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TRADITIONAL PLANT MEDICINES AS A SOURCE OF NEW DRUGS IN CURRENT TRENDS

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ABSTRACT: Prior to the advances in synthetic chemistry and discovery of antimicrobials in the 19th early to 21st centuries, plants provided the major source of medicines. Traditional knowledge is more and more an established resource for modern medical science. Ayurveda is the most ancient health care system and is practiced widely in India, Srilanka and other countries. This article reviews some of the past success of the natural products approach and also explores some of the reasons why it has fallen out of favour among major pharmaceutical companies and challenge in drug discovery from natural products especially higher plants. In this review, we consider the past, present and future value of employing information from plants used in traditional medical practice for the discovery of new bioactive compounds.

INTRODUCTION: Method: Traditional and Chinese medicine kampoh system finds its references in the yellow emperor's classic of internal medicines which is believed to be prepared between 200 BC and 100 AD. This herbal is based on the idea that all life is subject to natural laws. According to this system diseased condition are the expressions of imbalance in yin and yang like excess or deficiency of either of them. The treatment makes use of various herbs especially the formulations, the important herbs from this system are *Ephedra sinica*, *Rheum palmatum*, *Carthamus tinctorius* and *Panax ginseng*.

Properties of Herbs: Ayurvedic herbs are described and classified according to five major properties rasa (taste), lavana (salty), katu (pungent), tikta (bitter) and kashsya¹ (astringent).

These each taste is made of a combination of two of the five basic elements (earth, water, fire, air and ether). Each taste has their own effects on the three bodily doshas (vata, pitta and kapha). Guna represents the physical aspects of medicinal substance. There are five major classes of guna and each class corresponds to one of the major elements (mahabhutas) unctuousness with water; heaviness corresponds with earth; keenness and sharpness with fire; dryness with air and light with ether.

Guans are generally considered in pairs; cold/hot, wet/dry, soft/hard, stable/unstable *etc.* Veeraya represents the active principle or potency of a drug. The two divisions are sita veerya (indicates kapha varag) and Ushant veerya (indicates pitta varag); vata remains buffer. Vipaka is the quality a substance takes on after it has been acted on by the body (after digestion). The three types of vipaka are madhura (increases kapha), sour (increases pitta) and katu (increases vata). The type of food responsible for Mathura, sour and katu are carbohydrates, proteins and fats respectively. Prabhava is the activity or influence of a drug in the

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The drugs may have the same area rasa, guna, veerya and vipaka but prabhav may be different due to the chemical composition.

Traditional Use of Plants in India in Family Welfare: Better conjugal life is seldom enjoyed by the poor for various factors and reasons. One of the major reasons is the great increase in the number of children-which enhances poverty and other problems. In such situation it becomes imperative on the scientists to suggest cheap but hygienic measures to improve upon the quality of conjugal life of the poor and backward people. This idea persuaded the present author to search the traditional use of plants in India for various aspects of family welfare².

Enumeration of Information: Increasing the vitality and ensuring better sexual life in the medicinal plants playing vital role in the recent trends in the industry.

Textual Sources: 1) The agni purana states that application of sap of *Anthocephalus chinensis* Rich. ex Walp along with honey and can sugar over the sex organs in beneficial for conjugal life. 2) The sap of *Limonia acidissima* Linn., *Madhuca longifolia* Magadhi mixed with honey also serve the same purpose, 3) The sexual vigour of a man increase immensely by regular consumption of milk in which the following have been boiled. The decoction of fruits of *Terminalia chebula* Retz, *Terminalia bellirica* Roxb. and *Embilica officinalis* Gaertn, wood of *Santalum album* Linn., juice of *Bacopa monnerei* Linn. Wettst and *Marsilea quadrifolia* Linn.

Tribal Sources: To increase the potency of a man the Bhils give him 1) to drink the water containing root paste of *Asparagus racemosus* Willd. (satawari) for fifteen days in the morning 2) the seedling roots of *Bombax ceiba* Linn. (salamali) to chew; and 3) administer ghee mixed with root paste of *Curculigo orchoides* Gaertn (musali). To treat the impotency of man the sandals administer, for a period of one month, pills made by pestling the roots of *Temeda gigantean* Heckle and *Tragia involucrata* along with camphor.

Treatment of Semen:

Textual Sources: The agni purana states that 1) The quantity of sperms can be increased by

consumption ghee either boiled with the juice of *Asparagus racemosus* Willd. (satawari) or along with the grains of *Vigna radiatus* Linn. (masa) and ipomoea aquatic Forsk. (kalamvi). 2) The use (specific method not mentioned) of *Santalum album* L. (canadana), *Aganosma dichotoma* (roth) K. schum (malati), *Butea monosperma* (Lamk) Taub. (laksa) and *Plectranthus barbatus* (girimrttika) can help curing the deformed sperms.

Tribal Source: The Bhils 1) chew 5 or 6 leaves of *Grewia rhamnifolia* Roth for 20 days to concentrate the semen; and 2) to treat nocturnal pollution, they consume the flowers of *Bombax ceiba* L. (salmali).

Treating Leucorrhoea and Menorrhagia:

Textual Sources: According to the agni purana a lady should consume white or red flowers of *Hibiscus rosa-sinensis* L. (japa) for treatment of the white or red discharge; *Mimosa pudica* Linn. (samanga), flowers of *Grislea tormentors* Roxb. (dhataki), *Symplocos racemosa* Roxb. (lothra) and *Nelumbo nucifera* Gaertn. (nilotpala) with milk.

Tribal Sources: In leucorrhoea the bhils give the stem-bark extract of *Mitragyna parvifolia* (Roxb)³ Korth (dhulikadamba) with sugar ladies till cure. The santal women take root-powder of *Smilax perfoliata* Lour. with rice powder in the form of cake to cure white and blood discharge with urine.

Traditional and Alternative System of Medicines:

Traditional Chinese Medicine and Kampoh System: The Chinese system of medicine is prevalent. The ancient system finds its references in the yellow Emperor's classic of Internal Medicine which is believed to be prepared between 200 BC and 100 AD. This herbal is based on the idea that all life is subject to natural laws. The traditional Chinese system of medicine has spread to Japan and Korea in a form called kampoh, called as the traditional system of Japanese medicine. Although, it has developed its own characters, giving due importance to the Japanese style of simplicity and naturalness, still the basic ideas like yin and yang have a crucial role in kampoh medicine. As compared to kampoh, Korean system is much similar to Chinese system and includes most of the herbs in it.

Ayurveda-Indian System of Medicine: Ayurveda ancient science of life is believed to be prevalent

for last 5000 years in India. It is one of the most noted systems of medicine in the world. Ayurveda⁴ is based on the hypothesis that everything in the universe is composed of five basic elements viz. space, air, energy, liquid and solid. They exist in the human body in combined forms like vata (space and air) pitta (energy and liquid) and kappa (liquid and solid) vata, pitta and kapha together are called tridosha (three pillars of life).

Unani System of Medicine: The roots of this system go deep to the times of the well known Greek philosopher Hippocrates who is credited with it. Aristotle golen Greek-philosopher “Father of natural history” made valuable contribution to it. This system of Greek origin was further carried to Persia (Iran), where it has been improved by Arabian physicians.

Unani-Medicines: Madar, Fufal, Gilo, Kabab Chini, Karanj, Lodh, Qust, Sana, Tagar, Seera, Siyah.

Homeopathic System of Medicine: In comparisons to other traditional systems of medicines, Homeopathy is a newer one and has been developed in the eighteenth century by Samuel Hahnemann- a germ a physician and chemist. In homeopathy system, the drug treatment is not specified, but the choice of drug depends on symptoms and the clinical condition of the patient. This based on the concept of proving and proved. In a healthy person called proved, the symptoms created by different doses of drug extracts are noted which is called proving, and specifically consider physical, mental and emotional changes of the proven.

TABLE 1: SOURCES OF OCCURRENCE OF HOMEOPATHIC MEDICINES

Vegetable of drugs	Animal drugs	Minerals of metals
Arnica, Belladonna, Marigold, Chamomile, Colchicum, Hemlock, Hyoscynamus, Hypercom, Ipecacunha, Lycopodium, Opium, Ergot, Thuja, Aconite, Nuxvomica.	Honey bees, Calcium carbonate, Cantharis.	Arsenic oxide, Barium carbonate, Calcium phosphate, Kalashisa, Mercuric chloride, Antimony tartarate, Sulphur, Copper, Aluminium, Phosphorous, Platinum

Sidha System of Medicine: The term “sidha” means achievements and “Sidhars” were saintly personalities, who attained proficiency in medicine through practice of Bhakthi and yoga⁵. According

to traditional belief Lord Shiva unfolded the knowledge of medicine to his parvathy which was then passed to siddhars. This is the system of prevedic period identified with Dravidian culture and it is largely therapeutic in nature. The literature of Sidha system is mostly in Tamil. A few natural drugs used in siddha system of medicine are: Abini (*Papaver soniferum*), Alari (*Nerium indicum*), Ethi (*Strychnos nuxvomica*), Gomathi (*Datura indicum*), Haikalli (Euphoribia), Ratha polam (*Aloe - barbadensis*)

Naturopathy and Yoga: Naturopathy is not merely a system of treatment, but also a way of life, which is based on laws of nature. The attention is particularly paid to eating and living habits, adoption of purificatory measures use of hydrotherapy, mud packs, baths, massage, etc⁶. The system of yoga is as old as Ayurveda. The eight component of yoga are restraining of sense of organ, breathing exercises, contemplation, meditation and Samadhi. Yoga exercises have potential in improvement of better circulation of oxygenated blood in the body, restraining the sense organs, improvement of social and personal behaviour and induction of tranquillity and serenity in the mind.

Bach Flower Remedies: Bach flower remedies were discovered by Edward Bach, a physician in the early decades of the twentieth century. These include 38 remedies prepared from flowers of wild plants bushes or trees. The remedies are prescribed as per the patients’ state of mind as, depression, anger, feared.

Aromatherapy: It is one of the most ancient healing arts and trace sits origin to 4500 BC when Egyptians used aromatic substances in medicines. Greek also used plant essence for aromatic baths scented massage⁷. In ayurvedic there is mention of scented baths (abhyanga). Professor Gantle Fosse, a French cosmetic chemist coined the term ‘Aromatherapy’ and described healing properties of essential oils.

Many scientists at various Universities are, now - a - days, investigating this method of healing. Aromatic substance are massaged into skin or inhaled or taken as bath. They have been shown to heal wounds, promote formation of scar tissue, treat acne and skin problems, pre-menstrual

tension, rheumatism, poor circulation and also nerviness disorders like headache, stress, insomnia, etc. Various essential oils used in aromatherapy are basil, bergamot, black pepper, calendula, caraway, eucalyptus, fennel, garlic, geranium, ginger, jasmine, juniper, lavender, rosemary and sandalwood⁸.

Classification of Crude Drugs: The term 'crude drug' generally applies to the products from plant or animal origin found in a raw form. However, the term is also applied to inclusion of pharmaceutical products from mineral kingdom in original form and not necessarily only of organic origin such as kaolin, bentonite⁹ etc. Crude drugs are further grouped as organized (cellular) or unorganized (acellular) according to whether they contain a regular organized cellular structure or not.

Organized drugs comprise those crude drug materials which represent a part of the plant and are, therefore, made up of cells. Unorganized drugs are a diverse group of solid and liquid materials which do not consist of parts of plants and are obtained from natural sources by a variety of extraction procedures. In Pharmacognosy, the crude drugs may be classified according to:

1. Their alphabetical status,
2. The taxonomy of plants and animals from which they are derived,
3. Their morphology,
4. The chemical nature of their active constituents,
5. Chemotaxonomic status.

Indigenous Traditional Drugs: Medicinal plants have been playing a significant role in the treatment of various ailments in India. The important traditional methods in our country are ayurvedic, homeopathy, Unani and Siddha system of medicine. In India there are about 700 naturally occurring drugs used in various formulations¹⁰. There are about 20 large scale manufacturers of traditional drugs in addition to 1200 small manufacturers and thousands of miniature manufacturing units running by vaidhakims. More frequently traditional drugs are used to cure the following ailments.

Cold and Cough: Senega, ipecac squill, glycyrrhiza and ginger contain expectorant activity. The leaves of *Angelica archangelica*, *Pimpinella anisum* (Anise fruit).

TABLE 2: SOME MORE RECENT NEW PRODUCTS AND DRUGS IN DEVELOPMENT

Source of plant	Plant product	Derivative	Indication	Mode of action
<i>Galanthus woronowiss</i>	Galanthamine	Etoposide	Alzheimer's	Reversible choline esterase inhibitor
<i>Podophyllum peltatum</i>	Podophyllotoxin	Etoposide	Anticancer	Topoisomerase II inhibitor
<i>Camptotheca acuminata</i>	Camptothecin	Topotecan	Anticancer	Topoisomerase I inhibitor
<i>Cannabis sativa</i>	Cannabidiol	Hemisuccinate	Pain management	Free radical scavenger

TABLE 3: SIGNIFICANT PLANT-DERIVED PHARMACEUTICAL PRODUCTS

Source plant	Drug	Indication
Salix app	Aspirin	Analgesic, antipyretic, cardiovascular
<i>A. belladonna</i>	Atropin	Anti-cholinergic, Pupil-dilation
<i>D. lanata</i>	Digoxin	Cardiotonic
<i>M. deeringiana</i>	(L)-dopa	Antiparkinsonism
<i>D. deltoidea</i>	Diosgenin	Anti-fertility
<i>P. somniferum</i>	Morphin, Codeine	Analgesic, antitussive
<i>C. autumnale</i>	Colchicine	Anti tumour, anti-gout
<i>C. ledgeriana</i>	Quinine	Antimalarial
<i>C. roseus</i>	Vincristin, vinplatin	Antitumour

CONCLUSION: In conventional system of medicines, drug is given to eradicate the symptoms. An evident from the above discussion, nature is the best combinatorial chemist and till now natural products compound discovered from medicinal plants have provided numerous clinically useful

drugs. In spite of the various challenges encountered in the medicinal plant based drug discovery natural products isolated from plants will still remain as essential compound in the search for new medicines. The key factors to remain competitive with the modern system of medicine includes continual improvements in the speed of dereliction, isolation, structure elucidation and compound supply processes and prudent selection of drug targets for the screening of natural product libraries. Necessity is the mother of invention.

This dictum fully applies to the rural or primitive societies which have to discover solution to almost all their needs and problems from natural resources around them. The birth of Homeopathic medicines is from the day of discovery of homeopathy by Dr. Samuel Hanemann. It is based on the similarity of

symptoms produced by the disease and the symptoms produced by the particular drug in healthy individual which leads to its successful application in the treatment of disease. The concept is based on the law of similar, which means that like sufferings are treated by the like medicines.

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