



Research article

Bidens bachulkarii (Asteraceae-Heliantheae): A new species from Western Ghats, India

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Abstract: *Bidens bachulkarii* a new species in Asteraceae (Tribe: Heliantheae) from Western Ghats (Maharashtra and Karnataka), India is described and illustrated. The species is closely related with the *Bidens pilosa* and *Bidens pilosa* var. *minor*. However, it differs in several characters viz., glabrous and ribbed stem, head terminal and axillary in position, tri-lobed, bisexual and fertile ray florets, achenes dimorphic, pappus awns of ray and disc achenes half covered with retrose bristles.

Keywords: *Bidens bachulkarii* - Heliantheae - New species - Maharashtra - Karnataka.

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INTRODUCTION

Bidens L. is one of the largest genus of family Asteraceae- Heliantheae, having ca. 150–235 species distributed in different habitats of world (Serff 1937, Chowdhery 1995, Strother & Weedon 2006). Amongst these 10 species and one variety were reported from India, of which only two species and two varieties were reported from Maharashtra & four species from Karnataka, two major states of Western Ghats (Hajra *et al.* 1995, Shirodkar & Lakshminarsimhan 2001, Jagtap *et al.* 2014, Sharma *et al.* 1984). The authors had collected an interesting species of *Bidens* from Western Ghats of Maharashtra and Belgaum district of Karnataka. The critical taxonomic investigations and relevant literature revealed that it is new species belonging to genus *Bidens* L. which is described and illustrated here.

RESULTS

Taxonomic description:

Bidens bachulkarii Jagtap & Cholekar *sp. nov.*

(Fig. 1&2)

Annual herbs, erect, up to 1.0–1.1 m tall; stems glabrous, branched. Leaves variable, imparipinnate, ternate-pinnate or ternately-trifoliate, 4–9 × 3.0–4.5 cm, petiolate; leaflets ovate to elliptic-lanceolate, serrate, sharply acuminate, cuneate, glabrous, 0.7–5.0 × 0.3–2.5 cm; base obtuse or oblique. Heads radiate, terminal or axillary, lax corymbose, in the axial of leaves, 5–6 × 10–12 mm across. Peduncles 1.5–10.0 cm long, glabrous, ribbed, with scaly or leafy bractlets. Involucral bracts biseriate; outer linear-spathulate, distinctly 8, connate at the base, 5–6 × 1.0–1.5 mm across; inner linear, lanceolate, ciliate at apex, 5–6 × 1.5–2.0 mm across. Receptacle convex, paleaceous; pale 5–7 mm long, linear lanceolate. Ray florets distinctly 5, fertile, bisexual; corolla creamy white, bilobed; lower lip completely dissected, 3.5–4.5 mm long. Anthers black, appendiculate, ca 1 mm long, linear or obtuse at base. Style 3.2 mm long; arms ciliate or papillose, 2 mm long. Achenes flat, somewhat curved, ribbed, 5.5–6.0 mm long, fully covered with barbellate tubercles. Pappus awns 2–3, unequal, 2.0–2.5 mm long, smooth at lower part; retrose barbed bristles at upper half. Disc florets 26–30, fertile, bisexual; corolla tubular, yellow, 5-dentate, glabrous, 4.5–5.0 mm long. Anther black, appendiculate, linear, 1.6–1.7 mm long, sagittate. Style 5.5–6.0 mm long; arms ciliate or papillose, 2 mm long. Achenes blackish brown, tetragonous, ribbed, truncate at apex, 7–9 mm long, covered with barbellate tubercles. Pappus awns 2–3, 2.5–3.0 mm long, upper half is covered with retrose barbed bristles.

Type: INDIA, Maharashtra, Satara district, Yewteshwar, 500–600 m, 16°83'74.19" N, 74°32'33.59" E, 10.08.2015, D.G. Jagtap 1001, (**Holotype:** CAL, **Isotype:** SUK, BSI Pune, VYMP).

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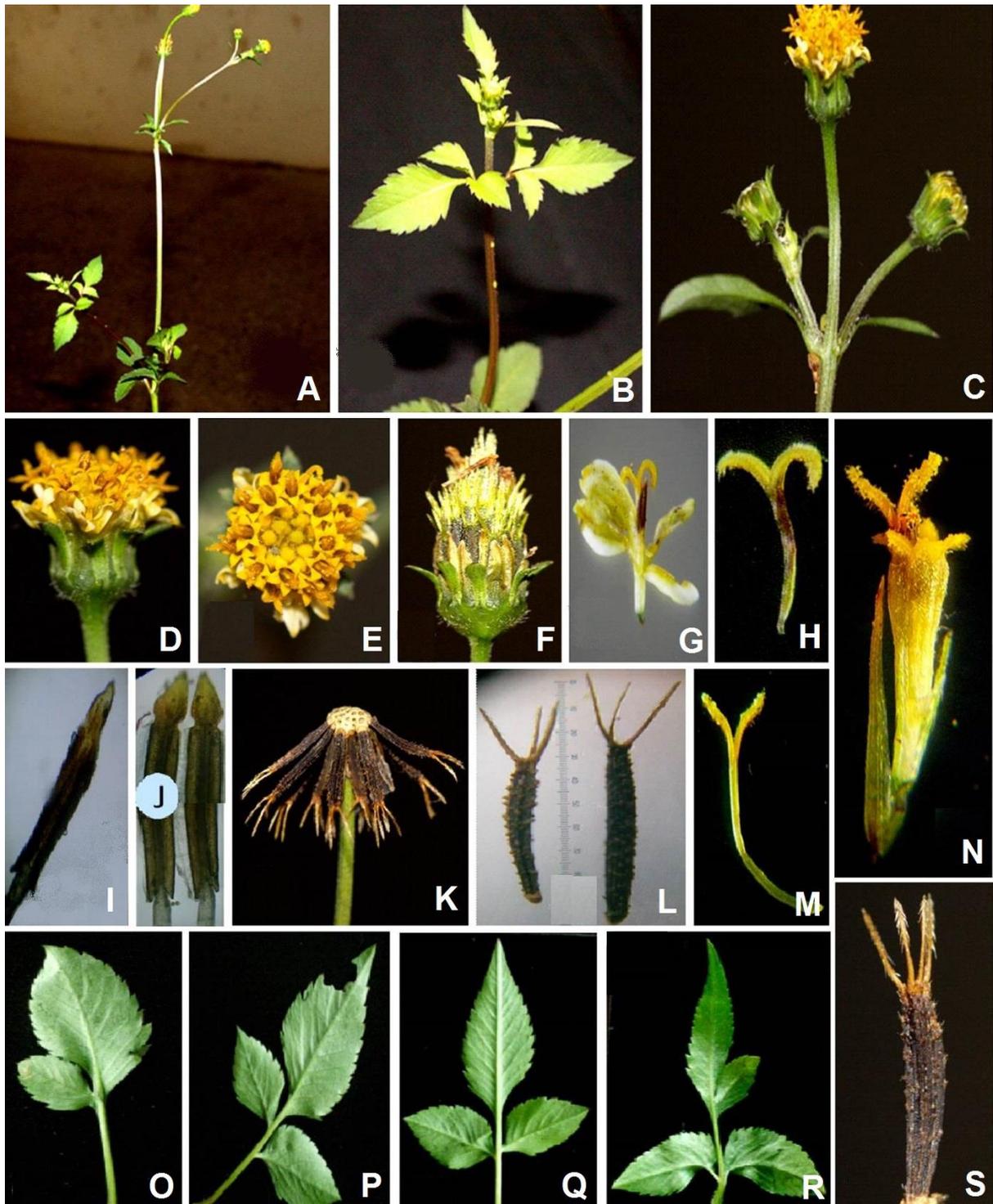


Figure 1. *Bidens bachulkarii* Jagtap & Cholekar: **A**, Habit; **B**, Portion of twig; **C**, Heads in lax corymb; **D**, Single head; **E**, Single head (top view); **F**, Mature head; **G**, Ray floret; **H**, Style of ray floret; **I**, Single stamen of ray floret; **J**, Stamen of disc floret; **K**, Achene on mature head; **L**, Achene of ray & disc floret; **M**, Style of disc floret; **N**, Mature disc floret; **O–R**, Variable leaves; **S**, Single achene of ray floret.

Flowering and Fruiting: August–December.

Habitat: it grows in moist places, ditches, fallow lands or along the roadside of Kolhapur, Satara Sangli districts of Maharashtra and Belgaum district of Karnataka.

Etymology: The species is named in the honour of Dr. M.Y. Bachulkar, well known Plant Taxonomist, Social worker, Environmentalist and Principal, of Shri Vijaysinha Yadav Arts and Science, College, Peth-Vadgaon, Kolhapur (Maharashtra) India, in recognition of his contribution in the Angiosperm Taxonomy.

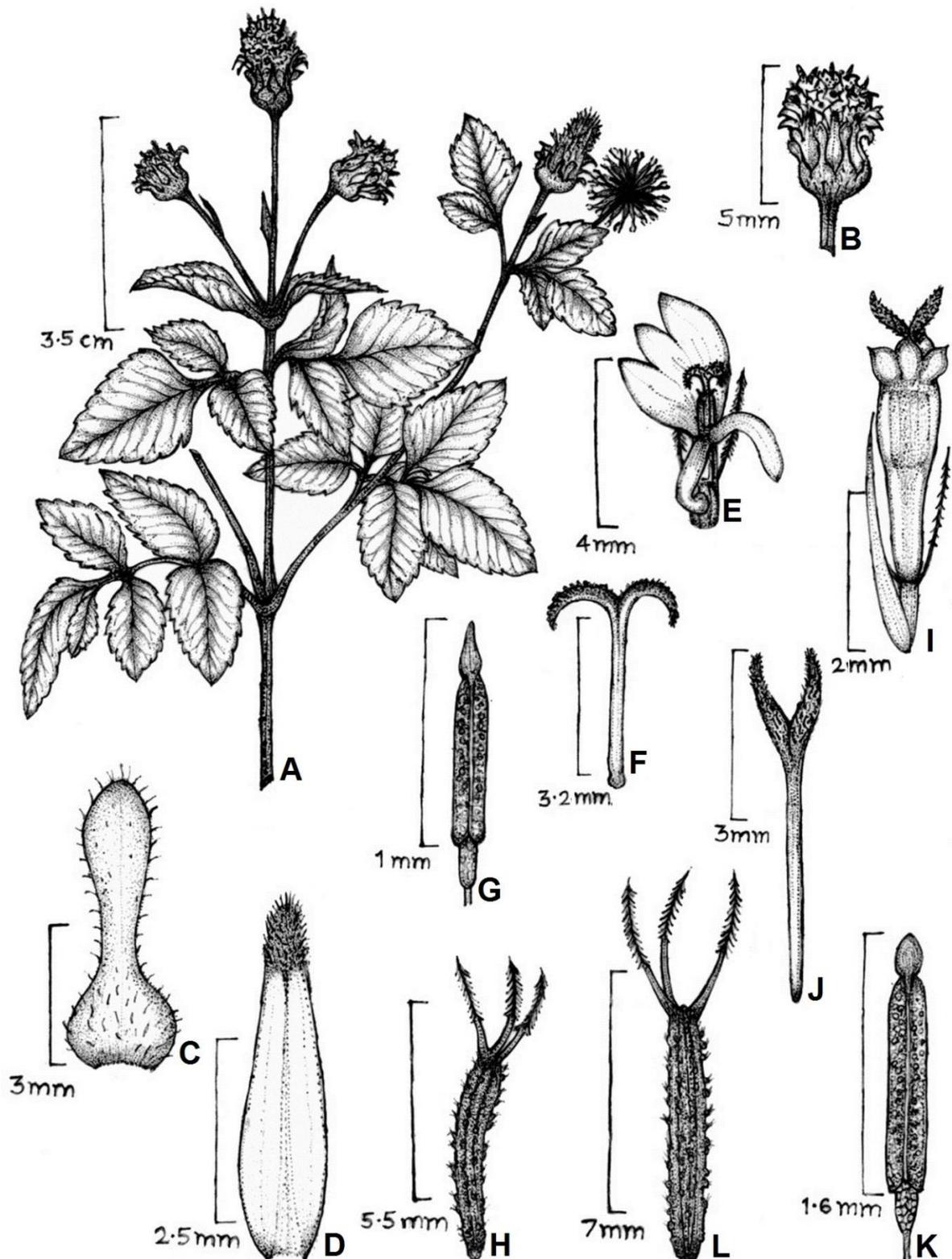


Figure 2. *Bidens bachulkarii* Jagtap & Cholekar: **A**, Habit; **B**, Single head; **C**, Outer involucre bract; **D**, Inner involucre bract; **E**, Single ray floret; **F**, Gynoecium of ray florets; **G**, Single stamen of ray floret; **H**, Achene of ray floret; **I**, Disc floret; **J**, Gynoecium of disc floret; **K**, Stamen of disc floret; **L**, Achene of disc floret.

Conservation Status: *Bidens bachulkarii* Jagtap & Bachulkar was collected from Peth-Vadgaon, Gaganbawada road and Malkapur of Kolhapur district, Yewteshwar, Kas and Koyananagar of Satara district, Chandoli and Bhivghat of Sangli district; Rakaskop and Bijarni of Belgaum district also. A population of about 500 individuals was found in each locality. The area of occupancy is 0.5–1.0 km²/per locality. Hence, it is assessed

as Endemic (E), Vulnerable (VN) species following the IUCN categories and criteria (IUCN 2001).

DISCUSSION

In India 10 species and 02 varieties of *Bidens* L. were reported. The species viz., *Bidens comosa*, *B. cernua*, *B. minima*, *B. tetraspinosa* are having simple leaves and leafy or foliaceous involucral bracts whereas other's viz., *B. tripartita*, *B. tripartite* var. *repens*, *B. pilosa*, *B. pilosa* var. *minor*, *B. biternata*, *B. bipinnata*, *B. sulphurea* and *B. humilis* are having pinnately compound leaves and linear-lanceolate or narrowly spatulate involucral bracts. The species *Bidens bachulkarii* is having spatulate involucral bract which is allied with the species *Bidens pilosa* L. and *Bidens pilosa* var. *minor* (Bl.) Sherff. However, it differs in several characters viz., glabrous and ribbed stem; leaves glabrous; head terminal and axillary in position; receptacle convex, alveolate; outer involucral bracts spatulate, densely hairy, distinctly 8, connate at base, acute at apex, 4–5 mm long; inner involucral bracts larger than outer, 5–6 mm long, linear-lanceolate, obtuse, hairy at apex; ray florets distinctly 5, tri-lipped, upper lip 2-nerved, creamy-white, bisexual, fertile; achenes dimorphic; achenes of ray florets curved with paired, barbellate tubercles, tetragonous, fertile, hairy; achenes of disc florets linear, truncate at both end, covered with paired barbellate tubercles, tetragonous, hairy; pappus awns of ray and disc achenes half covered with retrose bristles (Table 1). These differences helped us to describe the collected species from Kolhapur, Satara, Sangli and Belgaum districts as a new species.

Table 1. Comparative account of *Bidens bachulkarii* with its allied species.

Characters	<i>Bidens bachulkarii</i> sp. nov.	<i>Bidens pilosa</i> L.	<i>Bidens pilosa</i> var. <i>minor</i> (Bl.) Sherff.
Habit	Annual herb	Annual herb	Annual herb
Stem	Glabrous	Pilose	Pilose
Leaves	Very variable, 2–5 partite, glabrous	3–5 partite, sparsely hairy	3–5 partite, sparsely hairy
Receptacle	Convex, alveolate	Convex, necked	Convex, necked
Head	Radiate, 5–10 mm in diam., terminal and axillary in position	Radiate, 5–15 mm in diam., terminal in position	Discoid, 8–15 mm in diam., terminal in position
Involucral bracts	Bi-seriate; outer spatulate, densely hairy, distinctly 8, connate at base, acute at apex, 4–5 mm long; inner larger than outer, 5–6 mm long, linear-lanceolate, obtuse, hairy at apex	Bi-seriate; outer narrowly spatulate, 5–10, sparsely hairy at base, obtuse, 5–7 mm long; inner smaller or equal to outer, 4–5 mm long, ovate, glabrous, acute at apex	Bi-seriate; outer narrowly spatulate, 4–6 mm long, hairy at apex, obtuse; inner smaller than outer, glabrous, linear-lanceolate, apex acute,
Ray florets	Distinctly 5, tri-lipped, upper lip 2-nerved, creamy-white, bisexual, fertile	3–8, ligulate, white, 5-nerved, female, sterile unisexual	Absent, if present ligulate or tubercular, white, female, unisexual
Disc florets	Corolla yellow, 5-lobed, papillose, 4–5 mm long	Corolla yellow, 5-lobed, hairy on throat	Corolla dark yellow, 5-lobed, hairy on throat
Achenes of rays	Curved with paired, barbellate tubercles, tetragonous, fertile, hairy	Flat and sterile, smooth	Flat and sterile and flat
Achenes of disc	Linear, truncate at both end, covered with paired barbellate tubercles, tetragonous, hairy	Obconic, fusiform, tetragonous, glabrous or sparsely hairy	Linear, compressed, tetragonous, sparsely hairy
Pappus of awns	2–3, unequal, smooth at base, retrose bristles at apex	2–5, unequal, fully covered with retrose bristle	2–5, unequal, fully covered with retrose bristle

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