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CHARACTERISTICS OF MAJOR FOREST PRODUCT AND MEDICINAL HERBS OF SOUTH-WESTERN RAJASTHAN : A REVIEW

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ABSTRACT

The state of Rajasthan is situated between $23^0 3'$ and $30^0 12'$ N latitude and $69^0 30'$ and $78^0 17'$ E longitude. The total land area of the state is about 3,24,239 km², out of which about 1,98,100 km² is arid and the rest semi arid. Out of the total area , forests cover only about 37,638 km²,i.e. 11%. and are rich in biodiversity. The forest includes roughly 7% of depleted and denuded forests. Biodiversity of Rajasthan is related with the Aravalli hills. Most of the forests are in the south western part of Rajasthan which includes Banswara, Dungarpur, Pratapgarh, Rajsamand, Sirohi and Udaipurdistricts. Conservation of forests, specially the medicinal plants is receiving increased attention in view of resurgence of interest in herbal medicines for healthcare all across the globe. Recently, several studies have been conducted on Ayurvedic crude drugs for cure of digestive diseases (Gupta and Kumar, 2000, 2002 and Chaudhary and Kumar, 2002)[1-3], leprosy and skin diseases (Sanghi and Kumar, 2002)[4], malaria and paralysis (Yadav and Kumar, 2001)[5]. The application of herbal medicines has been studied by Sanghi and Kumar (2000, 2001)[6-7], Seema and Kumar (2004)[8], Sharma and Kumar (2013)[9] and Rana, Sharma and Paliwal (2014)[10]. Present paper presents characteristics of major forest product and medicinal herbs of south western Rajasthan.

Keywords : Characteristics, Forest products, Medicinal herbs, South-western Rajasthan.

INTRODUCTION

Rajasthan is one of the largest state located in the North-western part of India. The southern part of Rajasthan state comprises of a large population of tribal communities belonging to various ethnic groups. These forest dwellers live in forests and possess a vast knowledge on various aspects of plants. Bhil, Mina, Garasia, Sahariya, Damor etc., are the main tribes of this region. These people

are largely dependent on their traditional healing system for their healthcare and this information is passed on from generation to generation through the verbal communication without any written documentation. An attempt has been made to collect the information about characteristics of major forest product and medicinal herbs of the study area. Tribes of study area possess a vast knowledge on the ethno-biological uses of plants. These tribes move around the forest for their day-to-day requirements, cultural activities, beliefs, taboos, totems and performing religious rituals. Forest resources are the only means of livelihood for catering to the need of food, fodder, fuel, medicine etc. They have accumulated enormous knowledge of the treatment of their cattle through herbs and sustainable use of plant species available to them in their native lands.

CHARACTERISTICS OF MAJOR FOREST PRODUCT AND MEDICINAL HERBS OF SOUTH-WESTERN RAJASTHAN

In our study area, different plant species are the major source of folk medicine. The present study is an attempt towards the characteristics of major forest product and medicinal herbs. In the various regions of study area, different plant species are the major source of local medicine for their ailments.In the present study, the plants are arranged alphabetically. Other information provided includes name of family, brief description, plant part used and mode of utilisation.

Amaranthaceae Family

***Achyranthes aspera* L.:** It has slender erect perennial herb, sometimes climbing or scrambling. The leaves are often covered in silvery indumentum when young. Flowers are greenish to silvery-white, often tinged with purple-red. The ash of whole plant is mixed with maize flour to make a cake, locally called "PANIA" which is given to patient of cold and cough specially before going to bed.

***Aerva javanica* (Burm. f.) Juss. ex Schult.:** Plant is much branched, erect and perennial under shrubs, up to 1 m high, stem covered with thick, easily detachable tomentum. Leaves are alternate, flowers unisexual, dull-white, spikes.

The decoction of whole plant is used for swelling.

Whole plant has diuretic and stringent properties so used in relevant problems.

***Amaranthus spinosus* L.:** It has annual herb, mostly erect, up to 1.5 m, leaves glabrous or with sparse hairs. Flowers green in axillary clusters and branched terminal spikes. Male flowers on the apical part of the spikes.

Whole plant is used as blood purifier, in piles, as digestive agent, laxative and abortifacient.

Anacardiaceae Family

***Mangifera indica* L.:** It is large tree, flowers greenish-yellow, in terminal and axillary panicles, drupes 5-6 cm long, ovoid, greenish-yellow.

Indigestion and gastric problems, aphrodisiac, cardiac, appetizer and astringent, jaundice and skin infections.

Apocynaceae Family

***Nerium indicum* Mill.:** An erect, gregarious evergreen shrubs up to 4 m high, latex milky; leaves leathery, linear-lanceolate, tapering at both ends, acuminate, thick coriaceous, midrib prominent, nerves numerous, petiole 5-7.5 mm long. Flowers white, pink or dark red, single or double in cultivated.

Bark, leaves, flower are used as cardio tonic, diuretic, cure jawache, toothache.

Asteraceae Family

***Ageratum conyzoides* L.:** Aromatic herbs are flowers of bluish-white colour with globose heads. Fruits are black with pappus hairs.

These are used in stomach disorders as a tonic, sexual weakness, cough, asthmatic problems and traditional folk healers.

Asclepiadaceae Family

***Calotropis procera* (Aiton) W.T. Aiton:** Shrub or small tree with a rough corky bark, stems producing copious latex. Leaves are glaucous, flowers purplish-pink and white, fruits inflated, seeds with pappus of silky hairs.

It is used as anti-venom against snake bite, cough and cold, malarial fever, boils and to remove the thorn from the body and gastric problems (Fig. e).

***Tylophora indica* (Burm.F) Merill :** The plant is perennial, small, slander, a twining or climbing herb. Leaves are Ovate to elliptic, petioles are up to 12 mm long. Flowers are minute and corolla is greenish yellow or greenish purple in color. Fruit is a follicle.

It has been traditionally used for the treatment of bronchial asthma, jaundice and inflammation. It has antitumor, immunomodulatory, antioxidant, antiasthmatic, muscle relaxant.

Asteraceae Family

***Eclipta alba* (L.) Hassk:** It is annual herb, usually having prostrate or decumbent stems. Leaves subsessile; capitula solitary in the upper leaf axils, 6-10 mm in diameter. Ray-florets, 1-2 seriate, short, numerous, white.

Hair tonic, enlarge liver and spleen, skin diseases.

***Tridex procumbens* L.:** Annual or sometimes perennial, prostrate to ascending herb; leaf simple with ovate lamina, opposite arrangement, margin coarsely and often deeply dentate, inflorescence Capitula 1-1.5 cm in diameter. Flower cream to yellow, flowering and fruiting throughout the year. Fruit a turbinate achene, smooth or faintly ribbed.

It is applied on wounds and cuts to stop bleeding (Fig. a).

Caesalpiniaceae Family

***Cassia tora* L.:** A small annual herbs or undershrub growing as common weed, the herb is 1-2 m, leaves compound, paripinnate, flowers brightly yellow and axillary, fruit long pods-globose red.

Fresh or dried leaflet has been used as folk medicines in for treatment of constipation, stomach pain and ringworm and skin disease.

***Cassia fistula* Schimp. ex Oliv:** A medium-sized, deciduous tree with drooping branchlets, flowers bright yellow, in drooping races. Pods are oblong, woody and black on mature.

It is used as anti-helminthic, against ringworm and other skin infections, fever, purgative in all intestinal disorders and laxative.

***Bauhinia purpurea* L.:** Plant is perennial, trees, woody, erect or ascending, flowers red, blue, lavander to purple or violet actinomorphic or somewhat irregular.

It is used in constipation, gastric problems, headache and cosmetic.

Convolvulaceae Family

***Evolvulus alsinoides* L.:** It is herb, perennial, stems soft, prostrate or ascending, slender, with spreading hairs. Leaves are petiolate or subsessile, simple, alternate. Flower axillary, solitary; blue with white throat, flowering throughout the year.

Whole plant Febrifuge, enhance memory, asthma.

Cucurbitaceae Family

***Momordica balsamina* L.:** Perennial climber with prostrate or scandent stems up to 2.7 m long. Tendrils simple, leaves broadly ovate to almost circular in outline, deeply 5-7 lobed, each lobed often 3-5 lobed again, deeply cordate at the base. Flowers unisexual on the same plant, solitary; pale yellow, cream or white, darker at the base, often green-veined. Fruit ovoid, tuberculate, beaked, 2.5 - 6.5 cm long orange-red to red when ripe.

It is used as nutritive, diuretic, stomachic and blood purifier, jaundice and skin disorders, leucorrhoea diabetes.

Euphorbiaceae Family

***Acalypha indica* L.:** Erect annual herb is up to 1.2 m tall. Leaves are rhombic-ovate, flowers axillary spikes, unisexual on the same inflorescence, female flowers are larger comparatively below the male flower, held in shallowly cup-shaped bracts with toothed margins.

Whole plant is used for bronchitis, asthama, pneumonia, rheumatism and ulcers. Leaf juice is emetic and can induce vomiting if needed. A poultice of fresh leaves useful in ulcers (Fig. g).

***Emblica officinalis* L.:** Its tree 3-8 m tall, deciduous with bark brownish. Leaves distichous, stipules triangular-ovate; fascicles with many male flowers and sometimes 1 or 2 larger female flowers; fruit- drupe, globose, pale green or yellowish white.

For sores, pimples, laxative, refrigerant and diuretic.

***Euphorbia hirta* L. :** Herb, annual, 30-60 cm tall, stem branched from middle or above, ascending to erect, rarely prostrate. Leaves opposite, cyathium in dense, often head like, pedunculate cymes at upper nodes and campanulate involucre. Male flowers 4 or 5, female flower pedicel short, exserted from involucre.

It is used against worms, asthma, vomiting and ulcers (Fig. b).

***Jatropha curcas* L.:** Plant is glabrous shrub or small tree to 6-8 m, stems fleshy, copiously emitting a watery or milky sap. Leaves long-petiolate; lamina broadly ovate in outline, usually shallowly five-lobed, sometimes unlobed; flower terminal or axillary diachasial cymes; greenish-yellow. Fruits are ellipsoid, scarcely 3-lobed and flowering from April-July.

It is used for dysentery, colitis, to promote lactation, stomach disorders, toothache, rheumatism antidote for poisoning and purgative (Fig. i).

***Phyllanthus emblica* Schum. and Thonn.:** Annual herbs, leaves bipinnate, flowers greenish-yellow, in axillary fascicleas.

It is used for diabetes, leucorrhoea, diuretic, liver tonic, given in jaundice.

***Ricinus communis* L.:** Glaucous shrubs, leaves alternate, palmately compound 6-8-lobed, monoecious, flowers in terminal paniculate racemes, pale yellow, male flowers below, female ones above; male flowers- perianth cupular, 3 to5-lobed, lanceolate; stamens many, filaments connat;. Female flowers- tepals 5, subequal, lanceolate, ovary globose, trilocular, echinate, ovule uniloculer, styles 3, papillose. Capsule 3-lobed, prickly. Seeds oblong, smooth, marbled with caruncle.

It is used in rheumatism, menses pain, headache; rat killer, purgative, carminative, aphrodisiac, diagnosis of urinary problems (Fig. c).

Fabaceae Family

***Dalbergia sisoo* Roxb. ex DC.:** It is perennial, woody tree, stems erect or ascending and solid, flowers pinkish to rose, fruit legume, 2-seeded.

Leaves and bark on inflamed mammary glands.

***Pterocarpus marsupium* Roxb.:** Large tree with imparipinnate leaves, flowers yellow in terminal and axillary racemes or panicles. Pod stipulate and auricular. Water stored for 12 h in tumbler made out of the heartwood of the tree is taken internally for cardiac problems and diabetes.

Roots, leaves are used for sexual weakness, cough, dropsy, diuretic. Roots are used in several ailments by the traditional folk healers.

Liliaceae Family

***Asparagus racemosus* Wild.:** It is woody perennial climbers, stem often spinescent, green, cladodes from the axils of scale leaves in clusters of 2-6, flowers bisexual.

To treat white discharge in women, broken fresh tubers mixed with milk to improve sperm count.

Lytheraceae Family

***Lawsonia inermis* L.:** Plant is fragrant shrub up to 2.5 meter tall. Leaves elliptic, ovate or obovate, arrange opposite decussate; flower terminal panicles, cream, fragrant. Flowering from January-April; fruit-capsule, globose, seeds many and flat.

It is used for controlling birth, spermatorrhoea, hair dye and yellow fever.

Meliaceae Family

***Azadirachta indica* A. Juss.:** It is evergreen tree, up to 20 m, bark greyish-brown, vertically striated, exudation red and sticky. Leaves are imparipinnate, flowers (white and fragrant) are arranged in more-or-less drooping axillary panicles. The fruit is smooth (glabrous) olive-like drupe.

Plant is considered as a divine tree and great gift of nature to cure human problems. Different parts of plant used to treat boils, abscesses, adenitis, eczema, ulcers, skin diseases, rheumatism, fever, stomachic and toothache.

Mimosaceae Family

***Acacia catechu* (L. Khair f.) Willd:** A deciduous, thorny tree which grows up to 15 m (50 ft) in height. Leaves bipinnate compound; stipules spiny, flowers pale yellow, sessile, in long solitary or in groups of 2-4 axillary spikes.

The paste of the bark is applied locally in stomatitis. The exudates of the plant are given orally in case of difficult child birth. It is digestive and have cooling effect on human body. Traditional healers believe that the trees also have antileprotic properties. The extract of the seeds have antifungal properties and can be useful in some skin deiseases. It is also useful in women diseases (Fig. d).

***Acacia nilotica* (L.) Babool Wild. Ex Delile sp. indica (Benth.) Brenen:** It is a small to medium-sized tree. It's bark is dark brown to almost black, thorns in pairs, straight, often typically pointing backwards, leaves compound, flowers in spherical heads, pods distinctive, constricted in between the seeds.

The fruit powder along with sugar is taken orally in case of dysentery. Bark latex is used in cholera treatment. Raw fruits have medicinal values in women diseases and check excessive bleeding during menstruation. It is also used in urino-genital disorder.

***Acacia senegal* L. Willd.:** It is slender like tree with long erect, straggly branches, hooked prickles in tree, leaves with 3-5 pairs of pinnae, bearing grey-green leaflets, flowers in axillary spikes, white, appearing before the leaves.

The gum is taken orally in cases of inflammation of intestinal mucosa. This gum is also used on burning and other inflamed area. Fruits are stored for future use as vegetable.

***Mimosa pudica* L.:** It diffuse herbs with sharp prickles. Flowers pale rose, axillary with globose heads. Pods linear-oblong.

It is applied externally over wounds, diarrhoea, dysintry and colitis.

Moraceae Family

***Ficus benghalensis* L.:** It is tree, evergreen, up to 30 m, aerial root often descending to ground level and forming pillar-roots. Bark of trunks and older branches brown, smooth; leaves leathery, stipules stout, leaf blade ovate, base cordate, margins entire, apex obtuse; surfaces abaxially puberulent, adaxially glabrous.

It is used in obstinate vomiting, piles, boils and blisters, diarrhoea, sexual impotency, prevent loss of hair, rheumatism and leucorrhoea.

***Ficus religiosa* L.:** It's tree, evergreen or deciduous, 6-15 m tall, trunk 2-3 cm in circumference with spreading branches and usually without aerial roots, barks grey, fissured, young twig pubescent with pink new leaves. Leaves with a pale-green lamina, hypanthodia sessile, in axillary pairs. Male flowers sessile in a single ostiolar whorl or sometimes absent, female and gall flowers are sessile or pedicellate; fruit/figs depressed globose, dark-purple on maturity.

It is used for inflammatory ulcers and prevent conception forever, leucorrhoea, impotency, astringent, expectorant laxative, conceptive, asthma and whooping cough.

Nyctaginaceae Family

***Boerrhavia diffusa* L.:** Its herb is with long trailing branches, stem reddish and tomentose. Leaves unequal; flowers 4 mm long, purplish red to reddish pink or nearly white.

It is used in kidney stones, jaundice and hepatic disorders (Fig. f).

Oxalidaceae Family

***Oxalis corniculata* L. :** Trailing herb with digitatelly trifoliolate leaves. Flowers yellow with long-peduncled pseudo-umbels; capsules oblong, acuminate.

It is used for sexual weakness, cough, dropsy, diuretic, traditional folk healer.

Poaceae Family

***Cynodon dactylon* L. Pers. :** Perennials, terrestrial, stolon's or runners, stems trailing, spreading or prostrate. Leaves mostly cauline, inflorescence a panicle with narrowly racemose or spicate branches, flowers bisexual, spikelets sessile or subsessile and laterally compressed.

It is used for boils, diabetes, piles and chronic gleet.

Rutaceae Family

***Aegle marmelos* L. Correa :** Its tree is up to 12 m tall, deciduous, leaves-alternate, trifoliolate, flowers bisexual, greenish white or yellow, fragrant.

Reputed medicinal properties of ripe fruits for curing chronic dysentery, habitual constipation, dyspepsia, vomiting, fever, piles, diabetes, brain tonic and soothing agent are widely known to the tribal communities. It is a divine gift for stomach and intestine. Leaves chewed every morning with black pepper help in healing stomach ulcer.

Solanaceae Family

***Datura stramonium* L.:** It is erect, usually dichotomously branched, annual or short-lived perennial herb, up to 1.5 m tall. Flowers solitary in the forks of the branches, white to pale mauve-purple, sometimes darker purple in the tube.

Asthma and ophthalmic problems (Fig. h).

***Withania somnifera* (L.) Dunal:** Shrub of 60-90 cm hight, branches ascending; leaves elliptic-ovate to broadly ovate, acute, cuneate or oblique, entire to repand. Leaf arrangement alternate-spiral, flowers sessile to subsessile, greenish-yellow; fruit a globose berry, orange, overtopped by the inflated, seeds pyriform to reniform discoid and trigonous, fruiting from July-December.

It used for sexual weakness, cough, dropsy, diuretic and traditional folk healer.

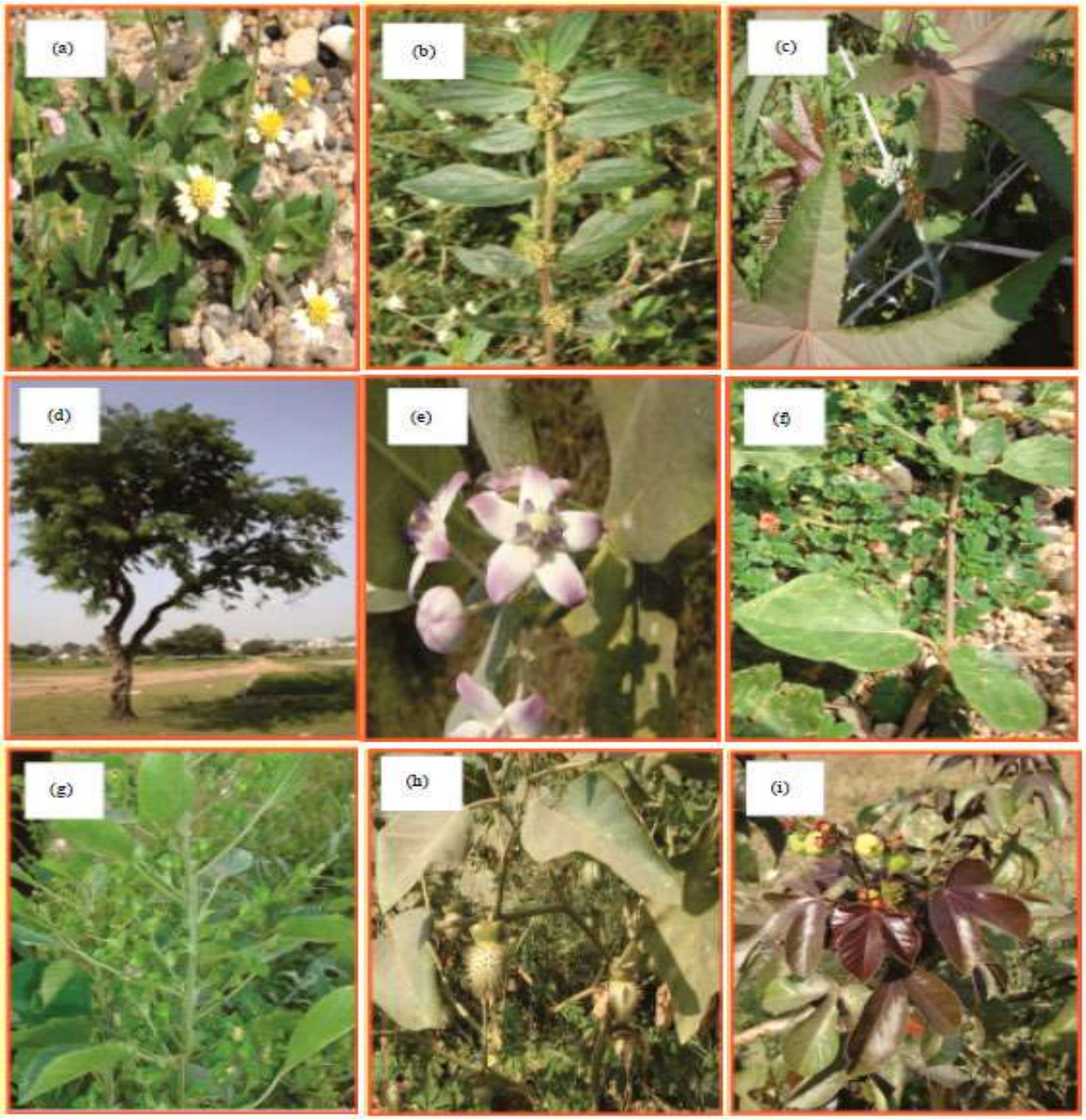

Fig. (a-i): (a) *Tridex procumbence*, (b) *Euphorbia hirta*, (c) *Ricinus communis*, (d) *Acacia catechu*, (e) *Calotropis procera*, (f) *Boerrhavia diffusa*, (g) *Acalypha indica*, (h) *Datura stramonium* and (i) *Jatropha curcas*

RESULTS AND DISCUSSION

There is an urgent need to study and document the precious knowledge of ethno-medicinal practices. Documentation of such information will go a long way in developing new drugs through further researches. A large number of plant species occur in south-western part of Rajasthan in which mainly tribal people live, which are the intellectual property rights of indigenous people and

documentation of such knowledge is necessary. The tribal community possess a vast knowledge regarding multifarious uses of plants.

In present study many plant species belonging to different genera and families have been recorded and enumerated. These plants are being used by ethnic groups and rural people of south-western Rajasthan to treat various ailments which are presented in above discussion. The information mentioned in above study will certainly help in developing strategies for the conservation, cultivation of traditional medicine and economic welfare of rural and tribal population of this region of Rajasthan.

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