



## **Five new additions to the Angiospermic Forest Flora of Chota Nagpur Plateau, Jharkhand state, India**

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### **Abstract**

Five species are added to the angiosperm forest flora of Chota Nagpur Plateau, Jharkhand state, India. For each species, taxonomic information such as accepted name, basionym, phenology, material examined and distributional data have been provided.

**Keywords:** Angiosperm, new additions, extended distribution, Chota Nagpur plateau, Jharkhand state.

### **Introduction**

The state of Jharkhand is situated at the Eastern India which is also known for its waterfalls. Jharkhand, a forest and mineral rich state in India, formed as a separate state after bifurcation of the erstwhile state of Bihar in the year 2000, and comprises two distinct regions- the Chota Nagpur and the Santal Parganas. The state possesses undulating tracts, hills and ridges ranging from 300 to 900 m, many rivers, valleys and basins. There are 11 Wildlife Sanctuaries and 1 National Park in the state that cover an area of about 2,182.15 km<sup>2</sup> and constitute 2.74% of the total geographical area of the state. The Palkot Wildlife Sanctuary, established in 1990, is one among the 11 wildlife sanctuaries of Jharkhand state, located in the Deccan peninsula zone within the Indo-Malaysian region of Chota Nagpur plateau of south Jharkhand.

To assess the angiosperm diversity of Palkot Wildlife Sanctuary, Jharkhand intensive field explorations have been conducted during 2010-2013, during which five species of was collected first time from the area.

A careful scrutiny of herbarium specimens housed at CAL revealed that perusal of literature Hooker (1825-1897), Haines (1910, 1921-25), and others have extensively surveyed various areas and have made significant contributions on the flora and vegetation of Bihar and Jharkhand states. Thus the present collection is an extended new distributional record for Jharkhand, India, and hence a detailed description, photographs are provided here to facilitate its identification.

### **Materials and Methods**

During field explorations 2010-2013 in Palkot Wildlife Sanctuary, Jharkhand, the author has collected the samples of Angiospermic taxa from different habitats. Herbarium specimens were prepared following standard herbarium techniques (Jain & Rao, 1977). The taxonomic identification of prepared Herbarium specimens was done with regional and national floras, recent taxonomic revisions and

contemporary monographs. Finally the identity of the specimen was confirmed after verification with authentic herbarium material deposited at CAL (Central National Herbarium, Botanical Survey of India, Kolkata). While studying all previous herbarium collections made from the areas which were already housed at CAL, the author found few hitherto-unreported specimen records for the state Jharkhand and the same are also included here. All herbarium materials studied have been seen and are deposited at CAL. Species are listed in enumeration and their families are recognized according to APG IV Classification.

## Taxonomic enumeration

**Lepisanthes tetraphylla** (Vahl) Radlk., Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München 8: 276. 1878; Haines, Bot. Bihar & Orissa: 212. 1921; Pant in N.P. Singh & al., Fl. India 5: 372. 2000. *Sapindus tetraphyllus* Vahl, Symb. Bot. 3: 54. 1794. [**Sapindaceae**]. *Panikusum*, *Kaathkusum* (Hindi). **Plate 1 A-B**

Small trees, upto 8 m tall, with glabrescent to variably hairy twigs. Leaves paripinnate, alternate; petiolar base appendaged; leaflets 2 pairs, ovate or lanceolate, 3–13×2.5–6 cm, smaller with subcordate at base, or elliptic-oblong, 10–15×6–7 cm with cuneate at base, acute or usually rounded at apex, entire at margins, glabrous. Inflorescence axillary, rarely terminal, greyish to fulvous-tomentose, branched panicles, 3–30 cm long, mostly from the old wood, dense-flowered nearly the base; rachis tomentose. Flowers white or pale yellow, irregular, scented. Sepals 5; outer 2 smaller, ovate or elliptic to orbicular, oblong to transversely elliptic. Petals 4–6, usually 4, oblong, longer than sepals, with basal scales having either a hairy rim or 2 small auricles, entire to 2–4-lobed. Disc anterior, hairy or glabrous. Stamens 8, hypogynous within the disc, didynamous. Ovary villous-tomentose, obscurely 3-lobes. Drupes 3-gonus, 2 cm long, coriaceous, yellow tomentose, 1-seeded. Seeds oblong.

*Fl. & Fr.*: February – May.

*Habitat*: Uncommon, Rarely in hilly mixed forest.

*Distribution*: India (Andhra Pradesh, Arunachal Pradesh, Assam, **Jharkhand**, Karnataka, Kerala, Maharashtra, Mizoram, Odisha and Tamil Nadu), Myanmar, Thailand, Vietnam, Sri Lanka and Malay Peninsula.

*Specimen examined*: Jharkhand (Gumla; PWLS: Near Jogimath Pahad, c. 727 m, 22°53'03.3" N, 84°34'83.8" E, 22.3.2013, V.K. Mastakar 58231; Kura pahad, c. 632 m 22°50'46.0" N, 84°38'05.0" E, 26.3.2011, V.K. Mastakar 41828.

**Lindernia dubia** (L.) Pennell, Monogr. Acad. Nat. Sci. Philadelphia 1: 141.1935. *Gratiola dubia* L., Sp. Pl. 1: 17. 1753. *Ilysanthes dubia* (L.) Barnhart, Bull. Torrey Bot. Club 26(7): 376. 1899. *Lindernia neliyampathiensis* Sunil, Jaleel, Ratheesh & V. Balakr., Int. J. Advanced Res. 2: 136. 2014. [**Linderniaceae**]. **Plate 1 C-D**

Erect annual stout, sometimes ascending herbs; stems quadrangular, glabrous, much branched at base. Leaves sessile, ovate or ovate-elliptic, upper ones narrowly ovate to lanceolate, lower ones larger, smaller towards apex, 0.5–1.5 × 0.3–0.4 cm, base cuneate-attenuate or rounded, apex acute to acuminate, 3–5 veined from base, larger leaves, margin entire or shallowly 2–3 toothed, largest leaves near base. Flowers solitary, axillary, pedicel slender, 4-angled, sparsely glandular hairy; calyx deeply 5-lobed, linear or lanceolate, apex acute, sparsely glandular hairy and reddish-orange color when young; corolla bilabiate, white, occasionally with pale purple spots, tube slightly nerved; upper lip slightly emarginated at the apex; lower lip distinctly 3-lobed, lobes rounded; perfect stamens 2; staminodes 2, linear, densely covered with yellowish stalked glands throughout and corolla tube below, distinctly spurred just below the apex. Ovary obliquely ellipsoid; stigma 2-lamellate. Capsule ellipsoid or obliquely ellipsoid, obtuse to acute at apex, glabrous, equalling or slightly longer than persistent calyx. Seeds ellipsoid, longitudinally ridged.

*Fl. & Fr.*: August – March.

*Habitat*: Common in marshy areas of the forest, rice fields and moist river banks.

*Distribution*: India (Andhra Pradesh, **Jharkhand**, Kerala, Madhya Pradesh and Odisha), Argentina, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, U.S.A. and Venezuela; introduced in Europe and East Asia.



**Plate 1:** A–B. *Lepisanthes tetraphylla* (Vahl) Radlk., A. Habit, B. Flower close up; C–D. *Lindernia dubia* (L.) Pennell, C. Habit, D. Flower close up; E–F. *Salomonina cantoniensis* Lour., E. Habit, F. Inflorescence and flower close up; G. *Cyanotis arachnoidea* C.B. Clarke; H–I. *Melinis repens* (Willd.) Zizka, H. Habit, I. Inflorescence and flower close up.

*Specimen examined:* Jharkhand: Gumla; PWLS: Way of Baghma (Misaratoli), c. 590 m, 22°55'72.8" N, 84°39'23.5" E, 23.3.2013, V.K. Mastakar 58251; Alangkera (Basia Road), c. 589 m, 30°00'00.0" N, 68°54'22.5" E, 20.9.2011, V.K. Mastakar 49423.

**Salomonina cantoniensis** Lour., Fl. Cochinch. 1: 14. 1790; A.W. Benn. in Hook.f. Fl. Brit. India 1: 206. 1872; R.N. Banerjee in B.D. Sharma & al., Fl. India 2: 489. 1993. *Salomonina edentula* DC. Prodr. 1: 334. 1824; A.W. Benn. in Hook.f. Fl. Brit. India 1: 207. 1872. *Salomonina cantoniensis* var. *edentula* (DC.) Gagnep., Bull. Soc. Bot. France 56: 16 1909; R.N. Banerjee in B.D. Sharma & al., Fl. India 2: 490. 1993. [**Polygalaceae**]. **Plate 1 E-F**

Herbs, annual, erect, 5–25 cm tall, branched dichotomously glabrous. Stems 3 winged glabrous. Leaves, simple, alternate, ovate-deltoid, cordate-trullate, 0.6–1×0.5–1 cm, truncate attenuate or cordate at base, entire or slightly undulate, abruptly acuminate or aristate at apex, flaccid, caudate thin, papery, winged. Inflorescence spikes, 0.5–6 cm long, terminal or upper axillary elongated; rachis winged. Flowers very small, sessile, bracts lanceolate, caducous, sepals 5, persistent, connate at base, scaly, lanceolate-linear subulate. Petals 3 pink-purple, sometimes whitish below and pinkish above, subequal or equal; connate at base, lateral petals pinkish, white, lobes, reniform or orbicular-obovate, middle lobe cleft above, keel, slightly sub circinnate, dark pinkish on top. Stamens 4–5, united into an open sheath. Ovary obcordate or reniform, margin narrowly denticulate; style sigmoid, curved at apex, hyaline; stigma slightly lobed, colliculate, yellowish. Capsules sessile, 2 seeded, reniform, slightly flattened, surface with protruding reticulations. Seeds 2, black, shiny, ovoid, lenticular.

*Fl. & Fr.:* January – October.

*Habitat:* Rare in the forests, forest margins, wasteland, marshy places, on sand soil, shrubs forest, grasslands, on hills and mountain slopes; 600-1500m.

*Distribution:* India (Arunachal Pradesh, Assam, **Jharkhand**, Nicobar Islands, Sikkim and West Bengal), Bangladesh, Borneo, Cambodia, China South-Central, China Southeast, Jawa, Laos, Lesser Sunda Is., Malaya, Maluku, Myanmar, Nepal, New Guinea, Philippines, Sulawesi, Sumatera, Thailand, Vietnam

*Specimen examined:* Jharkhand: Gumla; PWLS: Khamban van near Palkot, c. 622 m, 22°53'04.0" N, 84°38'47.2" E, 03.10.2012, V.K. Mastakar 42056.

**Cyanotis arachnoidea** C.B. Clarke in A. DC. & C. DC., Monogr. Phan. 3: 250. 1881; Hook.f., Fl. Brit India 6: 386. 1892; Karthik. & al., Fl. Ind. Enum. Monocotyl.: 26. 1989. *Tonningia arachnodea* (C.B. Clarke) Kuntze, Revis. Gen. Pl. 2: 722. 1891. [**Commelinaceae**]. **Plate 1 G**

Perennial decumbent herb; all parts covered with white, cobwebby hairs. Leaves distichous, oblong, lanceolate or linear-oblong, base broadened, apex acute or obtuse, often mucronate, 0.4–1.2×2–23 cm, silky cobwebby on both sides; sheaths up to 2.5 cm. Flowers 3–4 mm long, pink or blue, in dense terminal or axillary cymes; bracts ovate-lanceolate, acuminate, cobwebby; bracteoles falcate, oblong-lanceolate; sepals linear-lanceolate, ciliate at margin; petals oblong; stamens 6; anthers yellow. Capsules oblong, pilose, c.3 mm across. Seeds ovate-elliptic, cylindrical, obscurely pitted, variously striated.

*Fl. & Fr.:* August – December.

*Habitat:* Grasslands, forest edges and Hilly slopes.

*Distribution:* India (Andhra Pradesh, **Jharkhand**, Kerala, Maharashtra, Odisha and Tamil Nadu), Its native range is W. Tropical Africa to Tanzania, India to Taiwan.

*Specimen examined.:* Jharkhand: Gumla; PWLS: Koleng Pahad. c. 740 m, 22°55'32.0" N, 84°35'24.7" E, 24.9.2011, V.K. Mastakar 49447.

**Melinis repens** (Willd.) Zizka, Biblioth. Bot. 138: 55. 1988; K.A.A. Kabeer & V.J. Nair, Fl. Tamilnadu-Grasses: 262. 2009. *Saccharum repens* Willd., Sp. Pl., ed. 4, 1(1): 322 (Tricholaena sp.). 1797. [**Poaceae**]. **Plate H-I**

Annual or perennial herbs; culms tufted, to c. 1 m high, erect, sparsely hairy at nodes. Leaves 0.1–0.8×3.5–16 cm, linear, sparsely pubescent; sheaths and ligules hairy. Panicles pyramidal, silvery-white, purple or reddish-brown; pedicels pilose at apex. Spikelets ovate, villous. Lower glume emarginate, 1-nerved; upper glume gibbose, boatshaped, aristate, villous. Lower lemma coriaceous, shining; upper lemma elliptic-oblong. Grains 0.5 cm long, oblong-ellipsoid, brownish.

Fl. & Fr.: January – May.

Habitat: Usually hilly areas, open dry areas.

Distribution: India (Andhra Pradesh, **Jharkhand**, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu). Native to Africa, widely introduced to tropical and subtropical regions in Old and New World.

Specimen examined: Koynardaarn forest, c. 650 m, 22°49'59.7" N, 84°33'27.2" E, 19.2.2012, V.K. Mastakar 43519; Pozenga forest, c. 600 m, 22°47'47.7" N, 84°39'46.2" E, 24.3.2013, V.K. Mastakar 58259.

## Conclusion

The data will be ready references to assess the plant diversity in the state of Jharkhand. It will facilitate strategies for management of wild plants and habitat conservation aspects in terms of plant diversity and resource management for protected areas and forestry management.

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