The genus *Gynochthodes* (Rubiaceae, Rubioideae, Morindeae) in India

P. Murugan¹*, V. Ravichandran¹ & C. Murugan²

¹Botanical Survey of India, Southern Regional Centre, TNAU Campus, Coimbatore – 641003, Tamil Nadu, India
²Botanical Survey of India, CGO Complex, Salt Lake, Kolkata – 700064, West Bengal, India

ABSTRACT. The genus *Gynochthodes* Blume (Rubiaceae) in India is revised. Five species are recognised and described, including the new species *Gynochthodes nilagiriensis* P.Murugan, V.Ravich. & Murugan. *Gynochthodes cochinchenensis* (DC.) Razafim. & B.Bremer has been recorded for India but is excluded here. All names are typified.


Introduction

The genus *Gynochthodes* Blume (Rubiaceae, subfamily Rubioideae, tribe Morindeae) was first described based on the species *Gynochthodes coriacea* Blume from Java (Blume, 1826–1827). It comprises about 93 species and is native to Madagascar, tropical and subtropical Asia to the Pacific (Razafimandimbison & Bremer, 2011; POWO, 2022). In India it has hitherto been known from four species of which three species are recorded from Peninsular India. *Gynochthodes ridsdalei* Razafim. & B.Bremer is an endemic species restricted only to the Agasthyamalai hill ranges in Peninsular India, *G. macrophylla* Kurz is found in the Andaman and Nicobar group of islands, *G. umbellata* (L.) Razafim. & B.Bremer is distributed throughout India, and *G. villosa* (Hook.f.) Razafim. & B.Bremer is found in Northeast India, Andhra Pradesh and Odisha (Nayar et al., 2014; Murugan et al., 2016; Gangopadhyay et al., 2020). The genus has recently been re-circumscribed based on a molecular phylogenetic study (Razafimandimbison et al., 2009). It can be easily distinguished from genera in other tribes of Rubiaceae by their head-like inflorescences, massive T-shaped placentae inserted in the middle of the septum bearing two anatropous ovules per carpel, and pyrenes with a single lateral germination slit (Igersheim & Robbrecht, 1993). Razafimandimbison et al. (2009) demonstrated the paraphyly of the genus *Morinda* L. with respect to *Coelospermum* Blume, *Gynochthodes* Blume, *Pogonolobus* F.Muell. and *Sarcopygea* Setch. & Christoph., resulting in a number of species being moved from *Morinda* into *Gynochthodes*. With respect to the other genera in the tribe Morindeae, the genus *Gynochthodes* can be readily separated by characters such as mostly being lianas, inflorescences terminal or rarely axillary shoots, inflorescences
composed of 2 to 10 heads arranged into umbellate racemes or cymes, peduncles present or rarely sessile, and plants polygamous or dioecious (Razafimandimbison & Bremer, 2011).

As part of a project to revise the Rubiaceae in Peninsular India, the genus *Gynochthodes* has been revised throughout India based on herbarium specimens housed at the following herbaria: CAL, FRC, KFRI, MH, PBL, RHT and XCH, along with material available online at other international herbaria. All cited specimens have been seen unless otherwise noted; those that were seen only as digital images are marked with an asterisk (*). In addition, three *Gynochthodes* species were collected from 2020 to 2022 from four different localities in the Western Ghats of Kerala and Tamil Nadu. After critical study of the type specimens (E, G-DC, K and MH) and perusal of pertinent literature (De Candolle, 1830; Kurz, 1872; Hooker, 1880; Gamble, 1920; Mohanan & Sivadasan, 2002), the new collections were identified as *Gynochthodes umbellata*, *G. ridsdalei* and *Gynochthodes nilagiriensis* P.Murugan, V.Ravich. & Murugan, a new species allied to *Gynochthodes rigida* (Miq.) Razafim. & B.Bremer and described below.

** Taxonomic treatment **


Evergreen or semi-evergreen, usually lianas or rarely shrubs or trees; branchlets terete or sub-terete, glabrous or pubescent. **Leaves** simple, opposite-decussate or rarely ternate, chartaceous or coriaceous; stipules triangular or sheathing, base slightly
Gynochthodes in India

connate or free; petiolate. **Inflorescences** terminal or axillary, solitary or in 2–10 heads in an umbel-like, racemose or cymose arrangement. **Flowers** hermaphrodite but functionally unisexual, or sometimes hermaphrodite (plants polygamous), sessile or sometimes pedicellate; corolla tubes shorter than corolla lobes, rarely as long as or longer than corolla lobes; stamens alternate to the corolla lobes, filaments included in corolla throat, linear, glabrous, white, anthers basifixed, dithecous, partly exserted, rarely included. Ovary inferior, globose, c. 1 mm long, 2–4-celled, two ovules in each cell; styles filiform, terete, thick; stigma bilobed, ovate or tongue-like, exserted. **Infructescence** globose or subglobose, syncarpous or drupaceous. Seeds ovate or sub-ovate, or reniform, cream, pale brown, 2–4 mm long, in pyrenes.

**Key to Gynochthodes species in India**

1a. Branchlets glabrous or rarely glabrescent ............................................................ 2
1b. Branchlets pubescent or villous ........................................................................... 4

2a. Leaves on both surfaces glabrous or sometimes glabrescent or midvein pubescent; peduncles very long, slender, up to 20 cm long; infructescence 6–10 mm diam. ..... .......................................................... 4. *G. umbellata* 
2b. Leaves on both surfaces glabrous; peduncles short, stout, up to 1 cm long; infructescence 8–15 mm diam. .......................................................... 3

3a. Stipules ovate or truncate; leaf laminas broadly elliptic or oblong-lanceolate, margins entire and slightly revolute; inflorescence axillary, in 4 globose heads, mostly 1-flowered per head ....................................................... 1. *G. macrophylla* 
3b. Stipules sheathing; leaf laminas linear-lanceolate or oblanceolate, margins entire or slightly wavy; inflorescence terminal, 4–5 heads, mostly 8–10 flowers per head ......................................................................................................... 3. *G. ridsdalei* 

4a. Stems when young densely ferruginous villous and brown when dry; leaf laminas chartaceous or membranous, caudate at apex; lateral veins 6–12 pairs; infructescence 10–15 mm diam. ........................................ 5. *G. villosa* 
4b. Stems when young densely pubescent and black when dry; leaf laminas coriaceous, acuminate at apex; lateral veins 4–5 pairs; infructescence 15–20 mm diam. ........ .......................................................... 2. *G. nilagiriensis* 


Climbing shrubs; branchlets sub-terete or sub-quadrangular, young parts glabrous. **Leaves** opposite-decussate; lamina membranous, broadly elliptic or oblong-lanceolate,
6–18 × 2.5–6.5 cm, base cuneate, apex rounded to shortly acuminate, margins entire and slightly revolute, both surfaces glabrous, glossy, pale beneath; lateral veins 6–12 pairs, reticulate, with domatia; stipules shortly ovate or truncate, obtuse, caducous; petioles 1–1.5 cm long, terete. Inflorescence axillary, cymes, in 4 globose heads, mostly 1-flowered per head, subsessile or shortly pedunculate; peduncles when present 0.2–0.5 cm long, stout. Flowers greenish white, 4-merous; bracts and bracteoles absent. Calyx cupular, tube short, 4- or 5-toothed, teeth minute, caducous. Corolla salverform or campanulate, tube 2.5–4 mm long, 4- or 5-lobed; lobes 2.5–4 mm long, oblong, reflexed. Stamens 4 (or 5), just above the middle of the corolla tube, included; filaments c. 1 mm long; anthers oblong, c. 1.5 mm long. Ovary 2-celled; in each cell one ovule; style 1.5–3 mm long, slender; stigma bilobed. Infructescence axillary, a group of syncarps, globose or subglobose, 8–12 mm diam., pale green when ripe; seeds not seen.

Distribution. India (Andaman and Nicobar Islands), Thailand and Malaysia.

Phenology. Flowering and fruiting September to April.

Specimens examined. INDIA: Andaman and Nicobar Islands: North Andaman, Landfall Island, on the hill top, c. 40 m, s.d., Kamble 30943 (PBL); South Andaman, Port Blair, 17 Jan 1959, Thothathri 9082 (MH); Mount Harriet, 100 m, 10 Nov 1963, Balakrishnan 1359 (CAL); Port Blair, 3 m, 13 Apr 1964, Ellis & Ramamurthy 18779 (MH, PBL); Corbyn’s cove, ± 20 m, 10 Oct 1973, Nair 496 (PBL); ibidem, coastal forests, 31 Oct 1973, Balakrishnan 552 (PBL); Rutland Island, along Ghasnullah towards mountain Ford, 22 Jan 1982, Rao 8631 (PBL); Ferrargunj Reserve Forest, Bomboo Tikari, 15 May 2006, Pandey 26054 (PBL); Nicobar Islands, Nancoy, 13 May 1966, Thothari 11651 (CAL); North Nicobars, way towards Jula, Katchal, ± 25 m, 13 Aug 1974, Chakraborty 2073 (PBL); Mildera, Katchal Island, ± 25 m, 17 Dec 1974, Chakraborty 2203 (PBL); Kapanga, Katchal Island, 19 Jun 1977, Chakraborty 6060 (PBL); South Nicobars, Kamorta Island, ± 20 m, 23 May 1977, Bhargava 5059 (PBL); Kamorta Island, 25 Apr 1988, Rao 13013 (PBL); ibidem, 26 Apr 1988, Rao 13030 (PBL).

Notes. In the protologue, Kurz (1872) cited only the locality ‘Andamans’. Kurz’s types are known to be available mainly at CAL, and some Indian materials also at K and L. However, for the present study we have been unable to locate any original material from the Andamans and instead designate a Kurz specimen from the Nicobars in K [K000763879] as neotype.

2. Gynochthodes nilagiriensis P.Murugan, V.Ravich. & Murugan, sp. nov.

Closely allied to Gynochthodes rigida (Miq.) Razafim. & B.Bremer, but differs in the branchlets terete (vs branchlets sub-quadrangular or quadrangular); stipules sheathing or tubular (vs stipules triangular or ovate), leaf laminas elliptic or ovate, 3–8 × 3–4 cm, lateral veins 4 or 5 pairs, with domatia (vs leaf laminas elliptic to oblong, 4–15 × 3–7 cm, lateral veins 6–9 pairs, without domatia); inflorescence usually solitary,
Gynochthodes in India

15–25-flowered or sometimes 2–4 heads, with 6–8 flowers per head, usually sessile or rarely pedunculate, peduncles 0–3 cm long, terete (vs inflorescence in 2–4 heads, with 3–16 flowers per head, shortly pedunculate, peduncles 0.3–0.6 cm long, sub-terete or sub-quadrangular); flowers 3–8 × 4–5 mm (vs flowers 2.5–5 × 3–5.5 mm); fruits 15–20 mm diam., green to slightly golden brown, sparsely covered in stiff long hairs (vs fruits 10–15 mm diam., pale green, sparsely pubescent). – TYPE: India, Tamil Nadu, Nilgiris District, Thaishola, near Kinnakorai viewpoint, 11°12′45.1″N 76°38′39.6″E, ± 1700 m, 6 August 2021, P. Murugan 145034 (holotype MH; isotypes CAL, MH). (Fig. 1–3; Table 1)

Evergreen, lianas; stem 8–15 cm diam., pale brown; branchlets terete, when young parts densely pubescent and black when dry; internodes 1–4 cm long. Leaves opposite-decussate; lamina coriaceous, elliptic or broadly ovate, 3–8 × 3–4 cm, base rounded or shortly acute, apex acuminate, margins entire when young, ciliate, adaxial surface pubescent, dark green, abaxial surface especially pubescent on veins, pale; lateral veins 4 or 5 pairs, with domatia, tertiary venation reticulate; stipules sheathing, 4–8 mm long, apex obtuse or acute, shortly connate at the base, pubescent, sub-chartaceous, caducous; petioles up to 1 cm long, sub-terete, channelled, pubescent. Inflorescence terminal heads, usually solitary, occasionally 2–4 heads, when solitary the head is 15–25-flowered, when branched it has 2–4 heads with 6–8 flowers per head, usually sessile (solitary head) or rarely pedunculate (branched head); peduncle 0–3 cm long, dull black powder-like dusty. Flowers usually 4-merous or rarely 3- or 5-merous, cream, greenish white or white, fragrant. Calyx limb tubular, 1.5–2 × 1–2 mm, sparsely pubescent outside; lobes indistinct. Corolla valvate, tube 3–4 mm long, cylindrical, both surfaces glabrous, throat lanuginose; usually 4-lobed or rarely 3- or 5-lobed, lobes lanceolate or oblong, 2–3 × 1.5–2.5 mm, deflexed, inner surface lanuginose, outer glabrous and apex with small protuberance with scattered hairs. Stamens 4 (3 or 5), epipetalous, included or partly exserted; filaments 1–2 mm long, slender; anthers 1.5–2 mm long, lanceolate or oblong. Ovary globose, 0.5–0.8 mm long, 2–4-celled, ovules one in each cell; style slender, 2–3 mm long, thick; stigma bilobed, flattened, oblong, exserted. Infructescences terminal, usually solitary or rarely in 2 to 4 heads, umbellate, globose or subglobose, 15–20 mm diam., syncarps composed of 4–20 fused fruitlets, sparsely pubescent with long stiff hairs; stalks sessile or 2–30 mm long, terete, pubescent. Seeds obovate to oblong or reniform, 3–5 × 3–4 mm, apically obtuse to rounded and basally acute to obtuse, glabrous.

Distribution. India (Kerala and Tamil Nadu).

Habitat. In evergreen forests above 1700 m growing with Lasianthus venulosus (Wight & Arn.) Wight, Psychotria nilgiriensis Deb & M.G.Gangop., Syzygium montanum Gamble, Memecylon randerianum S.M.Almeida & M.R.Almeida, Tetrastigma leucostaphylum (Dennst.) Alston, Passiflora leschenaultii DC., Gnetum edule (Willd.) Blume, Cryptocarya neilgherrensis Meisn. and Litsea floribunda (Blume) Gamble.
**Phenology.** Flowering and fruiting July to March.

**Etymology.** The specific epithet refers to the type locality, Nilgiri Biosphere Reserve, India.

*Additional specimens examined.* **INDIA:** *Tamil Nadu:* Nilgiris Distr., Bikkatty, ± 1800 m, 27 Jun 2017, *Ravichandran 139019* (MH); on the way to Kinnakorai near Thaishola, 11°12′59.9″ N 76°38′40.6″E, ± 1700 m, 2 Mar 2020, *Murugan & Ravichandran 144890* (MH); Avalanche, on the way to Cauliflowershola, 11°17′53.5″N 76°35′06.2″E, ± 2000 m, 5 Aug 2021, *Murugan 145030* (MH). **Kerala:** Palakkad Distr., Silent Valley National Park, Sispara, 11°11′55.8″N 76°26′21.2″E, ± 2150 m, 2 Jan 2022, *Murugan 149311* (MH).

*Fig. 1. Gynochthodes nilagiriensis* P.Murugan, V.Ravich. & Murugan. Drawn by R. Suresh.
### Table 1. Diagnostic differences between Gynochthodes nilagiriensis P.Murugan, V.Ravich. & Murugan and the morphologically similar species G. rigida (Miq.) Razafim. & B.Bremer and G. umbellata (L.) Razafim. & B.Bremer.

<table>
<thead>
<tr>
<th>Characters</th>
<th>Gynochthodes nilagiriensis</th>
<th>Gynochthodes rigida</th>
<th>Gynochthodes umbellata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branchlets</td>
<td>Terete, when young densely pubescent</td>
<td>Sub-quadrangular or quadrangular, when young densely hirsute or pubescent</td>
<td>Sub-terete to weakly angled, usually glabrous or sometimes glabrescent</td>
</tr>
<tr>
<td>Leaf lamina</td>
<td>Elliptic or broadly ovate, 3–8 × 3–4 cm; lateral veins 4–5 pairs and domatia present</td>
<td>Elliptic to oblong, 4–15 × 3–7 cm; lateral veins 6–9 pairs and domatia absent</td>
<td>Lanceolate or elliptic-lanceolate, 6–14 × 2–4 cm; lateral veins 6–10 pairs and domatia present</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>Usually solitary, 15–25-flowered or sometimes 2–4 heads, 6–8 flowers per head; usually sessile or rarely pedunculate, peduncles 0–3 cm long, terete</td>
<td>2–4 heads, 3–16 flowers per head; peduncles 0.3–0.6 cm long, sub-terete or sub-quadrangular</td>
<td>4–8 heads, 5–9 flowers per head; peduncles up to 20 cm long, slender</td>
</tr>
<tr>
<td>Flowers</td>
<td>3–8 × 4–5 mm</td>
<td>2.5–5 × 3–5.5 mm</td>
<td>1.5–3 × 2.5–3 mm</td>
</tr>
<tr>
<td>Fruits</td>
<td>Globose, 15–20 mm diam., green to slightly golden brown, sparsely stiff long hairy</td>
<td>Globose or subglobose, 10–15 mm diam., pale green, sparsely pubescent</td>
<td>Globose, 6–10 mm diam., orange, glabrous</td>
</tr>
</tbody>
</table>

Table 1. Diagnostic differences between *Gynochthodes nilagiriensis* P.Murugan, V.Ravich. & Murugan and the morphologically similar species *G. rigida* (Miq.) Razafim. & B.Bremer and *G. umbellata* (L.) Razafim. & B.Bremer.

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>Gynochthodes nilagiriensis</em></th>
<th><em>Gynochthodes rigida</em></th>
<th><em>Gynochthodes umbellata</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Branchlets</td>
<td>Terete, when young densely pubescent</td>
<td>Sub-quadrangular or quadrangular, when young densely hirsutae or pubescent</td>
<td>Sub-terete to weakly angled, usually glabrous or sometimes glabrescent</td>
</tr>
<tr>
<td>Leaf lamina</td>
<td>Elliptic or broadly ovate, 3–8 × 3–4 cm; lateral veins 4–5 pairs and domatia present</td>
<td>Elliptic to oblong, 4–15 × 3–7 cm; lateral veins 6–9 pairs and domatia absent</td>
<td>Lanceolate or elliptic-lanceolate, 6–14 × 2–4 cm; lateral veins 6–10 pairs and domatia present</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>Usually solitary, 15–25-flowered or sometimes 2–4 heads, 6–8 flowers per head; usually sessile or rarely pedunculate, peduncles 0–3 cm long, terete</td>
<td>2–4 heads, 3–16 flowers per head; peduncles 0.3–0.6 cm long, sub-terete or sub-quadrangular</td>
<td>4–8 heads, 5–9 flowers per head; peduncles up to 20 cm long, slender</td>
</tr>
<tr>
<td>Flowers</td>
<td>3–8 × 4–5 mm</td>
<td>2.5–5 × 3–5.5 mm</td>
<td>1.5–3 × 2.5–3 mm</td>
</tr>
<tr>
<td>Fruits</td>
<td>Globose, 15–20 mm diam., green to slightly golden brown, sparsely stiff long hairy</td>
<td>Globose or subglobose, 10–15 mm diam., pale green, sparsely pubescent</td>
<td>Globose, 6–10 mm diam., orange, glabrous</td>
</tr>
</tbody>
</table>


Climbing shrubs or lianas; stem when young white and when dry pale yellowish white; branchlets terete, glabrous. *Leaves* opposite-decussate; lamina coriaceous, linear-lanceolate or oblanceolate, 10–15 × 2–5 cm, base attenuate, apex acuminate to caudate, margins entire or slightly wavy, adaxial surface glossy, abaxial surface pale
beneath; lateral veins 10–12 pairs, tertiary venation reticulate and prominent; stipules sheathing, obovate, obtuse at apex, caducous; petioles < 1 cm long, stout, sub-terete. **Inflorescence** terminal in 4–5 heads, with mostly 8–10 flowers per head, umbellate, bracteate; peduncles up to 1 cm long, terete, pale green. **Flowers** pale green, usually 4-merous or rarely 5-merous, fragrant, sessile; bracts foliaceous; bracteoles hairy on margins. Calyx truncate, limb forming a ring, fleshy, persistent. Corolla funnel-shaped, tube < 2 mm long, shorter than the lobes, throat lanuginose; usually 4-lobed or rarely 5-lobed, lobes 2–3 mm long, ovate, apex shortly mucronate, deflexed, whitish villous. Stamens 4 (or 5), included or partly exserted; filaments thick, very short; anthers linear, 1–2 mm long. Ovary globose, 4-celled, in each cell with one ovule; style stout, 2–3 mm long, slightly exserted; stigma bilobed, ovate, thick. **Infructescence** terminal,
in 4–5 heads, umbellate, globose or subglobose, 8–15 × 8–15 mm, syncarps composed of 6–10 fused fruitlets, orange, irregularly lobed, puberulous, with prominent scars of persistent calyx ring. Seeds oblong, white, 2–3 mm long, in pyrenes.

**Distribution.** India (Kerala and Tamil Nadu). Endemic to southern Western Ghats.

**Habitat.** Occasional along river banks in evergreen forests.

**Phenology.** Flowering and fruiting April to October.

**Specimens examined.** **INDIA:** Kerala: Quilon Distr. [Kollam Distr.], Thenmala forest Division, Naduvanoorkadavu on the way to coupe, 3 Jun 1964, Subramanian 1585 (FRC); Thiruvananthapuram Distr., Kallar, ± 250 m, 20 Aug 1980, Mohanan 69263 (MH); Kallar, ± 250 m, 11 Mar 1980, Mohanan 66652 (MH); Merchiston to Kallar, 650 m, 6 Mar 1980, Vivekananthan 66118 (MH); way to Bonaccauld [Bonacaud], 650 m, 23 May 1979, Mohanan 63228 (MH); Boneccord [Bonacaud], 600 m, 22 Mar 1978, Mohanan 54747 (MH); on the way Bonacaud to Attayar Camp, ± 700 m, 28 Mar 2021, Murugan 145022 (MH). Tamil Nadu: Kanniyakumari Distr., Way to Vallachithodu-lower Kodayar, ± 600 m, 3 Aug 1977, Henry 49597 (MH); to Vallachithodu-lower Kodayar, ± 600 m, 3 Aug 1977, Henry 70659 (MH).

**Notes.** Gamble (1920) originally described Morinda reticulata Gamble from Bourdillon 591, collected in Merchiston, and Rama Rao 1281, collected in Kulathurpolay. Morinda reticulata Gamble is a later homonym of M. reticulata Benth. Later, Razafimandimbison & Bremer (2011) transferred Morinda reticulata Gamble into the genus Gynochthodes based on a molecular phylogenetic study. They proposed the new name Gynochthodes ridsdalei Razafim. & B.Bremer because the Gamble name, as well as being illegitimate, is preoccupied in Gynochthodes by G. reticulata (Valeton) Razafim. & B.Bremer. Recently, Raju & Rao (2019) recognised a broadly defined Morinda and transferred Gynochthodes ridsdalei into the genus Morinda as M. ridsdalei (Razafim. & B.Bremer) V.S.Raju & J.Prak.Rao. We recognise the more narrowly defined Morinda and retain Gynochthodes ridsdalei in Gynochthodes. Razafimandimbison & Bremer (2011) typified the name on Bourdillon 591 but there are two herbarium sheets at K [K000031579, K000031580] and one at MH [MH00002205]. Among the two sheets at K, the specimen K000031579 matches well with the protologue and also has the line drawing by Gamble on the sheet. It is hence designated here in a second step as the lectotype as per ICN Art. 9.3 (Turland et al., 2018).

**Morinda padavara** Juss. ex Schult., Syst. Veg. ed. 15 bis, 5: 216 (1819). – **TYPE:** India, Malabar, s.d., s.coll. s.n. (lectotype P-JU, designated by Razafimandimbison & Bremer (2011)).


Lianas or climbing shrubs; bark bluish black to reddish brown; branchlets sub-terete to weakly angled, glabrescent. **Leaves** opposite-decussate; lamina subcoriaceous, lanceolate or elliptic-lanceolate, 6–14 × 2–4 cm, base cuneate, apex acute to acuminate, margins entire, both surfaces glabrous or sometimes glabrescent, glossy and especially midvein pubescent; lateral veins 6–10 pairs, tertiary venation reticulate, domatia present; stipules tubular, 2–6 mm long, membranous, minute puberulous, apex bristled on both sides, caducous; petioles 4–8 mm long, glabrescent or sparsely hirsute. **Inflorescence** terminal in 4–8 heads, with 5–9 flowers per head, fasciculate, umbellate or shortly racemiform, glabrescent; peduncles up to 20 cm long, slender. **Flowers** usually 4-merous or sometimes 5-merous, greenish white or white. Calyx sub-campanulate, limb < 1 mm long, truncate to denticate. Corolla shortly campanulate, tube 1.5–2 mm long, shorter than the lobes, throat densely villous; lobes usually 4 or sometimes 5, 2.2–3 mm long, narrowly oblanceolate, apically thick and rostrate. **Infructescence** terminal, in 4–8 heads, umbellate, subglobose or compressed globose, 0.6–1 cm diam., orange-red when ripe, glabrescent. Seeds oblong, 3–5 mm long, in pyrenes.

**Distribution.** India (Andaman and Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu and West Bengal), Sri Lanka, China, Japan and Northern Australia.

**Habitat.** In deciduous forests and in plains.

**Phenology.** Flowering and fruiting January to March.

**Specimens examined.** **INDIA:** **Andhra Pradesh:** Chittoor Distr., Talakona Reserve Forest, ± 700 m, 27 Feb 1986, Charyulu 288 (MH); Akkagairgudi-Tirumala hills, ± 1300 m, 29 Apr 1988, Charyulu 2099 (MH); Gogarham Dam down-Tirumala hills, ± 800 m, 5 Jul 1987, Charyulu 1575 (MH); Tirumalai, 1100 m, 17 Jun 1962, Subbarao 31901 (CAL, MH); way to Japalathirtham, 933 m, 3 Mar 1959, Subramanyam 7856 (MH); Cuddapah Distr., 4500 ft [1370 m], Jun 1884, Gamble 15792 (MH); Hombalura dam, 4500 ft [1370 m], Jul 1881, Gamble 15192 (CAL); Vishakapatnam Distr., on the eastern slope of Galikonda, 1200 m, 16 May 1964, Subbarao 19657 (MH); Minumuluru towards Paderu, 1050 m, 30 May 1968, Subbarao 30014 (CAL, MH). **Karnataka:** Mysore Distr., Bandipur Reserve Forest, 950 m, 21 Apr 1965, Naithani 23860 (CAL, MH); North Canara Distr., Bangalore, Mar 1889, Unknown s.n. (MH). **Kerala:** Quilon Distr. [Kollam Distr.], 24 Sep 1913, Unknown [illegible] 2254 (CAL); Oachira groves, sea level, 16 Feb 1980, Mohanan 65050 (CAL, MH); Malabar Distr., 1864, Beddome s.n.
(MH). **Tamil Nadu:** Erode Distr., Dhimbam-Bazalatti forest, 850 m, 26 Aug 1984, *Vajravelu 80695* (CAL, MH); Sathyamangalam forest division, Engineer road Dimbam, 1120 m, 23 Aug 2008, *Sathyanarayana 125663* (MH); Mamanatham, 1160 m, 24 Aug 2008, *Sathyanarayana 125679* (MH); Coimbatore Distr., Gaddesal, 30 Aug 1914, *Unknown s.n.* (MH); Vadakumalai, 1075 m, 8 Jun 1971, *M.V Viswanadhan 988* (MH); Thekkau kadu-Chothaukadu, 4000 ft [1219 m], 23 Aug 1929, *Narayanaswami 19190* (MH); Marudamalai shola west Kolagathikallu, 24 Jun 1930, *Narayanaswami 3089* (MH); Hassanur, 3000 ft [915 m], 9 Mar 1931, *K.C. Jacob 157* (MH); Dindigul Distr., way to Sirumalai top, 967 m, 25 Apr 1958, *Subramanyam 5772* (CAL, MH); Sirumalai, Aug 1913, *Unknown s.n.* (MH); Namkkal Distr., Kolliimalai, 26 Jun 1916, *Unknown 12965* (MH); Karavalli Reserve Forest, Kolli hills, 25 Jun 1966, *Subramanian 2554* (FRC); Kolli hills, Semmedu-Nachiarkoil Shola, 1320 m, 17 Apr 1978, *Mohan RHT 12980 & RHT 13004* (CAL); Kamarajar Distr. [Virudhunagar Distr.], way to Kurathividuthi estate, Seithur hills, 1100 m, 12 Nov 1989, *Srinivasan 86987* (MH); Kurathividuthi estate, 1100 m, 12 Jun 1979, *Srinivasan 63558* (CAL, MH); Nagariar estate, Seithur hills, 950 m,

**Gynochthodes in India**


Scandent shrubs; branchlets terete or sub-terete, leaf scars present, parts densely ferruginous villous when young and brown when dry. **Leaves** opposite; lamina chartaceous or membranous, narrowly elliptic-oblong or obovate-lanceolate, 8–14 × 2–5 cm, base rounded or sub-oblique or sometimes sub-cordate, apex caudate, margins entire, upper surface sparsely strigose or strigillose with pubescence denser along veins, lower surface densely ferruginous hirtellous; lateral veins 6–12 pairs, with domatia; stipules sheathing or tubular, partially fused, 2 apiculate at apex, 6–10 mm long, pilosulous or hirtellous; petioles 6–15 mm long, terete, densely ferruginous hirtellous. **Inflorescence** terminal in often 4 or sometimes 5–8 heads, with 6–8 flowers per head, umbellate; peduncles 3–10 cm long, slender, villous. **Flower** white or greenish white, usually 4- or rarely 5-merous, sessile; bracts 2 to several, subulate, 4–6 mm long; bracteoles linear, 0.2–0.5 mm long. Calyx campanulate, tube short, 4- or 5-toothed or lobed; lobes c. 1 mm long, rounded to obtuse. Corolla salverform or tubular, puberulous on outer surface, tube 10–12 mm long, cylindrical, densely barbate at throat within, 4- or 5-lobed; lobes 3–4 mm long, narrowly oblong, reflexed. **Infructescences** a group of syncarps, globose to subglobose, 1–1.5 cm diam., orange when ripe; seeds not seen.

**Distribution.** India (Northeast). China, Thailand and Vietnam.

**Phenology.** Flowering May; fruiting July to September.

**Uses.** Local tribal people eat the fruits to treat fevers and reduce body weight. The bark is used for treating bowel problems and as animal fodder. The ripe fruits are eaten by birds and other animals (Kamila et al., 2020).

**Specimens examined.** INDIA: Khasia, 2000 ft [610 m], 4 Oct 1850, Hooker & Thomson 2495 (K [K000763806*]). **Andhra Pradesh:** Visakhapatnam Distr., Paderu Hills, Solabham village, 17°58′57.7″N 82°34′53.9″E, 1183 m, 2 Aug 2015, Rao 20495 (AUV). **Odisha:** Mayurbhanj Distr., Similipal Biosphere Reserve, Nuagaon, Jenabil, 21°42′36″N 86°20′24″E, 887 m, 5 Sep 2016, Kamila & Das 11038 (Regional Plant Resource Centre, Bhubaneswar).

**Notes.** Hooker (1880), when describing *Morinda villosa* Hook.f., mentioned the gathering ‘Khasia Mountains by De Silva; at the Bor Panee river by J.D.Hooker & T.Thomson’. Recently, Razafimandimbison & Bremer (2011) transferred *Morinda villosa* to the genus *Gynochthodes* as *G. villosa* (Hook.f.) Razafim. & B.Bremer and cited the type as Wall. cat. n. 8425 at K but this is not a valid typification as the term ‘designated here’ or its equivalent was not used as has been required since 1 January
We traced five syntypes from two different herbaria, i.e., four sheets at K [K000031581, K000763806, K001125487, K001125488] and one sheet at E [E00143141]. The best-preserved specimen at K [K000031581], which matches well with the protologue and includes an annotation by J.D. Hooker, is designated here as the lectotype.

Recently, *Morinda cochinchinensis* DC. and the homotypic *Gynochthodes cochinchinensis* (DC.) Razafim. & B.Bremer were reported from Andhra Pradesh (Rao et al., 2019) and Odisha (Kamila et al., 2020) states in India. After critical examination of the specimens and photographs, we have concluded that this name has been misapplied to material of *G. villosa*. For this reason, *Gynochthodes cochinchinensis* is excluded from India and *G. villosa* has been added to the flora of Andhra Pradesh and Odisha states respectively.

**Typification of Gynochthodes cochinchinensis**


**Notes.** As noted above, *Gynochthodes cochinchinensis* does not occur in India. However, whilst we were investigating this question, we discovered that there was a problem with the typification of the name. Razafimandimbison & Bremer (2011) cited the type of *Morinda cochinchinensis* DC. as being the description of *Morinda umbellata* by Loureiro (1790), on which *Morinda cochinchinensis* was based. According to Turland et al. (2018), the type of a name must be a specimen or illustration, and hence the description cannot be considered as a type. As the only original material that could be found is Rumphius’s illustration as cited by Loureiro (1790), it is here designated as the lectotype.

**ACKNOWLEDGEMENTS.** The authors are thankful to Dr A.A. Mao, Director, Botanical Survey of India, Kolkata, for constant support and encouragement and Dr M.U. Sharief, Scientist-F & Head of Office, Botanical Survey of India, Southern Regional Centre, Coimbatore for providing facilities. We are indebted to the curators of CAL, E, FRC, G-DC, K, KFRI, MH, PBL, RHT and XCH herbaria for providing digital images or access to consult the herbarium specimens. We are also grateful to the anonymous reviewers and journal editors for the betterment of our manuscript. Thanks are due to the Forest Departments of Kerala and Tamil Nadu for permission and necessary help during the field study and to the Ministry of Environment, Forest and Climate Change, Government of India, New Delhi, for financial support under the Flora of India project.
Fig. 7. Lectotype of *Morinda cochinchinensis* DC. (= *Gynochthodes cochinchinensis* (DC.) Razafim. & B.Bremer)
References


