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AN INTRODUCTION TO TRADITIONAL MEDICINES OF SEMI ARID REGIONS

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ABSTRACT

The dependence of man on nature for food, fuel, fodder and medicines goes back to prehistoric times. The oldest civilizations have indication of plants being worshipped by man and different forms of grain are found associated with human beings globally. Initially, man was dependent on plant system for its medical needs, vitality and cure of diseases. The knowledge about plants as a source of medicine was confined to dwellers of high mountains, tribal people, village folk and priests. Now the traditional Indian system of medicine can be broadly classified into the empirical forms of folk medicine which are village based, region-specific, indigenous herb based, local resources based and in many cases, community-specific. At present moment, the pharmaceutical industries are giving much importance to Indian system of medicine to find out possible remedies because synthetic drug preparations take lot of time and is a tedious jobs.

Key words: Traditional medicines, WHO, tribal people, village folk, pharmaceutical industries.

INTRODUCTION

The dependence of man on nature for food, fuel, fodder and medicines goes back to prehistoric times. The oldest civilizations have indication of plants being worshipped by man and different forms of grain are found associated with human beings globally. Initially, man was dependent on plant system for its medical needs, vitality and cure of diseases. The Neanderthal burial place in Iraq, some 60,000 years, ago point out to the use of several plants (Pandey and Chadha, 1997).

There is indeed, enormous germplasm in the vast number of wild plants used by man, that can be fruitfully employed to improve the existing cultivars and adopt new ones. The prolonged use of wild plants has played an important role in the socio-economy of man to the extent that some of them have found place in his rituals and ceremonies and some have been accorded sanctity as sacred plants. Even where modern man has drifted far away from his dependence upon plants, as a matter of reminiscence, perhaps, he still continues to use some of them, though rarely, the wild rice grain is gathered and eaten by brahmins on certain days of fast.

Initially, the knowledge about plants as a source of medicine was confined to dwellers of high mountains, tribal people, village folk and priests. Globally, the earliest origin of documentation about

medicinal plants appeared for the first time in the vedic literature in Indian sub continent and subsequently, with the advent of Buddhism and Jainism, the documentation of medicinal plants was recorded systematically. Different system of medicine developed accordingly, which have been termed as Ayurvedic, Chinese, Korean, Malaysian, Japanese, Yunani and more recently Homoeopathic. The age old Indian systems of medicine, have been neglected mainly because of the rapid expansion of the Allopathic system of medical treatment. This is despite the fact that our country has a long history of local health traditions, which are backed by thousands of scriptures left behind by practitioners of these systems of medicine.

2. Historical

2.1 Prehistoric

The use of plants as source of medicine dates back to about 4000 to 5000 B.C. The Indian and Chinese were the pioneers in using plants as valuable sources of medicine. Drug plants had been extensively described by Aristotle, Theophrastus and others as early as 77 B.C. Dioscorides (64-1600 B.C.) in his famous book 'De Materia Medica' has given invaluable and authoritative references about drug yielding plants.

Folk medicine utilize 1600 species which are newly identified as drug yielding plants and are well known for their use in about 4000 drug industries of various Indian systems of medicine like Ayurveda, Unani, Siddha (South Indian System) and Homeopathy, it is about 12% of present Indian flora. About 80% of the raw materials of medicinal plants are still now collected mainly from 75.17 million hectares of forest coverage.

Chopra *et al.* (1958) classified the Hindu period of medicine into four categories *viz.,* (i) The vedic period

(ii) The period of original research

(iii) The period of compilation, Tantras and Siddhas and

(iv) The period of decay and recompilation. At the end of third period, the knowledge of Ayurvedic medicine spread all over the world. During that period western world particularly Greece and Rome took substantial materials from India to enrich their medical knowledge.

The history of medicine in India can be traced back to the oldest repository of human knowledge - The Rigveda (4500 B.C. – 1600 B.C.) where mention has been made of 67 medicinal plants. But, in the Atharvaveda (2000 B.C. – 1500 B.C.) mention has been made of about 290 plants used as charms, for curing the diseases. Post vedic period constitutes the most flourishing and fruitful age of ancient India. Lord Dhanvantari, one of the disciples of Lord Asvini is the originator of Ayurveda (2500 B.C. – 900 B.C.) who established the real foundation of earliest medical science where the properties of various drugs have been given, in detail in the eight divisions of Ayurveda. Two Samhitas Charak (1000 B.C.) and Sushruta (800 B.C.) which exclusively deal with medicine and surgery respectively, are probably the parts of Agnivesa Samhita. About, 700 plant species have been mentioned as medicinal plants in Charak Samhita.

World Health Organisation (WHO) has estimated that 80% of the people in the world rely on traditional medicines for primary health care needs. Around 400 species are used in Ayurvedic system of medicine (Farnsworth, 1990).

2.3 Ayurvedic medicines

Ayurveda is a science of positive health and its origin is almost as old as human race. Ayurvedic system of medicine deals with maintainance of health, prolongation of healthy and qualitative life and prevention of diseases. The Ayurvedic system of medicine is the integral part of the Indian tradition in which plants and herbs are used not only to cure the diseases, but also to provide a source of minerals and vitamins which give proper health and nutrition to human being. Though, the sources of medicine are plant kingdom, animal kingdom and minerals and metals, yet plants are easily available in nature and can be used according to needs.

Pharmaceutics occupies an important role in Ayurveda. Medicinal preparations are invariably complex mixtures being derived from plants, animal products, minerals and metals. Plants play a dominant part in Ayurvedic pharmacopoeia and are the basic raw material for pharmacopoeia industry

for manufacturing single as well as compound formulations, classical formulations and patent drugs.

In the course of time around 2,000 plant species were included in the indigenous Materia Medica which have the medicinal value. The medicinal plant wealth is a treasure of Ayurvedic system of medicine. The effectiveness of medicine depends upon the genuineness of ingredients which are used for the preparation of medicine. Medicinal plants are not only important source of Ayurvedic drugs but also provide a large number of drugs of modern system of medicine.

2.4. Yunani System

The Sumerians of the Tigris and Euphrates (present day Iraq) around 4000 B.C. utilized opium, liquorices, thyme, mustard and the chemical element sulphur as medicine. The Babylonians who apparently followed Sumarians in the field, added senna, coriander, saffron, cinnamon and garlic among the other herbs in their formulations. The Egyptians, Mesopotamians and Babylonians have written use of over 700 drugs which included plants like Aloe, wormwood, peppermint, henbane, myrrh, hemp, dogbane and castor. Indian drugs in the pharmaceutical list of Hippocrates proves that they have learnt many of these from Indian sources.

The Yunani system of medicine originated in Greece. The system was developed into an elaborate medical system by the Arabs who gave it a scientific base. In India, Yunani system of medicine was introduced by the Arabs and soon it took firm root in Indian soil and has ever since, been serving vast section of the people. Yunani system is based on humoural theory. The theory was based on four humours-blood, phlegm, yellow bile and black bile. The Yunani system of medicine persists on some of these humours. It uses naturally occurring herbs like *Abutilon indicum* (Linn) Sweet, *Acorus calamus* Linn, *Vitex negundo* Linn and *Boerhaavia diffusa* Linn.

In the first century A.D., Greece produced the forerunner of all modern pharmacopoeias and the most authoritative text on botanical medicine for over a thousand year, "De Materia Medica". In this book, Dioscoroides (64-120 A.D.) discussed in detail the identification, collection, adulteration and therapeutic uses of several thousands of plants.

2.5 Siddha system

The origin of Siddha system of medicine can be traced back from the days of Sangam. This distinct medical science and unique art of healings were probably practiced first time in Chennai (Madras) at first millennium A.D. This system owes, as its name suggests, its origin to Siddhars – a class of great poet mystics known as third erudition in herbal medicine. They advocated *Yoga* as a means of realization of the supreme and utilization of herbs, salt, liquids, corals and pearls as curatives to the ailments. The sages Agasthya, Yogananda and others were the pioneers of Siddha system of medicine. This system is as ancient as the Ayurveda. It is also popular in Sri Lanka, Myanmar, Malaysia and other South East Asian countries. From literary sources it is known that many Chinese priests came to India and had studied this system from eminent Siddhars named by Bogar. Yacob (Ramadwar) – a scholar of this system of medicine paid his visit to Arabia, Turkey, China and several other countries in the East for spreading the wisdom of the Siddha system of medicine.

At present, Siddha system of medicine is known as Tamil medicine. It has specific remedies for diseases like mycosis, venereal diseases, leucoderma, asthma, leprosy, etc., having use of ash after burning the metal like gold, silver and copper, pearls, conch shells etc. in combination with various salts, minerals and medicinal plants like *Aconitum ferox* Wallich ex Ser, *Acalypha indica* L., *Aristolochia bracteolata* Lamk., *Boerhaavia diffusa* Linn., *Psoralea corylifolia* Linn., *Sesbania sesban* (L.) Merr., *Andrographis paniculata* Nees, *Acorus calamus* Linn. etc. The Siddha therapeutic has some original features such as Varmam, Muccukalayam, Nadi-vijnanam and Tukanam which are akin to the Acupuncture and Moxa treatment in China, pulse feeling of Egypt and massage methods of Japan. Siddha practitioners in India are 15,000 in number.

2.6 Tibetan system

Tibetan medicine follows almost the same principles as mentioned in Ayurvedic system of medicine. Plants like *Berberis aristata* D.C., *Isatis*

tinctoria L., etc. are used in Tibetan medicine. But, the Tibetan system of medicine has certain special features. According to Yishi Dhonden and Cyatsko Tshering-mind is superior to body. Mind is the architect of all the sufferings and happiness. Body and spirit are the attendants of mind. Tibetan physicians give stress on development of mental power and observances of moral laws. The psychology, ethics and philosophy of Buddhism provide effective means for controlling consciousness and preventing illness.

There is an urgent necessity for making comparative studies of all these Asian system of medicine including the tribal one, for giving better health care to the mass of the developing countries where cheap and effective health care measures are yet to be developed.

2.7 Burmese traditional medicine

The practice of Burmese traditional medicine can be traced back from Sakiya King's dynasty in North Burma (c.2000 years ago). It is probable that various tribal groups migrated from Tibet into Burma. They have carried with them the practice of using the plants, plant parts, animal organs and extract of minerals for medicinal purpose.

2..8 Chinese medicine

The history of traditional system of Chinese medicine can be traced back from about 200 B.C. One of the most important medicinal works in this system is the Nei-ching-canon of Chinese Medicine. This system is mainly based on integration and modelization of the models of Yin and Yang which are five elements and three leaves, i.e.; Heaven, Earth and Man. The models are set up with Organic Recognition and Therapeutic Recognition. These models practically cover the medico-clinical, the differential diagnosis, treatment, prescription and management of aliments. About 4,941 vascular plants like *Artemisia annua* Linn., *Aleurites montana* (Lour.) Wils, *Benincasa hispida* (Thunb.) Cogn., *Blumea lanceolaria* (Roxb.) Druc etc. are used in Chinese system of medicine.

2.9. Vietnamese system

The Vietnamese system of medicine also dates back to 4000 years back and has provided source of development of Chinese system of medicine. During almost 1000 years of Chinese domination of Vietnam, many medicines were exported to China. Vietnamese used hundred of herbs to cure various diseases. They included ginger, beetle, cinnamon etc. during the period 2000 B.C. to 111 B.C. During the period of Chinese invasion 111 B.C. to 938 A.D. many precious medicines such as sandal wood, rhinoceros horn and tortoise shell were commonly used. During the period 939 to 196 A.D. the Buddhism spread widely fighting against superstition. The Vietnam also became free and promoted cultivation of medicinal herbs.

The period between 1000 B.C. to 1200 A.D. was glorious period of Ayurvedic, Buddhist and traditional medicines. However, after 1200 A.D., there was a period of decline in the investigation of local medicinal plants due to the invasion of the Arabs and others, and Arabic medicine which was also based mainly on plants attained more prominence. During this period, many important medicinal plants like senna, isabgol, roselle, chirata, opium etc. were introduced into India by them.

2.10 Modern period of medicine

From 1800 A.D. onwards, the European invasion resulted in the introduction of the Western Allopathic system in India and this also included the use of the number of medicinal plants of proven therapeutic value.

In India, Egypt and Sudan, around 70 per cent of the rural people use traditional medicine. Similar situation exists in a large number of developing countries. In India and China, 60 percent of the people affected with cholera and malaria are treated with herbal medicines. In these countries the market for traditional medicines is US $ 500 million, while Western type medicine account for only US $ 300. In Singapore, 50 percent and in Australia, 60 percent of population uses alternative medicine. Around 17,000 herbal products are registered in these countries. In Belgium, 40 percent contemporary and 84 percent home medicines and 74 percent acupuncture medicine is utilized. In France, 50 percent of the people take advantage of complementary medicine. In Germany, 10,000 to 13,000 alternative medical practitioners are thriving well and 75 percent of them utilize complementary medicines. 77 percent of pain clinics utilize

acupuncture. In UK, 90 percent of the complementary medical practitioners utilize osteopathy and acupuncture. In US, where in 1990 only 30 percent of the people were utilizing complementary medicines, in 1997 it grew to 40 percent. With increasing use of traditional medicines globally, attempts are also underway to discover the cure of HIV in the traditional medical system.

India has long history of researches on Ayurvedic medicine. Recently, several studies have been conducted on Ayurvedic medicinal plants curing different ailments. Gupta and Kumar (2000, 2002) have worked on Ayurvedic crude drugs of diabetes.

Choudhary and Kumar (2001, 2002), Sanghi and Kumar (2002); Shivani and Kumar (2000), Yadav and Kumar (2001) , Vandana and Kumar (2001) Bhuvnesh et al (2008); Saini et al (2010); Sharma and Kumar (2011)Sharma and Kumar (2012) have also conducted studies on Ayurvedic crude drugs for cure of digestive diseases, leprosy, skin diseases, malaria and paralysis. Sharma and Kumar (2002) worked on herbal cosmetics. Similar works have been done by Santosh and Kumar (2001, 2002a, 2002b), Sanghi and Kumar (2000, 2001) and Mishra and Kumar (2001).

3.1 Prospects of herbal medicines in semi arid regions

India has 90 million ha of waste land, out of which around 60% lies in semi arid region of Rajasthan. The state of Rajasthan has total land area of about 3,42,239 km^2, out of which about 1,96,100 km^2 is arid and rest is semi arid region. Since, these areas are agriculturally unproductive, they can be used for raising energy plantations (Kumar, 2000).

The state of Rajasthan is situated between 23°3 and30°12 North latitude and 69°30 and 73°71 East latitude. The forest of Rajasthan covers 11% of the total areas. This forest includes roughly 7% of depleted and denuded forest and the remaining area is fairly well stocked. The physical features of Rajasthan are characterized by the Aravalli and to some extent by the Vindhyan formation. The Aravalli hills divide the state in two parts, North Western portion with a total area of 3,08,591 km^2 has the major portion measuring about 1,20,983 km^2 in the form of sand dunes. Only 2% of the total area of the region is under forest cover. The South Eastern part is comparatively productive and around 20% of the area is under forest cover. As compared to the all Indian average value of 1.4 ha per capita forest area, Rajasthan has the lowest value (0.01) ha. In comparison to the world average rainfall increment of forest of 2.1 m^3 per ha, India's average is only 0.5 m^3 per ha.

3.2 Medicinal plants of Aravallis

Aravallis, remnant of one of the earth's most ancient mountain ranges, diagonally intersect the state of Rajasthan, end to end stretching from Banas Kantha in North Gujarat to Delhi for a distance of 692 kms. Biodiversity of Rajasthan is related with the Aravalli hills and rainfall.

The major families in which medicinal plants occur are Fabaceae, Euphorbiaceae, Asteraceae, Poaceae, Rubiaceae, Cucurbitaceae, Apiaceae, Convolvulaceae, Malvaceae and Solanaceae. Drugs are derived from trees, shrubs and herbs. Drugs are made from fruits (*Solanum nigrum* Linn.), flowers (*Butea monosperma* Lamk (Taub), *Bauhinia veriegata* Linn.), leaves (Senna, Datura, Periwinkle, *Tylophora*), stems (Liquorice, Ginger, Dioscorea, Garlic), roots (Rauwolfia, Periwinkle, Ginseng), seeds (Isabgol, Abrus, Nux vomica) and even bark (Cinchona). Although, early men and the primitive civilizations had discovered over 3,000 species of plants of economic uses, mostly as a source of food, only some 200 species have been domesticated by the modern society and only about 30 species are in cultivation practice world wide as a major source of food. Among the medicinal plants, out of 30,000 species estimated to be used by the indigenous and ethnic societies of world, around 10,000 have been used by the traditional systems of medicine of respective countries such as in Ayurveda, Siddha, Yunani and Homeopathy medicines in India. About 150 species have also entered into the global market to be used in modern medicine, as several valuable chemical compounds of significant biological actions have been discovered in them.

Some forest species like Sarpagandha (*Rauwolfia serpentina* (Linn.) Benth. Ex. Kurz.), Brahomakomal (*Saussurea lappa* (Dcne.) CB Clarke) etc. are endangered or threatened species. A list of most commonly used medicinal plants is given in Table-1.

4. 1 Traditional Indian system of medicine:

Now the traditional Indian system of medicine can be broadly classified into the empirical forms of folk medicine which are village based, region-specific, indigenous herb based, local resources based and in many cases, community-specific. The other system called the Shastriya stream which includes the Ayurveda, Siddha and Yunani systems of medicine is more complicated and elaborate with theoretical and research findings.

The vast agroclimatic conditions of India make it an ideal place for the luxuriant growth of flora and fauna. There has been a tremendous upsurge in the demand for phytopharmaceutical, raw medicinal herbs and vegetable drugs of Indian origin from the Western nations. There is also an increase in domestic demand for raw material used for perfumeries, pharmacies and biopesticidal units. The demand for traditional herbal drugs is also increasing rapidly mainly because of the harmful effects of synthetic chemical drugs, and also because of an expansion of pharmacies manufacturing natural drug formulations (Sukhdev, 1983).

Several of the herbal drugs used by the traditional folk healers since long have proved to be of great biological significance and modern researches have convincingly established their medicinal property and restored their credibility which has been eroded with the coming of the modern synthetic medicines. Further studies on the phytochemistry of other herbal drugs used by the traditional folk healers would reveal some more valuable chemical compounds of greater biological significance not yet known to the world of medicine. A particular herb which is being used by a traditional folk healers as medicine for the treatment of some ailment may be of considerable significance for other ailments also. Further researches have revealed that a particular herb is not only useful in those ailments for which they were being used by them for long time, but also for other ailments about which was not known either to them or to the science of medicine.

But the future of traditional medicine which had a glorious history in our country since the time of Charaka and Sushruta seemed to be fading out primarily due to the onslaught of the modern medicine and also apathy of the government. The herbal drugs had badly suffered in preference to the fast acting synthetic drugs of the modern medicine. Fortunately, people are getting conscious of the grave side effect of the modern synthetic medicine and herbs are once again staging a dramatic comeback. The herbal medicines are beginning to find its due place and recognition in the society which it rightly deserved.

5. WHO and traditional medicine

With the introduction of Western civilization during the British rule, the Western medicine became popular due to its spectacular achievements in the surgical specialities. After independence, a spirit of inquiry and investigation and research gained some momentum to develop Ayurvedic system of medicine. During the last 50 years several committees have been appointed by the government of India to resolve the problem of controversial drugs. Recently, government of India has established a separate department of Indian system of medicine and Homeopathy for its development. Ayurvedic system of medicine is now passing through an active phase of development. Newer steps are being taken to develop Ayurveda as a scientific discipline for the health care of the country and to serve the humanity in a better way.

At present moment, the pharmaceutical industries are giving much importance to Indian system of medicine to find out possible remedies because synthetic drug preparations takes lot of time and is a tidious jobs.

The research on herbal drugs has extended to the Western countries also to find out the chemical structure and pharmacological action. There is a world trend to a greater use of herbal medicine and in recent years there has been a many fold expansion of herbal drug industry in our country. Consequently the demand of plant material has been increased.

World Health Organisation (WHO) also encourages herbal remedies in global health care programme because such drugs are easily available at low cost and comparatively safe. In the wake of worldwide interest in herbal drugs, it is very essential that only quality products enter the market. Herbal medicine represent a substantial portion of the global drug market.

6. Herbal medicines of Rajasthan

During the present investigations, attempts were made to find out use of traditional medicinal system including tribal and non tribal to cure different ailments in various ways. The medicinal plants are generally collected from the fields and utilized as crude drugs. However, increasing demands of herbal drugs are leading to depletion of medicinal plants from the fields and have endangered certain plant species. This has lead to the necessity to study the growth and physiology of medicinal plants and factors affecting their propagation, productivity and active ingredients. The growth and productivity of medicinal plants are affected by physico-chemical, nutritional and growth regulators. Present investigations were undertaken with an object to study the ethnobotany, pharmacognosty, growth and physiology of some medicinal plants of semi-arid regions (Table. 1).

Table-1 : ***List of some important medicinal plants common in various traditional system of medicine***

S. No.	*Botanical Name*	Ayurvedic Name	Tibbi Name	Siddha Name	Tribal Name
	Acacia nilotica (L.) Delile	*Babul*	Schmaghe-e-arabi	**Randoalu**	Gubul-daru
	Achyranthes aspera Linn.	Apang	Apamaga	Naayurivi	Rechari
	Acorus calamus Linn.	Bach	Vaj-e-turki	Vasambu	Nai-naglea
	Allium sativum Linn.	Lashuna	Seer	Vallaipondu	-
	Aloe vera Linn.	Ghrtia Kumari	Sxbr	Soathukttalai	-
	Alstonia scholaris (L.) R. Br.	Sapta	Sapta	Aalilai	Chatini-daru
	Andrographis paniculata (Burm. f.) Wall ex. Nees	Kirata	Chirata	Nilava embu	Bhui-nimb
	Aristolochia indica Linn.	Iswar mul	Zarawand	Garudakkodi	Isher-mul
	Asparagus adscendens Roxb.	Musli	-	-	-
	Aspargus racemosus Willd.	Satimuli	Satavar	Thannirvittaan	Gai-sira
	Azadirachta indica A. Juss.	Nimba	Neem	Vaeppa	Nim-daru
	Bauhinia vahlii, W and A	Jallur	-	-	Sehari
	Bacopa monnieri (Linn.) Wettst	Nira-brahmi	-	-	-
	Bauhinia variegata Linn.	Ashmantaka	-	-	Koch-nar
	Boerhaavia diffusa Linn.	Punarnava	Ispast	Mookirattai	Kecho-ara
	Butea monosperma Lamk. (Taub)	Palas	Samaghe-e-dhak	Porasu	Palas-bahu
	Calotropis gigantea (Linn.) R.Br.	Akra	Madar	Euukku	Orakka Kulators
	Cannabis sativa Linn.	Bhang	Bhang	Pangi	Bhang
	Cardiospermum helicacabum Linn.	Karnasphota	Habulqibi	Mudakotta	Merom-med-nari
	Carica papaya Linn.	Papita	Papita	Pappaoli	Papaw
	Cassia fistula Linn.	Suvaruaka	Khiyarshambar	Konnai	Punden
	Centella asiatica Linn.	Madnuka parnui	Indian Pennywort	Vallaari	-

Coriandrum sativum Linn.	Dhanyak	Kish	Dhaniya	-
Cyperus rotundus Linn.	Mutha	Sadekuti	Kokarai	-
Datura metel Linn.	Dhustura	Datura	Oomathai	Marang-tunture
Eclipta alba (L.) Hossk.	Bhringa-raj	Bhangra	Kesuta	Prii-kesari
Emblica officinalis Gaertn. f.	Adiphalla	Amla	Nelli	Miral-daru
Euphorbia hirta Linn.	Pusitoa	Doodhi Khrud	Ammaarpachchairs	-
Euphorbia neriifolia Linn.	Sehunda	-	-	Kanta-manasa
Helicteres isora Linn.	Mrigashinga	Moror phalli	Karuvi	Atmura
Holarrhena antidysenterica (Roth) A. DC.	Kutaja	-	-	Padal
Justicia adhatoda Linn.	Vasak	Aroosa	Adhathodai	-
Mucuna pruriens (L.) D.C.	Atmagupta	Koonch	Poonaikaali	Alkusi
Ocimum sanctum Linn.	Tulsi	Raihan	Tulsia	Bir-tulsi
Phyllanthus fraternus Webster	Bhui-amlaki	Jamin	Arunelli	Mui-ara
Piper betle Linn.	Tombuli	Pan	Vettiali	-
Plumbago zeylanica Linn.	Chitralla	Shitraj	Kizhangu Chitra	Chitaparu
Pterocarpus marsupium Linn.	Pitusara	Pitsal	Vaengai	-
Rauwolfia serpentina (Linn.) Benth. ex. Kurz.	Sarpagandha	Chiran	Chivan. Ameelpadi	Simjenagaara-ba
Ricinus communis Linn.	Eranda	Reri	Kottamusthu	Digherandi
Saraca asoca (Roxb.) De. Wilde	Asoka	Asoka	-	-
Solanum xanthocarpum Schrod. Wendl	Kantakari	Katei	Kauttan	-
Strychnos nux-vomica Linn.	Visha-mushti	Kuchila	Yetti	Kuchila
Terminalia arjuna (Roxb.) Wt and Arn.	Arjuna	Arjuna	Vella-maruthan	Gara-hatana
Terminalia chebula (Gaert) Retz.	Haritaki	Haela	Kadukkaay	Hora-dary
Tribulus terrestris Linn.	Gokshur	Khar-e-khask	Niranji	-
Vitex negundo Linn.	Nirgundi	Shambhalu	Nochi	Bengunia
Withania somnifera (L.) Dunal	Asvakandika	Asgandnagori	Aswagomdi	Care-su
Zingiber officinale Rosc.	Adraka	Zanjabeel	Injchi	Adi
Zizyphus mauritiana Lamk.	-	-	-	Dodari

7. DISCUSSION

WHO has prepared an inventory of medicinal plants numbering over 20,000 species. The world population is expected to touch 750 crores soon and this will further escalate the health budget especially those of the developing countries. The developing countries spend roughly 40-50% of their total health budget on drugs and as a strategy to reduce the financial burden on developing

countries, WHO encourages, recommends and provides for the inclusion of herbal medicines in natural health care programme. Such herbal medicines are easily available at a cheaper price for the common man. They are time tested and considered safer than some of the modern synthetic drugs.

The market for herbal medicines in the developed countries is growing at a faster rate than other pharmaceutical products. Some of the reasons are :

(i) The realization that Allopathic drugs have harmful side effects.
(ii) Most of the present day ailments are life style diseases. Allopathic medicine are ineffective against many chronic diseases like cancer. Moreover, many people suffering from diabetes, arthritis, respiratory diseases, skin ailments, gastric problems, jaundice are turning more and more to Ayurveda and Yunani for permanent cures.
(iii) Herbal medicines are comparatively less expensive.
(iv) The western medical profession has begun to acknowledge the value of herbal medicines. This also explains the fact that many purely Allopathic units have also adapted the use of formulations which include natural herbal drugs (Bassher, 1980).

The herbal medicine also suits to the social and cultural needs of the people and influence the patient's physical, mental and emotional states as well. The herbal drugs prepared with the traditional methods through slow grinding and mixing processes conserves all the natural substances within it in the 'naturally balanced form' without loosing any essential component and maintains the activity and purity of the drug. The presence of several essential components in the 'naturally balanced state' is perhaps the very basis which accounts for the minimal side effects of herbal drugs.

Herbal drug in its completely balanced state is biologically more compatible to the human body constitution which the modern 'synthetic drugs' are not. The human body readily accepts the former as it does to any other plant product, the cereals and pulses but tries to reject and repel the later treating them as a 'foreign substance' which is manifested in the form of allergic reactions. Another significant property of the herbal drug is that it can be useful against several ailments in different combinations. In one combination it has one medicinal effect while in the other, it has other effect.

Thus, the Ayurvedic medicine completely fits in the social perspective of India where over 70% of the people live in villages. In addition to this many modern day diseases are life style diseases which have no cure in Allopathic medicines. The consumption of Allopathic medicines also have harmful side effect, while no such side effects are reported from the use of Ayurvedic medicines.

The growing sale of herbal medicines all over the world is an indication of a great future about herbal medicine in Europe and U.S.A. However, the share of the Indian market in such a trade is negligible, despite of the fact that India has a large number of medicinal plants and over 200 drugs are exported from India.

The annual export of herbal drugs from India during the year 1995-96 was rupees 183.30 crores which is a very small fraction of global trade which is nearing to 2,50,000 crores. However, there is lack of proper documented information and knowledge about method or their cultivation. Studies on various factors promoting growth and production of active ingredient by these plants could be highly beneficial for their large scale cultivation (Farooqi and Sreeramu, 2001).

The over exploitation of the existing plant resources, including forest trees have resulted in changes in microclimate. This has adversely affected the regeneration potential of large number of plant species, which were occurring naturally.

The WHO has emphasized the need for better utilization of indigenous system of medicine based on locally available medicinal plants in the developing countries, owing to the realization of the toxicity associated with the use of antibiotic and synthetic drugs. The global societies and the WHO are increasingly aware of the fact that drugs from natural resources are safer. The total dependence of the Ayurvedic practitioners on the collection of herbal plants without adequate development regarding their cultivation practices is leading to

extinction of several plant species which were available to mankind only some years ago.

9. Summary

During the present investigations, the information on plants used in traditional medicine was recorded from the old literature and interaction with the local tribal people. Ethnobotanical information about the use of the plants for cure of various diseases, improvement of health and life style has been recorded.

Some of the important medicinal plants which have great traditional uses include *Abrus precatorius, Abutilon indicum, Acacia nilotica, Achyranthes aspera, Argemone mexicana, Azardirachta indica, Boerhaavia diffusa, Butea monosperma, Calotropis procera, Cassia tora, Catharanthus roseus, Croton roxburghii, Euphorbia hirta, Ficus bengalensis, Ficus religiosa, Prosopis cineraria, Ricinus communis, Sida cordifolia, Solanum surattense, Tinospora cordifolia, Tribulus terrestris, Withania somnifera* and *Ziziphus nummularia*.

In Rajasthan, Guggul, Kachnar, Snuhi, Satavar and Chitrak are largely exploited for medicinal purposes which is leading to their extinction. The plants form the basic ingredient of the medicine in the traditional medical system but the juices, extracts and other formulations derived from one or more plants mixed with other ingredients are also used for medicinal purposes. This information was compiled and different plants, their formulations have been presented in detail. Different plant parts have been used for various ailments for e.g. in Kachnar the flower is used to cure diarrhoea, plant bark is used for the treatment of leprosy and scrofula. A combination of two or more plant part is also given for various diseases. Santhals give powder of flower buds with paste of black peppers to women to regulate vaginal discharge. In addition to this, different tribes use the plant variously for e.g. Lodhas describe root bark paste with rice water for ripening of boils. Oraons give dried root powder with water to patients suffering from rheumatism. Mundas prescribe dried root powder with brassica oil as balm on cuts and wounds.

Satavar (*Asparagus adscendes*) has great potential for Rajasthan. *A. adscendes* and *A. racemosus* have been reported for cure of various disorders on one hand and aphrodisiac and tonic for promotion of strength and longevity on the other. Different tribes use the plant in different ways for eg. Lodhas prescribe root paste with red roots of *Smilax zeylanica* in the treatment of constitutional disorders. Santhals take root infusion as cure for sunstroke.

Guggul (*Commiphora wightii*) is shrubby, 1.2-1.8 m high, commonly found in Aravallis and Rajasthan is one of the most important plant used in traditional medicine. Guggul is important ingredient of Amrita-guggulu and others. Saptanga-Guggulu cures all kinds of malignant boils, sinuses, enlargement of the glands of the neck and leucoderma.

Several plants of Euphorbiaceae are widely present in semi-arid region and have great medicinal potentials. Snuhi (*Euphorbia neriifolia*) flowers are offered to Manasa Devi. Lodhas rub diluted latex with common salt on eyelids, against dimness of sight. Santhals use fresh diluted latex as purgative and worship the plant as a symbol of snake goddess. Some other species of snuhi also have great medicinal values:

Plumbago has three species *P. zeylanica*, *P. auriculata* and *P. rosea.* All of these have potential value. Chitrak (*Plumbago zeylanica*) is a perennial shrub propagation of *P. zeylanica* can be undertaken by stem cuttings and seeds.

Due to its stimulatory properties it is used by different tribes in various ailments and it is also main ingredient of Ayurvedic remedies. Lodhas and Santhals use a piece of root for causing abortion upto 3 to 4 months of pregnancy. Mundas boil root in mustard oil and apply this oil for treatment of paralysis.

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