taxol*) from the needles of the European Yew tree has been used extensively in the treatment of certain types of cancers.

The Solanacea family of plants includes tomatoes, potatoes and aubergine as well as belladonna or the ‘deadly nightshade’, the foliage and berries of which are extremely toxic, contain tropane alkaloids which can cause delirium, hallucinations and death. The *Atropa* genus, to which the *Belladonna* species belong, has a long history of use as a medicine, cosmetic and poison. Modern pharmaceutical preparations from the nightshade species include atropine, Hyoscine and scopolamine. Its name, ‘belladonna’, meaning ‘beautiful woman’ derived from Italian, is due to its use by ancient Egyptian women as eye drops to cause pupillary dilatation which has a subconscious attractive effect on men.

All of these plants and many other herbal medications have many side effects and are poisonous unless the

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proper dose, methods of preparation and administration are carefully controlled.<sup>1</sup>

### Iranian Medicinal Plants

Of course, the most popular herbal remedies in Iran are different from those in Europe and North America. In the western world, the most popular remedies include Echinacea, Ephedra, Kava, St. John's wort, Ginkgo, Ginseng, Valerian, Chamomile, Ginger and several others. In 1999, the US National Institute of Health (NIH) in Bethesda, Maryland, established a National Center for Complementary and Alternative Medicine (NCCAM) to evaluate the efficacy and safety of alternative therapies and found significant hazards in the use of some herbal remedies including Ephedra, Kava and St. John's wort as well as the fact that many Ayurvedic medicinal products contained significant levels of lead, mercury and arsenic.<sup>2,3</sup>

St. John's Wort plant because of its interference with performance of oral contraceptives (OCP), ginkgo and ginseng due to interactions with the action of warfarin, and keratome drugs due to being agonistic with opioid receptors can be referred.<sup>3</sup>

In some countries, such as the Germany, all forms of herbal compounds are not OTC and are not available for use without prescription.<sup>4</sup> In Iran, herbal medicines are traditionally different from those in the west. Since the Islamic revolution, governmental, university and religious leaders have encouraged the resurgence of traditional 'Iranian' and 'Islamic' medical practices most of which are neither Iranian nor Islamic and are an amalgam of ancient Greek and other retrogressive medical practices.

Of the 8100 plant species in Iran, approximately 2300 species are aromatic and medicinal and about 450 species are sold by herbal apothecaries without any controls as to their purity. The consumers of these herbal medications have no knowledge of their toxicity, side effects or their interactions with other herbal or pharmaceutical medications nor are they instructed as to their dosage and specificity of their actions. Development of herb shops in recent years and the lack of proper monitoring, as well as the misuse of some profiteers through the extensive and exaggerated propaganda of medicinal plant compounds such as weight loss and obesity, etc. which is often non-scientific and commercial in nature, make it more necessary to monitor these kinds of activities.<sup>5</sup>

The most common herbal medicines sold in Iran, according to a survey carried out by Tehran University of Medical Sciences are as follows<sup>6</sup>:

Borage (golgavezaban), Valerian (sonboletip), Rocket seeds (khakeshir), Violet (banafsheh), Chicory (kasni), Thyme (avishan), Marshmallow (khatmi), as well as Foxglove (gole angoshtooneh), Castor (karchak), Liquorice (shirin bian), Stramonium (taatooreh), Cordya

(sepestan) as well as a host of other plants.

Most of these plants are quite harmless and have a long history as ancient medicinal plants, but the multiple medicinal properties claimed for each have not been scientifically proven in evidence based clinical trials but merely extracted from ancient pharmacopeias. Some, however, can be toxic if consumed in excess, such as Borage (golgavezaban) which contains *pyrrolizidine* alkaloids that are hepatotoxic and Stramonium (taatooreh) belonging to the Solanacea family can cause confusion, hallucination, delirium and coma. Some may interfere with blood clotting and blood pressure medications or anesthetics and therefore care must be exercised under such circumstances.<sup>7</sup> According to Mahmood Najmabadi, Abu Ali Sina had warned that "the excessive use of herbal medications could be dangerous."<sup>8</sup>

Due to the extensive use of medicinal herbs in Iran, with the aim of promoting Traditional Iranian-Islamic medicine, the Office of Natural Medicines (in 2006) and the Department of Natural-Traditional and Supplementary Health (in 2013) were formed by the Ministry of Health Foods and Drug Administration. With the increase of manufacturing and packaging companies in the field of traditional and natural medications, the above mentioned departments were formed to monitor the quality, purity and safety of such products.

Unfortunately, the mushrooming of unmonitored herb shops throughout the country selling masses of uncleaned and raw herbs in unhygienic conditions in an unsupervised manner, while touting the multiple medicinal properties of each herb to thousands of unsuspecting buyers each day, is a tragic unfolding of misapplication. Many of these raw products are unprocessed, unrefined and contain many contaminants including eggs of several parasites.

In conclusion, the belief that medicinal herbs are safe because they are natural is a common misconception. Although most medicinal herbs sold in Iran are relatively harmless, yet they may have side effects as well as interactions with each other and with pharmaceutical medications. What the Iranian medical establishment, including the ministry and other governmental agencies must consider is to revise and redevelop more comprehensive regulations and monitoring during the production of these herbal medications including planting, harvesting, refining and packaging of these products.

It is also of paramount importance to carry out scientific based experiments and clinical trials similar to those required by the US Food and Drug Administration (FDA) to ensure the effectiveness of these medications compared with placebos for the treatment of the conditions claimed. It is unfortunate that the Herbal

Medicine community is rather negligent and unscientific in their experimental and clinical trials. Their unbound enthusiasm in unrealistic propaganda and claims for these medications, and the public's readiness to accept these claims may be hazardous to the community.

#### Conflict of Interest Disclosures

The authors have no conflicts of interest.

#### Ethical Statement

Not applicable.

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Received: February 16, 2017, Accepted: April 15, 2018, ePublished: July 1, 2018

**Cite this article as:** Sheibani M, Nayernouri T, Dehpour AR. Herbal medicines and other traditional remedies in Iran – a tragedy unfolds. *Arch Iran Med.* 2018;21(7):312–314.



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