



Corynandra chelidonii var. *pallai* (Reddy and Raju) V.S. Raju (Cleomaceae) - An Addition to the Flora of Rajasthan, India

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Key words: *Corynandra chelidonii*, Rajasthan, Pratapgarh, New record, Cleomaceae

<http://dx.doi.org/10.12692/ijb/23.3.69-74>

Article published on September 04, 2023

Abstract

The plant *Corynandra chelidonii* var. *pallai* (Reddy and Raju) V.S. Raju belongs to the family Cleomaceae. During the botanical exploration of Pratapgarh District, we discovered a new variety of *Corynandra chelidonii*, i.e., var. *pallai*, which is unrecorded for the state's flora. Previously, the plant was only reported from Andhra Pradesh and Maharashtra state of India. This paper envisages a brief citation, description, distributional notes, flowering and fruiting time followed by ecological notes, artificial key, and photo plate of the species.

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Introduction

Rajasthan, the largest state in India, is characterized by a wide range of ecosystems, including semi-arid, arid and sub-humid regions. The state is located between 23°3' and 30°12' N latitude and 69°30' and 78°17' E longitude and covers about 3,42,239 km² land area. Despite its harsh climatic conditions and arid landscape, the state harbours a remarkable diversity of plant species. These distinctive habitats and climatic conditions always attract taxonomists. Henceforth various papers on plant diversity with their ecological and taxonomical information are available for the state of Rajasthan (Puri *et al.*, 1964; Bhandari, 1978; Sharma and Tiagi, 1979; Shetty and Singh, 1987, 1991 & 1993; Singh and Singh, 2006 and Singh and Srivastava, 2007). Recently, Kotiya *et al.* (2020) have published and updated Flora of Rajasthan, India.

Several new additions to the Flora of Rajasthan were made by Kumar *et al.* (2020), Solanki *et al.* (2020), Suresh Kumar *et al.* (2020), Purohit (2020); Purohit *et al.* (2020); Choudhary and Meena (2021); Kotiya *et al.* (2021); Sushila *et al.* (2021); Sharma *et al.* (2022); Sharma and Sarsavan (2023).

The district Pratapgarh is located at 24.03° N 74.78° E. The district has an average elevation of 491 meters. It is the second highest place in Rajasthan after Mount Abu and has a subtropical climate with an average rainfall of 750 mm. The district is situated at the junction of the Aravali hills range and the Malva plateau. The primary vegetation of the area is dry deciduous, along with thorn scrub, grassland and riverine vegetation.

Cleome chelidonii var. *pallai* (Reddy and Raju) V.S. Raju belongs to the family Cleomaceae. Genus *Cleome* L. comprises around 250 species worldwide (Mabberley, 2008). Raghvan (1993) documented 15 wild species, two cultivated species (*C. hassleriana* Chodat and *C. spinosa* Jacq.) and two varieties (*C. gynandra* var. *nana* (Blatter & Hallberg) Bhandari and *C. viscosa* var. *nagarjunakondensis* Sund. of *Cleome* in Indian Flora (BSI) under the family

Capparaceae. *Corynandra chelidonii* var. *pallai* (Reddy and Raju) V.S. Raju (Reddy and Raju, 2001) and *Cleome hirta* (Klotzsch) Oliv. (Bhatt *et al.*, 2017) were recently reported from Andhra Pradesh and Gujarat.

In Rajasthan, it has only 10 species (Shetty and Singh, 1987). Later, one more species of the *Cleome* that is *C. burmannii* was reported from Bhilwara for the flora of Rajasthan by Yadav and Meena (2009). Hereafter, 11 species of *Cleome* have been reported from Rajasthan.

Now, *Cleome chelidonii* L. f. is considered as *Corynandra chelidonii* (L. f) Cocharane and Iltis (2014). Cochrane and Iltis (2014) just listed the variety *pallai* as a synonym of *Cleome chelidonii*, stating that they had not seen the type of material. Somkuwar *et al.* (2018) reported this variety as a new record from Nagpur for Maharashtra state, India. Sirangi *et al.* (2020) studied intraspecific genetic variation in *C. chelidonii* and justified the recognition of the two subpopulations of *Corynandra chelidonii* based on genetic and environmental variations as two distinct varieties, *C. chelidonii* var. *pallai* (Reddy and Raju) V.S. Raju and *C. chelidonii* var. *chelidonii*.

As a result of the intraspecific morphological and molecular diversity, there is clear evidence for two varieties in *C. chelidonii*. After studying regional flora and other taxonomic literature, it was found that this variety has not yet been reported from Rajasthan. Hence, this article is about the first time reporting of *C. chelidonii* var. *pallai* (Reddy and Raju) V.S. Raju for the flora of the state. The plant was collected from four areas of the Pratapgarh district of Rajasthan.

Material and methods

During an extensive field survey in the Pratapgarh district of Rajasthan, India, the authors collected plant specimens along with their field data such as habit, habitat, flowering and fruiting time. The plant was collected from Manohargarh, Nanirel, Padaliya and Dhamloo, etc. areas of Pratapgarh district of Rajasthan (Fig. 1).

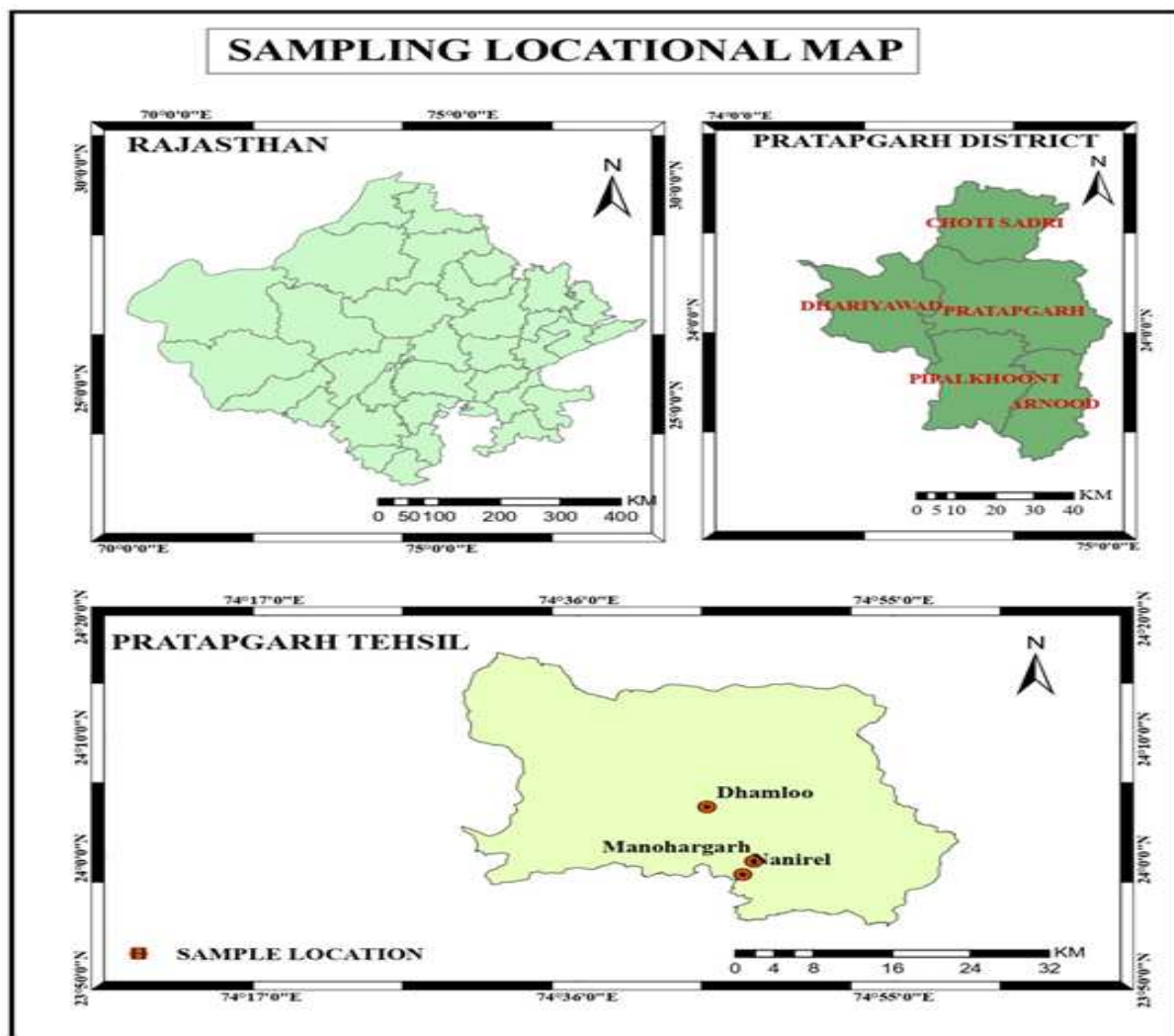


Fig. 1. Sampling sites of the plant (Dhamloo, Manohargarh and Nanirel).

The identification of these specimens was made possible by using regional floras and relevant academic literature. After critical examination, it is revealed that the plant specimens correspond to *C. chelidonii* var. *pallai* (Family Cleomaceae), a variety previously known from other regions but not recorded from the Rajasthan state. The authentication of the plant was done by Dr Amit Kotiya with the RUBL21394 accession number. The specimen of the plant is submitted to the Rajasthan University Herbarium (RUBL).

Observation

Type and Specimen examination

India, Rajasthan, Prapatgarh district, Manohargarh Nanirel and Dhamloo, 23°59'07", 24°00'53" and 24°03'36" N and 74°45'31", 74°47'37" and 74°44'02" E, 30 July 2023, Anoop Kumar 115 121 and 125 (field

number). Accession number-RUBL21394 (Dr. Amit Kotiya); date: 25/08/2023.

Taxonomic description

Cleome chelidonii var. *pallai* C.S.Reddy & V.S.Raju, J. Econ. Taxon. Bot. 25(1): 217 (2001).

An erect branched, annual, aquatic and semiaquatic herb up to 2.0 m high. Basal leaves 3-5 foliate, petiole 4-5 cm., leaflets up to 4-7 × 0.3-0.7 cm lanceolate, base cuneate, apex acute or rounded, margin crenate to crenate-serrate; upper leaves 1-3 foliate, petiole 2-4 cm., leaflets linear, cuneate or rounded at the base, acute at the apex, margin serrate.

Flowers in lax terminal corymbose racemes, showy, pinkish, or rosy; bracts foliaceous 1.5 mm long. Petals ovate, 1.4- 1.7 cm, pink or rosy. Stamens numerous (more than 60); filaments 1.5-1.8 cm, purple-tinged.

Ovary sessile, 8-10 mm long, glabrous. Capsule linear cylindrical, beaked. Seeds many asymmetrical ovoid, comma-shaped, compressed. 1.3-1.8 mm in diam.

Dark brown, central portion paler and smooth, cleft narrow, slightly coloured, about 0.5- 0.7 mm deep (Fig. 2A-2L).



Fig. 2. (A) Plant habit (B) Twigs of the plant (C) Leaf with petiole (D) Leaf (E) Flower bud (F) & (G) Flower (H) Stamens (I) Fruits (J) Carpel (K) Seeds with fruit (L) Seeds.

Flowering and fruiting

July- December.

Distribution

Andhra Pradesh, Maharashtra and Rajasthan.

Ecological note

Aquatic and semiaquatic (along the margins and centre of Streams).

Population size

C. chelidonii var. *pallai* is growing in water and along the margins of water bodies and around 50-100 individuals have been located.

Identification Key

1a. Plants terrestrial; upper leaves usually oblanceolate to lanceolate; seeds yellow-brown, ovoidal, smaller (1.3~1.8 mm across); cleft less open; testa with tubercles pointed, sparse.....*Corynandra chelidonii* var. *chelidonii*

1b. Plants aquatic to semi-aquatic; upper leaves usually linear; seeds dark brown, globose, bigger (1.5~2.5 mm across); cleft more open; testa with tubercles straight and blunt, denser*Corynandra chelidonii* var. *pallai*.

Acknowledgement

We are thankful to Dr Amit Kotiya, Assistant Professor, Department of Botany, University of Rajasthan, Jaipur for the authentication of the plant. Thanks to colleague Assistant professors, Govt PG College, Pratapgarh for help in the collection of plant material. We are also thankful to the Principal, Govt PG College, Pratapgarh for their cooperation.

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