

The Present Status of Medicinal Plants – Aspects and Prospects

Sangita kumari*, Govind Shukla and A. Sambasiva Rao

Sri indu institute of Pharmacy, seriguda, ibrahimpatnam, Hyderabad, A.P., India.

ABSTRACT

“The Lord has created medicines out of the earth and he that is wise will not abhor them” as was professed by Ecclesiastes”.

Herbal medicines are the synthesis of therapeutic experiences of generations of practicing physicians of indigenous systems of medicine for over hundreds of years and they are known to be oldest health care products that have been used by mankind all over the world in the form of folklore medicines or traditional medicines or ethnic medicines. The therapeutic use of herbal medicines is gaining considerable momentum in the world during the past decade. The World Health Organization (WHO) estimates that herbal medicine is still the mainstay of about 75-80% of the world population, mainly in the developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body and lesser side-effects. In India the value of botanicals related trade is about US\$ 10 billion per annum with annual export of US\$1.1 billion. India is sitting on the goldmine of well-recorded and well-practiced knowledge of traditional herbal medicine and it has a rich heritage of medicinal plants (more than 8,000 medicinal plant species). But, unlike china, India has not been able to capitalize on this herbal wealth by promoting its use in the developed world, due to the non-availability of standardized herbal drugs and their formulations. In this paper we have reviewed the present status of herbal medicines market, estd. drugs of natural origin aspects & prospects of herbal medicines which will gain the international acceptance with assured safety & therapeutie use.

Key Words: Medicinal plants, Prospects

INTRODUCTION

Man is the only clever living being that knows how to adopt to the changing environment of time and space. Thar genius of him has given to him the supreme position in the world and enabled him to make progress and utilize all the new achievement of science in the interest of himself and humanity.

An herb is a plant or a part of plant valued for its medicinal aromatic or savourly qualities. Herbal medicines have been used for thousands of years in many parts of the world. The first written record detailing the use of herbs in the treatment of illness are in the form of Egyptian papyrus. Primitive men and women treated illness by using plants, animal parts and minerals that were not part of their usual diet. They learned by trial and error method. Indian literature advocate the use of medicinal plants in the treatment of various diseases. Herbal medicines have been used for thousands of years in many parts of the world. Medical knowledge began with scattered references in the ‘vedas’. Ayurveda is a branch of ‘Atharva veda’. The self created Brahma before creating men, first formulated this science of life.

*Address for correspondence:

E-mail: sangita.mpharm@gmail.com

Thus, traditional medicine evolved over countries depending on local flora, culture and religion. Indeed, well into the twentieth century, much of the pharmacopoeia of scientific medicine was derived from the herbal care of native people. This knowledge of plant based drugs developed gradually and was passed on this laying the foundation for many systems of traditional medicine all over the world – Folk medicine does strongly assent its faith in the therapeutic effectiveness of plant preparations.

According to **World Health Organization (WHO)** -“Any plant and its organs containing any substance that can be used therapeutically, or can be used as raw material for chemical / pharmaceutical synthesis” is classified as drugs.

Why herbal remedies?

Their **effectiveness, easy availability, low cost** and comparatively being **devoid of serious toxic effects** (time tested) popularizes herbal remedies. Herbal medicine is triumph of popular therapeutical diversity. Nature has provided the complete store house of remedies to cure all elements of mankind.

The medicinal establishment has become a threat to health” wrote Ivan Illiach an eminent researcher in his book “Limits to Medicine” The modern allopathic system of medicine stakes no

claim to its ability to fully cure several difficult to treat chronic diseases. There is a distinct possibility that the curative properties required to treat them successfully may lie within the ken of herbal medicinal system. India has 45,000 plant species and among them several thousands have claimed to medicinal properties.

Global Herbal Market

Medicinal plants have played a key role in world health. It is estimated that about 25 – 30% of all modern medicines are directly or indirectly derived from higher plants.

The herbal products industry comprises a number of inter related sub sectors including as Herbal teas; Functional foods; Nutraceuticals; Phytochemicals; Ethical OTC medicines; Flavours and fragrances; Aroma therapy; Culinary herbs and Spices



Fig. 1: Overview of the Different Sub-Sectors of the Herbal Industry. (Adapted from Denzil Phillips International Ltd. UK)

As per World Bank reports trade in medicinal plants, botanical drug products and raw material is growing at an annual growth rate between 5 to 15%. The Global pharmaceutical market has risen from US \$550 billion in 2004 worth to a close to US\$900 billion in the year 2008. The herbal industry shares about US\$62 billion with good growth potential. In India the value of botanicals related trade is about US\$10 billion per annum with annual export of US\$1.1 billion while China annual herbal drugs production is worth US\$48 billion with export of US\$3.6 billion. Presently the United States is the largest market for Indian botanical products accounting for about 50% of the total exports. Japan, Hong Kong, Korea and Singapore are the major importer of the herbal drugs making 66% share of China botanical drug export. Within the European community botanical medicine represents an important share of the pharmaceutical market.

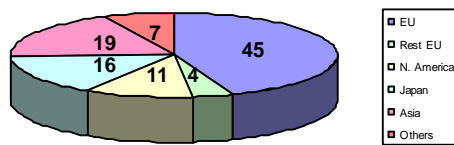


Fig. 2: Global market shares between the different countries (Source: WHO reports)

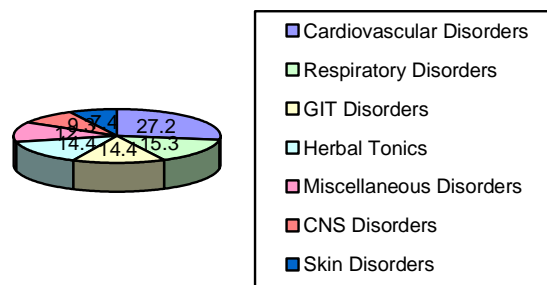


Fig. 3: Global herbal markets with respect to therapeutic category (Source: WHO reports)

The herbs and botanicals market as it applies to the dietary supplement, self medication and functional food segments is driven by consumer and health concerns. Broadly speaking, these trends include antiaging, weight control, joint and bone health digestion / immunity cardiovascular health / diabetes, cognition / memory, female / male and the growing wellness and beauty trends. Another trend benefiting the herbs and botanical market is the natural and the exotic ingredients trend, which is taking off in functional food, as well as medicinal products. Out of many best 10 popular selling herbal medicines in USA are shown in Table 1.

TABLE 1
TEN BEST SELLING HERBAL MEDICINE
IN USA

Drug	Botanical Name	Market rank as per sale
Echinacea	Echinacea species	1
Garlic	Allium sativum	2
Goldenseal	Hydratis Canadensis	3
inseng	Panax species	4
Ginko	Ginko biloba	5
Saw Palmeto	Serenoa repens	6
Aloe vera	Aloe barbadensis	7
Ephedra	Ephedra species	8
Eleuthero	Eleutherococcus senticosus	9
Cranberry	Vaccinium macrocarpon	10

NATURAL PRODUCTS AS A RESOURCE FOR ESTABLISHED NEW DRUGS

Natural products have served as a major source of drugs for centuries, and about half of the pharmaceuticals in use today are derived from natural products. Quinine, Theophylline, Penicillin G, Morphine, Digitoxine, Vincristine, Doxorubicin, Cyclosporin, and vitamin A, all share two important characteristics: they are the cornerstones of modern pharmaceutical care and they are all natural products. The use of natural substance, particularly plants, to control diseases is centuries-old practice that has led to the discovery of more than half of all "Modern" pharmaceuticals.

ESTABLISHED DRUGS OF NATURAL ORIGIN:

ANTIMALARIAL AGENTS

Quinine is considered to be the drug of choice for severe chloroquine-resistant malaria due to *P.falciparum*. In the United States, the related alkaloid quinidine is recommended for this purpose because of its wide availability, there in its use as an antiarrhythmic agent.

CARDIOVASCULAR DRUGS

The cardiac glycosides, which include Digoxin, Digitoxin, and Deslanoside, exert a powerful and selective positive inotropic action on the cardiac muscles. Digoxin is still produced by mass cultivation and extraction of a strain of foxglove (*D.purpurea*) that has been selected for maximum production of the bioactive glycosides.

CNS - DRUGS

One of the most cited examples of important natural product-derived drugs is the neuromuscular blocker, d-tubocurarine, which recently helped

recognition of the possibility that a number of vastly different CNS and peripheral nervous system diseases may be therapeutically controlled by selective nicotinic acetylcholine receptor (nAChR) agonists and has opened a new area of drugs design based on the Nicotine molecule.

ANTIBIOTICS

Today, new important anti-infectives are being discovered from microbial, plant, and animal sources. For example, the antimalarial agent, Artemisinin, was isolated from the Chinese medicinal plant *Artemisia annua*, the active constituent was isolated and identified as the sesquiterpene endoperoxide artemisinin, due to its lipophilic structure, to cross the blood-brain barrier, it was particularly effective for the deadly cerebral malaria.

ANTINEOPLASTIC AGENTS

The major anticancer drugs are natural products from plants or microorganisms. Examples of such important anticancer drugs are Bleomycin, Doxorubicin, Daunorubicin, Vincristine, Vinblastine, Mitomycin Streptozocin and now the recent additions of Paclitaxel (Taxol™), Irinotecan (a camptothecin derivative) and Etoposide and Tenoposide (podophyllotoxin derivatives). An exciting new drug in recent history, Paclitaxel (Taxol™) was a direct result of this effort.

CHOLESTEROL-LOWERING AGENTS (HYPOLIPIDIMICS)

These drug acts by Inhibition of 3-hydroxy-3-methylglutaryl coenzyme-A reductase (HMG-CoA reductase), an enzyme critical in the biosynthesis of cholesterol. The first of the HMG-CoA reductase inhibitors were isolated from *Penicillium sp.*

IMMUNOMODULATORS

The immunomodulator Cyclosporin was originally isolated from a soil fungus, *Trichoderma polysporum*. This compound was a major breakthrough for organ transplantation.

ANTIHYPERGLYCEMICS

The major antihyperglycemic drugs are natural products derived from popular plant such as *Momordica charantia* (Karela); *Tinospora cordifolia* (Guduchi); *Gymnema sylevestre* (Gurmar); *Azadirachta indica* (Neem); *Ficus benghalensis* (Indian banyan tree); *Aegle Marmelos* (bel or bilva); *Aloe Vera*; *Eugenia Jamboiana* – Jamun; *Allium sativum* – Garlic; *Eugenia Uniflora* – Surinam Cherry

HEPATOPROTECTIVES

Number of plants for the effective treatment of liver disorder. Some of these plants are – *Tinospora cordifolia*; commonly known as Guduchi or Gulvel

belongs to family Euphorbiaceae; *Astracaula longifolia* belongs to family- *acanthaceae*; *cleoma viscosa* belongs to family *cappiradoeae* stem bark extract of *Bauhania variaata*; root bark of *Alstoma scholaris* are useful as hepatoprotective against carbon tetrachloride induced hepatic damage.

CONCLUSION

In spite of a widespread usage of herbals by indigenous practitioners it has always fallen short of global acceptance owing to the lack of standard protocols and reproducible product performance. Therefore to maximize their ultimate effect. We have to ensure that preparations derived from medicinal plants are of acceptable quality, safety and efficacy.

The adoption of multidisciplinary research strategies in their study should facilitate their rapid

development, their more extensive public use quality, safety and efficacy.

Thus it is hoped that assessment of these traditional remedies could become the basis for a future classification of herbal medicines.

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