

# A new species of *Gymnema* (Asclepiadaceae) from the Kollihills in Peninsular India

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## ABSTRACT

A new species of Asclepiadaceae, *Gymnema kollimalayanum* A. Ramachandran & M.B.Viswan., sp. nov. is described here from the Kollihills in the Eastern Ghats of Peninsular India. This species is allied to *G. hirsutum* Wight & Arn. by habit, woody stems, milky latex, umbellate cymose inflorescence, 5-merous flowers, calyx, corolla, anthers, follicles and comose seeds but differs by size and shape of leaves being elliptic or elliptic-rotund, subtruncate at base, abruptly acute at apex, longer petioles, arrangement of flowers, longer pedicels, shape and size of calyx, corolla, larger size of follicles, seeds and coma.

## KEY WORDS

Asclepiadaceae,  
*Gymnema*,  
Kollihills,  
Peninsular India,  
new species.

## RÉSUMÉ

*Une nouvelle espèce de Gymnema (Asclepiadaceae) des Kollihills en Inde péninsulaire.*

Une nouvelle espèce d'Asclepiadaceae, *Gymnema kollimalayanum* A. Ramachandran & M.B.Viswan., sp. nov. est décrite de la région des Kollihills dans l'est des Ghats d'Inde péninsulaire. Cette espèce est proche de *G. hirsutum* Wight & Arn. par son aspect, ses tiges ligneuses, son latex laiteux, ses inflorescences ombellées cymeuses, ses fleurs 5-mères, son calice, sa corolle, ses anthères, ses follicules et ses graines avec touffe de poils mais diffère par la taille et la forme des feuilles qui sont elliptiques ou elliptiques-arrondies, subtronquées à la base, abruptement aiguës à l'apex, ses pétioles plus longs, l'arrangement des fleurs, ses pédicelles plus longs, la forme et la taille du calice, de la corolle, et des follicules, graines et touffe de poils de plus grande taille.

## MOTS CLÉS

Asclepiadaceae,  
*Gymnema*,  
Kollihills,  
Inde péninsulaire,  
espèce nouvelle.

## INTRODUCTION

Specimens of Asclepiadaceae collected by the authors with flowers and fruits during an in-depth botanical research of the Kollihills in Namakkal District of Tamil Nadu State of Peninsular India belong to the genus *Gymnema* R.Br. They did not match with specimens of this genus housed in MH or any of the species reported in the literature such as Hooker (1883), Gamble (1923), Fyson (1932), Huber (1983), Srinivasan (1987), Rahman & Wilcock (1989a, b), Lal (1997) and Jagtap & Singh (1999). Regarding the number of species, there are two versions such as 20 species distributed in India and continental Southeast Asia with one species extending to Africa (Jagtap & Singh 1999) or about 25 species distributed in tropical or subtropical Asia, S Africa, and Oceania (Teng Shu 1995). According to Jagtap & Singh (1999), *G. acuminatum* (Roxb.) Wall. var. *acuminatum*, *G. alterniflorum* (Lour.) Merr., *G. hirsutum* Wight & Arn., *G. lactiferum* (L.) R.Br. vars *lactiferum* and *hasiana* Hook.f., *G. latifolium* Wall., *G. lushaiense* Rahman & Wilcock (1989b) and *G. sylvestre* (Retz.) R.Br. ex Schult. are present in India. But Teng Shu (1995) treated *G. alterniflorum* (Lour.) Merr. as a synonym of *G. sylvestre* (Retz.) R.Br. ex Schult. in the *Flora of China*. However, *G. acuminatum* (Roxb.) Wall. var. *glabrum* Rahman & Wilcock (1989a) is distributed only in Myanmar and Bangladesh. Sri Lanka has endemics such as *G. lactiferum* (L.) R.Br. vars *thwaitesii* Hook.f. and *walkeri* Hook.f. and *G. rotundatum* Thw. But, Huber (1983) did not include var. *walkeri* Hook.f. On scrutiny of the published literatures, the specimens collected from the Kollihills turned out to be an undescribed species we therefore describe as new.

## SYSTEMATICS

*Gymnema kollimalayanum*

A. Ramachandran &amp; M.B.Viswan., sp. nov.

(Fig. 1)

*Gymnema kollimalayanum* A. Ramachandran & M.B.Viswan., sp. nov., ab *G. hirsutum* Wight & Arn. *affinis*, sed foliis ellipticis vel elliptico-rotundis, 2.5-16.8 ×

1-9.8 cm, base subtruncatis, apice abrupte acutis; petioli ad 4.2 × 0.2-0.4 cm; pedunculis: primario-axibus ad 1.5 × 0.12 cm, secundario-axibus si presentes ad 0.5 × 0.1 cm; pedicellis ad 5 × 1 mm; lobis calycis ovatis, c. 2.2 × 1.4 mm; corollis triangulario-ovatis; cristis coronae glabris; folliculis 6.5-8.5 × 0.9-1.0 cm, ferrugineo-pubescentibus; seminibus oblongo-lanceolatis, 12-14 × 3-4 mm, marginibus c. 1 mm latis, et comis 3-4 cm longis differt.

TYPUS. — **India**. Tamil Nadu State, Namakkal District, Kollihills (11°8'N, 78°20'E), Sethukadai, c. 850 m, 13.VIII.2005, Ramachandran 912 (holo-, MH; iso-, herbarium of the Department of Plant Science, Bharathidasan University).

PARATYPES. — **India**. Tamil Nadu State, Namakkal District, Kollihills (11°8'N, 78°20'E), Sethukadai, c. 850 m, 21.X.2005, Ramachandran 928 (herbarium of the Department of Plant Science, Bharathidasan University).

## DESCRIPTION

Twining shrubs, up to 25 m high. Stem woody, 1.2-2.7 cm across; internodes terete, 4-25 cm long; branches and branchlets with warty outgrowths due to localized greater activity of cork cambium, and arranged irregularly and in rows, variable in structure, pustule-like, conical or rectangular, 3-17 × 3-7 mm; tender branchlets densely tomentose; latex milky white, turning into light yellow when exposed to air. Leaves decussate opposite, elliptic or elliptic-rotund, 2.5-16.8 × 1-9.8 cm, subtruncate at base, undulate with a ciliate margin, abruptly acute at apex, rusty pubescent above, rusty tomentose beneath; nerves 3 or 4 pairs, densely hairy at nerves, especially below; petioles terete, up to 4.2 cm long, 2-4 mm across, rusty tomentose. Flowers numerous in umbellate cymes, flowered, each c. 4 × 5 mm; peduncles arising from in between petioles nearer to one of them on dorsal and ventral surfaces; terete, rusty tomentose; primary axes up to 1.5 × 0.12 cm; secondary axes if present up to 0.5 × 0.1 cm; pedicels up to 5 × 1 mm long; bracts ovate, c. 0.8 × 0.6 mm, ciliate at margin, acute at apex, rusty tomentose. Calyx 5-lobed, divided up to base; lobes ovate, c. 2.2 × 1.4 mm, entire and ciliate at margin, obtusely rounded at apex, rusty tomentose. Corolla yellow, campanulate, c. 4 mm long, corolla tube 1.9 mm long; lobes 5, triangular-ovate, contorted in bud, c. 1.7 × 1.2 mm, ciliate at margin, bluntly acute at apex. Corona coralline, creamish white, uniseriate,

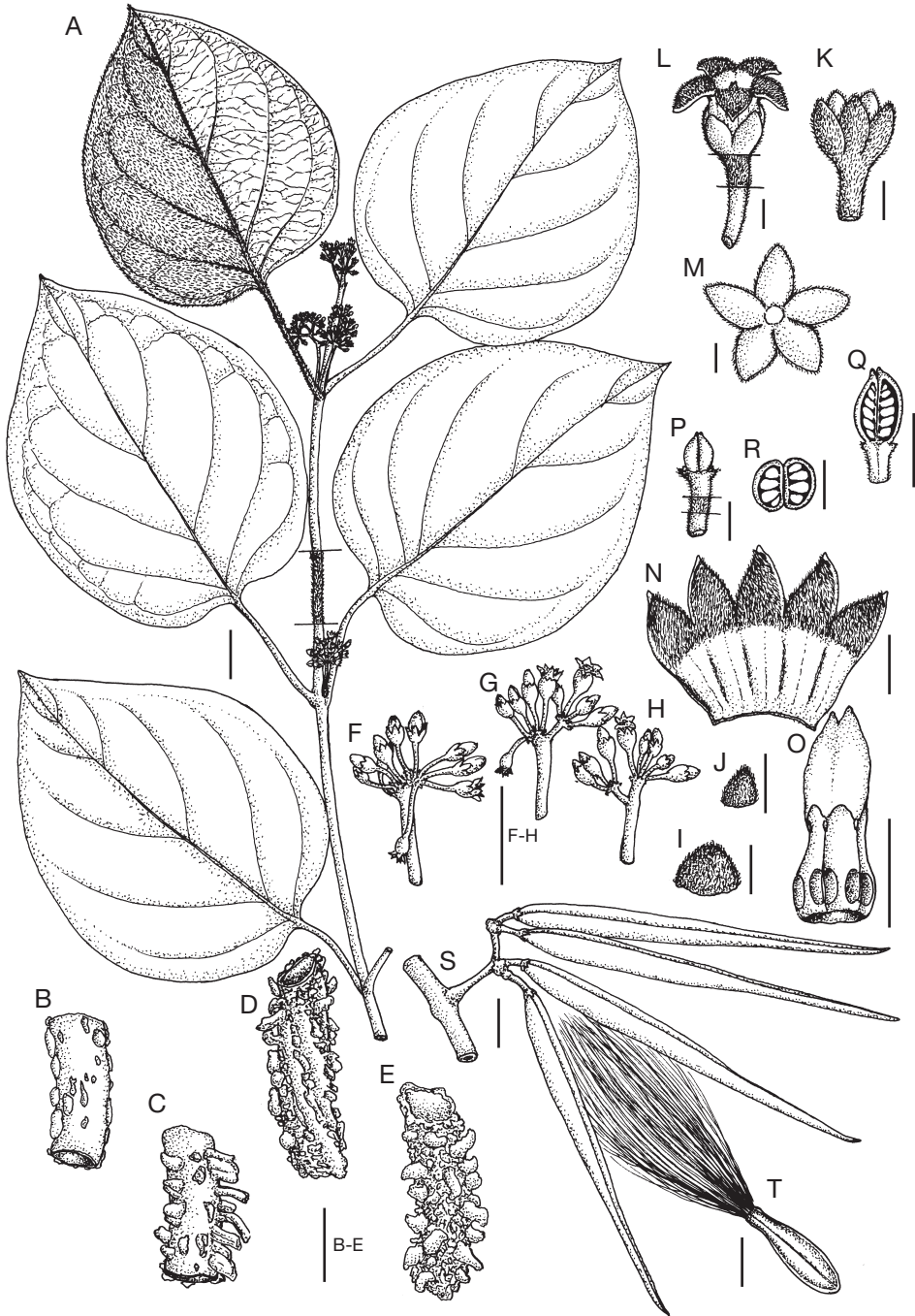


FIG. 1. — *Gymnema kollimalayanum* A. Ramachandran & M.B.Viswan.: **A**, habit (flowering twig); **B-E**, portions of stem enlarged showing development of warty outgrowths in different stages; **F-H**, parts of inflorescence showing different types of floral arrangements; **I**, dorsal view of bract; **J**, ventral view of bract; **K**, calyx; **L**, flower; **M**, dorsal view of corolla; **N**, corolla split open without coralline corona; **O**, part of coralline corona; **P**, ovary; **Q**, longitudinal section of ovary; **R**, transverse section of ovary; **S**, follicles; **T**, seed with coma. A-R, Ramachandran 912; S, T, Ramachandran 928. Scale bars: A, 15 mm; B-H, S, 10 mm; I-R, 1 mm; T, 5 mm.

TABLE 1. — Characters to distinguish *Gymnema kollimalayanum* A. Ramachandran & M.B.Viswan., sp. nov., from *G. hirsutum* Wight & Arn.

Characters	<i>G. kollimalayanum</i>	<i>G. hirsutum</i>
Leaves	elliptic or elliptic-rotund, 2.5-16.8 × 1-9.8 cm, subtruncate at base, abruptly acute at apex	broadly ovate, 2.3-7.5 × 1.3-5.0 cm, rounded or cordate at base, acute or acuminate at apex
Petioles	up to 4.2 cm long, 2-4 mm across	up to 1 cm long, 1-1.5 mm across
Primary axes	up to 1.5 × 0.12 cm	up to 0.5 × 0.15 cm
Secondary axes	if present up to 0.5 × 0.1 cm	absent
Pedicels	up to 5 × 1 mm long	up to 3 × 0.5 mm long
Calyx lobes	ovate, c. 2.2 × 1.4 mm	elliptic-lanceolate, c. 2 × 1 mm
Corolla lobes	triangular-ovate	ovate
Follicles	6.5-8.5 × 0.9-1.0 cm, rusty pubescent	4-6.2 × 0.6-0.7 cm, glabrous
Seeds	oblong-lanceolate, 12-14 × 3-4 mm, c. 1 mm wide margin	ovate-oblong, 5.0-8.7 × 2.5-3 mm, c. 0.5 mm wide margin
Coma	3-4 cm long	1-2 cm long

5-lobed, processes c. 1.8 mm long, gibbous, conical with bluntly acute apex, adnate to mouth of corolla tube, alternating with lobes; ridges of corona fleshy, protruding out of mouth of corolla tube, glabrous. Stamens 5, c. 1 mm long; anthers with membranous appendage; pollinia 5; pollen masses solitary in each anther cell, yellow, waxy, ascending, 60-76 × 74-80 µm, attached by light brown caudicle c. 29 µm long, c. 10 µm wide to dark brown corpuscle 20-29 µm long and 8-10 µm wide. Gynostegium c. 1.5 mm long; stigma conical, 5-angled, much exerted beyond anthers. Follicles in pairs, linear-lanceolate, 6.5-8.5 × 0.9-1.0 cm, apex with blunt tips, rusty pubescent. Seeds many, oblong-lanceolate, 12-14 × 3-4 mm, dark brown with papery light brown, c. 1 mm wide margin; coma silky white, c. 4 cm long.

#### DISTRIBUTION

A strict endemic of the Kollhills in Namakkal District of Tamil Nadu State in the Eastern Ghats of Peninsular India.

#### HABITAT AND ECOLOGY

This species is a giant twining shrub and occurs in shola of the semi-evergreen forest type at depressed localities where microclimate, aspect and altitude influence edaphic factor. Minerals are rich such as nitrogen (N)-595, phosphorus (P)-29 and potassium (K)-193 per kg/ha<sup>-1</sup> where carbon status is estimated as 161.67 of biomass carbon and 184.00 of soil carbon per t/ha<sup>-1</sup> (Ramachandran *et al.* 2007). Such localities

consist of both deciduous and evergreen elements. Several tree species, including *Neolitsea scrobiculata* (Meissn.) Gamble, *Callicarpa tomentosa* (L.) Murr., *Gmelina arborea* Roxb., *Ficus microcarpa* L.f., *Cannarium strictum* Roxb., *Myristica dactyloides* Gaertn., *Pterocarpus marsupium* Roxb., *Litsea deccanensis* Gamble, shrubs of *Stenosiphonium parviflorum* T.And., *Pilea melastomoides* (Poir.) Bl., *Murraya paniculata* (L.) Jack, subshrubs of *Plectranthus coleoides* Benth. and *Justicia betonica* L., herbs of *Scleria lithosperma* (L.) J.Sw. var. *lithosperma* and *Eranthemum capense* L. var. *capense*, climbers of *Aristolochia tagala* Cham., *Jasminum angustifolium* (L.) Willd. var. *sessiliflorum* (Vahl) P.S.Green, *Dioscorea oppositifolia* L. var. *oppositifolia*, *Ipomoea nil* (L.) Roth, *Naravelia zeylanica* (L.) DC., *Tetrastigma leucostaphylum* (Dennst.) Alston, *Sageretia parviflora* (Klein) G.Don and *Cissus repens* Lam., as well as the epiphytes of *Peperomia dindigulensis* Miq. and *Procris crenata* Robinson and the parasite *Helicanthus elastica* (Desr.) Danser.

#### PHENOLOGY

Flowering in July to September; fruiting in October and November.

#### CONSERVATION STATUS

We assess the conservation status of the species as vulnerable (VU) based on the field observations made between 2001 and 2008 as it falls under A4 population reduction of >30% by (a) direct observation, and (c) a decline in area of occupancy (AOO), extent of

occurrence (EOO) and/or habitat quality as defined by Standards and Petitions Working Group (2006).

#### RECOMMENDATIONS

Supporting research: life history studies; is population and habitat viability assessment recommended: population ecology; management: genome resource banking, wild population management.

#### ETYMOLOGY

*Gymnema kollimalayanum* is named after the type locality "Kollimalai" (*malai* means hill in Tamil language).

#### REMARKS

Though *G. kollimalayanum* A. Ramachandran & M.B.Viswan., sp. nov. closely resembles *G. hirsutum* Wight & Arn., differs by the distinguishing characters shown in Table 1.

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