



TAXONOMIC CHARACTERIZATION OF TWO SPECIES OF THE GENUS *SESBANIA* (FABACEAE) FROM THE STATE OF PUNJAB, INDIA

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ABSTRACT

Present study is conducted in the district Faridkot, Punjab India during paddy season in the year 2023. Two species of the genus *Sesbania* viz. *S. sesban* (L.) Merr. and *S. bispinosa* (Jacq.) W. Wight. are collected from the study area. *Sesbania bispinosa* is a weed species of different kharif crops such as rice, maize, sorghum and cotton. *Sesbania sesban* is generally grown as a green manure crop in the study area. Morphological parameters (stem, leaf, flower, androecium, gynoecium, fruit, seed, etc.) of these species were examined for proper identification. Present findings will be useful for researchers, botanists, ethnobotanists accurate identification of *Sesbania* species.

KEY WORDS- *Sesbania*, weed, taxonomy, flower, botany, Faridkot, Punjab

INTRODUCTION

Genus *Sesbania* is a member of family Fabaceae with about 60 species which consists of annuals, perennials, herbs, shrubs and trees (Evans, 1990). Papilionaceous corolla, smooth to hairy stem, green to light green leaflets and long and narrow pods, small brown to black colour seeds are the important feature of the genus *Sesbania*. According to Heering, (1995) each species of genus *Sesbania* possess the unique features.

So many taxonomic tools available for identification and classification of organisms such as morphology, cytology, palynology, phytochemistry, molecular biology etc. But according to Singh and Sidhu (2022), morphology is a simple and classical tool used for identification of plants. Therefore morphological parameters are consider for identification two *Sesbania* species during present investigation.

Legume species plays a vital role in reforestation of any area (Curasson, 1956) (Bashan *et al.*, 2012). Keeping this in view present study was planned for documentation and taxonomic characterization of two species of the genus *Sesbania* from the state of Punjab, India.

MATERIALS AND METHODS

Study Area

Punjab state is agricultural state which is situated in northern Part of India. Geographically it is divided in to three zones (Majha, Malwa and Doaba). Present study was conducted in district Faridkot (Malwa) during the year 2023.

Collection, morphological study and identification

Regular field visits were conducted for documentation and collection of research material. Morphological features such as plant height, stem (colour and nature), Leaf (colour and size), Flower (colour and size), fruit (size) and seed (size) were studied for identification. Photographs of habitat and morphological parameters were also clicked. Available literature (Hooker, 1872-1897; Bamber, 1916; Nair, 1978; Singh and Sidhu, 2022) was also consulted for proper identification.

Herbarium specimens were submitted to the Herbarium, Biology Lab, Sangat Sahib Bhai Pheru Khalsa Senior Secondary School, Faridkot, Punjab (KSF-118,119,120,121).

RESULTS AND DISCUSSION

Both species of genus *Sesbania* (*S. sesban* (L.) Merr. and *S. bispinosa* (Jacq.) W. Wight. collected from district Faridkot (Punjab) during paddy season in the year 2023. *S. bispinosa* documented from paddy crop fields as a weed species whereas *S. sesban* as a green manure



crop. *S. sesban* also grown as a fuel crop in the study area. Various morphological features such as stem, leaf, flower, fruit, seeds *etc.* were studied for identification (Table no. 1.) (Fig.1 and Fig.2). *S. sesban* is differentiated from *S. bispinosa* on the basis of nature and color of stem, flower *etc.* Stem is pinkish red in *S. sesban* but green in *S. bispinosa*. *S. bispinosa* possesses spines whereas spines are absent in *S. sesban*. Flower is light yellow and dark yellow in *S. bispinosa* and *S. sesban* respectively.

Chanda *et al.* (2021) identified four species of genus *Sesbania* (*S. cannabina*, *S. bispinosa*, *S. sesban*, *S. sastrata*) on the basis of morphological features from Bangladesh. Singh and Sidhu (2022) documented *Sesbania bispinosa* as a weed species from different kharif crops from the state of Punjab and suggested this species possess 2n=12 chromosome number. Bradbury (1990) also advised that some wild leguminous plants are generally mixed with agricultural crops as a weed species. Recently, Negawo *et al.* (2023) also studied genetic diversity and population structure of *Sesbania sesban*. They collected about one hundred and seventy one accessions of *S. sesban* from different parts of the world.

Table.1. Morphological detail of *Sesbania* species.

S. No.	Character		<i>S. bispinosa</i>		<i>S. sesban</i>	
			Range	Mean	Range	Mean
1.	Height		15cm - 8Ft	6 Ft	25cm - 12 Ft	9 Ft
2.	Stem	Colour	Green		Pinkish red	
		Nature	Spines present		Spines absent	
3.	Leaf	Colour	Light green		Dark green	
		Length	5cm - 25cm	17cm	7cm - 34cm	21cm
4.	Leaflet	Colour	Light green		Dark green	
		Length	1cm - 2.3cm	1.59cm	1.6cm - 3.5cm	2.7cm
5.	Flower	Colour	Light Yellow		Dark Yellow	
		Length	1cm - 1.1cm	1.4cm	1.2cm - 1.6cm	1.4cm
6.	Pedicle	Length	5mm - 7mm	6mm	3mm - 6mm	4.4mm
7.	Fruit	Nature	Pod		Pod	
		Length	4cm - 14cm	11.1cm	6cm - 23cm	11.9cm
8.	Seed	Length	2mm - 4mm	3.5mm	2mm - 4mm	2.8mm
9.	Herbarium Sheet Number (KSF)		118 - 119		120 - 122	

CONCLUSION

Sesbania sesban and *Sebania bispinosa* are identified on the basis of micro morphological parameters. Findings of present study will be useful for taxonomists, researchers, botanists *etc.* for differentiation of two *Sesbania* species.

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REFERENCES

- Bamber, C. J. (1916). *Plants of the Punjab. A descriptive Key of the flora of the Punjab, North- West Frontier Province and Kashmir.* Government Printing Press, Lahore, 652pp.
- Bashan Y., Salzar, B. G., Moreno. M., Lopez, B. R., and Linderman, R. G. (2012). Restoration of eroded soil in the Sonoran Desert with native leguminous trees using plant growth promoting microorganisms and limited amounts of compost and water. *Journal of Environment Management*, 102: 26-36. <https://doi.org/10.1016/j.jenvman.2011.12.032>
- Bradbury M. (1990). The effect of water stress on growth and dry matter distribution in juvenline *Sesbania sesban* and *Acacia nilotica*. *Journal of Arid Environments*, 18(3): 325-333. [https://doi.org/10.1016/s0140-1963\(18\)30842-5](https://doi.org/10.1016/s0140-1963(18)30842-5).
- Chanda, S. C., Abdullah, M. R., Razzak, M. A and GolamSarwar, A. K. M. (2021). Morphological and Physiological characterization of *Sesbania* genotype. *Legume Research- An International Journal*, 44 (9): 1087-1091
- Curasson G. (1956). *Etudes Sur Les pâturages tropicaux.et sub-tropicaux: Legumineuses fourrageres.* Revue d'élevage et de médecine vétérinaire des pays tropicaux. Montpellier, France, 9 (4): 381-398.
- Heering, J. H. (1995). *Botanical and agronomic evaluation of a collection of Sesbania sesban and related perennial species [Thesis, p.124. Wageningen Agricultural University, Wageningen, The Netherlands.].* https://library.wur.nl/web_query/wurpubs/2999/

7. Hooker, J. D. (1872-1897). *The Flora of British India*, London. Vols I to VII.
8. Nair, N. C. (1978). *Flora of the Punjab Plains*. Botanical Survey of India, Indian Botanic Garden, Howrah. 326pp.
9. Negawo, A. T., Akinmade, H. O., Muktar, M. S., Habte, E., Assefa, Y., Muchugi, A., Sartie, A. M. and Jones, C. H. (2023). Genetic diversity Polpulation size and subset developmet in a *Sesbania seban* collection. *Plants*, 2023, 12, 13.
10. Singh, R. and Sidhu, M. C. (2022). Cytotaxonomy and Palynology study of some weed species from the state of Punjab, India. *Journal of Threatened Taxa*, 14 (4):20866-20872.

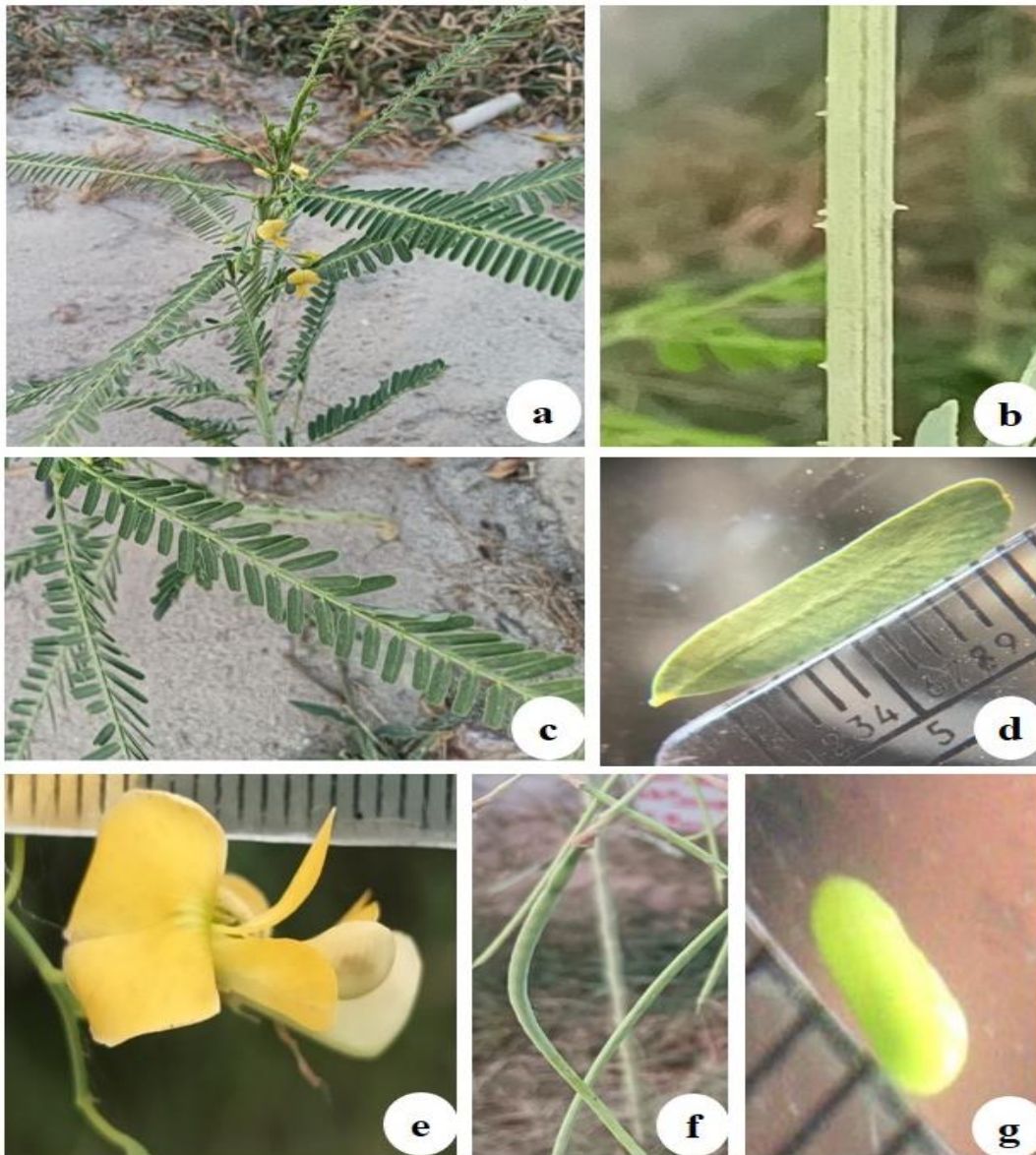


Fig.1. Morphological parameters of *Sesbania bispinosa* (a-g). a- Habit; b- Stem; c- Leaf; d- Leaflet; e- Flower; f- Fruit; g- Seed.

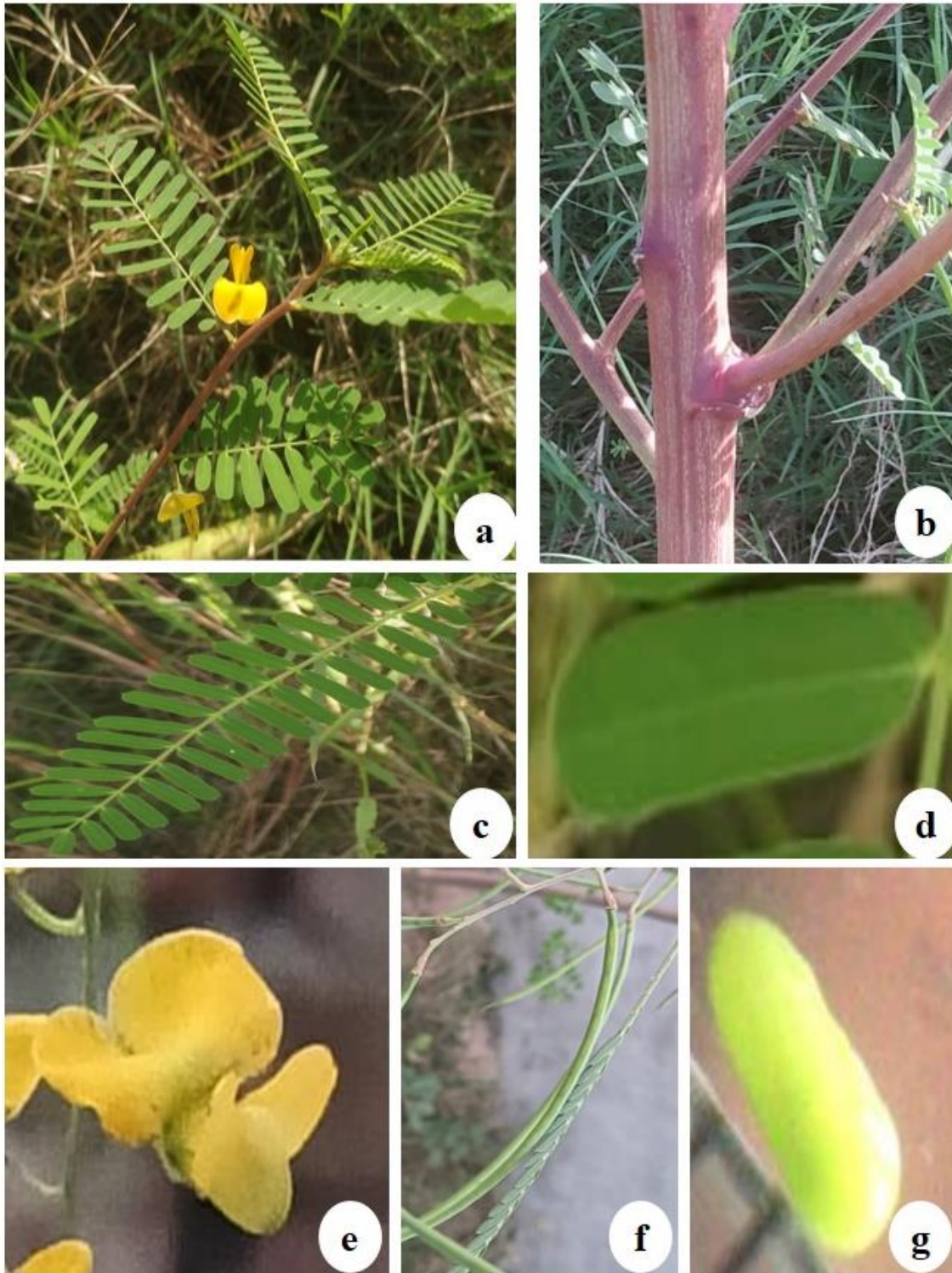


Fig.2. Morphological parameters of *Sesbania sesban* (a-g). a- Habit; b- Stem; c- Leaf; d- Leaflet; e- Flower; f- Fruit; g- Seed.