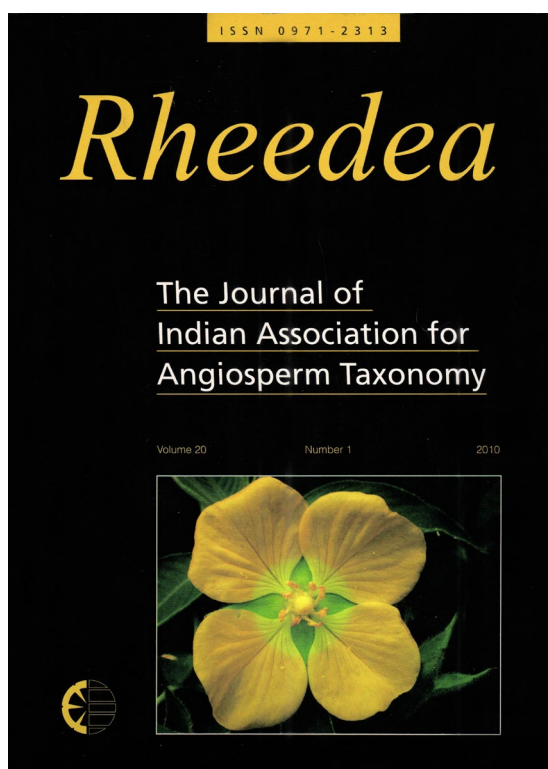




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The genus *Atuna* (Chrysobalanaceae) in southern Western Ghats, India

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Abstract

Atuna indica (Bedd.) Kosterm. is rediscovered after the type collection. Detailed descriptions with illustrations are provided for the Southern Western Ghats species of *Atuna* based on the recent collections. Conservation status and distribution pattern are also discussed.

Keywords: *Atuna*, Chrysobalanaceae, India, IUCN Status, Southern Western Ghats

Introduction

The Indomalaysian genus, *Atuna* Raf. has ten taxa including two varieties, mostly confined to the tropical lowland rain forests from India to Samoa in the Pacific through Malaysia (Govaerts *et al.*, 2003; Mabberley, 2008). There are two species of *Atuna* distributed in the southern Western Ghats of India, viz., *A. indica* (Bedd.) Kosterm. and *A. travancorica* (Bedd.) Kosterm. *Atuna travancorica* was described based on Hooker's collection from Courtallum and Bourdillon's and Lawson's collections from Ponnudi and "Colotoorpoly". The specimens of *A. indica* were first collected by Beddome from Carcoor ghats of Wayanad. After the type collection, *A. travancorica* has been relocated from a few localities in the south and central Kerala (Sasidharan & Sivarajan, 1996; Sasidharan, 2003). Whereas, *A. indica* remained unnoticed for nearly one and half century. However, during our recent floristic exploration, *A. indica* was recollected from two localities in northern Kerala that form the rediscovery of this species after the type collection, about 150 years later.

Atuna Raf., *Sylva Tellur.*: 153. 1838; Kostermans, *Reinwardtia* 7: 421. 1969. *Cyclandrophora* Hassk., *Flora* 1: 47. 1842; Steenis, *Bull. Jard. Bot. Buitenzorg Ser.* 3, 17: 461. 1948; Kostermans, *Candollea* 20: 118. 1965. *Parinari* subg. *Cyclandrophora* (Hassk.) Blume, *Melang. Bot.* 2: 10. 1855. *Entosiphon* Bedd., *Madr. J. Lit. Sci.* 3, 1: 44. 1864. *Parinari* auct. non Aubl. 1775: Benth in Hooker, *Niger Fl.*: 333. 1849, p.p.; Blume, *Ann. Mus. Bot. Lugduno-Batavum* 2: 94. 1852; Benth in Benth & Hooker, *Gen. Pl.* 1: 607. 1865.

Evergreen trees. Leaves simple, entire; stipules subulate. Flowers in axillary or terminal corymbose

racemes, bisexual. Calyx lobes imbricate. Petals 5, inserted along the mouth of calyx tube. Stamens many; filaments basally connate; anthers small. Carpel 1, adnate to the side of calyx tube; ovary 2-loculed; ovules 2, erect; style basal, filiform; stigma truncate. Drupe ovoid or suborbicular; stone 1 or 2-seeded.

Key to the species

1. Leaves oblong to elliptic-lanceolate, 5 – 7 cm broad; racemes lax, stout; petals lanceolate, acuminate at apex ***A. indica***
2. Leaves lanceolate, less than 3.5 cm broad; racemes dense, slender; petals broadly ovate, rounded at apex ***A. travancorica***

Atuna indica (Bedd.) Kosterm., *Reinwardtia* 7: 422. 1969; Chithra in Nair & Henry, *Fl. Tamil Nadu* 1: 144. 1983; Purohit & Panigrahi, *Rosac. India*: 265. 1991. *Entosiphon indicum* Bedd., *Madr. J. Lit. Sci.* 3, 1: 45. 1864. *Parinari indicum* (Bedd.) Bedd., *Icon. Pl. Ind. Or.*: 22, t. 109. 1868 – 1874; Hooker, *Fl. Brit. India* 2: 311. 1878; Gamble, *Fl. Madras* 1: 437. 1919. *Ferolia indica* (Bedd.) Kuntze, *Revis. Gen. Pl.* 1: 216. 1891. *Cyclandrophora indica* (Bedd.) Prance ex Kosterm., *Candollea* 20: 124. 1965. – Type: Kerala, Wayanad, Carcoor ghats, *R.H. Beddome s.n.* (MH). **Fig. 1a – c**

Trees, to 20 m tall; bark thin, smooth, brown, blotched with grey; blaze reddish. Leaves simple, alternate oblong, elliptic-lanceolate, elliptic-oblong or elliptic-ovate, 17 – 21 × 5.5 – 7.5 cm, acute at base, entire at margins, acuminate or obtusely acuminate at apex,

chartaceous, glabrous; lateral nerves 12 – 18 pairs, pinnate, prominent, raised beneath; intercostae reticulate, prominent; stipules free, lateral, lanceolate; petioles stout, 6 – 12 mm long, glabrous. Flowers white; bracts hairy, brown. Calyx tube funnel-shaped, pubescent, 5-lobed; lobes imbricate. Petals 5, lanceolate, acuminate at apex, white. Fruit a drupe, ovoid, 3.5 – 4 × 2.5 – 3 cm, smooth.

Flowering & Fruiting: November – February.

Habitat: West coast tropical evergreen forests.

Specimens examined: INDIA, Kerala, Malappuram district, Nadukani hills, ± 800 m, 2.1.2004, *P. Sujanapal & N. Sasidharan* 30831; Nadukani hills, 22.11.2005, *P. Sujanapal & N. Sasidharan* 30837 (KFRI); Wayanad district, Wayanad, Carcoor ghat, *s. die*, *Beddome s.n.* (MH).

Atuna travancorica (Bedd.) Kosterm., *Reinwardtia* 7: 422. 1969; Chithra in Nair & Henry, *Fl. Tamil Nadu* 1: 144. 1983; Nayar & Ahmedullah in Nayar & Sastry, *Red Data Book Indian Pl.* 2: 90. 1988; Purohit & Panigrahi, *Rosac. India*: 265. 1991; Mohanan & Henry, *Fl. Thiruvananthapuram District*: 178. 1994; Sasidharan & Sivarajan, *Fl. Pl. Thrissur For.*: 172. 1996. *Parinari travancorica* Bedd., *Icon. Pl. Ind. Or.*: 43, t. 189. 1868 – 1874; Hooker, *Fl. Brit. India* 2: 311. 1878; Gamble, *Fl. Madras* 1: 437. 1919. *Ferolia travancorica* (Bedd.) Kuntze, *Revis. Gen. Pl.* 1: 216. 1891. *Cyclandrophora travancorica* (Bedd.) Prance ex Kosterm., *Candollea* 20: 125. 1965. – Type: Rose-mallay, Travancore, March 1873, *R.H. Beddome* 292 (Holo, K!).

Fig. 1d – f

Trees, to 25 m tall; bark thin, smooth, greyish brown, mottled with white; blaze dull red; branchlets pubescent. Leaves alternate, lanceolate, 7 – 16.5 × 1.7 – 4.5 cm, acute at base, acuminate or acute at apex, coriaceous, glabrous, glossy above except silky pubescent midrib; lateral nerves 11 – 17 pairs, pinnate, prominent; intercostae reticulate, prominent; stipules free, lateral, subulate; petioles stout, 2 – 6 mm long, grooved above, silky tomentose when young, glabrous at maturity. Racemes usually axillary, slender, drooping, silky-villous. Flowers *c.* 1.5 cm across, pale lavender or white; bracts ovate-lanceolate, villous. Calyx tube funnel-shaped; lobes ovate-cuspidate, villous outside. Petals 5, broadly ovate, *c.* 7 mm long, deciduous. Stamens purple. Fruit a drupe, suborbicular, 2 – 3.5 × 2 – 3 cm, compressed, smooth, brown.

Flowering & Fruiting: January – May.

Habitat: West coast tropical evergreen forests, usually riparian.



Fig. 1. *Atuna indica* (Bedd.) Kosterm. (a – c): a, b. Flowering twig; c. Fruiting twig; *A. travancorica* (Bedd.) Kosterm. (d – f): d. Flower; e. Fruit; f. Twig with flowers and fruits.

Specimens examined: INDIA, Kerala, Kollam district, Kallar, 500 m, 19.1.1994, *N. Sasidharan* KFRI 10806; Palakkad district, Orukomban, 550 m, 13.12.2003, *P. Sujanapal* KFRI 30827; Thrissur district, Poringal, 780 m, 10.3.1981, *N.G. Nair* KFRI 1505; Poringal, 780 m, 10.3.1981, *N. Sasidharan* KFRI 5359 (KFRI).

This evergreen tree genus shows a narrow range of distribution from South India through Malaysia to Fiji and Samoa in Pacific. Most of the species in this genus have a 'localised' distribution pattern and relatively high rate of endemism. Among the eight species, five are narrow endemics and placed under various threat categories (IUCN, 2006). Prance (1995) reported three species from Sabah and Sarawak of Malaysia. Among these *A. cordata* and *A. pentangiana* are restricted to Malaysia are belonging to the Endangered category. *Atuna elliptica* from Viti levu of Fiji, is a red-listed species in the Pacific region. The two species reported from India are restricted to the evergreen forests of southern Western Ghats and belong to 'Endangered' category (Nayar & Ahmedullah, 1988).

Atuna travancorica, is known from Thrissur, Palakkad, Ernakulam, Kollam and Thiruvananthapuram districts of Kerala and forests of Courtallum in Tamil Nadu. There are two Wildlife Sanctuaries namely, Parambikulam (Palakkad) and Shenduruni (Kollam) within its distributional range. The species has a localised distribution pattern in the Anamalai and Agasthyamali regions. Field studies show that the population and extent of distribution are extremely low. It was also observed that the population declined in areas such as Kothamangalam, Thiruvananthapuram and Vazhachal due to plantation activities. Best available evidence indicates that the extent of occurrence is less than 500 sq. km with severely fragmented population and is facing a high risk of extinction in the wild. Therefore, it has been assessed as Endangered (EN B1+2c) category (IUCN, 2006).

Atuna indica shows restricted distribution and limited extent of occurrence than *A. travancorica*. This species was known only by its type collection from the Wayanad region until we recollected it from the Nadukani, Kakkayam and Banasura forests of Wayanad ghats in Nilgiri hill ranges. IUCN (2006) categorised this species as endangered (EN B1+2c). However, our observations for the last three years showed that this species faces a more serious threat than what is stated by IUCN. The extent of occurrence estimated to be less than 100 km². The population is severely fragmented and known to exist in no more than five localities. All these clearly indicate that the species can be placed under Critically Endangered (CR B1+bi) category.

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