

## Species

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# New Distribution Record of *Desmanthus virgatus* (L.) Willd. (Fabaceae) from Kachchh District, Gujarat, India

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## ABSTRACT

*Desmanthus virgatus* (L.) Willd., a tropical American legume widely introduced as fodder and a soil-improving plant, is recorded for the first time from the Kachchh district, Gujarat. We recorded the species from Sharad Baug Palace and Gujarat Institute of Desert Ecology (GUIDE). Several plants at different growth stages, including seedlings and fruiting ones, were noticed. The species is self-sustaining, with a healthy regenerating ratio in the population. Previous Literature show the species distribution from Gujarat, but no record has been found from the Kachchh district. Therefore, with this article, we report this species as an addition to the Kachchh flora. The voucher specimen was deposited in the herbarium of GUIDE, Bhuj.

**Keywords:** *Desmanthus virgatus*, Fabaceae, New record, Kachchh, Arid region flora

## 1. INTRODUCTION

The family Fabaceae includes numerous species that have been introduced for fodder production, pasture improvement, and soil enrichment (Cooke, 1903; Santapau, 1962; Shah, 1978). Several legumes have demonstrated the ability to escape cultivation and establish in disturbed habitats, particularly in semi-arid regions. The Kachchh district located in the western part of Gujarat, India. The Kachchh district reparents one of the largest arid and semi-arid regions of the country. The Kachchh region has temperature fluctuations extremely, high evaporations rates, low rainfall, and soils are mostly saline, alkaline, sandy or rocky. Though having such challenging environmental conditions, Kachchh district holds an impressive diversity in floral composition. Patel et al., (2011) recorded 124 total plant species from the Kachchh district. The vegetation is largely composed of xerophytic shrubs, grasses, and ruderal herbs adapted to disturbed habitats.

During floristic survey in Bhuj City of Kachchh, a mimosoid legume belonging to the Fabaceae was observed growing spontaneously in the open ground from two locations. With help of detailed morphological examination via pervious published literatures, the collected specimen was identified as *Desmanthus virgatus* (L.) Willd. The *Desmanthus* Willd. genus Comprise approximately 25 species which is

distributed across subtropical and tropical regions of the Americas (POWO, 2025). In India, only a single species of *Desmanthus* Willd. which is *D. virgatus* exists, it has been widely introduced and cultivated as a fodder plant (Hooker, 1876–1897).

Documentation of newly occurring plant species in this region is important, as some introduced species may successfully establish and spread under suitable environmental condition.

*D. virgatus* is native to tropical America and is cultivated widely in subtropical and tropical regions as fodder and soil-improving plants. It is commonly grown in grazing lands due to its nitrogen-fixing ability and tolerance of dry condition. In several tropical regions, the species reported to establish in disturbed habitats, and escape from cultivation indicating its potential for naturalization under favorable conditions. It reported that inclusion of *D. virgatus* up to 50% as a replacement for concentrate in goat diets improves growth performance and increases net profit. Additionally, adding *Vachellia nilotica* pods (up to 5%) to *D. virgatus* makes it more nutritious, showing that it can be useful in many ways as a fodder source (Sarkar et al., 2022). Because of high nutritious, it is good alternative protein source for ruminants. The plant is easy to digest with crude protein content of about 19.71% of which about 83.7% is digestible protein (Karangiya et al., 2025). Using it in livestock feeding has been shown to increase milk production and lower feeding costs.

In Gujarat, the species is predominantly associated with cultivated fields. Although it has been previously reported from Ahmedabad and South Gujarat (Parmar, 2015; Karangiya et al., 2025), its occurrence in the Kachchh district is reported here for the first time. As documenting newly occurring plant species in this region is important, as some introduced species may successfully establish and spread under suitable environmental conditions.

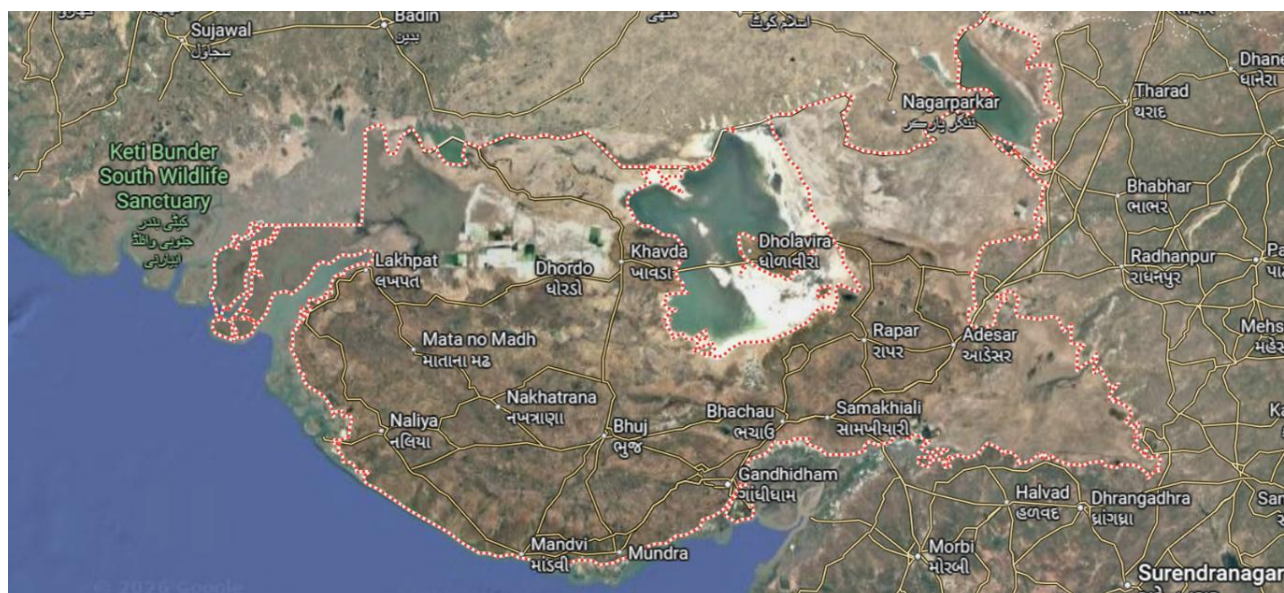
However, the present study documents its occurrence outside cultivation, in open and disturbed habitats, including wasteland. It indicates its adaptability to extreme conditions and its ability to survive in an arid ecosystem. The establishment of *D. virgatus* to establish outside cultivation, while maintaining its nutritional value, shows its dual role as a retaining its naturalizing species and a valuable fodder resource in tolerant region.

## 2. MATERIAL AND METHODS

### Study area

The collection site is in Bhuj city, Kachchh district, Gujarat, India (Figure 1). It falls within an arid climatic zone. The terrain of the area of study is flat, with dry open ground and sandy to compact soils. Natural vegetation in the area of study is scanty and mostly comprises grasses and herbaceous weeds.

The plant observed from two locations within the Bhuj: Sharad Baug Palace and the campus of the Gujarat Institute Desert Ecology (GUIDE). At both sites, plants individuals recorded growing on unmanaged patches, rather than in planted beds, hedges, or irrigated garden spaces.



**Figure 1.** Map of Kachchh district, Gujarat, India. Source: Google Maps (2025).



**Figure 2.** *Desmanthus virgatus* (L.) Willd. **a.** Flowering twig, **b.** Bipinnate leaves adaxial side, **c.** Bipinnate leaves abaxial, **d.** stem node with stipules and annular gland, **e.** flower buds, **f.** globose heads (capitulum) inflorescence, **g.** male flower, **h.** Sterile flower, **i.** Bisexual flower, **j.** Sepals, **k.** petals, **l.** stamen, **m.** pistil, **n.** young legume fruit, **o.** mature legume fruit, **p.** seeds arrangement, **q.** seeds (Photos by R. S. Thacker & R. A. Poptani).

### Collection and Identification

A voucher specimen (Accession no. 2507) was prepared by following the standard methodology and deposited in the herbaria of the Gujarat Institute of the desert ecology (GUIDE), Bhuj.

## 3. RESULTS & DISCUSSION

### Taxonomic Account

*Desmanthus virgatus* (L.) Willd., Sp. Pl. 4: 1047, 1806; Baker in Hook. f. Fl. Brit. Ind.2: 290, 1878, Woodrow in JBNHS 11: 428, 1897; Cooke, Fl. Press. Bombay 1: 456, 1903; Almeida, Fl. Maharashtra; 2: 217, 1996–2009.

*Mimosa virgata* L., Sp Pl, 519, 1753.

*Mimosa anqustifolia* Lamk., Encyclop. 1: 10, 1783.

*Acacia virgata* Gaertn., fruct. 2: 317, t. 148, 1793

Erect or decumbent glabrous herb or subshrub, 0.5–3 m tall. Branches long, slender, ribbed. Leaves 4–4.5 cm long, bipinnate, alternate, Stipules subulate, 0.3–0.5 cm long; 2 cm long Petiole; Pinnae 2–4 pairs; Rachis 1–4 cm long, pubescent, with an annular large gland at the base of the petiole; Leaflets opposite, 9–20 pairs, 0.3–0.5 cm long, oblong, oblique. Flowers in globose heads (capitulum), white to pale yellowish-white, sessile, 0.2–0.7 cm long, actinomorphic, bisexual flower, male or sterile; peduncle 2 cm long; bracts cuspidate; sepal 0.2–0.3 cm long, gamosepalous, glabrous with white margin; petal oblanceolate, 0.5–0.8 cm long white in colour, gamopetalous; 10 stamens or 10 staminodes 0.6–0.7 cm long; Style 0.6–0. cm long, expanded apically into a truncate stigma 0.3 cm long; ovary sessile, glabrous. Fruit pods, linear, compressed, 5–7 × 0.2–0.3 cm, young fruit green and mature fruit brown. Seed 15–21 per pod, non-endospermic, oblong to oval, slightly compressed, 0.1 cm long, red or brick red, smooth glabrous; hilum clearly visible; a distinct oval on one side, slightly darker than the surrounding. (Figure 2).

*Flowering and fruiting*: year-round.

*Habitat*: Growing on open, disturbed soil patches in unmanaged ground.

### Specimen examined

India, Gujarat, Kachchh district, Bhuj taluka, Sharad Baug, 27 December 2025, 23.252224° N, 69.658911° E, 106 m., R. S. Thacker 2507, GUIDE1032 (Herbarium GUIDE). GUIDE campus, 23.218317° N, 69.656437° E, 136m., R. S. Thacker 2507, GUIDE1033 (Herbarium GUIDE).

*D. virgatus* reported in India in agronomic and animal husbandry research because of its value as a high-protein fodder crop. Previous researches from Tamil Nadu have demonstrated the forage potential of *D. virgatus* and it highlighting its importance as a valuable fodder species (Gawali & Bhashkar, 1994).

Despite these reports from different parts of India, a review of available floristic literature and regional plant records did not reveal the occurrence of *D. virgatus* in the Kachchh district of Gujarat. In Gujarat, the species has been mentioned mainly as a cultivated fodder plant (Parmar, 2015).

## 4. CONCLUSION

The study documents the occurrence of *D. Virgatus* from Kachchh district of Gujarat. Furthermore, surveys and studies are required to understand the distribution and establishment of the species in region.

### Author contributions

Ruchika S. Thacker carried out field surveys, collected plant specimens, performed plant dissection and morphological examination, and prepared the manuscript. Rashmi S. Yadav contributed to interpretation of morphological characters and critically revised the manuscript. Santosh Yadav contributed in specimen identification and manuscript preparation. Rakesh A. Poptani and Vivek Chauhan contributed to plant dissection and morphological examination, and provided supervision, technical guidance, also reviewed the manuscript for scientific accuracy. All authors read and approved the final manuscript.

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### Conflict of Interest

The authors declare that they have no conflicts of interest, competing financial interest or personal relationship that could have influenced the work reported in this paper.

### Informed consent

Not applicable.

### Ethical approval & declaration

In this article, as per the plant regulations followed in the Department of Botany, St. Xavier's College (Autonomous), Ahmedabad, Gujarat, India; the author observed the new distribution record of *Desmanthus virgatus* (L.) Willd. (Fabaceae) from Kachchh District, Gujarat, India. The ethical guidelines for plants & plant materials are followed in the study for species collection, identification & experimentation.

### Data and materials availability

All data associated with this study are present in the paper.

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