

***TINOSPORA SINENSIS* (LOUR.) MERR. FROM
SICKUPARA, KOLLI HILLS FOREST,
NAMAKKAL DISTRICT, TAMIL NADU**

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Web supplement

Kolli Hill or Kollimalai is located near Rasipuram Taluk of Namakkal District in Tamil Nadu (11°10'-11°30'N & 78°15'-78°30'E, 1000-1400m). A small area of the eastern portion of these hills lies in the Perambalur District. The total Kollimalai area of 283km² is part of the Talaghat stretch and to the east lie the Patchamalai. A broad valley divides Kollimalai and Patchamalai. Kollimalai appears to be abruptly ascending from the plains on the western, eastern and southern sides and descending to the plains by numerous long and gently sloping spurs on the northern side. The maximum temperature ranges between 20°C and 30°C and minimum temperature between 10°C and 20°C. The average annual rainfall is around 1445mm. The soil type is deep to very deep and is non-calcareous. The topmost hill area is characterised by sandy-loam soil where as the bottom of the valley is characterised by alluvial and clayey-loam soil. The forest types range from evergreen to moist deciduous and dry deciduous. On the western side of the hills, good shola patches still exist, though a great portion of the plateau is cleared.

Earlier studies on flora of Tamil Nadu do not record the occurrence of this species in the state (Nair & Henry, 1983; Matthew, 1981, 1983, 1984, 1991, 1996, 1999; Pallithanam, 2001).

The present survey conducted in the Kolli Hills resulted in the collection of 70 taxa of angiosperms. Out of these, *Tinospora sinensis* (Lour.) Merr. has not been reported in any of the previous publications on the flora of Tamil Nadu. It is enumerated here with updated nomenclature, brief description, phenological data, distribution, specimens examined and notes for better understanding of this taxon. The voucher specimens are deposited at the Centre for Medicinal Plants Research (CMPR), Kottakkal.

***Tinospora sinensis* (Lour.) Merr.**

Tinospora sinensis (Lour.) Merr. in Sunyatsenia 1: 193. 1934 & Trans. Am. Phil. Soc. Philad. 24: 158. 1935; Forman, Kew Bull. 36: 1981; Ramesh in Sald., Fl. Karnataka 1: 101. 1984; Sasi. & Sivar., Fl. Plants of Thrissur Forests 39. 1996; Sivar. & Philip Mathew, Fl. Nilambur 51. 1997; A. Pramanik in Sharma *et al.*, Fl. India 1: 349. 1993. *Campylus sinensis* Lour., Fl. Cochinch. 113. 1790. *Menispermum malabaricum* Lam., Encycl. Meth. 4: 96. 1797. *Cocculus tomentosa* Colebr. in Trans. Linn. Soc. Lond. 13: 56. 1872. *T. malabarica* (Lam.) Hook.f. & Thoms., Fl. Ind. 1: 183. 1855 & in Hook.f., Fl. Brit. India 1: 96. 1872. *T. tomentosa* (Colebr.) Hook.f. & Thoms., Fl. Ind. 1: 183. 1855 & in Hook.f., Fl. Brit. India 1: 96. 1872. (Menispermaceae)

Malayalam name: *Kattamrithu, Pothan amrithu.*

Specimen examined: 19.ii.04, Sickupara, Kolli Hills, ca.1400m, coll. P.S. Udayan *et al.*, CMPR 02368

Distribution: India, Sri Lanka, Nepal, Bangladesh, Myanmar, China, Thailand, Vietnam and Cambodia. In India it occurs in Assam, Bihar, Orissa, Maharashtra, Andhra Pradesh, Karnataka, Kerala and now reported for the first time from Tamil Nadu.

Description: Large fleshy deciduous climber; mature stem shiny, bark papery. Young parts tomentose; latex light, yellowish, watery. Leaves broadly ovate to suborbicular, 5-16 x 4-12cm, membranous, sparingly pubescent above, pilose beneath with glandular patches at basal nerve axils, acutely acuminate at apex, abruptly truncate or cuneate or subcordate at base; lateral nerves 5-7 pairs; petioles 5-12cm long, puberulous, thickened at base. Flowers greenish-yellow, in racemes or panicles, axillary or from the old stem; panicles 3-12cm long, slender. Male flowers: pedicels 2-5mm long; sepals yellowish-green, glabrous; outer three ovate, 1-1.5mm long; inner three broadly elliptic, 3-5 x 2-5mm; petals six, obliquely rhomboid-ovate, 3-4 x 1-3mm; stamens ca. 1.5-2mm long; anthers dehiscing longitudinally. Female flowers: carpels three, stigma flat, 2-lobed, staminodes six, clavate; gynophore ca. 1mm long. Drupes globose, 1-3, 10-13mm across, red, scarlet or orange red; carpophores 2-3mm long on 8-10mm long peduncles; endocarp rugose, dorsally keeled and ventrally concave, 7-9 x 5-6mm, tuberculate (Image 1^w).

Habitat: Climbing on *Ficus arnottiana* and *Schefflera stellata* along the rocky valleys of mixed deciduous forests.

Phenology: Flowering and Fruiting: February - June.

Remarks: In India, four species of *Tinospora* are found. Out of this only two species are present in southern India, *viz.*, *Tinospora cordifolia* and *T. sinensis*. *T. glabra* occurs in Andaman Islands and *T. crispa* is found in northeastern region. This species can be easily recognised by the presence of puberulous hairs throughout the plant when young. The red listed status of this species is "Vulnerable" for Karnataka, "Lower Risk near Threatened" for Kerala and "Not evaluated" for Tamil Nadu. The Flora of India and all the published floras of Tamil Nadu do not make any mention of its occurrence in the state of Tamil Nadu. So, the present collection of this species is not only a new report to the Tamil Nadu but also an extension of distribution further towards the southern parts of the Eastern Ghats of Andhra Pradesh. Only two mature individuals were recorded from Kolli Hills. In Kerala it is fairly common in moist deciduous to semi-evergreen forests.

Medicinal uses: Stems are used for treating piles, ulcerated wounds, liver complaints, chronic rheumatism and also as muscle relaxant. It is also used as a substitute for *Tinospora cordifolia* (*Amrita*).

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^w See Image 1 in the web supplement at www.zoosprint.org

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GYMNEMA KHANDALENSE SANTAPAU – A RARE AND LITTLE KNOWN ENDEMIC RED LISTED MEDICINAL PLANT FROM NILAKKAL FOREST, KERALA

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web supplement

A botanical survey was conducted in Nilakkal forest near Sabarimala of Pathanamthitta District (09°16'-09°24'N & 76°47'-77°04'E), Kerala, to collect medicinal plants for the establishment of a germplasm bank at Kottakkal, Malappuram District. During the survey an interesting species of *Gymnema* was collected. Critical studies have confirmed it as *Gymnema khandalense*. The specimens have also been compared with the specimens housed in the herbarium of Kerala Forest Research Institute, (KFRI), Peechi. This species was so far known only from the type locality in the Khandala forests of Western Ghats in Maharashtra collected by Santapau in 1944-45. After a period of 34 years, Kothari and Moorthy could collect the plant in 1979 from Raigad District of Maharashtra State. Sasidharan (1996) reported this species from Vazhachal forests of Thrissur District, Kerala, extending its distribution further towards southern Western Ghats, which clearly shows its disjunct distribution and a new report from south India. Nayar and Sastry (1990) included this species in the *Red Data Book of Indian Plants*

and placed it under rare and threatened category. A brief description with ecological notes is provided for better understanding of this endemic and little known taxon.

Gymnema khandalense

Sant., Kew Bull. 1948: 486. 1949 & Rec. Bot. Surv. India 16:52. 1967; Kothari & Moorthy, J. Bombay Nat. Hist. Soc. 80: 259. 1983; Nayar & Sastry, Red Data Book Indian Pl. 3: 37. 1990; Sasi. & Sivar., Fl. Plants of Thrissur Forests 289. 1996. *Bidaria khandalense* (Sant.) Jagtap & Singh in Biovigyanam 16 (1): 62. 1990 & Fasc. Fl. India 24. 1999.

Specimens examined: Three mature individuals were observed, 20.xi.2003 and 29.xi.2003, Nilakkal to Pampavalley (Attathode), forests near Sabarimala, Pathanamthitta District, Kerala State, ± 300m, coll. P.S. Udayan *et al.*, 02101 and 02113.

Distribution: Endemic to the Western Ghats of Maharashtra (Khandala Ghat of Pune District; Masadi forests in Roha of Raigad District; Kolhapur District) and of Kerala (Vazhachal of Thrissur District).

Description: Large climbing shrubs; mature stem corky, ca. 6cm in diameter; young stem lenticellate and tender stem pubescent. The latex is milky white when cut. Leaves opposite, broadly elliptic-ovate, acute-acuminate at apex, truncate at base, subcoriaceous, densely tomentose below and sparsely above, 8-12.5 x 5-8cm; lateral nerves five or six pairs; petiole terete, densely tomentose, 3-3.5cm long. Flowers slightly fragrant, puberulous, in axillary umbellate cymes, 0.8-1cm; peduncles ca. 1 cm long; pedicel about 0.7cm long. Calyx lobes oblong, acute, yellowish-green, 1-1.2mm long, outer surface and margins pubescent. Corolla yellow, campanulate, to 3-3.5 x 1-1.2mm; lobes fleshy, triangular, prominently pubescent on inner surface and ciliolate along margins. Corona of five hairy, fleshy processes arising from and adnate to the corolla tube, alternating with the corolla lobes. Ridges of the corona slightly protruding the corolla tube. Translators five, ca. 0.3mm the pollinia yellow and the corpusculum red. Gynostegium about 2mm long. Fruits not collected (Image 1^w).

Flowering: October-December

Biotic association: This endemic climber is rare and found to grow near moist and shady localities of semi evergreen forests. It is seen growing on *Macaranga peltata* (Roxb.) Muell.-Arg. along with straggling *Acacia pennata* (L.) Willd. Other associated climbers are *Sarcostigma klenii* Wight & Arn., *Piper argyrophyllum* Miq., *Anamirta cocculus* (L.) Wight & Arn., *Miquelia dendata* Bedd., *Mikania micrantha* Kunth, *Thunbergia mysorensis* (Wight.) Anders., *Chonemorpha grandiflora* (Roth) M.R. & S.M. Almeida, *Strychnos colubrina* L., *Tetrastigma sulcatum* (Lawson) Gamble *etc* and shrubs like *Dendrocnide sinuata* (Blume) Chew, *Dichapetalum gelonioides* (Roxb.) Engl., *Clerodendrum viscosum* Vent., *Leea indica* (Burm.f.) Merr., *Nothopegia beddomei* Gamble and trees such as *Xanthoxylum flavescens* Roxb., *Canarium strictum* Roxb., *Grewia tiliifolia* Vahl, *Antiaris toxicaria* Lesch., *Myristica malabarica* Lam., *Knema attenuata* (Wall. ex Hook.f & Thoms.) Warb., *Alstonia scholaris* (L.) R. Br., *Prunus ceylanica* (Wight)

^w See Image 1 in the web supplement at www.zoosprint.org