

A new species of *Aganope* (Fabaceae) from the Southern Western Ghats, Peninsular India

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ABSTRACT
A new species of Fabaceae, *Aganope agastyamalayana*, is described here from the Agastyamalai hills in the Southern Western Ghats of Peninsular India. Using IUCN Red List Categories, conservation status of the species is assessed as critically endangered.

MOTS CLÉS
Fabaceae,
Aganope,
Péninsule indienne,
Liste Rouge UICN.

RÉSUMÉ
Une nouvelle espèce d'Aganope (Fabaceae) des Ghats du SW, Péninsule indienne.
Description d'une nouvelle espèce de Fabaceae, *Aganope agastyamalayana* des collines Agastyamalai des Ghats du SW de la Péninsule indienne. L'application des catégories des listes rouges de l'UICN indique que cette espèce est en danger critique.

INTRODUCTION

MIQUEL (1855) established the genus *Aganope* based on *A. floribunda* Miq. PRAIN (1897), RIDLEY (1922) and THOTHATHRI (1961) followed BENTHAM (1860) in treating *Aganope* as a section under the genus *Derris* Lour. which they placed in tribe Dalbergieae. Of the 25 species enumerated by THOTHATHRI (1961) under the genus *Derris*, 3 [*D. polystachya* Benth., *D. sinuata* Benth. ex Thw. and *D. thyrsiflora* Benth. (including var. *eualata* (Bedd.) Thoth. and var. *wallichii* (Prain) Thoth.)] were included in sect. *Aganope*

(Miq.) Benth. POLHILL (1971) accorded generic status to *Aganope* and retained it in tribe Dalbergieae, but later (POLHILL 1981) he transferred it to tribe Tephrosieae following BENTHAM (1865). SANJAPPA (1992) following POLHILL (1971) transferred *D. sinuata* to *Aganope* and cited it as synonym for *Aganope heptaphylla* (L.) Polhill (based on *Sophora heptaphylla* L.), which was placed in tribe Millettieae instead of Tephrosieae. THOTHATHRI & DAS (1992) transferred the remaining species and varieties of *Derris* to *Aganope*, making the needed combinations [*A. polystachya* (Benth.) Thoth. & Das,

A. thyrsoiflora (Benth.) Polhill var. *eualata* (Bedd.) Thoth. & Das and var. *wallichii* (Prain) Thoth. & Das].

MATERIALS AND METHODS

THOTHATHRI (1964) described *Derris brevipes* Baker var. *travancorensis* Thoth. based on the fruiting specimen of T.F. Bourdillon (*s.n.*, Acc. No. 17409 MH!) collected from western slopes (Travancore hills) of the Agastyamalai hills in Kerala state in the Southern Western Ghats of Peninsular India on 19 November 1890. More than 110 years later, specimens of this taxon with flowers and fruits were collected from eastern slopes (Kalakkad-Mundanthurai Tiger Reserve) of the Agastyamalai hills in Tamil Nadu state. Critical studies of the specimens now available have revealed that this entity should not be treated as a variety of *Derris brevipes* Baker but instead represents a distinct species of *Aganope*, the fourth known from India which we describe here under a new name, providing a detailed description and an illustration. The conservation status of the new species is assessed by applying the IUCN Red List Category criteria (IUCN 2001).

Aganope agastyamalayana M.B. Viswan., U. Manik. & A.C. Tang., **sp. nov.**

Affinis *Aganope thyrsoiflora* (Benth.) Polhill *ramulis, ferruflavido, sericeibus, folioliis 5 rare 3 or 7, dissimilariis, ferruflavido sericeibus, nervis lateralis, 9-15 paribus, petiolis stipulisque ferruflavido sericeibus, bracteis late ovatis ferruflavido sericeibus, filamentis glabribus, stigmatibus capitellatis, legumen tumidus, oblongus, semina tumida, ad basin concava, 24-27 mm longis, 15-18 mm latis, differt.*

TYPUS. — *Viswanathan & Manikandan 14473*, India, Tamil Nadu state, Kalakkad-Mundanthurai Tiger Reserve (eastern slopes of Agastyamalai hills, 8°20'-8°53'N and 77°10'-77°35'E), Nondimangadu, c. 1,100 m, 31 May 2001, (holo-, MH; iso-, herbarium of the Sri Paramakalyani Centre for Environmental Sciences).

Derris brevipes Baker var. *travancorensis* Thoth., Bull. Bot. Surv. India 6: 67, fig. 2 (1964); Sanjappa in

Leg. India: 144 (1992). — Type: *T.F. Bourdillon 17409*, India, Kerala state, Travancore hills (western slopes of Agastyamalai hills): Velveva mally, 19 Nov. 1890, ± 2,333 m (MH!).

Climbing shrubs, robust; branchlets obtusely quadrangular when young, terete when mature, striate, lenticellate, densely rusty yellowish sericeous when young, sparsely rusty yellowish sericeous when mature; stems hollow; internodes 3.5-12.5 × 0.4-0.8 cm. Leaves alternate, imparipinnate, 16-34.5 × 20-27 cm, densely rusty yellowish sericeous; stipules oblong-lanceolate, c. 2.5 × 1 mm, caducous, apex acuminate; petioles canaliculate above, grooved beneath, 4.7-14 × 0.2-0.3 cm; leaflets mostly 5, rarely 3 or 7, dark brown or dark brownish yellow above, pale yellowish brown beneath, unequal, larger towards apex, margin undulate and cartilaginous, apex cuspidate; first pair of laterals elliptic-ovate or elliptic-oblong, 10.7-14.4 × 5.4-6.9 cm, base obtusely rounded or obliquely rounded; second pair of laterals oblong-obovate or oblong-oblancheolate, 12-19 × 4.9-7.8 cm, obtusely or acutely rounded; third pair of laterals oblong-elliptic, 12.2-12.9 × 4.2-4.5 cm, base acute; terminal ones oblanceolate, oblong-oblancheolate or oblanceolate-oblong, 12.4-22.5 × 4.2-10.4 cm, apex obtusely rounded or acute and cuspidate, margin undulate; stipels 2, linear-oblong, c. 3.8 × 1 mm; midrib canaliculate above, grooved beneath; lateral nerves 9-15 pairs, impressed above, raised beneath, terminated faintly below margin; petiolules brownish yellow, 0.9-1.5 × 0.1-0.3 cm, canaliculate above, grooved beneath. Inflorescence in lax thyrsoid panicles, both axillary and terminal, densely rusty yellowish sericeous on peduncles, pedicels, bracts and bracteoles; peduncles quadrangular; primary panicles 7.5-45 × 5-12.5 cm; secondary ones 3-5 × 1-1.5 mm; thyrses 10-14, 0.3-2.2 cm apart between, each 3-6-flowered, c. 1.8 × 2.5 cm. Flowers 1.2-1.4 × 0.9-1 cm, zygomorphic; bracts 2, broadly ovate, 1.8-3.2 × 1.2-1.5 mm; bracteoles 2, ovate, 1.5-2 × 0.8-1.2 mm; pedicels brown, 0.8-2.4 × 0.7-1.4 mm. Calyx cup campanulate, 4.6-4.8 × 5-5.2 mm, oblique at one side, densely rusty yellowish sericeous outside, gland dotted inside; rim truncate but faintly 5-toothed. Standard violet and glabrous inside,

brown sericeous outside, orbicular, 12-12.5 × 12.5-13 mm, 25-30-nerved, apex emarginate; claw to 1.8 × 2 mm, glabrous outside, finely sericeous inside, not adherent to keels in lower half; callosities absent; wings 2, white, oblong, 12-12.8 × 3.5-3.9 mm, distinctly clawed to 4 × 1 mm, glabrous inside, sericeous above claw to apex except glabrous on the margin toward the base; keels 2, white, oblong, 11.3-11.5 × 3.3-3.5 mm, distinctly clawed to 4.7 × 1 mm, glabrous inside, sericeous above claw and in the terminal half. Stamens 10, white with yellowish striations, diadelphous, 9 + 1, at alternate levels, 5 longer, 4 shorter, c. 12 × 8.5 mm, 10th stamen free to base; bundle 7.6-9.2 × c. 6.9 mm; individual filaments c. 9.2 × 0.9 mm; free portion of filaments c. 0.3 mm in diam., 1.2-1.5 mm long; anthers brown, dithecal, oblong, larger ones c. 1.1 × 0.75 mm, smaller ones c. 0.9 × 0.65 mm, longitudinally dehiscent. Ovary white, linear-oblong, sericeous, c. 11.5 × 1.6 mm; ovules 4-6, white, reniform, c. 0.6 × 0.3 mm; style white, arcuate, c. 1.8 × 1 mm, attenuate towards apex, glabrous; stigma pale yellow, capitate, c. 0.2 × 0.2 mm. Pods flat, oblong, 9.5-14 × 2.5-3.4 cm, narrowly winged on both sutures, reticulately veined, 2-3-seeded, densely rusty yellowish sericeous when young, sparsely rusty yellowish sericeous when mature, arcuate towards apex, dehiscent when dry; wing 2-3.5 mm across; venation reticulate, alternate to seeds. Seeds reddish brown, broadly obloid and flattened, 2.4-2.7 × 1.5-1.8 cm, shiny, base concave, apex convex; hilum eccentric, c. 4 × 3.5 mm; radicle spread, c. 0.7 mm across. — Fig. 1.

PARATYPES. — *T.F. Bourdillon 17409*, India, Kerala state, Travancore hills (western slopes of Agastyamalai hills): Velleva mally, 19 Nov. 1890, ± 2,333 m (MH!); *Viswanathan & Manikandan 18278*, Tamil Nadu state, Kalakkad-Mundanthurai Tiger Reserve (8°20'-8°53'N, 77°10'-77°35'E), Nondimangadu, c. 1,100 m, 21 May 2002 (herbarium of the Sri Paramakalyani Centre for Environmental Sciences).

DISTRIBUTION. — Endemic to the Agastyamalai hills [eastern slopes (Kalakkad-Mundanthurai Tiger Reserve in Tamil Nadu state) and western slopes (Travancore hills in Kerala state)], 8°20'-8°58'N, 77°10'-77°35'E.

HABITAT AND ECOLOGY. — Southern tropical wet evergreen forest, associated with the following trees: *Ardisia pauciflora* Heyne ex Roxb., *Elaeocarpus venustus* Bedd., *Eugenia rottleriana* Wight & Arn., *Euonymus dichotomus* Heyne ex Roxb., *Ficus nervosa* Heyne ex Roth var. *nervosa*, *Filicium decipiens* (Wight & Arn.) Thw., *Isonandra lanceolata* Wight, *Memecylon subcordatum* Cogn., *Polyalthia tirunelveliensis* M.B.Viswan. & U. Manik., *Sapindus emarginatus* Vahl, *Schefflera rostrata* (Wight) Harms var. *micrantha* (Clarke) Mahesh., *Trema orientalis* (L.) Blume, shrubs of *Alpinia galanga* Sw., *Elettaria cardamomum* (L.) Maton var. *major* Thw., *Sarcandra chloranthoides* Gard. and *Tabernaemontana gamblei* Subram. & Henry. Associated herbs include *Amorphophallus smithsonianus* Sivadas., *Christella parasitica* (L.) H. Lév., *Elatostema lineolatum* Wight var. *setosum* Henry, *Goodyera procera* (Ker-Gawl.) Hook., *Impatiens verticillata* Wight, *Peperomia dindigulensis* Miq., *P. tetraphylla* (Forst.f.) Hook. & Arn. and climbers such as *Cyclea peltata* (Lam.) Hook.f. & Thoms. and *Piper mullesua* Buch. Ham. ex D. Don.

PHENOLOGY. — Flowering in April and May; fruiting in May and June.

CONSERVATION STATUS. — SANJAPPA (1991) accepted rare status assigned by AHMEDULLAH & NAYAR (1986) to *Derris brevipes* var. *travancorensis*. MANILAL & RAVEENDRAKUMAR (1998) stated that the taxon is endemic to Kerala state but NAYAR (1996) doubted its continued existence and suggested that it was possibly extinct. GOPALAN & HENRY (2000) likewise assigned it to the extinct category based on a CAMP (Conservation Assessment and Management Plan) analysis. *Aganope agastyamalayana* is known only from eastern and western slopes of Agastyamalai hills in certain localities. Analysis field data (VISWANATHAN & MANIKANDAN, pers. observ. 2001, 2002), earlier collections and literature, we assign an IUCN Red list Category of CR — **Critically Endangered (B2** - Area of occupancy estimated to be less than 10 km²; **a** - severely fragmented; **b** - continuing decline, observed and inferred basing; **ii** - area of occupancy and **iv** - number of locations).

Table 1. — Distinguishing characters of *Aganope thyrsoflora* and *A. agastyamalayana*.

Characters	<i>A. thyrsoflora</i>	<i>A. agastyamalayana</i>
Branchlets	Both young and mature branchlets glabrous	Rusty yellowish sericeous, young ones densely so, mature ones sparsely so
Leaflets	Mostly 7-9, similar in shape and size, ovate-oblong, 8-15 × 4.5-8 cm, entire, glabrous, not cartilaginous, apex obtuse or acute	Mostly 5, rarely 3 or 7, heterogeneous in shape and size, 1 st pair of laterals elliptic ovate or elliptic-oblong, 2 nd pair oblong-obovate or oblong-oblancheolate, 3 rd pair oblong-elliptic, terminal leaflets oblancheolate, oblong-oblancheolate or oblancheolate-oblong, 10.7-22.5 × 4.2-10.4 cm, rusty yellowish sericeous, undulate, cartilaginous, apex cuspidate
Lateral nerves	5-7 pairs, glabrous	9-15 pairs, rusty yellowish sericeous
Rachis, petioles, petiolules, stipules and stipels	Glabrous	Rusty yellowish sericeous
Petiolules	Dark brown, 5-8 mm long	Yellowish brown, 9-15 mm long
Bracts	Linear, glabrous	Broadly ovate, rusty yellowish sericeous
Bracteoles	Linear, glabrous	Ovate, rusty yellowish sericeous
Calyx cup	Finely silky	Long silky
Standard, wings and keels	Minutely pubescent, glabrate	Long sericeous, persistent
Standard	Ovate-orbicular	Orbicular
Staminal filaments	Pubescent	Glabrous
Ovary	Pubescent	Sericeous
Stigma	Minute	Capitellate
Pods	Thin, strap-shaped, 3.8-9 cm long, broadly winged (4-6 mm across) on both sutures, glabrous throughout	Turgid, oblong, 9.5-14 cm long, narrowly winged (2-3 mm across) on both sutures, rusty yellowish sericeous, densely when young, sparsely when mature
Seeds	Flat, convex at base, 15-17 × 8-9 cm	Turgid, concave at base, 24-27 × 15-18 mm

Aganope agastyamalayana is so named because it comes from Agastyamalai hills comprising Kalakkad-Mundanthurai Tiger Reserve (eastern slopes) in Tamil Nadu state and Travancore hills in Kerala state (western slopes) in the Southern Western Ghats of India. As the varietal epithet *travancorensis* does not cover Kalakkad-Mundanthurai Tiger Reserve (eastern slopes) in Tamil Nadu state it is rejected.

NOTES. — The habit of *Aganope agastyamalayana* was stated as a dwarf shrub by THOTHATHRI (1964) but our observations indi-

cate that it is a robust climbing shrub. The distinguishing characters of *A. agastyamalayana* and *A. thyrsoflora* are shown in Table 1.

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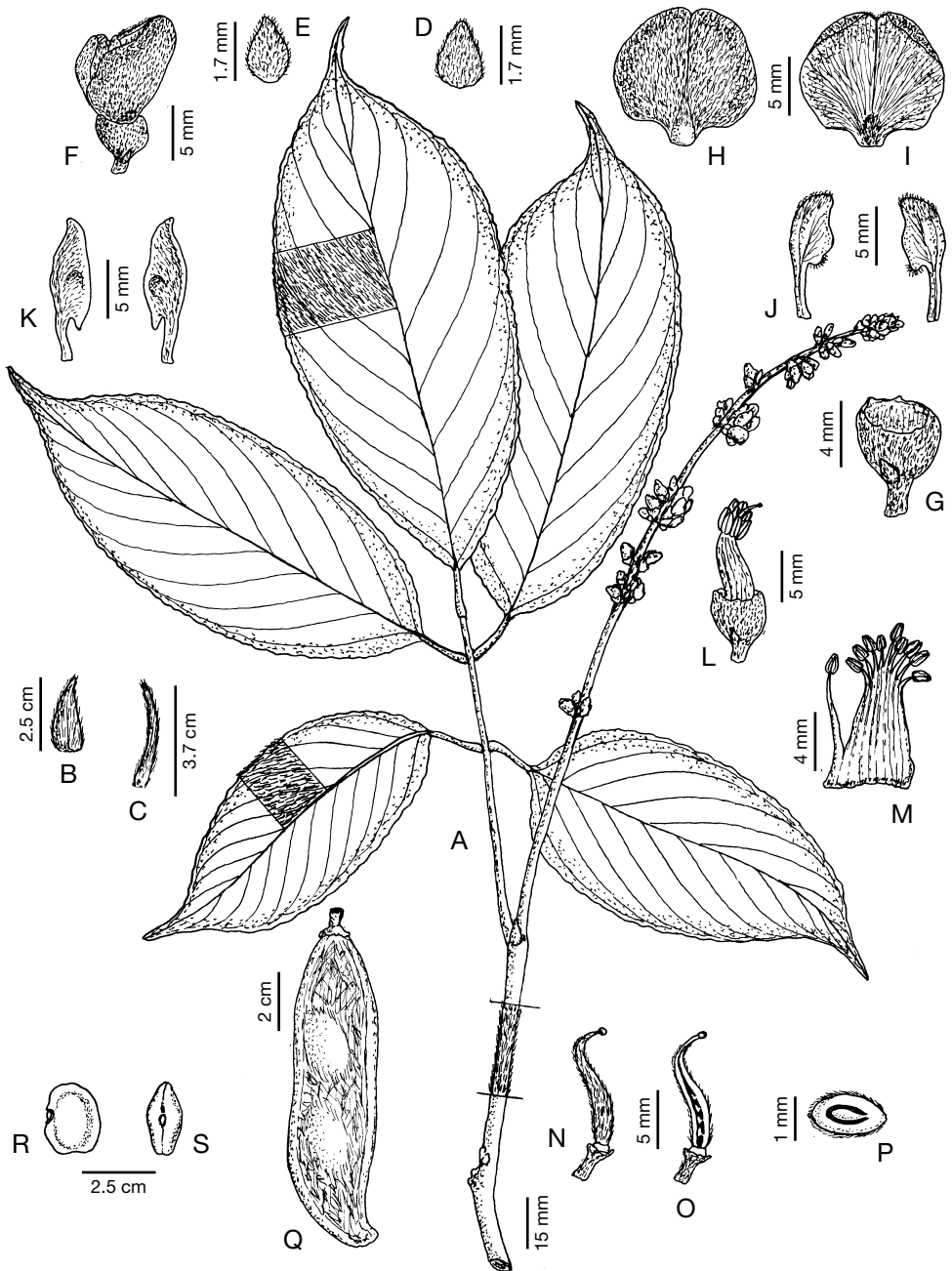


Fig. 1. — *Aganope agastyamalayana* M.B. Viswan., U. Manik. & A.C. Tang.: A, habit (flowering twig); B, stipule; C, stipe; D, bract; E, bracteole; F, flower; G, calyx; H, standard (dorsal side); I, standard (ventral side); J, wing petals (dorsal view); K, keel petals (dorsal view); L, flower without petals; M, stamens; N, ovary; O, longitudinal section of ovary; P, transverse section of ovary; Q, pod; R, seed (lateral view); S, seed (front view). *Viswanathan & Manikandan 14473*.

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