

|   |  |   |
|---|--|---|
|  | <p>Journal Homepage: -<a href="http://www.journalijar.com">www.journalijar.com</a></p> <h2>INTERNATIONAL JOURNAL OF<br/>ADVANCED RESEARCH (IJAR)</h2> <p>Article DOI:10.21474/IJAR01/5596<br/>DOI URL: <a href="http://dx.doi.org/10.21474/IJAR01/5596">http://dx.doi.org/10.21474/IJAR01/5596</a></p> |  |
|---|--|---|

### RESEARCH ARTICLE

#### A NEW SPECIES OF ERIOCAULON (ERIOCAULACEAE) FROM LATERITIC PLATEAUS OF SINDHUDURD, MAHARASHTRA, INDIA.

Paithane V. A.<sup>1</sup>, \*Bhuktar A. S.<sup>2</sup>, Kashetti R.P<sup>1</sup> and Patil S. B<sup>1</sup>.

1. Dept. of Botany, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi, Dist. Sindhudurg – 416810, Maharashtra, India.
2. Dept. of Botany, Vivekanand Arts, S. D. Commerce and Science College, Aurangabad-431002, Maharashtra, India.

#### Manuscript Info

##### Manuscript History

Received: 11 August 2017  
Final Accepted: 13 September 2017  
Published: October 2017

##### Key words:-

*Eriocaulongulnarparianum*,  
Eriocaulaceae, India, Western Ghats,  
Maharashtra.

#### Abstract

The genus *Eriocaulon* L. (Eriocaulaceae) is distributed in tropical and subtropical regions of World. Ansari & Balakrishnan reported 85 species in India, later on 11 species have been described from India and now 96 species recorded for India. During collections from Konkan, Western Ghats, India author collected one interesting specimen of *Eriocaulon*. After critical observation and survey of literature it revealed to be a new species. *Eriocaulon gulnarparianum* sp. nov. described which is allied to *Eriocaulon xeranthemum* Martius and *E. devendranii* Sankar, Ravi kumar & Babu, but differs in its leaf length 0.8 mm to 1.5 cm, head 5mm across with involucre bracts, without involucre bracts 2 mm across, floral bracts oblong-oblongate, involucre bracts up to 3 mm, acuminate, multifid. Sepals of male flower obtuse at apex, 3 lobed, 2 lobes connate and one free, Petals of female flower spatulate and notched apex, seed with transverse elongated cells with 1-2 appendages which is described with brief morphology, association, photographs and note on identity.

Copy Right, IJAR, 2017., All rights reserved.

#### Introduction:-

The genus *Eriocaulon* is monotypic genus of family Eriocaulaceae. Linnaeus (1753) reported only four species (Three from India), later on in 19<sup>th</sup> century, (Brown, 1810; Martius 1832; Wallich, 1832; Royle, 1839; Kunth, 1841; Dalzell, 1851; Griffith, 1851; Steudel, 1854-1855; Koenig 1856 & 1867) described number of new species from India. In flora British India, Hooker (1893) given accounts 43 species of which 14 new species. Ruhland (1903) in monographic study shows 47 species from India. Fyson (1919-1922) described 51 species and few varieties for British India. Ansari and Balakrishnan (1994 & 2009) in the revisionary study reported 85 species. Later on Yadav et al. 1998, 2008; Shimpale et al., 2009; Vijaysankar et al., 2006; Shimpale & Yadav, 2010; Vivek et al., 2010; Namphy et al., 2011; Puneekar et al., 2002; Puneekar & Lakshaminarsimhan, 2004; Puneekar et al., 2004; Swapna et al., 2012; Sunil & Naveen Kumar, 2015; Naveen Kumar et al., 2017, Sunil & Pradeep, 2003; Gaikwad & Yadav, 2002; Gaikwad et al., 2002, and many others added new species for India, till date 96 species reported for India.

While exploring lateritic plateaus of Konkan regions, author collected an interesting specimen from plateaus of Achirne Village, Salva plateaus, and hills slopes in Vaibhavwadi Village of Sindhudurg in Maharashtra and after critical study and comparison with other species of *Eriocaulon* and scrutiny of literature, it turned out to be quite

**Corresponding Author:-Paithane V. A.**

Address:-Dept. of Botany, Anandibai Raorane Arts, Commerce and Science College, Vaibhavwadi-416810, Maharashtra, India.

different taxa from known species hence we describe these collection as a new species. The new species is closely allied to *Eriocaulon xeranthemum* Martius a species common throughout India, Myanmar, Nepal and *E. devendranii* Sankar, Ravikumar&Babu, a species endemic to Western Ghats, Kerala

### Taxonomy:-

*Eriocaulon gulnarparianum* Paithane, Bhuktar A.S., Kashetti R.P. &Patil S.B. *sp.nov.* (Fig.1 A-F & Fig.2 a,b,c.)

*Eriocaulon gulnarparianum* is similar to *Eriocaulon xeranthemum* Martius and *E. devendranii*, but differs from the former in having leaf length 0.8 mm to 1.5 cm ( up to 1 cm in *E.devendranii*), head 5 mm across with involucre bracts, without involucre bracts 2 mm across, floral bracts oblong-oblancheolate (oblancheolate in *E. devendranii*), involucre bracts upto 3 mm, acuminate, multifide (spreading in *E. xeranthemum*). Sepals of male flower obtuse at apex (Truncate in *E. xeranthemum*), 3 lobed, 2 lobes connate and one free (Three lobed, in *E. xeranthemum* and *E. devendranii*), Petals of female flowers are spatulate and notched apex ( notch absent in *E. devendranii* and *E. xeranthemum*), seed with transverse elongated cells with 1-2 appendages (2-4 in *E.devendranii* and *E.xeranthemum*). Type:- India, Maharashtra,Sindhudurg,13<sup>o</sup>43.509' N,79<sup>o</sup>19.345E, 80 m elevation, 10<sup>th</sup> August 2016, Gulnarpari Patankar and Paithane V.A, Kashetti R. P. and Patil. S. B.1044 (Holotype VH!; isotype BSI, CAL)

Acaulescent herb. Root stock absent. Leaves rosulate, linear, acute, 0.8-1.5 cm long. Peduncles 3-15, up to 3 cm long, glabrous, virgate. Sheath 0.5 -1cm long, glabrous; limb ovate, acute, entire. Head hemispherical or cuneate, ca 5 mm across with involucre bracts, 2 mm across without involucre bracts, straw-coloured. Receptacles convex, glabrous. Involucre bracts erect, not spreading, linear-oblong, acuminate, 2.5-3 mm x 0.2- 0.5 mm, chartaceous, glabrous, straw coloured. Floral bracts oblancheolate, obtuse, sparsely hoary at apex, 0.5-0.7 x 0.2-0.3 mm. Male flowers: Pedicel minute. Sepal 3, obovate, 2 lobes connate into spathe and one free ca 0.9-1.2 x 0.5-0.7 mm; lobes obtuse, hoary at apex, brown turns black at maturity, stipe of corolla 1mm long. Petals 3, minute, equal, acute to sub-acute, with black gland. Anthers 6, black. Female flowers: Sub-sessile, sometimes with short pedicel. Sepals 3, free, two lateral one oblancheolate, obtuse, sparsely hairy at apex, ca 1mm x 0.2mm ; middle one linear, ca 1 mm x 0.1 mm, sparsely hairy at apex. Petals 3, sub-equal, spatulate, one to two petal notched at apex, 0.5-0.7-0.8-1.2 mm long, hyaline, barbet with black gland. Stipitate between sepals and petals. Ovary sessile, ovoid; style 3-fid. Seed oblong-ellipsoide, acute at base, obtuse at apex, 0.5 x 0.2 mm, pale yellow; cells of seed coat transversely elongated, aligned in vertical rows; appendages 1-2 from transverse radial wall, setiform, dilated at apex.

Etymology :- The new species named after our under graduate student Gulnarpari Patankar for his valuable collection during exploration and for proving specimens from various localities of Sindhudurg District of Maharashtra State.

**Phenology:-**Flowering and fruiting in August to October.

Distribution and Ecology:- *Eriocaulon gulnarparianum* is currently known from Achirne, Salva plateaus and hills slopes of Vaibhavwadi villege, Sindhudurg District in Maharashtra State. It grows on lateritic plateaus and wet rocky hillside, in association with *Utricularia reticulata*, *Glyphochloa acuminata*, *Fimbristylis tetragona*, *Eriocaulon eurypeplon*, *Indopoa paupercula*, *Danthonidium gammiei*, *Drosera indica*, *Trithuria konkanensis*, *Euphorbia concanensis*, *Exacum lawii*, *Eragrostis sp.*, *oldenlandia sp.*

Conservation Status:- Achirne and Salva Plateaus are not thoroughly explored therefore we assess the new species and uncontrolled grazing on Salva and mining at Achirne are added impacts of habitat destruction, hence its necessary to conserve these ecosystem.

**Table 1:-** Diagnostic morphological characters of *Eriocaulon gulnarparianumsp. nov.* and allied species.

| Sr.No | Characters            | Name of Taxa                      |  |                          |
|-------|-----------------------|-----------------------------------|--|--------------------------|
|       |                       | <i>E. devendranii</i>             | <i>E.gulnarparianum sp. nov.</i>   | <i>E. xeranthemum</i>    |
| 1     | Involucre Bracts      | Upto 3.5 mm, acuminate, multifide | Up to 3 mm, acuminate, multifide   | 2-3.5 mm long, Spreading |
| 2     | Floral Bracts         | Oblanceolate                      | Oblong-oblancheolate   | Truncate                 |
| 3     | Sepals in Male flower | Obtuse at apex, 3 lobed,          | Obtuse at apex, 3 lobed, 2 lobes connate, one free, slightly jointed at base | Truncate, 3 lobed        |
| 4     | Petals in Female      | Spatulate                         | Spatulate, one-two petal with  | Spatulate                |

|   |                 |     |       |     |
|---|-----------------|-----|-------|-----|
|   | flowers         |     | notch |     |
| 5 | Seed Appendages | 2-4 | 1-2   | 2-4 |

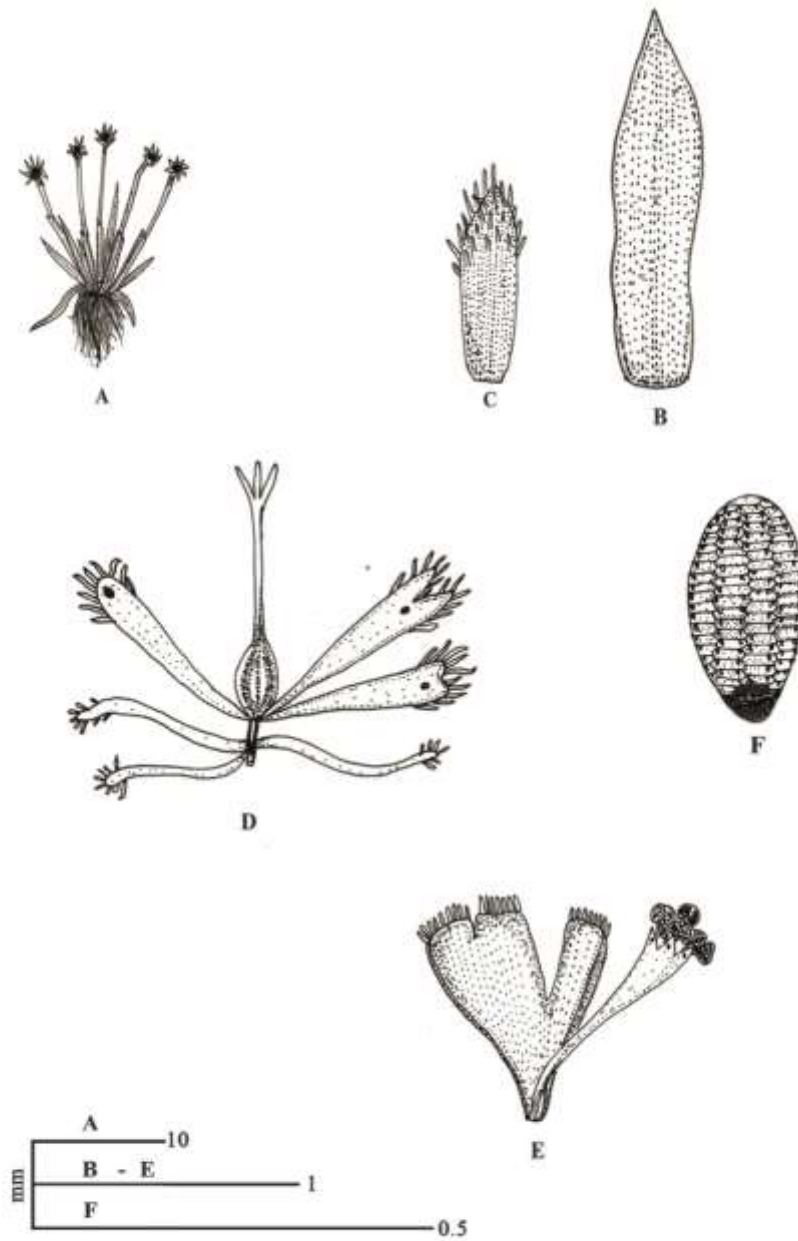


Fig. 1 *Ericaulon gulnarparianum* sp. nov. - A. habit. B. involucre bract. C. floral bract. D. male flower. E. female flower. F. seed (A-F drawn from Paithane et al. 1044, type).



**Fig.2** *Eriocaulon gulnarparianum* sp. nov. SEM images of seed (a-entire seed, b-Seed coat showing transversely elongate cell,c- appendage).

#### Distribution of allied taxa:-

*Eriocaulon xeranthemum* Martius is common in open moist or marshy lands and in crevices of moist rock from sea level to 700 altitude, known from Maharashtra, Kerala, Karnataka, Andaman and *E. devendranii* Sankar, Ravikumar & Babu (2006) is rare on exposed moist soil and endemic to Western Ghats of Kerala where as described new species is rare on lateritic plateaus of Konkan, Sindhudurg District of Maharashtra State and easily identified by its notched petals of female flower which is distinct characters as compared to all Indian *Eriocaulon* species.

#### Acknowledgements:-

The authors are very much thankful to R. Ansari, Malabar Botanical Garden, Kozhikode, Kerala for his comments and Vijayasankar Raman, National Center for Natural Products Research, The University of Mississippi, USA for providing pictures of *Eriocaulon devendranii* for comparison. We also thankful to Dr. Kanchi Gandhi, Harvard University Herbaria, Harvard University, Cambridge, USA for nomenclature of described of species and Principal, AnandibaiRaorane Arts, Commerce and Science College Vaibhavwadi, Sindhudurg for Laboratory facilities. I thankful to Head, Dept. of Physics, Shivaji University Kolhapur for providing SEM facility.

#### References:-

1. Ansari, R &Balakrishnan, N. P. 1994 The family Eriocaulaceae in India, BishenSingh Mahendra Pal Singh, Dehradun.
2. Ansari, R &Balakrishnan, N. P. 2009 Revised by R. Ansari The family Eriocaulaceae in India, Bishen Singh Mahendra Pal Singh, Dehradun.
3. Brown, R. 1810 Prodrromus Florae Novae Hollandiae et insulae van- Diemen.- Facsimile edition: Weinhelm 1960.
4. SUNIL C. N. & V. V. NAVEEN KUMAR 2015 A NEW SPECIES OF ERIOCAULON (ERIOCAULACEAE) FROM WESTERN GHATS, INDIA JOURNAL OF PLANT TAXONOMY AND GEOGRAPHY 70:20, 211-215.
5. SUNIL C. N., M. K. RATHEESH NARAYANAN, M. K. NANDAKUMAR, SUJATA K. A., JAYESH P. JOSEPH AND N. ANIL KUMAR 2013 ERIOCAULON KANNURENSE (ERIOCAULACEAE) A NEW SPECIES FROM KERALA, INDIA. INTERNATIONAL JOURNAL OF PLANT , ANIMAL AND ENVIRONMENTAL SCIENCE VOL. 3(2)116-120.
6. Sunil C.N. & V.V. Naveen Kumar 2015 A new species of *Eriocaulon* (Eriocaulaceae) from Western Ghats, India Webbia Vol. 70 (2) 211-215.
7. Dalzell, N. A 1851. *Eriocaulonrivulare*.- Hooker's J. Bot. kew Gard. Misc.3:280.

8. Fyson, P. F. 1919-1922. The Indian Species of Eriocaulon.- J. Indian Bot. 1:51-55, 2:133-150, 192-207, 259-266, 307-320, 3: 12-18, 91-115.Griffith, W. 1851 *Nayulæ Ad Plantas Asiaticas*. Part III. Calcutta.
9. Gaikwad, S. P., M. M. Sardesai and S. R. Yadav. 2002. A new species of Eriocaulon L. (Eriocaulaceae) from Maharashtra, India. *Rheedea* 12: 133 – 136.
10. Gaikwad, S.P. and S.R. Yadav. 2002. Eriocaulaceae in Maharashtra. In: Pullaiah, T. (Ed), *Biodiversity of India* 1: 256–341. Regency Publications, New Delhi.
11. Gaikwad, S.P., M. M. Sardesai, U. S. Yadav and S. R. Yadav. 2004. A new species of Eriocaulon L. (Eriocaulaceae) from Karnataka, India. *Rheedea* 14: 63 – 65.
12. Griffith, W. 1851. *Natulae Ad Plantas Asiaticas*. Part. III Calcutta.
13. Hooker, J. D. 1893. Eriocaulaceae.- flora of British India. 6: 571-585. London.
14. Koernicke F. A. 1867. Eriocaulaceae. In Miquel, F.A.W.-*Annales Musei Botanici Lugduno-Batavi*. Vol. 3. P. 162-164, 238-241, Amsterdam.
15. Koernicke, F. A. 1856 *Monographiae Eriocaulacearum Supplementum*.- *Linnaea* 27: 561-692.
16. Kunth, C. S. 1841 *Enumeratio Plantarum*. Vol. 3 Stuttgart.
17. Linnaeus, C. 1753. *Species Plantarum*. Vol. 1. Stockholm.
18. Swapna M. M., K. P. Rajesh, C. N. Manju, R. Prakashkumar 2012 *Eriocaulon madayiparense* (Eriocaulaceae) – A new species from the foot hills of the Western Ghats of India *PhytoKeys* 10: 19-23
19. Martius, C. F. P. 1832. Eriocaulaceae et xyrideae Indae Orientalis.- In Wallich, N. –*Plantae Asiaticae Rariores*. Vol. 3 p. 27-30. London.
20. Nampy S, Manudev K. M, Pradeep A. K. (2011) Two new species of *Eriocaulon* (Eriocaulaceae) from India. *Edinburgh J. Botany* 68: 257-263.
21. BIJU, P. K. SUBRAMANYA PRASAD, P. AJITH KUMAR, JOMY AUGUSTINE, K. RAVEENDRAN AND R. ANSARI 2012 ERIOCAULON CHEEMENIANUM (ERIOCAULACEAE) A NEW SPECIES FROM KERALA, INDIA, INTERNATIONAL JOURNAL OF PLANT, ANIMAL AND ENVIRONMENTAL SCIENCE VOL. 2(4) 176-179.
22. Pradeep, A.K. and C.N. Sunil. 2003. *Eriocaulon ansarii* Pradeep & Sunil (Eriocaulaceae), a new species from India. *Candollea* 58: 321–323.
23. Punekar, S. A. and Lakshminarasimhan, P. 2004. *Eriocaulon peninsulare* (Eriocaulaceae) – a new species from India. *Nord. J. Bot.* 23: 173 – 175.
24. Punekar, S. A., Lakshminarasimhan, P. & Vasudeva Rao, M. K. 2002 *Eriocaulon balakrishanii* (Eriocaulaceae), A new species from the Western Ghats of India- *Nord. J. Bot.* 22 (5): 609-611.
25. Punekar, S. A., N. V. Malpure and P. Lakshminarasimhan. 2003. Five new species of Eriocaulon L. (Eriocaulaceae) from the Western Ghats, India. *Rheedea* 13: 19 – 27.
26. Punekar, S. A., N. V. Malpure, and P. Lakshminarasimhan. 2004. Three new species of Eriocaulon L. (Eriocaulaceae) from Peninsular India. *Sida* 21: 625 – 635.
27. Royle, J. F. 1839. Eriocaulaceae.-In: *Illustration of The Botany and other Branches of the Natural History of Himalayan Mountain and of the Flora of Cashmere*. Vol. 1 P. 409. London.
28. Ruhland, W. 1903, Eriocaulaceae.-In: Engler, A. – *Das Pflanzenreich*. 13. Heft. IV. 30.
29. Shimpale V. B., Bhagat R. B., Deshmukh R. B., Yadav S. R. (2009) A new species of *Eriocaulon* (Eriocaulaceae) from Maharashtra, India. *Rheedea* 19 (1 & 2): 47–49.
30. Shimpale V. B., Yadav S.R. 2010 *Eriocaulon belgaumensis*: a new species of Eriocaulaceae from the Western Ghats of India. *Kew Bulletin* 65 (2): 337-339
31. Shimpale, V.B., R. B. Bhagat, R. B. Deshmukh and S.R. Yadav. 2009. A new species of Eriocaulon L. (Eriocaulaceae) from Maharashtra, India. *Rheedea* 19: 47 – 49.
32. Naveen Kumar V. V., C. N. Sunil, C. R. Remya Krishnan, M. G. Sanilkumar & E. C. Baiju 2017 A new species of *Eriocaulon* (Eriocaulaceae) from Southern Western Ghats, Kerala, India *Webbia* Vol.
33. Vijayasankar, R., K. Ravikumar and N.M.G. Babu. 2006. A new species of Eriocaulon L. (Eriocaulaceae) from Anamalai Hills of Kerala, India. *Rheedea* 16: 59 – 61.
34. Vivek, C. P., M. M. Swapna, and K. K. Suresh. 2010. *Eriocaulon wayanadense* (Eriocaulaceae), a new species from Kerala, India. *Rheedea* 20, 25-27.
35. Wallich, N. 1832. *Plantae Asiaticae Rariores*. Vol. 3. London
36. Yadav S. R., Potdar G.G, Kumar A.A, Ottaghvari M, Sonkar A (2008) *Eriocaulon pedunculatum* a new species of *Eriocaulaceae* from the Western Ghats India. *Kew Bulletin* 63 (3): 503-505.
37. Yadav, S. R., S. P. Gaikwad and M. M. Sardesai. 1998. A new species of Eriocaulon L. (Eriocaulaceae) from India. *Rheedea* 8: 145 – 147.