



## New Records of occurrence of Six Flowering Plant species from State of Odisha, India

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### Abstract

During floristic exploration six unreported angiospermic plant species, belonging to five different families were recorded from Jajpur district of Odisha (India). They are *Justicia longii* Hilsenb, *Spermacoce exilis* (L.O. Williams) C.D. Adams, *Dyschoriste linearis* (Torr. & A.Gray) Kuntze, *Acmella radicans* (Jacq.) R.K. Jansen, *Euphorbia hypericifolia* L. and *Eleocharis macrostachya* Britton. Correct botanical nomenclature, detailed descriptions, and geographic distribution with coloured photographs of each species have been provided for easy identification. On close examination of herbarium specimens and thorough scrutiny of literature published till date on these taxa, it can be claimed that these are new records and addition to the Flora of Odisha.

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## Introduction

Jajpur an interior district of Odisha, India, situated between 86° 33' 663" East longitude and 20° 85' 145" North latitudes, covers an area of 2,888 sq. kms. The climate of Jajpur is quite normal so far as the Indian standard is concerned. Average height of the district from the sea level is 330 m and its average rain fall is 1015.5 mm. The average maximum and minimum temperatures are 40 °C and 10 °C respectively. It is surrounded by other four districts like Bhadrak in east, Dhenkanal in west, Keonjhar in north and Cuttack in south. Three types of soil found in the district are alluvial, saline and red laterite. The district is wildly festooned with many diversified flora, which are completely unique in their habitat and shows idiosyncrasy in ecological condition. Although the study area in the state of Odisha has been investigated and documented previously (Satapathy and Brahmam, 1999; Mohapatra and Satapathy, 2004; Sahoo and Satapathy, 2009; Satapathy *et al.*, 2012; Satapathy, 2010 & 2015; Jena *et al.*, 2018; Arzoo and Satapathy, 2020) in terms of its botanical perspective, but during further floristic studies in the said area indicated the presence of some unexplored angiospermic flora. Hence, the present study aims at exploring and documenting the occurrence of some unexplored plant species of the area, which are not recorded in earlier floristic literatures.

### Research methodology

During different field surveys plant specimens were collected from the area under study and essential measurements as well as snapshots of plant specimens were taken at each site in the field. Then the specimens were taken to the Laboratory of Post Graduate Department of Botany, Utkal University, Bhubaneswar, where morphological characters were meticulously studied for each species. The plants specimens were matched with the collections preserved in the herbarium units of the state (Regional Plant Resource Centre, Bhubaneswar; Post Graduate Department of Botany, Utkal University, Bhubaneswar and CSIR-Institute Minerals and Materials Technology, Bhubaneswar, Odisha) and

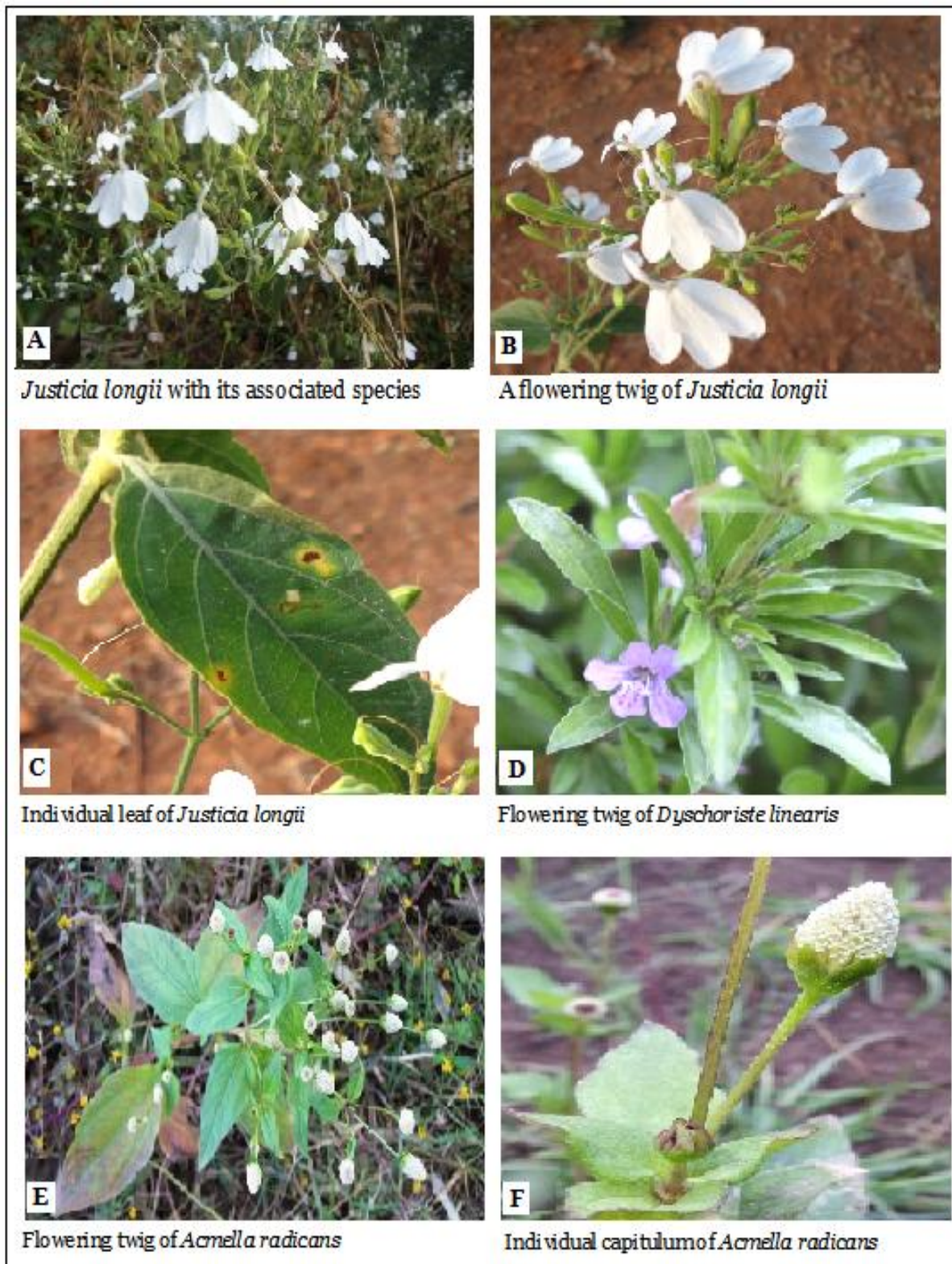
found that these specimens have not been collected earlier and preserved. Thorough perusal of all the relevant literatures (Das and Misra, 1998, 2000; Henrickson, 1999; Pattnaik *et al.*, 2006; Behera and Misra, 2007; Reddy and Pattnaik, 2011; Rout *et al.*, 2012; Biswal *et al.*, 2013; Kalidass and Murugan, 2016; Sarvanan *et al.*, 2014; Murugan *et al.*, 2015, 2017; Rahman *et al.*, 2016; Mishra *et al.*, 2009; Mishra *et al.*, 2018a,b; Jena *et al.*, 2018; Acharya *et al.*, 2009; Das and Kumar, 2013; Dash *et al.*, 2015; Dhal *et al.*, 2006; Kar *et al.*, 2014a,b,c; Kar *et al.*, 2014, Kar *et al.*, 2017; Dhole *et al.*, 2015; Kalidass, 2015; Kalidass and Srivastav 2015) as well as the relevant Floras of the area under study (Haines, 1922-1924; Mooney, 1950; Saxena and Brahmam, 1994-1996) it was revealed that these species have not been reported so far within the boundary of Odisha and thus confirmed as new plant records for the state. However, these specimens were identified by using the Flora of British India (Hooker, 1885), Flora of Assam (Kanjilal, 1939), Flora of Pakistan (Nasir, 1978) and Flora of Tamil Nadu (Henery *et al.*, 1987), Flora of China (Chen and Taylor, 2010; Shuang and Gilbert, 2010) and Flora of Southwestern Arizona (Felger *et al.*, 2004). The collected voucher specimens were preserved and deposited to the Post Graduate Department of Botany, Utkal University Vani Vihar, Bhubaneswar, Odisha (India).

## Results and discussion

### *Justicia longii*

*Justicia longii* Hilsenb Pl. Syst. Evol. 169 (3-4): 231.1990; *Siphonoglossa longiflora* (Torr.) A.Gray Syn. Fl. N. Amer. 2(1): 328. 1878; *Adhatoda longiflora* Torr. Rep. U.S. Mex. Bound. Botany 2(1): 125. 1859.

Vernacular name(s): Sweta basa (O), Dwarf White Honeysuckle (E) Family: Acanthaceae. Habit: erect herb or undershrub, branching occurs very freely towards above. Habitat: terrestrial mesophyte. Stem: erect, herbaceous; dark green to brown above, gray to brown and woody below, 7-80 cm tall, emerges from rhizome, inconspicuously striate, with evenly pubescent hairs to 0.2 mm long, quadrangular.



**Fig. 1.** Photographs of New Records of occurrence of Flowering Plant species from the State of Odisha.

Leaves: subsessile to petiolate, lanceolate to elliptic, 3-7 cm long, 1-2 cm wide, acuminate, sickle shaped or rounded, base attenuate to short petiole, less than 1 cm long, dark green to olive above, pale dull green below, stem pubescent veins and margins puberulous.

Inflorescence: axillary, solitary or clustered. Flowers: bracteate, obovate, bracteolate; the flowers subtended by two obovate bracteoles that are linear to lance-elliptic, 8-15 mm long, 1.5-3 mm wide, usually pubescent, hermaphrodite, zygomorphic,

hypogynous, white. Calyx: with 5 deep lobes, 5.5-8.5 mm long, 1 cm long in fruit, sepals broadly lanceolate but constricted above calyx cup, 5-7.5 mm long. Corolla: white, zygomorphic with slenderly cylindrical tube, about twice as long as lips, 2.5-4.5 cm long, scarcely widened above, upper lip reflexed and 6-8 mm long by 1.5-2.5 mm wide, the lower lip 3-parted and broadly spreading, each 9-10 mm long, 3-4.5 mm wide. Androecium: 2 stamens, epipetalous, exerted, anthers ditheous; insertion of thecae occurs in an equal or unequal manner, parallel to perpendicular, one or both spurred at base or sometimes lacking basal appendages; staminodes absent. Gynoecium: bicarpellary, syncarpous, carpels median, ovary superior, bilocular, ovary with 2 ovules per locule; stigma slightly 2-lobed. Fruits & Seeds: contracted capsule 7-9 mm long, on stipe 2.5-3.5 mm long with small apical beak, glabrous and dark brown with 2-4 round and flattened seeds (Fig. 1 A, B, C).

Flowering: April-July & Fruiting: August-October  
World distribution: Arizona upland of the Sonoran desert, China, Myanmar etc.

Indian distribution: Unknown.

Specimen examined: Katikata, Jajpur, 13.6.2014, GSJP & RM 1067 (Herbarium Utkal University, Vani Vihar, and Bhubaneswar), 300 m.

GPS Reading: 86° 38' 657"E & 20° 88' 167"N

Associated species: Plant is found associated with *Cynodon dactylon*, *Dactyloctenium aegypticum*, *Ischemum indicum*, *Portulaca oleracea* etc.

#### *Spermacoce exilis*

*Spermacoce exilis* (L.O. Williams) C.D. Adams, Fieldiana, Bot., N.S., 33: 316, f.5. 1993; *Spermacoce mauritiana* Gideon Kew. Bull. 37(4): 547. 1983; *Spermacoce ocymoides* sensu Hook.f., Fl. Brit. India 3: 200. 1881 p.p., non Burm.f. 1768. *Spermacoce decandollei* sensu Mohanan & Sivad., Fl. Agasthyamala 358. 2002; *Spermacoce repens* (DC.) Fosberg & D. Powell Smithsonian Contrib. Bot. 45: 30. 1980; *Borreria exilis* L.O. Williams, Phytologia 28(3): 227. 1974; *Borreria gracilis* L.O. Williams Phytologia 26(6): 487-488. 1973; *Borreria repens* DC. Prodr. Syst. Nat. Reg. Veg. 4:

542. 1830.

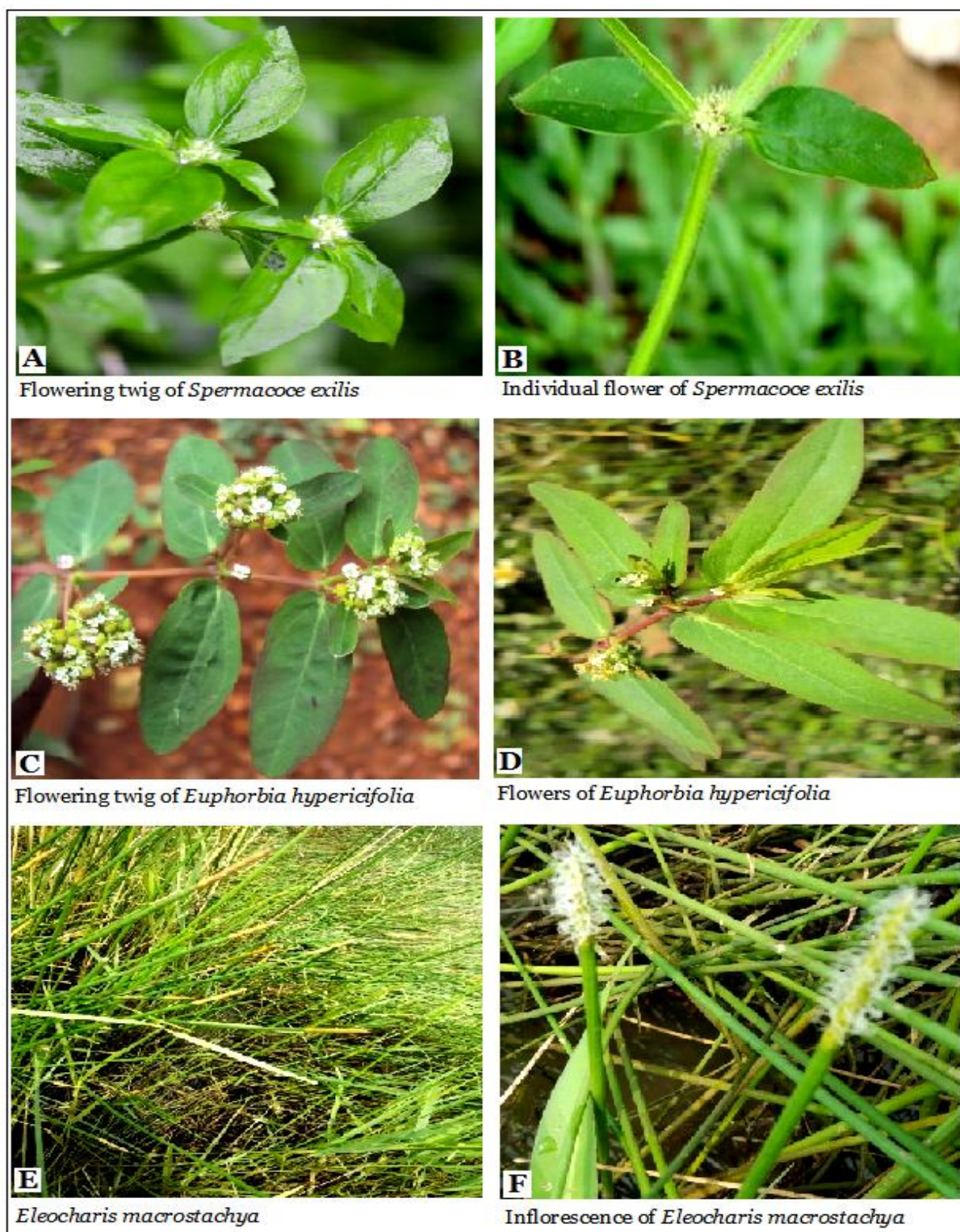
Vernacular name(s): Krusha golakabeeji (O), Creeping button weed (E) Family: Rubiaceae Habit: herbs, annual to perennial, slender, creeping to weakly ascending, to 35 cm tall. Habitat: terrestrial mesophyte. Stem: 4-angled, puberulent to glabrescent, angles winged, wings 0.1-0.5 mm wide, ciliate or ciliolate. Leaves: simple, entire, opposite subsessile to shortly petiolate; petiole to 1.5 mm, puberulent to glabrescent; blade drying membranous, ovate or elliptic-oblong, 0.7-30 × 4-15 mm, sparsely puberulent to glabrous throughout or pilose to hispid along midrib abaxially, base obtuse to cuneate, apex acute to obtuse; secondary veins 2 or 3 pairs; stipules pilosulous or hirtellous to glabrescent; sheath 0.4-1.5 mm, with 4-11 bristles, 0.4-2.5 mm, glandular. Inflorescence: terminal and in uppermost leaf axils, 4-7 mm in diam, several too many flowered; bracts numerous, filiform, 0.6-1.7 mm. Calyx: hirtellous to glabrescent; hypanthium portion obovoid, ca. 0.5 mm; lobes 2, linear lanceolate to triangular, 0.5-1 mm. Corolla: white, rotate to shortly tubular, 0.5-0.6 mm, outside glabrous, bearded in throat; lobes spatulate triangular, as long as tube. Androecium: stamens 4, epipetalous, inserted in corolla throat to near base of tube, included or exerted, filaments short or developed, anther 2 celled, basifixed. Gynoecium: bicarpellary, syncarpous, inferior, bilocular, style simple, ovules 1 in each cell, axile placentation, stigma capitate or 2-lobed with lobes short to linear, included or exerted. Fruit: a capsule, ellipsoid, or three dimensional oval shape with circular or elliptic cross-sections, weakly to strongly flattened at right angles to septum, 1.2-1.5 × 0.5-1.5 mm, glabrescent, membranous and sometimes glassy, septicidal from apex then both valves loculicidal through septum or sometimes fragmenting. Seeds: brownish yellow, ellipsoid, ca. 0.7 × 0.5 mm, obtuse at both ends, shiny, three surfaces apparently with numerous fine horizontal striations or ridges (Fig. 2 A, B).

Flowering & Fruiting: almost throughout the year. World distribution: Tropical America, widely

introduced at other parts of the world. Indian distribution: Kerala, Palakkad, Alappuzha, Idukki, Pathanamthitta, Thiruvananthapuram, Malappuram, Kollam, Thrissur, Sikkim, Nagaland and Andhra Pradesh. Specimen examined: Jajpur, 12.8.2014, GSJP & RM 1478 (Herbarium Utkal University, Vani

Vihar, Bhubaneswar), 255 m. GPS Reading: 86° 43' 686" E & 20° 84' 178" N.

Associated species: Plant is found along with *Hedyotis corymbosa*, *Ruellia tuberosa*, *Eragrostis ciliata*, *Spilanthes paniculata* etc.



**Fig. 2.** Photographs of New Records of occurrence of Flowering Plant species from the State of Odisha.

*Dyschoriste linearis*

*Dyschoriste linearis* (Torr. & A. Gray) Kuntze, Rev. Gen. Pl. 2: 486. 1891; *Dipteracanthus linearis* Torr. & A. Gray, Bost. Jour. Nat. Hist. 5: 50 1845 (Pl. Lindh. 1:50); *Calophanes linearis* (Torr. & A. Gray) A. Gray. Syn. Fl. N. Am 2(1): 324. 1879.

Vernacular name(s): Sarpa lata (O), Snake herb, Narrow leaf dyschoriste (E). Family: Acanthaceae. Habit: perennial rhizomatous herbs, rhizomes 1-1.5 mm thick. Habitat: marshy hydrophyte. Root: fibrous root. Stem: erect, 6-12 inches tall, grow from the root of the plant, branches and stems are puberulent, stems briefly decumbent or erect-ascending with internodes, 1-3.5(-6) cm long, simple or few (-several) branched in the lower half, glabrous or sparsely to densely pubescent, strigose to villous-setose with retrorse to decurved, spreading, wavy or straight, tapering, mostly coarse, white, uniseriate hairs, 0.1-1.2(-1.5) mm long, these or only the longer hairs restricted to the stem. Leaves: simple, opposite, 3/4-2 3-4 inches long, entire, ciliate margin, acuminate apex, cuneate base, alternate, petiolate, puberulent, elliptic to oblanceolate, pinnately veined, lateral vein raise beneath, glabrous to pubescent, 3-5 cm in bunches at each node. Inflorescence: crowded in 1-3 flowered dichasial axillary cymes, peduncles and pedicels 0.5-2 mm long; leafy bracts, ranges from linear to spatulate to linear, 1-3(-4) cm long, 1-4.5 cm wide. Flowers: bilipped, 1/2-1 inch long and up to 1 inch across, lavender to purple, with purple strips in the throat. Calyx: (12-) 16-21(-24) mm long during flowering stage, tubular, 3-5.5(-7) mm long, lobes thin, subulate, to 0.5-1.5 mm wide basally, glabrous to hairy and pilose to setose in the lower margin and raised in the midrib with curved hairy structures at the anterior part and longer spreading hairs of 0.2-2(-2.5) mm long. Corolla: bilipped, petals lavender-blue to pink, sometimes with white markings on the lower portion, 16-20 mm long, tube 6-10 mm long, 3-7 mm wide, rounded. Androecium: anthers 1.5-2.5 mm long, produced in the upper part; filaments in the lower part 4-6 mm long, upper one 1-2.5 mm long. Gynoecium: bicarpellary, syncarpous, carpels median, ovary superior, bilocular, 2 celled, 2 ovule in each

locule, axile placentation, style narrow and long, 15-18 mm, simple, stigma usually 2-lobed, unequal, protruding the anthers. Fruit: capsule, loculicidal to the very base, 8-10.5 mm long, 1.5-2 mm broad, glabrous. Seeds: 4, 2.5 -3.5 mm long, 1.5-1.7 mm in width (Fig. 1 D).

Flowering & Fruiting: April - October

World distribution: Western two thirds of Texas.

Indian distribution: Unknown

Specimen examined: Jajpur, Mallikapur, Kanikapada, and 24.12.2014, GSJP &RM 768 (Herbarium, Utkal University, Vani Vihar, and Bhubaneswar)

GPS Reading: 86° 51' 616" E & 20° 51' 252" N.

Associated species: Plant is found as a weed in the crop fields as well in garden along with *Lindernia crustacea*, *Phyllanthus fraternus*, *Ammania baccifera*, *Centella asiatica* and others.

*Acmella radicans*

*Acmella radicans* (Jacq.) R.K. Jansen Syst. Bot. Monogr. 8. 69-70. f.18.1985. var. *radicans*; *Spilanthes radicans* Jacq. Collect. Bot. Chem. Hist. Nat. 11(3): 1714. 1804; Sivaraj & Matthew in Anc. Sci. Life 3: 169. 1984; Schrad. in DC. Prodr. 5: 624:1836; *Spilanthes ocymifolia* (Lam.) A.H. Moore, Proc. Amer. Acad. Sci. 42 (20): 531. 1907.

Vernacular name (s): Sweta bindukoni (O), White spot flower (E) Family: Asteraceae

Habit: erect annual herb. Habitat: marshy hydrophytes to mesophytes. Stem: 5-95 cm, erect to ascending, cylindrical or slightly tapering, rooting at nodes occur rarely minutely pubescent, herbaceous. Leaves: opposite, ovate to narrowly ovate, 1-10 cm long, 1-7 cm wide, long obtuse at base, margin serrulate to serrate, hispid, apex acute, glabrous, 4-8 pairs, petiolate, petiole 0.5-1.5 cm long, puberulous. Inflorescence: head or capitulum with many flowers called florets borne on a structure called receptacle. Capitulum: in groups of 2 or 3 or solitary, white, discoid, cone like, axillary and terminal, 7-12 mm across; peduncle 4 - 9 cm long. Phyllaries: receptacle is often subtended by involucre of bracts, 8-13, 2-

seriate, ovate-lanceolate, ca. 7 mm, herbaceous, glabrous. Receptacle: conical, glabrous. Involucre: involucre bracts oblong, subentire at margin, subulate-obtuse at apex, trinerved at base, puberulous beneath. Paleae or Chaff: each floret is subtended by an involucre of bracts, concave, cymbiform, 4-7 mm long, keeled along the back, oblong, acute or obtuse at apex, glabrous. Corolla: tube 2 mm long, bulbous at base, with short neck, 4-5 lobed; lobes papillose. Pappi: modified calyx, pappus 2-3 unequal bristles, longer one 0.5-1.7 mm long, shorter one 0.3-0.8 mm persistent. Corolla: consists of outer ray floret and central disc floret, 4 petals, fertile, hermaphrodite, gamopetalous, valvate, 4-lobed, deltate, 0.55-1 mm long, white to greenish white; corolla tubes 1.4-2.3 mm long, papillose, base bulbous; corolla lobes 1-1.55×1-1.5, ovate, spreading, glabrous, marginally entire, apically obtuse. Androecium: stamens 5, epipetalous, alternating with corolla lobes, syngenesious, dithecous, connective prolonged, introrse, longitudinally dehiscent. Gynoecium: bicarpellary, syncarpous, inferior, unilocular, one ovule, anatropous, basal placentation, style 1, 2 branched, stigma pointed, an epigynous nectar secreting disc is also present at the base of the corolla tube surrounding the style. Fruit: an achene, dimorphic, ellipsoid, obcordate, with corky and densely ciliate at margins, marginal ones trigonous, brownish-black, laterally compressed, 1.5-2.8 mm long (Fig.1 E, F).

Flowering: August-October & Fruiting: October-January.

World distribution: Native to Central and South America, and a widespread weed in most of the countries.

Indian distribution: Kerala, Tamilnadu, Maharashtra, Jharkhand and Andhra Pradesh.

Specimen examined: Jajpur, crop field 22.4.2016, GSJP & RM 2453 (Herbarium Utkal University, Vani Vihar, and Bhubaneswar), 260 m

GPS Reading: 86° 82' 676"E & 20° 43' 265"N.

Associated species: Plant is found along with *Acmella paniculata*, *Ageratum conyzoides*, *Alternanthera sessilis*, *Cynodon dactylon*, *Eleusine indica* and

*Paspalum scrobiculatum* etc.

It is noticed that previously, this plant was treated in the genus *Spilanthes* but now it is included in *Acmella* genus.

#### *Euphorbia hypericifolia*

*Euphorbia hypericifolia* L. Sp. Pl. 1: 454. 1753; Haines Bot. Bihar & Orissa Vol.2. 141.1921; *Chamaesyce hypericifolia* (L.) Millsp. Publ. Field Columb. Mus. Bot. Ser. 2(7): 302.1909; *Anisophyllum hypericifolium* (L.) Haw. Syn. Pl. Succ. 161. 1812; *Chamaesyce glomerifera* Millsp. Publ. Field Mus. Nat. Hist., Bot. Ser. 2(9): 377. 1913.

Vernacular name(s): Sweta chitakuti (O). Family: Euphorbiaceae

Habit: annual herbs. Habitat: terrestrial mesophyte. Stem: 12-35 cm tall, branching starts mainly from the upper parts of the plant, erect, 1-5 mm thick, glabrous or sparsely pilose. Leaves: opposite, stipulate, stipules triangular, 1.4-1.6 mm, free or connate, petiolate, petiole 1-3 mm; leaf blade narrowly oblong or obovate, 1-3.5 cm × 3-10 mm, back side dark green, light green front side, sometimes purple-red, sparsely pilose on both surfaces, or glabrescent abaxially, base rounded, margin entire or finely serrulate towards apex, apex obtuse or rounded; involucre leaves two, similar to normal leaves. Inflorescence: a cyathium, many in axillary or terminal cymes, peduncle 4-6 mm; involucre turbinate, ca. 1 × 1.5 mm, marginal lobes five, ovate-triangular; glands four, appendages white or light pink; contains terminally a single naked female flower. Flower: bracteate, unisexual, actinomorphic, hypogynous, and imbricate. Perianth: parts of individual flowers absent. Androecium & Male flower: in the axil of each bract develops a group of stamens in a scorpioid manner, each stamen represents a naked male flower because it is a jointed structure which indicates that its upper portion is the filament bearing the anther and its lower portion represents the pedicel of the male flower bearing numerous stamens, slightly exerted from involucre. 2-20. Female flower: surrounded by a cupular involucre formed by five connate sepaloïd bracts,

pedicellate, pedicel longer than involucre, bracteate, actinomorphic, hypogynous. Gynoecium: tricarpeal, syncarpous, superior, trilobate, one anatropous ovule in each locule, axile placentation, styles three, each bifurcating apically into two feathery stigmas; a nectariferous disc is present at the base of the ovary. Ovary: triangular, glabrous, free, 0.5 mm, bifid 1/2 length stigma, slightly 2-lobed. Fruit: capsule triangular or depressed-globoid 1-2 × ca. 2 mm, smooth, glabrous, columella 1-1.5 mm. Seeds: with very thin whitish mucilaginous coat over light brown testa below, ovoid-triangular, bluntly 4-angled in cross section, 0.9-1.1 × 0.5 mm, with shallow irregular depressions alternating with low, smooth striate, caruncle absent (Fig. 2 C, D).

Flowering: August-October & Fruiting: October-December. World distribution: Bolivia, Mesoamericana, Nicaragua, Panama, Paraguay, Peru and new world tropics. Indian distribution: All most all states. Specimen examined: Jajpur, crop field 25.7.2016, GSJP & RM 1274 (Herbarium Utkal University, Vani Vihar, and Bhubaneswar), 324 m.

GPS Reading: 86° 47' 63.4" E & 20° 54' 26.7" N.

Associated species: Plant is found along with *Euphorbia indica*, *Euphorbia hirta*, *Cynodon dactylon*, *Amaranthus spinosus*, *Alternanthera sessilis* etc.

N.B.: Very much similar to *Euphorbia indica*, but differs in completely glabrous, narrower leaves and narrowing to an acute or sub-acute apex, puberulent stem and capsule.

*Eleocharis macrostachya*

*Eleocharis macrostachya* Britton in J. K. Small, Fl. S.E. U.S. 184: 1327. 1903.

*Eleocharis perlonga* Fernald & Brackets *Rhodora* 31: 70 1929; *Eleocharis xyridiformis* Fernald & Brackets Fl. Great Plains i-vii, 1-1392.1986.

Vernacular name(s): Bada Anupa shobha (O), Creeping/Pale spikerush (E) Family: Cyperaceae Habit: plants perennial, mat-forming. Habitat:

marshy hydrophytes. Rhizomes: inconspicuous, long, 1-3 mm thick, firm, cortex persistent, longer internodes, 11-57 mm, scales often short lived, 4-12 mm, membranous, not fibrous. Culms: terete to markedly compressed, to three times wider than thick, often with up to 20-27 blunt ridges when dry, 8-105 cm × 0.4-2.7(-3.7) mm, firm (to soft), internally spongy. Leaves: distal leaf sheaths persistent, rarely splitting on upper side, proximally red, distally green (or red), papery (to membranous), apex truncate to obtuse, tooth sometimes present on some or all culms, 0.1-0.7(-1) mm. Inflorescence: a spikelet narrowly lanceolate to ovoid, 5-40 × 2-5 mm, acute, rarely obtuse; proximal scale clasping (2/3-3/4 or more of culm to amplexicaulous, usually variably in same plant; subproximal scale empty or with flower, usually empty in some spikelets and with flower in other spikelets in same plant; floral scales deciduous, often spreading in fruit, 40-90, 2-6 per mm of rachilla, medium brown, sometimes red-brown or dark chestnut-brown, midrib regions often stramineous to green, ovate to narrowly lanceolate, 2.5-5.5 × 1.5-2.5 mm, entire, mostly carinate in distal part of spikelet. Flowers: perianth bristles 4(-5), sometimes rudimentary or absent, brown, slender to stout, much shorter than achene to equaling tubercle. Androecium: stamens 3; anthers dark yellow to orange-brown, 1.3-2.7 mm. Gynoecium: ovary 2- or 3-carpellate, unilocular, with a single ovule; style divided or rarely undivided, base sometimes persistent and variously shaped in fruit; stigmas 2 or 3; styles 2-fid. Fruit: achenes not persistent, yellow maturing to yellow-brown or dark brown, ellipsoid, obovoid, or obpyriform, biconvex to plano-convex, angles obscure, 1.1-1.9 × 0.8-1.5 mm, apex rounded, neck absent or short, smooth at 45X, or finely rugulose at 10-20X with 20 or more horizontal ridges in a vertical series. Tubercles: brownish white, pyramidal, 0.35-0.6 × 0.22-0.8 mm (Fig. 2 E, F).

Flowering: August-October & Fruiting: October-June World distribution:

Bolivia, Mesoamericana, Nicaragua, Panama, Paraguay, Peru and new world tropics.

Indian distribution: Unknown.



Specimen examined: Jajpur, crop field 24.9.2016, GSJP & RM 1267 (Herbarium Utkal University, Vani Vihar, and Bhubaneswar), 224m.

GPS Reading: 86° 45' 623" E & 20° 56' 254" N.

Associated species: Plant is found along with *Typha angustata*, *Lindernia* spp., *Alternanthera philoxeroides* and many other grasses.

### Conclusion

The authors have gone through all the relevant published literatures and visited the Utkal University Herbarium unit, CSIR-IMMT Herbarium unit, Bhubaneswar and the Herbarium of Regional Plant Resource Centre, Bhubaneswar to ascertain the occurrence, distribution and habitat of these species. It was found that these species were neither preserved nor reported earlier from the state.

On close examination of herbarium specimens and detailed scrutiny of literature published till date on these taxa, it can be claimed that these are new records and addition to the flora of Odisha. The report of new addition to the flora of Odisha indicated that the state needs thorough Botanical exploration.

The inventory of the flora of the state of Odisha in the context of further exploration will certainly provide a platform to the plant diversity conservation of the state as well as documenting the new species.

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