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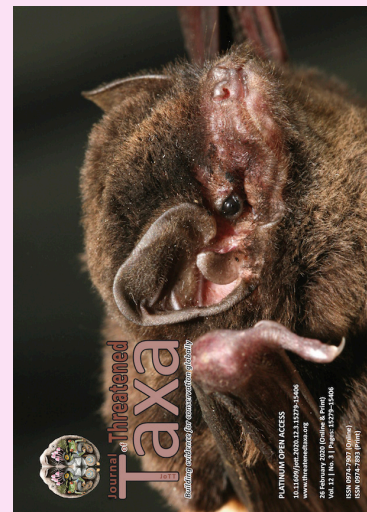
NOTE

***GYNOCOTHODES COCHINCHINENSIS* (DC.) RAZAFIM. & B. BREMER (MORINDEAE: RUBIOIDEAE: RUBIACEAE): AN ADDITION TO THE WOODY CLIMBERS OF INDIA**

Pradeep Kumar Kamila, Prabhat Kumar Das, Madhusmita Mallia,
Chinnamadasamy Kalidass, Jagayandatt Pati & Pratap Chandra Panda

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Gynochthodes cochinchinensis (DC.) Razafim. & B. Bremer (Morindeae: Rubioideae: Rubiaceae): an addition to the woody climbers of India

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The family Rubiaceae, with 611 genera and approximately 13,143 species, is distributed in the tropical, subtropical, temperate, and arctic regions (Davis et al. 2009). The subfamily classification based on morphological characters divided Rubiaceae into four subfamilies, viz., Cinchonoideae, Ixoroideae, Antirheoideae, and Rubioideae (Robbrecht 1988), though recent molecular phylogenetic studies recognize three subfamilies such as: Cinchonoideae, Ixoroideae, and Rubioideae (Bremer 2009). One of the tribes of the subfamily Rubioideae is Morindeae (Bremer & Manen 2000; Bremer & Eriksson 2009), which is comprised of six genera namely, *Appunia* Hook.f., *Coelospermum* Blume, *Gynochthodes* Blume, *Morinda* L., *Pogonolobus* Muell., and *Siphonandrium* Schum. (Razafimandimbison et al. 2008).

Blume (1827) described the genus *Gynochthodes* by putting together the species having similar morphological features such as presence of 8–9 flowers per umbel on the inflorescence, flowers being villous inside the tube; 4–5 stamens, one style, bifid verrucous

stigma, globose stipule, umbilicate drupe, 4-locular ovary and erect albuminous embryo. *Gynochthodes* can be segregated from other genera of the tribe Morindeae by having inflorescences that are never paniculate, small flowers (corolla tubes 0.7–5.5 mm long and corolla lobes 1.5–11.0 mm long) and partly exerted anthers (Razafimandimbison et al. 2009; Suratman 2018). Razafimandimbison et al. (2009) also discussed the circumscription of *Gynochthodes* in a wider sense to accommodate all lianescent species of *Morinda* with small flowers in order to make *Morinda* monophyletic based on molecular phylogeny. The majority of lianescent species of *Morinda* having multiple fruits have been transferred to *Gynochthodes* and necessary nomenclatural changes made (Razafimandimbison & Bremer 2011). According to Johansson (1987), the genus can be distinguished from *Morinda* by its lianescent habit, stipules and bracts with marginal hairs, terminal umbellate inflorescences, flowers with recurved calyx tubes, corollas with long hairs within the tubes and on the adaxial side of the lobes. As per the present

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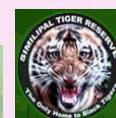
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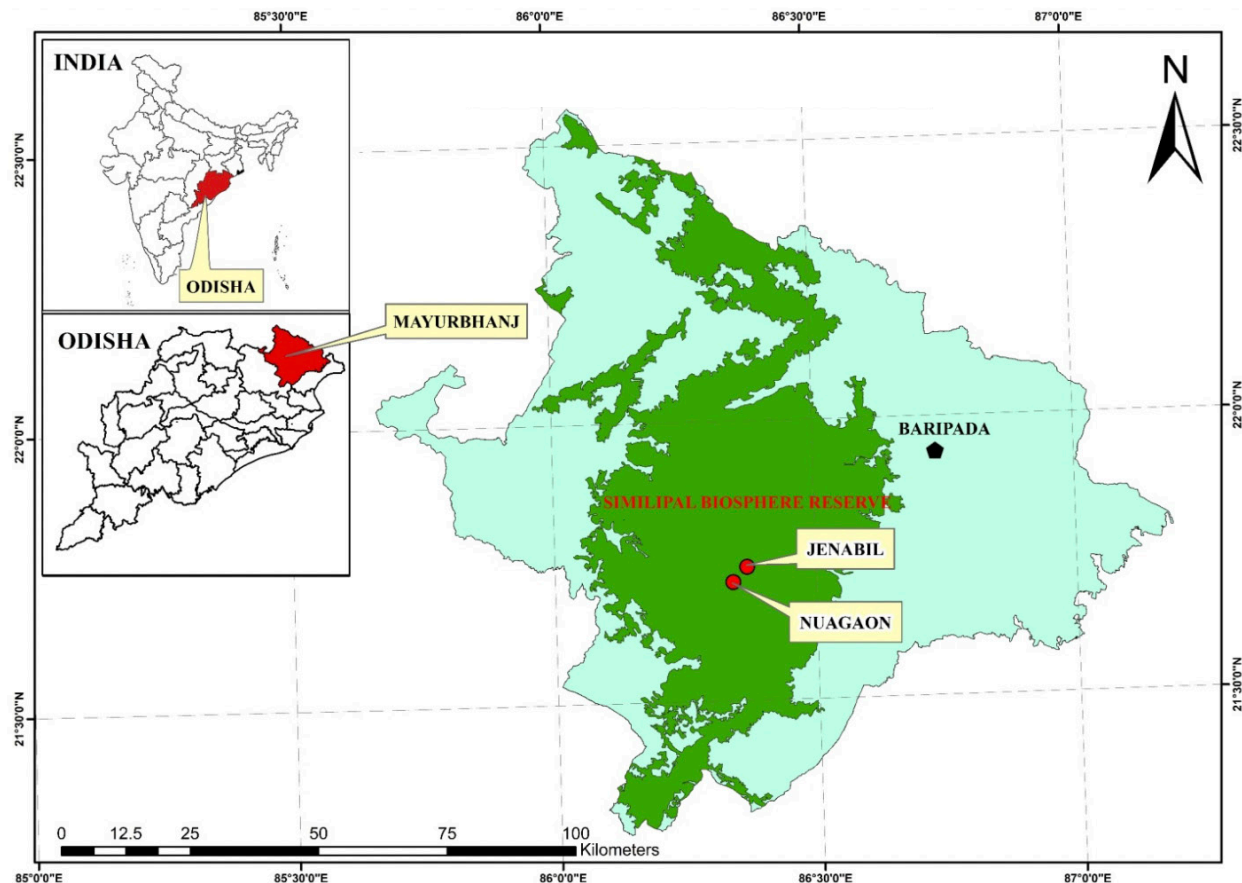


Figure 1. The distribution of *Gynochthodes cochinchinensis* in Similipal Biosphere Reserve, Odisha, India.

circumscription, the genus *Gynochthodes* is comprised of 93 species distributed mainly in tropical and subtropical Madagascar, Asia, and Australasia (Mabberley 2017).

During the population inventory of threatened plants of Odisha, we collected some interesting specimens of Rubiaceae from Nuagaon and Jenabil forest areas of Similipal Biosphere Reserve, Mayurbhanj District, Odisha, India at an altitude of 800–900 m. On critical examination of their morphological characters and consultation of relevant literature (Loureiro 1790; de Candolle 1830), we identified the species as *Gynochthodes cochinchinensis* (DC.) Razafim. & B. Bremer. Perusal of relevant literature revealed that this species has not yet been reported from within the geographical boundary of India and thus, turned out to be a new distribution record for India. A detailed botanical description along with notes on nomenclature, ecology, phenology, distribution, and color photographs of different plant parts are provided to facilitate easy identification of the species in the field. The herbarium specimens have been deposited in the Herbarium of Regional Plant Resource Centre (RPRC), Bhubaneswar, Odisha, India.

Gynochthodes cochinchinensis (DC.)

Razafim. & B. Bremer, (Image 1)

Adansonia 33(2): 288 (2011). *Morinda cochinchinensis* DC., Prodr. 4: 449. 1830. *Morinda trichophylla* Merr., Philipp. J. Sci. 23: 267. 1923.

Lianas; branches woody and at base with persistent leafless stipules, when young densely ferruginous or yellow villosulous, terete to weakly quadrangular. Leaves opposite, mature leaf 12.0 × 6.5 cm, apex acuminate, base obtuse, veins 14 pairs, petiolate, petiole up to 1.0 cm in length, young leaf 8 × 3 cm, apex acuminate to terete, base obtuse, 15 pairs of secondary veins, petiole 0.5 mm, elliptic to ovate and sometimes oblanceolate, margin entire, adaxially sparsely strigose to strigillose, abaxially densely ferruginous or yellow hirtellous to villosulous with pubescence denser along veins. Stipules fused into the tube or spathe, 1 cm in length, densely hispidulous to hispid on each side with two bristles, usually quickly deciduous. Inflorescence terminal, peduncles 8–15, umbellate, 4–5 cm long, densely ferruginous or yellow hirtellous, as a group subtended by two to several bracts of 1–3 mm long, two to several lobed. Each peduncle



Image 1. *Gynochthodes cochinchinensis* (Rubiaceae).

A—habit | B—stem with corky bark | C—leaf showing distinct secondary veins | D—tubular stipule | E—umbelliform inflorescence | F—close view of inflorescence | G—(i) calyx with hypanthium, (ii) flower, (iii) corolla tube with villous in nature, (iv) style with bifid stigma | H—young fruits | I—matured fruits | J—fruiting plants in wild | K—T.S. of a mature fruit | L—seeds. © P. K. Das & P. K. Kamila.

Table 1. Comparison of morphological characters of *Gynochthodes umbellata* and *Gynochthodes cochinchinensis*.

Morphological characters	<i>Gynochthodes umbellata</i>	<i>Gynochthodes cochinchinensis</i>
Branches	Glabrous, shiny and smooth, when young weakly angled often channelled, bluish-black to reddish-brown.	Scarbulous, rough and hard, when young densely ferruginous or yellow villosulous, quadrangular, dark brown to greyish-brown.
Leaves	Petiole 0.4–0.6 cm in length, glabrous, adaxially shiny and greenish, mid vein pale brown or brownish-black, abaxially matte, greenish.	Petiole 0.9–1.0 cm in length, pubescence, adaxially sparsely strigose to strigillose, mid vein light green to greenish-white, abaxially densely ferruginous or yellow hirtellous to villosulous.
Secondary veins	4–5 pairs.	14–15 pairs.
Stipules	Fused into a tube, 2–6 mm, scarious to membranous, puberulous, broadly rounded to truncate	Fused into the tube or spathe, 1cm, densely hispidulous to hispid, broadly triangular to truncate.
Peduncles	Peduncles 3–11, fasciculate, umbellate, or shortly racemiform, 4–11 mm, puberulous to glabrescent.	Peduncles 8–15, umbellate, 4–5 cm, densely ferruginous or yellow hirtellous.
Limb	Limb 0.2–0.8 mm in length, truncate to denticulate.	Limb 3–4 mm in length, unequal or reflexed.
Flower	Calyx glabrous, truncate to denticulate. Corolla campanulate, outside glabrous to puberulent; tube 1.2 mm, inside densely villous from middle to throat; lobes 4 or 5, narrowly oblong to ligulate, 2.2–3.0 mm, apically thickened and hooked.	Calyx with hypanthium portion densely strigose to strigillose. Corolla rotate to salver-shaped, lower surface pilosulous, upper part of petal hispidulous, inside densely villous throughout the tube onto lobes; tube 1.5 mm; lobes 4 to 5, narrowly oblong to lanceolate, 4.0–4.5 mm, apically thickened.

with one umbelliform inflorescence, sub-globose, 5–6 mm in diameter, 5–15 flowered; bracteoles linear, 0.2–1.0 mm long. Limb sometimes unequal or reflexed, 3–4 mm in length, 2.2mm in diam., pilosulous. Flower with hypanthia partially fused, gamopetalous. Calyx with hypanthium, densely strigose to strigillose, sepals 4–5, narrowly triangular, 1–2 mm long, sometimes unequal on an individual flower. Corolla white, gamopetalous, rotate, 4–5 lobed, lower surface pilosulous, upper part of petal hispidulous, inside densely villous around the tube onto lobes; tube 1.5–2.0 mm; lobes 4 to 5, narrowly oblong to lanceolate, 4.0–4.5 mm, apically thickened and rostrate. Anthers four, oblong, 0.5mm in length, yellow in color, single margined in crimson red veined, basifixed, filament 1.0–1.5 mm in length, brown, stigma bilobed, attached directly to the ovary, linear, exerted, greenish in colour, papillose, 0.1mm in length, style 0.4mm, slightly pubescent. Ovary 2-celled with four locules, formed due to secondary false septa. Fruit drupaceous, subglobose or oblong or irregular, orange yellow to orange-red, 1–2 cm in diameter, peduncle elongating up to 4cm. Seeds 2 × 3 mm, slightly pubescent in nature, kidney shaped, orange to red in colour.

Flowering: May–June.

Fruiting: September–October.

Habitat: *Gynochthodes cochinchinensis* was found growing along forest roads close to perennial streams in the moist deciduous and semi-evergreen forest patches of Similipal Biosphere Reserve, Odisha, India at an altitude of about 900m (Figure 1).

Associated species: The species was observed to form association with *Lasiococca comberi* Haines, *Leea indica* (Burm.f.) Merr., *Uvaria hamiltonii* Hook.f. & Thoms., *Celastrus paniculatus* Wild., *Aphanamixis*

polystachya (Wall.) R. Parker, *Styrax serrulatus* Roxb., *Polyalthia simiarum* (Buch.-Ham. ex Hook.f. & Thoms.) Benth. ex Hook.f. & Thoms., *Cipadessa baccifera* (Roth) Miq., *Combretum album* Pers. and *Xantolis tomentosa* (Roxb.) Raf.

Distribution: The species is native to southeastern China to Indo-china and reported to occur in Vietnam, and Thailand. In India, the species was not so far known to occur and the present report on wild occurrence of the species in Odisha extends the range of distribution of the species to India.

Specimens examined: 11038 (RPRC), 06.ix.2016, India, Odisha, Mayurbhanj District, Similipal Biosphere Reserve, Nuagaon, Jenabil, 21.71°N & 86.34°E, 887m; 21.73°N & 86.36°E, 900m, coll. P.K. Kamila & P.K. Das. (Image 2).

Common name: Lata Achhu (Odia), Bagackich (Vietnamese).

Use: Fruits are occasionally consumed by the tribals of Similipal Biosphere Reserve for its medicinal properties and assumed to reduce body weight. The birds and other frugivorous animals also feed on ripe fruits.

Taxonomic affinity: *Gynochthodes cochinchinensis* has morphological similarities with its closely related species *Gynochthodes umbellata* but both can be distinguished from each other by some distinct vegetative and floral characters. A comparative morphological differences between the two species is presented in Table 1.



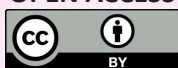
Image 2. Herbarium specimen of *Gynochthodes cochinchinensis* housed in the herbarium of RPRC, Bhubaneswar, Odisha.

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