ADDITIONAL NOTES ON THE ERIOCAULACEAE. XIV

Harold N. Moldenke

ERIOCAULACEAE Lindl.

Additional & emended bibliography: Petiv., Gaz. pl. 6, fig. 2. 1702; Pluk., Alm. pl. 409, fig. 5. 1769; Lam., Encycl. 3: 276. 1789; Willd. in L., Sp. Pl., ed. 4, 1: 486. 1797; Michx., Fl. Bor.-am. 2: 165. 1803; Pursh, Fl. Am. Sept. 1: 91. 1814; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 864. 1817; Nutt., Gen. 1: 90. 1818; Ell., Sketch Bot. 2: 565. 1824; Wall., Plant. As. Rar. 3: 28. 1832; Wall., Numer. List 207--208 ["207"]. 1832; Beck, Bot. 370. 1833; Benth. in Hook., Niger Fl. 547. 1849; Hook. f., Fl. Brit. Ind. 6: 571--585. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877--880. 1893; Britton & Br., Ill. Fl., ed. 1, 1: 371--373, 602--604, & 611, fig. 899--903 (1896) and 3: 536, 537, 541, 545, & 577. 1896; Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 1--108. 1903; R. M. Harper, Ann. N. Y. Acad. Sci. 17: 267--268, pl. 24, fig. 1. 1906; Alv. Silv., Archiv. Mus. Nac. Rio Jan. 23: 162, pl. 4. 1921; Fern., Rhodora 48: iv & 58. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877--880 (1946) and pr. 3, 1: 877--880. 1960; B. G. Briggs, Contrib. N. S. Wales Nat. Herb. 4: 24 & 26. 1966; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Bull. 17: 19. 1966; G. L. Davis, Syst. Embryol. Angiosp. 1966; K. Larsen, Dansk Bot. Arkiv 23: 375--399. 1966; C. C. Townsend, Excerpt. Bot. A.10: 310. 1966; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1965: 31. 1966; S. V. Ramaswami, Study Flow. Pl. Bangalore [thesis] 219--221 & 1406--1407. 1966; Goodland, Bol. Soc. Venez. Cienc. Nat. 26: 345. 1966; Klots, New Field Book Freshw. Life 94. 1966; Begum, Curr. Sci. [India] 35: 262--263. 1966; R. H. Compton, Journ. S. Afr. Bot. Suppl. 6: 19, 33, & 92. 1966; Subramanyam & Henry, Bull. Bot. Surv. India 8: 214. 1966; Sebastine & Ramamurthy, Bull. Bot. Surv. India 8: 182. 1966; J. L. Ellis, Bull. Bot. Surv. India 8: 329 & 339. 1966; O. D. Evans, Biol. Abstr. 48: 4562 & 4563. 1967; Soukup, Biota 6: 359. 1967; Anon., Pollen & Spores 9: 642. 1967; Kral, Biol. Abstr. 48: 3190. 1967; Anon., Ind. Bibliog. Bot. Trop. 4 (1): 53 & 88. 1967; Y. H. Harrison, Biol. Abstr. 48: 8707. 1967; Anon., Biol. Abstr. 48: 3190 & 4563 (1967), 48 (10): S.60 & S.117 (1967), and 48 (22): S.65. 1967; Moldenke, Biol. Abstr. 48: xxii & 10099 (1967) and 48 (20): S. 61, S.161, S.165, & S.183. 1967; Dombrowski & Kuniyoshi, Araucariana 1: 15 & 18. 1967; J. de J. Jiménez, Archiv. Bot. & Biogeog. Ital. 43: 4. 1967; Begum, Bioresearch Index 1967: 2255. 1967; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Bull. 18: 45. 1967; Moldenke, Résumé Suppl. 15: [1]--5, 8, 10, 12, 14, 20, & 21. 1967; W. G. Burger, Fam. Flow. Pl. Ethiop. 132. 1967; Sculthorpe, Biol. Aquat. Vasc. Pl. 23, 389--391, 393, & 394. 1967; L. V. Barton, Bibl. Seeds 782. 1967; Satake, Nat. Sci. & Mus. 34: 161 & 162. 1967; Fulling, Ind. Bot. Record. Bot. Review 178. 1967; R. M. Harper, Castanea 32: 17. 1967; Rickett, Wild Fls. U. S. 2 (1): 135, pl.

27 (1967) and 2 (2): 659 & 666. 1967; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 1--2. 1967; Berhaut, Fl. Sénégal, ed. 2, 311. 1967; J. & A. Raynal, Adansonia 7: 329. 1967; L. S. Thomas, Pine Barrens 23. 1967; D. A. Livingstone, Ecol. Monog. 37 (1): 43. 1967; L. O. Williams, Fieldiana Bot. 31: 249--269. 1967; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1966: 9 (1967) and 1967: 31. 1968; Cronquist, Evol. & Class. Flow. Pl. 335, 336, & 390. 1968; F. A. Barkley, Outline Classif. Organisms, ed. 2, 10. 1968; Moldenke, Biol. Abstr. 49: 4188 (1968) and 49 (9): S.58. 1968; Anon., Biol. Abstr. 49: 1975 (1968) and 49 (7): S.58, S.133, & S.180. 1968; Moldenke, Résumé Suppl. 16: [1], 2, 5--9, 12, 19, 21, 23, 25--27, & 30. 1968; R. M. White, Irish Naturl. Journ. 16: 40. 1968; Meikle, Kew Bull. 22: 141--144. 1968; Justice & Bell, Wild Fls. N. C. 13 & 209. 1968; Moldenke, Phytologia 17: 348--352. 1968; Fassett, Index Rep. Fl. Wisc. [1]. n.d.

Burger (1967) informs us that in this family "a pistillode [is] often present in staminate flowers". Airy Shaw (1966) states that the genus Reilia Steud. may belong in either the Eriocaulaceae or the Juncaceae; he also tells us that the Eriocaulaceae was included by Bentham & Hooker in a "Series" called Glumaceae. Tomlinson (1964) compares the Eriocaulaceae with the genus Aphyllanthes in the Liliaceae. Runner (1961) places the genera Streptolirion and Juncoides in the Eriocaulaceae by the apparent error of omitting the name of family "31" between families "30" and "32". Tamayo (1961) places Leucothoë venezuelensis A. C. Sm. in the Eriocaulaceae instead of in the Ericaceae. Larsen (1966) reports the chromosome numbers for seven species in this family from Thailand.

BLASTOCAULON Ruhl.

Synonymy: Blastocaular Angely, Fl. Bacia Paran. 22: 31, sphalm. 1962.

Additional bibliography: Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 223. 1903; Moldenke, Known Geogr. Distrib. Erioc. 7, 28, 31, 39, 44, 52, 53, 55, & 59. 1946; Moldenke, Phytologia 4: 338. 1953; Angely, Cat. Estat. 10: [2]. 1956; Angely, Fl. Paran. 10: 6, 7, 9, & 10. 1957; Moldenke, Résumé 87, 237, 279, 281, 285, 292, 323, 327, 328, 334, 352, 402, & 479. 1959; Angely, Liv. Gen. Bot. Bras. 19 & 39. 1960; Angely, Fl. Bacia Paran. 22: 31. 1962; Hegnauer, Chemotax. Pfl. 2: 153. 1963; Moldenke, Résumé Suppl. 7: 7 (1963) and 12: 11. 1965; F. A. Barkley, List Ord. Fam. Anthoph. 113 & 145. 1965; Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 138. 1966.

The generic name is taken from the Greek words, βλαστός, and καυλος, meaning "young branchlet stems" because the stems produce small branchlets.

BLASTOCAULON ALBIDUM (Gardn.) Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 7, 28, 44, & 55. 1946; Moldenke, Phytologia 4: 338. 1953; Moldenke,

Résumé 87, 279, 285, 323, 334, & 479. 1959.

Additional citations: BRAZIL: Minas Gerais: G. Gardner 5273 (B--isotype, N--isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

BLASTOCAULON PROSTRATUM (Körn.) Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Eriocaul. 7, 28, 31, 52, & 55. 1946; Moldenke, Résumé 87, 281, 327, 334, & 479. 1959.

Pereira reports that this plant grows in pure stands with no other plants in the formation. The species has been collected in anthesis in May.

Additional citations: BRAZIL: Minas Gerais: Martius s.n. [Cabo Agosto; Macbride photos 18733] (B--isotype, Mu--292--isotype, N--photo of isotype, W--photo of isotype); E. Pereira 2802 [Pabst 3638] (Bd--3847, Z); J. E. Pohl s.n. (Mu--293). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

BLASTOCAULON RUPESTRE (Gardn.) Ruhl.

Additional synonymy: Blastocaulon rupestris (Gardn.) Ruhl. ex Moldenke, Phytologia 4: 338, in syn. 1953.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 7, 28, 39, 53, 55, & 59. 1946; Moldenke, Phytologia 4: 338. 1953; Moldenke, Résumé 87, 237, 292, 328, 334, 352, & 479. 1959; Moldenke, Résumé Suppl. 12: 11. 1965.

Additional citations: BRAZIL: Minas Gerais: G. Gardner 5272 (B--isotype, N--isotype, W--1067056--isotype); Mexia 5779 (B, Ca-509143, Mi, Ut--50252a, Vi, W--1571904), 5780 (Gg, Go, Mi, Ut--50251a, W--1571905); E. Pereira 2805 [Pabst 3641] (Bd--3846, Z); Schwacke 8485 (B). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

BLASTOCAULON SPELEICOLA Alv. Silv.

Additional bibliography: Alv. Silv., Fl. Mont. 274, pl. 182. 1928; Moldenke, Known Geogr. Distrib. Erioc. 7 & 28. 1946; Moldenke, Résumé 87 & 479. 1959.

CARPTOTEPALA Moldenke

Bibliography: Moldenke, Fieldiana Bot. 28: 114. 1951; Angely, Cat. Estat. 10: [2]. 1956; Moldenke, Bull. Jard. Bot. Brux. 27: 118. 1957; J. A. Steyerm., Fieldiana Bot. 28: 1157. 1957; Angely, Fl. Paran. 10: 7, 9, & 10. 1957; Moldenke, Résumé 70, 74, 249, 326, 401, & 479. 1959; F. A. Barkley, List Ord. Fam. Anthoph. 113 & 149. 1965; Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 202. 1966.

Type: C. insolita Moldenke [=C. jenmani (Gleason) Moldenke].

The generic name is derived from the Latin, carptim, and the latinized French, tepala, meaning separate divisions of the perianth, because of the completely free sepals and petals in the flowers of both sexes.

CARPTOTEPALA JENMANI (Gleason) Moldenke

Synonymy: Paepalanthus jenmani Gleason, Bull. Torrey Bot. Club 56: 14. 1929. Carptotepala insolita Moldenke, Fieldiana Bot. 28: 114--116. 1951. Paepalanthus chimantensis Moldenke, Bull. Jard. Bot. Brux. 27: 118, in syn. 1957.

Additional bibliography: Gleason, Bull. Torrey Bot. Club 56: 14. 1929; Moldenke, Fieldiana Bot. 28: 114--116. 1951; Moldenke, Phytologia 4: 338. 1953; Moldenke, Mem. N. Y. Bot. Gard. 9: 278. 1957; Moldenke, Bull. Jard. Bot. Brux. 27: 118--119. 1957; Moldenke, Résumé 70, 74, 249, 326, & 479. 1959.

Collectors describe the roots of this plant as thickish and orchid-like, the leaves borne in dense clusters, rigid, erect, firmly membranous or rigid-coriaceous, varying from rich- or pale-green to grass-green on both surfaces, the involucre buff, the heads white or gray-white with blackish on the outer parts at the base, the flowers white or whitish, and the bracts gray-brown. Gleason's original description was "Leaves densely cespitose, soft and lax, 1--2 mm. wide, 8--12 cm. long, glabrous, subulate-tipped; peduncles 20--25 cm. long, costate, somewhat twisted, glabrous; sheaths strongly twisted, 4--5 cm. long, sparsely hirsute; heads hemispheric, 3--5 mm. in diameter; bracts broadly ovate to ovate-oblong, appressed, imbricate in several series, glabrous."

The type of the species is Jenman 1032, collected on the Kaieteur savanna in British Guiana, and deposited in the herbarium of the Royal Botanic Gardens at Kew. The conspecific C. insolita, on the other hand, was based on J. A. Steyermark 60703, collected by a waterfall in a swampy savanna between Río Karuai and Salto de Itaba-naima along the Río Karuai, at the southwestern base of Ptari-tepui, at 1220 meters altitude, Bolívar, Venezuela, on November 28, 1944, and is deposited in the herbarium of the New York Botanical Garden. Paepalanthus chimantensis was based on Steyermark & Wurdack 365, also from Bolívar, Venezuela.

The plant has been collected at altitudes of 65 to 2600 meters, in anthesis from January to March, and in July, August, October, and November, and in fruit in July. Steyermark records the vernacular name "leut". He also states that the species forms dense mats on wet rocks at the base of waterfalls, that it is common along swift water and rapids, locally abundant in large colonies in rapid water among rocks, and found in the spray zone on top of waterfalls. Maguire found it on moist rocks, while Sandwith describes it as tufted in sand among boulders by falls. Maguire & Fanshawe found it by waterfalls, on sandstone savannas, and locally common by riversides. Steyermark & Wurdack describe it as locally frequent on moist mossy ground, in scrub forests, in dense cushions in thickets, in dry sand, and in large colonies in rapid water among rocks. On the label of their no. 365 they note that its "leaves narrower and caudex more elongate than 364 but probably only an ecological variant". I agree with this conclusion. Whitton found the species growing on wet rocks, in moistish open white sand, and as recently exposed or still below

river water. He notes "buds farther advanced the further up shore one goes".

Additional citations: VENEZUELA: Bolívar: B. Maguire 33516a (N); J. A. Steyermark 6070 (N), 74662 (Z), 76016 (Z), 76057 (Z); Steyermark & Wurdack 72 (N), 364 (N), 365 (N), 476 (N). BRITISH GUIANA: S. G. Harrison 1391 (K, S); Jenman 1032 [N. Y. Bot. Gard. Type Photo neg. 5007] (K--type, N--photo of type, N--photo of type), 7198 (K), 7486 (Ut--9107a); Maguire & Fanshawe 32312 (N), 32643 (Mu, N); Sandwith 1258 (K, Ut--44224a); Schomburgk s.n. (K); Whitton 36 (K), 77 (K), 367 (K).

COMANTHERA L. B. Sm.

Bibliography: L. B. Sm., Contrib. Gray Herb., ser. 2, 117: 38-39, pl. 2. 1937; Moldenke, Phytologia 4: 338. 1953; Angely, Cat. Estat. 10: [2]. 1956; Angely, Fl. Paran. 10: 5, 7, 9, & 11. 1957; Anon., U. S. Dept. Agr. Bot. Subj. Index 5: 4226. 1958; Moldenke, Résumé 70, 75, 88, 351, 400, & 479. 1959; Moldenke, Résumé Suppl. 1: 5, 6, 16, 21, 23, & 25. 1959; Angely, Liv. Gen. Bot. Bras. 19 & 42. 1960; F. A. Barkley, List Ord. Fam. Anthoph. 113 & 154. 1965; Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 268. 1966; Moldenke, Phytologia 13: 218. 1966; Moldenke, Biol. Abstr. 47: 6792. 1966.

The generic name is derived from the Greek, κόμα, and ανθός, meaning "hairy flower", since the anthers are long-hairy.

Mrs. A. Gürts-van Rijn, in a letter to me dated March 21, 1966, casts some doubt on the validity of this genus. She says: "We have been looking very thoroughly to some Comanthera kegeliana specimens, partly annotated by you, and also used the publication of L. B. Smith in Contr. Gray Herb. 117: 38. 1937. He gives the description and some illustrations of this new genus and of C. linderi. We cannot agree with him on the characteristics of the flowers. He describes the male flowers as having a very reduced perianth and only one stamen. The sterile flowers, according to him, have reduced stamens. We have been looking to the flowers of Syngonanthus or Comanthera kegeliana, but could not find similar male flowers. We did, however, find overripe female flowers, where the fruits had come out and the perianth-segments had partly fallen off; these had the appearance of the described male flowers of Comanthera L. B. Smith. About the sterile flowers we are not quite sure, but they are supposed to be the immature male ones. They do have stamens, but it is difficult to say whether they are reduced or only very young." In a letter to me dated August 3, 1967, Dr. Smith replies as follows: "I have just gotten around to studying my Comanthera that I borrowed from Harvard at your suggestion. It has staminate flowers as I described them. Your Syngonanthus akurimensis is the same thing as regards the type but the Irwin collection shows no such stamens. Maybe the species is polymorphic and some heads lack functional stamens."

Type: Comanthera linderi L. B. Sm. [=C. kegeliana (Körn.)

Moldenke.

COMANTHERA KEGELIANA (Körn.) Moldenke

Synonymy: Paepalanthus kegelianus Körn. in Mart., Fl. Bras. 3 (1): 438. 1863. Dupatya kegeliana (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Syngonanthus kegelianus (Körn.) Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 273. 1903. Comanthera linderi L. B. Sm., Contrib. Gray Herb., ser. 2, 117: 38--39, pl. 2. 1937. Syngonanthus akurimensis Moldenke, Phytologia 2: 371--372. 1947. Syngonanthus akurimensis var. amazonicus Moldenke, Phytologia 3: 42. 1948.

Additional bibliography: Körn. in Mart., Fl. Bras. 3 (1): 438. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 273. 1903; Moldenke, Bull. Jard. Bot. Brux. 27: 119--120. 1957; Angely, Fl. Paran. 10: 5. 1957; Anon., U. S. Dept. Agr. Bot. Subj. Index 5: 4226. 1958; Moldenke, Résumé 70, 75, 77, 88, 280, 326, 351, & 479. 1959; Moldenke, Résumé Suppl. 1: 5, 6, 16, 21, 23, & 25. 1959; Moldenke, Phytologia 13: 218. 1966; Moldenke, Biol. Abstr. 47: 6792. 1966.

The species has been encountered by Lindeman on a large sand savanna. It has been collected in anthesis from March to July and in fruit in May. It is described by Tamayo as growing 5--8 cm. tall. An isotype, Kegel 1473, was photographed by Macbride in the herbarium of the Conservatoire et Jardin Botaniques at Geneva and is his type photograph number 25170. Material has been misidentified and distributed in herbaria as "Compositae".

Additional & emended citations: VENEZUELA: Bolívar: Lasser 1705 (K, N, N, Ve, W--1901897); Tamayo 3234 (F--photo, N, N--photo, Ve, W, Z--photo). Federal District: Lockhart s.n. [Caracas] (K). BRITISH GUIANA: Cox & Hubbard 121 (N); Irwin BG. 20 (W--2141414, Z); Linder 40 [N. Y. Bot. Gard. Type Photo neg. 5006] (G, N--photo, N--photo); Martyn 146 (K). SURINAM: Kegel 1473 [Macbride photos 25170] (N--photo of isotype, W--photo of isotype); Lanjouw & Lindeman 2984 (N, Ut--178768); Lindeman 4018 (Ac). BRAZIL: Amazonas: Fróes 22433 (Ca--28252, N). Pará: Ducke s.n. [Herb. Mus. Goeldi 12088] (Bs).

ERIOCAULON Gron.

Additional & emended synonymy: Erioucaulon L., Mant. 580, sphalm. 1767. Cespa Hill, Herb. Brit. 1: pl. 66 [some copies]. 1769. Nasmythia Huds., Fl. Angl., ed. 2, 2: 414. 1778. Ericaulon Lour., Fl. Cochinch. 1: 60, sphalm. 1790. Eriocaulon L. ex Steud., Nom. Bot., ed. 1, 312. 1821. Randalia P. Beauv. ex Desv., Ann. Sci. Nat. Paris 13: 47. 1828. Sphaerochloa P. Beauv. ex Desv., Ann. Sci. Nat. Paris, ser. 1, 13: 47. 1828. Sphoerochloa P. Beauv. ex Desv., Ann. Sci. Nat. Paris, ser. 1, 13: pl. 5, fig. 1. 1828. Symphachne P. Beauv. ex Desv., Ann. Sci. Nat. Paris, ser. 1, 13: 47. 1828. Leucocephala Roxb., Fl. Ind. 3: 612. 1832. Busseuillia Lesson in Bougainville, Journ.

Navig. Aut. Freg. Thetis & Corv. Espér. 2: 348. 1837. Sympachne P. Beauv. ex Steud., Nom. Bot., ed. 2, 2: 654. 1841. Chaetodiscus Steud., Syn. Pl. Cyp. 2: 261. 1855. Electrosperma F. Muell., Trans. Philos. Soc. Victoria 1: 23. 1855. Dichrolepis Welw., Apont. Phyt.-geogr. 542. 1859. Lasiolepis Boeck. (in part), Flora 56: 90. 1873 [not Lasiolepis Bennett, 1838]. Symphyachna Post & Kuntze, Lexicon 544. 1904. Ericaulon Merr. & Walker, Bibl. East. Asiat. Bot. 343, sphalm. 1938. Lasiolepsis Böck. apud Milne-Redhead, Kew Bull. Misc. Inf. 1948: 472, sphalm. 1948. Randalia Petit apud Moldenke in Humbert, Fl. Madag. 36: 2, in syn. sphalm. 1955. Randalia "Petiv. ex Desv." ex Angely, Cat. Estat. 10: [2], in syn. sphalm. 1956. Sphaerochloa "P. Beauv. ex Desv." apud Angely, Cat. Estat. 10: [2], in syn. 1956. Symphachne "P. Beauv. ex Desv." apud Angely, Cat. Estat. 10: [2], in syn. 1956. Eriaucolon L. ex Moldenke, Résumé 285, in syn. 1959. Randalia Beauv. & Desv. ex Moldenke, Résumé 342, in syn. 1959. Randalia Petiv. ex Moldenke, Résumé 342, in syn. 1959. Sphaerochloa Beauv. & Desv. ex Moldenke, Résumé 345, in syn. 1959. Eriocaullon With. ex Moldenke, Résumé Suppl. 3: 31, in syn. 1962. Eriocaulum Körn. apud Angely, Bibl. Veg. Paran. 155, sphalm. 1964. Randalia "Beauv. ex Desv." apud Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 950, in syn. 1966. Sympachne Steud. apud Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 1091, in syn. 1966.

Additional & emended bibliography: Petiv., Gaz. pl. 6, fig. 2. 1702; L., Sp. Pl., ed. 1, 87 & 129. 1753; Crantz, Inst. 1: 360. 1766; Pluk., Alm. pl. 409, fig. 5. 1769; Hope, Phil. Trans. Roy. Soc. 59: 241--245, pl. 12. 1770; Scop., Introd. Hist. Nat. 204. 1777; Huds., Fl. Angl., ed. 2, 2: 444. 1778; Walt., Fl. Carol. 83. 1788; Lam., Encycl. 3: 276. 1789; Lour., Fl. Cochinch. 1: 60. 1790; L. C. Rich., Act. Soc. Hist. Nat. Paris 1: 113. 1792; Willd. in L., Sp. Pl., ed. 4, 1: 486. 1797; Michx., Fl. Bor.-am. 2: 165. 1803; Pursh, Fl. Am. Sept. 1: 91. 1814; Roxb., Hort. Beng. 68. 1814; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 864. 1817; Nutt., Gen. 1: 90. 1818; Ell., Sketch Bot. 2: 565. 1824; Lodd., Bot. Cab. 14: pl. 1310. 1828; Bong., Mém. Acad. Sci. St. Pétersb., ser. 6, Sci. Math. Phys. & Nat. 1: 601--656, pl. 1--10. 1831; Wall., Numer. List 207--208 ["207"]. 1832; Hook. in Curtis, Bot. Mag. 59: pl. 3126. 1832; Wall., Plant. As. Rar. 3: 28. 1832; Beck, Bot. 370. 1833; Bong., Mém. Acad. Sci. St. Pétersb., ser. 6, Sci. Math. Phys. & Nat. 2: 219--238, pl. 11--19 (1833), ser. 6, Sci. Nat. 1: 545--560 (1835), and ser. 3, Bot. 9--29, pl. 20--25. 1840; Steud., Nom. Bot., ed. 2, 2: 654. 1841; Griff., Itin. Notes [Posthum. Papers 2:] 65. 1848; Benth. in Hook., Niger Fl. 547. 1849; Steud., Syn. Pl. Cyp. 2: 261 & 268--283. 1855; F. Muell., Trans. Philos. Soc. Victoria 1: 24. 1855; Benth., Fl. Hongkong 382. 1861; Benth., Fl. Austral. 7: 192. 1878; F. Muell., Syst. Census Austral. Pl. 123. 1882; F. M. Bailey, Syn. Queensl. Fl. 578. 1883; A. W. Chapm., Fl. South. U. S.,

ed. 2, 502--504, 658, & 696. 1889; F. Muell., Proc. Linn. Soc. N. S. Wales 5: 250. 1890; F. Muell., Bot. Centralbl. 44: 302. 1890; Morong, Bull. Torrey Bot. Club 18: 354. 1891; Maxim., Diagn. Pl. Nov. As. 8: 25. 1892; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877--880. 1893; Moore & Betche, Handb. Fl. N. S. Wales 440. 1893; J. G. Baker, Journ. Linn. Soc. Lond. Bot. 20: 227. 1893; Hook. f., Fl. Brit. Ind. 6: 571--585. 1893; Coult., Contrib. U. S. Nat. Herb. 2: 459. 1894; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 681. 1895; Britton & Br., Ill. Fl., ed. 1, 1: 371--373, 602, & 611, fig. 899--901. 1896; Ruhl. in Engl., Bot. Jahrb. 27: 65--85. 1899; Tate, Trans. Roy. Soc. S. Austral. 23: 291. 1899; H. T. Holm, Bot. Gaz. 31: 17--37. 1901; N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 255. 1901; F. M. Bailey, Queensl. Fl. 6: 1715. 1902; B. L. Robinson, Rhodora 5: 175--176. 1903; J. K. Small, Fl. Southeast. U. S., ed. 1, 236. 1903; Ruhl. in Engl. Pflanzenreich 13 (IV, 30): 1--108. 1903; Post & Kuntze, Lexicon 544. 1904; Ruhl. in Urb., Engl. Bot. Jahrb. 37: 519--520. 1906; R. M. Harper, Ann. N. Y. Acad. Sci. 17: 267, pl. 24, fig. 1. 1906; C. H. Wright, Kew Bull. Misc. Inf. 1907: 3--4. 1907; Robins. & Fern. in A. Gray, New Man. Bot., ed. 7, 261 & 898. 1908; M. A. Day, Check List 39. 1908; Nakai, Bot. Mag. Tokyo 24: 5--6. 1910; Kawakami, List Pl. Formos. 130. 1910; G. T. Stevens, Ill. Guide Flow. Pl. pl. 9, fig. 5. 1910; R. W. Sm., Bot. Gaz. 49: 281--289, pl. 19 & 20. 1910; A. Chev., Sudania 1: 7. 1911; W. H. Br., Contrib. U. S. Nat. Herb. 13: 323. 1911; Nakai, Bot. Mag. Tokyo 26: [93--94]. 1912; Ann. Rep. N. J. State Mus. 1910: pl. 28, fig. 2. 1912; F. M. Bailey, Compreh. Cat. Queensl. Pl. 584. 1913; J. K. Small, Fl. Southeast. U. S., ed. 2, 236. 1913; Britton & Br., Illustr. Fl., ed. 2, 1: 453--455 & [678]. 1913; Domin, Bibl. Bot. 20: 506. 1915; Maiden & Betche, Census N. S. Wales Pl. 38. 1916; Fern., Rhodora 23: 92. 1921; Alv. Silv., Archiv. Mus. Nac. Rio Jan. 23: 162, pl. 4. 1921; Fyson, Journ. Indian Bot. 2: 133--150, 192--207, 259--266, & 307--320, pl. 1--40 (1921) and 3: 12--18 & 91--115, pl. 11--32. 1922; Anon., Kew Bull. Misc. Inf. 1923: 303. 1923; Lützelburg, Estud. Bot. Nordéste 3: 147 & 150. 1923; Fyson, Indian Sp. Erioc. 1--88, pl. 1--51. 1923; Alv. Silv., Fl. Mont. 17--19, pl. 5 & 5a. 1928; Uphof in Karst. & Schenck, Vegetationsbild. 21 (1-2): n.p. 1930; Ruhl., Notizbl. Bot. Gart. Berlin 10: 1040--1044. 1930; N. E. Br., Kew Bull. Misc. Inf. 1931: 61. 1931; Ewart, Fl. Vict. 263. 1931; Solomon, Journ. Indian Bot. Soc. 10: 139--144. 1931; R. M. Adam, New Fl. & Silv. 6: 60--63, pl. 24 & 25. 1933; Tu, Chinese Bot. Dict., abrdg. ed., 1317. 1933; J. K. Small, Man. Southeast. Fl. 258. 1933; Tang, Contrib. Inst. Bot. Nat. Acad. Peiping 2: 133. 1934; H. B. Davis, Life & Works Pringle 43, 55, 56, 94, 105, 123, 141, 219, & 655. 1936; Van Steenis, Trop. Natuur 25: 2. 1936; Moldenke, N. Am. Fl. 19: 17--37, 40, 43, 44, 46, & 50. 1937; Cory, Texas Agr. Exp. Sta. Bull. 550: 29. 1937; Merr. & Walker, Bibl. East. Asiat. Bot. 343. 1938; Satake, Journ. Jap. Bot. 15: 140--145 & 627--632. 1939; Wells, Bot. Rev. 8: 537. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 4--5. 1942; Carolin. Florist Gov. J. Drayton S. C. 14. 1943; Black, Fl. S. Austral., ed. 2, 1: 179. 1943;

Rouleau, Contrib. Inst. Bot. Univ. Montreal 54: 161 & 313. 1944; Eyles & Robertson, U. S. Pub. Health Bull. 286: 106. 1944; W. A. Murrill, Guide Fla. Pl. 34. 1945; Castellanos in Descole, Gen. Sp. Pl. Argent. Eriocaulac. 87, pl. 17. 1945; Abbiatti, Revist. Mus. La Plata Bot. 6 (26): 329--330, pl. 2 (1), fig. 4 (d) & 6. 1946; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Fern., Rhodora 48: iv & 58. 1946; Moldenke, Known Geogr. Distrib. Erioc. [1]--8, 19--28, 30, 32--42, 44, 47, 53, 56, & 60--62. 1946; R. R. Tatnall, Fl. Del. 75. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877--880. 1946; Abbiatti, Soc. Argent. Bot. Bul. 1: 280--281. 1946; Castellanos, Lilloa 20: 244. 1949; Raizada, Sci. & Cult. 14: 387--388. 1949; Faegri & Iversen, Text-book Mod. Pollen Analys. 193 & 221. 1950; Hare, Linn. Soc. Lond. Journ. Bot. 53: 422--448. 1950; Herter, Rev. Sudam. Bot. 8: 163--164. 1950; Maekawa, Journ. Jap. Bot. 26: 116. 1951; Penfound, Bot. Rev. 18: 431. 1952; Zinderenbakker, S. Agr. Pollen 1: 32, 36, & 79, pl. 7, fig. 33 & 44. 1953; Moldenke, Biol. Abstr. 27: 984. 2026 & 3121. 1953; Moacyr Lisboa, Cent. Nascim. Leon. Bot. Damazio [2]. 1954; Koyama, Philip. Journ. Sci. Bot. 84: 367--368 & 378, pl. 6. 1955; Razi, Journ. Mysore Univ. B.14 (10): 160. 1955; Razi, Contrib. Bot. 40: 92. 1955; Razi, Proc. Nat. Inst. Sci. India 21B (2): 82. 1955; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1955: 29--30. 1956; Koyama, Journ. Jap. Bot. 31: 9--11, fig. 3. 1956; Masa Ikusi, Pollen Gr. Jap. 1956; Angely, Cat. Estat. 10: [2]. 1956; H. Hess, Bericht. Schweitz. Bot. Gesell. 67: 83. 1957; E. H. Walker, Proc. 8th Pacif. Sci. Cong. 4: 406. 1957; Angely, Fl. Paran. 10: 4--9 & 11. 1957; Anon., Biol. Abstr. 29: 3248 & 3626 (1957) and 30: 3931 & 4393. 1958; Anon., U. S. Dept. Agr. Bot. Subj. Index 5: 4226--4277. 1958; Kostermans, Proc. Sympos. Humid Trop. Veg. 159. 1958; Suvatabandhu, Proc. Sympos. Humid Trop. Veg. 173. 1958; Alain, Revist. Soc. Cub. Bot. 15: 49. 1958; DeRoon, Internat. Direct. Spec. 201. 1958; P. van Royen, Nov. Guin., new ser., 10: 21--44, fig. 1--5. 1959; Soukup, Biota 5: 300--301. 1959; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1958: 31. 1959; Razi, Rec. Bot. Surv. India 18: 19. 1959; Anon., Kew Bull. Gen. Index 1929-1956, 111. 1959; Reitz, Sellowia 11: 103. 1959; Moldenke, Résumé 4--12, 14, 22, 23, 25, 27, 32, 35, 36, 41, 43, 46, 48, 51--53, 63, 66, 70, 71, 75, 77--79, 83, 88, 89, 112, 113, 116, 119, 123, 132--138, 140, 144--151, 153, 156--163, 165--167, 169--176, 178--181, 184, 186, 188, 190--193, 196, 201, 204, 205, 207--209, 211, 218, 226, 240, 277, 278, 281, 284--294, 309, 320, 323, 324, 326, 328, 329, 342, 345, 350, 351, 395--399, 414, 415, 417--419, 424, 426, 428, 479--484, & 494. 1959; Moldenke, Résumé Suppl. 1: [1]--3, 5--19, 21, 23, & 25. 1959; P. van Royen, Blumea 10: 126--135, fig. 1. 1960; Straka, Erdkunde 14: 60 & 87. 1960; Angely, Fl. Paran. 15: 14. 1960; Rennó, Levant. Herb. Inst. Agron. 68. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877--880. 1960; Angely, Liv. Gen. Bot. Bras. 19 & 44. 1960; Moldenke, Biol. Abstr. 35: 1688 & 2177. 1960; Santapau, Fl. Bombay & Salsette [3]. 1960; Moldenke, Résumé Suppl. 2: [1], 2, 4--7, & 9. 1960; Panigrahi & Naik, Bull. Bot. Surv. India 3: 383. 1961; Runner, Rep. G. W. Groff Coll. 292. 1961; Fables, Bartonia 32: 9.

1961; Angely, Fl. Paran. 17: 24. 1961; Van Steenis-Kruseman, Fl. Males. Bull. 3: xli, 781, 861, & 862. 1962; J. H. Willis, Handb. Pl. Vict. 281. 1962; Hocking, Excerpt. Bot. A.4: 592 & 593. 1962; K. Larsen, Nat. Hist. Bull. Siam Soc. 20: 113. 1962; Moldenke, Résumé Suppl. 3: [1]--5, 7, 9, 12, 15--24, 26, 28, 31, & 32 (1962), 4: [1]--7 & 11 (1962), and 5: [1], 2, 5, & 6. 1962; Angely, Fl. Bacia Paran. 22: 31. 1962; Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3 (1): 123 (1962) and 3 (2): 123 & 131. 1962; G. L. Shah, Bull. Bot. Surv. India 4: 237. 1962; Prain, Bengal Pl., ed. 2, 2: 847--848. 1963; Arker, Water Pl., ed. 2, 286. 1963; J. Joseph, Bull. Bot. Surv. India 5: 283 & 297. 1963; Hegnauer, Chemotax Pfl. 2: 152. 1963; Montgomery & Fairbrothers, Bull. Torrey Bot. Club 90: 92 & 96. 1963; Gleason & Cronquist, Man. Vasc. Pl. 183--184. 1963; Espirito Santo, Junt. Invest. Ultramar Est. Ens. & Docum. 104: 54 & 88. 1963; H. P. Riley, Fam. Flow. Pl. S. Afr. 199. 1963; Moldenke, Résumé Suppl. 6: [1], 2, 5, 6, 8, & 9 (1963), 7: 3 & 6 (1963), 8: 2 & 3 (1964), 10: 4 & 5 (1964), and 11: [1] & 4--6. 1964; Rao & Sastry, Bull. Bot. Surv. India 6: 281 & 284. 1964; Hunt, Reg. Veg. 9. 1964; Langman, Select. Guide Lit. Flow. Pl. Mex. 911. 1964; Panigrahi, Chowdhury, Raju, & Deka, Bull. Bot. Surv. India 6: 260--261. 1964; Bhattacharyya, Bull. Bot. Surv. India 6: 208. 1964; C. M. & D. S. Patel, Vidya 7: [58]--70. 1964; Moldenke, Biol. Abstr. 45: 5019. 1964; Batson, Wild Fls. S. C. 28. 1964; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 175--185, pl. 48. 1964; Angely, Bibl. Veg. Paran. 155 & 253. 1964; D. Walker, Govt. Sarawak Sympos. Ecol. Res. Humid Trop. Veg. 141. 1965; F. A. Barkley, List Ord. Fam. Anthoph. 113 & 164. 1965; Thanikaimoni, Pollen & Spores 7: 181--189. 1965; Thanikaimoni, Mém. Mus. Nat. Hist. Nat. Paris, new ser. B, 14: 9--38. 1965; J. S. Beard, Descrip. Cat. W. Austral. Pl. 9. 1965; Hedberg, Webbia 19: 526. 1965; Humbert, Trav. Sect. Scient. & Techn. Inst. Franç. Pond., ser. 6, Not. Carte Madag. 66. 1965; Stocking, Nat. Conserv. Ecolog. Stud. Leafl. 6: [15]. 1965; F. R. Fosberg, Govt. Sarawak Sympos. Ecol. Res. Humid Trop. Veg. 286. 1965; Moldenke, Résumé Suppl. 12: [1]-5 & 7--10 (1965), 13: [1], 3, 5, & 7 (1966), and 14: [1]--3 & 8. 1966; Thanikaimoni, Biol. Abstr. 47: 4169. 1966; S. V. Ramaswami, Study Flow. Pl. Bangalore [thesis] 219--221 & 1406--1407. 1966; J. A. Steyerm., Act. Bot. Venez. 1: 15 & 19. 1966; Goodland, Bol. Soc. Venez. Cienc. Nat. 26: 345. 1966; Klots, New Field Book Freshw. Life 94. 1966; B. G. Briggs, Contrib. N. S. Wales Nat. Herb. 4: 24 & 26. 1966; Shinners, Sida 2: 441. 1966; R. C. Jacks., Reg. Veg. 43: 33. 1966; Anon., Gen. Costa Ric. Phan. 2. 1966; R. H. Compton, Journ. S. Afr. Bot. Suppl. 6: 19, 33, & 92. 1966; Kral, Sida 2: 290--312 & 330. 1966; O. D. Evans, Contrib. N. S. Wales Nat. Herb. Fl. Ser. 27/28: 9--12. 1966; Airy Shaw in Willis, Dict. Flow. Pl., ed. 7, 168, 223, 224, 349, 396, 417, 418, 620, 647, 758, 950, 1057, 1091, & 1092. 1966; Subramanyam & Henry, Bull. Bot. Surv. India 8: 214. 1966; Sebastine & Ramamurthy, Bull. Bot. Surv. India 8: 182. 1966; J. L. Ellis, Bull. Bot. Surv. India 8: 329 & 339. 1966; Sculthorpe, Biol. Aquat. Vasc. Pl. 23, 389--391, 393, & 394. 1967; L. V. Barton, Bibl. Seeds 782. 1967; Satake,

Nat. Sci. & Mus. 34: 161 & 162. 1967; Fulling, Ind. Bot. Record. Bot. Review 178. 1967; L. O. Williams, Fieldiana Bot. 31: 249--269. 1967; R. M. Harper, Castanea 32: 17. 1967; O. D. Evans, Biol. Abstr. 48: 4562. 1967; Rickett, Wild Fls. U. S. 2 (1): 135 (1967) and 2 (2): 659. 1967; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 1--2. 1967; Berhaut, Fl. Sénégal, ed. 2, 311. 1967; Anon., Biol. Abstr. 48 (10): S.60. 1967; J. & A. Raynal, Adansonia 7: 329. 1967; L. S. Thomas, Pine Barrens 23. 1967; D. A. Livingstone, Ecolog. Monog. 37 (1): 43. 1967; Moldenke, Résumé Suppl. 15: [1], 8, 10, 12, 14, & 20 (1967) and 16: [1], 2, 5, 7--9, 12, 19, 21, & 25--27. 1968; Justice & Bell, Wild Fls. N. C. 13 & 209. 1968; Meikle, Kew Bull. 22: 141--144. 1968; R. M. White, Irish Naturl. Journ. 16: 40. 1968.

The scientific name of this genus is taken from the Greek, ἔριον, and καυλός, meaning "hairy stem", since many species have pubescent scapes or peduncles. Berhaut (1967) describes this genus, as known to him, as "Bractées triangulares, sommet beaucoup plus large, base cunéiforme, 6a bractées de base seulement, dont 3 exterieures débordant la base du capitule....capitules blanc-neigeux". Riley (1963) reports the sporophytic chromosome number as 32 and 36. Thanikaimoni (1965) studied the pollen of 46 species of the genus. Livingstone (1967) tells us that the genus is among the minor taxa in the ericaceous belt of the Ruwenzori Mountains in equatorial Africa. Rickett (1967) records the common names "hatpins" and "pipeworts" for the genus as a whole, and Espirito Santo (1963) records "orõ".

The Lasiolepis of Bennett, referred to in the synonymy above, is a synonym of Harrisonia R. Br. in the Rutaceae. The type species of Eriocaulon is E. decangulare L. [as established by Britton & Brown (1913)]; that of Chaetodiscus is C. gilberti Steud., based on Gilbert 153 from Australia [Ruhland reduces this genus to synonymy under Eriocaulon, but fails to dispose of the type binomial anywhere in his work]. The type of Electrosperma is E. australasicum F. Muell. [=Eriocaulon australasicum (F. Muell.) Körn.]. Lasiolepis has no type indicated; three species were proposed in the original publication: L. aquatica Boeck., L. brevifolia Boeck., and L. pilosa Boeck. — of these the first two are members of the genus Eriocaulon, while the last-mentioned belongs in the genus Paepalanthus. The type species of Nasmythia is N. articulata Huds. [=Eriocaulon septangulare With.], that of Randalia is R. decangulare (L.) P. Beauv. [=Eriocaulon decangulare L.], and that of Symphachne is S. xyroides P. Beauv. [=Eriocaulon decangulare L.].

The Poilane 13849, distributed to herbaria as a species of Eriocaulon, is actually Fimbristylis tetragona R. Br. in the Cyperaceae.

ERIOCAULON ABYSSINICUM Hochst.

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27:

122. 1957; Moldenke, Résumé 135, 138, 147, 153, & 479. 1959; Killick, Bot. Surv. S. Afr. Mem. 34: 119. 1963; R. H. Compton, Journ. S. Afr. Bot. Suppl. 6: 33. 1966; Moldenke, Résumé Suppl. 16: 8. 1968.

Compton (1966) records this species from Swaziland. The H. Wild 1162 [Govt. Herb. 15100], distributed as E. abyssinicum, is actually E. amboënse Schinz.

Additional citations: ETHIOPIA: Schimper 648 (S), 1944 (B--isotype, Z--isotype).

ERIOCAULON ACHITON Körn.

Synonymy: Eriocaulon heteropeplon Körn. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959 [not E. heteropeplon Alv. Silv., 1928]. Eriocaulon schlagintweitii Ruhl. ex Moldenke, Résumé Suppl. 1: 18, in syn. 1959. Eriocaulon thomsoni Körn. ex Moldenke, Résumé Suppl. 1: 18, in syn. 1959.

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 122. 1957; Moldenke, Résumé 159, 161, 175, 178, & 479. 1959; Moldenke, Résumé Suppl. 1: 11, 17, & 18 (1959), 3: 16 (1962), and 15: 8. 1967.

This species has been collected on wet cliffs in open areas, at altitudes of 50--2000 meters, flowering from January to March and in October, and fruiting in February. Hansen & Smitinand describe it as "common in wet localities" in Thailand, and tell us that the flowers are "whitish" or "dirty-white". Smitinand says of it "common in sandy soil along edge of water hole".

The name, E. heteropeplon Körn., appears to be based on Schlagintweit 2653, from East Punjab, deposited in the herbarium of the Botanisches Museum at Berlin, and 11311, from Sind, deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm, while E. schlagintweitii Ruhl. is based on Schlagintweit 188, from Khasia, deposited at Berlin, and E. thomsoni Körn. is based on J. D. Hooker 3, from Sikkim, also deposited at Berlin. Ruhland also annotated the Hooker collection at Berlin as "Eriocaulon n. sp."

Hansen & Smitinand 12388a is a mixture with E. sexangulare L., while Ritchie 1242 is a mixture with E. stellulatum Körn. and E. thwaitesii Körn.

Material has been misidentified and distributed in herbaria as E. sexangulare L. The Smitinand 1982a, distributed as E. achiton, is actually E. alpestre Hook. f. & Thoms.

Additional citations: PAKISTAN: East Bengal: Griffith 5576 (B, C, S). Sind: Schwagintweit 11311 (S). INDIA: Assam: Chand 2978 (Mi); Koelz 31319a (Mi). East Punjab: Schlagintweit 187 (B), 2653 (B). Kerala: Stocks, Law, &c. s.n. [Malabar, Concan, &c] (B). Khasi States: Griffith 47 (B--type); Schlagintweit 188 (B). Madras: Perrottet 1170 (V, V--96838, V--270556). Mysore: S. N. Ramaswamy 20 (Ac), 21 (Rf), 29 (Ac). Sikkim: J. D. Hooker 3 (B).

State undetermined: Ritchie 1242, in part (T). THAILAND: Hansen & Smitinand 11897 (Cp, Rf), 12388a (Cp), 12389 (Cp, Rf); Smitinand 5602 (Cg).

ERIOCAULON ADAMESII Meikle

Additional bibliography: Moldenke, Phytologia 3: 181. 1949; Moldenke, Résumé 136 & 479. 1959; Moldenke, Résumé Suppl. 1: 8 & 9 (1959) and 4: 6. 1962.

This species has been collected in flower in December, growing in poor sandy soil at the uppermost ends of tidal creeks, and also "common in wet ditches, often submerged". Meikle (1948) comments that E. adamesii "is a very distinct Eriocaulon, having closer affinities with the West Indian E. echinospermum C. Wright, and its allies, than with any African representatives of the genus. E. mutatum is the only African species with which it could possibly be confused, but this has blackish capitula, and the sepals of the ♀ flowers have broad wing-like keels."

Additional citations: SENEGAL: J. G. Adam 18299 (Z), 18377 (Z). REPUBLIC OF GUINEA: Boismare 417 [Herb. Chillou 3937] (An); Chillou 1746 (An). LIBERIA: Dinklage 3009 (B).

ERIOCAULON AEQUINOCTIALE Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 5 & 32. 1946; Moldenke, Phytologia 3: 181. 1949; Moldenke, Résumé 70 & 479. 1959.

ERIOCAULON AFRICANUM Hochst.

Additional bibliography: J. Hutchinson, Botanist in South. Afr. 678. 1946; Moldenke, Bull. Jard. Bot. Brux. 27: 122—123. 1957; Moldenke, Résumé 148, 151, & 153. 1959; Moldenke, Résumé Suppl. 2: 9 (1960) and 3: 16. 1962.

This species has been collected at 6000 feet altitude. Hutchinson (1946) cites his no. 4324. The Zeyher 1730, distributed as E. africanum, is actually Syngonanthus wahlbergii (Wikstr.) Ruhl.

Additional citations: SOUTH AFRICA: Transvaal: F. A. Rogers s. n. [Moss & Rogers 1921] (S).

ERIOCAULON AFZELIANUM Wikstr.

Synonymy: Eriocaulon kouroussense Lecomte ex Moldenke, Résumé 289, in syn. 1959. Eriocaulon afzelii Wikstr. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959.

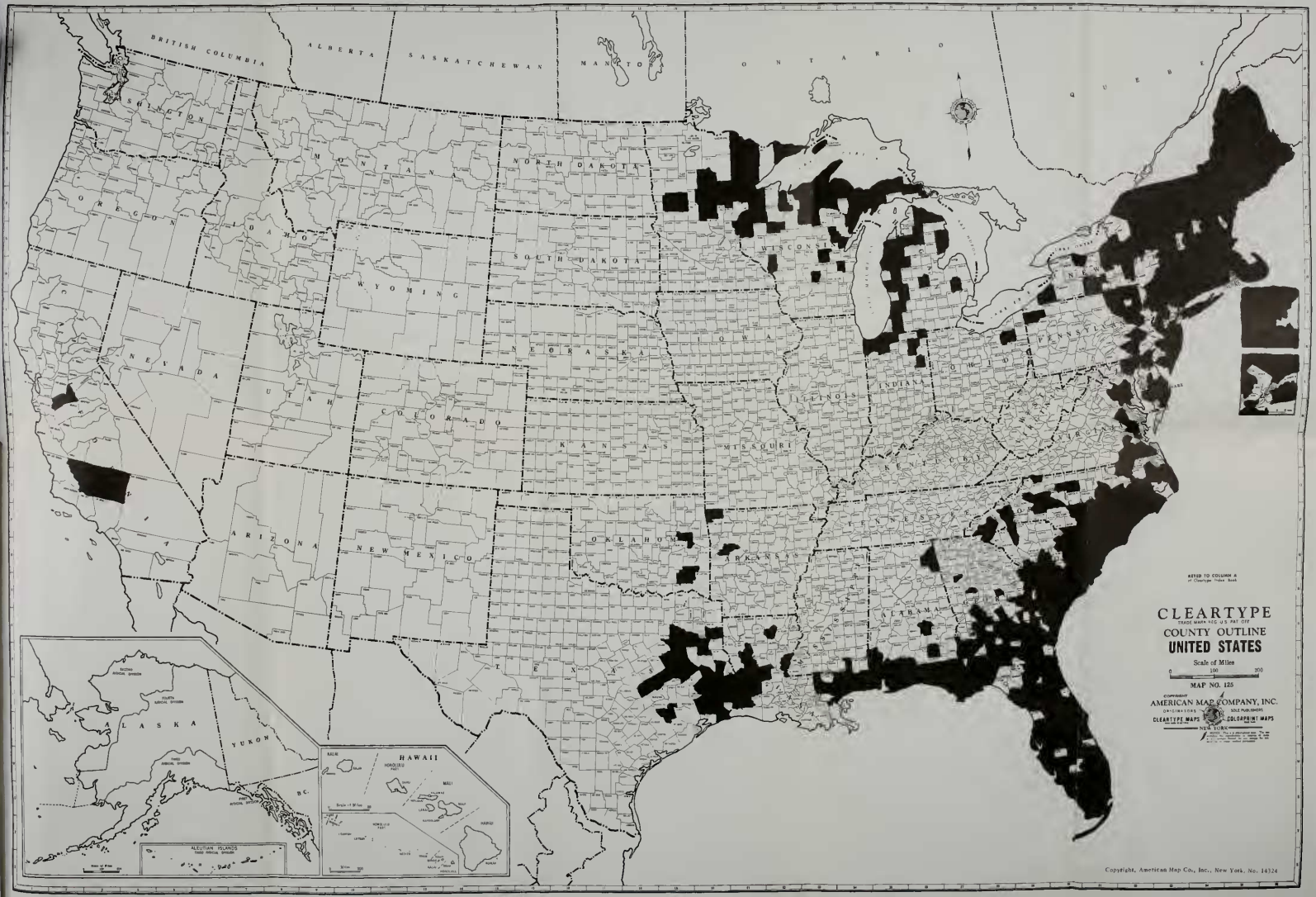
Additional & emended bibliography: Moldenke, Known Geogr. Distrib. Erioc. 20, 21, 32, & 36. 1946; Moldenke, Bull. Jard. Bot. Brux. 27: 123. 1957; Moldenke, Résumé 134—138, 289, & 479. 1959; Moldenke, Résumé Suppl. 1: 16. 1959; Hepper, Bull. Inst. Fond. Afr. Noire 27: 420. 1965; Berhaut, Fl. Sénégal, ed. 2, 311. 1967.

The name, E. kouroussense Lecomte, appears to be based on Raynal & Raynal 6795 in the herbarium of the California Academy of Sciences at San Francisco. Hepper (1965) found the species grow-

Figure 1. Distribution of the Eriocaulaceae in the United States

Herbarium curators who have material of this family from additional counties are asked to send it to the author for verification and record, so thet future editions of this map may be more complete

Mapping by counties done by Andrew R. Moldenke



ing in seasonally inundated ricefields in Northern Nigeria. Berhaut (1967) cites his numbers 1636, 6432, 6633, & 6651 from Sénégal. Material has been misidentified and distributed in herbaria as E. bongense Engl. & Ruhl. and under the name Utricularia spiralis Sm.

Additional citations: SÉNÉGAL: J. G. Adam 15887 (Z), 15922 (Z), 15947 (Z), 16968 (Z), 18477 (Z), 18527 (Z); Raynal & Raynal 5231 (Z, Z--drawing), 6795 (Gg); Roberty 16336 (An). REPUBLIC OF GUINEA: Boismare 442 [Herb. Chillou 3962] (An); Chillou 7 (An), 14 (An), 754 (Z), 789 (An, An), 935 (An), 1155 (Z), 3435 (An), 3555 (An), 4010 (An); Pitot s.n. [13.X.1950] (An). SIERRA LEONE: Afzelius 14 (B--type, S--isotype, S--isotype, Z--isotype). NIGERIA: Northern: C. Barter 1019 (B, S, Ut--325). CHAD: Schweinfurth s. n. [Djur, 1869] (B).

ERIOCAULON ALATUM H. Lecomte

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 26 & 61. 1946; Moldenke, Phytologia 3: 181 (1949) and 4: 339. 1953; Moldenke, Résumé 175, 184, 201, & 479. 1959; Moldenke, Résumé Suppl. 1: 13 (1959) and 3: 20. 1962; Thanikaimoni, Pollen & Spores 7: 183. 1965.

Collectors have found this species growing in savannas, describe it as an herb with yellowish heads, at 200 meters altitude, flowering in April, October, and December, fruiting in April, and called "chuk nok yung" in Thailand.

Additional citations: THAILAND: Bunnal 571b [Roy. Forest Dept. 18264] (Bk); Larsen 8425 (Z); Sørensen, Larsen, & Hansen 784 (Cp), 8070 (S). WESTERN PACIFIC ISLANDS: PHILIPPINE ISLANDS: Luzon: Reillo 19270 (N). INDONESIA: GREATER SUNDA ISLANDS: Celebes: Eyma 3383 (Ut--11518b), 3996 (Ut--11514b). Sumatra: H. H. Bartlett 7456 (Mi).

ERIOCAULON ALLEIZETTEI Moldenke

Additional bibliography: Moldenke, Biol. Abstr. 27: 2026. 1953; Moldenke, Bull. Jard. Bot. Brux. 27: 123. 1957; Moldenke, Résumé 156 & 479. 1959.

ERIOCAULON ALPESTRE Hook. f. & Thoms.

Synonymy: Ericaulon alpestre Merr. & Walker, Bibl. East. Asiat. Bot. 343, sphalm. 1938. Eriocaulon alpestre var. alpestre (Hook. f. & Thoms.) Koyama, Philip. Journ. Sci. Bot. 84: 368. 1955. Eriocaulon femineo-spathaceum Ruhl. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959.

Additional bibliography: Maxim., Diagn. Pl. Nov. As. 8: 25. 1892; Hook. f., Fl. Brit. Ind. 6: 578. 1894; Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 95. 1903; Kawakami, List Pl. Formos. 130. 1910; Nakai, Bot. Mag. Tokyo 26: [93--94]. 1912; Lecomte, Fl. Gén. Indochine 7: 10, pl. 6D. 1922; Mak., Jap. Bot. Journ. 3: 26. 1926; S. Sasaki, List Pl. Formos. 99. 1928; Tu, Chinese Bot. Dict.,

abrdg. ed., 1317. 1933; Merr. & Walker, Bibl. East. Asiat. Bot. 343. 1938; Moldenke, Known Geogr. Distrib. Erioc. 23, 25, 26, 32, & 61. 1946; Koyama, Philip. Journ. Sci. Bot. 84: 367—368. 1955; Moldenke, Résumé 161, 169, 171, 172, 175, 178, 184, 285, & 479. 1959; Moldenke, Résumé Suppl. 1: 11 & 17 (1959), 2: 6 (1960), and 3: 19. 1962; Thanikaimoni, Pollen & Spores 7: 183. 1965; Moldenke, Résumé 16: 21. 1968.

Koyama (1955) cites a Hayata s.n. from Tonkin and remarks: "Having expected the occurrence of the present species in Indo-China, Lecomte included this in his Flora général de l'Indo-Chine, without any citation of extant specimen from Indo-China. This Hayata's record may be the first one based upon a real specimen. E. alpestre in Ruhland's sense is composed of two taxa in the present days, namely E. alpestre in his meaning includes E. robustius, a Japanese allied one. Examining E. alpestre, I, however, found that there was not very important difference between the above two entities, and I was inclined to place E. robustius in a varietal rank as Maximowicz did in his first publication of this taxon." Koyama, therefore, recognizes E. alpestre var. robustius Maxim. and E. alpestre var. nigrum (Satake) Koyama, which I maintain as E. robustius (Maxim.) Mak. and E. robustius var. nigrum Satake, respectively.

Eriocaulon alpestre has been collected in bogs, at pond margins, and in rice paddies near carabao pastures and Chara pools, at altitudes of 5000 to 12,000 feet, flowering in August. Common names recorded for it are "hiroha-no-inunchige", "hiroha-no-inunohige", "kok-cheng", and "kuro-imunohiga". Material has been misidentified and distributed in herbaria under the names E. achiton Körn., E. atrum Nakai, E. japonicum Körn., E. luzulaefolium Mart., and E. wallichianum Mart. The cheironymous binomial, E. femineospathaceum Ruhl., was based by Ruhland on Warburg s.n. from Yulupo, Japan, deposited in the herbarium of the Botanisches Museum at Berlin.

Additional citations: INDIA: Assam: Jenkins s.n. [Assam; h.r. m. 310] (S). Khasi States: C. B. Clarke 18851a (B); Hooker & Thomson 19 (B), s.n. [Mont. Khasia, 5-6000 ped.] (S, S, Ut—304). Sikkim: J. D. Hooker 18 (B), s.n. [Sikkim, 8-12,000 ped.] (S, Ut—305). THAILAND: Smitinand 1982a (Gg). INDOCHINA: Annam: Clemens & Clemens 4212 (Ca—339345). KOREA: Komarov 349 (N). WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Furuse s.n. [16 Sept. 1954] (S), s.n. [17 Sept. 1954] (S, S), s.n. [14 Sept. 1955] (S); Saida s.n. [Matsushiro, Prov. Shinano, Aug. 1885] (B). Kiushu: Hayakawa s.n. (S). Island undetermined: Warburg s.n. [Yulupo] (B).

ERIOCAULON ALTO-GIBBOSUM Ruhl.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 7 & 32. 1946; Moldenke, Résumé 88 & 479. 1959.

Additional citations: BRAZIL: Mattogrosso: Pilger 757 (B--type, Z--isotype).

ERIOCAULON AMANOANUM Koyama

Bibliography: Koyama, Journ. Jap. Bot. 31: 9--11, fig. 3. 1956; Moldenke, Résumé 181 & 479. 1959; Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3 (1): 123. 1962; Moldenke, Résumé Suppl. 12: 8. 1965.

The type of this species was collected by T. Amano (no. 4) -- in whose honor it is named -- at Ogimi-mura, Okinawa, in 1937, and is deposited in the herbarium of the National Science Museum. Koyama (1958) states that this species is related to E. latifolium J. Sm., of Africa, but differs in its pilose receptacle, the sepals of the staminate florets being glaucous-nigrescent, the anthers nigrescent, and the petals of the pistillate florets being smaller. He says that it resembles E. sexangulare L., which differs in being dimerous.

Additional citations: WESTERN PACIFIC ISLANDS: JAPAN: Kiushu: Hatusima & Sako 25289 (Z).

ERIOCAULON AMBOËNSE Schinz

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 123. 1957; Moldenke, Résumé 147, 151, & 479. 1959; Moldenke, Résumé Suppl. 3: 16 (1962) and 4: 6 & 7. 1962; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 1 & 2. 1967.

This species has been collected at 5440 feet altitude in Southern Rhodesia. Material has been misidentified and distributed in herbaria as E. abyssinicum Hochst., E. inyangense Arwidsson, and E. sexangulare L.

Additional citations: SÉNÉGAL: J. G. Adam 15709 (Z), 183622 (Z). REPUBLIC OF GUINEA: Schuell 2366 (An). RHODESIA: C. K. Brain 4470 (N), 9010 (N); Horaky H.2388 [Govt. Herb. 13417] (N--photo); H. Wild 1162 [Govt. Herb. 15100] (N). SOUTHWEST AFRICA: Baum 111 (S, Z); Dinter 7220 (S). SOUTH AFRICA: Cape of Good Hope: F. A. Rogers s.n. [Moss & Rogers 1593] (S).

ERIOCAULON AMPHIBIUM Rendle

Additional bibliography: Moldenke, Phytologia 3: 181. 1949; Moldenke, Résumé 148 & 479. 1959.

ERIOCAULON ANDONGENSE Welw.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 21 & 32. 1946; Moldenke, Résumé 147 & 479. 1959.

Additional citations: ANGOLA: Loanda: Welwitsch 2443 (B--cotype, Z--cotype).

ERIOCAULON ANGUSTIFOLIUM Körn.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 7 & 32. 1946; Moldenke, Phytologia 4: 340. 1953; Moldenke, Résumé 88 & 479. 1959; Moldenke, Résumé Suppl. 14: 2. 1966.

This plant has been collected in flower and fruit in October.

Additional citations: BRAZIL: Brasilia: Sucre 839 [Luiza 69] (Z). Goiás: G. Gardner 4382 [Macbride photos 10555] (B--type, N-isotype, W--photo of type). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

ERIOCAULON ANGUSTISEPALUM H. Hess

Additional bibliography: Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1955: 29--30. 1956; Moldenke, Bull. Jard. Bot. Brux. 27: 124. 1957; H. Hess, Bericht. Schweitz. Bot. Gesell. 67: 83. 1957; Moldenke, Résumé 147 & 479. 1959; Moldenke, Résumé Suppl. 1: 10. 1959.

This plant has been collected at 1850 meters altitude in Angola.

Additional citations: ANGOLA: Huila: Antunes 168b (B); H. Hess 52/1754 (B, Z). MOUNTED ILLUSTRATIONS: fig. 1A (B).

ERIOCAULON ANNAMENSE H. Lecomte

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 26 & 61. 1946; Moldenke, Résumé 175 & 479. 1959.

ERIOCAULON ANNUUM Milne-Redhead

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 21. 1946; Moldenke, Phytologia 3: 181--182. 1949; Moldenke, Résumé 144, 148, & 479. 1959; Moldenke, Résumé Suppl. 1: 9 (1959) and 4: 6. 1962.

Additional citations: REPUBLIC OF GUINEA: Boismare 422 [Herb. Chillou 3942] (An); Chillou 727 (An); Pitot s.n. [4.X.1950] (An), s.n. [13.X.1950] (An). MAFIA ISLAND: Schlieben 2574 (B, N, S).

ERIOCAULON ANTUNESII Engl. & Ruhl.

Synonymy: Eriocaulon antunesii Engl. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 21 & 32. 1946; Moldenke, Résumé 147 & 479. 1959; Moldenke, Résumé Suppl. 1: 16 (1959) and 4: 6 & 7. 1962.

Additional citations: VOLTAIC REPUBLIC: Winkony 3 (Z). SÉNÉGAL: Winkony 23 (Z). IVORY COAST: Winkony 1 (Z). ANGOLA: Huila: Antunes 139 (B--type, B--isotype, Z--isotype).

ERIOCAULON APICULATUM H. Lecomte & Moldenke

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 125. 1957; Moldenke, Résumé 156 & 479. 1959.

ERIOCAULON AQUATILE Körn.

Synonymy: Paepalanthus aquatilis Mart. ex Moldenke, Résumé 323, in syn. 1959.

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 7, 32, & 44. 1946; Moldenke, Phytologia 3: 321. 1950; Moldenke, Résumé 88, 323, & 479. 1959; Rennó, Levant. Herb. Inst. Agron. 68. 1960; Moldenke, Résumé Suppl. 14: 2. 1966.

The name, Paepalanthus aquatilis, is apparently a cheironym

placed on the type collection of this taxon by Martius himself. The type specimen, Martius s.n., deposited in the Munich herbarium, was photographed there by Macbride as his type photograph number 18684. The species has been collected in anthesis in June.

Additional citations: BRAZIL: Brasilia: Irwin & Soderstrom 5822 (N). Minas Gerais: Martius s.n. [Macbride photos 18684] (N--photo of type, N--photo of type, W--photo of type); Sena s.n. [Herb. Schwacke 14561] (B). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B); drawings of type collection by Martius (B).

ERIOCAULON ARECHAVALETAE Herter

Additional bibliography: Castellanos, Lilloa 20: 244. 1949; Moldenke, Bull. Jard. Bot. Brux. 27: 125. 1957; Moldenke, Résumé 119, 285, 289, & 479. 1959.

The Pedersen 812, distributed as E. arechavaletae, is actually E. magnum Abbiatti.

Additional citations: MOUNTED ILLUSTRATIONS: Descole, Gen. Sp. Pl. Argent. pl. 14 (N), pl. 15 (N).

ERIOCAULON ARENICOLA Britton & Small

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 125. 1957; Moldenke, Résumé 53 & 479. 1959.

Additional citations: ISLA DE PINOS: Killip 42715 (S); Marie-Victorin & Alain 166 (Vi).

ERIOCAULON ARISTATUM H. Hess

Additional bibliography: Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1955: 29--30. 1956; H. Hess, Bericht. Schweitz. Bot. Gesell. 67: 83--84. 1957; Moldenke, Bull. Jard. Bot. Brux. 27: 125. 1957; Moldenke, Résumé 147, 151, & 479. 1959; Moldenke, Résumé Suppl. 1: 10. 1959; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 2. 1967.

Hess (1957) records this species from Southern Rhodesia. Friedrich-Holzhammer (1967) reduces E. welwitschii var. pygmaeum Rendle to synonymy under E. aristatum.

ERIOCAULON ATABAPENSE Moldenke

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 126. 1957; Moldenke, Résumé 66, 71, & 479. 1959.

The Cruyent 47 collection, cited below, is a mixture with some cyperaceous material.

Additional citations: VENEZUELA: Amazonas: Cruyent 47, in part (Ve); Vareschi & Maegedfrau 6608 (Ve--42903); Ll. Williams 13858 (Z--photo of type).

ERIOCAULON ATRATUM Körn.

Additional bibliography: Hook. f., Fl. Brit. Ind. 6: 574. 1894; Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 69. 1903; Fyson, Journ. Indian Bot. 2: 310. 1921; Moldenke, Known Geogr. Distrib. Erioc. 24 & 32. 1946; Moldenke, Phytologia 4: 340. 1953; Moldenke, Résumé

167 & 479. 1959.

Ruhland (1903), in his monograph of this group, cites the type collection of this species as "Gardner 972", but the actual type seems definitely to be number 932. The Collector undesignated s. n. [18/10/13], distributed as E. atratum, is actually E. atrum Nakai.

Additional citations: CEYLON: G. Gardner 932 (B--type, Z--isotype).

ERIOCAULON ATRATUM var. MAJOR Thwaites

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 24, 32, 33, & 38. 1946; Moldenke, Phytologia 4: 340. 1953; Moldenke, Résumé 167, 286, 291, & 479. 1959.

The Herb. Holtermann s.n. specimen, cited below, has stems to 12 inches long and leafy throughout!

Additional citations: CEYLON: Herb. Holtermann s.n. (B); Thwaites C.V.131 (B--isotype, B--isotype).

ERIOCAULON ATROIDES Satake

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 126. 1957; Moldenke, Résumé 172 & 479. 1959.

This species has been found growing in muddy swamps. A common name recorded for it is "kuro-imunohiga". Material has been misidentified and distributed in herbaria as E. atrum Nakai.

Additional citations: WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Furuse s.n. [6 Oct. 1955] (S), s.n. [2 July 1956] (S).

ERIOCAULON ATROIDES f. NANUM Satake

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 126--127. 1957; Moldenke, Résumé 172 & 479. 1959.

ERIOCAULON ATRUM Nakai

Synonymy: Eriocaulon atratum Nakai, in herb. [not E. atratum Körn., 1856].

Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 25 & 61. 1946; Moldenke, Bull. Jard. Bot. Brux. 27: 127. 1957; Moldenke, Résumé 171, 172, & 479. 1959; Moldenke, Résumé Suppl. 3: 18 & 21. 1962; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 184--185, pl. 48, fig. 310, text fig. 126 (2). 1964.

This species has been found growing in boggy pondsides. The Koyama plate, cited above, is in full color. The Furuse s.n. [6 Oct. 1955], distributed as E. atrum, is actually E. atroides Satake, while Furuse s.n. [17 Sept. 1954] is E. alpestre Hook. f. & Thoms.

Additional citations: WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Collector undesignated s.n. [18/10/13] (S); Furuse s.n. [14 Sept. 1955] (Ca--59916), s.n. [2 July 1956] (S), s.n. [21 Sept. 1957] (S).

ERIOCAULON ATRUM var. INTERMEDIUM Nakai

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 127--128. 1957; Moldenke, Résumé 172 & 479. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 185. 1964.

ERIOCAULON ATRUM var. PLATYPETALUM Satake

Additional bibliography: Moldenke, Bull. Jard. Bot. Brux. 27: 128. 1957; Moldenke, Résumé 172 & 479. 1959.

ERIOCAULON AUSTRALASICUM (F. Muell.) Körn.

Synonymy: Electrosperma australasicum F. Muell., Trans. Philos. Soc. Victoria 1: 24. 1855. Eriocaulon electrospermum F. Muell., Syst. Census Austral. Pl. 123. 1882.

Bibliography: F. Muell., Trans. Philos. Soc. Victoria 1: 24. 1855; Körn., Linnaea 27: 616. 1856; F. Muell., Syst. Census Austral. Pl. 123. 1882; Moore & Betche, Handb. Fl. New S. Wales 440. 1893; Ruhl. in Engl., Pflanzenreich 13 (IV, 30): 114. 1903; Maiden & Betche, Census New S. Wales Pl. 38. 1916; Moldenke, Known Geogr. Distrib. Erioc. 27, 32, & 34. 1946; Ewart, Fl. Vict. 263. 1931; Moldenke, Résumé 208, 284, 286, 287, & 479. 1959; J. H. Willis, Handb. Pl. Vict. 281. 1962; O. D. Evans, Contrib. New S. Wales Nat. Herb. Fl. Ser. 27/28: 10. 1966.

Evans (1966) describes this plant as follows: "Small annual scapigerous herb. Leaves 2--5 cm. long, ca. 1.5 mm. broad, linear-subulate, pellucid, fenestrate, 3- to 5-nerved. Scapes about as long as the leaves, erect, 4- to 5-ribbed. Flower-heads ovate to subglobose, 3--4 mm. diam.; outer bracts almost lanceolate, obtuse to acute, glabrous; inner bracts narrow, acuminate, glabrous; receptacle conical. Male flowers central, pedicellate; 3 outer tepals cohering at the base; 3 inner tepals fused into a tube, with 3 lobes at the apex each bearing a gland; stamens 6. Female flowers on short pedicels; perianth absent; style short with 3 filiform stigmatic branches. Capsule smooth, 3-locular; seeds solitary, smooth." He says that the type was collected by Ferdinand Jacob Heinrich von Mueller, in December, 1853, in wet ground along the Murray River towards the junction with the Murrumbidgee [Nat. Herb. New South Wales 58361, part of the holotype]. He comments "Known only from the type locality; if not extinct, it would be expected to occur on both the New South Wales (South-western Plains) and Victorian sides of the Murray River. Search for it is desirable." It should also be noted that if the above description is correct and there are really no sepals (as well as no petals) in the pistillate florets, then this species does not fit into the generic description of Eriocaulon and Mueller's genus Electrosperma may well be revived for it.

ERIOCAULON AUSTRALE R. Br.

Additional bibliography: Benth., Fl. Austral. 7: 192. 1878; F. Muell., Syst. Census Austral. Pl. 123. 1882; F. M. Bailey, Syn. Queensl. Fl. 578. 1883; Moore & Betche, Handb. Fl. New S.

Wales 440. 1893; F. M. Bailey, Queensl. Fl. 6: 1715. 1902; Kuhl. in Engl., Pflanzenreich 13 (IV, 30): 66. 1903; F. M. Bailey, Compreh. Cat. Queensl. Pl. 584. 1913; Domin, Bibl. Bot. 20: 506. 1915; Maiden & Betche, Census New S. Wales Pl. 38. 1916; Koyama, Philip. Journ. Sci. Bot. 84: 368 & 378, pl. 6. 1955; Moldenke, Bull. Jard. Bot. Brux. 27: 128. 1957; Moldenke, Résumé 169, 175, 208, 211, & 479. 1959; Moldenke, Résumé Suppl. 3: 17. 1962; O. D. Evans, Contrib. New S. Wales Nat. Herb., Fl. Ser., 27/28: 10—11. 1966; Moldenke, Résumé Suppl. 16: 12. 1968.

The specific epithet of this species is sometimes uppercased for no valid reason. Koyama (1955) cites Hayata 99 from Annam. Bailey (1913) records the common name "hat-pin plant". Evans (1966) describes the plant as follows: "Annual scapigerous herb sprinkled with loose hairs at least on the lower parts of the leaves and scapes. Leaves basal, tufted, linear, up to 60 cm. long and 0.8 cm. wide. Scapes about half again as long as the leaves, ribbed when dry with 6—7 distinct ribs. Flower-heads hoary, semi-globose, changing to depressed-globose at maturity, up to 8 mm. wide; involucral bracts closely imbricate, broad, glabrous or nearly so, the margins entire or lacerate; fertile bracts closely imbricate, 3 mm. long, up to 3 mm. wide, obconical, narrowed at the base into a short stalk, broad and rounded at the apex which is covered externally with a very short and dense, white, persistent tomentum. Flowers very numerous, the male and female mixed together or sometimes one sex or the other predominating, the tepals scarious or hyaline. Male flowers: outer tepals 3, irregular, the 2 laterals ca. 2.5 mm. long, 0.5 mm. wide, the middle one linear, much narrower; inner tepals 3, equal, less than 1 mm. long, inserted on the receptacle close beneath the stamens, each fringed with a few white hairs. Stamens 3--6 on very short filaments. Female flowers: parts seen better in fruiting stage as follows: outer tepals 3, irregular, the 2 laterals ca. 3 mm. long, up to 3 mm. wide, complicate, the keel very broadly winged, lacerate on the upper margin, the middle one lanceolate, concave, shorter than the laterals; inner tepals 3, regular, ca. 2.5 mm. long, linear but with a broader base. Ovary 3-lobed, 3-locular; style branches 3, filiform. Capsule similar to the ovary, slightly enlarged, opening by longitudinal slits. Seeds ellipsoid, ca. 0.8 mm. long, brown, shining." He comments that the species flowers in summer "and possibly most of the year," growing in wet places in sandy heathland and on margins of swamps. From New South Wales he cites Collector undesignated s.n. [Nat. Herb. 58391], Constable s.n. [Jan. 1953; Nat. Herb. 22205], Ingram s.n. [Aug. 1941; Nat. Herb. 63340] and s.n. [Jan. 1961; Nat. Herb. 63344], and Maiden & Boorman s.n. [Nov. 1903; Nat. Herb. 58392]. He reports it also from Queensland and Northern Territory.

Additional citations: CHINA: Fukien: En 2141 (Ca--288123). Kwangtung: Tsang 330 [Herb. Lingnan Univ. 19611] (N), 331 [Herb. Lingnan Univ. 19612] (N); Tso 21077 (N, N). AUSTRALIAN REGION: AUSTRALIA: Queensland: Dallachy s.n. [Rockingham Bay] (V--71557).

State undetermined: Collector undesignated s.n. [Nov. Holl.] (V).
MOUNTED ILLUSTRATIONS: Baur Icon 249 (V), 250 (V).

ERIOCAULON BARBA-CAPRAE Fyson
Additional bibliography: Fyson, Journ. Indian Bot. 2: 1921; Moldenke, Known Geogr. Distrib. Erioc. 23 & 61. 1946; Moldenke, Phytologia 4: 341. 1953; Moldenke, Résumé 161 & 479. 1959; Thanikaimoni, Pollen & Spores 7: 184. 1965; Moldenke, Résumé Suppl. 15: 20. 1967.

ERIOCAULON BARBEYANUM Ruhl.
Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 23 & 32. 1946; Moldenke, Résumé 161 & 479. 1959.
Additional citations: INDIA: Mysore: Ritchie 1247 (B--isotype, Z--isotype).

ERIOCAULON BASSACENSE Moldenke
Bibliography: Moldenke, Phytologia 3: 308--309 & 321. 1950; Moldenke, Résumé 175 & 479. 1959.

ERIOCAULON BAURII N. E. Br.
Synonymy: Eriocaulon bauri N. E. Br. ex Zinderenbakker, S. Afr. Pollen 1: 32, 36, & 79, pl. 7, fig. 33 & 44. 1953.
Additional bibliography: Zinderenbakker, S. Afr. Pollen 1: 32, 36, & 79, pl. 7, fig. 33 & 44. 1953; Moldenke, Bull. Jard. Bot. Brux. 27: 128. 1957; Moldenke, Résumé 153 & 479. 1959; Moldenke, Résumé Suppl. 2: 9 (1960) and 3: 16. 1962; Thanikaimoni, Pollen & Spores 7: 182. 1965; R. H. Compton, Journ. S. Afr. Bot. Suppl. 6: 33. 1966; Moldenke, Résumé Suppl. 16: 8. 1968.
This species has been collected at altitudes of 5600--6000 feet, flowering in November. Killick states that it is "locally very abundant" in Natal. Compton (1966) records it from Swaziland.
Additional citations: SOUTH AFRICA: Cape of Good Hope: Baur 1166 (B--cotype, Z--cotype). Natal: Killick 1164 (S). Transvaal: F. A. Rogers 19580 (S).

ERIOCAULON BEAUVERDI Moldenke
Additional bibliography: Moldenke, Known Geogr. Distrib. Erioc. 35, 61, & 62. 1946; Moldenke, Phytologia 3: 183 (1949), 3: 321 (1950), and 4: 341. 1953; Moldenke, Résumé 88, 288, & 479. 1959.

ERIOCAULON BENTHAMI Kunth
Additional bibliography: H. B. Davis, Life & Works Pringle 56 & 655. 1936; Moldenke, Bull. Jard. Bot. Brux. 27: 129. 1957; Moldenke, Résumé 35, 286, & 479. 1959; Moldenke, Résumé Suppl. 4: 4 (1962) and 12: [1] & 2. 1965; Thanikaimoni, Pollen & Spores 7: 181. 1965.
Recent collectors have found this plant growing in water, in scattered colonies in moist sandy soil of moist open wooded ravines, and in moist to wet places in low wet meadows along with