

ADDITIONAL NOTES ON THE ERIOCAULACEAE. XX

Harold N. Moldenke

ERIOCAULACEAE Lindl.

Additional & amended synonymy: Eriocaulaeae L. C. Rich. apud H.B.K., Nov. Gen. & Sp. Pl., ed. quarto, 1: [251]. 1816. Eriocaulaeae Mart., Nov. Act. Nat. Cur. 17 (1): 3 & 71. 1835. Eriocauloneae L. C. Rich. apud Lindl., Veg. Kingd., ed. 1, 122, in syn. 1846.

Additional & amended bibliography: Breyn., Exot. Min. Cog. Pl. Cent. 1: 108--109, pl. 50. 1678; Moris., Pl. Hist. Univ. 3: 259--260, sect. 8, pl. 16, fig. 17. 1699; L., Sp. Pl., ed. 1, pr. 1, 1: 87 & 129 (1753) and 2: [1203]. 1753; J. A. Murr. in L., Syst. Veg., ed. 12, 109 & 834. 1774; Reich. in L., Syst. Pl. 1: 243--244 (1779) and 4: [668]. 1780; J. A. Murr. in L., Syst. Veg., ed. 13, 1: 108--109 (1783) and 2: 855 (1783) and ed. 14, 127--128 & [1004]. 1784; Palau & Verdera, Part. Pract. Bot. 1: 530--532. 1784; Jacq., Ind. Pl. 63. 1785; Lippert, Pflanzensyst. 1: 187--188 (1786) and 2: [2036]. 1786; Palau & Verdera, Part. Pract. Bot. 8: 214. 1788; Pers. in L., Syst. Veg., ed. 15, 132 & [1033]. 1797; J. A. Murr. in L., Syst. Veg., ed. 15 nov., 106--107 & 812. 1798; Jolyclerc, Syst. Sex. Vég., ed. 1, pr. 1, 92 & 781 (1798) and pr. 2, 92 & 781. 1803; Mouton-Fontenille in L., Syst. Pl. 1: 147--148 (1804) and 5: tab. 2: vii & tab. 12: xvii. 1805; Jolyclerc, Syst. Sex. Vég., ed. 2, 1: 101 (1810) and 2: 474. 1810; Roem. & Schult. in L., Syst. Veg., ed. 15 nov., 2: 56--57, 61, 861--870, & 938. 1817; Roem. & Schult., Mant. 2: 468--470 & 499. 1824; Spreng. in L., Syst. Veg., ed. 16, 1: 188 & 980 (1825) and 3: 774--776. 1826; Roem. & Schult., Mant. 3: 527, 671, & 687. 1827; Spreng. in L., Syst. Veg., ed. 16, 5: 267--268. 1828; Bong., Ess. Monog. Erioc. Brés. 1--12. 1831; Cham. & Schlecht., Linnaea 6: 43. 1831; Lindl., Veg. Kingd., ed. 1, 122, 797, 802, 818, & 830, fig. 82 (1846) and ed. 2, 122, 797, 802, 818, & 830, fig. 82. 1847; Walp., Ann. 5: 919--947, 954, 957, 958, 960, & 964 (1858) and 6: 1170--1171 & 1245. 1861; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): [21]--27, fig. 11--13. 1888; Niederlein, Bol. Mus. Prod. Argent. 3 (31): 336. 1890; Komarov, Fl. Mansh. 1: 418--419. 1901; Prain, Bengal Pl., pr. 1, 121 & 1125--1127. 1903; Schlecht. in Engl., Bot. Jahrb. 40, Beibl. 92: 20. 1908; Guillaum., Ann. Mus. Colon. Marseille, sér. 2, 9: 256. 1911; Fedch., Rastit. Turk. 811. 1915; Hayata, Icon. Pl. Formos. 10: 49--56, fig. 27--31. 1921; Rendle, Journ. Linn. Soc. Lond. Bot. 45: 259--260. 1921; Gleason, Bull. Torr. Bot. Club 52: 195. 1925; Mak., Nippon Shokubutsu 725. 1926; Sasaki, List Pl. Formos. 99. 1928; Sasaki, Cat. Govern. Herb. 118--119. 1930; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1607--1620. 1931; Komarov & Alis., Opred. Rast. Dal'nevost. Kr. 1: 340. 1931; Däniker, Vierteljahrsschr. Naturf. Gesell. Zürich 77, Beibl. 19: 91. 1932; L., Sp. Pl., ed. 1, pr. 2, 1: 87 & 129 (1934) and 2: [1203]. 1934; Fl. U. S. S. R. 3:

494—498 & 748, pl. 27, fig. 1—5. 1935; Masamune, Short Fl. Formos. 262—263. 1936; Mak., Illustr. Fl. Jap. 8, 771, & E.26, fig. 2311—2316. 1940; Guillaum., Fl. Analyt. & Synop. Nouv-Caléd. 49—50 & 361. 1948; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1119—1128 & 1333. 1956; Bourdu, Bull. Soc. Bot. France 104: 156—158, fig. A—F. 1957; Straka, Erdkunde 14: 61 & 63. 1960; Van Royen, Blumea 11: 224—225, fig. 1. 1961; Fl. U. S. S. R., Engl. transl., 3: 392—395 & 512. 1964; Moldenke in Guillaum., Mém. Mus. Hist. Nat. Paris, new ser. B, 15: 6. 1964; Anon., Ind. Bibliogr. Bot. Trop. 1 (1): 25 & 32. 1964; R. Good, Geogr. Flow. Pl. 227, 440, & 495. 1964; Hamblen, Journ. Ecol. [Brit.] 52: 581. 1964; Guillaum., Thorne, & Viot, Univ. Iowa Stud. Nat. Hist. 20 (7): 26. 1965; Angely, Fl. Anal. Paran., ed. 1, 198—202. 1965; Faden, Idrobo, Jiminez, & Tomlinson, Common Dist. Int. Pl. Cerro Muerte 2. 1966; Thornberry, U. S. Dept. Agr. Agric. Handb. 165: 137. 1966; Ogden, Quatern. Paleoecology 7: 175—183. 1967; Satake, Nat. Sci. & Mus. 34: 161—162. 1967; Begum, Proc. Indian Acad. Sci. B.67 (4): 148—156. 1968; Winner, Biol. Abstr. 49: 11782. 1968; Ogden, Biol. Abstr. 49: 9863. 1968; Moldenke, Phytologia 18: 163—186. 1969; Anon., Biol. Abstr. 49 (24): S.61 (1969) and 50 (3): S.63. 1969; Moldenke, Biol. Abstr. 50: 1490. 1969.

Lindley (1846) is in error when he states that Humboldt, Bonpland, and Kunth spelled the family name "Eriocauloneae". The spelling which they adopted was Eriocaulaeae. He also dates their work on this subject as "1815", whereas it should be 1816. These three authors refer the name to L. C. Richard in "Ann. Mus. Hist. Nat. 17: 52" (1811) — a reference that has been widely copied — but the name does not occur on that page, nor anywhere else in that volume, as far as I can see, nor is it in Mém. Mus. Hist. Nat. Paris, volume 17.

The Niederlein (1890) reference given in the bibliography above is sometimes quoted as "31: 68. 1890", apparently an alternate citation.

The Gonzalez Quintero 560, distributed as "Eriocaulaceae", is actually a species of Eleocharis in the Cyperaceae.

BLASTOCAULON PROSTRATUM (Körn.) Ruhl.

Synonymy: Paepalanthus prostratus Körn. in Mart., Fl. Bras. 3 (1): 350. 1863 [not P. prostratus Mart., 1959]. Philodice prostrata (Körn.) Benth. apud Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 22. 1888. Dupatya prostrata Kuntze, Rev. Gen. Pl. 2: 746. 1891. Philodice prostrata Benth. & Hook. apud Ruhl. in Engl., Pflanzenreich 13 (4, 30): 224 & 292, in syn. 1903.

Additional bibliography: Benth. & Hook. f., Gen. Pl. 3: 1024. 1883; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 22. 1888; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Moldenke, Phytologia 18: 165. 1969.

The Paepalanthus prostratus Mart., referred to above, is a synonym of P. bongardii Kunth. Ruhl. (1903) cites the name, Philo-

dice prostrata, to Benth. & Hook. f., Gen. Pl. 3: 1024 (1883), but it does not occur there, nor is it listed in the Index Kewensis.

ERIOCAULON INSULARE Ruhl.

Additional bibliography: Moldenke, N. Am. Fl. 19 (1): 19 & 28. 1937; Moldenke, Phytologia 1: 318. 1939; Moldenke, Known Geogr. Distrib. Erioc. 4 & 36. 1946; León, Fl. Cuba 1: 281. 1946; Moldenke, Phytologia 3: 328. 1950; Moldenke, Résumé 51, 53, & 481. 1959; Moldenke, Phytologia 18: 189. 1969.

Killip found this plant growing along roadsides, mixed with E. sclerocephalum Ruhl., Syngonanthus lagopodioides (Griseb.) Ruhl., and various members of the Lentibulariaceae, and his no. 45170 is a mixture of these elements.

Additional citations: CUBA: Pinar del Río: Ekman 17808 (S--type). ISLA DE PINOS: Killip 45170, in part (Z).

ERIOCAULON INTERMEDIUM Körn.

Synonymy: Eriocaulon setaceum Kunth apud Walp., Ann. 5: 931, in syn. 1858 [not E. setaceum Benth., 1893, nor Crantz, 1893, nor Heyne, 1832, nor L., 1753, nor Lour., 1790, nor Rottl., 1960, nor Wall., 1893, nor Wight, 1832, nor Willd., 1959]. Eriocaulon setaceum Auct. ex Ruhl. in Engl., Pflanzenreich 13 (4-30): 90 & 287, in syn. 1903. Eriocaulon glabrifolium Vesterdal, in herb.

Bibliography: Körn., Linnaea 27: 601. 1854; Walp., Ann. 5: 931 (1858) and 6: 1171. 1861; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Körn. in Mart., Fl. Bras. 3 (1): 476. 1863; Benth., Fl. Austral. 7: 192. 1878; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 27. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Hook. f., Fl. Brit. Ind. 6: 572. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 18, 64, 90, 286, & 287. 1903; Fyson, Journ. Indian Bot. 2: 193, pl. 2. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1618. 1931; Moldenke, Known Geogr. Distrib. Erioc. 23, 24, 26, 36, & 40. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Phytologia 3: 328. 1950; Moldenke, Résumé 162, 167, 176, 178, 292, & 481. 1959; Moldenke, Résumé Suppl. 1: 13. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Moldenke, Phytologia 18: 169. 1969.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 2. 1921.

Hooker (1893), Fischer (1931), Thwaites & Hooker (1964), and Thanikaimoni (1965) all reduce this taxon to synonymy under E. setaceum L., but Ruhland (1903) and Fyson (1921), both specialists on this genus and careful workers whose conclusions should not be taken lightly, keep it separate. The Flora of British India, in fact, goes so far as to suggest that E. bifistulosum Van Heurck & Muell.-Arg., E. intermedium Körn., and E. setaceum L. are all conspecific. I wonder why E. melanocephalum Kunth was not also included! And why not also E. schippii Standl.? These

five species, inhabiting precisely the same type of habitat, but in different parts of the world, all do look very similar in general habital aspect, which is to be expected from their similar submerged aquatic habitat. Fyson, however, points out that E. intermedium is "Similar in habit to E. setaceum L., but the floral bracts glabrous, making the heads black. Flowers as in E. setaceum, but female petals unequal." He records it from "[?] Assam: Khasia: Peninsular India; Malabar: Ceylon."

It should be noted here that the E. setaceum L., referred to above and in the synonymy, is a valid species, with E. setaceum Crantz and E. setaceum Wall. as synonyms, while the homonym of Loureiro is actually Fimbristylis setacea Benth. in the Cyperaceae, that of Rottler and of Willdenow is E. cinereum R. Br., that credited to Wight is E. quinquangulare L., that credited to Heyne is E. sexangulare L., and that of Bentham is E. bifistulosum Van Heurck & Muell.-Arg. Walpers (1858, 1861) implies a homonym accredited to Steudel, but does not actually write it.

Smitinand & Abbe found E. intermedium growing in stagnant water, while the former of these collectors describes it as an "aquatic herb submerged in stream, sending up flower stalk above the surface, flowers greenish" in Thailand. The Clemenses found it growing with Chara in a paddy outlet by a pasture in Annam. It has been collected at altitudes of 100 to 1300 meters, flowering and fruiting in August, September, and November.

The cheironymous name, E. glabrifolium, seems to be based on Vesterdal 8f from Thailand, deposited in the Copenhagen herbarium. Material of E. intermedium has been, as is to be expected, widely misidentified and distributed in herbaria as E. setaceum L.

Additional citations: INDIA: Travancore: Wight 2369 (Ac, B), s.n. [Quilon, 1835] (V—159840). CEYLON: Thwaites C.V.791 (B, B). THAILAND: Floto 7350 (Cp); Smitinand 1908 [Herb. Roy. Forest Dept. 11527] (Z); Smitinand & Abbe 6155 [Herb. Roy. Forest Dept. 24385] (Gg); Sørensen, Larsen, & Hansen 5780 (S); Vesterdal 8f (Cp). INDOCHINA: Annam: Clemens & Clemens 4214 (Ca—339334). INDONESIA: GREATER SUNDA ISLANDS: Sumatra: E. von Martens 8 (B), s.n. [April 1862] (B). LOCALITY OF COLLECTION UNDETERMINED: Thunberg s.n. (S). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicker (B).

ERIOCAULON INTRUSUM Meikle

Synonymy: Eriocaulon lacteum "sensu Hutch. & Dalz." ex Meikle, Kew Bull. 22: 141, in syn. 1968 [not E. lacteum Rendle, 1899].

Bibliography: Meikle, Kew Bull. 22: 141. 1968; Winner, Biol. Abstr. 49: 11782. 1968; Moldenke, Résumé Suppl. 17: 4 & 10. 1968.

The type of this species was collected by Hugh Vandervaes Lely (no. 283) at Naraguta, in the Plateau province, Nigeria, on June 20. 1921, and is deposited in the herbarium of the Royal Botanic

Gardens at Kew. The E. lacteum Rendle, referred to in the synonymy above, is itself a synonym of E. teusczii Engl. & Ruhl.

ERIOCAULON INUNDATUM Moldenke

Bibliography: Moldenke, *Phytologia* 3: 413--414. 1951; G. Taylor, *Ind. Kew. Suppl.* 12: 55. 1959; Moldenke, *Résumé* 135 & 481. 1959; Moldenke, *Phytologia* 18: 171. 1969.

This plant has been collected in anthesis and fruit in October and December. Material has been misidentified and distributed in herbaria as E. buchananii Ruhl.

Citations: SENEGAL: Monod s.n. [28 octobre 1943] (An--type, N--isotype, N--photo of type, Z--photo of type); Raynal & Raynal 6879 (Mi), 6988 (Z), 6996 (Mi).

ERIOCAULON INYANGENSE Arwidsson

Bibliography: Arwidsson, *Bot. Notiser* 1934: 83. 1934; A. W. Hill, *Ind. Kew. Suppl.* 9: 105. 1938; Moldenke, *Phytologia* 3: 328. 1950; Moldenke, *Résumé* 149 & 481. 1959; Moldenke, *Phytologia* 17: 387. 1968.

This plant has been found growing in wet sandy soil along rivulets, at altitudes of 1550 to 1650 meters, flowering and fruiting in October and November. The Brain 4470 & 9010, Govt. Herb. Salisbury 13417 & 15100, Hornby H.2388, and H. Wild 1162, distributed as E. inyangense and some of which were so cited by me in my 1950 work, are actually E. amboense Schinz.

Additional citations: RHODESIA: Freid, Norlindh, & Weimarck 2478 (S--isotype, Z--isotype), 3225 (S); Haptröm 163 (S).

ERIOCAULON IRREGULARE Meikle

Synonymy: Eriocaulon heterochiton "sensu Lecomte" ex Meikle, *Kew Bull.* 22: 143, in syn. 1966 [not E. heterochiton Körn., 1867, nor A. Chev., 1959].

Bibliography: Meikle, *Kew Bull.* 22: 143--144. 1968; Winner, *Biol. Abstr.* 49: 11782. 1968; Moldenke, *Résumé Suppl.* 17: 4 & 10. 1968; Moldenke, *Phytologia* 18: 178. 1969.

It should be noted here that the E. heterochiton Körn. referred to in the synonymy above is a valid species, while the homonym attributed to Chevalier is a synonym of E. plumale N. E. Br.

The type of E. irregulare was collected by P. Adames (no. 353) on the Plaine de la Fetoré, near Koubi, Guinea, on September 12, 1962, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Meikle (1968) cites also Chevalier 18488 and Schnell 7379 from Guinea and Jaeger 184 from Sierra Leone. Concerning the last-mentioned collection, however, he notes that "The specimen from Sierra Leone, with regularly 2-merous flowers, is untypical; though it agrees so closely with typical Guinean specimens in details of floral structure that it would be unwise, at least for the present, to regard it as distinct, especially as the material is overripe and unsatisfactory."

ERIOCAULON JAPONICUM Körn.

Synonymy: Eriocaulon japonicum Körn. in Miq., Bot. Lugd. 3: 162. 1867.

Bibliography: Körn. in Miq., Ann. Mus. Bot. Lugd. 3: 162—163. 1867; Franch. & Savat., Enum. Pl. Jap. 2: 99. 1879; Maxim., Diagn. Pl. Nov. Asiat. 8: 24. 1892; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Mak., Bot. Mag. Tokyo 8: 506. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 65, 95, 117, & 286. 1903; Matsumura, Ind. Pl. Jap. 2 (1): 176. 1905; Mak & Nemoto, Fl. Jap., ed. 1, 1305 (1925) and ed. 2, 1511. 1931; Nemoto, Suppl. Fl. Jap. 1038. 1936; Honda, Nom. Pl. Jap. 462. 1939; Satake, Journ. Jap. Bot. 15: 628—629. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 1, 13, 45, 79, & 87, fig. 19. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 32—33. 1940; Moldenke, Known Geogr. Distrib. Erioc. 25 & 36. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Résumé 173, 289, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 184 & 429. 1964; Moldenke, Phytologia 17: 386. 1968.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 45, fig. 19. 1940.

A common name recorded for this species is "yamato-hosikusa". Satake (1940) comments that "Not having met with any plant quite corresponding to the original description, the writer doubted the existence of this species, but recently in examining the specimens in the Herbaria of the Hokkaido Imperial University and of the Tokyo Science Museum, he found two specimens which he accurately determined as E. japonicum Koernicke, thus confirming the existence of this plant." He cites Miura s.n. [Mobara, Jul. 1911] and Togasi s.n. [Yatumi, Sept. 1937] from Honshu, where he says the species is apparently endemic. The Warburg s.n. [Yulupo], distributed as E. japonicum, is actually E. alpestre Hook. f. & Thoms.

Citations: MOUNTED LITERATURE: Ruhl. in Engl., Pflanzenreich 13 (4-30): 95. 1903 (B).

ERIOCAULON JAUENSE Moldenke

Bibliography: Moldenke, Résumé Suppl. 17: 2. 1968.

This species is based on a collection made by Julian Alfred Steyermark (no. 98179) in a wet savanna bordering woods just below the second fall at "Meseta de Jáua, Cerro Jáua: Cumbre de la porción Central-Occidental de la Meseta, 4°45' Lat. No., 64°26' Long. Oest, 36 millas nauticas o 60 Kms. noroeste de la misión de Campamento Sanidad del Río Kanarakuni", Bolívar, Venezuela, between March 22 and 27, 1967, deposited in my personal herbarium at Plainfield, New Jersey. The collector notes that the plants formed large spongy mats, the leaves being subcoriaceous, rich-green on both surfaces, ascending to subspreading, the heads white with black. A formal description is in manuscript, to be published soon in the Memoirs of the New York Botanical Garden.

ERIOCAULON JOHNSTONII Ruhl.

Bibliography: Ruhl. in Engl., Bot. Jahrb. 27: 82. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 63, 82, & 286. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; H. Lecomte, Bull. Soc. Bot. France 55: 571. 1908; Moldenke, Known Geogr. Distrib. Erioc. 22 & 36. 1946; Moldenke, Résumé 157 & 481. 1959; Punt, Reg. Veg. 36: 9. 1964.

The type of this species was collected by Sir Harry Hamilton Johnston -- in whose honor it is named -- along a forest stream, at an altitude of 1920 feet, on Mauritius, on September 28, 1888, and is deposited in the herbarium of the Botanisches Museum at Berlin. The collector describes the leaves as recurved-patent, the heads greenish-brown, and the flowers trimerous. Material has been misidentified and distributed in herbaria as E. repens Lam.

Citations: MASCARENE ISLANDS: Mauritius: Bouton 1829 (P); H. H. Johnston s.n. [28th September 1888] (B--type, Z--isotype); Petit-Thouars s.n. (N, N--photo, P, Z--photo).

ERIOCAULON JORDANI (Moldenke) Meikle

Synonymy: Syngonanthus jordani Moldenke, Phytologia 5: 91.

1954. Eriocaulon jordani (Moldenke) Meikle, Kew Bull. 22: 143. 1968.

Bibliography: Moldenke, Phytologia 5: 91--92. 1954; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1954: 34. 1955; Anon., Trav. Lab. Bot. Syst. Brux. 16: 32. 1955; Moldenke, Résumé 137, 352, & 492. 1959; G. Taylor, Ind. Kew. Suppl. 12: 138. 1959; Meikle, Kew Bull. 22: 143. 1968; Winner, Biol. Abstr. 49: 11782. 1968; Moldenke, Résumé Suppl. 17: 4, 10, & 12. 1968.

It should perhaps be recorded here again that I do not approve of the recommendation of the American Joint Committee on Horticultural Nomenclature as published in "Standardized Plant Names" (1924) that all subgeneric epithets terminating in "i" or "ii" when originally proposed be written always with a single "i", nor the opposing recommendation of the International Rules of Botanical Nomenclature, now so widely followed, which asks that many, though not all, names originally proposed with a single "i" always be corrected to a double "i". I still feel that the original orthography of the original author of a name be followed unless it can be shown that an error in gender was made [e.g., "schulzii" when the person being honored by the epithet actually was a woman and the name should have been written "schulzae"]. I therefore do not adopt Meikle's new orthography of the specific epithet which I originally gave to this taxon.

Citations: SIERRA LEONE: H. D. Jordan 721 (Z--type).

ERIOCAULON KAINANTENSE Masamune

Synonymy: Eriocaulon kainantensis Masamune, Trans. Nat. Hist. Soc. Taiwan 33: 13. 1943.

Bibliography: Masamune, Trans. Nat. Hist. Soc. Taiwan 33: 13. 1943; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Ré-

sumé Suppl. 17: 5 & 13. 1968.

The type of this endemic Hainan species was collected by Genkei Masamune at Sana, Hainan, on November 30, 1940, and is deposited in the herbarium of the University of Tokyo. Masamune's original (1943) use of the incorrect gender for the specific epithet used by him for this taxon was corrected by Salisbury (1953). Masamune records the vernacular name "kainan-hosikusa", and cites also Masamune & Fukuyama 86 & 845 from Hainan island, deposited in the herbarium of the University of Tokyo. His description of the species is as follows: "(sect. Heterochiton) Annuæ. Folia caespitosa, lineari-lanceolata, basi dilatata, utrimque tomentella multinervia rigida 17—25 cm longa, medio ca. 4 mm lata. Pedunculii plures, glabri 6 costati plus minusve torte 30—40 cm alti. Vaginae oblique fissae, laxiusculae tomentellae, 7—10 cm longae. Capitula semiglobosa, glabriuscula 3—5 mm longa, 5—10 mm lata, 5—10 mm in diametro. Bracteae involucentes late obovatae, obtusae, glabrae stramineae, disco breviores. Bracteae flores cuneato-obovatae, plus minusve cuspidato-acuminatae, summo dorso saepe dense albotomentosae quam flores vix longiores. Flos ♂: sepala 2 a medium in spatham antice fissam connata, oblongo-spathulata, obtusa saepe minute incisa glabriuscula concava hyalina. Antherae 6 nigrae. Elos ♀: sepala 2 angusto-linearum glabra hyalina apice truncata dorso alata. Petala 3 linearum glabra, illis ca aequilonga. Stigmata 3."

ERIOCAULON KATOI Onuma

Bibliography: Moldenke, Résumé 173 & 481. 1959.

It would appear that this species is based on two collections made by S. Kato — in whose honor the taxon is named — at Kukuri-mura, Mino, Honshu, on September 14, 1914, and another also from Honshu on September 28, 1918. The former collection has "nov. sp." written after the binomial on the Stockholm specimen. I have not as yet been able to ascertain where the taxon was officially described.

Citations: WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Kato s.n. [Kukuri-mura, 13/9/14] (S—cotype), s.n. [Sept. 28, 1918] (Kg—cotype, Z—cotype).

ERIOCAULON KENGII Ruhl.

Bibliography: Ruhl., Notizbl. Bot. Gart. Berlin 10: 1042—1043 & 1060. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Moldenke, Known Geogr. Distrib. Erioc. 25 & 36. 1946; Moldenke, Résumé 169 & 481. 1959.

ERIOCAULON KINABALUENSE Van Royen

Bibliography: Van Royen, Blumea 10: 133. 1960; G. Taylor, Ind. Kew. Suppl. 13: 52. 1966; Moldenke, Résumé Suppl. 17: 6. 1968.

Nothing is known to me about this species except that it is supposed to grow in and presumably be endemic to Sabah.

ERIOCAULON KINLOCHII Moldenke

Bibliography: Moldenke, N. Am. Fl. 19 (1): 23—24. 1937; Molden-

ke, *Phytologia* 1: 318. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 140--141. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 4 & 36. 1946; Hill & Salisb., *Ind. Kew. Suppl.* 10: 86. 1947; Moldenke, *Résumé* 43 & 481. 1959; Moldenke, *Phytologia* 18: 169. 1969.

This species has been confused with and material distributed to herbaria as E. benthami Kunth of Mexico and Guatemala, from which it differs in many respects, notably in its dimerous florets, long-attenuate and filiform-tipped leaves, 3-costate peduncles, and many floral characters.

Emended citations: BRITISH HONDURAS: Kinloch 213 (F--675903--type).

ERIOCAULON KIUSIANUM Maxim.

Bibliography: Maxim., *Bull. Acad. Sci. Pétersb.* [Dec. Pl. Asiat.] 8: 7 & 22. 1893; Hook. f., *Fl. Brit. Ind.* 6: 578. 1893; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 158 & 501. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 65, 95, & 286. 1903; Satake in Nakai & Honda, *Nov. Pl. Jap.* 6: 1, 77, & 87. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 64. 1940; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 158 & 501. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 25 & 36. 1946; Moldenke, *Résumé* 172, 173, & 481. 1959; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 158 & 501. 1959; Moldenke, *Résumé Suppl.* 3: 19. 1962; Moldenke, *Phytologia* 18: 167. 1969.

This binomial was published in the synonymy of E. alpestre Hook. f. & Thoms. by Hooker (1893), as reported in the *Index Kewensis Supplement 1*: 158 (1902). On a later page, p. 501, of the same Supplement, however, it is credited to "Maxim. Dec. Pl. Asiat. 8: 7" (1893), apparently as a correction of the previous entry. Satake (1940) gives "1892" as the date of publication of Maximowicz's original description, but it would seem that 1893 is correct.

Durand & Jackson (1902) reduce this species to synonymy under E. alpestre Hook. f. & Thoms. It has been collected in anthesis in May. Material has been misidentified and distributed in herbaria under the names E. cinereum R. Br. and E. formosanum Hayata.

Citations: CHINESE COASTAL ISLANDS: Hainan: S. K. Lau 3883 (B, S); Liang 66137, in part (Go). WESTERN PACIFIC ISLANDS: JAPAN: Kiushu: Maximowicz s.n. [Prov. Simabara, 1863] (B--isotype, Br--isotype, N--isotype, N--photo of isotype, Z--photo of isotype). FORMOSA: Masamune & Suzuki 23 (W--2062441, W--2062456, Z); Tanaka & Shimada 13574 (B, Ca--517642, Go, Mi, N, S).

ERIOCAULON KLOTZSCHII Moldenke

Synonymy: Eriocaulon brevifolium Klotzsch in Schomb., *Faun. & Fl. Brit. Guian.* 1116, nom. nud. 1848 [not E. brevifolium Mart., 1863, nor Raf., 1840].

Additional bibliography: Klotzsch in Schomb., *Faun. & Fl. Brit. Guian.* 1116. 1848; Walp., *Ann.* 5: 931 (1858) and 6: 1170. 1861; Körn. in Mart., *Fl. Bras.* 3 (1): 496--497. 1863; Moldenke, *Phytologia* 17: 9, 451--452, & 484--485 (1968) and 18: 79--80. 1969.

The bibliographic references given above are in addition to those previously noted by me under E. brevifolium before I realized that this binomial is invalid. The Klotzsch binomial, published invalidly in 1848, was validated by Körnicke in 1863, but is still a later homonym of Rafinesque's name. The ten herbarium specimen citations enumerated by me previously under E. brevifolium should now, of course, be transferred to E. klotzschii.

The Eriocaulon brevifolium of Martius, referred to in the synonymy above, is a synonym of E. sellowianum Kunth, while that of Rafinesque is E. pellucidum Michx.

ERIOCAULON KLOTZSCHII var. PROLIFERUM (Moldenke) Moldenke

Synonymy: Eriocaulon brevifolium var. proliferum Moldenke in Maguire & Wurdack, Mem. N. Y. Bot. Gard. 9: 278. 1957.

Emended & additional bibliography: Moldenke in Maguire & Wurdack, Mem. N. Y. Bot. Gard. 9: 278. 1957; Moldenke, Bull. Jard. Bot. Brux. 27: 130. 1957; Moldenke, Résumé 71 & 480. 1959; Moldenke, Phytologia 17: 9, 452, & 484. 1968.

ERIOCAULON KOERNICKEI Britten

Synonymy: Eriocaulon pygmaeum Körn. in Mart., Fl. Bras. 3 (1): 477—478. 1863 [not E. pygmaeum Dalz., 1851, nor Mart., 1841, nor Soland., 1809]. Eriocaulon vauthieri Ruhl. in Engl., Pflanzenreich 13 (4-30): 37. 1903.

Bibliography: Walp., Ann. 5: 927 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 475, 477—478, & 500, pl. 40, fig. 2. 1863; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 23 & 25, fig. 12 L—R. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Britten, Journ. Bot. 1900: 481 & 482. 1900; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 37, & 286—288. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 203. 1904; Prain, Ind. Kew. Suppl. 3: 69 & 70. 1908; H. Lecomte, Bull. Soc. Bot. France 55: 644. 1909; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 8, 36, 39, & 41. 1946; Moldenke, Résumé 89, 291, 293, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 40, fig. 2. 1863; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 23, fig. 12 L—R. 1888.

It should be noted here that the Eriocaulon pygmaeum Soland., referred to above, is a valid species, while the homonym of Dalziel is a synonym of E. xeranthemum Mart. and that of Martius is Paepalanthus bifidus (Schrad.) Kunth. The Vauthier collection cited below as the type of E. koernickei, seems also to be the type collection of E. vauthieri Ruhl., as well, of course, as of E. pygmaeum Körn.

Citations: BRAZIL: State undetermined: Vauthier s.n. (B—type, B—iso-type). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B, B).

ERIOCAULON KÖRNICKIANUM Van Heurck & Muell.-Arg.

Synonymy: Eriocaulon koernickianum Van Heurck & Muell.-Arg. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893. Eriocaulon kornickianum Van Heurck & Muell.-Arg. apud Kral, Sida 2: [298] & 299. 1966.

Bibliography: Van Heurck, Obs. Bot. 101. 1870; Morong, Bull. Torr. Bot. Club 18: 356. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Coult., Contrib. U. S. Nat. Herb. 2: 459. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 35, & 286. 1903; J. K. Small, Fl. Southeast. U. S., ed. 1, 236 (1903) and ed. 2, 236. 1913; Cory, Texas Agr. Exp. Sta. Bull. 550: 29. 1937; Moldenke, N. Am. Fl. 19 (1): 19 & 30. 1937; Moldenke, Phytologia 1: 318. 1939; Moldenke in Lundell, Fl. Texas 3 (1): 7-8. 1942; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Known Geogr. Distrib. Erioc. 3 & 36. 1946; Moldenke, Phytologia 3: 153 (1948) and 3: 328. 1950; Moldenke, Résumé 22, 25, 27, 289, 444, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Kral, Sida 2: [298], 299, & 330. 1966; Shinnery, Sida 2: 441. 1966.

Illustrations: Kral, Sida 2: [298]. 1966.

Because of the rarity of this species it may be worthwhile to repeat here the statements about it by several botanists. Morong (1891) says "I have not seen a specimen of this Texan plant, but the authors of the species describe it as having pellucid leaves which are five to seven-nerved, plane, smooth, 8 to 11 lines long and a little over 1 line wide at the base. Scapes numerous, 4 to 5 inches high, setaceous, smooth, compressed, two to three-angled, with lax sheaths which are as long as the leaves. Heads ovoid-globose, about 1 1/2 inch long, a little longer than broad. Involucral scales fuliginous, broadly obovate, irregularly denticulate and white-woolly above, at length slightly recurved. Receptacle smooth. Bracts not quite 1 line high, surpassing the flowers. Sterile flowers about 1/2 line high; outer perianth segments smooth and black-glandular at the apex; inner obovate and pilose at the apex. Stamens four. Inner perianth segments of the fertile flower white-woolly on the margins. Style two-parted plainly destitute of appendages. Seeds ellipsoidal, rough papillose. East Texas. Coll. Charles Wright, in herb. DC et Van Heurck."

In my 1937 work the distribution of this species is given as "Springy places and swamps on the Coastal Plain, Arkansas, Oklahoma, and eastern Texas." In my 1942 work the Texan distribution is given as "In springy places on prairies and wet sandy ground, Timber Belt area of eastern Texas" and the comment is made that "No Texan material of this species has been seen by the writer, but the type is said to have been collected in 'East Texas' [-Tyler Co.] by Charles Wright. Coulter records it from eastern Texas, and Cory from the Timber Belt area. Small lists it for the state. It is definitely known from Arkansas and Oklahoma, so its occurrence in Texas is very probable."

The Little specimen cited below has a label originally inscri-

bed "Utah" as the locality of collection, but Dr. Elbert L. Little, Jr., the collector, in a letter to me dated March 29, 1958, says "there is an error somewhere. If the specimen was collected by me in 1929, then it is the specimen from the top of Porum Mountain, about 2 miles west of Porum, Muskogee County, Oklahoma. I have changed the label accordingly. Your identification Eriocaulon körnickerianum Van Heurck & Muell.-Arg. agrees, as you listed this species from Oklahoma in your monograph. The locality where I collected Eriocaulon in Oklahoma is not on the Coastal Plain but is about 100 miles northward."

The Moore specimen cited below was gathered in Magazine Mountain in Logan County, Arkansas, where Kral also collected it (apparently after the writing of the quotation from him given below), and where he describes the locality as follows: "alt. 2650 ft., top of Magazine Mtn., on moist fine sand of bed and bank of intermittent stream through boggy swale in scrub oak. This is the only Eriocaulon known from the Interior Highlands province, although more populations of it have been found in Oklahoma & Texas, it is also reported from the lower Coastal Plain of Texas."

Kral (1966) gives a thorough description of this plant: "Solitary or in small tufts, reproducing vegetatively by short lateral offshoots. Leaf pale green, very thin, linear-attenuate, 1-5 cm. long, tapering evenly from a thin, pale, aerenchymatous base, the margin slightly incrassate. Sheath of the scape about the length of most of the leaves (ca. 2-3 cm.) loose, somewhat inflated and scarious above, bifid. Mature scape filiform, 5-8 cm. long, about 0.5 mm. broad, twisted, 3-4 ridged. Mature head subglobose or short-oblong, 0-0-4.0 mm. broad, dark gray or gray-green save for pale 'rims' of the white-ciliate perianth parts and bracts and the pale, scarious, outer bracts. Outer involucre bracts broadly oblong to suborbicular, reflexed at maturity, 1.0-1.25 mm. long, smooth, very thin, stramineous, translucent, the apex rounded. Receptacular bractlet oblong to cuneate, ca. 1.5 mm. long, gray or gray-green, acute to obtusely angled, translucent, acute to obtusely angled, concave and unequilaterally keeled, smooth save for a scattering of white, clavate, trichomes along the somewhat erose upper margin. Surface of the receptacle of the head smooth. Male flower: sepals linear-curved, concave, ca. 1 mm. long, grayish-translucent, with a few white, clavate trichomes on the backs apically. Corolla members subequal, yellowish, primarily consisting of a narrowly obpyramidal androphore which terminates in two low, glanduliferous, tooth-like lobes whose apices have a few white-clavate trichomes. Female flower: sepals linear-curved, ca. 1 mm. long, gray-translucent save for the pale, clawed bases, smooth or with a scattering of hairs on the backs apically; petals spatulate, curved, the blades broadly rhombic and opaque, the bases clawed, ca. 1 mm. long or slightly longer, yellowish-white, the inner surface and upper margin with white-clavate trichomes. Seeds broadly ovoid, ca. 0.5 mm. long, deep reddish brown, the surfaces papillate or rugose. Upland seepage areas and bogs, from the Interior Highlands (Magazine Mt.,

Arkansas) south and west to Oklahoma and Texas. I have never seen living examples of this apparently rare, diminutive, Eriocaulon. Superficially it is closest to E. ravenelii of the eastern Coastal Plain, differing from it primarily in its smaller stature, its trichomiferous bractlets and perianth parts, and its smaller, rugose rather than alveolate, seeds." In his distribution map he indicates two Arkansas, one Oklahoma, and three Texas localities, but the county names are illegible.

The only common name recorded for the plant is "pipewort". It has been collected and flower and fruit in July. Material has been misidentified and distributed in herbaria under the name E. articulatum (Huds.) Morong. On the other hand, the Cory 52778, distributed as E. körnckianum, is actually Lachnocaulon anceps (Walt.) Morong.

Additional citations: ARKANSAS: Logan Co.: Kral 24579 (N); D. M. Moore 4333 (Ws). OKLAHOMA: Muskogee Co.: E. L. Little Jr. s.n. [Jul. 14, 1929] (Ok--2123). TEXAS: Tyler Co.: C. Wright s.n. (B-isotype).

ERIOCAULON KUNTHII Körn.

Synonymy: Eriocaulon elichrysoides Kunth apud Körn. in Mart., Fl. Bras. 3 (1): 482--483, in syn. 1863 [not E. elichrysoides Bong., 1831]. Eriocaulon kunthii var. α Körn. in Mart., Fl. Bras. 3 (1): 482--483. 1863. Eriocaulon kunthii var. β Körn. in Mart., Fl. Bras. 3 (1): 482--483. 1863. Eriocaulon kunthii var. γ Körn. in Mart., Fl. Bras. 3 (1): 482--483. 1863. Eriocaulon kunthii var. δ Körn. ex Alv. Silv., Fl. Mont. 1: [397] & 398. 1928. Eriocaulon callocephalum Alv. Silv. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959.

Bibliography: Vell., Fl. Flum. 36 (1825) and Icon. 1: pl. 86. 1827; Bong., Mém. Acad. Sci. Pétersb., sér. 6, 1: 631 (1831) and 3: 559, pl. 27. 1840; Kunth, Enum. Pl. 3: 525, 546, & 575. 1841; Körn., Linnaea 27: 599. 1856; Walp., Ann. 5: 930 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 482--483. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 41, 44, 45, 285, & 286. 1903; Alv. Silv., Fl. Mont. 1: [397] & 398. 1928; L. B. Sm., Contrib. Gray Herb., new ser., 124: 5. 1939; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 82 & [103]. 1945; Moldenke, Known Geogr. Distrib. Erioc. 8, 34, & 36. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Résumé 89, 218, 287, 289, & 481. 1959; Moldenke, Résumé Suppl. 1: 16 & 17 (1959) and 2: 5. 1960; Rennó, Levant. Herb. Inst. Agron. 68. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Angely, Fl. Paran. 17: 24. 1961; Hocking, Excerpt. Bot. A.4: 592. 1962; Angely, Fl. Anal. Paran., ed. 1, 199. 1965; Moldenke, Phytologia 18: 87 & 177. 1969.

The type of this species seems to be a specimen collected by Friedrich Sellow in Minas Gerais, Brazil, deposited in the herbarium of the Botanisches Museum at Berlin and labeled as no. B.1290

C.263. The type of E. callocephalum appears to be A. Silveira 2939 in the same herbarium; Stephan s.n. [Congonhas do Campo, 1843] is the type collection of E. kunthii var. ♀, while L. Riedel 2388 is the type collection of E. kunthii var. γ. Silveira (1928) cites his no. 203 for E. kunthii and his no. 204 for what he calls E. kunthii var. j. The E. elichrysoides Bong., referred to above, is a valid species.

Kunth (1841) regards Dupatya ligulata Vell. as a synonym of E. elichrysoides Bong., while Körnigke (1863) regards it as a synonym of E. kunthii. L. B. Smith (1939) also feels that Dupatya ligulata and Eriocaulon kunthii are conspecific, and reduces them both to E. ligulatum (Vell.) L. B. Sm. Ruhland (1903), however, considered Velloso's name probably to belong in the synonymy of Eriocaulon vaginatum Körn. Following this disposition by the last previous monographer of the group, I consider Dupatya ligulata and Eriocaulon vaginatum conspecific and reduce them both [rather than E. kunthii] to synonymy under E. ligulatum (Vell.) L. B. Sm. If this disposition of the names is followed, then, according to Ruhland, the two taxa may be distinguished as follows:

E. kunthii has the receptacle pilose, the sepals of the staminate florets free, subacute at the apex, and the sepals of the pistillate florets subovate, two subacute and the third obtuse at the apex. E. ligulatum has the receptacle glabrous, the sepals of the staminate florets connate at the base, obtuse at the apex, and the sepals of the pistillate florets oblong-spatulate, all obtuse at the apex.

Eriocaulon kunthii has been found growing at altitudes of 1500 to 2200 meters, flowering and fruiting in November. The initial letter of the specific epithet is often uppercased. Material has been misidentified and distributed in herbaria as E. magnificentum Ruhl., E. vaginatum Körn., and Paepalanthus calvus Körn. On the other hand, the Mexia 5833, widely distributed in herbaria as E. kunthii, is actually the type collection of Paepalanthus mexiae Moldenke, while A. Silveira 2914 is a cotype collection of Eriocaulon majusculum Ruhl.

Additional citations: BRAZIL: Minas Gerais: Black 51-11001 (Z); A. Castellanos 24179 [Herb. Cent. Pesq. Florest. 2951] (An, Rf); Dusén 2045 (S, S); Glaziou 6742 [Macbride photos 22275] (N—photo, W—photo); R. S. Santos s.n. [12.9.63] (Bd—28326); Santos & Castellanos 24179 [Herb. Bradeanum 28327] (N); Sellow B.1290 (Br), B.1290 C.263 (B—type, B—isotype, B—isotype); A. Silveira 2939 (B); Stephan s.n. [Congonhas do Campo, 1843] (Br, N); Ule s.n. [Herb. Mus. Nac. Rio Jan. 28] (S). Paraná: Braga s.n. [28/8/59; Herb. Inst. Hist. Nat. 5271] (Mm); Dombrowski & Saito 350/159 (Ac); Hatschbach 7303 (Ca). Rio Grande do Sul: Friedrichs 30570 (S), 30670 (N); Gaudichaud 262 (P); Rambo 36785 (S), 52183 (S);

Saint-Hilaire C².1805 (P, P, P). Santa Catarina: Reitz & Klein 7351 (N, Z), 8242 (OK, S). São Paulo: L. Riedel 2388 (B); Segadas-Vianna 3123 (Sm). CULTIVATED: Brazil: Hemmendorff 468 (N, S). MOUNTED ILLUSTRATIONS: drawings & notes by Körnigke (B).

ERIOCAULON KUSIROENSE Miyabe & Kudo

Synonymy: Eriocaulon kushirense Kudo, Jap. Journ. Bot. 2: 248, nom. nud. 1925. Eriocaulon atrum Miyabe & Kudo apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 62 & [86], in syn. 1940 [not E. atrum Masamune, 1940, nor Nakai, 1911]. Eriocaulon kushiroense Miyabe & Kudo apud Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 52. 1940. Eriocaulon kusiroense Miyabe & Kudo apud Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947.

Bibliography: Kudo, Jap. Journ. Bot. 2: 248. 1925; Satake, Journ. Jap. Bot. 15: 629—630. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, 13, 62—63, 81, [86], & 87, fig. 1 (C), 2 (E), & 29. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 52—53, fig. 16. 1940; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Résumé 173, 286, & 481. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 185 & 429. 1964; Moldenke, Phytologia 18: 78, 107, & 108. 1969.

Illustrations: Satake in Nakai & Honda, Nov. Pl. Jap. 6: 6, 7, & 63, fig. 1 (C), 2 (E), & 29. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] fig. 16. 1940.

The type of this species was collected by M. Nakamura (no. 52) at Syakubetu, in the province of Kusiro, Hokkaido, Japan, in August, 1886, and is deposited in the herbarium of the Imperial University of Hokkaido.

Satake refers to this species as endemic to the provinces of Hidaka, Iburi, Kusiro, Nemuro, and Tokachi, on the island of Hokkaido [which he calls "Yezo"], and comments that it "Closely resembles Eriocaulon sachalinense, but the sepals of the flowers are slightly 2—3-lobed, and the capitulum has many flowers. This species may lie between E. atrum and E. sachalinense."

The E. atrum Nakai, referred to above, is a valid species, while the homonym ascribed to Masamune is a synonym of E. hananogense Masamune.

ERIOCAULON KWANTUNGENSE Ruhl.

Synonymy: Eriocaulon kwantungense Ruhl. apud A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933.

Bibliography: Ruhl., Notizbl. Bot. Gart. Berlin 10: 1042 & 1060. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Moldenke, Known Geogr. Distrib. Erioc. 25 & 36. 1946; Moldenke, Résumé 170 & 481. 1959; Moldenke, Résumé Suppl. 1: 17. 1959.

I see no justification for Hill's "correction" of the spelling of the specific epithet of this taxon. The "accepted" spelling of geographic names often varies with the nationality of the writer and often with the current political situation, witness, e.g., "Pensylvania" vs. "Pennsylvania", "Porto Rico" vs. "Puerto

Rico", "Honshu" vs. "Honshiu", "Liukiu" vs. "Ryukyo", "Geneva" vs. "Genf", "Bruxelles" vs. "Brussels", "Belge" vs. "Belgique", etc.

ERIOCAULON LACUSTRE Ruhl.

Bibliography: Ruhl. in Fedde, Repert. Spec. Nov. 22: 33. 1925; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Moldenke, N. Am. Fl. 19 (1): 19 & 34. 1937; Moldenke, Phytologia 1: 318. 1939; León, Fl. Cuba 1: 281. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4 & 36. 1946; Moldenke, Phytologia 3: 328—329. 1950; Moldenke, Résumé 51 & 481. 1959.

Additional citations: CUBA: Pinar del Río: Ekman 17877 (N—photo of type, S—type, Z—photo of type); León 17002 (Um—936).

ERIOCAULON LANATUM H. Hess

Bibliography: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 137—139, pl. 8, fig. 1, 2, & 4. 1955; G. Taylor, Ind. Kew. Suppl. 12: 55. 1959; Moldenke, Résumé 447 & 481. 1959.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: pl. 8, fig. 1, 2, & 4. 1955.

This species is based on H. Hess 52/2108 from Baixo Cubango, at an altitude of 1230 meters, 5 km. east of Rio Cueba and 30 km. north of Caiundo in the region of Mission Capico on the Rio Ceuvi, Bié, Angola, collected on February 5, 1952. The species is sometimes infested by the fungus, Tolyposporium hessii E. Müller.

Hess (1955) comments that "Eriocaulon lanatum wächst auf sandig-moorigen Boden, der während der Regenzeit überschwemmt ist. So fanden wir die Art an Altläufen des Rio Quiriri und am kleinen Bach Cuevo. Als Begleiter wurden gesammelt: Mesanthemum radicans Körn., Syngonanthus angolensis H. Hess, verschiedene Utricularien, eine Genlisea und Buchnera-Arten.... Das ganze Material ist einheitlich. Unterschiede in der Höhe der Halme und in der Länge der Blätter sind standortsbedingt." For its distribution he says "Provinz Bié: an den Seitenflüssen des Rio Cubango, im unteren Teil dieses Stromgebietes. Die Fundstellen am Rio Cuevo und am Rio Quiriri sind in der Luftlinie gemessen etwa 150 km voneinander entfernt."

He also says "Eriocaulon lanatum steht E. pictum Fritsch nahe; E. lanatum ist jedoch an den behaarten Halmen sofort von E. pictum zu unterscheiden. Nach unserem 7 Bogen umfassenden Material zu schlieszen, sind die roten Blätter eine weitere Eigentümlichkeit von E. lanatum. Auch fehlt bei E. lanatum das Rhizom. Die Blütenköpfe sind bei der neuen Art durchwegs kleiner als bei E. pictum. Die einzelnen Blütenteile von E. lanatum sind nur etwa halb so gross wie jene von E. pictum; die Petalen der ♀ Blüten sind ausserseits kahl, bei E. pictum hingegen sind sie beiderseits behaart. Sonst finden sich in den Blüten keine sicheren Unterscheidungsmerkmale. Mit Eriocaulon Teusczii Engl. et Ruhl. und E. matopense Rendle braucht die neue Art trotz habitueller Ähnlichkeiten nicht verglichen zu werden, da jene Arten freie Sepalen

haben."

ERIOCAULON LANCEOLATUM Miq.

Synonymy: Eriocaulon metzianum Miq. ex C. Muell. in Walp., Ann. 6: 1171. 1861. Eriocaulon metzianum C. Muell. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878, in syn. 1893. Eriocaulon metzianum O. Muell. ex Moldenke, Résumé 290, sphalm. in syn. 1959.

Bibliography: Walp., Ann. 5: 942 (1858) and 6: 1171. 1861; Steud., Syn. Pl. Glum. 2 (Cyp.): 271. 1855; Hook. f., Fl. Brit. Ind. 6: 577. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 78, & 286. 1903; Fyson, Journ. Indian Bot. 2: 266, pl. 23. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1610 & 1619. 1931; Moldenke, Known Geogr. Distrib. Erioc. 23, 36, & 37. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 205. 1949; Moldenke, Phytologia 3: 329. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1122, 1127, & 1333. 1956; Moldenke, Résumé 162, 290, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Moldenke, Résumé Suppl. 3: 17. 1962.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 23. 1921.

Both E. lanceolatum and the synonymous E. metzianum seem to be based on a Metz collection [probably Pl. Metz. Exsicc. 131] from Mangalore, Canara, in what is now called the state of Kerala, India, although most of the specimens of this collection are accompanied by a label which is generally interpreted as and cited as Hohenacker 131 from Mangalore.

Fyson (1921) describes the plant as follows: "Scapes slender 5--6 in. hairy. Leaves 2 1/2 cm. by 1/4 in. at the widest, acute, nearly or quite glabrous. Heads 1/4 in., white. Floral bracts short, darkish, obcuneate, but overtopped by the female sepals which are longer and visible beyond them. Female petals shorter or longer than the sepals, oblanceolate, often or always unequal in length. Seeds dark brown, oval....Western Peninsular on the Malabar Coast. Remarkable for the glabrous conspicuous sepals." It is said by Hohenacker to flower in the rainy season. The initial letter of the specific epithet of the three synonymous names is, of course, often uppercased.

Additional citations: INDIA: Kerala: Hohenacker 131 [Pl. Metz. Exsicc. 131] (Mi--cotype, S--cotype, S--cotype, Ut--309-cotype); Metz s.n. [Mangalore] (B--cotype, B--cotype, Z--cotype); Stocks, Law, etc. s.n. [Malabar, Concan] (S).

ERIOCAULON LANCEOLATUM var. PILOSUM Moldenke

Bibliography: Moldenke, Phytologia 3: 164 (1949) and 3: 329. 1950; Moldenke, Résumé 162 & 481. 1959.

ERIOCAULON LANIGERUM H. Lecomte

Bibliography: H. Lecomte, Journ. de Bot. 21: 109. 1908; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, Known Geogr. Distrib. Erioc. 26 & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 205. 1949; Moldenke, Résumé 176 & 481. 1959.

ERIOCAULON LAOSENSE Moldenke

Bibliography: Moldenke, Phytologia 3: 309 & 329. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 176 & 481. 1959.

Material of this species has been misidentified and distributed in herbaria as E. quinquangulare L.

Additional citations: INDOCHINA: Laos: D. I. Jeffrey 5096 (Ca-343655).

ERIOCAULON LASIOLEPIS Ruhl.

Synonymy: Lasiolepis brevifolia Boeck., Flora 56: 90. 1873.

Lasiolepis brevicola Boeck. ex Moldenke, Résumé 309, in syn. 1959.

Bibliography: Boeck., Flora 56: 90. 1873; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 35. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 86, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 35. 1946; Moldenke, Known Geogr. Distrib. Erioc. 26, 36, & 42. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 139 & 205. 1949; Moldenke, Résumé 180, 309, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 35. 1960.

The initial letter of the specific epithet of this taxon is often uppercased.

ERIOCAULON LATIFOLIUM J. Sm.

Synonymy: Eriocaulon rivulare G. Don ex Benth. in Hook., Niger Fl. 547. 1849 [not E. rivulare Dalz., 1851]. Eriocaulon banani H. Lecomte, Bull. Soc. Bot. France 45: 645. 1909. Mesanthemum radicans Stapf ex Moldenke, Résumé 320, in syn. 1959 [not M. radicans (Benth.) Körn., 1856]. Mesanthemum latifolium J. Sm. ex Moldenke, Résumé Suppl. 7: 8, in syn. 1963.

Bibliography: J. E. Sm., Cycl. 13. 1809; Benth. in Hook., Niger Fl. 547. 1849; Dalz. in Hook., Kew Journ. 3: 280. 1851; Walp., Ann. 5: 940 (1858) and 6: 1171. 1861; Britten, Journ. Bot. 38: 482. 1900; Thiselt.-Dyer, Fl. Trop. Afr. 8: 243. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 78, 286, & 287. 1903; H. Lecomte, Bull. Soc. Bot. France 45: 645. 1909; A. Chev., Sudania 1: 11. 1911; H. Lecomte, Not. Syst. 2: 215, 216, & 393. 1913; Fyson, Journ. Indian Bot. 3: 14. 1922; Hutchinson & Dalz., Fl. W. Trop. Afr. 2: 326. 1936; Dinklage in Fedde, Repert. Spec. Nov. 41: 243. 1937; Moldenke, Known Geogr. Distrib. Erioc. 20, 21, 32, 36, 39, 41, 44, & 62. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 111, 112, & 205. 1949; Moldenke, Phytologia 3: 329.

1950; Meikle & Baldwin, *Am. Journ. Bot.* 39: 45. 1952; E. J. Salisb., *Ind. Kew. Suppl.* 11: 88. 1953; Moldenke, *Résumé* 133, 136, 137, 286, 291, 320, & 481. 1959; Moldenke, *Résumé Suppl.* 4: 6 (1962), 7: 8 (1963), and 17: 4. 1968; Moldenke, *Phytologia* 17: 387 (1968), 17: 482, 497, & 498 (1969), and 18: 79 & 169. 1969.

This plant has been found growing in acid water, rather rapid current, with only the inflorescences above water, in streams, on submerged prairies, and in swift streams, flowering and fruiting from November to January. Meikle & Baldwin (1952) assert that it is "Widespread along the West Coast [of Africa] from Senegal to Angola", citing Baldwin 10091, 10382, & 10946 and Whyte s.n. [April 1904] from Liberia. The common name "orro" is recorded for the plant.

The E. rivulare Dalz., referred to in the synonymy above, is a synonym of E. dalzellii Körn.; E. latifolium Arech. is now more correctly known as E. arechavaletae Herter, while E. latifolium Bong. is a synonym of Paepalanthus serralapensis Moldenke.

Eriocaulon vittifolium H. Lecomte is sometimes regarded as conspecific with E. latifolium, but is probably distinct. Chevalier (1911) cites A. Chevalier 524.

Additional citations: MALI: Soudan: Raynal & Raynal 5449 (Z, Z-drawing). REPUBLIC OF GUINEA: Landale-Brown 2638 (S); Pitot s.n. [8.V.1949] (An). LIBERIA: J. T. Baldwin Jr. 10382 (N), 10946 (N). CONGO LEOPOLDVILLE: Malaise 6017 (Ac, Rf).

ERIOCAULON LATIFOLIUM f. PROLIFERUM Moldenke

Bibliography: Moldenke, *Résumé Suppl.* 4: 6. 1962; Moldenke, *Phytologia* 8: 387-388. 1962; Moldenke, *Biol. Abstr.* 42: 1517. 1963; Hocking, *Excerpt. Bot. A.6:* 455. 1963; Anon., *Assoc. Stud. Tax. Fl. Afr. Trop. Index* 1962: 29. 1963.

Material of this taxon has been misidentified and distributed in herbaria under the name E. zambeziense Ruhl.

Citations: SÉNÉGAL: Herb. Inst. Fr. Afr. Noire 10358 (An-type).

ERIOCAULON LAXIFOLIUM Körn.

Synonymy: Paepalanthus laxifolium Mart. ex Körn. in Mart., *Fl. Bras.* 3 (1): 494, in syn. 1863.

Bibliography: Körn., *Linnaea* 27: 60. 1854; Walp., *Ann.* 5: 931 (1858) and 6: 1171. 1861; Körn. in Mart., *Fl. Bras.* 3 (1): 494. 1863; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 878. 1893; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 43, 57, & 286. 1903; Alv. Silv., *Fl. Mont.* 1: 20 & 398. 1928; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 878. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 8 & 36. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77 & 205. 1949; Moldenke, *Résumé* 89 & 481. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 878. 1960; Moldenke, *Résumé Suppl.* 12: 9 (1965) and 17: 11. 1968.

Silveira (1928) cites A. Silveira 710 as representing this taxon, but as yet I have not seen material of this collection.

Citations: BRAZIL: Minas Gerais: Martius 1499 [Macbride photos 18687] (N--photo of type, W--photo of type). State undetermined: Glaziou 22308 (Br, N). MOUNTED ILLUSTRATIONS: drawings & notes by Körnigke (B); drawings & clipping from Pflanzenreich (B).

ERIOCAULON LEPIDUM Koyama

Bibliography: Koyama, Philip. Journ. Sci. 84: 371--372 & 377, pl. 3. 1956; Moldenke, Résumé 178 & 481. 1959; G. Taylor, Ind. Kew. Suppl. 13: 52. 1966.

Illustrations: Koyama, Philip. Journ. Sci. 84: 377, pl. 3. 1956.

The type of this species was collected by Bunzō Hayata at Doi Step, Thailand, on October 3, 1921, and is deposited in the herbarium of Tokyo University. The original publication is dated "1955", but the pages in question were not actually issued until 1956.

ERIOCAULON LEPTOPHYLLUM Kunth

Synonymy: Eriocaulon argentinum Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 81, 83, 84, & [103], pl. 18, fig. B. 1945. Eriocaulon leptophyllum Kunth ex Angely, Fl. Paran. 10: 14, sphalm. 1957. Paepalanthus sp. Niederlein apud Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 83, in syn. 1945. Syngonanthus gracilis Molino apud Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 83, in syn. 1945 [not S. gracilis (Bong.) Ruhl., 1965, nor Körn., 1965, nor (Körn.) Ruhl., 1903, nor (Kunth) Ruhl., 1959, nor Ruhl., 1908].

Additional & emended bibliography: Walp., Ann. 5: 931 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 476 & 494. 1863; Niederlein, Bol. Mus. Prod. Argent. 3 (31): 336. 1890; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 57, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 175. 1908; Molino, Physis 6: 363. 1923; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 81, 83, 84, & [103], pl. 18, fig. B. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Known Geogr. Distrib. Erioc. 8 & 36. 1946; Abbiati, Rev. Mus. La Plata Bot., new ser., 6: 312, 314, 318, 319, 321, 326--329, 339, & 340, fig. 4 (A--C) & 5, & pl. 2 (2). 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77, 103, & 205. 1949; Moldenke, Phytologia 3: 329. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Herter, Rev. Sudam. Bot. 9: 188. 1954; Angely, Fl. Paran. 10: 14. 1957; Moldenke, Résumé 89, 119, 123, 285, 329, 428, & 481. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Angely, Fl. Paran. 16: 51 (1960) and 17: 24. 1961; Moldenke, Résumé Suppl. 3: 32. 1962; Angely, Fl. Anal. Paran., ed. 1, 199. 1965.

Illustrations: Castell. in Descole, Gen. & Sp. Pl. Argent. 3: pl. 18, fig. B. 1945; Abbiati, Rev. Mus. La Plata Bot., new ser., 6: 327 & 328, fig. 4 (A--C) & 5, & pl. 2 (2). 1946.

The original description of this species by Kunth (1841) is as

follows: "Acaule; foliis angustissime linearibus, superne subulato-angustatis, fenestrato-5-nerviis, pellucidis, pedunculis vaginisque glabris; his folio brevioribus; illis sulcatis; bracteis involucrentibus obtusis, flores stipantibus acuminatis; floribus dioecis?; femineis trigynis: sepalis apice pilosis. -- *Brasilia meridionalis*. (Sellow.) -- Folia 2-3 1/4 pollicaris, dimidiam lineam lata. Pedunculi subquinquepollicares. Vaginae laxae, membranaceae, acutae, apice fissae, 1 1/4 - 1 1/2 pollicares. Capitula subglobosa, magnitudine grani piperis minores; suppetentia mere feminea. Bracteae involucrentes subellipticae, obtusae, pallide fusciscentes, glabrae, capitulo multo breviores; bracteae flores stipantes cuneato-spathulatae, acuminatae, pallide fusciscentes, ciliatae. Flores feminei pedicellati: Sepala 3 exteriora obovata, obtusiuscula, navicularia, subgrisea, apice pilosa, subaequalia; 3 interiora ab exterioribus valde remota, ideo ea parum superantia, subspathulata, obtusa, albida, apice ciliata, interne sub apice glandula minuta nigra notata, parum inaequalia. Ovarium brevissime stipitatum, ellipticum, tricoccum. Stylus longiusculus. Stigmate 3, filiformia, simplicia. Pili bractearum et calycum crassiusculi, obtusiusculi, opaci, nivei."

The type of the species appears to be Sellow 2513, labeled "*Brasilia meridionali*" and deposited in the herbarium of the Botanisches Museum at Berlin, cited by Ruhland (1903) as having been collected in Rio Grande do Sul. A second sheet of the same number, however, in the same herbarium, is labeled "Montevideo".

Herter (1954) says for the species: "Patria: Sudamérica cálida. Uruguay: A buscar." The initial letter of the specific epithet is sometimes uppercased for no valid reason. Abbiati (1946) cites and illustrates Niederlein 2257, which is the type collection of *E. argentinum* Castell., from Corrientes, Argentina. The Niederlein (1890) reference given in the bibliography above is sometimes cited as "31: 68. 1890". The *Syngonanthus gracilis* homonyms referred to above are all various mis-accreditations for the valid species, *S. gracilis* (Körn.) Ruhl. The Pedersen 3653, distributed as *E. leptophyllum*, is actually *E. modestum* Kunth.

Additional citations: BRAZIL: Paraná: Reitz & Klein 17618 (Z). Rio Grande do Sul: Sellow 2513 (B-type, B-isotype). URUGUAY: Sellow s.n. [Montevideo] (Br, N-photo, N-photo). ARGENTINA: Corrientes: Pedersen 1192 (N, Ut-25715, W-2122707). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B); Descole, Gen. & Sp. Pl. Argent. 3: pl. 18, fig. B (N, Z).

ERIOCAULON LEUCOGENES Ridl.

Bibliography: H. N. Ridl., Trans. Linn. Soc. Lond. Bot., ser. 2, 9: 240. 1916; Rendle in Gibbs, Contrib. Phytogeogr. & Fl. Arfak Mts. 100. 1917; A. W. Hill, Ind. Kew. Suppl. 6: 78. 1926; Moldenke, Known Geogr. Distrib. Erioc. 27 & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 149 & 205. 1949; Moldenke, Résumé 201 & 481. 1959; Moldenke, Résumé Suppl. 3: 24. 1962.

Ridley's original description (1916) of this plant states that its scapes are "11 mm." long. Meikle, in a letter to me dated December 22, 1951, has confirmed my suspicion that this statement should read "11 cm." This is another example of the unfortunate situations that can so easily arise when the metric system of measurement is used. Meikle also states that the ovaries of the type collection's florets are 3-celled, not 2-celled as stated by Ridley.

The plant has been found growing in wet open places, in damp meadows, in peaty swamps, and in seepage areas along small creeks, at altitudes of 1600 to 2830 meters, flowering and fruiting in April, June, August, and December. Hoogland & Pullen found it "in very wet muddy patch on gentle mountain slope" and "fairly common in open patches on wet peat". Common name recorded for it are "abundink", "jampi", "masul", "mirmeh", "poio", and "yogos". Gibbs (1917) avers that it is "common on marsh by ♀ lake [whatever that means!], where open and sandy" in the Arfak Mountains. She also says "Flower heads mauve" and "The plants show a great range in size from 6 cm. to 20 cm., the heads varying in diameter from .5 to 1 cm." She cites Gibbs 5567. Rendle comments in this connection that "A species of Eriocaulon was also collected by Miss Gibbs on Mt. Kinabalu at 12,000' (no. 4209) by Kadamaian torrent, on the granite core near the summit of the mountain; it was mixed with Centrolepis kinabaluensis Gibbs (no. 4209).....It is a caespitose plant, forming small cushions 2.5 cm. high, with glabrous leaves 2—2.5 cm. long, ±1 mm. wide in the middle, linear-tapering from a broad membranous base. The specimens are all sterile. No Eriocaulon has hitherto been recorded from the granite core of the mountain." It seems possible to me that the plant here being referred to is E. brevipedunculatum var. angustifolium Moldenke, with which it should certainly be compared.

Citations: INDONESIA: GREATER SUNDA ISLANDS: Celebes: Kjellberg 1580 (S), 2174 (S). MELANESIA: NEW GUINEA: Dutch New Guinea: D. Bergman 586 (S); Hoogland & Schodde 6765 (W—2393176), 6804 (W—2393189), 7474 (W—2393780). Northeastern New Guinea: M. S. Clemens 5299 (B, N), 6321 (N), 9379 (B, N); Hoogland & Pullen 5397 (W—2314903), 6009 (W—2315182).

ERIOCAULON LEUCOMELAS Steud.

Synonymy: Eriocaulon melaleucum Mart. in Wall., Plant. As. Rar. 3: 29. 1832 [not E. melaleucum Bong., 1831]. Eriocaulon nigrescens D. Dietr., Syn. Pl. 5: 265. 1852. Eriocaulon geoffreyi Fyson, Kew Bull. Misc. Inf. 1914: 330. 1914. Eriocaulon horsley-kundae var. megalocephala Fyson, Journ. Indian Bot. 3: 14, pl. 44. 1922. Eriocaulon horsleykondae var. megalocephala Fyson apud C. E. C. Fischer, Kew Bull. Misc. Inf. 1931: 261. 1931. Eriocaulon horsley-kondae var. megalocephala Fyson apud C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1121—1122, 1127, & 1333. 1956. Eriocaulon horsleykondae var. megaloceph-

ala Fyson ex Moldenke, Résumé Suppl. 14: 8, in syn. 1966.

Bibliography: Mart. in Wall., Plant. As. Rar. 3: 29. 1832; Wall., Numer. List 208 ["207"]. 1832; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 568. 1841; D. Dietr., Syn. Pl. 5: 265. 1852; Körn., Linnaea 27: 647—649 & 797. 1856; Walp., Ann. 5: 940 (1858) and 6: 1171. 1891; Hook. f., Fl. Brit. Ind. 6: 574—575. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 & 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 72, & 286. 1903; Fyson, Kew Bull. Misc. Inf. 1914: 330. 1914; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Fyson, Journ. Indian Bot. 2: 196 (1921) and 3: 14, 17, & 18, pl. 44. 1922; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1608—1609 & 1619. 1931; C. E. C. Fischer, Kew Bull. Misc. Inf. 1931: 261. 1931; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 & 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23, 24, & 35—37. 1946; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126, 129, & 205. 1949; Razi, Journ. Mysore Univ. 11 (1): 6 & 16. 1950; Moldenke, Phytologia 3: 329. 1950; Razi, Journ. Mysore Univ. B. 14 (10): 460. 1955; Razi, Contrib. Bot. 40: 92. 1955; Razi, Proc. Nat. Inst. Sci. India 21 B (2): 84. 1955; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1121—1122, 1127, & 1333. 1956; Moldenke, Résumé 162, 165, 288—290, & 481. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 & 879. 1960; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Panigrahi, Chowdhury, Raju, & Deka, Bull. Bot. Surv. India 6: 260. 1964; Thanikaimoni, Pollen & Spores 7: 184—185. 1965; Moldenke, Résumé Suppl. 14: 8 (1966), 15: 8 (1967), and 16: 9. 1968; Moldenke, Phytologia 18: 169, 173, & 174. 1969.

Illustrations: Fyson, Journ. Indian Bot. 3: pl. 44. 1922.

Because of the various interpretations that have been given this taxon by botanists in the past, it may be worthwhile to repeat Kunth's description (1841) here: "E. Melaleucum *) [*] Eriocaulon melaleucum Bong. est Paepalanthi species.] Mart. in Wall. Plant. rar. 3. 29. Rhizomate annuo; scapo (3—4-pollicari) striato, folia angusto-linearia acuta fenestrata vaginasque transverse truncatas duplo superante; capitulis globosis; bracteis oblongis, nigricantibus; perianthis nigricantibus, superne pilis eburneis barbatis. Mart. E. quinquangulare Heyne herb. — Coromandelia. — Huic affine E. septangulare, quod foliis latioribus et scapis longioribus praesertim distinguitur. (Mart.) Folia radicalia rosulata, pollicem longa, vix lineam lata, tenera, subtiliter fenestrata. Vagina teres, ore nonnihil ampliata et scarioso-membranaceo truncata, foliis paulo brevior. Scapus e quavis rosula foliorum solitarius, 3—5-pollicaris, ut tota planta, exceptis calycibus, glaber. Bracteae oblongae, linea paulo longiores, nigricantes, margine passim inciso-lacerae, tenerae, ut calyces nigricantes. Mas: Calyx exterior: Sepala oblonga, acuta; interior angustotubaeformis: laciniis triangularibus. Cilia eburnea, opaca, niten- tia. Stamina 6: longiora laciniis opposita. Antherae subglobosae, flavescens, tandem nigricantes. Femina: Calyx exterior ut in mare; interior: Sepala oblanceolata, albida, ciliata. Ovarium ob-

longum. Stylus tripartitus. Semina elliptica, nitida, lutescenti-fuscidula, pilis seriatis. (Ex Mart.)"

Fyson (1921) describes his E. geoffreyi as follows: "Stem 0. Leaves 1/2 — 2 in., flat tapering to the acute apex. Scapes solitary, in the type, or several, three or four times as long as the leaves. Heads gray; involucre black. Receptacle glabrous. Flowers regular, 3-merous. Petals unusually broad, the female spatulate with large glands. Fig. opp. Peninsular India; on the Pulneys at 7000 ft. The type plant was collected at 7500 feet on the Pulneys and is remarkable for the solitary scape rising from a rosette of stiff short leaves. It occurs all over the downs, not in particularly damp spots, and flowers in the autumn. What appears to be a dimerous variety of this species is on a sheet in Herb. Calc., dated July 5th, 1865 collected at 'North Hastings'."

It should be noted here that the E. melaleucum Bong., referred to in the synonymy above, is a synonym of Paepalanthus melaleucus (Bong.) Kunth. Martius (1832), Wallich (1832), Kunth (1841), Körnicke (1856), and Hooker (1893) all regard E. quinquangulare Heyne as a synonym of E. leucomelas, but I have placed it in the synonymy of E. cristatum Mart.

As an example of how various botanical workers have differed in their interpretation of taxa in this group, Meebold 9735 was originally distributed as E. cristatum Mart.; then Fyson re-determined it as E. horsley-kundae Fyson; then it was re-determined as E. ritchieanum Ruhl.; and finally it was placed in E. leucomelas Steud.

The species has been found growing at altitudes of 4769 to 7500 feet, flowering in February, April to June, and November. Panigrahi and his associates (1964) record it as "occasional in sandy rocky beds of rivers" in Orissa; this is the first record of the species from Bihar & Orissa.

Material has been misidentified and distributed in herbaria under the names E. benthami Kunth, E. collinum Hook. f., E. mariae Fyson, E. modestum Kunth, E. nepalense Prescott, E. oliveri Fyson, E. ritchieanum Ruhl., E. smithii R. Br., E. sollyanum Royle, and E. trilobum Ham. The B. Schmid 827, cited below, is a mixture with E. sollyanum Royle, while Bembower 30 is a mixture with something non-eriocaulaceous.

In a letter to me from Dr. A. R. Kulkarni, dated December 24, 1968, he says "During my recent excursions in Western Ghats I have collected a species of Eriocaulon with tuberiferous habit. The stem in this species is condensed into a short disc bearing rosette of leaves and a few scapes above and numerous septate roots below. Tuber primordia originate as axillary buds. Each primordium grows vertically up to 5 mms to form a small stout axillary branch. Its tip then branches dichotomously into 2--4 branches, which turn down, pierce through the subtending or adjacent leaf base and enter into the soil where their tips swell to form tubers. Mature

tubers have an average size of 4 x 2.5 mms. Their surface is covered with dense growth of unicellular hairs. One or two sprouting eyes are often found on the tuber. Tubers are full of simple circular starch grains. The species has anesopetalous male flowers. Anthers are white when young but become blackish at maturity. Heads and involucral bracts are glabrous. Floral bracts are densely tufted with white hairs. Referring to the Indian floras, Fyson's and Ruhland's work, I have placed it tentatively in E. melaleucum Mart., though tuberiferous habit has not been recorded for E. melaleucum."

Additional citations: INDIA: Madras: Bembower 28 (Mi), 29 (Mi), 30, in part (Mi), 31 (Mi), 32 (Mi), 36 (N), 431 (Z), 432 (Ca—495798); Perrottet 1166 (B); Saulière 71 (Ca—262279, N); B. Schmid 823 (B), 825 (B), 826 (B), 827, in part (B). Mysore: Begum 5 (Mf); Meebold 9735 (Z); Nusrath 39 (Bn—3251). State undetermined: Wight 2856 (B). MOUNTED ILLUSTRATIONS: drawings & notes by Körn-icke (B).

ERIOCAULON LIGULATUM (Vell.) L. B. Sm.

Synonymy: Dupatya ligulata Vell., Fl. Flum. 36 (1825) and Icon. 1: pl. 86. 1827. Eriocaulon vaginatum Körn., Linnaea 27: 599, nom. nud. (1856); Mart., Fl. Bras. 3 (1): 482—484. 1863.

Bibliography: Vell., Fl. Flum. 36 (1825) and Icon. 1: pl. 86. 1827; Körn., Linnaea 27: 599. 1856; Walp., Ann. 5: 930 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 482—484. 1863; Vell., Arch. Mus. Nac. Rio Jan. 5: 37. 1881; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 804 & 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 41, 45, 46, & 288. 1903; L. B. Sm., Contrib. Gray Herb., new ser., 124: 5. 1939; Moldenke, Known Geogr. Distrib. Erioc. 8, 30, & 41. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 804 & 879. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Phytologia 3: 470. 1951; Rambo, Sellowia 7: 283. 1956; Angely, Fl. Paran. 10: 14. 1957; Moldenke, Résumé 89, 281, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 804 & 879. 1960; Rennó, Levant. Herb. Inst. Agron. 69. 1960; Angely, Fl. Paran. 17: 24. 1961; Angely, Fl. Anal. Paran., ed. 1, 199. 1965; Moldenke, Résumé Suppl. 17: 3, 9, & 11. 1968; Moldenke, Phytologia 18: 87. 1969.

Illustrations: Vell., Fl. Flum. Icon. 1: pl. 86. 1827.

There is considerable doubt as to the status of this taxon and as to its synonymy. Körnicke (1863), Jackson (1893), and Smith (1939) all consider Dupatya ligulata Vell. to be conspecific with Eriocaulon kunthii Körn. Kunth (1841) and Ruhland (1903), however, consider it to be conspecific (with a question) with E. vaginatum Körn. The only differences which Ruhland gives to separate these two species are as follows: in E. kunthii the receptacle is pilose, the sepals of the staminate florets are free and subacute, and the sepals of the pistillate florets are sub-

ovate, two subacute at the apex and the third obtuse. In E. vaginatum the receptacle is glabrous, the sepals of the staminate florets are connate at the base and obtuse at the apex, and the sepals of the pistillate florets are oblong-spatulate, all obtuse at the apex. As Dr. Smith points out, in a letter to me dated January 9, 1969, the female sepals in Velloso's illustration seem "nearer ovate than oblong-spatulate", but, of course, Velloso's drawings are notoriously poor. It may well be that the material cited by me under E. kunthii and here under E. ligulatum is all conspecific. E. kunthii seems to be based on Sellow B.1290 C.263 (probably a combination of two collections) from Minas Gerais, while E. vaginatum is based on Regnell II.291 & III.291, also from Minas Gerais, and Sellow 99, whose locality of collection has not been accurately determined as yet. All this historic material should be re-examined very carefully to note the critical differences, if any, and all cited material under both taxa should then also be re-examined.

The so-called E. ligulatum Bong. is merely a misspelling of the name, E. lingulatum Bong., and belongs in the synonymy of Paepalanthus lingulatus (Bong.) Kunth.

Material of E. ligulatum has been found growing in swamps, at 900 meters altitude, flowering and fruiting in September and October. Material has been misidentified and distributed in herbaria as E. magnificum Ruhl. On the other hand, the Fridrichs s.n. [Rambo 30670], distributed as E. vaginatum and so cited by me in my 1951 work, is actually now cited by me under E. kunthii Körn.

Additional citations: BRAZIL: Minas Gerais: Mello Barreto 2530 [Herb. Jard. Bot. Belo Horiz. 8277; Herb. U. S. Nat. Arb. 236392] (W-2109991); Mosén 767 (S, S, S); Regnell II.291 [10/1846] (Ut-334), II.291 [2/9/1861; Macbride photos 10567] (B, Br, N, N, N-photo, S, S, W-photo), III.291 [10/1846] (W-200755); Widgren I.2 (S), s.n. [1845] (S, S, S, S, S, W-937195). Paraná: Dombrowski & Saito 351/157 (Ac), 352/158 (Ac), 416/235 (Ac); H. M. Filho 38 [Herb. Mus. Paran. 5324; Herb. Curso Farmac. 671] (S); Hatschbach 2868 (N), 8093 (Ca), 8311 (Ca); Jönsson 933a (N, S, W-1470451); Moure s.n. [R-19, No. 1; 24-9-52] (Z). Rio Grande do Sul: O. Camargo 62435 (S); Sehnem 2941 (B). São Paulo: Burchell 4916 (Br); Campos Novaes 1150 (W-389981); Hemmendorff 145 (S). State undetermined: Sellow 99 (B). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

ERIOCAULON LINEARE Small

Synonymy: Eriocaulon lineræ Sm. ex Moldenke, Résumé Suppl. 4: 11, in syn. 1962.

Additional bibliography: J. K. Small, Fl. Southeast. U. S., ed. 1, 236 & 1328. 1903; R. M. Harper, Ann. N. Y. Acad. Sci. 17: 267. 1906; Prain, Ind. Kew. Suppl. 3: 69. 1908; J. K. Small, Fl. South-

east. U. S., ed. 2, 236. 1913; J. K. Small, Man. Southeast. Fl. 257 & 258. 1933; Moldenke, N. Am. Fl. 19 (1): 18 & 23. 1937; Moldenke, Phytologia 1: 318—319. 1939; Moldenke, Known Geogr. Distrib. Erioc. 2, 3, & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 7—9, 11, & 205. 1949; Moldenke, Phytologia 3: 329—330. 1950; Moldenke, Résumé 10—12, 14, & 481. 1959; Moldenke, Résumé Suppl. 2: 2 (1960), 3: 3 (1962), and 4: 11. 1962; Radford, Ahles, & Bell, Guide Vasc. Fl. Carol. 106 & 107. 1964; Kral, Sida 2: 301, 302, 306, 307, 309, & 330. 1966; Moldenke, Résumé Suppl. 15: [1] (1967), 16: [1] (1968), and 17: [1]. 1968; Moldenke, Phytologia 17: 490. 1969.

Illustrations: J. K. Small, Man. Southeast. Fl. 258. 1933; Kral, Sida 2: 306. 1966.

This species has been collected in moist pinebarrens, Sarracenia sledgei bogs, in shallow water and wet margins of small sandy ponds, in somewhat wet soil with pitcherplants, in moist damp bog areas with orchids, mints, and milkweeds, and in boggy areas with orchids, pitcherplants, and sensitive-briers. Collectors sometimes report the plant bases submerged or they report the "plants practically or wholly submerged on lake shores". Harper found it growing "on Eocene overlaid by Lafayette formation in moist pinebarrens" in Georgia. Kral, collecting in Florida, found it abundant on sandy fluctuating shores of lakes, on wet sandy peat at the margins of sinkhole ponds in pinewoods, in sandy peat-muck or wet slash pine - saw palmetto flatwoods ditches, and abundant in wet sandy peat of lake edges. On Kral 17748 he notes "the tall specimens submersed save for upper portion of stem, short specimens on moist sandy shores, with perfect gradation of habitat between, the submersed ones tend to be stoloniferous." His reference to the upper portion of the "stem" here must certainly refer to the scapes instead. The heads are described as "white" and the only common name specifically recorded for the species is "hatpin". It has been collected in flower from April to September and in fruit from July to September.

Radford, Ahles, & Bell (1964) record it as growing "in bogs, savannas, pools, very rare, Henderson Co., N. C. April—July". Harper (1906) records it from Berrien, Bulloch, Coffee, Irwin, Montgomery, Sumter, Tattnall, and Wilcox Counties, Georgia.

Kral (1966), in his discussion of E. compressum Lam., notes "It is the closest in appearance to a shorter plant, E. lineare, which also has soft, white, usually hemispherical heads, but differs from that species in having larger, often unisexual (rather than bisexual) heads, the receptacular surfaces of which have at least sparse hairs (those of E. lineare are smooth). Also the surface of the seed of E. compressum is smoothish while that of the seed of E. lineare is indistinctly cancellate, sometimes papillate."

The same author, after giving a splendid and very detailed description of E. lineare, comments as follows: "Sandy or peaty lakeshores, margins of pineland ponds, ditches, and savannas, coastal plain, Florida north to North Carolina, west to Alabama.

Type. Eocene geologic formation overlain by Lafayette and Columbia, Bullock County, Georgia, R. M. Harper 830. At NY. This species is locally abundant, being commonest in the limesink country of northern Florida, where in midsummer its white 'buttons' ring the sandy sinkhole lakes and ponds. Length and breadth of leaf and scape vary drastically within the species, this directly related to degree or extent of submersion. Thus, a perfect continuum of habit may be found if one would run a cross contour line through a population. Those furthest from the shore would be the shortest leaved and have the shortest, narrowest scapes, while submersed forms have extremely elongated, spongy, leaves and scapes. Difficulties in identification of E. lineare stem from partial samples from such populations, the larger specimens having some resemblance to E. compressum. Curiously, E. lineare most closely resembles E. septangulare, whose range it may contact to the north and northwest, and E. texense, whose range it does contact to the west. A detailed examination of the Eriocaulons comprising this complex may well result in a far more conservative treatment of them than now exists. E. lineare is the only one of the three to have a perfectly smooth receptacular surface and flavescent outer bracts. On the other hand, E. septangulare has some populations in which the surface of the receptacle has trichomes, others in which it does not."

Small (1933) comments that "E. septangulare as admitted into our range, seems to have been, for the most part, based on small specimens of E. lineare." Thorne 5022 bears a notation "E. septangulare With., incl. E. lineare Small", indicating that collector's belief that both taxa are conspecific. Personally, I prefer to follow Small, Harper, Ahles, Bell, Radford, and Kral in keeping them separate.

Material has been misidentified and distributed in herbaria under such names as E. anceps (Walt.) Morong, E. compressum Lam., E. compressus Lam., E. gnaphalodes Michx., E. septangulare With., and Lachnocaulon anceps (Walt.) Morong. On the other hand, the R. M. Harper 2146 (at least in part) & 2219, distributed as E. lineare and the former so cited by me in my 1939 work, appear to be E. compressum Lam., while Wherry s.n. [1 m. s. of Flat Rock Sta., 5-30-1927] from Henderson County, North Carolina, and so cited by me in a previous work, seems to be E. pellucidum Michx.

Additional citations: NORTH CAROLINA: Henderson Co.: Murley 982 (Ok). GEORGIA: Baker Co.: R. F. Thorne 1581 (Ca-906392), 4370 (Mi, N). Bulloch Co.: C. Owens 154 (Hi-197942); W. Palmer 87 (Hi-197941); S. Taylor 127 (Hi-198300). Decatur Co.: R. F. Thorne 6551 (We). Dougherty Co.: R. F. Thorne 5022 (Mv). Montgomery Co.: R. M. Harper 2146, in part (B). Sumter Co.: R. M. Harper 1395 (Ms-15475). FLORIDA: Bay Co.: Kral 15671 (N). Calhoun Co.: W. M. Canby s.n. [Magnolia, April 1858] (Ws). Leon Co.: R. K. Godfrey 53684 (Hi-157556, N); Kral & Godfrey 15575 (N), 15585 (N).

Wakulla Co.: Kral 23024 (N). Walton Co.: Kral 17748 (N). ALABAMA: Baldwin Co.: W. Wolf s.n. [Summerdale, July 30, '26] (Ca--841809). County undetermined: A. Ruth s.n. [De Soto Falls, July 1898] (S). MISSISSIPPI: George Co.: Ahles & Bell 7695 (Ur).

ERIOCAULON LINEARIFOLIUM Körn.

Bibliography: Körn., *Linnaea* 27: 601. 1854; Walp., *Ann.* 5: 931 (1858) and 6: 1171. 1861; Körn. in Mart., *Fl. Bras.* 3 (1): 498. 1863; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 878. 1893; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 42, 47, 48, 58, & 286. 1903; Moldenke, *Known Geogr. Distrib. Erioc.* 8 & 36. 1946; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 878. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77 & 205. 1949; Moldenke, *Phytologia* 3: 330. 1950; Moldenke, *Résumé* 89, 113, & 481. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 878. 1960; Moldenke, *Résumé Suppl.* 11: 4. 1964; Moldenke, *Phytologia* 18: 188. 1969.

Material has been misidentified and distributed in herbaria as E. humboldtii Kunth.

Additional citations: BRAZIL: Goiás: Andrade 479 [Emmerich 471] (Bd--15506). Piahy: G. Gardner 2954 [Macbride photos 10561] (B--type, W--photo of type, Z--photo of type). BOLIVIA: Santa Cruz: Kuntze s.n. [Ost-Velasco, VII.92] (N). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

ERIOCAULON LIVIDUM F. Muell.

Bibliography: F. Muell., *Fragm.* 1: 92. 1859; Benth., *Fl. Austr.* 7: 191, 195, & 792. 1878; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 878. 1893; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 65, 98, & 286. 1903; Moldenke, *Known Geogr. Distrib. Erioc.* 28 & 36. 1946; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 878. 1946; Moldenke, *Résumé* 209 & 481. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 878. 1960; J. S. Beard, *Descrip. Cat. W. Austr. Pl.* 9. 1965; Moldenke, *Résumé Suppl.* 15: 14. 1967.

ERIOCAULON LONGICUSPE Hook. f.

Synonymy: Eriocaulon longicuspis Hook. f., *Fl. Brit. Ind.* 6: 573. 1893. Eriocaulon longicuspis var. typica Fyson, *Journ. Indian Bot.* 2: 308. 1921.

Bibliography: Hook. f., *Fl. Brit. Ind.* 6: 573. 1893; Hook. f. in Trimen, *Handb. Fl. Ceylon* 5: [1], 4, & 412. 1900; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 158. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 115, 116, & 286. 1903; H. Lecomte, *Journ. de Bot.* 21: 109. 1908; Fyson, *Journ. Indian Bot.* 2: 308, 309, & 312, pl. 25. 1921; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 158. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 24 & 36. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 130 & 205. 1949; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 158. 1959; Moldenke, *Résumé* 167, 289, 418, & 481. 1959.

Illustrations: Fyson, *Journ. Indian Bot.* 2: pl. 25. 1921.

Practically all previous authors spell the specific epithet of this taxon "longicuspis", as Hooker originally proposed it. The generic name, Eriocaulon, however, is neuter and the adjectival specific epithet must take on a neuter ending.

Fyson (1921) describes the species "Stem disciform, leaves usually 3 (2—8) in. Bracts acuminate, fringed with white hairs, and more or less hidden by the projecting male petals the lowest of which form a conspicuous fringe round the head. Flowers regular and normal." He describes his var. typica as having the scapes solitary, and states that it is endemic to Ceylon.

Hooker (1893) regarded "E. cristatum var. Thw. Enum. 341" as a synonym of E. longicuspe, but I place it in the synonymy of E. ceylanicum Körn. The E. longicuspis var. polycephala Fyson is regarded by me as E. polycephalum Hook. f.

ERIOCAULON LONGIPEDUNCULATUM H. Lecomte

Synonymy: Eriocaulon longepedunculatum H. Lecomte apud Moldenke, Known Geogr. Distrib. Erioc. 27, 36, & 62, sphalm. 1946 [not E. longepedunculatum Alv. Silv., 1928].

Bibliography: H. Lecomte, Not. Syst. 2: 380 & 393. 1913; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Moldenke, Known Geogr. Distrib. Erioc. 27, 36, & 62. 1946; E. H. Walker, Contrib. U. S. Nat. Herb. 30: 380. 1947; Guillaum., Fl. Analyt. & Synopt. Nouv.-Caléd. 49—50. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 151 & 205. 1949; Moldenke, Phytologia 3: 330. 1950; Moldenke, Résumé 205, 298, & 481. 1959; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960.

The E. longepedunculatum Alv. Silv., referred to in the synonymy above, is now placed in the synonymy of E. silveirae Moldenke.

Guillaumin (1948) keys this species from the other species of New Caledonia known to him as follows:

1. Plants stout (robust); leaves 20—35 cm. long; heads globose; scape 6-angled, 20—30 cm. long.....E. pancheri H. Lecomte.
- 1a. Plants very dwarf; leaves 13 cm. long or longer.
2. Heads globose.
3. Scapes plainly ribbed.
4. Scapes with 6 ribs, 14—16 cm. long; leaves 5—13 cm. long; pistillate sepals obtuse.....E. comptonii Rendle.
- 4a. Scapes with 5 ribs, 8—20 cm. long; leaves 3—7 cm. long; pistillate sepals acute.....E. scariosum J. Sm.
- 3a. Scapes almost cylindric, 5—8 cm. long; leaves 5—7 cm. long.....E. neo-caledonicum Schlecht.
- 2a. Heads turbinate, very small; scape 7-ribbed, 40—100 cm. long.....E. longipedunculatum H. Lecomte.

Citations: MELANESIA: New Caledonia: McKee 3373 (Go).

ERIOCAULON LONGIPETALUM Rendle

Bibliography: Rendle, Cat. Welw. Afr. Pl. 2: 96. 1899; Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1105. 1901; Ruhl. in Engl., Pflan-

zenreich 13 (4-30): 33, 40, 99, & 286, fig. 13 B & C. 1903; Thiselet.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; H. Lecomte, Bull. Soc. Bot. France 55: 644. 1909; Moldenke, Known Geogr. Distrib. Erioc. 22 & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 205. 1949; Moldenke, Résumé 147 & 481. 1959.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 99, fig. 13 B & C. 1903.

It should be noted here that Ruhland (1903) claims that the type collection, Welwitsch 2446, is from Morro do Lopolla in Benguela, Angola — not from Huila as cited herein below. The type locality is 1000—1500 meters in altitude.

Citations: ANGOLA: Huila: Welwitsch 2446 (B—isotype, Z—isotype). MOUNTED ILLUSTRATIONS: Ruhland in Engl., Pflanzenreich 13 (4-30): fig. 13 B & C (B).

ERIOCAULON LONGIROSTRUM Alv. Silv. & Ruhl.

Synonymy: Eriocaulon longirostrum Alv. Silv., Fl. Mont. 1: 398, sphalm. 1928. Paepalanthus longirostrum Alv. Silv. ex Moldenke, Résumé 326, in syn. 1959; Rennó, Levant. Herb. Inst. Agron. 70. 1960.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 21, 113, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, Known Geogr. Distrib. Erioc. 8 & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89, 289, 326, & 481. 1959; Rennó, Levant. Herb. Inst. Agron. 70. 1960.

Silveira (1928) cites A. Silveira 188 for this species as though it were the type collection, but the actual type specimen in the Berlin herbarium bears the number "1268", which seems to be a herbarium number.

Citations: BRAZIL: Minas Gerais: Alveiro de Silveira 188 [Herb. Com. Geogr. & Geol. M. Gerais 1268; Herb. Jard. Bot. Belo Horiz. 26676] (B—type, N—isotype).

ERIOCAULON LUTCHUENSE Koidz.

Synonymy: Eriocaulon lutschuense Koidz. ex Moldenke, Known Geogr. Distrib. Erioc. 26 & 36, sphalm. 1946. Eriocaulon sikokianum var. lutschuense (Koidz.) Satake ex Moldenke, Résumé 292, in syn. 1959. Eriocaulon sikokianum var. lutschuense Satake apud Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3 (2): 123. 1962.

Bibliography: Koidz., Bot. Mag. Tokyo 28: 171. 1914; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Mak. & Nemoto, Fl. Jap., ed. 1, 1305 (1925) and ed. 2, 1511. 1931; Nemoto, Suppl. Fl. Jap. 1038. 1936; Honda, Nom. Pl. Jap. 462. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 13, 48, 79, & 87, fig. 21. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 36—37, pl. 6, fig. 12. 1940; Moldenke, Known Geogr. Distrib. Erioc. 26 & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 140 & 205. 1949; Moldenke, Résumé 181, 292, & 481. 1959; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3

(2): 123. 1962.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 48, fig. 21. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 6, fig. 12. 1940.

The common names, "okinawa-hoshikusa" and "okinawa-hosikusa", are recorded for this species. Satake (1940) cites Kanasiro 137, Miyagi 298, and Tomoyori s.n. [Aug. 1923] from Okinawa island, where the species is apparently endemic. The type of the species is T. Miyagi 298, collected at Kogatsi, Okinawa, in May, 1912, and is deposited in the herbarium of the University of Tokyo; the other two cited collections are deposited in the herbarium of the Royal Botanic Gardens at Kew.

ERIOCAULON LUZULAEFOLIUM Mart.

Synonymy: Eriocaulon luzulifolium Mart. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 88, & 286. 1903 [not E. luzulifolium Thwaites, 1968].

Bibliography: Wall., Numer. List 207. 1832; Mart. in Wall., Plant. As. Rar. 3: 28. 1832; Royle, Illustr. Bot. Himal. 409. 1840; Kunth, Enum. Pl. 3: 553--555. 1841; Walp., Ann. 5: 937 (1858) and 6: 1171. 1861; Thwaites & Hook. f., Enum. Pl. Zeyl. 341. 1864; Hook. f., Fl. Brit. Ind. 6: 582. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 5: 2, 7, & 412. 1900; Prain, Bengal Pl., pr. 1, 1127. 1903; Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 88, & 286. 1903; Matsum. & Hayata, Enum. Pl. Formos. 468. 1906; H. Lecomte, Journ. de Bot. 21: 108. 1908; Kawakami, List Fl. Formos. 130. 1910; Fyson, Journ. Indian Bot. 2: 200, pl. 8. 1921; Sasaki, List Pl. Formos. 99. 1928; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23, 24, & 36. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 126, 129, 130, & 205. 1949; Moldenke, Phytologia 3: 331. 1950; Moldenke, Résumé 159, 162, 165, 167, 176, 290, & 481. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Panigrahi & Naik, Bull. Bot. Surv. India 3: 365 & 383. 1961; Moldenke, Résumé Suppl. 4: 7 (1962) and 6: 8. 1963; Prain, Beng. Pl., pr. 2, 2: 848 & 849. 1963; Thanikaimoni, Pollen & Spores 7: 183 & 185, tab. 1. 1965; Malick, Bull. Bot. Surv. India 8: 47 & 58. 1966; Moldenke, Phytologia 17: 386 (1968) and 17: 463. 1969.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 8. 1921; Thanikaimoni, Pollen & Spores 7: 183, tab. 1. 1965.

Because of considerable difference in opinion concerning the characters of this species, it may be worth repeating the description given by Kunth (1841) here: "Rhizomate [caulis perennis, simplex, radiculosus, apice folii- et florifer. Mart.] perpendiculari, brevi, simplici, apice folioso; foliis subsensiformi-linearibus, angustato-acutatis, fenestrato-9--11-nerviis, pellucidis glabris, vaginas superantibus; pedunculis umbellato-congestis, quinqsulcatis, glabris; capitulis albido-villosulis; bracteis involucrentibus obovatis, apice rotundatis; flores sti-

pantibus spathulatis, acutis; floribus masculis hexandris; feminis trigynis; calyce masculino interiore limbo irregulariter tridentato?: dentibus glabris, glanduliferis; sepalis masculis exterioribus postice cohaerentibus; femineis interioribus superne ciliatis, eglandulosis. — Silhet. (India orientalis.) 4 — Folia 16—18 lineas longa, 1 — 1 1/4 linea lata, laete viridia, plana. Vaginae laxae, membranaceae, glabrae, 1 1/4 — 1 1/2 pollicares, apice integrae vel bifidae. Pedunculi in apice caulis per 10—20 umbellato-congesti, 5—8-pollicares. Capitula hemisphaerica, magnitudine grani minoris piperis nigri. Bracteae involucrantes obovatae, apice rotundatae, convexae, arido-membranaceae, stramineo-pallidae, nitidulae, glabrae, capitulo parum breviores; bracteae flores stipantes spathulatae, acutae, griseae, apice pilosae. Receptaculum pilosum. Flores masculi longe pedicellati: Sepala 3 exteriora olivacea, pilosa, postice cohaerentia, apice libera: lateralia latiora, carinata, interdum distincta; sepala interiora in tubulum glabrum, apice 3?-dentatum connata; dentibus glabris, glanduliferis. Stamina 6, summo tubo inserta, inaequalia. Antherae didymo-reniformes, olivaceo-nigrae. Pistillorum rudimenta 3, nigra. Flores feminei brevissime pedicellati: Sepala 6, lineari-spathulata, obtusa, eglandulosa, apicem versus piloso-ciliata; 3 exteriora paulo majora, grisea; 3 interiora hyalino-albida, ab exterioribus parum remota. Ovarium sessile, subrotundo-ovatum, tricoccum. Stylus longitudine ovarii. Stigmate 3, elongata, simplicia. Pili bractearum et calycum crassiusculi, opaci, nivei."

Fyson (1921) describes the species as follows: "Leaves 2—4 in. narrowed from the 1/6 in. base, flat, many-nerved. Sheaths about as long. Scapes many, 2 to 4 times as high, slender. Heads 1/4 in., truncate, clasped below by the light? brown obtuse saucer shaped involucre. Floral bracts dark with white hairs, making the heads gray. Receptacle hairy. Sepals and petals three, narrow. Plate 8. Central Himalayas, Nepal, Assam; Silhet (type sheet!); Lr Bengal; and the Shan States. Hooker in F. B. I. has a much wider distribution extending over all India, Ruhland merely repeats this. But the sheets seen by me from Madras, Kanara and other parts are not the species of the above quoted type. The Ceylon plant C.P.796, so named, has none of the characteristic truncate appearance of the head on a saucer-shaped involucre and is E. collinum. Wallich's plant quoted above [Wall. Cat. 6071 in Herb. Calc.] does not in fact resemble E. quinquangulare as stated by Hooker."

In this connection I may point out that two sheets of Thwaites C.V.796 [doubtless the collection referred to by Fyson] in the Berlin herbarium seem to match perfectly the Bruce s.n. [Wallich 6071] sheet from Silhet in the same herbarium and apparently an isotype of the species, while the two other sheets at Berlin, also labeled as Thwaites C.V.796, seem to be E. collinum Hook. f. and one of them was actually so annotated by Ruhland. It is possible, therefore, that the Thwaites number is a mixture of the two species. Koelz 19398, cited below, is actually a mixture of E. luzu-

laefolium Mart., E. cinereum R. Br., E. oryzetorum Mart., and E. sollyanum Royle! The E. luzulifolium Thwaites, referred to in the synonymy above, is a synonym of E. collinum Hook. f.

Kunth (1841) says of E. truncatum Hamilt. "E. luzulaefolio simillimum, bracteis sat distinctum." Prain (1963) says for E. luzulaefolium: "Female flowers distinctly pedicelled.....Involucral bracts erect or spreading, never reflexed; head hemispheric, grey; leaves pale grey-green, opaque...in all the provinces [of Bengal]. A herb of rice-fields and wet places." Malick (1966) cites Malick 155 and reports the species common near rice-fields and in marshes in West Bengal. Panigrahi & Naik (1961) cite Bot. Surv. India 19843. The initial letter of the specific epithet is sometimes uppercased. Vernacular names recorded for the species are "shima-imuhige" and "taiwan-inunchige".

Material has been misidentified and distributed in herbaria as E. collinum Hook. f. and as E. sexangulare L. On the other hand, the Jenkins s.n. [Assam, h.r.m. 310], distributed as E. luzulaefolium, is actually E. alpestre Hook. f. & Thoms., while Hooker & Thomson s.n. [Mont. Khasia] is E. nepalense Prescott. The Mrs. D. J. Collins 1887 specimen, cited below, is very immature, and is placed here only tentatively.

Additional citations: INDIA: Assam: Bruce 14 (Br-isotype), s. n. [Wallich 6071] (B-isotype). Surguja: Koelz 19398, in part (M). CEYLON: G. Gardner 936 (Br); Thwaites C.V.796, in part (B, B). THAILAND: Mrs. D. J. Collins 1887 (W-1701537); Hosseus 102 (Cp); A. F. G. Kerr 1635 (Cp). INDOCHINA: Annam: Schmid 1414 (N); Souchère 4 (N).

ERIOCAULON MACROBOLAX Mart.

Synonymy: Eriocaulon macrobolax Körn. ex Walp., Ann. 5: 930.

1858. Paepalanthus macrobolax Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 485, in syn. 1863.

Bibliography: Körn., Linnaea 27: 599. 1854; Walp., Ann. 5: 930 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 484--485. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 41, 44, 45, & 286. 1903; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, Known Geogr. Distrib. Erioc. 8 & 36. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89 & 481. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Moldenke, Résumé Suppl. 17: 11. 1968.

The Macbride photograph cited below is of the type specimen deposited in the herbarium of the Botanische Staatssammlung at Munich.

Citations: BRAZIL: Minas Gerais: Macedo 2589 (N, S, S), 2620 (N); Martius s.n. [Macbride photos 18688] (B-isotype, N-photo

of type, N—photo of type, W—photo of type). MOUNTED ILLUSTRATIONS: drawings & notes by Kürnische (B).

ERIOCAULON MACROPHYLLUM Ruhl.

Synonymy: Eriocaulon brownianum var. macrophyllum Ruhl. ex Fyson, Journ. Indian Bot. 2: 262 & 264. 1921.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 77, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Fyson, Journ. Indian Bot. 2: 262 & 264. 1921; Moldenke, Known Geogr. Distrib. Erioc. 27 & 37. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 144 & 205. 1949; Moldenke, Résumé 190, 286, & 481. 1959; Moldenke, Phytologia 18: 169 & 171. 1969.

Fyson (1921) reduced this taxon to varietal status under E. brownianum Mart. He distinguished three varieties: (a) var. typica, with the "leaves and involucre often (but not always) glabrous, Assam; Silhet (type), Khasia; Burma; Manipur"; (b) var. nilagirensis, with the "Whole plant hairy and more robust than the type. Leaves usually shorter and broader, but sometimes narrow. Scapes stout and hairy. Heads 1 inch flat or hemispheric. Involucre black, hairy. Female flower: Sepals less deeply boatshaped. Petals a little broader; otherwise as in the type"; and (c) var. macrophyllum, with no diagnostic separation given, but with the comment "Ruhland described (lc. p. 77) the Malay Peninsula form (var. c) as a distinct species E. macrophyllum (Ruhl. No. 95) but if the sheet so named in Herb. Calc. is identified correctly it is in my opinion the same species. In Herb. Calc. is a sheet from China which might equally well be separated as a distinct species." Unfortunately, he does not cite the collector or number of the Calcutta sheet on which he bases this opinion.

Van Steenis recently has given the opinion that E. macrophyllum is a synonym of E. blumei Körn.

ERIOCAULON MACULATUM Schinz

Bibliography: Schinz, Bull. Herb. Boiss., sér. 2, 6: 709. 1906; Prain, Ind. Kew. Suppl. 4, pr. 1, 82. 1913; Moldenke, Résumé Suppl. 1: 10 & 25. 1959; Prain, Ind. Kew. Suppl. 4, pr. 2, 82. 1938.

This taxon is known to me only from the type collection, which was gathered at an altitude of 960 meters, flowering in March.

Citations: SOUTH AFRICA: Transvaal: F. R. R. Schlechter 4651 (B—isotype, Z—isotype).

ERIOCAULON MADAGASCARIENSE Moldenke

Bibliography: Moldenke, Phytologia 3: 444. 1951; Moldenke in Humbert, Fl. Madag. 36: [7]—9, fig. 1 (9—12). 1955; G. Taylor, Ind. Kew. Suppl. 12: 55. 1959; Moldenke, Résumé 156 & 481. 1959.

Illustrations: Moldenke in Humbert, Fl. Madag. 36: [7], fig. 1 (9—12). 1955.

Citations: MADAGASCAR: Perrier de la Bâthie 17905 (N—photo of type, P—type, Z—photo of type).

ERIOCAULON MAGNIFICUM Ruhl.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 42, 48, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 82. 1945; Moldenke, Known Geogr. Distrib. Erioc. 8 & 37. 1946; Abbiatti, Rev. Mus. La Plata Bot., new ser., 6: [311], 312, & 326. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Rambo, Anais Bot. 2: 128. 1950; Moldenke, Phytologia 3: 331. 1950; Rambo, Sellowia 6: 130 & 156. 1954; Reitz, Sellowia 7: 124. 1956; Angely, Fl. Paran. 10: 14. 1957; Moldenke, Résumé 89 & 481. 1959; Angely, Fl. Paran. 16: 51 (1960) and 17: 24. 1961; Reitz, Sellowia 13: 52, 53, 72, & 90. 1961; Angely, Fl. Anal. Paran., ed. 1, 199. 1965.

The type of this species is Ule 1689 from Santa Catarina, Brazil, deposited in the herbarium of the Botanisches Garten und Museum at Berlin. The plant has been collected at 8 m. altitude, flowering in September. It very closely resembles E. kunthii Körn., but Körnicke's species has the sheaths truncate at their apex, while in E. magnificum they are very plainly oblique. Both these taxa are also uncomfortably close to E. ligulatum (Vell.) L. B. Sm. and E. megapotamicum Malme. Rambo (1950) says "Eriocaulon magnificum Ruhl. — Até o momento aó o conhecimento de Sombrio; sua constatação ao sul de Torres é questão de posteriores pesquisas. Seja dito de passagem, que após comparação minuciosa do material com E. megapotamicum, não estou convencido duma verdadeira diferença entre as duas espécies."

The Hemendorff 468, cited by me as E. magnificum by me in my 1950 work, is apparently E. kunthii Körn. instead. Similarly, the Hatschbach 2868, distributed as E. magnificum, is actually E. ligulatum (Vell.) L. B. Sm.

Additional citations: BRAZIL: Rio Grande do Sul: Carisio 135 (S), 2036 (N, S). Santa Catarina: Rambo 31465 (Gg—354365, S); Reitz 1911 (S), C.1207 (N); Smith & Reitz 5876 (W—2120179); Ule 1689 [Macbride photos 10562] (B—type, N—photo of type, N—photo of type, W—photo of type).

ERIOCAULON MAGNUM Abbiatti

Synonymy: Eriocaulon arechavaletae Castell. ex Moldenke, Résumé 285, in syn. 1959 [not E. arechavaletae Herter, 1935, nor Moldenke, 1946].

Additional & emended bibliography: Abbiatti, Rev. Mus. La Plata Bot., new ser., 6: 312, 313, 316, 318, 319, 321, 323—326, 339, & 340, fig. 2 & 3, pl. 1. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 98, 103, & 205. 1949; Moldenke, Phytologia 3: 331. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 116, 123, 285, & 481. 1959; Cabrera, Pl. Acuat. 64. 1964; Moldenke, Résumé Suppl. 12: 5. 1965; Moldenke, Phytologia 17: 389 (1968) and 18: 87. 1969.

Illustrations: Abbiatti, Rev. Mus. La Plata Bot., new ser., 6: 324 & 325, fig. 2 & 3, pl. 1. 1946.

The type of this species was collected by Augusto Gustavo

Schulz (no. 6337) at Colonia Benítez, Chaco, Argentina, in October, 1945, and is deposited in the herbarium of the Universidad Nacional de la Plata as sheet number 56990. The species has been collected at 50 meters altitude, flowering and fruiting in September and October. Pedersen reports that it grows "in swamps and quaking bogs, not rare, but rarely accessible". Material has been misidentified and distributed in herbaria as E. arechavale-tae Herter and as Paepalanthus planifolius Körn. On the other hand, the Hassler 11348, distributed as E. magnum, is actually E. elichrysoides Bong.

Additional citations: PARAGUAY: Hassler 9428 (S, V--7009); Krapovickas & Cristóbal 13474 (Z). ARGENTINA: Chaco: T. Meyer s. n. [Herb. Herter 98017] (S). Corrientes: Burkart 19441 (W--2196266), 19598 (W--2196322); Pedersen 812 (W--2122569), 1891 (S, W--2432876).

ERIOCAULON MAJUSCULUM Ruhl.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 41, 44, 45, & 286, fig. 6. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Luetzelb., Estud. Bot. Nordeste 3: 147 & 150. 1923; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, Known Geogr. Distrib. Erioc. 8 & 37. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Phytologia 3: 331. 1950; Moldenke, Résumé 89 & 481. 1959; Rennó, Levant. Herb. Inst. Agron. 68. 1960.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 45, fig. 6. 1903.

Collectors have found this plant growing at 2100 meters altitude, in flower and fruit in February, March, and December. Silveira (1928) cites A. Silveira 105 from Minas Gerais. Material has been misidentified and distributed in herbaria as E. kunthii Körn.

Additional citations: BRAZIL: Minas Gerais: Santos & Castellanos 24179 [Herb. Brad. 28327] (LW); A. Silveira 2914 (B--cotype); Ule 3770 (B--cotype). Rio de Janeiro: Luetzelburg 6338 (N); Segadas-Vianna, Dau, Ormond, & Machline 1426 (Z).

ERIOCAULON MAMFEENSE Meikle

Bibliography: Meikle, Kew Bull. 22: 141--142. 1968; Winner, Biol. Abstr. 49: 11782. 1968; Moldenke, Résumé Suppl. 17: 4. 1968; Moldenke, Phytologia 18: 176. 1969.

This species is based on a specimen collected by S. Tamajong (F. H. I. 22107) at Basu, near Mamfe, Cameroons, on November 7, 1947, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Meikle (1968) cites also from the same country F. Migeod 276, J. K. Morton K.676, and P. W. Richards 5245. The species has been found growing at 120 meters altitude, flowering in November, December, and March, and is said to be related to E. dregel Hochst. "sed scapis numerosioribus, gracilioribus, capitulis minoribus, bracteis floralibus et floribus stramineis nec

fuscidulis, sepalis floris foeminei haud alato-carinatis inter alia recedit."

ERIOCAULON MANNII N. E. Br.

Bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 241. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 68, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Moldenke, Known Geogr. Distrib. Erioc. 21 & 37. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114 & 205. 1949; Moldenke, Résumé 140 & 481. 1959; Moldenke, Résumé Suppl. 1: 9 (1959) and 2: 6. 1960.

The Mann collection, cited below, sometimes bears labels which are inscribed "Gabun", but appears actually to have come from Corisco island.

Citations: CORISCO: G. Mann 1689 (B-isotype, S-isotype, Ut-326--isotype, Z-isotype). ANGOLA: Lunda: Gossweiler 14093 (B).

ERIOCAULON MARGARETAE Fyson

Bibliography: Fyson, Journ. Indian Bot. 1: 50 (1919) and 2: 316 & 317. 1921; A. W. Hill, Ind. Kew. Suppl. 6: 78 (1926) and 7: 89. 1927; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1612 & 1619. 1931; Razi, Journ. Mysore Univ. 7: 77. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23 & 37. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 205. 1949; Razi, Journ. Mysore Univ. 11: 6. 1950; Moldenke, Phytologia 3: 331. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1123, 1127, & 1333. 1956; Razi, Rec. Bot. Surv. India 18: 19. 1959; Moldenke, Résumé 162 & 481. 1959; Thanikaimoni, Pollen & Spores 7: 183 & 185, tab. 1. 1965; Moldenke, Phytologia 18: 86 & 179. 1969.

Illustrations: Thanikaimoni, Pollen & Spores 7: 183, tab. 1. 1965.

Because of the unavailability in many libraries of the journal in which the original publication of this species appeared, the description is repeated here: "E. Margaretae Fyson, sp. nov.

(Fyson 3839! Sedgwick 2979!) Caulis perbrevis. Folia angustolineraria aut setacea, 3-5 cm., longa, glabra. Pedunculi 5-10 cm., tenuia. Capitula 1.5 mm, lata, demum conica, alba, glabra. Bractae involucrentes glabrae, stramineae. Bractea flores superantes similes, glabrae aut sub-pubescentes, acutae. Flores trimeres. Flos ♀ sepala aequalia, apice acuta, medio naviculari-carinata, carina spongiosa: petala oblanceolata, ciliate. Flos ♂ antherae nigrae; petala et sepala 3. Bombay and Mysore on the Western Ghats, Rudrasiri, Bidi (Belgaum District). The peduncles are very slender, and the pale glabrous conical heads are very similar to those of E. Hamiltonianum var. minor (sp. No. 35). The three female sepals are all equal, winged and acute above the wing, otherwise the plants are very like the next species [E. elenorae Fyson]. This may be E. heterolepis Steud, but I have not seen any sheet so named. Ruhland l.c. s. described that species as having broader leaves and with the inner involucrent bracts obtuse and lacerate. See also note in Appendix I." He likewise states that E. elenorae Fyson is very close to E. margaretae, but that the lat-

ter is less robust and has the female sepals equal. Razi (1950) states that two "type sheets" are deposited in the Mysore University herbarium from Mysore, India.

ERIOCAULON MATOPENSE Rendle

Synonymy: Eriocaulon africanum Sonder ex Moldenke, Résumé Suppl. 2: 9, in syn. 1960 [not E. africanum Hochst., 1845].

Bibliography: Rendle, Journ. Linn. Soc. Lond. Bot. 37: 475. 1906; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119 & 205. 1949; Moldenke, Phytologia 3: 331—332. 1950; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 139. 1955; Moldenke, Résumé 149 & 481. 1959; Moldenke, Résumé Suppl. 2: 9. 1960; Moldenke, Phytologia 18: 167. 1969.

Fisher & Schweickerdt tell us that this plant is "locally frequent on rocks near river banks, submerged", flowering in July. Other collectors have found it in swamps at 2000 meters altitude.

Additional citations: RHODESIA: Bodong s.n. [10 August 1901] (S); Fisher & Schweickerdt 293 (Rh—22825); Fries, Norlindh, & Weimarck 3446 (S), 3547 (S); Wild 3581 [Govt. Herb. Salisbury 30400] (N).

ERIOCAULON MEGAPOTAMICUM Malme

Additional bibliography: Malme, Arkiv Bot. Stockh. 26 A (9): 8. 1935; A. W. Hill, Ind. Kew. Suppl. 9: 105. 1938; Moldenke, Known Geogr. Distrib. Erioc. 8 & 37. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Rambo, Anais Bot. 2: 128. 1950; Moldenke, Phytologia 3: 332. 1950; Rambo, Sellowia 6: 130 & 156. 1954; Moldenke, Résumé 89 & 481. 1959; Reitz, Sellowia 83: 53. 1961.

Rambo has found this plant growing in swamps, flowering in October. He notes (1950) "O lugar típico desta espécie é Povo Novo perto de Pelotas; entretanto, é o Eriocaulon predominante dos arredores de Osório, onde cresce de mistura com e Syngonanthus acima mencionado."

Citations: BRAZIL: Rio Grande do Sul: Malme 406 (N—photo of type, S—type, S—isotype, Z—photo of type); Rambo 61454 (S).

ERIOCAULON MEIKLEI Moldenke

Bibliography: Moldenke, Phytologia 3: 164—165 (1949) and 3: 332. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Monod, Bull. Inst. Fr. Afr. Noir 16: 316. 1954; Moldenke, Résumé 135 & 481. 1959; Berhaut, Fl. Sénégal, ed. 2, 312. 1967.

Berhaut (1967) cites Berhaut 1635, 6691, & 6983 from Sénégal.

ERIOCAULON MELANOCEPHALUM Kunth

Synonymy: Eriocaulon aquaticum Sagot ex Körn. in Mart., Fl. Bras. 3 (1): 498, in syn. 1863. Lasiolipsis aquatica Bück., Flora 56: 91. 1873. Paepalanthus melanocephalos Kunth ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959.

Bibliography: Kunth, Enum. Pl. 3: 549. 1841; Walp., Ann. 5: 931 (1858) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 476 & 498—500, pl. 43. 1863; Bück., Flora 56: 91. 1873; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 27. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877 & 878 (1893) and 2: 35. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 18, 22, 64, 89, 284, & 286. 1903; Beauverd, Bull. Herb. Boiss., sér. 2, 8: 284. 1908; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, N. Am. Fl. 19 (1): 19 & 33. 1937; Moldenke, Phytologia 1: 319. 1939; León, Fl. Cuba 1: 281. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4, 5, 7, 8, 32, 33, 37, 41, & 42. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877 & 878 (1946) and 2: 35. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43, 60, 63, 68, 77, & 205. 1949; Moldenke, Phytologia 3: 332. 1950; Moldenke in J. A. Steyerl., Fieldiana 28: 825. 1957; H. Hess, Bericht. Schweiz. Bot. Gesell. 67: 87—88. 1957; Alain, Revist. Soc. Cub. Bot. 15: 56. 1958; Moldenke, Résumé 51, 66, 71, 78, 89, 285, 309, & 481. 1959; Moldenke, Résumé Suppl. 1: 19 & 21 (1959) and 2: 5. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877 & 878 (1960) and 2: 35. 1960; Rennó, Levant. Herb. Inst. Agron. 69. 1960; Moldenke, Résumé Suppl. 6: 5. 1963; J. A. Steyerl., Act. Bot. Venez. 1: 195. 1966; Moldenke, Phytologia 17: 394 & 395 (1968) and 17: 483. 1969.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 43. 1863.

The type of this species was collected by Friedrich Sellow (no. 5850) in São Paulo, Brazil, and is deposited in the herbarium of the Botanisches Museum at Berlin. The original description by Kunth (1841) actually says "*Brasilia meridionalis*. (A St. Paulo ad meridiem, Sellow.)" The synonym, *E. aquaticum* Sagot, is based on Sagot 1330 from French Guiana, while *Lasiolepis aquatica* is based on Jelski s.n. from Cayenne in French Guiana, and is also deposited in the Berlin herbarium.

Kunth (1841) gives a very detailed description of this taxon, which should be of great value in checking the supposed conspecificity of certain similar-appearing taxa like *E. bifistulosum* Van Heurck & Muell.-Arg., *E. intermedium* Körn., *E. schippii* Standl., and *E. setaceum* L., all of which are similar submerged aquatics. Hess (1957) actually reduces *E. bifistulosum* to synonymy under *E. melanocephalum*, claiming that the differences enumerated by me do not hold. He therefore records the species from Angola.

Collectors have found *E. melanocephalum* growing at altitudes of 100 to 1065 meters, flowering in April, May, July, October, and December. Wurdack & Monachino describe it as "flower heads black, filaments white; locally frequent in morichal rivulets". Harrison notes "leaves pale yellowish-green, flowers gray, anthers white, stems very brittle, rooted in mud at base". Silveira (1928) cites A. Silveira 207 from Minas Gerais, Brazil. The collector undesignated 177, cited below, is a mixture with *Paepalanthus lamarckii* Kunth. The Milne-Redhead & Taylor 9929, distributed as *E. melanocephalum*, appears to be *E. bifistulosum* Van Heurck & Muell.-Arg.