

ORIGINAL ARTICLE

A New Species of *Desmodium*, *Desmodium Helicocarpa* Abdul Kader From The Southern Western Ghats (Kerala) Of India – An Addition To Fabaceae

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ABSTRACT

The genus *Desmodium* Desv. (Fabaceae) comprises of about 280 species found in the tropical, subtropical and temperate regions of Africa, Central and South America, East Asia and Oceania. Of these, 32 species (including 3 exotic species) are found in China. In India, it is represented by about 47 species, 7 subspecies and 5 varieties (including some exotic species). It was during the survey of *Desmodium* species in Kerala and Tamil Nadu, I have found one interesting *Desmodium* specimen from Kerala in the deciduous forests. When checked with the literature it is new and not reported anywhere from the world, till date. Hence, taxonomical data were recorded, herbarium was prepared, and photographs were taken. This is the first report on the distribution of this species in Kerala and thus the present discovery is phytogeographically very significant. This new species can be differentiated from the rest of the *Desmodium* species by its spring-like 5-6-jointed lomentum, terete hairy stems, 1 to pinnately trifoliolate stipellate chartaceous leaves on the same plant with long-petiolulate larger elliptic to obovate or oblong-elliptic or orbicular mucronate terminal leaflet, and smaller shortly-petiolulate oblong-elliptic mucronate side leaflets; all leaflets scabrous above and pubescent below with prominently raised nerves; terminal branched long raceme of about 32.5 cm long; persistent prominently punctate calyx, hairy outside with gland-tipped hairs; pink or rose-coloured pedicellate flowers in pairs on the scabrous and prominently gland-tipped hairy peduncle; pedicel filiform, prominently ciliate with gland-tipped hairs; sub-orbicular veined standard petal with two yellowish patches one each on either side at the base; diadelphous stamens (9+1) with rose-coloured staminal-tube; lomentum joints orbicular, and disc-like.

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INTRODUCTION

The genus *Desmodium* Desv. is belonging to the subtribe *Desmodiinae* of the tribe *Coronilleae* within the subfamily *Papilionoideae* of Fabaceae family. It is, generally, characterized by erect shrub or undershrub habit, alternate tri- to uni-foliolate leaves, terminal and axillary racemose or paniced inflorescence and hairy compressed lomentum fruits. There are about 280 species [but according to Hutchinson (1969) about 300 species], found mainly in humid to sub-humid regions of the tropics and subtropics [1], on acid soils (pH < 6.5) in Africa, Central and South America, East Asia and Oceania; however, some species occur in temperate regions also. Since the botanical names of some species were altered and shifted to some other genera, there is a wide variations in total number of species. *Desmodium* has been divided into seven genera such as *Codariocalyx*, *Dendrolobium*, *Desmodium* s.s., *Dicerma*, *Hegnera*, *Phyllodium* and *Tadehagi*. The centre of origin of the genus is South-East Asia. The highest species diversity is found from India eastward to western and south-western China and Malaysia. Mexico is the second centre of diversity.

It is represented by about 50-60 species in India [5], which includes about 47 species, 7 subspecies and 5 varieties (including some exotic species). In Hooker's *Flora of British India* (1879), 49 species were

recorded. Of these 24 species viz., *Desmodium triangulare* (Retz.) Merr. [= *D. cephalotes* (Roxb.) Wall. ex Wight & Arn.], *D. pulchellum* Benth., *D. biarticulatum* Benth., *D. brachystachyum* Grah., *D. laxiflorum* DC. [= *D. recurvatum* (Roxb.) Graham ex Wight & Arn.], *D. velutinum* (Willd.) DC. [= *D. latifolium* (Roxb. ex Ker.) DC.], *D. zonatum* Miq. [= *D. ormocarpoides* Baker], *D. laxum* DC. [= *D. podocarpum* var. *laxum* (DC.) Baker, *D. gardneri* sensu Baker], *D. dolabriforme* Benth., *D. repandum* (Vahl) DC. [= *D. scalpe* DC., *D. strangulatum* Wight & Arn.], *D. triquetrum* DC., *D. gangeticum* (L.) DC. [= *D. collinum* Roxb.], *D. pryonii* DC. [= *D. wightii* Graham ex Wight & Arn.], *D. rufescens* DC. [= *D. ferrugineum* Wall. ex Thw. ssp. *ferrugineum* Ohashi], *D. ferrugineum* Wall. ex Thw. ssp. *wynaadense* (Bedd. ex Gamble) Ohashi [= *D. wynaadense* Bedd. ex Gamble], *D. polycarpum* (Poiret) DC. [= *D. patens*, *D. heterocarpon* (L.) DC.], *D. polycarpum* var. *trichocaulan* Bak., *D. styracifolium* (Osbeck) Merr. [= *D. retroflexum* (L.) DC.], *D. triflorum* (L.) DC. [= *D. triflorum* (L.) DC. var. *minus* Wight & Arn.], *D. heterophyllum* (Willd.) DC. [= *D. triflorum* (L.) DC. var. *majus* Wight & Arn.], *D. alysicarpoides* van Meeuwen [= *D. parviflorum* (Dalz.) Baker], *D. microphyllum* (Thunb.) DC. [= *D. parvifolium* DC.], *D. oojeinense* (Roxb.) Ohashi [= *D. oojeinensis* Roxb.], *D. scorpiurus* (Sw.) Desv., *D. tortuosum* (Sw.) DC., *D. laburnifolium* DC. and *D. motorium* (Houtt.) Merr. [= *D. gyrans* (L. f.) DC.] have been reported in South India (Gamble and Fischer, 1935). The usual habitats are open woodland and forest clearings. In equatorial regions, it is found from sea-level up to 3000 m altitude.

Desmodium is predominantly a self-pollinating crop and is easily naturally regenerated from seeds. A considerable number of species are used as pasture and fodder crops, and for ground cover and green manure. Few species have a number of traditional medicinal uses. In South-East Asia, they are considered diuretic (e.g. *D. gangeticum*, *D. repandum* and *D. styracifolium*); other prominent uses are the treatment of diarrhoea, dysentery and stomach-ache (e.g. *D. diffusum*, *D. gangeticum*, *D. heterophyllum* (Willd.) DC., *D. triflorum* and *D. velutinum*), wounds, ulcers and other skin problems (e.g. *D. gangeticum*, *D. triflorum* and *D. sequax*), stones in the gall bladder, kidneys or bladder (e.g. *D. gangeticum* and *D. styracifolium*) and headache, toothache or other pains (*D. gangeticum*, *D. microphyllum*, *D. ormocarpoides*, *D. sequax*). In the Philippines, a decoction of *D. triflorum* is used as a mouthwash and as an expectorant. In India, fresh leaves of *D. triflorum* are used internally as a galactagogue; and in Taiwan, the whole plant is used against fever, rheumatism, jaundice and gonorrhoea. *D. auricomum* Grah. ex Benth. and *D. caudatum* (Thunb. ex Murray) DC. are reportedly used in local medicine in Indo-China, but no specific uses are mentioned. In Central America, *D. incanum* is used as a diuretic, stomachic, febrifuge and hemostatic. *D. heterocarpon* (L.) DC. and *D. heterophyllum* are primarily forages, but are also used medicinally in Malaysia. The boiled roots of *D. heterocarpon* are used in Malaysia to poultice sore breasts, and a decoction of the plant is regarded as a tonic and a bechic; *D. heterophyllum* is applied to treat sores, ear-ache, stomach-ache and abdominal complaints. In Cambodia, the stems of *D. heterocarpon* subsp. *angustifolium* H. Ohashi are applied to fractures and snake bites. In Taiwan, a decoction of the *D. heterocarpon* subsp. *angustifolium* H. Ohashi roots is used against rickets in children; and *D. renifolium* is used as a febrifuge. In India, the roots of *D. heterophyllum* are considered carminative, tonic and diuretic, the leaves are used as a galactagogue, and a decoction of the whole plant is used to treat stomach-ache and abdominal problems. *D. gangeticum*, locally known as 'Orila' (in Malayalam) or 'Orilai' (in Tamil) is commonly used in Ayurveda and Siddha systems of medicine.

***Desmodium helicocarpa* Abdul Kader**

Habitat: Moist and dry deciduous forests of Kerala. **Habit:** An erect branched undershrub with terete hairy stems, attaining 1-2.5 m height or more. **Leaves:** stipulate (stipule linear with triangular base, green, adnate to the stem), petiolate (petiole tomentose, 2.5 cm long, pulvinate at base), alternate, 1 to pinnately trifoliate on the same plant, entire; leaflets 1-3, chartaceous, stipellate (stipels 2 at each leaflet, 0.4 cm long), petiolulate, upper surface scabrous and lower surface pubescent, reticulately veined, nerves prominently raised below; if 3-foliate terminal leaflet larger, long-petiolulate (petiolule tomentose, 0.4 to 1.5 cm long), elliptic to obovate, mucronate, and side leaflets smaller, shortly-petiolulate (petiolule tomentose, 1 to 2 mm long), oblong-elliptic, mucronate; if unifoliate petiole up to 1.5 cm long, elliptic or oblong-elliptic or orbicular, mucronate; **Inflorescence:** terminal and in the upper leaf axils, branched long raceme, about 32.5 cm long; peduncle scabrous with prominent gland-tipped hairs; flowers in pairs on the peduncle. **Flowers:** buds ventricose, small, pink or rose-coloured, pedicellate (pedicel filiform, sub-erect, 4 mm long, prominently ciliate with gland-tipped hairs); bracts 2, small, mid-veined, ovate acuminate, 4 mm long, ciliate outside; bracteole 1, pale-green, broadly ovate or sub-orbicular (0.5 cm long x 0.4 cm broad), awned (awn 2 mm long), 0.7 cm long x 0.4 cm broad, ciliate outside and smooth glabrous inside, caducous. **Calyx:** hyaline, 5-lobed ($2/3$), prominently punctate hairy outside with gland-tipped hairs and smooth inside, persistent; upper two lobes united but bifid at tip, 2.5 mm long, covering the

standard petal, lateral two lobes 3 mm long, covering the wing petals and lower lobe 3.5 mm long covering the keel petals. **Corolla:** pink or rose-coloured, papilionaceous; standard petal sub-orbicular, veined, two yellowish patches one each on either side at the base, extreme base white, acute at tip and emarginate at base, 0.6 cm long x 0.7 cm broad; wing petals deep pink or rose coloured, obovate-obtusate, 0.4 cm long x 0.2 cm broad; keel petals boat-shaped, whitish, 0.5 cm long. **Androecium:** stamens diadelphous (9+1), staminal-tube rose-coloured, 0.6 cm long, 9 clefted at the tip, cleft white, each 1 mm long; single stamen filament 0.6 cm long. **Gynoecium:** ovary superior, stipitate, spring-like, minute, many ovuled; style 8 mm long, exerted (2 mm above the staminal-tube), white coloured. **Fruit:** stipitate (stalk curved, ciliate, 0.4-0.5 cm long, strong), lomentum coiled like a spring, jointed (4-6 joints but mostly 5-6, orbicular, disc-like), 0.4-0.7 cm long (usually 0.6 cm), indehiscent, with persistent calyx. **Seeds:** small, slightly reniform, and compressed.

Phenology: Flowering period short, about one-month only, during November-December. Fruiting during December-January.

Etymology: Since the pod (*i.e.* lomentum) is spring-like, the specific epithet is named as '*helicocarpa*'.

Type Locality: Karumathra, in Peechi-Vazhani Wildlife Sanctuary (Pattikkad Range, Thrissur Division).

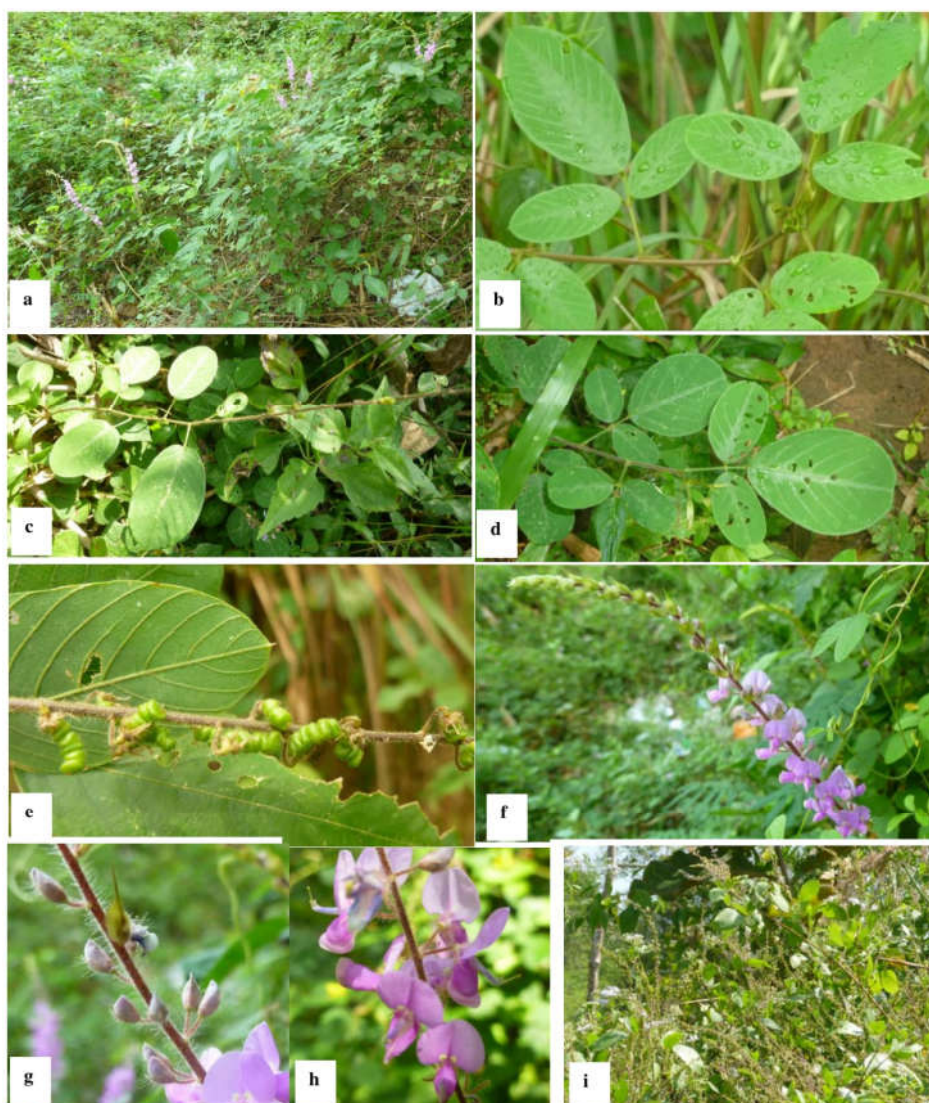


Fig. 1. *Desmodium helicocarpa* Abdul Kader. a) Habit; b & d) Trifoliate leaves; c) Unifoliate leaves; e) Leaf under surface; f) Inflorescence showing bracts; g) Flower buds; h) Opened flowers showing stamens, style and stigma; i) Gregarious fruiting



Fig. 2. *Desmodium helicocarpa* Abdul Kader. a) Inflorescence with flowers and developing fruits; b) Fruits; c) Fruits close up; d) Mature fruits joints separated; e) Seeds

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