



Malva sylvestris L. (Malvaceae): A new distributional species record for Odisha and Eastern India

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ABSTRACT

The members of genus *Malva* L. (Malvaceae) are widely grown as ornamental plants due to their attractive appearance and few are edible as leafy vegetables and medicinal usage too. During the exploration for germplasm collection of minor leafy vegetable in parts of Odisha, the occurrence of an interesting plant species of mallow viz. *Malva sylvestris*, found as a weed and used as leafy vegetable by locals was explored from western part of Odisha. On critical assessment of its distribution, its natural occurrence was found to be a new genus record for the flora of Odisha and new species record for Eastern India. A detailed taxonomic description on morphology along with field photographs and economic uses are provided for ease of identification and sustainable utilization.

Key words: Eastern India, germplasm collection, mallow, *Malva sylvestris*, new species record, Odisha

INTRODUCTION

The genus *Malva*, commonly known as “mallow” of family Malvaceae is primarily native to temperate, subtropical, and tropical regions of Asia, Africa, and Europe. The genus comprises about 40 species (Mabberly, 1997), however, it is represented by 29 accepted species names and further 2 taxa of infra-specific rank (The Plant List, 2013). The genus includes both annual and perennial herbs and under-shrubs. Several species are widely grown as ornamental plants due to their showy appearance and few are edible as leafy vegetables. Bodo tribes of Northeast India and local people of Kashmir domesticate few species of *Malva* viz. *Malva parviflora*, *M. sylvestris* and *M. verticillata* as traditional cuisine or vegetable dish. Leaves and flowers of few species have been used as traditional medicine for treatment of coughs, sore throats, and gastro-intestinal tract.

Malva sylvestris L. known as “common mallow or tall mallow”, alien to Indian flora, is native to the regions of Western Europe, Northern

Africa, North-West Asia, and Iran. Over the time, it has been introduced to and naturalized in parts of Eastern Australia, Canada, Mexico, and United states as an invasive species (Hinsley, 2014). It is a tall herb with showy bright mauve purple colour flowers with dark decorative stripes, spreads itself and grows in wastelands, crop fields, fallow lands etc. It is often domesticated as an ornamental plant in gardens for its attractive flowers. However, this species has a limited distribution in India and was recorded earlier in parts of north, west and central India and not reported previously in Eastern India. However, the occurrence of *Malva sylvestris* in central table land phyto-geographical zone leads to a new genus record of *Malva* for the flora of Odisha and new species record for Eastern India.

MATERIALS AND METHODS

During the course of plant exploration and germplasm collection of minor leafy vegetable in parts of Odisha during 2014 in collaboration with ICAR-Institute of Vegetable Research (IIVR), Varanasi, Uttar Pradesh, the occurrence of an

interesting plant species of Malvaceae found as a weed in the border of a fallow field was recorded from Bargarh district of Odisha. The plant specimens bearing both vegetative and flowering parts were collected from the natural habitat and the voucher specimens were deposited in the herbarium of ICAR-National Bureau of Plant Genetic Resources (NBPGR), Base Centre, Cuttack, Odisha along with one set at the National Herbarium of cultivated plants (NHCP), ICAR-NBPGR, New Delhi. The herbarium specimens were studied

and collected specimens were compared with the images of the authentic herbarium type specimens deposited at the Royal Botanical Garden, Kew (K000914119) to confirm the identity of the plant. The seed germplasm bearing accession number IC-610775 and collection number RCM/PKS/110 were conserved in the National Gene Bank, ICAR-NBPGR, New Delhi for long term storage. The images of vegetative, flowering, and fruiting parts of the plant were presented for reference and ease of identification (Fig. 1).



Fig. 1 (a)



Fig. 1 (b)



Fig. 1 (c)



Fig. 1 (d)



Fig. 1 (e)



Fig. 1 (f)



Fig. 1 (g)



Fig. 1 (h)



Fig. 1 (i)

Fig. 1. *Malva sylvestris*: a. Natural occurrence at village Dahita in Bargarh district, Odisha, b. Regenerated population in fallow lands, c. Twig with leaves and flowers, d. Flower, e. Dried fruits, f. Herbarium specimen preserved at Base Centre, Cuttack, g. Image of the herbarium type specimen (K000914119) at Royal Botanical Garden, Kew, h. Local woman shows the use of plant, i. Woman collects leaves to prepare curry

RESULTS AND DISCUSSION

After thorough examination of vegetative and floral characters of live plants along with study on herbarium specimens and perusal of literature, the species was identified as *Malva sylvestris*, a species reported so far from some states of India (Master, 1874; Cooke, 1901; Gamble, 1915; Duthie, 1976; Nair and Henry, 1983; Chowdhery and Wadhwa, 1984; Saldanha, 1984; Sharma et al., 1984; Roy et al., 1992; Verma et al., 1993; Singh and Karthikeyan, 2000). It was observed that the species was found as an escape and as a weed in crop fields and adjoining fallow lands near village Dahita in Padampur block of Bargarh district in Odisha. On verification of major published Indian literature, it was found that it has not been reported till date from Eastern India including Odisha and Andhra Pradesh (Prain, 1903; Haines, 1921; Mooney, 1950; Deb, 1981; Guha Bakshi, 1984; Sanyal, 1994; Saxena and Brahmam, 1994; Venkata Raju and Pullaiah, 1995; Pullaiah and Chennaiah, 1997; Singh et al., 2001). Therefore, the present collection counts an addition of genus *Malva* to the flora of Odisha and forms a new distributional plant record for Eastern India. A detailed taxonomic description on morphology along with field photographs and herbarium images (Fig. 1) and economic uses of the plant are provided for easy identification and sustainable utilization.

Taxonomic description

Malva sylvestris L. Sp. Pl. 689. 1753; Mast.: In. Hook. F. Fl. Brit. India 1: 320; 1874; Gamble, Fl. Madras 1: 88 (63). 1915; Paul: In Sharma et al. (eds) Fl. India 3: 357, f. 99. 1993. *M. sylvestris* var. *maurtiana* (L.) Boiss. Fl. Orient. 1:819. 1867; Cooke, Fl. Bombay 1: 96. 1901.

Annual or perennial erect herbs or undershrub up to 90 cm height. Stem stout, terete, glabrous. Leaves up to 15 cm long including petiole; lamina 4-6 × 5-8 cm, roundish in outline, sub-orbicular, shallowly 3-5 lobed, base truncate or broadly cordate, apex obtuse, margin crenate, glabrous, minutely hairy on nerves beneath; petiole slender, up to 9 cm long. Flowers 5-10, in each axillary fascicles; pedicels up to 2 cm long. Epicalyx segments 3, small, free, ovate to oblong, 3-5 × 2.0

mm, shorter than calyx. Calyx lobes 4.0-6.0 × 3.0 mm, cupular or rotate, broadly triangular, ovate-lanceolate to oblong, connate at base, ciliate along margins, glabrescent, accrescent in fruit. Corolla rotate or infundibuliform, much longer than calyx, 3-4 cm across; petals 5, bright purple with dark pink to violet ornamented stripes, 1.5-2.5 × 1.5-2.0 cm, obovate, emarginate, clawed, bearded at base. Staminal tube ca. 3 mm long, divided at the top into antheriferous filaments, column antheriferous at apex, shorter than petals. Carpels and styles 9-12, ovary many-celled, ovule solitary in each cell, styles as many as cells, filiform; stigmas linear; cocci forming a round depressed fruit, mucous, separating when ripe from each other and from the axis, indehiscent, 1-seeded. Schizocarp discoid with a depressed centre, ca.6 mm across. Mericarps 10-14, 1.5-2.0 mm across, reniform, reticulate at back, 2-keeled, nearly glabrous, flattened, indehiscent. Seeds 1.5-2.0 mm across, sub-reniform, brownish black.

Flowering and fruiting: November – February.

Germplasm collected and conserved and specimens examined

India, Odisha state, Bargarh district, Padampur block, Gram Panchayat and nearby village: Dahita, 20° 54' N latitude and 83° 04' E longitude, elevation 234 m from mean sea level, R.C. Misra HS number 22943 (Herbarium of NHCP, ICAR-NBPGR, New Delhi); date of collection: 20.01.2014; seed germplasm accession number IC 610775 (collection number RCM/PKS/110); source: disturbed, weed in a crop field/fallow land; sampling method: selective, frequency: rare; (Local name: *Gangatiria Nalita*, *Gangatiria saga*). Images of herbarium type specimens of *M. sylvestris* bearing barcode number K000914119 of Royal Botanic Garden, Kew, London.

Economic uses

Despite its use as ornamental plant, the local inhabitants use the leaves as leafy vegetable. They collect and cut the tender leaves into pieces, boil and or fry with tomato and brinjal and prepare curry. It is said to be of very tasty and they consume it with

day meal. Tender leaves, shoots, flowers, and fruits are consumed in salads, soups, or boiled vegetables.

Methanolic extracts from the leaves of *M. sylvestris* exhibited antibacterial activity against *Staphylococcus aureus*, *Enterococcus faecalis*, *Streptococcus agalactiae*, and *Erwinia carotovora* and the flowers showed activity against *Escherichia coli* (Razavi et al., 2011). Fluid extracts of *M. sylvestris* leaves and flowers are used to treat inflammatory diseases of mucous membranes, cystitis, and diarrhea (Farina et al., 1995). The results of studies on the antimicrobial properties of *M. sylvestris* indicate that the plant also has antibacterial and antiviral activity against many human pathogens (Benso et al., 2015). This amazing plant has antimicrobial, hepato-protective, anti-inflammatory and antioxidant properties and is considered as one of the most promising medicinal species. The traditional use of this species in treating many diseases such as cold, cough, bronchitis, digestive problems, eczema and cut wounds and preparing pharmaceutical compounds highlights the drugs used to produce antibiotics and other therapeutic agents (Mousavi et al., 2021).

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REFERENCES

- Benso, B., Rosalen, P.L., Alencar, S.M. and Murata, R.M. 2015. *Malva sylvestris* inhibits inflammatory response in oral human cells. An in vitro infection model. *PLoS One* **10** (10): e0140331.
- Chowdhery, H.J. and Wadhwa, B.M. 1984. *Flora of Himachal Pradesh: Analysis*, vol. 1, Flora of India Series 2. Botanical Survey of India, Howrah.
- Cooke, T. 1901. *The Flora of the Presidency of Bombay*, vol. 1 (Rep. 1967). Botanical Survey of India, Calcutta. p. 96.
- Deb, D.B. 1981. Malvaceae. In: *The Flora of Tripura State*. vol. 1, Today and tomorrow's Printers and Publishers, New Delhi. pp. 294-309.
- Duthie, J.F. 1976. *Flora of the Upper Gangetic Plain*, vol. 1. Bishensingh Mahendrapal Singh, Dehra Dun. p. 79.
- Farina, A., Doldo, A., Cotichini, V., Rajevic, M., Quaglia, M.G., Mulinacci, N. and Vincieri, F.F. 1995. HPTLC and reflectance mode densitometry of anthocyanins in *Malva sylvestris* L.: a comparison with gradient-elution reversed-phase HPLC. *J. Pharm. Biomed. Anal.* **14** (1-2): 203-211.
- Gamble, J.S. 1915. *Flora of the Presidency of Madras*, vol. 1. Adlard and Son Limited, Hart Street, W.C., London. p. 63.
- GuhaBakshi, D.N. 1984. Malvaceae. In: *Flora of Murshidabad District, West Bengal, India*. Scientific Publishers, Jodhpur. pp. 63-69.
- Haines, H.H. 1921. Malvaceae. In: *The Botany of Bihar and Orissa, part 1*. Adlard and Son, West Newman Ltd, London. pp. 57-74.
- Hinsley, S.R. 2014. The Malva (Mallow) Pages: Contents and overview. Retrieved from <http://www.malvaceae.info/Genera/Malva/Malva.html>
- Mabberly, D.J. 1997. *The Plant Book: A Portable Dictionary of The Vascular Plants (2nd edn)*. Cambridge University Press, United Kingdom. p. 434.
- Master, M.T. 1874. Malvaceae. In: J.D. Hooker (ed) *Flora of British India*. vol. 1, L. Reeve and Co., Convent Garden, England. p. 320.
- Mooney, H.F. 1950. Malvaceae. In: *Supplement to the Botany of Bihar and Orissa*. Catholic Press, Ranchi. pp. 27-28.s
- Mousavi, S.M., Hashemi, S.A., Behbudi, G., Mazraedoost, S., Omidifar, N., Gholami, A., Chiang, W., Babapoor, A. and Rumjit, N.P. 2021. A review on health benefits of *Malva sylvestris* L. nutritional compounds for metabolites, antioxidants, and anti-inflammatory, anticancer, and antimicrobial applications. *Evid. Based Complement Alternat. Med.* **2021**: 5548404.
- Nair, N.C. and Henry, A.N. 1983. Malvaceae. In: *Flora of Tamilnadu (India)*, Series 1: Analysis. vol. 1, Botanical Survey of India, Southern Circle, Coimbatore. p. 35.

- Prain, D. 1903. *Malva L. In: Bengal Plants*. vol. 1 (Rep. 1981), Bishen Singh Mahendrapal Singh, Dehradun. p. 256.
- Pullaiah, T. and Chennaiah, E. 1997. Malvaceae. In: *Flora of Andhra Pradesh (India)*, Vol. 1, Scientific Publishers, Jodhpur. pp. 114-135.
- Razavi, S.M., Zarrini, G., Molavi, G. and Ghasemi, G. 2011. Bioactivity of [*Malva sylvestris* (L.)], a medicinal plant from Iran. *Iranian J. Basic Med. Sci.* **14** (6): 574-579.
- Roy, G.P., Shukla, B.K. and Datt, B. 1992. *Flora of Madhya Pradesh (Chhatrapur and Damoh)*. Ashish Publishing House, New Delhi. p. 55.
- Saldanha, C.J. 1984. *Flora of Karnataka*, Vol. 1. Oxford & IBH Publishing Co., New Delhi. pp. 254-255.
- Sanyal, M.N. 1994. *Flora of Bankura District (West Bengal)*. Bishensingh Mandrapal Singh, Dehra Dun.
- Saxena, H.O. and Brahmam, M. 1994. Malvaceae. In: *The Flora of Orissa*, Vol 1, Orissa Forest Development Corporation Ltd, Bhubaneswar. pp. 126-172.
- Sharma, B.D., Singh, N.P., Raghavan, R.S. and Deshpande, U.R. 1984. *Flora of Karnataka: Analysis, Flora of India*, Series 2. Botanical Survey of India, Howrah. p. 24.
- Singh, N.P. and Karthikeyan, S. 2000. *Flora of Maharashtra State: Dicotyledons*, Vol. 1, Botanical Survey of India, Calcutta. pp. 318-320.
- Singh, N.P., Mudgal, V., Khanna, K.K., Srivastava, S.C., Sahoo, A.K., Bandopadhyay, S., Aziz, N., Das, M., Bhattacharya, R.P. and Hajra, P.K. 2001. Malvaceae. In: *Flora of Bihar: Analysis*. Botanical Survey of India, Calcutta. pp. 58-71.
- The Plant List. 2013. A working list of all plant species. Version 1.1. Published on the Internet; <http://www.theplantlist.org/> (accessed 1st January 2023).
- VenkataRaju, R.R. and Pullaiah, T. 1995. *Flora of Kurnool (Andhra Pradesh)*. Bishensingh Mahendrapal Singh, Dehra Dun.
- Verma, D.M., Balakrishnan, N.P. and Dixit, R.D. 1993. *Flora of Madhya Pradesh*, vol. I. Botanical Survey of India, Calcutta. pp. 202-203.