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Some Rare and Critically Endangered Medicinal Plants Species from the Peninsular Plateau Region (Odisha, Chhattisgarh and Andhra Pradesh) of India

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ABSTRACT

Medicinal plants have been exploited for centuries in the traditional system of medicines. Peninsular India is home to diverse kind of flora, including some of the rare and endangered medicinal plants. They are at constant risk of getting extinct due to the overexploitation by the local tribal population, who are mostly ignorant of the scientific knowledge associated with the taxa. Therefore, a brief comprehensive attempt has been made to know about some of the important medicinal herbs from Odisha, Chhattisgarh and Andhra Pradesh including their precise description, phenology, geographical distribution, traditional usesand respective chemical constituents.

Key words: Medicinal plants, Peninsular India, rare, traditional uses, chemical constituents.

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INTRODUCTION

India is the eighth largest nation of the world and is one of the richest countries in the world in terms of biodiversity. It is home to two major hotspots, namely the Western Ghats and the Himalaya in the Indian sub-continent which are of prime biodiversity concern. The rate of deforestation in these areas is very high and ecosystems have reached at a fragile stage. India is represented by a diverse array of climatic and altitudinal zones with corresponding respective rich floristic constituents.

Peninsular Plateau can be broadly categorized into the Central Highlands and the Deccan Plateau. The former region comprises of the Aravallis, the Malwa Plateau, and some parts of Vindhyan Range. Deccan Peninsula, the heart of India is characterized by the Tropical thorn forest to Tropical dry to moist deciduous forest (Rao, 1997). This biogeographical region is rich in diverse kind of flora which is highly overexploited by high anthropogenic activities resulting in loss of biodiversity gene pool and nature's self-sustaining capabilities. This realm is home to several endemic, endangered, rare and threatened plant species. The region houses approximately 3000 species of medicinal plants (Chaudhuri, 2007). Traditional systems of medicine in the public healthcare system of India is substantially high and is still in high prevalent in this part of India.

Study Area

The present study area comprises of isolated patches of Central Highlands and the Deccan Plateau of India. Since study is mainly concerned with rare and critically endangered species, we have considered only isolated, remote hamlets where these species are still found in the wild and ethnic communities are familiar with their medicinal uses. The primary locations for the present study (Figure 1) includes: i) Rajahmundry, East Godavari district, Andhra Pradesh; ii) Nrusinhanath Hill, Odisha; iii) Raipura village, Chattisgarh; iv) Sundra village, Rajnandgaon

district, Chattisgarh and v)Dugli village, Dhantri district, Chhattisgarh.

MATERIAL AND METHODS

The present study is an outcome of the surveys in the tribal and rural isolated patches of Central Highlands and the Deccan Plateau of India. The study area was investigated to get information from local people, traditional health practitioners having sound knowledge of medicinal plants. Their wealth of knowledge is based on hundreds of years of beliefs and observations and has been transmitted orally from generation to generation.

RESULTS AND DISCUSSIONS

Some important species of medicinal plants species from the study area :

1. *Uraria picta* (Jacq.) DC. (Figure 2 A, B)

   Family:Fabaceae

   Synonym: DoodiapictaRoxb.

   Tribal Name: Nagjari

   Description of the Plant: It is an erect, perennial shrub, attains a height of 1.0-2.2 m. This rare shrub has imparipinnate leaves, 15-30 cm in length; leaflets 10-20 cm long and 3.5-5.0 across; linear oblong, acute, blotched with white, minutely pubescent beneath, rounded base, unicostate reticulate venation with secondary branching; free lateral stipules. Inflorescence spicate, cylindrical racemes, 25.0-35.0 cm long; flowers in close fascicles along the rachis, downy, pubescent with hooked hairs. Flowers bisexual actinomorphic, purple coloured. Fruit pods with 3-6 joints, smooth, polished, brownish-black.

   Phenology: Flowering- June to October; Fruiting- December–January.

   Distribution: Dugli village, Dhantri district; Sundra village, Rajnandgaon district Chhattisgarh.

Traditional uses :

i. It is one of the vital ingredients of Dashmoola.

ii. Root has aphrodisiac properties.

iii. Piece of root is chewed in snake bite.

iv. Decoction of root is taken orally prescribed for cough, chills, sore-throat and fevers.

v. Leaves are considered antiseptic, is used externally.

Chemical Constituents: Seed is a rich house of protein, closely allied to garden pea, kidney bean, etc. Seed oil contains substantial concentration of essential and long chain fatty acids. Phytochemical screening of leaf extract has revealed the presence of alkaloids, flavonoids, tannins, carbohydrates, triterpenoids (Bhattacharya and Datta, 2010).

2. *Mimosa hamata*Willd. (Figure 2 C)

   Family: Fabaceae

   Synonym: Mimosa*armata*(R.Br) Poirr;*Mimosa hemata* Willd.

   Tribal Name: Undra.

Description of the Plant: It is a straggling shrub. Profusely branching, prickly, attaining a height of 1.5 m, with dark brown smooth stem; pinkish stiff spines, straight or slightly curved at apex. Alternate, stipulate, compound, bipinnate leaves, 1.5 to 3.0 cm, rachis densely pubescent, 2-4 small curved spines on its abaxial surface, 5-9 pairs of ovate, oblong, pubescent leaflets. Globose head inflorescence, borne in the axil of leaves, 10-13 mm in diameter; sessile pinkish, tetramerous, actinomorphic flowers; spirally coiled, one seeded legumes.

Phenology: Flowering- April to August/ July to October; Fruiting- August to November.

Distribution: Rajahmundry, East Godavari district, Andhra Pradesh.

Traditional uses:

i. Whole plant is used as anti-asthmatic; wound healing, analgesic, anti-inflammatory, contraceptive, anti-microbial, anti-viral, anti-fungal, antioxidant, blood purifier, anti-diarrheal and contraceptive agent.

ii. Used in treatment of bronchitis and diarrhea in children.

iii. Decoction of plant is used as tonic in urinary complaints.

iv. Paste of leaves used as dressing for sinus, sores, poultice and piles.

v. Fresh stem juice is used against snake bites.

vi. Leaf paste is used externally against leprosy.

vii. Seed powder in boiling milk is used to cure sexual weakness in male.

Chemical Constituents: Flowers contains therapeutically important compounds 4-ethylgallic acid, roots contain triterpenesaponin B (3-O-Larabinosyl-D-glucosyl morolic acid),mimonoside A, B, C and saponin A (3-O-D-glucosyl-L-rhamnosyl morolic acid), ethylgallate and gallic acid is obtained from leaves (Parvej et. Al., 2016).

3. *Vitexpeduncularis*Wall. Ex Schauer(Figure 2 D)

Family: Verbenaceae

Synonym: *V. alata*Roxb.

Tribal Name: Vavili.

Description of the Plant: The plant is a medium-sized to large deciduous tree, 6-12 m high. Trifoliate leaves, petiolate,; narrow elliptic to lanceolate leaflets, 5-15 cm long, entire, long acuminate, cuneate base. Inflorescence panicled cymes; flowers yellow, long-peduncled, 15-20 cm long. Fruit is a drupe, black when ripe.

Phenology: Flowering- September to October; Fruiting- November to January.

Distribution: Dugli village, Dhamtari district, Chhattisgarh.

Traditional uses :

i. Decoction of leaves alleviates fever.

ii. Leaves decoction in cure of typhoid.

iii. Bark paste made with water is used in cure of chest pain.

iv. Infusion of leaves or root bark or young stem bark is useful in malarial fever and blackwater fever.

v. It is very effective in curing typhoid; intake of its leaves decoction for 3 days fully cures chronic typhoid.

Chemical Constituents: Leaves contain triterpenoids and flavonoids - vitexin, pachypodol, ursolic acid and 2-hydroxy-ursolic acid. Leaves and bark contain vitexin (EyazulHaque et. al., 2018).

4. *Wattakakavolubilis*(L. f.) Stapf.(Figure 2 F, G)

Family: Asclepiadaceae.

Synonym: *Dregeavolubilis*(L.f.) Benth.ex Hook.f.

Tribal Name: Dudghika

Description of the Plant: The plant is a large twining shrub; broadly ovate acuminate leaves; yellowish green flowers in lateral drooping umbellate cymes; fruit follicles long, turgid, longitudinally ribbed, and velvety until mature with fine, white, silky haired elliptical seeds.

Phenology: Flowering- April-September; Fruiting- October to December.

Distribution: Nrusinhanath Hill, Odisha.

Traditional uses:

i. This plant is used as Jivanti. But, however original Jivanti is *Leptadeniareticulata*.

ii. Leaf paste used in boil and abscess.

iii. Root showed antihyperglycemic activity and beneficial protection against diabetic neuropathy.

iv. Tender stalks and roots are used as emetic and expectorant.

v. It is also used in eye diseases and snake bites.

vi. It is vatanashak, powder of the herb with hot water is used in all sort of diseases related to vatadosha.

vii. Herb is also used to get rid of

constipation.

Chemical Constituents:

Drevogenin D has been isolated from seeds; hydrolysate of seed extract yields drevogenins B, D, and P, D-cymarose, (+)methyl pachybioside, oleandrose, pachybiose and digitoxose. A new glycoside - dregoside A along with drevogenin A and drebbysogenin G has also been isolated from this plant (Babu et al., 2016).

5. *Clerodendrum phlomidis*L.f.(Figure 2 E, H)

Family: Verbenaceae

Synonym: *Volkameria multiflora* Burm.f.; *Clerodendrum multiflorum* (Burm. f.) Kuntze non G.Don.

Tribal Name: Panjot

Description of the Plant: The plant is a 1.5-3.0 m tall shrub with ashy-grey stem and velvety branches. Leaves are opposite, rhomboid-ovate, 1.5-4.5 cm long, 1-3 cm broad, entire to wavy-toothed, pointed to blunt. Flowers creamy-white, bracteates, about 1.5 cm across. Flower-tube is 2-2.5 cm long, much narrower than the calyx, velvety outside. Fruit is drupe, obovoid, black, wrinkled, usually 4-lobed, enclosedwithin the persistent calyx, seeds oblong, white.

Phenology: Flowering- August-October; Fruiting- September to March

Distribution: Sundra village, Rajnandgaon district, Chattisgarh.

Traditional uses :

i. Root used as bitter tonic for nervous disorder and debility.

ii. Is useful as anti-dote, analgesic, anti-asthamatic, rheumatism.

iii. Root is used in gonorrhea.

iv. Whole plant decoction is used in treatment of diabetes, dropsy.

v. Leaf used in cure of stomach pain, dyspepsia, digestive problems, lung diseases, rheumatism, asthma, inflammatory diseases, swellings, fevers, eye complaints and others.

Chemical Constituents: Stem, leaf and flower parts contains alkaloids, saponins and tannins. Leaf oil includes terpinen-4-ol,caryophyllene and beta-bisabolene. Other important chemical constituents includes Pectolinarigenin, Suutllarein,Apigenin, Hispidulin, Clerosterol, Clerodin, Clerodendrin, A, Cerolic acid, Cerylalcohol, raffinoseetc (Kumaradoss and Mishra, 2010).

6. *Bryonia laciniosa*L.(Figure 2 I, J)

Family: Cucurbitaceae

Synonym: *Cayaponia laciniosa*(L.) C.Jeffrey; *Diplocyclos palmatus* (L.)C.Jeffrey.

Tribal Name: Shivalingi

Description of the Plant: Stem much branched, slender, grooved and glabrous with slender, striate, glabrous, bifid tendrils; leaves are deeply palmately lobed with 5 major lobes. They are about 6-13 x 6-12 cm. Usually one female flower and three male flowers are present in each leaf axil; male flower in small fascicles of 3-6, measures about 20 mm

Glabrous; female flowers solitary or few or many, about 15 mm. Fruit sub-sessile, 1.3 -2.5 cm. diam., ovoid to ellipsoid, smooth, bright red when ripe with broad vertical lines containing 5 -6 mm. long, yellowish brown seeds.

Phenology: Flowering- August to December; Fruiting- September- December.

Distribution: Raipura village; Sundra village, Rajnandgaon district Chattisgarh.

Traditional uses :

i. This plant is used in combination with other medicinal herbs for helping conception and prevention of miscarriage by women.

ii. This plant is considered as a boon for the childless parents.

iii. A mixture of Shivalingi seeds is taken with

Tulsi (*Ocimumbasilicum* L.) leaves and Jaggery to treat female infertility.

iv. The seeds of Shivalingi are potentially contraceptive when used in combination with ginger (dry), pepper, Putrajivi Root bark of vata (*Ficusbengalensis* L.) and milk.

v. Paste of leaves is reported to be used for boils; herb is also used as a bitter tonic and febrifuge; cooked young fruit are consumed as sajoor, soup.

vi. Extract of the whole plant is used as insect repellent, laxative and for a range of elements like asthma, bronchitis, cholera, convulsions, cough delirium, fever, headache, paralysis etc. and also against snake bite.

vii. Fruit is used as tonic properties in fever with flatulence.

viii. Plant is used as antidote against scorpion and snake bites.

ix. The component of plant is also used to cure sharp, cutting, lancinating or tearing pain, and inflammation with muscular tension.

Chemical Constituents: *Bryonia lacinosa* contains punicic acid, lipids, Bryonin, polysaccharides like Goniothalamin, Glucomannan, Goniothalaminand Arabinoglucomannan (Pandey et al., 2016).

CONCLUSION

Current situation of these plants are in grave peril due to destruction of their natural habitats and rapid rate of urbanization. Sadly India is no longer the paradise where once thousands of species of flora and fauna flourished. At least about 20 % of the various plant species found in India are categorized as either threatened or endangered. Nearly about 28 percent of plants found in India are endemic to the country. We are in grave peril of losing these plants and theirbenefits forever.

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