



Bidens bipinnata L. (Asteraceae): A new species record to Rajasthan state, India

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Abstract

Bidens bipinnata L. (Asteraceae), first-time distribution records from the State of Rajasthan. Previously, this species was distributed only in Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh and Punjab. In Rajasthan, it is reported as an addition to the flora of the State. This article provides habitat, distribution, detailed description, plant association, flowering and fruiting time, artificial key and photographs of the species.

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Introduction

Rajasthan, the largest State of India, is widely recognized for having arid and semi-arid biogeographical habitats. The State of Rajasthan is located between a latitude of 23°3' and 30°12' N and a longitude of 69°30' and 78°17' E. The State's total area is 3,42,239 km². The State's distinctive flora has been studied and published by a number of taxonomists (Biswas and Rolla, 1953; 1964; Bhandari, 1978; Sharma and Tiagi, 1979; Shetty and Pandey, 1983; Shetty and Singh, 1987, 1991 & 1993; Sharma *et al.*, 2005; Tiagi and Aery, 2007; Singh and Srivastava, 2007; Kotia *et al.*, 2008; Meena and Yadav, 2011; Kumar *et al.*, 2020; Solanki *et al.*, 2020). Kotiya *et al.* (2020) published updated information about the flora of Rajasthan. Recent studies by Purohit (2020), Kotiya *et al.* (2021), Sharma *et al.* (2022), Ravikumar *et al.* (2022), Sharma and Sarsavan (2023) and Kumar *et al.* (2023) have expanded our knowledge of the State's floral composition. Asteraceae is one of the largest and most widely distributed families of dicot plants. The family is represented by around 43 tribes, 1600-1700 genera and 25000 species under 16 subfamilies (Funk *et al.*, 2005; Funk *et al.*, 2009;

Stevens, 2017). In India, the family comprises 1314 species under 204 genera and 24 tribes (Mitra and Mukherjee, 2017). The genus *Bidens* L. comes under the Helianthinae tribe of the family. Approximately 280 species of genus *Bidens* are distributed in tropical and temperate regions of the world (Mitich, 1994). Currently, the genus has 249 accepted species (The Plant List). 10 species and 2 varieties of *Bidens* have been reported in Flora of India (Chowdhery, 1995). The recent addition of a new species, *Bidens bachulkarii*, from the Western Ghats by Jagtap *et al.* (2016) brings the total number of species to 11 for the flora of India. To represent the genus *Bidens* L., the Flora of Rajasthan only listed the species *Bidens biternata* (Shetty and Singh, 1983). With the completion of this study, Rajasthan's flora now contains two species of *Bidens*.

Material and methods

During the floristic exploration in different parts of Jaipur, Rajasthan, the plant specimens were collected from Jamwa Ramgarh Wildlife Sanctuary. The sanctuary's geographical coordinates extend from 76° 03' E longitude to 27° 02' N latitude (Fig. 1).

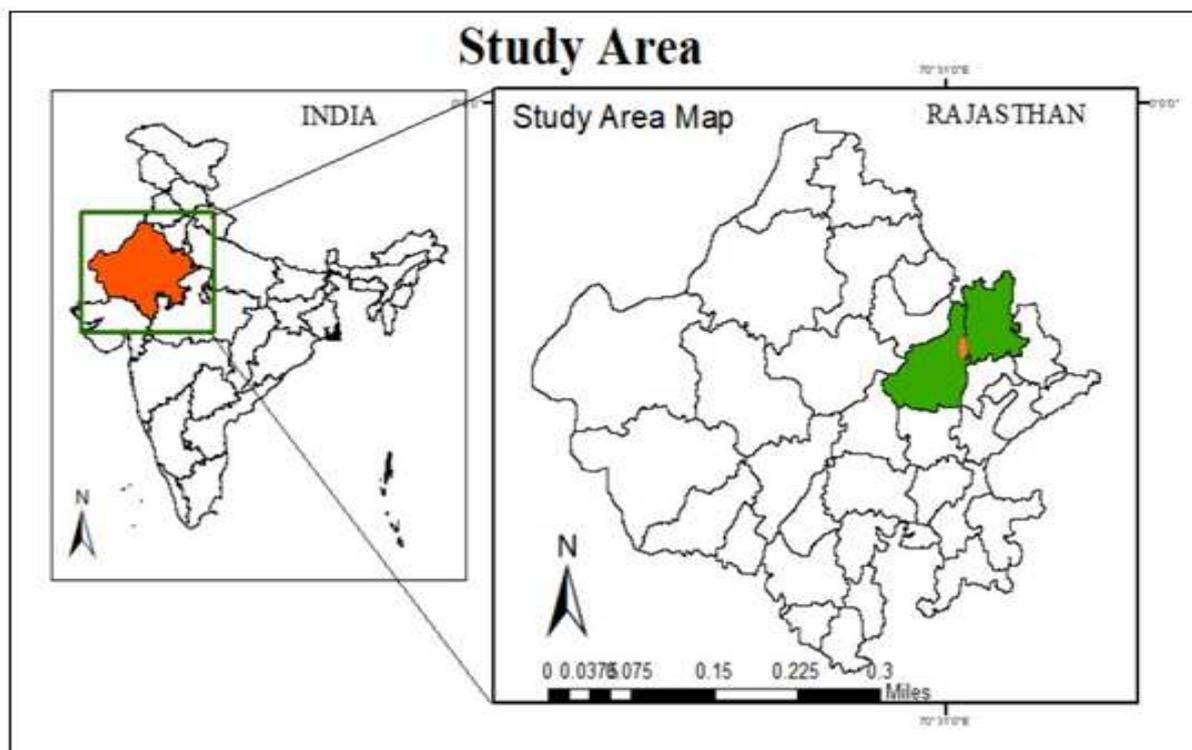


Fig. 1. Showing the map location of *Bidens bipinnata* L. collection point from Jamwa Ramgarh Wildlife Sanctuary, Jaipur, Rajasthan.

The vegetation of the sanctuary corresponds to Northern Tropical Dry Deciduous Forests and Northern Tropical Thorn Forest (Champion and Seth, 1968).

The specimen is collected from moist, shady areas of rocky habitats of the sanctuary. The collected voucher specimen is studied critically with literature and identified as *B. bipinnata* L., a species probably native to Eastern Asia and even some parts of North

America. After consulting the literature, it has been revealed that none of the State's flora includes *Bidens bipinnata* L. Consequently, this species represents a new record for Rajasthan's flora. For identification, detailed taxonomic description, key to species, phenological data, and field photographs (Fig. 2) are mentioned in the manuscript. The specimens have been deposited in the Herbarium of the University of Rajasthan (RUBL), Jaipur (Rajasthan).

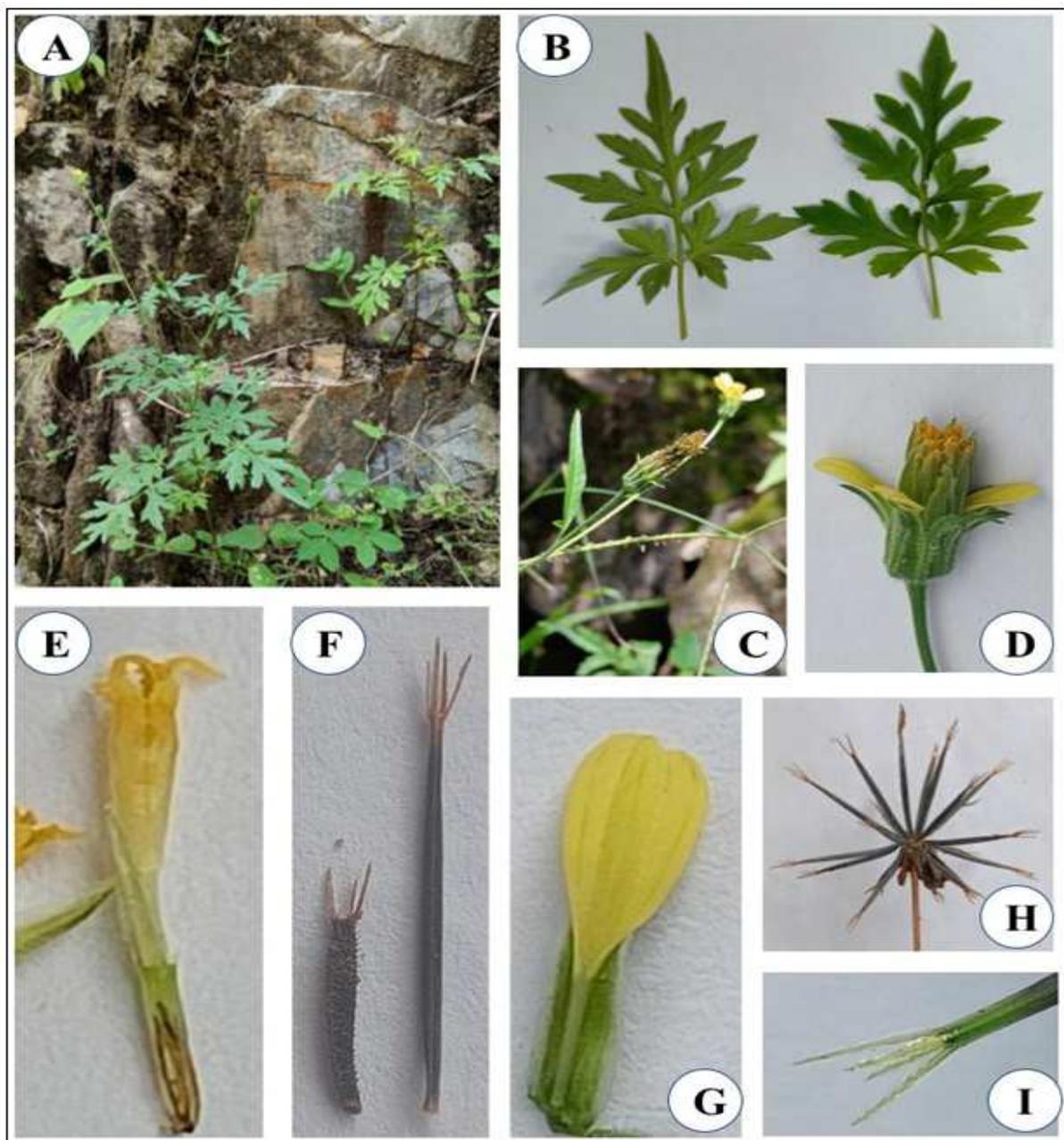


Fig. 2. *Bidens bipinnata* L. **A.** Habit, **B.** Leaves, **C.** Twig with flower and fruit, **D.** Flowering capitulum, **E.** Disc floret, **F.** Achene of disc floret and ray floret, **G.** Ray floret, **H.** Achenes on mature head, **I.** Retrorsely barbed bristles of achene.

Key to the species of Bidens provided below-

1. Leaves 2- or 3- pinnatisect; leaflet margin entire; terminal leaflet narrow..... *B. bipinnata*

1. Leaves unipinnately divided; leaflet margin serrate; terminal leaflet broad..... *B. biternata*

Taxonomic description

Bidens bipinnata L. Sp. Pl. 832. 1753. *B. pilosa* L. var. *bipinnata* Hook. f. FBI 3:309, 1881. Erect, annual, aromatic herbs. Stem 4-angled, usually glabrous; Leaves opposite, 2-3 pinnate, 7-15 × 5-9 cm, petiole 2-5 cm; segments ovate-lanceolate to linear, acute, margin entire (or 2-3 toothed), terminal leaflet narrow. Inflorescence capitulum, arranged in a cyme, heterogamous, solitary. Peduncles 3-8 cm. long. Involucral bracts 2-seriate; outer 4-7, linear-spathulate, 4-5 mm long, connate at the base, pubescent; inner ones 7-8, linear-lanceolate, 4-5 mm long, margin membranous. Receptacle paleaceous, linear-lanceolate, scarious. Ray florets ligulate; ligule 2-5, yellow, sterile, apically 2 or 3 lobed. Disc florets tubular, 20-25, corolla yellowish, corolla tube 5 lobed, hermaphrodite; inner disc florets longer than outer one; Stigma bifurcate, exerted. Achenes brown-blackish, four-angled, tapering towards the apex, dimorphic; outer cypselae generally brown, 10-12 × 1 mm and with a hairy surface; inner ones black and 12-15 × 1 mm, generally glabrous; pappus setae, yellowish, usually 3 or 4, 2-3 mm long, retrorsely barbed bristles (Fig. 2).

Habitat: On a hill slope under shady places

Flowering and fruiting: July to October

Distribution in Rajasthan: Jaipur (Jamwa Ramgarh Wildlife Sanctuary)

Distribution in India: Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Punjab.

Specimens examined

Dr. Amit Kotiya (RUBL21397, Date: 20/09/2023), collected by Yogita Solanki from Jamwa Ramgarh Wildlife Sanctuary, Jaipur, Rajasthan, India.

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