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Research Article

New distributional records for the flora of Tripura, India and their ethno-medicinal uses

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Abstract

The present study is providing the additional distributional records of three species namely *Dicliptera paniculata* (Forssk.) I. Darbysh, *Senna hirsuta* (L.) H. S. Irwin and Barneby and *Asystasia gangetica* (L.) T. Anderson, and their ethno-medicinal importance from various part of Tripura for the first time. Out of these three new species *Asystasia* is the new genus addition to the family Acanthaceae in the flora of the state. Detailed description, photographs, distributional and ecological details are provided.

INTRODUCTION

In the present age systematic documentation of biodiversity has given the instantaneous research priority. To this end, the first and foremost research urgency is to scientifically record the taxonomic diversity and distribution of life forms of the flora and fauna at local, regional, and global scales (Khuroo *et al*., 2007). The vegetation of any region varies with the change in altitude, precipitation and temperature (Tanveer *et al*., 2015). Tripura is one of the smallest undulating state in the Northeastern part of the country representing rich floral and faunal diversity. The forest cover is 62% of the 10497.69 sq. km of the total land area. The average maximum annual rainfall is about 2100 mm and the minimum is 1811 mm. The temperatures of the state varies between 6°- 38° C. Physiographically the state is 60% terrain undulated land with five parallel North-South directed hill ranges which support luxurious growth of mixed vegetation and silvicultural practices. In the state there are 19 ethnic groups, out of those maximum favour to live in the hill ranges, it may be for the easy collection of their daily needs. They carry a vast deal of traditional knowledge on the uses of plant and plant product since long back. They have an unfathomable confidence on their folklore medicines for their primary treatment of different ailments. Human impacts have often local extirpations force and reduce the levels of native biodiversity (Sukumaran and Parthiban, 2014). Recently due to anthropogenic activity at local level, particularly rubber cultivation practices in the region, hill ranges are under pressure resulting the degradation of forest ecosystem and augment the biodiversity lose. In the present situation digitalization of all bio-resources of this state is the need of age.

Previous workers (Deb, 1983) reported 19 genus under the family Acanthaceae and only one species under the genus *Dicliptera* from Tripura. So far there was no record about the occurrence of *Asystasia gangetica* and *Dicliptera paniculata* of the family Acanthaceae from the state. Earlier work also reported the occurrence of nine species (Deb, 1981) under the genus *Senna*, but distributional record of *S. hirsuta* was missing in the State flora.

Therefore, in order to scientifically authenticate the medicinal flora of the north eastern state of India, our present paper provide the additional distributional record of these three plants along with a details taxonomic description, microphotographs of diagnostic characteristics, ethnomedicinal usage, phenological observation and ecological status of *Asystasia gangetica*, *Dicliptera paniculata* and *Senna hirsuta*. This work will facilitate their easier field identification in future. The ethno-medicinal uses of these plants are also recorded first time to us.

MATERIALS METHODS

An intensive survey was done on the distribution, population status and ecology of medicinal plants of Tripura, the North Eastern state of India, for the preparation of medicinal database of the state. Standard taxonomic methods have been used for the collection, drying, and further processing of the herbarium specimens (Jain and Rao, 1977) and deposited in the Department of Forestry and Biodiversity, Tripura University with a proper voucher specimen number. The fresh plant specimens have been identified using relevant flora (Deb, 1983; Deb, 1981; Pullaiah, 2015; Kumar *et al*., 2005) and online e-flora (www.efloras.org). The ethno medicinal usages by local inhabitants are also recorded.

RESULTS AND DISCUSSION

Taxonomic treatment of the plants

Asystasia gangetica (L.) T. Anderson, Enum. Pl. Zeyl. 235. 1860; Gamble, Fl. Madras 2: 1063. 1924. *Justicia gangetica* L., Cent. Pl. 2: 3. 1756. *Asystacia coromandeliana* Wight ex Nees in Wall. Pl. Asiat. Rar. 3: 89. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 493. 1884.

Terrestrial, herbs or sub-shrubs, erect or procumbent, often somewhat climbing, annual. Stem quadrangular, glabrescent, grooved, branches. Leaves simple, petiolate, opposite, glabrescent, lamina ovate or elliptic, base cordate, margins crenuate to entire, apex acute or shortly acuminate. Inflorescence axillary or terminal racemes, about 3-15 cm. Flower bractate, bracteoles, zygomorphic, bisexual, hypogynous, complete, pentamerous, creamy in colour. Bracts 1, lanceolate, pilose, ca. 4-5 mm, apex acute; bracteoles 2, linear- lanceolate, ca. 1-2.5 mm, glabrescent with glandular tips, acute. Pedicel 2-4mm, glabrescent. Calyx sparsely pubescent with glandular tips, sepal 5, connate to the base, lobes linear- lanceolate, margin ciliate, apex acute, about 7 mm, imbricate. Corolla tubular, about 3.5 cm, petal 5, gamopetalous, corolla in flated above, limb ventricose; tube short, cylindric; petal pubescent, lobes orbicular or rounded, imbricate, creamish white in colour, pale yellowish veined. Stamen 4, didynamous, connate to the base of petal in pairs, interior to the petal, filaments hairy, anthers 2 celled, cells parallel, oblong, dorsifixed. Ovary superior, cylindric, glabrous, carpel 2, axile placentation, style linear, lower part hairy, stigma bilobed. Capsule about 3 cm long, seeds 4, angular.

Distribution: Arabia, Africa, Srilanka, Malaya, India Peninsular India, and Tripura.

Exsiccate: Jampai hill, *Dipan Sarma, CS- 80*, dated 17. 02. 2016

GPS Location: 24º 00′21.55″ N Latitude; 92º16′46.87″ E Longitude.

Altitude: 1983 ft.

Availability status: Occasional

Ecology: Grown along the road side and forest fringes in high elevation

Phenology: Flowering and fruiting throughout the year.

Less known ethno medicinal uses: Ethnic people in hills, leaf paste is applied externally for the treatment of asthma, Juice of the leaf is taken orally to treat intestinal hook warm and root paste is used for the treatment of skin allergy. The leaf juice along with onion juice is recommended for dry coughs. Leaf-decoction is used for the treatment of stomach-pain and urethral discharge.

Dicliptera paniculata **(Forssk.) I. Darbysh.** Kew Bull. 62: 122. 2007. *Peristrophe paniculata* (Forssk.) Brummitt, Kew Bull. 38: 451. 1983; *Peristrophe bicalyculata* (Retz.) Nees in Wall. Pl. Asiat. Rar. 3: 113. 1832; Hook. f., Fl. Brit. India 4: 554. 1885; Gamble, Fl. Pres. Madras 1084 (759). 1924; *Dianthera paniculata* Forssk., Fl. Aeg.-Arab. 7. 1775. *Dianthera malabarica* L. f., Suppl. Pl. 85. 1782, nom illeg. *Dianthera bicalyculata* Retz. Acta Holm. 1775. 297. t. 9. 1776.

Terrestrial, herb, erect stem, hexangular, branched, hirsute, hair present along with the angle, grooved. Leaves simple, opposite decussate, petiolate, entire, ovate, apex acute or acuminate, base attenuate, venation reticulate unicostate, margin scarious. Inflorescence in axillary pedunculate cymes, rachis and inflorescence pubescence. Flower bisexual, zygomorphic, bilabiate, bractate, bracteoles, pedicels, hypogynous, bright pink colour. Bracts 2, free, unequal, linear; bracteoles lanceolate, up to 7mm; involucre bracteoles 6, adnate at the base, unequal, outer larger one is about 10x2mm,

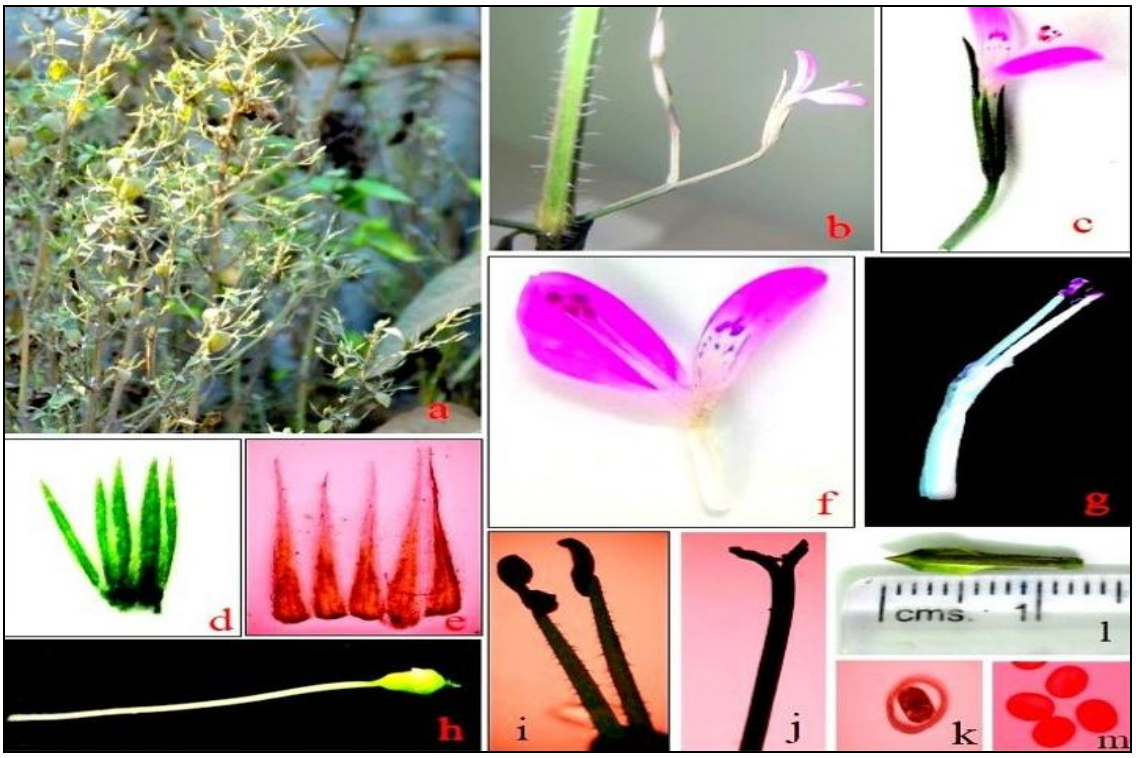

Plate 1: *Dicliptera paniculata* (Forssk.) I. Darbysh.; a: Habitat; b: Single flower: c: Bract and bracteoles; d: Calyx; e: Stamens along with petals; f: Hairy filaments bearing anthers; g: Gynoecium; h: Ovary; i: Stigma; j: T. S. Ovary; k: Pollen grains.

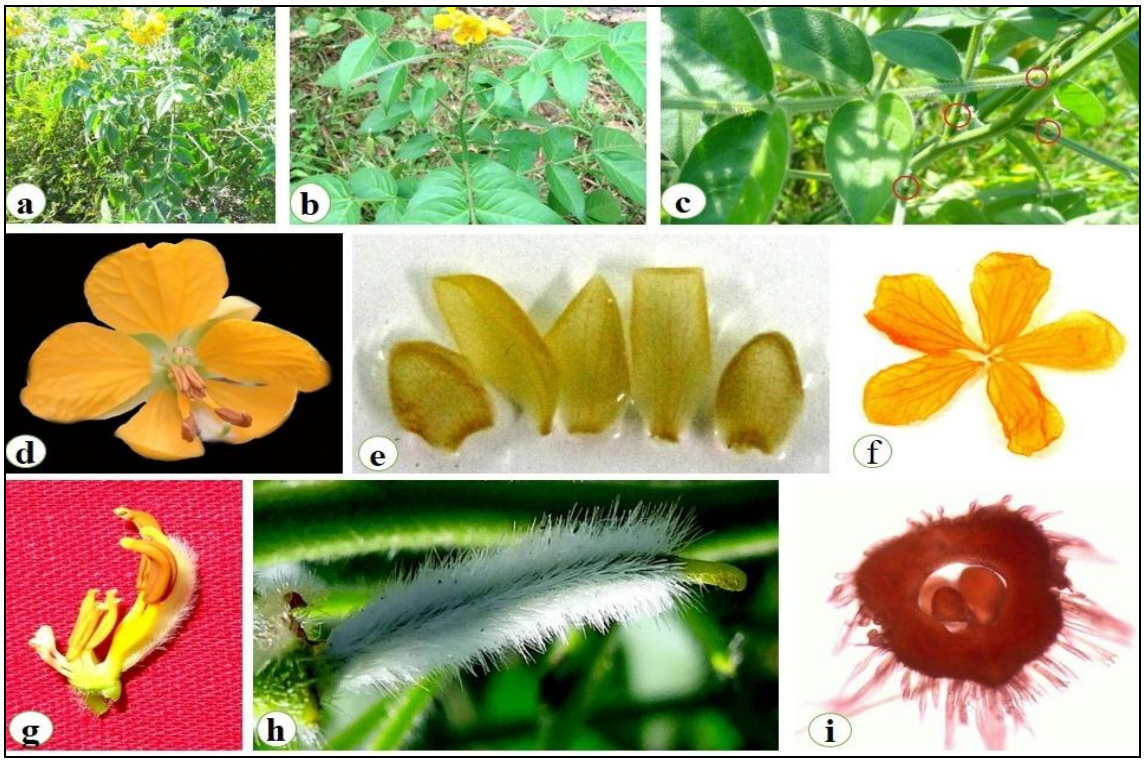

Plate 2: *Senna hirsuta* (Linn.) H. S. Irwin and Barneby; a: Habitat; b: Flowering twig; c: Leaf stalk bearing finger like projections; d: Flower; e: Sepals; f: Petals; g: Stamens; h: Gynoecium; i: T. S. Ovary

Plate 3: *Asystasia gangetica* (L.) T. Anderson; a: habitat; b: Flowering twig; c: Calyx; d: Corolla; e: Stamens; f: Gynoecium

axially pubescence with non-glandular trichomes and usually glandular tipped, one veined, apex acute and cuspidate; outer shorter involucre lanceolate, about 5x0.1mm; inner involucre bracteoles narrowly linear-subulate, lanceolate, unequal. Sepal 5, gamosepalous, linear-acuminate, lanceolate, about 3mm, irregular, connate, outside sparsely pubescent, trichomes non-glandular; inside sparsely pubescent, trichomes sessile glandular tipped, margin membranous at the base, apex long acuminate, glandular tipped, valvate, green. Corolla bright pink, gamopetalous, outside of petal non-glandular hairy, tube cylindric about 5mm, tube anticlockwise one rotate, bilabiate (3+2), lower lip (upper positional lip) narrowly elliptic or oblong, minutely 3 lobed; upper lip (lower positional lip) 2 lobed, elliptic, apex emarginated; twisted. Stamen 2, epipetalous, hairy filaments about 5mm, anther 2 cells, thecae ovoid, superposed, non-touching, dorsifixed. Style filiform, glabrous, stigma bifid, stigma fid flat, ovary superior, oblong or elliptic, carpel-2, ovule 2 locule, one ovule in each, axil placentation. Capsule flattened, length about 1.5cm, orbicular, tomentose, tip acuminate, non-glandular trichomes.

Family: Acanthaceae

Distribution: Tropical Africa, Myanmar and India [Tamil Nadu, Kerala District/s: Palakkad, Alappuzha, Kasaragode, Kollam, Idukki, Kozhikkode, Malappuram, Thrissur, Wayanad] and Tripura.

Exsiccate: Suryamaninagar, *Dipan Sarma*. CS- 59, dated 18. 11. 2015

GPS Location: 23º45′48.53″ N Latitude; 91º15′58.18″ E Longitude**.**

Altitude: 95 ft.

Availability status: Occasional.

Ecology: Grown along the road side and waste places.

Phenology: Flowering and Fruiting October to February.

Less known ethno medicinal uses: Leaf paste is applied in the cutting wounds and paste of the whole plant is applied in fracture bandage. 35 (1): 425. 1982; singh, Monogr. Cassinae 137. 2001. *Cassia hirsute* L., Sp. Pl. 378. 1753; baker in hook. f., Fl. Brit. India 2: 263. 1878; gamble, Fl. Madras 1; 401. 1919**.**

Terrestrial herb, perennial. Stem rounded, solid, hairy, hair greyish- white, woody, erect, node swollen. Leaf stipulate, petiolate, alternate, paripinnately compound, lamina shape elliptic-ovate, margin entire, apex acute, pubescent, green, 3-6 pairs of large leaflets, a small finger like projection present near the base of the leaf stalk. Inflorescence in panicle racemes. Flower arise from the small unbranched clusters, clusters contains

8 flowers, stalked, bractate, actinomorphic, bisexual, slightly perigynous. Sepal 5, hairy, polysepalous, imbricate. Petal 5, polypetalous, veined- brown petal when mature, yellow, imbricate. Stamen 9, length about 5-12 mm, 6 are fertile, 3 are sterile, filaments yellowish, anther 2 cells, anther length 2-8 mm, brown, 2.5- 8 mm long, dorsifixed. Ovary superior, sub sessile, densely silky hairy, stigma 1, style very short. Fruit pods, tomentose, slender, many seeded.

Family: Caesalpiniaceae.

Distribution: A Native of Tropical America, S. America - Argentina, North to the Caribbean and through Central America to Mexico. In India it found in all districts of Kerala, Telangana and Tripura.

Exsiccate: Atharamura (Dumbur), *Dipan Sarma,* CS- 44, dated 12. 10. 2015

GPS Location: 23º25′25.99″ N Latitude; 91º48′11.03″ E Longitude.

Altitude: 295 ft.

Availability status: Wild occasional.

Ecology: Grown in the moist shady forest floor and in waste places.

Phenology: Flowering and fruiting June to January.

Less known ethno medicinal uses: Locally leaf paste are uses externally in the affected area of skin like ring worm and other skin disorders. Paste of the root is applied in any rheumatic pain of the body. Vegetative parts of the plant are also widely used for stomach troubles and dysentery.

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REFERENCES

Deb DB, 1981. *The Flora of Tripura State*, New Delhi, Todays & Tomorrow' Printers and Publishers.

Deb DB, 1983. *The Flora of Tripura State*, New Delhi, Todays & Tomorrow' Printers and Publishers.

eFlora of China, available at www.eFloras.org

Jain SK, and Rao RR, 1977. *A hand book for field and herbarium methods*, (Today and tomorrow's printers and publishers, New Delhi).

Khuroo AA, Rashid I and Reshi Z, 2007. The alien flora of Kashmir Himalaya. *Biological Invasion*, **9**: 269-292.

Kumar NA, Sivdasan and Ravi N, 2005. *Flora of Pathanamthitta* (Western Ghats, Kerala, India), Daya publishing House Delhi-110035.

Pullaiah T, 2015. *Flora of Telangana*, Volume one. Regency Publications. a divistion of Astral International Pvt. Ltd.,

Sukumaran S and Parthiban B, 2014. Vascular plant diversity of Udayagiri fort, Kanyakumari district, Tamilnadu, India. *Bioscience Discovery*, **5**(2):204-217.

Tanveer AK, Vivek VD and Gawande NR, 2015. Four New Flowering plant Records from Satpuda Range of Jalgaon District, (MS) India. *Bioscience Discovery*, **6**(1): 45-48.

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