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

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**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. thyrsiflora (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).


Affinis Aganope thyrsiflora (Benth.) Polhill ramulis, ferruflavido, sericeibus, folioliis 5 rare 3 or 7, dissimilaris, ferruflavido sericeibus, nervis lateralis, 9-15 paribus, petiolis stipulisque ferruflavido sericeibus, bracteis late ovatis ferruflavido sericeibus, filamentis glabris, 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).


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, impari-innate, 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-oblancoleate, 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 oblancoleate, oblong-oblancoleate or oblancoleate-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 and bracts and bracteoles; petals 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, 12.5-13 mm, 25-30-nerved, apex emarginate; claw to 1.8 x 2 mm, glabrous outside, finely sericeous inside, not adherent to keels in lower half; callosites absent; wings 2, white, oblong, 12.8-13 mm, distinctly clawed to 4 x 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 x 3.3-3.5 mm, distinctly clawed to 4.7 x 1 mm, glabrous inside, sericeous above claw and in the terminal half. Stamens 10, white with yellowish striations, diadelphous, 3.5-3.9 mm, distinctly clawed to 4.7 x 1 mm, free to base; bundle 7.6-9.2 x 0.9 mm; free portion of filaments c. 0.3 mm in diam., 1.2-1.5 mm long; anthers brown, diotrichous, oblong, larger ones c. 1.1 x 0.75 mm, smaller ones c. 0.9 x 0.65 mm, longitudinally dehiscent. Ovary white, linear-oblong, sericeous, c. 11.5 x 1.6 mm; ovules 4-6, white, reniform, c. 0.6 x 0.3 mm; style white, arcuate, c. 1.8 x 1 mm, attenuate towards apex, glabrous; stigma pale yellow, capitellate, c. 0.2 x 0.65 mm; style white, attenuate towards apex, sericeous above claw to apex except glabrous on the margin toward the base; keels 2, white, oblong, 11.3-11.5 x 3.3-3.5 mm, distinctly clawed to 4.7 x 1 mm, glabrous inside, sericeous above claw and in the terminal half. Stamens 10, white with yellowish striations, diadelphous, 9 x 1, at alternate levels, 5 longer, 4 shorter, c. 12 x 8.5 mm, 10th stamen free to base; bundle 7.6-9.2 x c. 6.9 mm; individual filaments c. 9.2 x 0.9 mm; free portion of filaments c. 0.3 mm in diam., 1.2-1.5 mm long; anthers brown, diotrichous, oblong, larger ones c. 1.1 x 0.75 mm, smaller ones c. 0.9 x 0.65 mm, longitudinally dehiscent. Ovary white, linear-oblong, sericeous, c. 11.5 x 1.6 mm; ovules 4-6, white, reniform, c. 0.6 x 0.3 mm; style white, arcuate, c. 1.8 x 1 mm, attenuate towards apex, glabrous; stigma pale yellow, capitellate, c. 0.2 x 0.6 mm. Pods flat, oblong, 9.5-14 x 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 x 1.5-1.8 cm, shiny, base concave, apex convex; hilum eccentric, c. 4 x 3.5 mm; radicle spread, c. 0.7 mm across. — Fig. 1.


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. *travancorenitis*. 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 agastyaamalayana* is known only from eastern and western slopes of Agastyaamalai 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 baying; ii - area of occupancy and iv - number of locations).
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 indicate that it is a robust climbing shrub. The distinguishing characters of *A. agastyamalayana* and *A. thyrsiflora* are shown in Table 1.

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

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

Acknowledgements

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Fig. 1. — *Aganope agastyamalayana* M.B. Viswan., U. Manik. & A.C. Tang.: A, habit (flowering twig); B, stipule; C, stipel; 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.
A.N. Henry, Scientist Emeritus, of MH, respectively for permission to examine the type specimen and to clear nomenclatural doubt; to Dr. M.P. Nayar, Scientist Emeritus, former Director, Botanical Survey of India, for comments and for help with the Latin diagnosis; to (MOEn & F) project staff for co-operation in the field work; and to Mr. S.S. Mariappan for the illustration.

REFERENCES


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