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An Extended Distribution and Conservation of *Cordia macleodii* (Griff.) Hook. *f*. & Thomson in Rajasthan, India

Abstract

Cordia macleodii (Griff.) Hook. *f*. & Thomson belonging to family Boraginaceae has been recorded for the first time from the new geographical area, which is Mandal Tehsil of district Bhilwara, Rajasthan, India. In India, this genus is reported from the other state like Madhya Pradesh and Maharashtra and represented by seven species. The detailed description, up to date nomenclature, time of flowering - fruiting, notes on geographical distribution, conservation status and photographs of the species have been presented in the paper.

Keywords: *Cordia macleodii,* New Geographical distribution, Rajasthan, India.

Jyoti Singh
Assistant Professor,
Deptt.of Botany,
MLV Government College,
Bhilwara, Rajasthan

Kanhaiya Lal Meena
Associate Professor,
Deptt.of Botany,
MLV Government College,
Bhilwara, Rajasthan

Introduction

Rajasthan is the largest State of India, occupying an area of about 3, 48, 861 sq. km i.e. nearly 11 percent of the total area of India. It forms the eastern extremity of the great arid and semi-arid belt of the world. During botanical explorations in southern Rajasthan, the authors collected some plant specimens from Mandal tehsil (25° 26' N Latitude and 74° 35' E Longitude) in Bhilwara district of Rajasthan, India (Map 1). The study area is intersected by the Aravali ranges at several places. The soil varies from sandy loams to heavy loams. This tehsil has hot dry summer and cold winter with monsoon season from last week of June to mid-September and from mid-September to about the end of November is the post monsoon season. Natural vegetational covers include trees, shrubs, grasses and cultivated land occurs in between the hills.

Review of Literature

The Thar Desert plays a crucial role in attracting the moisture laden southwest summer monsoon winds that provide the majority of India's rainfall. Endemism among plants is about 33%. It is estimated that about 45,000 species of plants occur in India including 16,000 species of flowering plants which amounts to 6-7% of the total plant species in the world. This richness of the flora is due to wide range of climate, topology and habitat in the country. In recent years, a large number of publications dealing with floral composition of Rajasthan have been published. After a thorough survey of literature (Shetty and Singh 1991, Khanna, 1997 and Kulkarni, 2001), critical examination and expert opinion from Botanical Survey of India, Arid Zone Regional Centre, Jodhpur, these specimens were determined as *Cordia macleodii* (Griff.) Hook. *f*. & Thomson, belonging to the family Boraginaceae, a taxon not recorded from the present geographical area by earlier workers of Rajasthan (Bhandari 1987, Sharma and Tyagi 1979, Shetty and Pandey 1983, Singh 1983, Singh, 1991, Prasad et al. 1996, Sharma 2002, Tiagi and Aery 2007, Meena 2010a, b, 2013a, b, c, 2014a, b, Meena and Yadav 2010, Yadav and Meena 2011 and Meena 2013). Recently, Meena (2015) have further contributed to our knowledge about the flora of Rajasthan and added 28 species from southern Rajasthan. But *Cordia macleodii* (Griff.) Hook. *f*. & Thomson has not been reported so far from Rajasthan. Thus, the present paper provides description, phenology data and Photographs are provided to facilitate its easy identification in the field.

The genus *Cordia* L., consists of 250 species distributed in the tropical regions (Khanna, 1997). The species has been reported

from Madhya Pradesh and Maharashtra by Khanna (1997) and Kulkarni (2001). In India this genus has been represented by 7 species is one of them *Cordia macleodii* (Khanna 1997). During the recent floristic survey of the Bhilwara, authors came across one interesting plant specimen of *Cordia macleodii*. The report of its occurrence from Rajasthan is the first report for western India. Thus, present findings contribute an addition for Rajasthan and extends its distribution to the Western India.

Aims of the study

Inventorisation of the flora of the Mandal tehsil, including the Phytosociological study find out the Rare, Endangered, threatened (RET) and Endemic plants species of the study area (if any) and its Categorization. The study carried out to prepare the voucher specimen, and deposition of specimen in the herbarium, department of botany, MLV Government College, Bhilwara.

Research Design

Intensive and extensive Botanical exploration and exhaustive studies of the whole tehsil to study the angiospermic diversity, during 2015-2018 in different seasons so as to collect more and more plant specimens and information about wild flora of the area. The herbarium sheet is ready in its standard format, the collected plant specimens will be identified with the help of different recognized floras (such as Flora of India, Flora of Rajasthan), field data, consultation of authentic herbarium specimens lodged in Herbaria, Botanical Survey of India, Jodhpur. The nomenclature of taxa will be brought up to date in accordance with the International Code of Nomenclature for algae, fungi, and plants (ICN).

Observations

Cordia macleodii (Griff.) Hook. *f*. & Thomson, in J. Linn. Soc. 2: 128. 1858; C. B. Clarke in Hook. *f.* Fl. Brit. India 4: 139. 1883; Cooke, Fl. Pres. Bombay 2: 266. 1958 (Repr.); Kazmi in J. Arnold Arbor, 51: 143. 1970; Khanna *et al*., in Mudgal et al., Fl. Madya Pradesh 2: 119 - 120. 1997; Kulkarni in Singh *et al*., Fl. Maharashtra 2: 419 - 420. 2001. *Hemigymnia macleodii* Griff., Calc. J. Nat. Hist. 3: 363. 1843. *Vernacular name: Gundi.* (Plate1. A-D)

Polygamous tree, upto 8 - 10 m high. Bark corky, grey. Branches hairy. Leaves alternate or sometimes sub-opposite, broadly ovate or orbicular, 7 - 15 x 6.5 - 14 cm, cordate or rounded at base, margins crenate-dentate, apex obtuse. Flowers in short terminal and axillary corymbs, dense, tomentose, paniculate cymes, sub-sessile, white. Calyx 6 - lobed, lobes as long as or longer than tube, tomentose. Corolla lobes 0.5 - 0.8 cm long, white or creamy. Stamens exserted, filaments hairy at the base. Ovary glabrous, stigma bilobed, capitate. Drupes 1.1 - 1.8 cm long, ovoid, acuminate at apex, seated on persistent, tomentose, ribbed calyx, non-edible.

Flowering and Fruiting

February - August.

Conservation Status and Ecological Notes

Frequent in dry mixed deciduous forests (Khanna, 1997 and Kulkarni, 2001). But form Rajasthan, India it is extremely rare and endangered, in occurrence. Several regions of low population has been recorded such as early falling of flowers, few fruit formation, immature drying of fruits, low seed germination and lack of averring knowledge in local people. Due such regions this species has low populations. The species survives under the risk and few population has been reported from the present study so an urgent need to protect the species in the fields and some cultural activities are needed to protect this species.

Specimens Examined

India, Rajasthan, Bhilwara district, Mandal, 17 March 2016, Singh and Meena M-8219 (Herbarium, department of botany, M.L.V. Government College, Bhilwara).

Distribution

India: Maharashtra and Madhya Pradesh.

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Authors' Contributions:

Jyoti Singh and Kanhaiya Lal Meena surveyed the study area collected Plants specimens and observed the data from the field, Prepare voucher specimen and deposited to the herbarium, department of botany, MLV Government College, Bhilwara. Dr. S. L. Meena, Scientist D, Botanical Survey of India Identified the plant specimen and confirm the Identity of species.

References

1. *Bhandari, M. M. (1987). Flora of the Indian Desert. MPS Repros, Jodhpur.*
2. *Khanna, K. K. (1997). Boraginaceae. In: Flora of Madhya Pradesh. vol II. Eds Mudgal V., Khanna K. K., Hajra P. K. BSI, Calcutta.*
3. *Meena, K. L. (2010a). Morinda coreia Buch.-Ham.: A new record to the flora of Rajasthan. J Indian Bot Soc. 89 (1-2) 210 - 212.*
4. *Meena, K. L. (2010b). Synedrella vialis (Less.) A. Gray: A new record to the flora of Rajasthan. J Econ Taxon Bot 34 (3) 614 – 618.*
5. *Meena, K. L. (2013a). Some New Records to the Flora of Rajasthan, India. The Journal of Biodiversity. Photon. 112 233-240.*
6. *Meena, K. L. (2013b). Blumea malcolmii (C. B. Clarke) Hook. f., A new Record to the Flora of Rajasthan India. J Econ Taxon Bot. 37 (1) 53 - 55.*

7. *Meena, K. L. (2013c). Tageties minuta L. (Asteraceae): A newly naturalised plant in Rajasthan, India. J Econ Taxon Bot. 37 (2) 415 - 418.*
8. *Meena, K. L. (2013d). Diversity of family Acanthaceae from Sitamata Wildlife Sanctuary, Rajasthan, India. J Econ Taxon Bot .37 (3) 595 - 609.*
9. *Meena, K. L. (2014a). Flora of Wildlife Sanctuary, Discovery Publishing House Pvt. Ltd., New Delhi.*
10. *Meena, K. L. (2014b). Rediscovery of Cullen corylifolium (L.) Medik. (Fabaceae) from the Malwa region, India. The Journal of Biodiversity Photon. 113: 360-363.*
11. *Meena, K. L. (2015). Additions to the Flora of Rajasthan, India. Scholars' Press. Germany.*
12. *Meena, K. L., Yadav B. L. (2010). Spigelia anthelmia L. (Spigeliaceae): A New Generic Record to the Flora of Rajasthan. J Indian Bot Soc. 89(3-4) 258 - 261.*
13. *Kulkarni, B. G. (2001). Boraginaceae In: Flora of Maharashtra. vol II. eds Singh NP, Lakshminarasimhan, P., Karthikeyan, S., Prasanna, P. V. BSI, Calcutta.*
14. *Prasad, V. P., Daniel, M., Joy, E. M., Ajit Kumar, C. R. (1996). Illustrated Flora of Keoladeo National Park Bharatpur Rajasthan. Bombay Nat. Hist. Soc., Bombay.*
15. *Sharma, N. K. (2002). Flora of Rajasthan. Aavishkar Publishers Distributors, Jaipur.*
16. *Sharma, S., Tyagi, B. (1979). Flora of North-East Rajasthan. Kalyani Publishers, New Delhi.*
17. *Shetty, B. V., Singh, V (1991). Flora of Rajasthan. Vol II BSI, Calcutta.*
18. *Shetty, B. V., Pandey, R. P. (1983). Flora of Tonk District. BSI, Howrah.*
19. *Singh, V. (1983). Flora of Banswara District. BSI, Howrah.*
20. *Tiagi Y. D., Aery N. C. (2007). Flora of Rajasthan (South & South-East Region). Himanshu Publications, New Delhi.*
21. *Yadav B. L., Meena K.L. (2011). Flora of South Central Rajasthan. Scientific Publishers, Jodhpur.*

Map- 1. Study Area

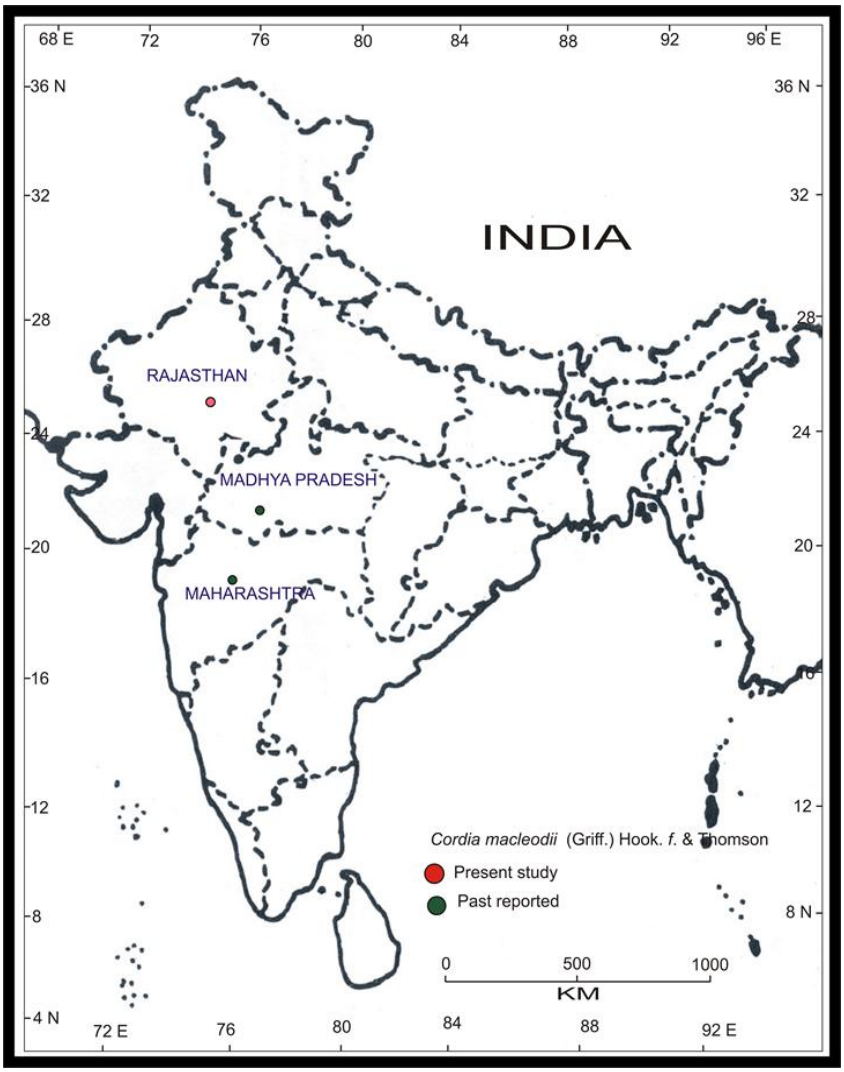

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Plate 1 (A-D). *Cordia macleodii* (Griff.) Hook. f. & Thomson A. Habit, B. Inflorescence, C. Fruits.