

## Three New Species of *Eriocaulon* L. (Eriocaulaceae) from India

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(Received 02 May 2019, Accepted 15 July, 2019)

(Published by Research Trend, Website: [www.researchtrend.net](http://www.researchtrend.net))

**ABSTRACT:** *Eriocaulon bastarensense* K.K. Khanna, *Eriocaulon chandrae* K.K. Khanna and *Eriocaulon mirzapurensense* K.K. Khanna & Anand Kumar are described as new species from India. *Eriocaulon bastarensense* K.K. Khanna is allied to *Eriocaulon martianum* Wall. ex Körn. but differs in the characters of colouration of leaf and sheath, male sepals (spathe) sparsely hoary with acute or acuminate lobes, female sepals hoary and cells of seed coat with appendages of 2-4 rectangular bands. *Eriocaulon chandrae* K.K. Khanna is allied to *Eriocaulon edwardii* Fyson but differs in having peduncles pilose towards base, involucre bracts long acuminate or cuspidate, floral bracts cuspidate and petals absent in female flowers while *Eriocaulon mirzapurensense* K.K. Khanna & Anand Kumar is allied to *Eriocaulon quinquangulare* L. but differs in having involucre bracts distinctly acute at apex, male petals larger and distinctly unequal in size, female petals smaller and seeds yellow in colour. All the new species are described and illustrated in the paper.

**Keywords:** *Eriocaulon bastarensense*; *Eriocaulon chandrae*; *Eriocaulon mirzapurensense*; New species; India; Eriocaulaceae.

**How to cite this article:** Khanna, K.K. and Kumar, A. (2019). Three New species of *Eriocaulon* L. (Eriocaulaceae) from India. *Biological Forum – An International Journal*, 11(2): 21-26.

### INTRODUCTION

The family Eriocaulaceae, represented by 11 genera and 1206 accepted species, (<http://www.theplantlist.org>) is distributed in tropical and temperate regions of the world (Mabberley, 2008). The type genus *Eriocaulon* established by Linnaeus (*Species Plantarum* 1: 87. 1753) includes 477 accepted species (<http://www.theplantlist.org>) and is represented by 80 species in India (Ansari and Balakrishnan, 2009). While thoroughly examining the specimens of *Eriocaulon* L. housed in the herbarium of Botanical Survey of India, Central Regional Centre, Allahabad, India (BSA) the authors observed that specimen numbers 16492 B, 13797, 23742 and 35240 are quite distinct in a number of characters from the so far described species and thus three new species have been erected to accommodate these specimens. All the three new species are described and illustrated in the paper.

### ENUMERATION OF NEW SPECIES

1. *Eriocaulon bastarensense* K.K. Khanna, *sp. nov.* (Fig. 1)

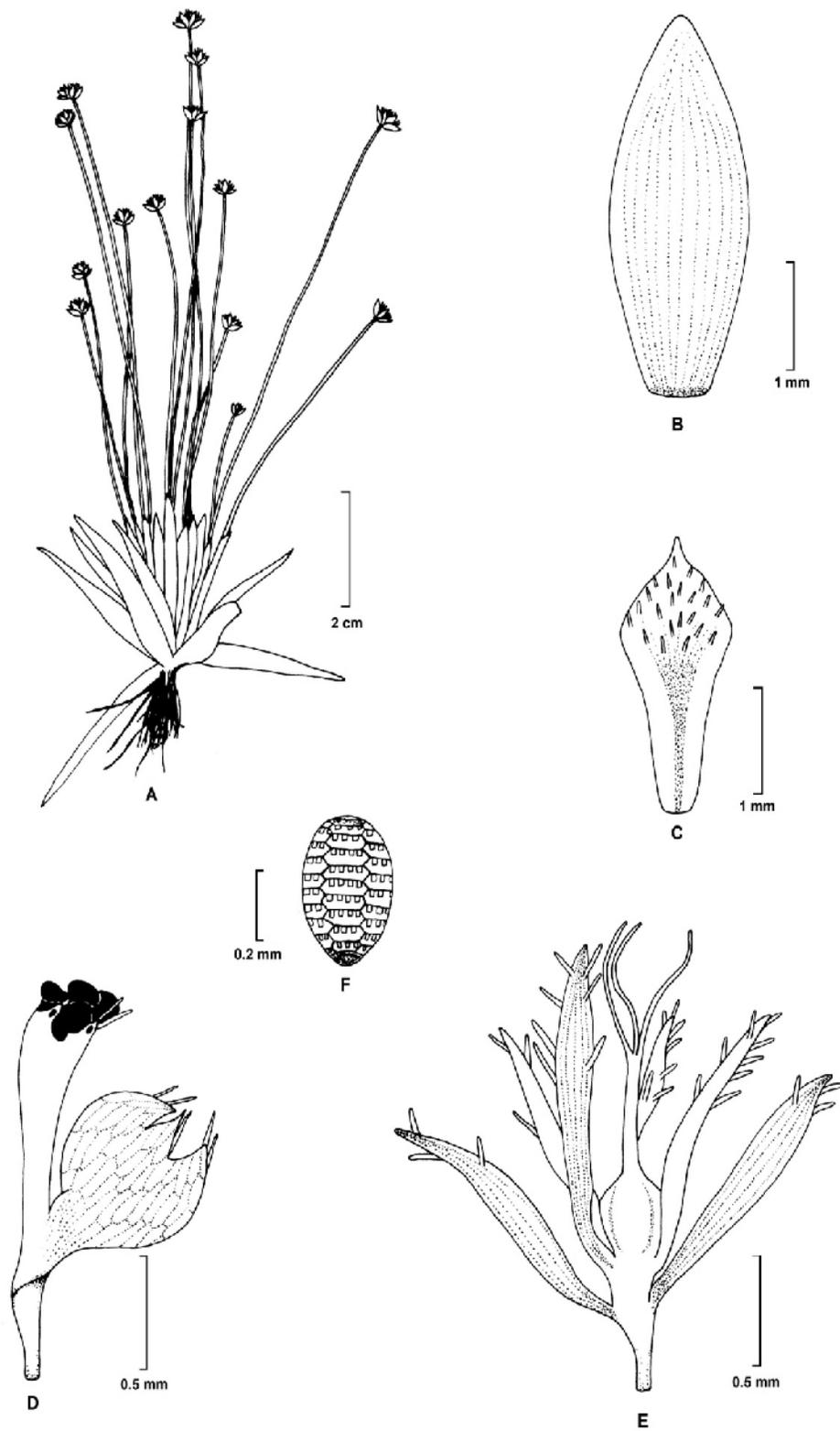
**Diagnosis:** *Eriocaulon bastarensense* K.K. Khanna is allied to *Eriocaulon martianum* Wall. ex Körn. but differs in having leaves and sheaths never turning purple, male sepals (spathe) sparsely hoary with acute or acuminate lobes, female sepals hoary and cells of seed coat with appendages of 2-4 rectangular bands (Table 1).

**Typus:** INDIA, Madhya Pradesh, Paladeeh, Abujh-marh, Bastar district, 15<sup>th</sup> November 1984, G.P. Roy &

S.K. Dixit 35240 A (Holotype CAL); Madhya Pradesh, Paladeeh, Abujh-marh, Bastar district, 15<sup>th</sup> November 1984, G.P. Roy & S.K. Dixit 35240 B & C (Isotypes BSA); Madhya Pradesh, Singhpur range, Raipur district, 17<sup>th</sup> January, 1976, D.M. Verma 23742 (Paratype BSA).

Herbs, acaulescent; rootstock absent. Leaves rosulate, lanceolate or linear, 1.5-6.5 x 0.3-0.5 cm, acuminate, glabrous, never turning purple on drying. Heads hemispherical, 4-6 mm across, straw-coloured or grey to blackish; peduncles many, 7-20 cm long, glabrous; sheaths up to 3.5 cm long, glabrous, never turning purple on drying; limb acute, entire; receptacles cylindrical, villous; involucre bracts elliptic, 3.0-3.8 x 1.2-1.4 mm, acute, chartaceous, straw-coloured; floral bracts oblanceolate-cuneate, 2.3-2.5 x 1-1.3 mm, acuminate, chartaceous, dorsally hoary towards apical half, pale black. **Male flowers:** Sepals connate into a spathe of 1.2-1.4 x ca 0.7 mm, 3-lobed with acute or acuminate lobes, black, sparsely hoary towards apex. Petals 3, hoary, rarely glabrous, each with a black gland. Anthers 6, black. **Female flowers:** Sepals 3, more or less equal, elliptic-falcate, 1.3-1.6 mm long, black, hoary towards apex. Petals 3, subequal, spatulate, 1.2-1.5 mm long, hyaline to straw-coloured, hoary, without any black gland. Ovary stipitate; style 3-fid. Seeds obovoid-oblong, 0.35-0.4 x ca 0.25 mm, yellow; cells of seed coat transversely elongated and arranged in vertical rows; appendages of 2-4 rectangular bands, arising from transverse radial wall.

**Habitat:** In moist places of forests.



**Fig. 1.** *Eriocaulon bastarenses* K.K. Khanna A: Habit; B: Involucral bract (abaxial); C: Floral bract (abaxial); D: Male flower; E: Female flower; F: Seed.

**Table 1: Distinguishing characters between *Eriocaulon martianum* Wall. ex Körn. and *Eriocaulon bastarensense* sp.nov.**

Characters	<i>Eriocaulon martianum</i> Wall. ex Körn.	<i>Eriocaulon bastarensense</i> sp. nov.
Leaves and sheaths	Turning purple on drying	Never turning purple on drying
Male spathe	Glabrous with obtuse lobes	Sparsely hoary with acute or acuminate lobes
Female sepals	Glabrous	Hoary
Seed cells appendages	Ribbon-like, never of bands	Of 2-4 rectangular bands

**Etymology:** The species is named after the type locality Bastar district.

**2. *Eriocaulon chandrae* K.K. Khanna, sp. nov.** (Fig. 2)

**Diagnosis:** *Eriocaulon chandrae* is allied to *Eriocaulon edwardii* Fyson but differs in having peduncles pilose towards base, involucre bracts long acuminate or cuspidate, floral bracts cuspidate and petals absent in female flowers (Table 2).

**Typus:** INDIA, Madhya Pradesh, Sanna-Khudia range, Raigarh district, 21st November 1971, G. Sen Gupta 16492 B (Holotype CAL).

Herbs, acaulescent; rootstock absent. Leaves rosulate, linear, up to 2 cm long, acute or acuminate. Heads hemispherical or subglobose, 2-3.5 mm across, grey to blackish; peduncles many, 2.5-10 cm long, pilose towards base; sheaths up to 2.5 cm long, glabrous; limb acute, entire; receptacles cylindrical, villous; involucre bracts oblong-lanceolate, 2.4-2.7 × 0.9-1 mm, long acuminate or cuspidate, chartaceous, straw-coloured; floral bracts oblong-elliptic, 2-2.5 × 0.4-0.6 mm,

cuspidate with 0.3-0.4 mm long cusp, glabrous, black. **Male flowers:** Sepals connate into a spathe of 1-1.2 × 0.5-0.6 mm, 2-lobed with acute to acuminate lobes, glabrous, black. Petals 3, very small, without any black gland. Anthers 6, black. **Female flowers:** Sepals usually 2, sometimes 3, linear, 1-1.2 mm long, glabrous, black; 3rd one (if present) narrower than others. Petals absent. Ovary stipitate; style 3-fid. Seeds oblong-ellipsoid, ca 0.35 × 0.25 mm, yellow; cells of seed coat transversely elongated arranged in vertical rows; appendages in the form of continuous ribbon-like bands arising from both transverse and vertical walls conforming to its length.

**Habitat:** In damp soil of meadows.

**Etymology:** The new species is named in honour of Late Professor Sudhir Chandra of the Botany Department, University of Allahabad, Allahabad an eminent botanist under whom the Senior author K.K. Khanna received the degree of Doctor of Philosophy.

**Note:** Specimen number 16492 A mounted on the holotype is *Eriocaulon hamiltonianum* Martius.

**Table 2: Distinguishing characters between *Eriocaulon edwardii* Fyson and *Eriocaulon chandrae* sp. nov.**

Characters	<i>Eriocaulon edwardii</i> Fyson	<i>Eriocaulon chandrae</i> sp. nov.
Peduncle	Glabrous	Pilose towards base
Involucre bract	Acute	Long acuminate or cuspidate
Floral bract	Acute or subacuminate	Cuspidate
Female flower	Petals present	Petals absent

**3. *Eriocaulon mirzapurensense* K.K. Khanna & Anand Kumar, sp. nov.** (Fig. 3)

**Diagnosis:** *Eriocaulon mirzapurensense* is allied to *Eriocaulon quinquangulare* L. but differs in having involucre bracts distinctly acute at apex, male petals larger (more than 0.2 mm long) and distinctly unequal in size (one male petal large, 0.45-0.6 mm long; two male petals small, 0.2-0.25 mm long), female petals smaller, up to 1.4 mm long and seeds yellow in colour (Table 3).

**Typus:** INDIA, Uttar Pradesh, On way to Pokhra, Mirzapur district, 28<sup>th</sup> December 1970, G. Panigrahi 13797 (Holotype CAL).

Herbs, acaulescent; rootstock absent. Leaves rosulate, linear or lanceolate, 1.2-2.5 cm long, acuminate, pinkish turning into pinkish purple on drying. Heads globose, 3-5 mm across, grey; peduncles many, 3-9 cm long, glabrous; sheaths pinkish purple, 1-2 cm long, glabrous; limb acute, entire; receptacles globose, villous; involucre bracts oblong-obovate, 1.5-1.7 × 1-

1.1 mm, acute, chartaceous to subcoriaceous, glabrous, straw-coloured; floral bracts oblanceolate, 1.6-2.0 × 0.6-0.8 mm, acuminate, chartaceous, dorsally hoary towards apex, black. **Male flowers:** Sepals connate into a spathe of 1-1.2 × 0.7-0.8 mm, 3-lobed with obtuse lobes, black, hoary towards apex. Petals 3, distinctly unequal in size; one large, 0.45-0.6 mm long; two small, 0.2-0.25 mm long, hoary, each with a black gland. Anthers 6, black. **Female flowers:** Sepals 3, free, spatulate, 1.1-1.3 mm long, black, hoary towards apex. Petals 3, free, unequal, spatulate, hyaline or light yellow, 1.1-1.4 mm long, hoary, each with a black gland. Ovary stipitate; style 3-fid. Seeds ovoid or oblong-ovoid, 0.35-0.4 × ca 0.25 mm, yellow; cells of seed coat transversely elongated arranged in vertical rows; appendages rectangular or 2-4 as ribbon like bands arising from transverse radial wall.

**Habitat:** In moist and damp places of forests.

**Etymology:** The species is named after the type locality Mirzapur district.

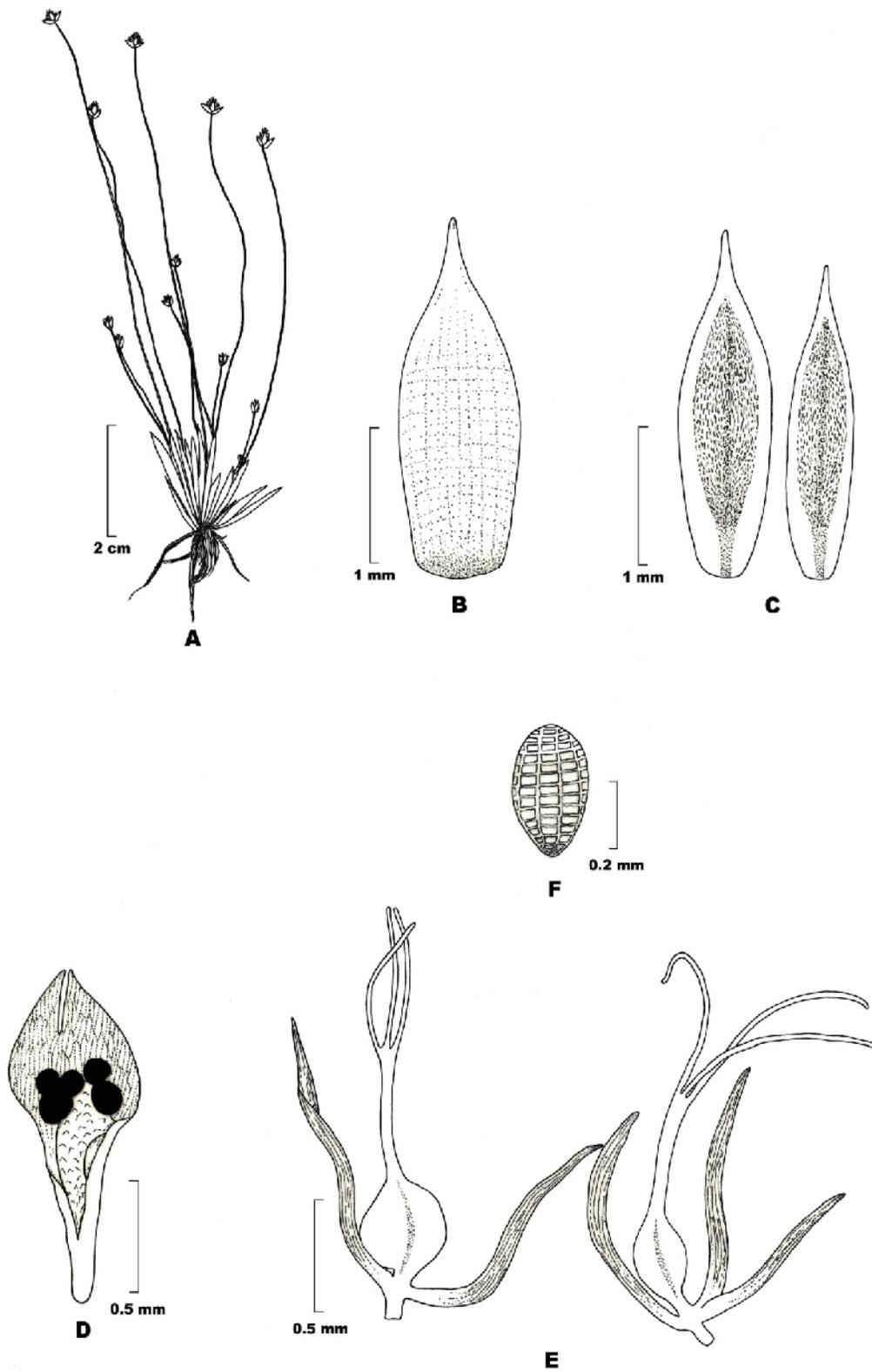
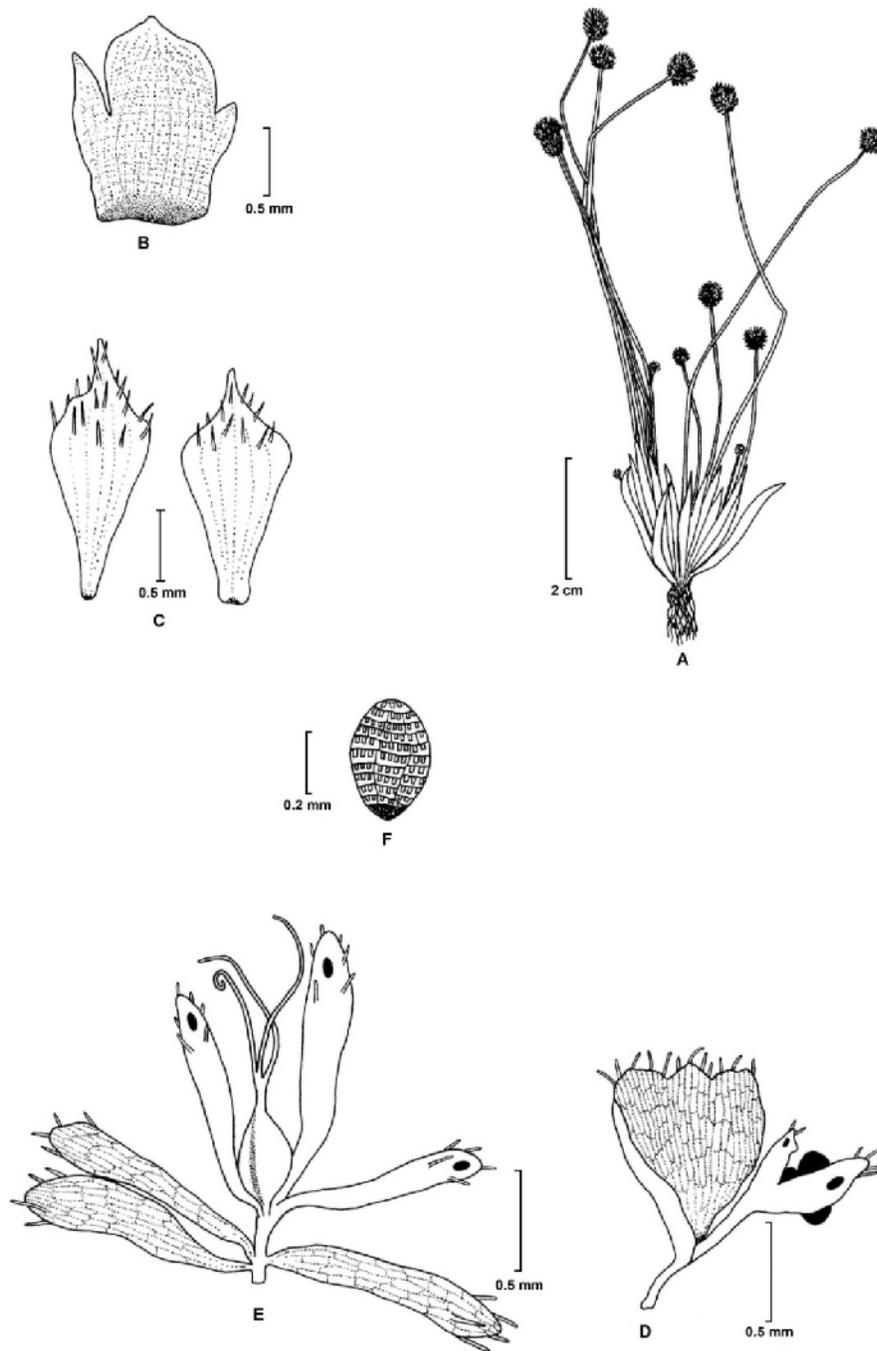


Fig. 2. *Eriocaulon chandrae* K.K. Khanna. A: Habit; B: Involucral bract (abaxial); C: Floral bracts (abaxial); D: Male flower; E: Female flowers; F: Seed.



**Fig. 3.** *Eriocaulon mirzapurense* K.K. Khanna & Anand Kumar. A: Habit; B: Involucral bract (abaxial); C: Floral bracts (abaxial); D: Male flower; E: Female flower; F: Seed.

**Table 3: Distinguishing characters between *Eriocaulon quinquangulare* L. and *Eriocaulon mirzapurense* sp. nov.**

Characters	<i>Eriocaulon quinquangulare</i> L.	<i>Eriocaulon mirzapurense</i> sp. nov.
<b>Involucral bract</b>	Obtuse	Distinctly acute
<b>Male petals</b>	Up to 0.2 mm long; subequal	0.2-0.6 mm long; distinctly unequal in size (one large, 0.45-0.6 mm long; two small, 0.2-0.25 mm long)
<b>Female petals</b>	1.5-2 mm long	Up to 1.4 mm long
<b>Seeds</b>	Pale purple	Yellow

**Acknowledgements**

The authors are thankful to the Director, Botanical Survey of India, Kolkata and Scientist-in-charge, Botanical Survey of India, Central Regional Centre, Allahabad for providing necessary facilities.

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