

slightly shorter than the calyx, minutely and sparsely scattered-strigillose-puberulent on the back, more or less ciliolate along the margins; calyx tubular, about 4 mm. long, densely appressed-strigose with antrorse white hairs, the rim 5-apiculate; corolla hypocrateriform, blue, the tube very slightly surpassing the calyx, the limb to 4 mm. wide, white in the throat.

The type of this species was collected by Andrew Ralph Moldenke and Alison Bishop Moldenke (no. 2922) at Comondu, Baja California Norte, Mexico, on March 19, 1969, and is deposited in my personal herbarium at Plainfield, New Jersey. The collectors state that the species was a common roadside weed for ten miles in either direction from the type locality.

ADDITIONAL NOTES ON THE ERIOCAULACEAE. XXII

Harold N. Moldenke

ERIOCAULACEAE Lindl.

Additional & emended bibliography: Pluk., *Alm. Bot. Mant.* 98. 1799; J. E. Sm. in Rees, *Cycl.* 13: *Eriocaulon*. 1809; Lesson in Bougainville, *Journ. Navig. Autour Globe* 2: 348--351, pl. 46. 1837; A. Wood, *Class-book*, ed. 1, 405, 470, & 474 (1845), ed. 2, pr. 1, 564, 640, & 645 (1847), ed. 2, pr. 2, 564, 640, & 645 (1848), and ed. 10, pr. 1, 564, 640, & 645. 1848; A. Gray, *Man. Bot.*, ed. 1, lxxi, 514--515, & 703. 1848; Walp., *Ann.* 1: 889--891, 1053, & 1093. 1849; A. Wood, *Class-book*, ed. 10, pr. 2, 564, 640, & 645 (1849), ed. 10, pr. 3, 564, 640, & 645 (1850), ed. 17, 564, 640, & 645 (1851), and ed. 23, 564, 640, & 645. 1851; Walp., *Ann.* 3: 662--663 (1852) and 3: 1014 & 1093. 1853; A. Wood, *Class-book*, ed. 29, 564, 640, & 645 (1853), ed. 35, 564, 640, & 645 (1854), ed. 41, pr. 1, 564, 640, & 645 (1855), and ed. 41, pr. 2, 564, 640, & 645. 1856; A. Gray, *Man. Bot.*, ed. 2, pr. 1, xciv, xxviii, 488--489, & 713. 1856; Knieskern, *Ann. Rep. N. J. Geol. Surv.* 33. 1856; A. Gray, *Man. Bot.*, ed. 2, pr. 2, xciv, 488--489, & [615] (1858) and pr. 3, xciv, xxviii, 488--489, & [713]. 1859; A. W. Chapp., *Fl. South. U. S.*, ed. 1, pr. 1, xxxviii, 502--504, 609, & 615. 1860; C. Mill. in Walp., *Ann.* 5: 919--947, 954, 957, 958, 960, & 964 (1860) and 6: 1170--1171 & 1245. 1861; Dalz. & Gibs., *Bomb. Fl.* 279--280, 316, & 325. 1861; A. Wood, *Class-book*, [ed. 42], pr. 1, 729--730, 826, & 832. 1861; A. Gray, *Man. Bot.*, ed. 3, xxxviii (c), 488--489, & [615] (1862) and ed. 4, pr. 1, xxxviii (c), 488--489, & [711]. 1863; A. Wood, *Class-book*, [ed. 42], pr. 2, 729--730, 826, & 832. 1863; A. Gray, *Man. Bot.*, ed. 4, pr. 2, xxxviii (c), 488--489, & [615]. 1864; A. W. Chapp., *Fl. South. U. S.*, ed. 1, pr. 2, xxxviii, 502--504, 609, & 615. 1865; A. Wood, *Class-book*, [ed. 42], pr. 3, 729--730, 826, & 832 (1865) and pr. 4, 729--730, 826, & 832. 1867; A. Gray,

Man. Bot., ed. 5, pr. 1, 31, 549—550, & 685 (1867) and pr. 2, 31, 549—550, & 687. 1868; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 29, 352, & 378. 1868; A. Wood, Class-book, [ed. 42], pr. 5, 729—730, 826, & 832 (1868) and pr. 6, 729—730, 826, & 831. 1869; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 2, 29, 352, & 378. 1869; A. Gray, Man. Bot., ed. 4, pr. 3, xxxviii (c), 488—489, & [615]. 1870; A. Wood, Class-book, [ed. 42], pr. 7, 729—730, 826, & 831. 1870; A. Wood, Am. Bot. & Flor., ed. 1, pr. 1, 355, 379, & 390 (1870), pr. 2, 355, 379, & 390 (1871), and pr. 3, 355, 379, & 390. 1872; A. W. Chapm., Fl. South. U. S., ed. 1, pr. 3, xxxviii, 502—504, 609, & 615. 1872; A. Wood, Class-book, [ed. 42], pr. 8, 729—730, 826, & 831. 1872; A. Wood, Am. Bot. & Flor., ed. 1, pr. 4, 355, 379, & 431 (1873) and pr. 5, 355, 379, & 431. 1874; O. R. Willis, Cat. Pl. N. J. 67. 1874; Lesq., U. S. Geol. & Geog. Surv. Terr. Ann. Rep. 7: 396. 1874; A. Wood, Am. Bot. & Flor., ed. 1, pr. 6, 355, 379, & 431. 1875; A. Wood, Class-book, [ed. 42], pr. 9, 729—730, 826, & 831. 1876; Lesq., U. S. Geol. Surv. Terr. Rep. 7: [Text. Fl.] 106, pl. 16, fig. 2 & 2a. 1878; A. Gray, Man. Bot., ed. 5, pr. 8, 31, 549—550, & 687 (1878) and pr. "8" [=9], 31, 549—550, & 687. 1880; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 3, 29, 352, & 378. 1880; A. Wood, Class-book, [ed. 42], pr. 10, 729—730, 837, & 842. 1881; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 1, xxxviii, 502—504, 681, & 687 (1883), pr. 2, xxxviii, 502—504, 681, & 687 (1884), and pr. 3, xxxviii, 502—504, 681, & 687. 1887; S. Wats., Proc. Am. Acad. 23: 283. 1888; O. R. Willis in A. Wood, Am. Bot. & Flor., ed. 2, 355, 379, & 431. 1889; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 4, xxxviii, 502—504, 658, 681, 687, & 696. 1889; S. Wats. & Coult. in A. Gray, Man. Bot., ed. 6, pr. 1, 16, 29, 566—567, & 753 (1889) and pr. 2, 16, 29, 566—567, & 753. 1890; Maxim., Dec. Pl. Asiat. 8: 7, 9, 21, & 22. 1893; Mak., Bot. Mag. Tokyo 4: 174. 1890; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 5, xxxviii, 502—504, 711, & 718. 1892; Mak., Bot. Mag. Tokyo 8: 506—507. 1894; Masee, Grevillea 22: 67. 1894; L. H. Bailey in A. Gray, Field For. & Gard. Bot., ed. 2, 12, 24, 456, & 511. 1895; A. W. Chapm., Fl. South. U. S., ed. 3, xxxix, 529—531, 648, & 652. 1897; Penhallow, Brit. Assoc. Adv. Sci. Rep. 68: 527. 1899; Rendle in Hiern, Cat. Afr. Pl. Welw. 2: 95—102. 1899; Penhallow, Brit. Assoc. Adv. Sci. Bradford Meet. 335. 1900; Ruhl. in Pilg., Engl. Bot. Jahrb. 30: 146—147. 1901; G. P. Clinton, Rhodora 3: 79—82, fig. 1 & 2. 1901; G. P. Clinton, Journ. Myc. 8: 137. 1902; C. H. Wright, Journ. Linn. Soc. Lond. Bot. 36: 198—202. 1903; V. A. Poulsen in Schmidt, Bot. Tidsskr. 26: 167. 1904; Keller & S. Br., Handb. Fl. Philad. 91—92. 1905; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145, 158, 235, 310, 483, & 501. 1906; Rendle, Journ. Linn. Soc. Lond. Bot. 37: 474—476. 1906; R. W. Sm., Bot. Gaz. 49: 281—289, pl. 19 & 20. 1910; B. Long, Bartonica 2: 20. 1910; G. T. Stevens, Ill. Guide Flow. Pl. 113—115, 718, & 746, pl. 9, fig. 5 & 9. 1910; Nakai, Journ. Coll. Sci. Imp. Univ. Tokyo 31: 281—283. 1911; Hosseus, Beih. Bot. Centralbl. 28 (2): 372—373. 1911; Creevey, Harper's Guide Wild Fls. 42, 44, [45],

469, & 529. 1912; W. Stone, Ann. Rep. N. J. State Mus. 1910: 323-325 & 817, pl. 28, fig. 1 & 2, & pl. 64, fig. 2. 1912; Britton & Br., Ill. Fl., ed. 2, 1: xxiii, 453-456, & [678]-680, fig. 1140-1145 (1913) and 3: 574, 575, 581, 597, & 625. 1913; Fyson, Fl. Nilg. & Puln. Hill-tops 1: 426-432, pl. 272-277. 1915; House, N. Y. State Mus. Mem. 15 (1): 44, pl. 6A (1918) and 15 (2): 347 & 355. 1918; Knowlton, U. S. Geol. Surv. Bull. 696: 260, 670, 685, 778, & 812. 1919; Palm, Svensk. Bot. Tidsk. 14: 264. 1920; Saida & Satô, Naigai Syokubutusi 1296, fig. 2009. 1921; Fyson, Fl. Nilg. & Puln. Hill-tops 3: 118-119, pl. 543. 1921; Fern., Rhodora 23: 92 & 102. 1921; Mori, Enum. Pl. Corea 80. 1922; Nakai in Mak. & Nemoto, Fl. Jap., ed. 1, 1303-1308. 1925; N. Taylor, Guide Wild Fls. 4, 6-7, 323, & 333, fig. 13. 1928; Tatew., Veg. Apoi 119 & 131. 1928; Duthie, Fl. Upper Ganget. Plain 3: 317-320. 1929; Pool, Fls. & Flow. Pl., ed. 1, 299 & 359, fig. 169. 1929; Nakai, Veg. Apoi 76. 1930; Knowlton, U. S. Geol. Surv. Prof. Paper 155: 132-133. 1930; Nakai in Mak. & Nemoto, Fl. Jap., ed. 2, 1510-1515. 1931; House, Wild Fls. 44, 347, & 355, pl. 6A. 1934; Svenson, Torreya 35: 119. 1935; Marie-Vict., Fl. Laurent., ed. 1, 54, 74, 546, 565, 674, 679-681, 837, & 892, fig. 244. 1935; Steinberg in Komarov & Schischkin, Fl. U. S. S. R. 3: 494-498 & 748, pl. 27, fig. 1-5. 1945; Nemoto, Fl. Jap. Suppl. 1038-1040. 1936; Sugawara, Pl. Saghal. 117. 1937; E. D. Merr. & Metc., Lingn. Sci. Journ. 16: 79. 1937; Satake in Nakai, Icon. Pl. As. Orient. 2: 97-100, pl. 42 (1937) and 2: 173-176 & 192, pl. 65. 1938; Satake, Journ. Jap. Bot. 14: 264. 1938; Terazaki, Zoku Nipp. Syokubutu Zuhu fig. 3712. 1938; Little, Am. Midl. Nat. 19: 378. 1938; Sugawara, Illustr. Fl. Saghal. 2: 517, pl. 241. 1939; Honda, Nom. Bot. Pl. Jap. 461-463. 1939; Fern., Rhodora 43: 211. 1941; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145, 158, 235, 310, 483, & 501. 1941; Karling, Torreya 41: 106. 1941; Pool, Fls. & Flow. Pl., ed. 2, 295 & 407, fig. 189. 1941; Erlandsson, Arkiv Bot. 30B (2): 1-4. 1942; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 31: 65-71. 1944; Moldenke, Phytologia 2: 220 & 349-352. 1947; Govindu, Journ. Mysore Univ. 10 (1): 4. 1949; Thirumalachar, Razi, & Swamy, Journ. Mysore Univ. 9 (5): 82. 1949; K. Jessen, Proc. Roy. Irish Acad. 52B: 173, [174], 193, 202, & 249-250, pl. 4, fig. 56 & 57. 1949; H. E. Jaques, Pl. Fam., ed. 2, 96, fig. 289. 1949; Razi, Journ. Mysore Univ. 11 (1): 6 (1950) and 11 (2): 29. 1950; Van Steenis, Bull. Jard. Bot. Buitenz., sér. 3, 18: 460-461. 1950; Razi & Govindu, Journ. Mysore Univ. 12 (9): 107. 1952; Satake, Journ. Jap. Bot. 27: 268. 1952; R. S. Lamotte, Geol. Soc. Am. Mem. 51: 157. 1952; Butters & Abbe, Rhodora 55: 136. 1953; E. J. Salisb., Ind. Kew. Suppl. 11: 38, 88, 133, 157, 175-176, 244, & 272. 1953; Thorne, Am. Midl. Nat. 52: 281. 1954; Hand, Bull. Torr. Bot. Club 81: 92. 1954; [Wiltshire], Rev. Appl. Myc. Ind. Fungi 1: 39, 50, & 393. 1954; E. Müll., Phytopath. Zeitschr. 23: 108-109. 1955; Razi, Proc. Nat. Inst. Sci. India 21B (2): 82 & 85. 1955; Koyama, Journ. Jap. Bot. 31: 6-11, fig. 3. 1956; Linderoth, Faunal Con. Ex. & N. Am. 240, 241, & 250. 1957; Anon., Algonquin Prov. Park Mus. Check-

list 7. 1957; Viennot-Bourgin, Bull. Soc. Bot. France 104: 271 & 273—275, fig. 2D & 3. 1957; A. & D. Löve, Bot. Notiser Lund 111: 380—381 & 387. 1958; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145, 158, 235, 310, 483, & 501. 1959; A. Löve, Rhodora 61: 31. 1959; Sparrow, Aquat. Phycomycet., ed. 2, [Univ. Mich. Stud. Sci. 15:] 376 & 1095. 1960; Nath, Bot. Surv. South. Shan States 9, 20, & 62. 1960; Anon., Billie Bear Plant List 3. 1961; Moldenke, Bol. Soc. Venez. Cienc. Nat. 23: 99—100. 1962; Seerwani, Bull. Bot. Surv. India 4: 230. 1962; J. M. Gillett, Canad. Field Nat. 77: 139. 1963; [Wiltshire], Rev. Appl. Myc. Ind. Fungi 2: 327, 329, 355, 356, 359, 404, 410, & Cum. Ind. 202. 1963; S. K. Maheshwari, Bull. Bot. Surv. India 5: 138. 1963; Henry & Buker, Trillia 12: 105 & 131. 1964; Roland & Sm., Proc. Nova Scot. Inst. Sci. 26 (2): 191—192, fig. 476, map 173. 1964; Panigrahi, Chowdhury, Raju, & Deka, Bull. Bot. Surv. India 6: 241 & 260—261. 1964; Steinberg in Komarov & Schischkin, Fl. U. S. S. R., Engl. transl., 3: 392—395 & 512. 1964; Rouleau in Marie-Vict., Fl. Laurent., ed. 2, 83, 90, 546, 674, 679, 680, 837, & 857, fig. 244. 1964; Van Steenis & Jacobs, Fl. Males. Bull. 20: 1359. 1965; Tatew. & Itô, Journ. Jap. Bot. 40: 156—157. 1965; Hartley, Univ. Iowa Stud. Nat. Hist. 21: 150. 1966; Griffith & Hyland, U. S. Dept. Agr. Pl. Inventory 166: 184 & 386. 1966; F. H. Montgomery, Pl. from Sea to Sea 4, 9, & 390, fig. 822. 1966; Lourteig, Taxon 15: 31. 1966; Panigrahi, Bull. Bot. Surv. India 8: 13. 1966; Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 7, 168, 223, 224, 349, 396, 417, 418, 620, 647, 758, 950, 1057, 1091, & 1092. 1966; S. V. Ramaswami, Stud. Flow. Pl. Bangalore [thesis] 219—223 & 1406—1407. 1966; Sebastine & Henry, Bull. Bot. Surv. India 8: 310. 1966; Anon., Ind. Bibliogr. Bot. Trop. 4 (1): 18, 53, & 88. 1967; H. C. D. de Wit, Plant World High. Pl. 2: 256—257. 1967; Sterling, Outer Isl. 159, [161], 167, & 179. 1967; E. L. Braun, Vasc. Fl. Ohio 1: 308—310. 1967; E. G. Voss, Mich. Bot. 6 (2): 41 & 46, fig. 6. 1967; Adam, Adansonia 8: 445. 1968; Backer & Bakh., Fl. Java 3: 25—26. 1968; W. C. Grimm, Recog. Flow. Wild Pl. 36—37. 1968; Hinds & Hathaway, Wildfls. Cape Cod 116, 117, & 168, fig. 107. 1968; Moldenke, Phytologia 18: 241—280 & 295—328. 1969; Anon., Biol. Abstr. 50 (5): S.67 (1969) and 50 (6): S.65 & 189. 1969; Moldenke, Biol. Abstr. 50: 2584 & 3108. 1969; Anon., Torr. Bot. Club Ind. Bot. Lit. 3: 303—310. 1969.

The Stone (1912) reference in the bibliography above is often cited as "1911", but the work in question was not actually issued until January 26, 1912. Similarly, the Erlandsson (1942) reference is often cited as "1940", but the part in question was not actually issued until February 25, 1942. The Ruhland work (1901) cited above is often cited as "1902", but was actually issued on July 2, 1901 — the "1902" is merely the volume title-page date.

De Wit (1967) gives "1200 species in 13 genera" as the statistics for this family. Actually, there are 1467 specific and subspecific taxa recognized by me as valid as of this date.

ERIOCAULON NEPALENSE Prescott

Emended synonymy: Eriocaulon nepalense Bong. apud C. Müll. in Walp., Ann. 5: 926 & 938. 1860.

Additional & emended bibliography: C. Müll. in Walp., Ann. 5: 926 & 938 (1860) and 6: 1171. 1861; Moldenke, Phytologia 18: 264, 274, & 328. 1969.

Completing the description by Kunth (1841), begun on the last page of my previous installment of these notes: "sepalis...feminis....eglandulosis. E. quinquangulare e Nepalia Wall. Cat. no. 6072. c. — Nepalia. — Folia late linearia, obtusiuscula, plana, laete viridia, 1 1/2 — 2-pollicaria, inferne vix 2 lineas lata. Vaginae laxae, laete virides, glabrae, apice acutae et hyalino-albidae, 1 — 1 1/2-pollicares. Pedunculi 3 — 4 3/4-pollicares. Capitula hemisphaerica, magnitudine grani minoris piperis nigri. Bracteae involucentes obovatae, apice rotundatae, convexae, tenuiter arido-membranaceae, stramineo-subcinerascentes, glabrae, capitulo dimidio breviores; bracteae flores stipantes rhombocuneatae, subacuminatae, cinerascentes, ad apicem dorso pilosae. Flores masculi longe pedicellati: Sepala 3 exteriora subspathulata, obtusa, cinerascens, superne pilosa, subaequalia: lateralia carinata; 3 interiora in tubum brevem infundibularem, irregulariter trilobum glabrum connata; lobis parvis, eglandulosis, antico majore, ciliato. Stamina 6, inaequalia. Antherae biloculares, subdidymo-reniformes, nigro-fuscae. Pistilla rudimentaria 3, subconica, nigra. Flores feminei (juveniles): Sepala 6? lanceolato-linearia, margine piloso-ciliata, eglandulosa; exteriora longiora?. Ovarium subrotundo-ovatum, tricocum. Stylus elongatus. Stigmate 3, capillacea, simplicia. E. luzulaefolio proximo, nil nisi hujus forma? An planta nostra vere eadem ac Prescottiana?"

Fyson (1921) says "E. nepalense Prescott (Fide Clarke No. 44827 in Herb. Calc.); F. B. I. vi 581, No. 32; Ruhland No. 130. Stem short or 0. Leaves flaccid, flat, tapering from 1/8 — 1/4 in. base, 2—3 in. long, acute. Scapes many, twice as long. Heads 1/6 — 1/4 in. nearly globular when mature. Involucral bracts black acute, receptacle glabrous. Sepals 3 all boat-shaped. Female petals narrow hairy, seeds oblong with pappilose ribs. Plate 6. Assam; Khasia: and 'from Garwhal to Sikkim.' (F. B. I.) I have not seen the type sheet and am relying on Clarke's plant quoted above, which appears to agree with the description in the F. B. I. The female petals in it have glands, but Ruhland (l.c.) says of the species that there are no glands."

It should be noted that the E. quinquangulare of Linnaeus, referred to in the synonymy above, is a valid species, with the homonym accredited to Wight as a synonym, while the E. quinquangulare credited to Martius and to Willdenow are synonyms of E. sollyanum Royle, that accredited to Heyne is E. cristatum Mart., and that accredited to Bojer is an as yet undetermined Madagascar species of the genus. The original Bongard description of E. nepalense is sometimes cited as "Act. Petrop. Sci. Math., ser. 6,

6: 610" and sometimes as "Mém. Acad. Pétersb., sér. 6, 1: 610". The initial letter of the specific epithet is often uppercased. In the original description Bongard actually does not seem to credit the binomial to Prescott. He merely states that Prescott collected the specimen. However, he does not place his own surname after the binomial anywhere, as far as I can ascertain, so perhaps Jackson (1895) had some valid reason for changing the accreditation in the "Index Kewensis" from Bongard to Prescott. He dates the original publication of E. viride as "1854", instead of 1856.

Recent collectors have found E. nepalense growing along streams and in moist places on riverbanks, at altitudes of 2100 to 2830 meters. Ramaswamy found the plant growing "between dripping rocks" on wind-exposed mountaintops and also "completely submerged under water in a huge pond.... Only the heads appeared above the surface of the water. It was invariably associated with a species of Isoetes", at altitudes of 5000 to 5500 feet. He notes that "This plant seems to be a perennial measuring 4-12 inches in height". The mountaintop collection bears a notation that it was growing among grasses, a few sedges, and E. odoratum Dalz. He collected the species flowering and fruiting in October.

Material has been misidentified and distributed in herbaria as E. luzulaefolium Mart. and as E. quinquangulare L. On the other hand, the Saulière 71, distributed as E. nepalense, is actually E. leucomelas Steud.

Additional citations: NEPAL: Poelt s.n. [12.10.1962] (Mu); Wallich 6072c (B). INDIA: East Punjab: Koelz 3032 (N), 10237 (Ml). Khasi States: Hooker & Thomson s.n. [Mont. Khasia] (Br, Ut--310). Mysore: Ramaswamy 1 (Z), 4 (Ac). State undetermined: T. Anderson s.n. [Grand Trunk Road, 11/58] (Br). LOCALITY OF COLLECTION UNDETERMINED: Herb. Martius 85 (Br).

ERIOCAULON NIGERICUM Meikle

Bibliography: Meikle, Kew Bull. 1950: 231. 1950; Meikle & Baldwin, Am. Journ. Bot. 39: 45, 46, & 50, fig. 1-8. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 137, 138, & 482. 1959; Moldenke, Résumé Suppl. 4: 6. 1962; Hambler, Journ. Ecol. [Brit.] 52: 581. 1964.

Illustrations: Meikle & Baldwin, Am. Journ. Bot. 39: 46, fig. 1-8. 1952; Hambler, Journ. Ecol. [Brit.] 52: 581. 1964.

This plant has been found growing on rock outcrops, flowering and fruiting in August, September, and November. Meikle & Baldwin (1952) cite in addition to the specimens I have seen of those collections: LIBERIA: J. T. Baldwin Jr. 9145 (K, Mu, S), 9456 (K, Mu, S), 10088 (K, S), 10336 (K, S). They say "Otherwise known only from the type locality in Nigeria". It is, however, also known from Mali and Guinea.

Citations: MALI: Soudan: Collector undetermined s.n. [Kankan, Octobre 1944] (An). GUINEA: Arrieu 231 [Herb. Chillou 3140] (An). LIBERIA: J. T. Baldwin Jr. 9145 (N), 9456 (N), 10088 (N), 10336 (N).

ERIOCAULON NIGRICEPS Merr.

Bibliography: E. D. Merr., *Philip. Journ. Sci. Bot.* 10: 290. 1915; Prain, *Ind. Kew. Suppl.* 5, pr. 1, 97. 1921; Moldenke, *Known Geogr. Distrib. Erioc.* 27 & 37. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 141 & 205. 1949; Moldenke, *Résumé* 184 & 482. 1959; Prain, *Ind. Kew. Suppl.* 5, pr. 2, 97. 1960; Moldenke, *Phytologia* 18: 300. 1969.

Material of this species has been misidentified and distributed in herbaria under the name of *E. sieboldianum* Sieb. & Zucc.

Citations: WESTERN PACIFIC ISLANDS: PHILIPPINE ISLANDS: Luzon: E. D. Merrill 7748 (S); J. K. Santos s.n. [*Herb. Philip. Bur. Sci.* 31747] (B, Z).

ERIOCAULON NIGRUM H. Lecomte

Synonymy: *Eriocaulon kaikoensis* Masamune, *Trans. Nat. Hist. Soc. Formosa* 33: 25—26. 1943. *Eriocaulon kaikoense* Masamune apud E. J. Salisb., *Ind. Kew. Suppl.* 11: 88. 1953. *Eriocaulon kaikoense* Masamune apud Koyama, *Philip. Journ. Sci.* 84: 373, in syn. 1956. *Eriocaulon nigrum* var. *nigrum* (H. Lecomte) Koyama, *Philip. Journ. Sci.* 84: 373, in syn. 1956.

Bibliography: H. Lecomte, *Journ. de Bot.* 21: 89 & 107—108. 1908; Prain, *Ind. Kew. Suppl.* 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Masamune, *Trans. Nat. Hist. Soc. Formosa* 33: 25—26. 1943; Moldenke, *Known Geogr. Distrib. Erioc.* 26 & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 136 & 205. 1949; E. J. Salisb., *Ind. Kew. Suppl.* 11: 88. 1953; Koyama, *Philip. Journ. Sci.* 84: 373 & 378. 1956; Moldenke, *Résumé* 174, 176, 289, 290, & 482. 1959; Moldenke, *Résumé Suppl.* 17: 13. 1968.

The type of *E. kaikoensis* was collected by Genkei Masamune and Noriaki Fukuyama (no. 322) between Suyuei and Kaiko, Hainan Island, on December 17, 1940, and is deposited in the herbarium of the University of Tokyo. Masamune (1943) cites also Masamune & Fukuyama 722 from Hainan, and records the vernacular name "kaiko-hosikusa". Koyama (1956), for *E. nigrum*, cites Hayata s. n. from Annam, Indochina, and says that the species is also known from Tonkin. His comments are "Through the courtesy of Mr. Keng, I was able to examine the type specimen of Dr. Masamune's *E. kaikoense* (Masamune & Fukuyama 322!). According to original description published in the Transactions of the Natural History Society of Formosa, *E. kaikoense* appears to be a smaller plant of *E. nigrum* reported from Tonkin. Our Annam plants are a little larger than Lecomte's specimen."

ERIOCAULON NIGRUM var. **FUSCESCENS** Koyama

Bibliography: Koyama, *Philip. Journ. Sci.* 84: 373 & 378, pl. 6, fig. E. 1956; Moldenke, *Résumé* 176 & 482. 1959.

Illustrations: Koyama, *Philip. Journ. Sci.* 84: pl. 6, fig. E. 1956.

Koyama (1956) describes this taxon as follows: "A typo caule

breviter evoluto, foliis latoribus, pedunculis gracilioribus, capitula floribusque pallide fuscescentibus non nigrescentibus praecipue distat."

The type of the variety was collected by Bunzō Hayata at Nhatrang, Annam, Indochina, now Vietnam.

ERIOCAULON NILAGIRENSE Steud.

Synonymy: Eriocaulon brownianum Hook. f. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 76 & 285, in syn. 1903 [not E. brownianum R. Br., 1959, nor Mart., 1832, nor Wall., 1832]. Eriocaulon brownianum var. nilagirense Steud. ex Fyson, Journ. Indian Bot. 2: 262. 1921. Eriocaulon brownianum var. nilagirense Fyson apud Razi, Journ. Mysore Univ. B.14 (10): 460. 1955. Eriocaulon brownianum "Mart., in part" apud C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1127, in syn. 1956. Eriocaulon nilagirense Steud., in herb.

Bibliography: Steud., Syn. Pl. Glum. 2 [Cyp.] : 271. 1855; C. Mill. in Walp., Ann. 5: 926 & 942—943 (1860) and 6: 1171. 1861; Hook. f., Fl. Brit. Ind. 6: 576. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 76, 285, & 286. 1903; Fyson, Fl. Nilg. & Puln. Hill-tops 1: 427 & 429—430 (1915) and 2: pl. 273. 1915; Fyson, Journ. Indian Bot. 2: 262—264. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1609 & 1619. 1931; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23, 24, 33, & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126, 129, 130, & 205. 1949; Razi, Journ. Mysore Univ. B.14 (10): 460. 1955; Razi, Contrib. Bot. 40: 92. 1955; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1122, 1127, & 1333. 1956; Moldenke, Résumé 162, 165, 167, 286, & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 3: 17. 1962; Thanikaimoni, Pollen & Spores 7: 184. 1965; Moldenke, Phytologia 17: 455 (1968) and 18: 170 & 275. 1969.

Illustrations: Fyson, Fl. Nilg. & Puln. Hill-tops 2: pl. 273. 1915; Fyson, Journ. Indian Bot. 2: 263. 1921.

Forrest describes this plant as growing 2 1/2 feet tall; other collectors describe the heads as gray or grayish-white. It has been found growing in old fields, boggy pastures by streams, grasslands, and rice fields, at altitudes of 3000 to 7000 feet, flowering and fruiting in May and August.

Fyson (1915) describes E. nilagirense as follows: "F.B.I. vi 576 included in E. brownianum, but not Wall. Cat. 60661; I 18*; Black-backed Giant Hatpin-flower, Honey-scented. Rhizome as thick as the finger, with two or three flower-stalks only. Leaves linear-oblong, acute, 6 to 12 by 1/3 to 1/2 inches, translucent, hairy. Peduncle about twice as long, ribbed and hairy, not much twisted: sheath 6 inches, with very long open mouth (1 to 1 1/2 inches), acute, translucent, with a tuft of hairs at the extreme base. Involucral bracts, oblong-ovate, obtuse, black, but covered

with white silky hairs and so almost grey: floral bracts oblanceolate-cuneate, hairy on the back of the triangular, not acuminate end. Male flowers:— Sepals black 1/8 inch, oblong or elliptic, obtuse, free, but connate into a sheath split open in front, glabrous except for a fringe of white hairs at the end. Petals connate into trumpet-shaped corolla, with small, very acute lobes, ciliate only at the tips. Stamens six; anthers oblong, black. Female flowers:— Sepals three, free, boat-shaped with decided ciliate keel, fitting by concave bases over the cells of the ovary. Petals very slender, linear except for the slightly dilated tips, fringed at the obtuse end with stout white hairs, and villous below with long silky hairs, each with a black gland. Each nutlet in fruit enclosed by the base of a sepal, the rest of which forms a slightly twisted wing. t. 273. In damp places. Pulneys: on the Kodaikanal downs. Flowers in September. Fyson 1078, 2083. Bourne 687, 1743.* Nilgiris: Hohenacker 953!; type is No. 950, not seen. The use of the sepal as a wing to the nutlet has not I believe been described before. E. brownianum Wall. Cat. 6066 is a Silhet plant and has smooth, smaller, light brown involucreal bracts."

The same author, in his 1921 work, discusses the taxon as follows: "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. See Fig. p. 263. S. India and Ceylon at high elevations. Very common in semi-dry or marshy land at about 7000 ft., forming usually dense tufts a foot or more across. The flowers smell strongly of honey and are visited by small butterflies. The name suggests that this is a variety confined to these regions but in Herb. Calcutta are sheets from Khazia hardly if at all different. Hooker was the first I think to reduce Steudel's species to E. Brownianum Mart. Koernicke considered it closest to E. Wightianum."

Fischer (1956) calls this taxon E. brownianum var. nilagirensis Fyson, which he cites to Fyson, Journ. Indian Bot. 2: 263, with a figure on p, 263. Fyson, however, credits the trinomial to Steudel.

Hohenacker 953 in the Stockholm herbarium, and elsewhere, is inscribed "Eriocaulon nilagirensis Steud. n. sp." on its printed labels, but Steudel gives the type collection as number "950"; perhaps this is a typographic error on his part. The initial letter of the specific epithet is often uppercased.

It should be noted here that the E. brownianum Mart., referred to in the synonymy above, is a valid species, with the homonyms accredited to Brown and to Wallich as synonyms.

Material of E. nilagirensis has been misidentified and distributed in herbaria under the names E. brownianum Mart. and E. hexangulare L. On the other hand, the Herb. Univ. Mich. s.n. [Mountains of India], distributed as E. nilagirensis, is actually

E. brownianum Mart.

Additional citations: INDIA: Assam: Cham 1550 (Mi), 1731 (Mi), 7712 (Mi); Chand 7998 (Mi). Madras: Bembower 33 (Mi), 34 (Mi), 429 (Ca—495797, N); Collector undetermined s.n. [M. Nilagiri] (Ca—2416); G. S. Gough s.n. [Mont. Nilgherry] (S); Hohenacker 953 (B, Mu—220, Mu, Mu, N, S, Ut—311), s.n. [in mont. Nilgiri] (B, B); C. McCann 50179 (N, Xa), 50180 (N, Xa), B.1225 (Xa). Mysore: Shetty 53 (Bn—3176). State undetermined: Herb. Heyne 4 (Br); R. Wight 2859 (Mu—330, S), s.n. [Ind. or.] (V—41269, V—41342, V—41346). CEYLON: Hosseus 41 (Mu—397); Thwaites C.V.378 (B). CHINA: Yunnan: G. Forrest 12002 (Ca—230875).

ERIOCAULON NIPPONICUM Maxim.

Synonymy: Eriocaulon decemflorum var. nipponicum (Maxim.) Nakai in J. Matsumura, Icon. Pl. Koisikav. 2: 47. 1914. Eriocaulon decemflorum Komarov apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 17 & [86], in syn. 1940 [not E. decemflorum Maxim., 1893]. Eriocaulon decemflorum var. nipponicum Nakai apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, 12, 15, 16, 41, 71, 78, & [86], fig. 1B & 2C. 1940. Eriocaulon decemflorum var. nipponicum f. typicum Nakai ex Satake in Nakai & Honda, Nov. Fl. Jap. 6: 17 & [86]. 1940. Eriocaulon decemflorum var. nipponicum f. yoshinoi Nakai ex Satake in Nakai & Honda, Nov. Fl. Jap. 6: 17 & [86]. 1940. Eriocaulon nipponicum f. yoshinoi Nakai ex Satake in Nakai & Honda, Nov. Fl. Jap. 6: 15 & 87. 1940. Eriocaulon nipponicum f. yosinoi Nakai apud Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 8, in syn. 1940. Eriocaulon decemflorum var. nipponicum f. yosinoi Nakai apud Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 8. 1940. Eriocaulon franchetianum Körn. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959. Eriocaulon nipponicum var. gracile Ruhl. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959.

Bibliography: Maxim., Dec. Pl. Asiat. 8: 9. 1893; Mak., Bot. Mag. Tokyo 8: 506—507. 1894; Komarov, Fl. Mansh. 1: 418. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 38, & 286. 1903; C. H. Wright, Journ. Linn. Soc. Lond. Bot. 36: 200. 1903; J. Matsumura, Ind. Pl. Jap. 2 (1): 176. 1905; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 501. 1906; Nakai, Journ. Coll. Sci. Imp. Univ. Tokyo 31: 282. 1911; Nakai in J. Matsumura, Icon. Pl. Koisakav. 2: 47. 1914; Nakai in Mak. & Nemoto, Fl. Jap., ed. 1, 1306. 1925; Ruhl., Notizbl. Bot. Gart. Berlin 10: 1043. 1930; Nakai in Mak. & Nemoto, Fl. Jap., ed. 2, 1513. 1931; Miyabe & Kudo, Journ. Fac. Agr. Hokkaido Imp. Univ. 27 [Fl. Hokk. & Saghal. 3]: 286. 1932; Tu, Chinese Bot. Dict., abrdg. ed., 1351. 1933; Nemoto, Fl. Jap. Suppl. 1039. 1936; E. D. Merr. & Metc., Lingn. Sci. Journ. 16: 79. 1937; Satake, Journ. Jap. Bot. 14: 264. 1938; Honda, Nom. Pl. Jap. 462. 1939; Mak., Illustr. Fl. Jap. 771 & E.26, fig. 2313. 1940; Sata-

ke in Nakai & Honda, Nov. Fl. Jap. 6: 1, 6, 7, 12, 15--17, 41, 71, 78, [86], & 87, fig. 1B, 2C, & 6. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 5--9. 1940; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158 & 501. 1941; Moldenke, Known Geogr. Distrib. Erioc. 25 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108, 132--134, & 205. 1949; Moldenke, Phytologia 3: 336. 1950; Moldenke, Résumé 132, 167, 170, 171, 173, 287, & 482. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158 & 501. 1959; Moldenke, Résumé Suppl. 1: 12 & 17 (1959) and 3: 31. 1962; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 429. 1964; Thanikaimoni, Pollen & Spores 7: 182. 1965; Moldenke, Résumé Suppl. 17: 10. 1968; Moldenke, Phytologia 17: 454 (1968) and 18: 47. 1968.

Illustrations: Mak., Illustr. Fl. Jap. fig. 2313. 1940; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, & 16, fig. 1B, 2C, & 6. 1940.

According to Inami, this species differs from E. decemflorum Maxim. "by large habit, pilose receptacle and obtusish tip of involucre scale", while Satake (1940) says "A var. genuino differt planta robustiore usque 30 cm alta, foliis multi-nervatis capitulis magnis 5 mm longis 6--7 mm latis bracteis sepalis petalisque dense albo-barbatis". Koyama notes that it is the "most common Eriocaulon in Japan, very polymorphous". Tsang reports it "abundant" on the mainland, in Kwangtung, China. Miyabe & Kudo (1932) record it from Hokkaido. Satake (1940), however, notes that "so many intermediate forms are met with in the field that it is difficult to distinguish E. decemflorum Maxim. from E. nipponicum Maxim. The writer agrees with Prof. Nakai's opinion that the two plants belong to one and the same species."

It has been found growing in meadows and bogs, swampy fields and meadows, very wet places at the sides of ricefields, in moist acid soil at the edge of small pools, in swamps and subalpine region swamps, and growing in loam or silt soil, flowering and fruiting from August to October. Vernacular names recorded for it are "ito-imunohige", "ito-imuno-hige", and "koimunohige". Nakai's f. yoshinoi is a form with abortive flowers. Franchet 3070 appears to be the type collection of E. franchetianum Körn., and Wichura 708 is the type of E. nipponicum var. gracile Ruhl., the holotypes in both cases deposited in the herbarium of the Botanisches Museum at Berlin, where these two taxonomists worked.

The E. nipponicum Körn., referred to in the synonymy above, is a synonym of E. buergerianum Körn., while E. nipponicum Tatem. is E. perplexum Satake & Hara. It should be noted here that Merrill (1937), Ruhland (1903), and Satake (1940) all give "1892" as the date of Maximowicz's original publication, while Durand & Jackson (1902) cite it erroneously to Bull. Acad. Sci. St. Pétersburg. This part of Maximowicz's work was apparently only issued separately.

Material of E. nipponicum has been misidentified and distributed in herbaria under the names E. decemflorum Maxim., E. decem-

lobflorum Maxim., E. parvum Körn., E. sikokianum Maxim., and Juncus prismaticarpus R. Br. Tsang 21681b is a mixture with a species of Rhynchospora.

Satake (1940) cites the following collections, mostly deposited in the herbarium of the Royal Botanic Gardens at Kew: KOREA: Boku s.n. [Kyurei, Aug. 1932]; Faurie 892; Kitamura 1820; Koidzumi s.n. [Hokkan-zan, Aug. 1932] & s.n. [Kangaku-zan, Aug. 1932]; Mori 59; Nakai 2899, 2930, 3113, 3114, & 6003; Nomura 13 & s.n. [Seiz-yori, Sep. 1935]; Okamoto s.n. [Titsan, Sept. 1934]; Tyo 110; Utiyama s.n. [Hokkan-zan, Oct. 1900]. KOREAN COASTAL ISLANDS: Quelpart: Faurie 1427 & 1429. Saisyŭ-tŏ: Isidoaya 76; Taquet 1538, 1541, & 9172. JAPAN: Honshu: Ando 28; Collector undetermined 19, 3596, 14499, 17066, 17153, 23741, 23742, 32720, & s.n. [Hamanosiba, Sept. 1880]; Faurie 7, 1242, 1865, 1874, 2728, 6546, 7200, 7202, 13782, 13809, & 13811; Hasimoto 57458; Hattori s.n. [Notomura, Sept. 1925] & s.n. [Miharu]; Hayata 17061 & 17063; Hermi 1108; Hosomi 52041; Iisiba 49451; Imai 5; Itŏ s.n. [Seiman-mura, Nov. 1933] & s.n. [Nikko]; Iwabuti 5430; Kato 4280; Kikuti 38233; Koidzumi s.n. [Yonezawa, Aug. 1906] & s.n. [Azumayama, Sept. 1929]; Maekawa 6629; Matuyama s.n. [Kanŏmizu, Oct. 1929]; Misono 52703; Miura s.n. [Mobara, Jul. 1911]; Murai 145; Nakai s.n. [Mitake, Oct. 1911] & s.n. [Hakone, Sept. 1929]; Nakazima s.n. [Tanabe, Oct. 1924] & s.n. [Sinzyŏ-mura, Oct. 1925]; Nikai 2374 & 49449; Numazira s.n. [Hutyu, Oct. 1935]; Okuyama 26 & 27; Ono 42438; Ooba 159; Saito 46; Sakaguchi 104; Sakai 42439; Sakurai 3595; Siobara 40337; Sioya s.n. [Hokunŏ-mura, Aug. 1928]; Sirakami 23127; Sugimoto 23812; Suzuki 52042 & s.n. [Kassiyama, Jul. 1930]; Tagaki s.n. [Toyone-mura, Aug. 1928]; Tanaki s.n. [Sendai, Sept. 1914]; Tasiro s.n. [Yamato, Aug. 1912]; Tiba s.n. [Itinoseki, Sept. 1910]; Toba 94; Tuboi s.n. [Yamato-mura, Oct. 1930]; Uemura s.n. [Tomobuti, Oct. 1932]; Watanabe s.n. [Simura, Sept. 1899]; Yamahara s.n. [Yanai, Aug. 1915]; Yamasita 39; Yosikawa 57459; Yosino s.n. [Sengokudani, Oct. 1910]. Kiushu: Collector undetermined s.n. [Buzen, Sept. 1880]; Doi 39; Kozuma 23126; Masamune s.n. [Kagosima]; Mayebara 9 & H.361; Nabesima 27; Nakasima 39 & 40; Sugihara s.n. [Kosiroyama, Sept. 1924]; Suzuki 7; Tasiro 28772, s.n. [Narukawa-mura, Aug. 1907], s.n. [Oohuna-yama, Aug. 1911], s.n. [Tahira-mura, Aug. 1911], s.n. [Zyusso-yama, Aug. 1917], s.n. [Kaziki, Oct. 1917], s.n. [Imuda-ike, Oct. 1918], s.n. [Yuhara, Jul. 1921], s.n. [Seto, Sept. 1921], s.n. [Kanadate-mura, Oct. 1921], s.n. [Hazuki-mura, Sept. 1922], & s.n. [Sinagawanagisa]; Tiba 8 & 10; Tokunaga 5; Yamasita s.n. [Agemine-mura]. Shikoku: Faurie 11866; Kusumoto s.n. [Haramati-mura]; Nikai 49450; Ogata s.n. [Tatekawa, Sept. 1925] & s.n. [Matumaru, Sept. 1926]; Oti 4 & 6; Yaki 38232; Yamasita s.n. [Omaki-mura, Oct. 1930] & s.n.

[Utiko].

Additional citations: CHINA: Chekiang: E. Faber 205 (B, N), s. n. (E); Keng 953 (Ca). Kwangtung: W. T. Tsang 21681b (Ca—23639, Mi, N, S). Manchuria: H. Bohnhof 309 (N). Province undetermined: Tsoong 4403 (Ca—225807). KOREA: Faurie 4428 (V—905). KOREAN COASTAL ISLANDS: Quelpart: Faurie 4429 (V—922). WESTERN PACIFIC ISLANDS: JAPAN: Honshu: E. Elliott 128 (Mi); Faurie s.n. [Kausikawa, 1894] (S); Franchet 3070 (B); Furuse s.n. [Fukuyama, 3 Oct. 1952] (S), s.n. [Imoto-mura, 16 Sept. 1954] (S), s.n. [16/IX/1954] (Ss), s.n. [Gyoonin-bara, 27 Sept. 1955] (S, S, S), s.n. [Orimoto-tooge, 28 Sept. 1955] (S), s.n. [Sara-mura, 6 Oct. 1955] (S), s.n. [Hikusa-mura, 20 Oct. 1955] (S), s.n. [2 July 1956] (S), s.n. [17 Sept. 1956] (S), s.n. [23 Oct. 1956] (S), s.n. [21 Sept. 1957] (S), s.n. [22 Sept. 1957] (S), s.n. [28 Sept. 1957] (S), s.n. [26 Sep. 1960] (S); Hayakawa s.n. [Koonodai, 1904] (S); Inami s.n. [8 September 1954] (Ss); Kawagoe s.n. [Sept. 30, 1906] (Kg); Koyama 13000 (Z); Murata 6688 (Ut—81635b); Ohwi 165 (Go), s.n. [26.X.1930] (N, N); Ohwi & Koyama 137 (Ca—932892, Go, Kg, Mg, Mi, N, S, Vi); Savatier 1362 (B); Suzuki s.n. [Sept. 24, 1951] (Ca—942044); Uyezuki s.n. [Aug. 1912] (Kg); Wawra 4407 (V); Yasuda s.n. [Sendai, Oct. 3, 1917] (S). Kiushu: Collector undetermined s.n. [Kagoshima City] (Kg); Ishada s.n. [Oct. 13, 1920] (Kg); Kawagoe s.n. [Higo, Oct. 10, 1924] (Kg); Naito s.n. [Sept. 7, 1926] (Kg); Rein s.n. [Aidzu] (Mu—349); Suzuki 93 (Ws). Island undetermined: Kayakawa s.n. [1904] (S). LOCALITY OF COLLECTION UNDETERMINED: Wichura 708 (B).

ERIOCAULON NIPPONICUM var. GLABERRIMUM Satake

Synonymy: Eriocaulon decemflorum var. nipponicum f. glaberrimum Satake in Nakai & Honda, Nov. Fl. Jap. 6: 17 & [86]. 1940.

Bibliography: Satake, Journ. Jap. Bot. 44: 264. 1938; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 15, 17, [86], & 87. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 8—9. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949; Moldenke, Résumé 173, 287, & 482. 1959; Moldenke, Phytologia 18: 47. 1968.

This variety differs from the typical form of the species only in having the receptacle completely glabrous.

It is based on H. Iwabuti 5419, 5420, 5421, 5425, 5427, 5428, 5432, 5434, 5447, 5448, 5452, & 5459 and Y. Satake s.n. [Huzi-wara-mura, Sept. 1933]. It is apparently endemic to the central and northern portions of Honshu Island, Japan, and is known there as "oku-itoinunohige".

Satake (1940) cites the following collections from Honshu: Collector undesignated s.n. [Aizu, Aug. 1880]; Hisauti 2453; Iwabuti 2984, 5366, 5419, 5420, 5421, 5425, 5427, 5428, 5432, 5434, 5447, 5448, 5452, & 5459; Kato 83033 & 83035; Koidzumi 106, 1140,

4940, 10684, 13405, 34739, 34900, 34901, 52347, 52472, 52473,
52474, 55797, & 55798; Maekawa 6749, 6839, & 10031; Miyabe s.n.
[Sept. 1893]; Okazaki s.n. [Aug. 1937]; Takahasi s.n. [Sept. 1897].

ERIOCAULON NOSORIENSE Ohwi

Bibliography: Ohwi, Bot. Mag. Tokyo 44: 567. 1930; Mak. & Nemoto, Fl. Jap., ed. 2, 1513. 1931; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Nemoto, Fl. Jap. Suppl. 1039. 1936; Honda, Nom. Fl. Jap. 462. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 13, 70, 81, & 87, fig. 36. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 58—59, pl. 10, fig. 20. 1940; Moldenke, Known Geogr. Distrib. Erioc. 25 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949; Koyama, Journ. Jap. Bot. 31: 6 & 7. 1956; Moldenke, Résumé 173 & 482. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 185 & 430. 1964.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 70, fig. 36. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 10, fig. 20. 1940.

The type of this species was collected by Jisaburo Ohwi at Nosori-no-ike, in the province of Kōzuke, Honshu, Japan, in September, 1929, and is deposited in the herbarium of Kyoto Imperial University. The only recorded vernacular name is "nosori-hosikusa". The species is known thus far only from the type collection.

ERIOCAULON NUDICUSPE Maxim.

Bibliography: Maxim., Diagn. Pl. Nov. Asiat. 8: 19. 1893; Mak., Bot. Mag. Tokyo 8: 506. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 65, 94, & 286. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 501. 1906; Mak. & Nemoto, Fl. Jap., ed. 1, 1306 (1925) and ed. 2, 1513. 1931; Tu, Chinese Bot. Dict., abrdg. ed., 308. 1933; Nemoto, Fl. Jap. Suppl. 1039. 1936; Honda, Nom. Jap. Pl. 462. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 1, 6, 7, 13, 53—55, 80, & 87, fig. 1J, 2G, 24, & 25. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 40—42. 1940; Mak., Illustr. Fl. Jap. 772 & E.26, fig. 2316. 1940; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 501. 1941; Moldenke, Known Geogr. Distrib. Erioc. 25 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949; Moldenke, Résumé 173 & 482. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 501. 1959; Hara, Outline Phytogeogr. Japan 60. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 182, 183, & 430, fig. 125 (1), pl. 48, fig. 307. 1964.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, 54, & 55, fig. 1J, 2G, 24, & 25. 1940; Mak., Illustr. Fl. Jap. fig. 2316. 1940; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 183, fig. 125 (1) & pl. 48, fig. 307 [in color]. 1964.

Satake (1940) notes that "This plant which is commonly known by people in the Provinces of Mikawa and Owari, as cut flowers or material for flower arrangements (Ikabana), is sold by florists dur-

ing the flower season (Autumn). It is said that children play with the niveous heads, which are dyed with various colours as ornamental hair-pins". The only recorded common name is "siratama-hosikusa". The plant has been collected in anthesis in September and October. Inami avers that it is "rare in moist places, very local", but Koyama says "abundant locally in marshy place along margin of large pool."

Satake (1940) cites the following collections from Honshu: Collector undesignated 3; Hattori s.n. [Sept. 1929]; Itô s.n. [Sept. 1891]; Koidzumi s.n. [Sakamoto]; Makino s.n. [Aug. 1889]; Matuyama 35027 & s.n. [Oct. 1929]; Satake s.n. [Sept. 27, 1938]; Siota 22.

Citations: WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Furuse s.n. [8 Oct. 1959] (S), s.n. [11 Oct. 1960] (S); Inami 956 (B, Ca—21979, Go, Mg, N, S), 13105 (Z); Koyama s.n. [20 Sept. 1955] (Ss).

ERIOCAULON OBTUSUM Ruhl.

Bibliography: Ruhl. in Engl., Pflanzreich 13 (4-30): 42, 46, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, Known Geogr. Distrib. Erioc. 8 & 38. 1946; Moldenke, Known Geogr. Distrib. Vernenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89 & 482. 1959.

The Eriocaulon obtusa Schult. is a synonym of Eleocharis obtusa (Willd.) Schult. in the Cyperaceae. Widgren 164, cited below, is a mixture with E. sellowianum Kunth. The Macbride photograph 10563 of the type specimen of E. obtusum in the herbarium of the Botanisches Museum at Berlin is erroneously inscribed "Ule 3137". The specimen of Ule 232 in the herbarium of the Muséum National d'Histoire Naturelle at Paris has two labels — the printed one indicates the locality of collection as "Goyaz", but another, in longhand, has that state name crossed out and "Minas Geraes" substituted. Silveira (1928) cites A. Silveira 623 from Minas Gerais. I am assuming that Widgren 164 was taken from cultivated material because the label gives "Jardim" as the locality of collection.

Material of E. obtusum has been misidentified and distributed in herbaria as E. sellowianum Kunth.

Citations: BRAZIL: Goiás: Macedo 3339 (N, S, W—2197098). Matogrosso: Lindman A.3055 (S, S); Malme 2259 (S). Minas Gerais: P. Clausen s.n. [1840] (S); Ule 232 [Herb. Mus. Nac. Rio Jan. 29529] (P, S). Rio de Janeiro: Ule 3157 [Macbride photos 10563] (B—type, N—photo of type, W—photo of type). CULTIVATED: Brazil: Widgren 164, in part (S).

ERIOCAULON ODASHIMAI Masamune

Bibliography: Masamune, Trans. Nat. Hist. Soc. Taiwan 33: 26. 1943; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé Suppl. 17: 5. 1968.

Masamune's original (1943) description of this taxon is: "Folia rosulata, pauca, lineari-lanceolata membranacea 1.0—1.5 cm longa ca. 1.5 mm lata apice acuminata. 3 nervia. Pedunculi 1—3, 4 costulati, tenues torti glabri ca. 3 cm alti; vaginae laxusculae, oblique fissae, tenues glabrae ca. 1 cm longae apice acuminatae; capitula glabra hemisphaerica, 4 mm lata; bracteae involucentes saepe 4 oblongo-lanceolatae glabrae hyalinae apice acuminatae 2.5—3 mm longae 1 mm latae; bracteae flores oblongo-spatulatae hyalinae ca. 2 m longae 0.8 mm latae. Fl. ♂: sepala 2 libera falcato-lanceolata hyalina purpureuscula ca. 1.3 mm longa ca. 1/4 mm lata; stamina saepe 4 anthera nigrae; flos ♀: sepala 3 lineari-lanceolata ca. 1 mm longa; petala nulla? germen 3 coccum; stylus germinis longior; stigmatibus 3, ca. 1.3 mm longa."

It is most probable that the length of the receptacular bractlets in the above description was intended to read "2 mm". The only recorded vernacular name for the species is "senke-hosikusa". The type was collected by K. Odashima — in whose honor it is named — between Gai and Senketo, Kainanto, Hainan Island, on December 8, 1940, and is deposited in the herbarium of Tokyo University. Thus far the species is known only from the original collection.

ERIOCAULON ODORATUM Dalz.

Synonymy: Eriocaulon odoratum Dolz ex H. Lecomte, Journ. de Bot. 21: 108, sphalm. 1908.

Bibliography: Dalz. in Hook., Journ. Bot. Kew Misc. 3: 280—281. 1851; Körn., Linnaea 27: 683. 1856; C. Müll. in Walp., Ann. 5: 927 & 945 (1860) and 6: 1171. 1861; Dalz. & Gibs., Bomb. Fl. 280. 1861; Hieron. in Engl., Nat. Pflanzenfam., ed. 1, 2 (4): 27. 1888; Hook. f., Fl. Brit. Ind. 6: 574. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 17, 103, 110, & 286. 1903; H. Lecomte, Journ. de Bot. 21: 107 & 108. 1908; Fyson, Journ. Indian Bot. 2: 308 & 310, pl. 24. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1608 & 1618. 1931; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 74, 77, & [103]. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 205. 1949; Moldenke, Phytologia 3: 336. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1121, 1127, & 1333. 1956; Moldenke, Résumé 162, 176, & 482. 1959; Moldenke, Résumé Suppl. 1: 11 & 13. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Thanikaimoni, Pollen & Spores 7: 185. 1965; S. V. Ramaswami, Study Flow. Pl. Bangalore [thesis] 220, 221, & 1407. 1966; Moldenke, Résumé Suppl. 13: 5 (1966) and 15: 8. 1967; Moldenke, Phytologia 17: 494 (1968) and 18: 102. 1969.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 24. 1921.

Fyson (1921) describes this species as follows: "Stem disciform. Leaves 1—3 in, by 1/8 in. at the base, and narrowed to the acuminate apex. Scape filiform, 6—10 in., deeply grooved.

Heads 1/6 — 1/4 in. snow white; bracts cuspidately acuminate. Sepals of the female flowers 3 or 2 only; otherwise flowers normal. Female petals with large glands. Smells strongly of camomile (Dalz.)." He notes that "I have seen only two sheets, both in Herb. Calc. One coll. by Hooker and Thomson, has apparently the female sepals 2 only, and black involucre bracts. The other Meebold No. 9889, has the female sepals 3 and the bracts pale. In other respects and especially in the large glands of the female petals they are alike. Hooker in F. B. I. describes the female sepals as longer than the petals."

The plant has been found growing in standing water and in open sandy soil, at altitudes of 20 to 1300 meters, flowering and fruiting in July, September, and December. Sangkhachand describes it as "common" in damp places on savannas in Thailand, Smitinand calls the plants "gregarious", while Smitinand & Floto found it to be a "tufted herb common in savannas", also in Thailand. The only vernacular names recorded for it are "chuk nok ying" and "pui ka ngong". The initial letter of the specific epithet is uppercased by Dalzell & Gibson (1861).

Material has been misidentified and distributed in herbaria under the names E. conicum Fisch., E. dalzellii Körn., E. pentangulare L., E. quinquangulare L., and E. siamense Moldenke. On the other hand, the Collector undesignated s.n. specimens in the Stockholm herbarium, distributed as E. odoratum, are actually E. gracile Mart.

Additional citations: PAKISTAN: East Bengal: W. Griffith 5564 (C). INDIA: Bombay: Dalzell 1496 (T); Santapau 11743 (Xa), 11756 (Xa). Hyderabad: S. N. Ramaswamy 30 (Ac). Kerala: Stocks, Law & c. s.n. [Malabar, Concan, &c.] (B, Mu--221). Mysore: S. N. Ramaswamy 8 (Rf), 19 (Ac), 25 (Rf), 1042 (Lw), 2267 (Lw). West Bengal: Bennet 1021 (Ac). State undetermined: Wight 2855 [Penins. Ind. orient.] (S, T). THAILAND: Hansen, Seidenfaden, & Smitinand 11096 (Cp), 11099 (Ac, Cp); K. Larsen 9791 (Lw); Sangkhachand 571 [Herb. Roy. Forest Dept. 18174] (Sm); Seidenfaden 2699 (Cp); Smitinand 416 [Herb. Roy. Forest Dept. 5113] (Bk), 3607 [Herb. Roy. Forest Dept. 18240] (Z); Smitinand & Floto 5935 [Herb. Roy. Forest Dept. 24088] (Gg); Vesterdal 5d (Cp), 464 (Cp). INDOCHINA: Laos: Pételot 8971 (N).

ERIOCAULON OFFICINALE Körn.

Synonymy: Eriocaulon officinalis Körn. apud Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25, sphalm. 1888.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 475 & 480. 1863; Körn. in Miq., Ann. Mus. Bot. Lugd. 3: 163 & 164. 1867; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25 & 27. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 117 & 286. 1903; C. H. Wright, Journ. Linn. Soc. Lond. Bot. 36: 200. 1903; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 77 & [103]. 1945; Jacks. in Hook. f. &

Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 25 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 132 & 205. 1949; Moldenke, Résumé 170 & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

This mysterious species is said to come from China. Its exact identity is still in much doubt.

ERIOCAULON OLIVACEUM Moldenke

Bibliography: Moldenke, N. Am. Fl. 19 (1): 18 & 22. 1937; Moldenke, Phytologia 1: 320. 1939; León, Fl. Cuba 1: 280. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4 & 38. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 45 & 205. 1949; Moldenke, Résumé 53 & 482. 1959.

Killip found this plant growing on white sand savannas, flowering in January.

Additional citations: ISLA DE PINOS: Killip 45489 (Mu, Z).

ERIOCAULON OLIVERI Fyson

Bibliography: Fyson, Kew Bull. Misc. Inf. 1914: 331. 1914; Fyson, Fl. Nilg. & Puln. Hill-tops 1: 428 & 431 (1915), 2: pl. 276 (1915), and 3: 118. 1921; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Moldenke, Known Geogr. Distrib. Erioc. 23 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 205. 1949; Moldenke, Phytologia 3: 336. 1950; Moldenke, Résumé 164 & 482. 1959; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Moldenke, Résumé Suppl. 11: 5. 1964; Thanikaimoni, Pollen & Spores 7: 184. 1965; Moldenke, Phytologia 17: 463 & 494 (1968) and 18: 264. 1969.

Illustrations: Fyson, Fl. Nilg. & Puln. Hill-tops 2: pl. 276. 1915.

Thanikaimoni (1965) regards this taxon as conspecific with E. collinum Hook. f., reducing both E. christopheri Fyson and E. oliveri Fyson to synonymy under E. collinum. In the present notes all three of these taxa are regarded as distinct.

Fyson (1915) describes his E. oliveri as follows: "I 46; White-headed Hatpin-flower. Similar in habit to E. geoffreyi, but larger and the involucre bracts white: male sepals not black. Scapes solitary, very slender, 4 to 6 inches: sheath 3/4 to 1 inch, with enlarged bifid mouth. Leaves as long acute, glabrous nine-nerved. Heads 1/4 inch, white. Involucre bracts white, glabrous. Floral bracts with numerous thick white hairs. Receptacle villous. Male flowers 1/8 inch. Sepals united into a spathe split in front; light coloured below, darker above but not black, with white hairs upwards on the back. Corolla tube tapering downwards; petals unequal with long fringing hairs and large glands. Anthers black. Female flowers as long. Sepals black. Petals with a few thick white hairs above and long white slender ones to the base. t.276. In damp places. Pulneys 7,500 feet. Fyson 2994." In his 1921 work he adds: "Vol. I, p. 431, II, t. 276. In flower later in the year than E. collinum. Petals of lower male flowers protruding as a fringe, conspicuous when fresh, but not seen when dry."

It may be noted here that his Volume 3 is sometimes cited as "1920", which is actually the title-page date, but the volume was not actually issued until 1921.

Material of E. oliveri has been misidentified and distributed in herbaria as E. conicum (Fyson) C. E. C. Fischer and as E. sexangulare L. On the other hand, the Bembower 431, distributed as E. oliveri, is actually E. leucomelas Steud.

Citations: INDIA: Mysore: S. N. Ramaswamy 2108 (Z); Swamy s.n. [Bannerghatta, 25.11.62] (Bn--3199).

ERIOCAULON ORYZETORUM Mart.

Bibliography: Mart. in Wall., *Plant. As. Rar.* 3: 28. 1832; Wall., *Numer. List* 207. 1832; Royle, *Illustr. Bot. Himal.* 409. 1840; Kunth, *Enum. Pl.* 3: 552. 1841; C. Müll. in Walp., *Ann.* 5: 926 & 938--939 (1860) and 6: 1171. 1861; Hieron. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 2 (4): 27. 1888; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 879. 1893; Hook. f., *Fl. Brit. Ind.* 6: 579. 1893; Prain, *Beng. Pl.*, ed. 1, 1127. 1903; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 64, 86, & 286. 1903; Fyson, *Journ. Indian Bot.* 2: 312--313, pl. 32. 1921; Haines, *Bot. Bihar & Orissa* 6: 1067 & 1069--1070. 1924; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 879. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 23, 24, 26, & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 125, 126, 129, 139, & 205. 1949; Moldenke, *Phytologia* 3: 336--337. 1950; Moldenke, *Résumé* 160, 162, 165, 176, 180, & 482. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 879. 1960; Moldenke, *Résumé Suppl.* 3: 20 (1962) and 4: 7. 1962; Prain, *Beng. Pl.*, ed. 2, 2: 848. 1963; Nath, *Burm. Flow. Pl.* 58. 1963; Thanikaimoni, *Pollen & Spores* 7: 185. 1965; Moldenke, *Phytologia* 18: 106, 178, & 274. 1969.

Illustrations: Fyson, *Journ. Indian Bot.* 2: pl. 32. 1921; Nath, *Burm. Flow. Pl.* 58. 1963.

Hooker (1893) regarded E. hamiltonianum Mart. as a synonym of E. oryzetorum. This fact is doubtless the basis for the homonym E. oryzetorum Hook. f. now regarded as a synonym of E. hamiltonianum Mart.

Eriocaulon oryzetorum seems to be based on Wallich 6069 [in some herbaria as Wallich s.n. "e Nepalia"] from Nepal. Prain (1903) records the species also from Chota Nagpur, where he says that it is "A weed of rice-fields". Smitinand tells us that it is "common in wet places" and "common in moist localities on savannas" in Thailand. It has been collected at 1300 meters altitude, flowering and fruiting in November. Koelz 19398 is a mixture with E. cinereum R. Br., E. luzulaefolium Mart., and E. sollyanum Royle.

Fyson (1921) describes this taxon as "Leaves 2--3 in. by 1/6 in. Sheaths as long. Scapes several, slender, 12--17 in. Heads 1/3 in. Involucral bracts blunt; floral acuminate scabrid. Flowers normal.....C. Himalayas; Nepal and southwards to Chota Nagpur and Burma Pegu. Mart. in Wall *Pl. As. Rar.* iii gives flo-

ral bracts as 'dorso-barbulatis'."

Material has been misidentified and distributed in herbaria as E. stramineum Körn. On the other hand, the Souchère 27, distributed as E. oryzetorum, is actually E. soucherei Moldenke.

Additional citations: NEPAL: Wallich 1821 ["22"] (Br, N), 6069, in part ["e Nepalia"] (B--isotype, E--isotype, Mu--222--isotype). INDIA: Surguja: Koelz 19398, in part (Mi). Uttar Pradesh: Strachey & Winterbottom 1 (Br, N). THAILAND: Smitinand 5014 [Herb. Roy. Forest Dept. 18556] (Gg), 5020 [Herb. Roy. Forest Dept. 18586] (Gg); Sørensen, Larsen, & Hansen 2255 (Cp), 6082 (S), 7049 (S). INDOCHINA: Annam: Souchère 1 (N), 5 (N), 24 (N), 25 (N), s.n. [Herb. Schmid 1411, in part] (Z).

ERIOCAULON OVOIDEUM Britton & Small

Additional bibliography: Britton & Small in N. L. Britton, Bull. Torr. Bot. Club 44: 32. 1917; Moldenke, N. Am. Fl. 19 (1): 19 & 31. 1937; Moldenke, Phytologia 1: 320. 1939; León, Fl. Cuba 1: 280. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 45 & 205. 1949; Moldenke, Phytologia 3: 337. 1950; Moldenke, Résumé 53, 288, & 482. 1959.

Killip found this plant growing on white sand savannas, flowering and fruiting in January.

Additional citations: ISLA DE PINOS: Alain & Killip 2164 (N); Britton, Britton, & Wilson 14220 (S--isotype); Killip 42859 (Le), 45380 (B, Mu, Z); León & Seifríz 17511 (Vi).

ERIOCAULON OZENSE Koyama

Bibliography: Koyama, Journ. Jap. Bot. 31: 6--7, fig. 1. 1956; Moldenke, Résumé 173 & 482. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 185 & 430. 1964; G. Taylor, Ind. Kew. Suppl. 13: 52. 1966.

Illustrations: Koyama, Journ. Jap. Bot. 31: 6, fig. 1. 1956.

Koyama (1956) based this species on a collection made by Hiroshi Hara in a marsh at Shimotashiro, Ozegahara, in the province of Kodzuke, Honshu, Japan, on August 20, 1955, and deposited in the herbarium of the University of Tokyo. He notes "Hoc Eriocaulon ab E. nosoriensi Ohwi quod e Nosori-ike provinciae Kodzuke descriptum est, calyce floris masculi extra dense piloso, petalis intus perdense pilosis sursum subsensim attenuantibus et apicem obovatam fuscotoglaucam dense albopuberulam formantibus stasis distinguitur." He records the vernacular name "hara-inunohige". The Furuse collection cited below is said to be a topotype collection.

Additional citations: WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Furuse s.n. [18 Aug. 1954] (Ca--59912, S, Z).

ERIOCAULON PACHYSTROMA Van Royen

Bibliography: Van Royen, Blumea 11: 224--225, fig. 1. 1961; Van Steenis-Kruseman, Fl. Males. Bull. 17: 954 (1963) and 4: lv.

1967.

Illustrations: Van Royen, *Blumea* 11: 225, fig. 1. 1961.

The type of this apparently endemic species was collected by Cornelis Gijbert Gerrit Jan van Steenis (no. 9691) in Gajol Alas Lands on Mount Kemiri, at 3000 meters altitude, Sumatra, forming dense cushions on the slope together with *Centrolepis*, *Oreobolus*, *Monostachya*, and *Scirpus subcapitatus*, flowering and fruiting in February and March. Van Royen (1961) says that the species grows on wet slopes or in poor peaty places, in small hollows with a thin covering of quartz sand, or on stony peaty ridges at high altitudes, from 2950 to 3400 meters above the sea. He notes that "This species closely resembles *E. pulvinatum* Van Royen described from New Guinea by the dense cushions, but differs by the unequal petals in both types of flowers, by the oblong or ovate-oblong individual bracts, and by the pubescence of the floral bracts." He also cites *Van Steenis* 8594, 9045, & 9661 from Sumatra.

ERIOCAULON PALLESCENS (Nakai) Satake

Synonymy: *Eriocaulon sachalinense* var. *pallescens* Nakai in Miyabe & Kudo, *Fl. Hokkaido & Saghal.* 3: 288. 1932. *Eriocaulon pallescens* Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 13, 67, 68, 81, & 87, fig. 34. 1940.

Bibliography: Nakai in Miyabe & Kudo, *Fl. Hokkaido & Saghal.* 3: 288. 1932; Nemoto, *Fl. Jap. Suppl.* 1039. 1936; Honda, *Nom. Pl. Jap.* 463. 1939; Satake, *Journ. Jap. Bot.* 15: 631-632. 1939; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 13, 67, 68, 81, & 87, fig. 34. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 56-57, pl. 11, fig. 21. 1940; Hill & Salisb., *Ind. Kew. Suppl.* 10: 86. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 134 & 205. 1949; Moldenke, *Résumé* 173, 292, & 482. 1959; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Japan* 3: 183, 184, & 430, fig. 126 (1). 1964; Moldenke, *Résumé Suppl.* 17: 10. 1968.

Illustrations: Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 68, fig. 34. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] pl. 11, fig. 21. 1940; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Japan* 184, fig. 126 (1). 1964.

The type of this species was collected by Kenji Miyabe at Titose, in the province of Iburi, Hokkaido, Japan, in September, 1926, and is deposited in the herbarium of the Faculty of Agriculture at Hokkaido Imperial University. An isotype is cited by Satake (1940) in the herbarium of Tokyo University. The species is known thus far only from the type collection, its common name is "siro-ezohosikusa", and Satake notes that "This plant has been regarded as a variety of *Eriocaulon sachalinense* Miyabe & Nakai, but the flowers are trimerous, and the character of the calyx differs considerably from the type species. The writer therefore offers the opinion that it comes from the type species *E. sachalinense* and allied species, judging from the fact that the involucre are white or pallescent, the calyx colourless and 3-lobed

at the apex, and the style much shorter than the stigma."

ERIOCAULON PALLIDUM R. Br.

Bibliography: R. Br., *Prod. Nov. Holl.* 1: 254. 1810; Roem. & Schult. in L., *Syst. Veg.*, ed. 15 nova, 2: 867 & 869. 1817; Spreng. in L., *Syst. Veg.*, ed. 16, 3: 775. 1826; Kunth, *Enum. Pl.* 3: 570. 1841; C. Müll. in Walp., *Ann.* 5: 926 & 937—938 (1860) and 6: 1171. 1861; Benth., *Fl. Austral.* 7: 191, 194, & 792. 1878; Hieron. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 2 (4): 25. 1888; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 879. 1893; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 103, 108, & 286. 1903; F. M. Bailey, *Compreh. Cat. Queensl. Pl.* 584. 1913; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 879. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 28 & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 153 & 205. 1949; Moldenke, *Résumé* 209 & 482. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 879. 1960.

Kunth (1841) describes this species as follows: "Scapo angulato (1—2-unciali), foliis planis latiusculis parum longiore; capitulo convexo; paleis imberbibus; perianthio femineo quinquepartito: foliolis 2 exterioribus angustissimis; 3 interioribus ciliatis; masculo triandro: exteriori diphyllo; interioris laciniis obsolete." The initial letter of the specific epithet is upercased by Kunth.

ERIOCAULON PALMERI Ruhl.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 42, 48, & 286. 1903; Prain, *Ind. Kew. Suppl.* 3: 69. 1908; Moldenke, *N. Am. Fl.* 19 (1): 19 & 32—33. 1937; Moldenke, *Phytologia* 1: 320—321. 1939; Moldenke, *Known Geogr. Distrib. Erioc.* 4 & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 30 & 205. 1949; Moldenke, *Résumé* 36 & 482. 1959.

This species is known thus far only from the type collection.

Additional citations: MEXICO: Durango: Edw. Palmer 172 (B—type, Ca—143780—isotype, Mi—isotype, S—isotype).

ERIOCAULON PALUDICOLA Alv. Silv.

Synonymy: Eriocaulon palludicola Alv. Silv. ex Moldenke, *Known Geogr. Distrib. Erioc.* 8, sphalm. 1946.

Bibliography: Alv. Silv., *Arch. Mus. Nac. Rio Jan.* 23: 160. 1921; Alv. Silv., *Fl. Mont.* 1: 13—16 & 398, pl. 3. 1928; A. W. Hill, *Ind. Kew. Suppl.* 7: 89. 1929; Moldenke, *Known Geogr. Distrib. Erioc.* 8 & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77 & 205. 1949; Moldenke, *Résumé* 89, 290, & 482. 1959.

Illustrations: Alv. Silv., *Fl. Mont.* 1: pl. 3. 1928.

Silveira (1928) cites A. Silveira 553 from Minas Gerais.

ERIOCAULON PALUSTRE Salzm.

Bibliography: Steud., *Syn. Pl. Glum.* 2: [Cyp.] 280. 1855; C. Müll. in Walp., *Ann.* 5: 930 (1860) and 6: 1171. 1861; Körn. in

Mart., Fl. Bras. 3 (1): 475, 480, & 500, pl. 41, fig. 1. 1863; Körn. in Miq., Ann. Mus. Bot. Lugd. 3: 163. 1867; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 65, 93, & 286, fig. 11. 1903; Moldenke, Known Geogr. Distrib. Erioc. 8 & 38. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89 & 482. 1959; Moldenke, Résumé Suppl. 1: 6. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 12: 4. 1965.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 41, fig. 1. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 93, fig. 11. 1903.

Pickel found this species growing on wet soil among grasses in a lagoon, flowering and fruiting in October. Material has been misidentified and distributed in herbaria as Leiothrix curvifolia (Bong.) Ruhl.

Citations: BRAZIL: Bahia: Martius s.n. [August '35] (B); Salzmann s.n. [Herb. Bernhardi] (E--isotype, E--photo of isotype, F--photo of isotype, N--isotype, N--photo of isotype, Z--photo of isotype). Minas Gerais: L. Riedel 1031 (Ut--335). Pernambuco: Pickel 2805 (W--1541643). MOUNTED ILLUSTRATIONS: drawings by Körnicke (E); original of Mart., Fl. Bras. 3 (1): pl. 41, fig. 1 (B, B).

ERIOCAULON PANAMENSE Moldenke

Bibliography: Moldenke, N. Am. Fl. 19 (1): 19 & 31--32. 1937; Moldenke, Phytologia 1: 321. 1939; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 31: 68. 1944; Moldenke, Known Geogr. Distrib. Erioc. 4 & 38. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 40 & 205. 1949; Moldenke, Phytologia 3: 337. 1950; Moldenke, Résumé 48 & 482. 1959.

This species has been found growing in wet or swampy meadows at altitudes of 1200 to 1700 meters above the sea.

Emended citations: PANAMA: Chiriquí: Killip 3614 (W--635858--type).

ERIOCAULON PANCHERI H. Lecomte

Bibliography: Guillaum. & Beauvis., Ann. Soc. Bot. Lyon 38: 40. 1914; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Moldenke, Known Geogr. Distrib. Erioc. 27 & 38. 1946; Guillaum., Fl. Analyt. & Synop. Nouv.-Caléd. 49--50. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 151 & 205. 1949; Moldenke, Résumé 205, 206, & 482. 1959; Moldenke, Résumé Suppl. 1: 14. 1959; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Moldenke, Résumé Suppl. 16: 12. 1968; Moldenke, Phytologia 18: 270, 326, & 327. 1969.

The Herb. Reichenbach f. 38770 specimen, cited below, was the basis for my previous erroneous recording of E. pancheri from Lord Howe Island. The specimen is labeled as having come from "Ile des

Pins", but the island by this name here referred to is undoubtedly the one in the New Caledonian Islands group of Melanesia, not Lord Howe Island in the Australian region, which is also known as "Isle of Pines". The Herb. Reg. Monac. s.n. collection, also cited below, bears a notation by H. Ross in his own handwriting, to the effect that "Die Pflanze stammt wahrscheinlich von Isla de Pinos, die bei Cuba liegt. Auf den oceanischen Inseln kommt keine Eriocaulon-Art vor. Vgl. Erioc. pseudocompressum Ruhl." However, the specimen is plainly E. pancheri, not E. pseudocompressum, and the original label is inscribed "Isle of Pines, oc. pacific".

The Franc A.266, distributed as E. pancheri, is actually a cotype collection of E. neo-caledonicum Schlecht.

Guillaumin (1948) keys this species from the other species of the genus known to him from New Caledonia 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 3--7 cm. long.....E. neo-caledonicum Schlecht.
 - 2a. Heads turbinate, very small; scapes 7-ribbed, extremely long, 80--100 cm. long....E. longipedunculatum H. Lecomte.

Citations: MELANESIA: NEW CALEDONIAN ISLANDS: Ile des Pins: Herb. Reg. Monac. s.n. [Isle of Pines] (Mu--316); Herb. Reichenbach f.38770 (V). New Caledonia: Franc 266a (N); H. S. McKee 8089 (W--2375789).

ERIOCAULON PAPILLOSUM Körn.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 489. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 55, 57, & 286. 1903; Moldenke, Known Geogr. Distrib. Erioc. 8 & 38. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89 & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

Citations: BRAZIL: Goiás: Weddell 2135 (Br--isotype, N--isotype, N--photo of isotype, Z--photo of isotype).

ERIOCAULON PARADOXUM Moldenke

Bibliography: Moldenke, Phytologia 2: 133--134. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 30 & 205. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 36 & 482. 1959.

This species is known thus far only from the original collection.

ERIOCAULON PARAGUAYENSE Körn.

Additional bibliography: Körn. in Mart., Fl. Bras. 3 (1): 493 & 497—498. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 48, 58, & 286. 1903; Moldenke, Known Geogr. Distrib. Erioc. 8 & 38. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Phytologia 3: 337. 1950; Moldenke, Résumé 89 & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

Collectors have found this plant growing in grassy swampy places, flowering and fruiting in February.

Citations: BRAZIL: Mattogrosso: Lindman A.2471 (S, S); Malme 1456b (S), 2225 (S), 2225a (S), 2225b (S), 2225c (S); Weddell 3054 (Br—isotype, N—isotype, N—photo of isotype, Z—photo of isotype). São Paulo: Severén 185 (S).

ERIOCAULON PARANENSE Moldenke

Synonymy: Eriocaulon paranensis Moldenke, Résumé Suppl. 6: 9, in syn. 1963. Paepalanthus paranensis Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Bibliography: Moldenke, Phytologia 3: 166 (1949) and 3: 337. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Angely, Fl. Paran. 10: 11 & 14 (1957) and 12: 9. 1958; Moldenke, Résumé 89 & 482. 1959; Angely, Fl. Paran. 16: 51 (1960) and 17: 24. 1961; Moldenke, Résumé Suppl. 6: 9. 1963; Angely, Bibl. Veg. Paran. 196. 1964; Moldenke, Résumé Suppl. 12: 11. 1965; Angely, Fl. Anal. Paran., ed. 1, 199. 1965.

This species was found by Luetzelburg on dry campos. Material has been misidentified and distributed in herbaria as E. sellowianum Kunth.

Additional citations: BRAZIL: Paraná: Dombrowski 82 [Herb. Inst. Nat. 6793] (Z); Hatschbach 8723 (Lw); Luetzelburg 6787a (Mu).

ERIOCAULON PARKERI B. L. Robinson

Synonymy: Eriocaulon fistulosum Nees ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959 [not E. fistulosum R. Br., 1810].

Bibliography: B. L. Robinson, Rhodora 5: 175. 1903; Keller & S. Br., Handb. Fl. Philad. 92. 1905; Prain, Ind. Kew. Suppl. 3: 69. 1908; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 261 & 898. 1908; M. A. Day, Check List 39. 1908; B. Long, Bartonia 2: 20. 1910; G. T. Stevens, Pl. Guide Flow. Pl. 114. 1910; W. Stone, Ann. Rep. N. J. State Mus. 1910: 323 & 324. 1912; Britton & Br., Pl. Fl., ed. 2, 1: 454, fig. 1111 (1913) and 3: 575. 1913; Marie-Vict., Fl. Laurent., ed. 1, 54, 74, 565, 679—681, & 892, fig. 244. 1935; Svenson, Torreya 35: 119. 1935; Moldenke, N. Am. Fl. 19 (1): 19 & 26. 1937; Moldenke, Phytologia 1: 321. 1939; Fern.,

Rhodora 43: 211. 1941; R. R. Tatnall, Fl. Del. 76. 1946; Moldenke, Known Geogr. Distrib. Erioc. [1], 2, & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed.2], 2—6 & 205. 1949; Moldenke, Phytologia 3: 337—340. 1950; R. McVaugh, Bull. N. Y. State Mus. 360: 93. 1958; A. & D. Löve, Bot. Notiser Lund 111: 380. 1958; Moldenke, Résumé 4—9 & 482. 1959; Moldenke, Résumé Suppl. 1: 17 (1959), 2: [1] (1960), and 3: [1] & 2. 1962; Gleason & Cronquist, Man. Vasc. Pl. 184. 1963; Rouleau in Marie-Victorin, Fl. Laurent., ed. 2, 54, 74, 565, 679—681, & 892, fig. 244. 1964; Shinners, Sida 2: 441. 1966; Kral, Sida 2: 296—297, 299, & 331. 1966; Sculthorpe, Biol. Aquat. Vasc. Pl. 393. 1967; R. M. Harper, Castanea 32: 17. 1967; Moldenke, Phytologia 18: 112. 1969.

Additional & emended illustrations: Britton & Br., Ill. Fl., ed. 2, 1: 454, fig. 1141. 1913; Marie-Vict., Fl. Laurent., ed. 1, 680, fig. 244. 1935; Rouleau in Marie-Vict., Fl. Laurent., ed. 2, 680, fig. 244. 1964; Kral, Sida 2: 296. 1966.

Recent collectors have found this plant in brackish water and on tidal shores with hard bottoms, flowering and fruiting from August to October, and describe the plants as "purplish-green". The only common name recorded for the species is "Parker's pipe-wort". Rouleau (1964) says that in the Laurentian region it is found only in the intertidal zone of the St. Lawrence estuary, growing with Bidens hyperborea Greene, from Lake Saint Pierre to salt water — "L'E. parkeri a une distribution bicentrique: côte de l'Atlantique depuis la Virginie jusqu'à la riviere Penobscot (Maine); estuaire du Saint-Laurent. Cette disjonction est intéressante et soulève tout de problème de l'origine de la florule endémique des grèves estuariennes du Saint-Laurent." The Löves (1958) report the chromosome number as $2n = c. 48$.

McVaugh (1958) says "Tidal mud along the Hudson Aiver, otherwise unknown [in New York]. First reported from our area by Svenson (Torreya 35: 119. 1935), who found it in the town of Red Hook, at the mouth of Stony Creek. Poelsburg, 3807; shore east of Rogers Island, 2958." Tatnall (1946) records it "in tidal mud of coastal plain" in Delaware, flowering there from August to mid-October. Fernald & Svenson state that they found it "forming close carpets, extremely fragile on muddy tidal shores" in Massachusetts. Walker reports it "forming dense stands on soft mud covered by fresh water backed up by tide" in Maryland.

It should be noted here that E. parkeri apparently in the taxon which Ruhland (1903) called E. flavidulum Michx. in his monograph as distinct from Syngonanthus flavidulus (Michx.) Ruhl., the correct name for Michaux's plant. Also, it should be noted that the index to Marie-Victorin's work (1935) and Rouleau's later edition of it (1964) states that this species is mentioned on page 75 of that work, but I fail to find it there. It occurs on page 74 instead.

The Stone (1912) reference in the bibliography above is often dated "1911", but the work was not actually issued until January 26, 1912.

Material has been misidentified and distributed in herbaria

under the names E. flavidulum Michx. and E. septangulare With. On the other hand, the E. L. Little s.n. [Utah, Jul. 14, 1929], distributed as E. parkeri, is actually E. körnickianum Van Heurck & Muell.-Arg. and the A. P. Garber s.n. [S. Fla., 1877] is E. ravenelii Chapm. C. C. Plitt 909 is a mixture with Sagittaria subulata (L.) Buch., B. L. Robinson s.n. [Newburyport] is a mixture with Sagittaria montevidensis Cham. & Schlecht., and L. F. Ward s.n. [Aug. 1878] & s.n. [Sept. 29, 1878] are mixtures with Sagittaria pusilla Nutt.

Kral (1966) gives the distribution of this species as "Muddy tidewater riverbanks, southeastern Canada to eastern North Carolina". This is the first published record known to me of the species occurring south of Virginia. He is doubtless referring to the same collection from Tyrrell County cited by me below, the only one known to me from that state. He differentiates the species from E. pallucidum (which he calls E. septangulare With.) as follows: "This species has been most often confused with E. septangulare but may be distinguished from it by the following criteria: a. Scape tending to be straight rather than twisted, and with fewer ridges. b. Head narrower (seldom more than 0.4 mm.), hemisphaerical, the outer involucrel bracts a very pale, dull gray or stramineous, in contrast to the broader, when mature subglobose, heads of E. septangulare the outer involucrel bracts of which are much darker and more lustrous. c. Bracts and perianth parts sparingly clavate-hairy, often some perianth parts smooth, in contrast to the more pubescent perianth and bractlets of E. septangulare. d. Involucrel bracts tending to remain ascending even on the fruiting heads, thus mainly concealing the bractlets and florets while, on E. septangulare, the involucrel bracts tend to be reflexed in the flowering and fruiting heads and are themselves partly concealed by the hairy florets."

Additional citations: QUEBEC: Bellechasse Co.: Raymond & Kucyniak 3328 (Mg). Montmagny Co.: Iltis 3509c (Ws); Löve, Löve, & Rousseau 7051 (Wp). Montmorency Co.: Desmarais 1150 (Mg). Portneuf Co.: Marie-Victorin & Rolland-Germain 2412 (Vi). Québec Co.: Clausen & Trapido 2779 (Ca--841794, Ok); Marie-Victorin, Rolland-Germain, & Raymond 56166 (Um--8801); Raymond, Kucyniak, Marie-Victorin, & Rolland-Germain 55073 (Um--9128). MAINE: Cumberland Co.: A. H. Norton s.n. [20 Aug. 1924] (Ws). Penobscot Co.: Fassett 19031 (Ws); Fernald & Long 13165 (B). Sagadahoc Co.: Fassett 2495 (Ws); Fernald & Long s.n. [Pl. Exsicc. Gray. 174] (B, Br, Ca--204649, Dt, Mg, Mu--415, S, Vi, Ws). MASSACHUSETTS: Essex Co.: B. L. Robinson s.n. [Sept. 26, 1903] (Ca--923757), s.n. [Newburyport] (N). Plymouth Co.: S. F. Blake 10964 (B, S, Ws); Fernald & Svenson 860 (Ca--924139). CONNECTICUT: New Haven Co.: D. C. Eaton s.n. [1858] (S). New London Co.: R. W. Woodward s.n. [Old Lyme, Sept. 1, 1918] (Ca--841796, Ms--77192). NEW YORK: Co-

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1

11

12

Figure 4. Distribution of *Eriocaulon parkeri* in the United States

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

Mapping by counties done by Andrew R. Moldenke



lumbia Co.: Muenschel & Curtis 5600 (Ca--586092, Ws). Greene Co.: Muenschel & Curtis 5604 (Mi). Ulster Co.: H. D. House 25069 (Ca--841795); Muenschel, Brown, & Langdon 21534 (S); Muenschel & Curtis 5606b (Ws); Muenschel, Wimpe, & Isely 20694 (Ca--906911). NEW JERSEY: Camden Co.: Martindale s.n. [Camden, Sep. 1877] (B). Ocean Co.: E. H. Day s.n. [17.7.82] (N). PENNSYLVANIA: Lancaster Co.: Heller & Halbach s.n. [September 12, 1891] (Dt). Philadelphia Co.: R. C. Alexander s.n. [Redbank, 3 Sept. '69] (Ca--379007); Bernhardi s.n. [Philadelphia] (B); E. J. Durand s.n. [Schuylkill River] (Ws). DELAWARE: Sussex Co.: E. C. Earle 1820 (Ca--22688). MARYLAND: Baltimore Co.: C. C. Plitt 909, in part (G). Cecil Co.: W. L. Abbott 2432 (S). Charles Co.: Fassett 22345 (Ws). Worcester Co.: E. H. Walker 4220 (Ws). DISTRICT OF COLUMBIA: F. Blanchard s.n. [bank of the Potomac, Aug. 14, 1891] (Dt); L. F. Ward s.n. [Aug. 1878] (E--881531), s.n. [Sept. 29, 1878] (E--86217, E--773768), s.n. [Sept. 10, 1882] (N). VIRGINIA: King William Co.: Fernald & Long 11539 (S). Nansemond Co.: Fernald, Long, & Clement 15238 (Vi, Ws). New Kent Co.: Mikula 3125 (N). Prince William Co.: F. H. Sargent 6270 (Ok, St). NORTH CAROLINA: Tyrrell Co.: Radford 44454 (N). LOCALITY OF COLLECTION UNDETERMINED: Herb. Mus. Bot. Berol. s.n. (B); Stüve s.n. [1819] (B).

ERIOCAULON PARVICAPITULATUM Moldenke

Bibliography: Moldenke, *Phytologia* 3: 415--416. 1951; Moldenke in Humbert, *Fl. Madag.* 36: 12, fig. 1 (32--34). 1955; G. Taylor, *Ind. Kew. Suppl.* 12: 55. 1959; Moldenke, *Résumé* 156 & 482. 1959.

Illustrations: Moldenke in Humbert, *Fl. Madag.* 36: fig. 1 (32--34). 1955.

Citations: MADAGASCAR: Perrier de la Bâthie 7250 (N--isotype, N--photo of type, P--type, Z--photo of type), 7256 (N, P).

ERIOCAULON PARVUM Körn.

Bibliography: Körn. in *Miq., Ann. Mus. Bot. Lugd.* 3: 163. 1867; Franch. & Savat., *Enum. Pl. Jap.* 2: 99. 1879; Mak., *Bot. Mag. Tokyo* 4: 174. 1890; Maxim., *Diagn. Pl. Nov. Asiat.* Dec. 8: 14. 1893; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 879. 1893; Mak., *Bot. Mag. Tokyo* 8: 506. 1894; J. Matsumura, *Ind. Pl. Jap.* 2 (1): 176. 1905; Nakai, *Rep. Veg. Quelp.* 28. 1914; Saida & Satô, *Naigai Syokubutusi* 1296, fig. 2009. 1921; Mori, *Enum. Pl. Corea* 80. 1922; Mak & Nemoto, *Fl. Jap.*, ed. 1, 1307 (1925) and ed. 2, 1513. 1931; Nemoto, *Fl. Jap. Suppl.* 1039. 1936; Satake in Nakai, *Icon. Pl. As. Orient.* 2: 97--100, pl. 42 (1937) and ed. 2, 192. 1938; Terazaki, *Zoku Nipp. Syokubutu Zuhu* fig. 3712. 1938; Honda, *Nom. Pl. Jap.* 462. 1939; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 1, 6--9, 11, 12, 20, 28, 29, 78, & 87, fig. 1M, 2A, 3A, 5B, & 11. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 19--21. 1940; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1:

879. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 25 & 38. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 133, 134, & 205. 1949; Moldenke, *Résumé* 171, 173, & 482. 1959; Moldenke, *Résumé Suppl.* 1: 12. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 879. 1960; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Japan* 3: 179—180 & 430, fig. 122 (1), pl. 48, fig. 305. 1964; Moldenke, *Résumé Suppl.* 12: 10. 1965; Thanikaimoni, *Pollen & Spores* 7: 182. 1965; Moldenke, *Phytologia* 17: 461 (1968) and 18: 184. 1969.

Illustrations: Saïda & Satô, *Naigai Syokubutusi* fig. 2009. 1921; Satake in Nakai, *Icon. Pl. As. Orient.* 2: pl. 42. 1937; Terazaki, *Zoku Nipp. Syokubutu Zuhu* fig. 3712. 1938; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 6—8, 11, & 29, fig. 1M, 2A, 3A, 5B, & 11. 1940; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Japan* 3: 179, fig. 122 (1) & pl. 48, fig. 305 [in color]. 1964.

Collectors have found this plant growing in bogs at the shores of ponds, while Koyama states that he found it "scattered in densely vegetated small marshes and shallow pools with *Juncus*, *Mentha*, and *Utricularia*", flowering and fruiting in September and October. The only recorded vernacular name for it is "kurohosikusa". The Maximowicz (1893) reference in the bibliography above is sometimes cited to "Bull. Acad. Sci. St. Pétersb." and dated "1892", but this work appears only to have been issued as a separate and, according to the *Index Kewensis*, should be dated "1893".

The Collector undesignated s.n. [Tokyo], distributed as *E. parvum*, is actually *E. cinereum* R. Br., while Rein s.n. [Aidzu] is *E. nipponicum* Maxim.

Satake (1940) cites the following additional collections from various herbaria: KOREA: Boku 140; Faurie 894. JAPAN: Honshu: Hisauti s.n. [Sept. 1922] & s.n. [Oct. 1936]; Itô s.n. [Oct. 1893]; Koto 57465; Maekawa 10030; Makino s.n. [Oct. 1894] & s.n. [Sept. 1895]; Matusima 37354; Matuyama s.n. [Sept. 1928]; Miura s.n. [Jul. 1909]; Nakazima s.n. [Oct. 1927]; Okuyama 51290; Saito 86; Satake s.n. [Oct. 1936]; Sugimoto 42900; Turumati 39; Ui 81650. Kyushu: Collector undetermined 9 & s.n. [Oct. 1909]; Doi 59; Ikebe s.n. [Sept. 1926]; Mayebara s.n. [Oct. 1916], s.n. [Aida, Oct. 1924], & s.n. [Kawa-mura, Oct. 1924]; Nakano 24; Nakasima 37 & 38; Nakazima s.n. [Oct. 1911]; Taniguti s.n. [Amakusa]; Tasiro 36742 & s.n. [Oct. 1926]. Shikoku: Makino 3600 & s.n. [Oct. 1891]; Murai 8; Ogata s.n. [Oct. 1923]; Oti 4; Watanabe s.n. [Sept. 1894]; Yamamoto 2; Yamasita s.n. [Oct. 1930].

Citations: KOREAN COASTAL ISLANDS: Quelpart: Taquet 1542 (B). WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Collector undetermined s.n. [Kasanisi-mura, 29/9/07] (S); Furuse s.n. [6 Oct. 1955] (S); Koyama 13107 (Z), s.n. [7 October 1935] (Ss). Kyushu: Kodama 219 (Kg); Naito s.n. [Nov. 6, 1932] (Kg).

ERIOCAULON PECTINATUM Ruhl.

Bibliography: Ruhl. in Engl., Pflanzreich 13 (4-30): 64, 85, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Journ. Indian Bot. 3: 17. 1922; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1613-1614 & 1620. 1931; Moldenke, Known Geogr. Distrib. Erioc. 23 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126 & 205. 1949; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1124, 1127, & 1333. 1956; Razi, Rec. Bot. Surv. India 18: 19. 1959; Moldenke, Résumé 162 & 482. 1959.

Citations: INDIA: Madras: Perrottet 1167 (B--type, Z--isotype).

ERIOCAULON PELLUCIDUM Michx.

Synonymy: Eriocaulon noveboracens Pluk. ex Hook. in Curtis, Bot. Mag. 59: pl. 3126, in syn. 1832. Eriocaulon pumilum Raf., Atl. Journ. 1: 121. 1832 [not E. pumilum Afzel., 1856, nor "Afzel. ex Körn.", 1952, nor N. E. Br., 1903, nor Cham., 1959]. Eriocaulon pellucidum var. pumilum Raf., Autikon Bot., pr. 1, 189. 1840. Eriocaulon brevifolium Raf., Autikon Bot., pr. 1, 189. 1840 [not E. brevifolium Klotzsch, 1848, nor Mart., 1863]. Eriocaulon sp. Penhallow, Brit. Assoc. Adv. Sci. Bradford Meet. 335. 1900. Eriocaulon septangulare var. natans Hexamer & Meier ex Moldenke, Phytologia 1: 323, in syn. 1939. Lepidosphaera lacustris La Pylaie ex Moldenke, Résumé Suppl. 1: 19, in syn. 1959. Globularia graminifolia Schreb., in herb.

Additional & emended bibliography: Michx., Fl. Bor. Am. 2: 166. 1803; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 868. 1817; Spreng. in L., Syst. Veg., ed. 16, 3: 775. 1826; Raf., Atl. Journ. 1: 121. 1832; Hook. in Curtis, Bot. Mag. 59: pl. 3126. 1832; Mart. in Wall., Plant. As. Rar. 3: 28. 1832; Raf., Autikon Bot., pr. 1, 189. 1840; Kunth, Enum. Fl. 3: 540 & 557. 1841; A. Wood, Class-book, ed. 1, 405 (1845) and ed. 2, pr. 1, 564. 1847; A. Gray, Man. Bot., ed. 1, 514-515. 1848; A. Wood, Class-book, ed. 2, pr. 2, 564 (1848), ed. 10, pr. 1, 564 (1848), ed. 10, pr. 2, 564 (1849), ed. 10, pr. 3, 564 (1850), ed. 17, 564 (1851), ed. 23, 564 (1851), ed. 29, 564 (1853), ed. 35, 564 (1854), ed. 41, pr. 1, 564 (1855), and ed. 41, pr. 2, 564. 1856; A. Gray, Man. Bot., ed. 2, pr. 1, 489. 1856; Knieskern, Ann. Rep. N. J. Geol. Surv. 33. 1856; A. Gray, Man. Bot., ed. 2, pr. 2, 489. 1858; C. Müll. in Walp., Ann. 5: 928 (1860) and 6: 1171. 1861; A. Wood, Class-book, [ed. 42], pr. 1, 729. 1861; A. Gray, Man. Bot., ed. 3, 489 (1862) and ed. 4, pr. 1, 489. 1863; A. Wood, Class-book, [ed. 42], pr. 2, 729. 1863; A. Gray, Man. Bot., ed. 4, pr. 2, 489. 1864; A. Wood, Class-book, [ed. 42], pr. 3, 729 (1865) and pr. 4, 729. 1867; A. Gray, Man. Bot., ed. 5, pr. 1, 550 (1867) and ed. 5, pr. 2, 550. 1868; A. Wood, Class-book, [ed. 42], pr. 5, 729. 1868; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 352 (1868) and pr. 2, 352. 1869; A. Wood, Class-book, [ed. 42], pr. 6, 729 (1869) and pr. 7, 729. 1870; A. Gray, Man. Bot., ed. 4, pr. 3, 489. 1870; A. Wood, Am. Bot. & Flor., ed. 1, pr. 1, 355 (1870), pr. 2,

355 (1871), and pr. 3, 355. 1872; A. Wood, *Class-book*, [ed. 42], pr. 8, 729. 1872; A. Wood, *Am. Bot. & Flor.*, ed. 1, pr. 4, 355 (1873) and pr. 5, 355. 1874; O. R. Willis, *Cat. Pl. N. J.* 67. 1874; A. Wood, *Am. Bot. & Flor.*, ed. 1, pr. 6, 355. 1875; A. Wood, *Class-book*, [ed. 42], pr. 9, 729. 1876; A. Gray, *Man. Bot.*, ed. 5, pr. 8, 550 (1878) and pr. "8" [-9], 550. 1880; A. Gray, *Field For. & Gard. Bot.*, ed. 1, pr. 3, 352. 1880; A. Wood, *Class-book*, [ed. 42], pr. 10, 729. 1881; O. R. Willis in A. Wood, *Am. Bot. & Flor.*, ed. 2, 355. 1889; A. W. Chappm., *Fl. South. U. S.*, ed. 2, pr. 4, 658. 1889; S. Wats. & Coult. in A. Gray, *Man. Bot.*, ed. 6, pr. 1, 567 (1889) and pr. 2, 567. 1890; Morong, *Bull. Torr. Bot. Club* 18: 353—354. 1891; A. W. Chappm., *Fl. South. U. S.*, ed. 2, pr. 5, 658. 1892; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 879. 1893; Masee, *Grevillea* 22: 67. 1894; Britton & Br., *Ill. Fl.*, ed. 1, 1: 371 & 602, fig. 899 (1896) and 3: 537. 1896; A. W. Chappm., *Fl. South. U. S.*, ed. 3, 530. 1897; Penhallow, *Brit. Assoc. Adv. Sci. Rep.* 68: 527. 1899; Penhallow, *Brit. Assoc. Adv. Sci. Bradford Meet.* 335. 1900; G. P. Clinton, *Rhodora* 3: 82. 1901; G. P. Clinton, *Journ. Myc.* 8: 137. 1902; J. K. Small, *Fl. Southeast. U. S.*, ed. 1, 236. 1903; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 19, 32—35, 286, & 287. 1903; Keller & S. Br., *Handb. Fl. Philad.* 91. 1905; Robinson & Fern. in A. Gray, *New Man. Bot.*, ed. 7, 261 & 898. 1908; M. A. Day, *Check List* 39. 1908; R. W. Sm., *Bot. Gaz.* 49: 281—289, pl. 19 & 20. 1910; G. T. Stevens, *Ill. Guide Flow. Pl.* 114 & 115, pl. 9, fig. 9. 1910; W. Stone, *Ann. Rep. N. J. State Mus.* 1910: 323 & 324, pl. 28, fig. 1. 1912; Creevey, *Harper's Guide Wild Fls.* 42, 44, [45], 469, & 529. 1912; Britton & Br., *Ill. Fl.*, ed. 2, 1: 454, fig. 1140 (1913) and 3: 575 & 625. 1913; J. K. Small, *Fl. Southeast. U. S.*, ed. 2, 236. 1913; House, *N. Y. State Mus. Mem.* 15 (1): 44, pl. 6A (1918) and 15 (2): 347 & 355. 1918; Knowlton, *U. S. Geol. Surv. Bull.* 696: 260 & 812. 1919; Fern., *Rhodora* 23: 102. 1921; N. Taylor, *Guide Wild Fls.* 6—7 & 323, fig. 13. 1928; Pool, *Fls. & Flow. Pl.*, ed. 1, 299 & 359, fig. 169. 1929; House, *Wild Fls.* 44, 347, & 355, pl. 6A. 1934; Marie-Vict., *Fl. Laurent.*, ed. 1, 546, 674, 679, 680, 837, & 892, fig. 244. 1935; Moldenke, *N. Am. Fl.* 19 (1): 18 & 24. 1937; Little, *Am. Midl. Nat.* 19: 378. 1938; Moldenke, *Phytologia* 1: 323—327. 1939; Pool, *Fls. & Flow. Pl.*, ed. 2, 295 & 407, fig. 189. 1941; Karling, *Torreya* 41: 106. 1941; Moldenke in Lundell, *Fl. Texas* 3 (1): 6—7. 1942; Raf., *Autikon Bot.*, pr. 2, 189. 1943; Castell. in Descole, *Gen. & Sp. Pl. Argent.* 3: 76 & [103]. 1945; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 879. 1946; R. R. Tatnall, *Fl. Del.* 75. 1946; Moldenke, *Known Geogr. Distrib. Ericoc.* [1]—3, 20, 38—40, & 44. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 2—6, 11, 12, 14, 15, 107, & 206. 1949; E. D. Merr., *Ind. Rafin.* 82. 1949; H. E. Jaques, *Pl. Fam.*, ed. 2, 96, fig. 289. 1949; Hare, *Journ. Linn. Soc. Lond. Bot.* 53: 422—448. 1950; Moldenke, *Phytologia* 3: 385—397. 1950; Niering, *Ecolog. Monog.* 23: 132. 1953; Butters & Abbe, *Rhodora* 55: 136. 1953; Hand, *Bull. Torr. Bot. Club* 81: 92. 1954; [Wiltshire], *Rev. Appl. Myc. Ind. Fungi* 1: 39, 50, & 393.

1954; Thorne, *Am. Midl. Nat.* 52: 281. 1954; Linderoth, *Faunal Con. Eu. & N. Am.* 240, 241, & 250. 1957; Anon., *Algonquin Prov. Park Mus. Check-list* 7. 1957; A. & D. Love, *Bot. Notiser Lund* 111: 380—381 & 387. 1958; R. McVaugh, *Bull. N. Y. State Mus.* 360: 93. 1958; A. Löve, *Rhodora* 61: 31. 1959; Moldenke, *Résumé* 4—10, 15, 16, 19, 173, 286, 287, 291, 292, 414, & 482. 1959; Moldenke, *Résumé Suppl.* 1: [1], 2, 7, & 17—19 (1959) and 2: [1] & 2. 1960; Sparrow, *Aquat. Phycomycet.*, ed. 2, [*Univ. Mich. Stud. Sci.* 15:] 376 & 1095. 1960; Jacks. in *Hook. f. & Jacks., Ind. Kew.*, pr. 3, 1: 879. 1960; Anon., *Billie Bear Plant List* 3. 1961; Moldenke, *Résumé Suppl.* 3: [1], 2, 4, 5, 15, 18, & 31 (1962), 4: [1] (1962), and 6: [1] & 2. 1963; Gleason & Cronquist, *Man. Vasc. Pl.* 184. 1963; J. M. Gillett, *Canad. Field Nat.* 77: 139. 1963; R. Good, *Geogr. Flow. Pl.* 182, 293, & 294. 1964; Melchior in *Engl., Syl-lab. Pfl.*, ed. 12, 2: 555 & 556, fig. 230 A—D. 1964; Henry & Baker, *Trillia* 12: 105 & 131. 1964; Roland & Sm., *Proc. Nova Scot. Inst. Sci.* 26 (2): 191—192, fig. 476, map 173. 1964; Rouleau in *Marie-Vict., Fl. Laurent.*, ed. 2, 546, 674, 679, 680, & 837, fig. 244. 1964; Radford, Ahles, & Bell, *Guide Vasc. Fl. Carol.* 106 & 107. 1964; Lakela, *Fl. Northeast, Minn.* 110—111. 1965; Stocking, *Nat. Conserv. Ecol. Stud. Leaflet* 6: [15]. 1965; F. H. Montgomery, *Native Wild Pl.*, pr. 2, 9, fig. 16. 1965; Shinners, *Sida* 2: 441. 1966; F. H. Montgomery, *Pl. from Sea to Sea* 390, fig. 822. 1966; Hartley, *Univ. Iowa Stud. Nat. Hist.* 21: 150. 1966; Kral, *Sida* 2: 308—309 & 330. 1966; Moldenke, *Résumé Suppl.* 13: [1] (1966), 14: [1] (1966), and 15: [1]. 1967; Ogden, *Quatern. Paleoecology* 7: 175—183. 1967; Sculthorpe, *Biol. Aquat. Vasc. Pl.* 393. 1967; E. G. Voss, *Mich. Bot.* 6 (2): 41 & 46, fig. 6. 1967; E. L. Braun, *Vasc. Fl. Ohio* 1: 308—310. 1967; Sterling, *Outer Isl.* 159, [161], 167, & 179. 1967; L. S. Thomas, *Pine Barrens* 23. 1967; Freer, *Castanea* 33: 168. 1968; W. C. Grima, *Recog. Flow. Wild Pl.* 36. 1968; Ogden, *Biol. Abstr.* 49: 9863. 1968; Hinds & Hathaway, *Wildfls. Cape Cod* 116, 117, & 168, fig. 107. 1968; Moldenke, *Résumé Suppl.* 16: 21 (1968) and 17: [1], 8, & 9. 1968; Moldenke, *Phytologia* 17: 9, 382, 490, & 500 (1968), 18: 45 (1968), 17: 484—485 (1969), and 18: 79—80, 175, 187, 188, 249, 250, 253, 263, 268, 299, & 301. 1969.

Illustrations: Britton & Br., *Ill. Fl.*, ed. 1, 1: 371, fig. 899. 1896; R. W. Sm., *Bot. Gaz.* 49: pl. 19 & 20. 1910; G. T. Stevens, *Ill. Guide Flow. Pl.* 115, pl. 9, fig. 9. 1910; W. Stone, *Ann. Rep. N. J. State Mus.* 1910: pl. 28, fig. 1. 1912; Creevey, *Harper's Guide Wild Fls.* [45]. 1912; Britton & Br., *Ill. Fl.*, ed. 2, 1: 454, fig. 1140. 1913; House, *N. Y. State Mus. Mem.* 15 (1): pl. 6A [in color]. 1918; N. Taylor, *Guide Wild Fls.* 7, fig. 13. 1928; Pool, *Fls. & Flow. Pl.*, ed. 1, 299, fig. 169. 1929; House, *Wild Fls.* pl. 6A [in color]. 1934; Marie-Vict., *Fl. Laurent.*, ed. 1, 680, fig. 244. 1935; Pool, *Fls. & Flow. Pl.*, ed. 2, 295, fig. 189. 1941; Roland & Sm., *Proc. Nova Scot. Inst. Sci.* 26 (2): 191, fig. 476. 1964; Rouleau in *Marie-Vict., Fl. Laurent.*, ed. 2, 680, fig. 244. 1964; F. H. Montgomery, *Native Wild Pl.*, pr. 2, fig. 16. 1965; F. H. Montgomery, *Pl. from Sea to Sea* fig. 822. 1966; E. G.

Voss, Mich. Bot. 6 (2): 46, fig. 6. 1967; E. L. Braun, Vasc. Fl. Ohio 1: 308. 1967; Sterling, Outer Isl. 159 & [161]. 1967; Hinds & Hathaway, Wildfls. Cape Cod fig. 107. 1968.

It is worth noting here that the E. pumilum Afzel. and the E. pumilum "Afzel. ex Körn.", referred to in the synonymy above, belong in the synonymy of E. pulchellum Körn. as does also the homonym accredited to N. E. Brown, while E. pumilum Chapm. is a synonym of Lachnocaulon engleri Ruhl. Rafinesque (1840) describes his E. pellucidum var. pumilum as having "leaves uncial, scape 3 uncial, heads small, on Mts." I feel that it is only a dwarf edaphic form of this very variable species. The type of Lepidosphaera lacustris appears to be an unnumbered Brongniart collection from "terra nueve" deposited in the herbarium of the Botanisches Museum at Berlin.

The Eriocaulon brevifolium of Klotzsch is a synonym of what is now known as E. klotzschii Moldenke, while the homonym accredited to Martius is E. sellowianum Kunth.

In my earlier publications I united E. pellucidum with the Old World E. septangulare With., as most authors have done. Rouleau (1964) lists E. septangulare, along with Spiranthes romanzoffiana Cham. and Juncus tenuis Willd., as species which occur native in North America and also in Great Britain and which are supposed to represent an ancient flora when the two continents were united. Melchior (1964), however, points out that the "E. septangulare" plants of North America have only half the chromosome count of those living in Europe. Askell & Doris Löve (1958) have thoroughly investigated this matter and report as follows: "Eriocaulon septangulare is an aggregate complex, the typical unit of which was originally described by Withering (1776) from Ireland. The American species, E. pellucidum described by Michaux (1803) was regarded distinct by Torrey (1826), doubtfully identified with the British plant by Bigelow (1824), whereas Gray (1848) and most later authors have regarded them as synonymous. Some taxa at the specific level have been separated from the American populations by later authors, as, for instance, E. Parkeri of the tidal mudflats and estuaries from Virginia north to the St. Lawrence described by Robinson (1903), and E. Rollandii from Lake Mistassini described by Rouleau (1957), but the common North American plant is still regarded as conspecific with the British taxon by all American authors (Fernald, 1950; Gleason, 1952; Rousseau, 1957). It is rather variable and seems to be greatly affected by environmental conditions in the lakes it inhabits. The only chromosome numbers hitherto reported from Eriocaulon are $2n = 32$ and 36 counted by Erlandsson (1940) in three species from Australasia. None of these is closely related to E. septangulare agg. In our material from two localities in western Ireland (plants from Clooney Lakes in southern Kerry County, and germinating seeds from Lough Gall on Achill Island in May County) we counted $2n =$

64 chromosomes, a number very close to the inexact $2n = c. 60$ reported by Hare (1950) in connection with detailed morphological and anatomical studies on the Irish plant. In our American material of what the manuals name E. septangulare, from Lake Nominigue and Lake Ouareau in the Laurentian Mountains, we counted $2n = 32$ chromosomes, and the number $2n = c. 48$ is typical for E. parkeri from the estuaries of the St. Lawrence River. There is, thus, good reason to doubt the correctness of the identification of the American plant with the Irish species, and the name E. pellucidum Michx. should be reinstated for this taxon of eastern North America. E. septangulare s. str. differs from E. pellucidum in its generally somewhat broader and shorter leaves when cultivated under similar conditions; the scapes do not reach the same length and are thicker just above the base; the heads are generally larger, more sphaerical at first and later more vertically flattened, and not as depressed-globose as those of the American species; the seeds are ellipsoidal or subsphaerical and definitely larger in the plant from the British Isles than in any of the species from northeastern North America....The present results, conclusive for Eriocaulon and Sisyrinchium, indicate that the explanations hitherto presented for this problem [of North American - European relationships] have been based on insufficient taxonomic evidence, at least in part. It is clear that the two most discussed species of this element are not identical with taxa in North America as has always been thought, and there is considerable doubt as to the occurrence of these species outside of the British Isles. That they are old inhabitants of Ireland is beyond all doubt, and in fact Jessen (1949) has demonstrated that Eriocaulon grew in Ireland in early post-glacial times." They conclude that "Eriocaulon septangulare agg. is divided into three species in America and one in Ireland. No cytological information is available for the recently described E. Rollandii, while the American E. pellucidum has $2n = 32$, and E. Parkeri $2n = 48$ chromosomes. Irish plants of E. septangulare s. str. have $2n = 64$ chromosomes; that species seems to be endemic to the British Isles." It should be mentioned here that several North American botanists, notably the late Agnes Chase and Ellsworth P. Killip, who have observed both the Old and New World populations in the field, agreed that they are not conspecific. Unfortunately, the differences noted in the field are not as obvious on dried and pressed herbarium material.

The fossil described by Penhallow in 1899 came from Taylor Brickyard, Don Valley, Ontario, Canada, in a Pleistocene formation, while that described by him in 1900 was also from the Pleistocene of the Don River Valley, Ontario, and is almost certainly the same taxon.

Eriocaulon pellucidum has been collected on shore sand, on shores or muddy shores, on sandflats at creek mouths, and exsiccated shores at the mouths of brooks, in the swampy edges of lakes,

shallow pools in bog-barrens, wet sandy soil along lakeshores, dessicating mud of boggy roadside pools, peaty quagmire pools in sphagnum bogs, in the shallow water of lakes and bays, in the Sphagnum layers of pond shores, in peaty lake margins, quaking peaty margins of ponds, in water from 1 inch to almost 6 feet in depth, on bottoms of sand, sand and gravel, fibrous peat, muck, or sandy muck, growing at altitude to 550 meters.

Rouleau (1964) says that it is very common in the lakes of the Laurentides and the Appalachians in general in Quebec, also in Gaspé and Anticosti, frequently growing along with Lobelia dortmanna L. In Ontario it is said by Voss to be "occasional in floating bog mats". In Michigan it is described by Van Deusen as "very dense on exposed shoals, scapes 32—39 cm. long", by Mc Vaugh as "very abundant turf-forming", and by Voss as "abundant on moist sandy shores".

In New Jersey it is described by Adams as "submerged in dense colonies in shallow water" and by Kral as "in peaty banks and shallow water at edge of ponds in Chamaecyparis areas, the heads chalk-white, the submerged plants with much longer scapes". Wiegmann found it growing along with Cephalanthus occidentalis, Sphagnum, Pontederia, Castalia, and Eleocharis acicularis in New York, while in North Carolina it is said by Radford, Ahles, & Bell (1964) to be "rare in shallow pools of Bladen, Craven, Perquimans, and Tyrrell Counties". A distribution map preserved in the herbarium of the University of Wisconsin indicates this species as occurring in Ashland, Barron, Bayfield, Burnett, Chippewa, Dane, Dodge, Douglas, Forest, Langlade, Lincoln, Marquette, Oconto, Oneida, Polk, Price, Rusk, Sawyer, Shawano, Vilas, Washburn, Waupaca, and maybe Sheboygan Counties in that state.

Chapman (1889) records "E. septangulare" from southern Mississippi on the basis of an unnumbered Hilgard collection not as yet seen by me.

Sparrow (1960) reports that the leaves of this plant are parasitized by the fungus Endophlyctis texana Karling, a fungus also found on Elodea canadensis and Vallisneria. This report is apparently based on one by Karling (1941) to the effect that he found this fungus on dead leaves of E. septangulare in water in Texas. However, since E. pellucidum does not occur in Texas, he must have misidentified the host, which more probably was Eriocaulon texense Körn.

Clinton (1901) describes a smut fungus, Ustilago eriocauli Clint., from the ovaries of Eriocaulon pellucidum. In his 1902 work he claims that this smut is identical with the Cintractia eriocauli Masee, described from E. fenestratum Bojer in Madagascar.

Tucerman reports the "scapes 8- or 9-ribbed" on his specimens. Voss (1967) notes that the permanent septate appearance of the roots of this pipewort distinguish it at once from all other species of submerged rosette-forming plants in Michigan. Roland &

Smith (1964) say that the "Sterile plants often form a green growth on the bottom of lakes as much as 2 m. below the surface throughout our sandy lake shores, rarely in running water".

McVaugh (1958) distinguishes this species from the much-confused E. parkeri as follows: E. pellucidum -- heads when mature white-hairy at the summit, the involuclral bractlets at maturity spreading or reflexed, the head itself hemispheric or nearly spherical. E. parkeri -- heads never white-hairy, depressed-hemispheric, the involuclral bractlets closely appressed even at maturity, the involucre short-campanulate. He found E. pellucidum in "Shallow water, margins of ponds; frequent. Sometimes emerged, on muddy shores, or in sphagnum bogs".

The E. decangulare Lightf., previously regarded by me as a synonym of E. pellucidum, belongs in the synonymy of the European E. septangulare With. instead, since it is based on Scottish plants. Martius (1832), under E. quinquangulare L., notes that E. pellucidum "e speciminibus americanis huic et insequenti [E. sexangulare L.] comparari potest". It is interesting to note that he fails to compare it with E. septangulare!

Rafinesque's E. pumilum was said by him (1832) to be from the Catskill Mountains of New York and there is therefore no doubt of its identity. His E. pellucidum var. pumilum, published 8 years later, was proposed without designation of type locality. His E. brevifolium appears to be a mixture of two taxa: he cites New Jersey and Texas as the localities where it is said to grow, but the only species of Eriocaulon known to me from both these states is E. compressum Lam. and this does not fit his description as to size and color of the heads and the size of the leaves. It also seems to me that Merrill's suggestion of Syngonanthus flavidulus (Michx.) Ruhl. for the Rafinesquian plant is highly unlikely since that plant grows neither in New Jersey nor Texas! I suspect that Rafinesque's Texan plant was E. texense Körn. and his New Jersey plant was one of the forms of the highly variable E. pellucidum Michx. His description applies best to E. pellucidum and so I regard his binomial as strictly synonymous with that of Michaux and his Texan reference as an error in identification or remembrance on his part.

Thorne (1954), referring to Georgian material, apparently considers E. lineare Small conspecific with the present species, saying "E. septangulare With. (incl. E. lineare Small). -- Shallow water and wet margins of ponds and borrow-pits and moist pinelands, frequent. Our material may be separable from the more northern typical E. septangulare as a subspecies". Kral (1966) says "Sandy or peaty lakeshores, margins of ponds, ditches, muskeg, and sphagnum bogs, the Canadian Shield of southern Canada, the Great Lakes region, New England, and south in the Appalachians into mountainous North Carolina.....In habit, habitat, and floral character this species most closely resembles E. lineare and E. texense, en-

titles with which it may someday be considered as identical. However, it does differ from E. lineare by its darker, grayish or sooty bracts, bractlets, and sepals and from E. texense by its much smoother receptacle."

The Stone (1912) reference in the bibliography above is often cited as "1911", but the work was not actually published until January 26, 1912.

In the index to his work Sterling (1967) indicates that what he calls E. articulatum is illustrated on page "162", but it is actually depicted on page 161. Tatnall (1946) describes E. pellucidum as follows: "(E. articulatum in part of Gray's 7th); borders of fresh ponds, central part of peninsula [Delmarva]; one coll. in NewCastle Co. along Delaware River; mid July—Sept." Hartley (1966) says "Reported (personal correspondence) from the Trempealeau Lakes Area along the Mississippi River in Trempealeau Co. [Wisconsin] by Wm. Greene of the U. S. Fish & Wildlife Service, Winona, Minnesota. A collection (not seen by this writer) was made from this station by Dr. Greene in 1956 and is on file at the U. S. Fish & Wildlife Service Herbarium at Winona."

Ogden (1968) reports that Eriocaulon pellucidum stems rooted near the old lake margin on Martha's Vineyard island showed a radiocarbon content of + 37 percent (above the modern reference standard). The mean of four samples from the upper 10 cm. of sediment showed a radiocarbon content of only + 4.7 percent — the lower value implies mixing with deeper sediments because there is no detectable limestone in the till to reduce the proportion of C¹⁴. Sedimentation rates per century are about 4.5 cm. for the early postglacial, 5 cm. for the hypsithermal, and 6.8 cm. for the upper 1.5 cm. of the core. Both here and in an Ohio lake tested, the sedimentation rates for post-colonial times (above the sharp rise in Ambrosia and European weed pollen) are considerably greater than in the rest of the cores.

Common names for E. pellucidum are "ericaulon à sept angles", "northern pipewort", and "seven-angled pipewort". Lakela (1965) cites Lakela 3027 & 17073 from Minnesota, where she says that the species is "Frequent, shallow water, shores, and marshes". She gives its overall distribution as "Nfld to w Ont, NS to Minn". Freer (1968) cites Freer 7165 from Augusta County, Virginia. Little (1938) records the species from Muskogee County, Oklahoma, but this is surely an error for E. kornickianum Van Heurck & Muell.-Arg. Gillett (1963) cites Gillett 5471 and Schofield 783 from Labrador. The Wherry s.n. [1 m. s. of Flat Rock St., 5-30-1927], cited below, was previously regarded and cited by me as E. lineare Small.

Material has been misidentified and distributed in herbaria under the names E. compressum Lam., E. decangulare L., E. flavidulum Michx., E. lineare Small, E. septangulare With., Danthonia spicata (L.) Beauv., and Eleocharis acicularis Britton.

On the other hand, the W. C. Coker s.n. [4/3/1910] & s.n. [June

27, 1931] and Tharp s.n. [Bellville, 5/4/40], distributed as this species, are actually E. compressum Lam.; F. A. Barkley 13543, W. M. Canby s.n. [Pine barrens, Aug. 1861], and W. R. Taylor T.1073 are E. decangulare L.; E. L. Little Jr. s.n. [Jul. 14, 1929] is E. kornickianum Van Heurck & Muell.-Arg.; R. F. Thorne 1581, 4370, & 5022 and W. Wolf s.n. [Summerdale, July 30, '26] are E. lineare Small; Widgren s.n. is E. modestum Kunth; R. C. Alexander s.n. [Redbank, 3 Sept. '69] and Martindale s.n. [Camden, Sep. 1877] are E. parkeri B. L. Robinson; Lundell & Lundell 11152 and Olds s.n. [Montgomery, 2.20.94] are Lachnocaulon anceps (Walt.) Morong; McCarthy s.n. [Wilmington, June 1892] is Lachnocaulon minus (Chapm.) Small; and Adrien 3308 is a species of Lobelia. A sheet of Nuphar advena (Ait.) Ait. f. was actually identified as E. septangulare in the McGill University herbarium -- doubtless another case of transposed labels!

Additional citations: LABRADOR: Gillett & Findlay 5471 (S). NEWFOUNDLAND: Fernald, Long, & Fogg 1476 (N); Fernald & Wiegand 5068 (S), 5069 (Ca--207734); Grether 7818 (Ca--935540, Ws); Janson 361 (S), 362 (S), s.n. [Buchans Junction] (Go); K. K. Mackenzie s.n. [7/19/1921] (N); Rouleau 2508 (Mu). PRINCE EDWARD ISLAND: Queens Co.: Fernald, Long, & St. John 7128 (N). NOVA SCOTIA: Digby Co.: Graves & Linder 20590 (S); Fernald & Long 23575 (S, Ws). Guysborough Co.: Faribault 1908 (V1); Smith, Taylor, Webster, & Slipp 9491 (V1). Halifax Co.: Dore, Judd, & Gorham 45-1101 (V1); "A. H. H." s.n. [Halifax] (S); E. G. Knight s.n. [Grand Lake, 12.7.79] (N). Hants Co.: Fernald, Bartram, & Long 23568 (N), 23569 (V1); Smith, Taylor, Webster, & Slipp 9159 (V1). Inverness Co.: Smith, Schofield, Sampson, & Bent 4916 (V1). Lunenburg Co.: Fernald & Long 23574 (V1); Smith, Taylor, Webster, & Slipp 8986 (V1). Queens Co.: Fernald, Long, & Linder 20593 (S). Richmond Co.: Rousseau 130088 (S); Smith, Schofield, Sampson, & Bent 5052 (V1); Smith, Taylor, Webster, & Slipp 10095 (V1). Shelburne Co.: Fernald & Long 23571 (N), 23572 (N, V1). Victoria Co.: Smith, Schofield, Sampson, & Bent 4625 (V1); Smith, Schofield, Taylor, Webster, & Slipp 8090 (V1); Smith, Taylor, Webster, & Slipp 6638 (V1). Yarmouth Co.: Fernald & Long 23576 (N). County undetermined: Dawson s.n. [1869] (Mm--3295). Brier Island: Smith, Roland, Collins, Erskine, & Schofield 62 (V1). Saint Paul Island: Perry & Roscoe 127 (S). NEW BRUNSWICK: Charlotte Co.: Malte 447/29 (S, V1, V1). Madawaska Co.: Malte & Watson 733 (S). Saint John Co.: G. U. Hay s.n. [Aug. 4, '77] (V1). QUEBEC: Abitibi Co.: W. K. W. Baldwin 5471 (S, V1); Baldwin & Breitung 4325 (S, V1); Marie-Victorin, Rolland-Germain, & Blain 308 (Um--9130); Marie-Victorin, Rolland-Germain, & Dominique 125 (Um--9131). Argenteuil

Co.: Major-Barnabé s.n. [28 août 1940] (Vi); Marie-Victorin & Rolland-Germain 56405 (Um--9717); Marie-Victorin, Rolland-Germain, Raymond, & Boivin 56488 (Um--9721); Raymond 3045 (Vi); Raymond, Boivin, Marie-Victorin, & Rolland-Germain 56488 (Ca--740926); Rolland-Germain 6070 (S, Vi), s.n. [August 21, 1946] (B, Ca--48598, Hi--200059, N, Ok, S, St, Ur, Ut--69493b, Vi, We).

Beauce Co.: P. Masson 3519 (Vi). Brome Co.: Raymond & Kucyniak 807 (Mg). Charleroi Co.: Desmarais 224 (Vi, Ws), 491 (Vi, Ws). Gaspé Est Co.: Proulx s.n. [21 août 1933] (Ca--22931); Taché & Le Page s.n. [18 juillet 1938] (Vi). Gatineau Co.: Minshall & Zinck 197 (Ut--92964A); Senn 197 (Ok), 1860 (Um--41423). Iberville Co.: Marie-Victorin, Rolland-Germain, & Raymond 56191 (Um--9906); Raymond & Cinq-Mars 30331 (Mg). Jacques Cartier Co.: E. Hultén s.n. [Aug. 1959] (S). Joliette Co.: Jolicoeur 1471 (Vi); Marie-Victorin, Rolland-Germain, & Blain 124 (Um--9129). Labelle Co.: Desmarais 1198 (Mg); Dutilly & Lepage 34171 (Mg); Gauthier 11378 (N, S, Vi); Lamarre s.n. [28 août 1955] (Ca--72375); Lucien 204 (Um--9960); Lucien & Eloi 205 (Um--41424); Marie-Victorin s.n. [Lacs des Laurentides, Août 1912] (B); Marie-Victorin, Rolland-Germain, & Blain 124 (Ws); Raymond 243 (Um--58577); E. Roy 1638 (Vi, Vi). Lake Saint John Est Co.: Marie-Victorin 15736 (Vi). Laprairie Co.: Cléonique 4273 (Vi). Maskinongé Co.: Gauthier 2201 (Vi). Matane Co.: Boivin & Blain 782 (Gg--340478, Um--9291, Ut--25215b). Montcalm Co.: Cailloux s.n. [30 août 1936] (Vi); Raymond & Kucyniak 55272 (Mg); Rouleau 61 (Um--45740); Rousseau & Goudreault 151 (Go, S); E. Roy 123 (Vi); Sylvio 1229 (Vi), 1335 (Vi), 1385 (Vi). Papineau Co.: Gauthier 11530 (Vi). Portneuf Co.: Anselme 4 (Vi); Marie-Victorin 615 (Mm--23026). Rouyn-Noranda Co.: Hustich 443 (Mg). Saguenay Co.: Markle & Markle s.n. [Bergeronnes, July 26, 1955] (Ms--44351). Saint Maurice Co.: Gauthier 2244 (Vi). Terrebonne Co.: C. M. Boardman 36 (Mg); Cinq-Mars s.n. [août 1948] (Vi); Meilleur 535 (Mg), 562 (Mg); H. N. Moldenke 21740 (Bm, Ca, Gg, Mi, Mm); Nabor-Gabriel 294 (Vi); Rouleau 1229 (Vi). Timiskaming Co.: W. K. W. Baldwin 5968 (Vi). Vaudreuil Co.: E. Roy 1417 (Go, Vi). Wolfe Co.: Raymond & Kucyniak 1421 (Mg). Yamaska Co.: Marie-Victorin, Rolland-Germain, & Meilleur 45028 (Ca--341799). Madore Island: Boivin 4395 (Um--49921). ONTARIO: Algoma Dist.: Fassett 14699 (Ws); Grassl 7617 (Mi), 7619 (Mi), 7620 [Algona] (Mi, Mi); Hosie, Harrison, & Hughes 1317 (S), 1319 (N); Koelz 4622 (Mi); Taylor, Hosie, Fitzpatrick, Losee, & Leslie 1338 (Ca--341800), 1339 (S). Carleton Co.: Rolland 15737 (Ca--341808). Frontenac Co.: J. Fowler 21891 (Ws), s.n. [Battersea, Aug. 18, 1898] (B). Haliburton Co.: G. L. Fisher s.n. [Dorset, Aug. 3, 1898] (S). Hastings Co.: Macoun s.n.

[Aug. 15, 1874] (Mm--2326). Kenora Co.: Bisby s.n. [Ingolf] (Wp); Garton 1749 (Wp); Leach s.n. [Minaki] (Wp); G. B. Rossbach 34 (Ca--28298). Muskoka Co.: Britton & Timmerman s.n. [Port Sandfield, Sept. 1, 1889] (Ca--2419); Grassl 7618 (Mi). Nipissing Dist.: Grassl 7620 [Deer Lake] (Mi). Renfrew Co.: Umbach 10348 (Ws), s.n. [July 22, 1899] (Ok). Sudbury Co.: Grassl 2082 (Mi), 2083 (Mi), 2084 (Mi, N); Krotkov 5086 (Ws); Soper & Soper 3619 (Vi). Thunder Bay Dist.: J. A. Calder 1749 (S, Vi); Core C.46 (We); Garton 7632 (Hi--206119); Hosie, Losee, & Bannan 1401 (Ca--707061), 1402 (Vi); McClement 24893 (Ws); E. G. Voss 10356 (Mi, S). Caribou Island: Grassl 1301 (Mi). Eagle Island: Grassl 2081 (Mi). Georgian Bay Island 510a: E. D. McDonald 482 (Ws). MAINE: Aroostook Co.: G. D. Chamberlain 501 (Ca--841804). Cumberland Co.: Addams s.n. [Bridgeport, July--Aug. 1926] (Ws). Franklin Co.: L. O. Eaton 16988 (Ws). Hancock Co.: R. C. Friesner 3399 (Mi). Kennebec Co.: Fassett 7335 (Ws), 15631 (Ca--539309); Stabler & King 59 (Mi). Lincoln Co.: Fassett 2460 (Ws), 18795 (Ws), 18799 (Ws); C. H. Knowlton s.n. [Newcastle, July 27, 1932] (Hi--166350). Oxford Co.: J. F. Reed 442 (Hi); L. A. Wheeler s.n. [Bethel, 8/5/29] (S). Penobscot Co.: Fernald 369 (Ws). Piscataquis Co.: F. J. Hermann 19124 (Mi), 19612 (N). Somerset Co.: Fassett 13492 (Ws); Goodale s.n. [11 August 1933] (Ms--70876); Spaulding & Collins s.n. [August 21, 1919] (Vi). Waldo Co.: R. C. Friesner 4840 (Mi, Wp), 10224 (Ca--597242, Lb--30195), 23054 (Ok, S). York Co.: Cléonique-Joseph 2367 (Vi), 2617 (Vi). Mount Desert Island: Batchelder s.n. [Aug. 5, 1905] (Dt); Macfarlane & Taylor 1229 (Mi). County undetermined: Houten & Schoenmakers s.n. [Lower Togue Pond] (Ut--52774a). NEW HAMPSHIRE: Belknap Co.: F. F. Forbes s.n. [New Hampton, Sept. 5, 1904] (S). Carroll Co.: Herb. Univ. Wisc. s.n. [L. Winnipisaukee, July 31st '51] (Ws). Cheshire Co.: W. Deane s.n. [Muddy Pond, July 2, 1891] (S), s.n. [Muddy Pond, Aug. 7, 1891] (S), s.n. [Aug. 17, 1896] (Ms--81538). Coos Co.: Collector undetermined s.n. [White Mountains] (B); Heuser s.n. [31 July '96] (B). Grafton Co.: Collector undetermined s.n. [Goose Pond, Sep. 6, 1875] (Ca--67328); Fassett 14353 (Ws); R. H. Piper 1523 (Ok), s.n. [31 July 1932] (Ms--69489). Hillsboro Co.: F. S. Beattie s.n. [7/14/1927] (Ok--2124, Ok--2125, Ok--2126). Merrimack Co.: Eggleston s.n. [N. London, '89] (Dt); Markert s.n. [11 August 1931] (Ms--64989). Rockingham Co.: Foote & Adams s.n. [September 24, 1940] (Ok). VERMONT: Caledonia Co.: F. Blanchard s.n. [Waterman's Pond, July 4th, 1878] (Dt), s.n. [West Danville, Sept. 1, 1884] (Ca--421731). Franklin Co.: Muenschler, Manning, & Maguire 312 (Ws). Grand Isle Co.: Carpenter s.n. [8-6-1919] (Ur). Lamoille Co.: A. R. Moldenke 1145 (Ac). Rutland

Co.: J. A. Drushel 9796 (Ur). Windham Co.: Eggleston s.n. [Marlboro, Sept. 15, 1895] (Dt); M. F. Moseley s.n. [Aug. 11, 1940] (Ms--44449). MASSACHUSETTS: Barnstable Co.: H. C. Cowles s.n. [Cape Cod, Sept. 1900] (E--1286913); B. W. Davis s.n. [Wood's Hole, Aug. 24, 1894] (M1); Elwell s.n. [Aug. 25, 1891] (Ms--50576); Fernald & Fogg 567 (Ca--923785); D. S. Francis 76 (Ok); J. P. Poole s.n. [Mashpee, 8/18/39] (Go). Berkshire Co.: Pease, Goodale, & Hopkins s.n. [19 Sept. 1930] (Ms--66116). Bristol Co.: O. Ames s.n. [Winnicunnitt Lake, 8/12/1895] (Rf); Baxter s.n. [New Bedford, July 26, 1906] (Ca--841780); Blomberg s.n. [Winnicunnitt Lake, 1894] (Rf); T. A. Greene s.n. [Frog Pond] (Ws). Franklin Co.: W. D. Forbes 444 (Ms--72921); Goodale s.n. [24 July 1925] (Ms--3730); Goodale & Markert s.n. [23 Aug. 1932] (Ms--68268); Goodale, Markert, & Piper s.n. [27 July 1929] (Ms--55835), s.n. [22 Aug. 1929] (Ms--55837); Goodale, Potsubay, & St. John s.n. [25 Aug. 1931] (Ms--62463), s.n. [30 Aug. 1931] (Ms--62462); Jesup s.n. [Locke's Pond, July 2, 1870] (Dt), s.n. [Sept. 1871] (Ms--3895); Livingston & Rowley s.n. [Sept. 9, 1960] (Ms--46191, Ms--46192). Hampden Co.: Bliss & Seymour G.779 (Ms--70764), G.832 (Ms--56861, Ws); Clark & Seymour G.745 (Ms--70763); Markert s.n. [1 Aug. 1930] (Ms--61690); F. C. Seymour 268 (Ms--3894), G.233 (Ms--70767), G.381 (Ms--70766), G.541 (Ms--70765), G.1042 (Ms--70762); E. Tuckerman s.n. [July 1860] (Ms--3896). Hampshire Co.: Goodale, Markert, & Piper s.n. [18 July 1929] (Ms--55832), s.n. [Aug. 1, 1929] (Ms--55834), s.n. [15 Aug. 1929] (Ms--55831), s.n. [26 Aug. 1929] (Ms--55839); Goodale, Potsubay, & St. John s.n. [13 July 1931] (Ms--62464); Jesup 3018 (Dt); C. H. K. Sanderson 3018 (Ms--71975). Middlesex Co.: M. E. Ames s.n. [Groton, 1865] (Dt); Cleaveland s.n. [Horn Pond, Woburn] (Lb--20646); Deane s.n. [Winchester, Oct. 7, 1917] (Dt); R. A. Harper s.n. [Walden Pond] (Ws); Pease 3225 (Ca--69997); C. E. Perkins s.n. [Winchester, Sept. 10, 1879] (Ca--67274); M. M. Stevens s.n. [Middlesex Fells, July 1892] (Dt); W. Trelease s.n. [Spot Pond, 10/3/80] (E), s.n. [Medford, Summer '83] (E). Norfolk Co.: Herb. Mt. Holyoke Sem. s.n. [Wellesley] (Dt). Plymouth Co.: Fernald & Long 9107 (S); M. Hopkins s.n. [17 Oct. 1931] (Ms--65398); F. C. Seymour 4127 (Ws), 4355 (Ws); Trow s.n. [July 17, 1866] (Ms--15484). Suffolk Co.: Boott s.n. [Boston, 1830] (B); Lenander s.n. [Boston, Aug. 27, 1933] (S). Worcester Co.: J. F. Collins s.n. [Oct. 25, 1893] (V1); Fassett 10624 (Ws); Goodale, Markert, & Piper s.n. [8 Aug. 1929] (Ms--55833), s.n. [17 Aug. 1929] (Ms--55838), s.n. [31 July 1929] (Ms--55836); Hoyten & Schoermakers 635 (Ut--52775a); G. E. Stone s.n. [Aug. 1890] (Ms--11009); M. B. White s.n. [Aug. 1893] (V1). County undetermined: Meebold s.n. [Massachusetts?]

(Mu); J. Torrey 23 (S). Martha's Vineyard Island: E. S. Burgess s.n. [July 24, '89] (N), s.n. [Aug. '92] (N), s.n. [Aug. 2, '93] (N); MacKeever MV.707 (N, N, N, N, N, N, N, Z). Nantucket Island: MacKeever N.677 (N, N, N, N, S, Z). RHODE ISLAND: Kent Co.: Congden s.n. [Apponaug, Sept. 11, 1873] (Ca—405215). Providence Co.: J. F. Collins s.n. [September 11, 1900] (Vi); E. J. Palmer 47900 (S). CONNECTICUT: New Haven Co.: G. H. Cornwell s.n. [Black Pond, 1843] (Ws), s.n. (Ws); E. H. Eames s.n. [Lake Whitney, Aug. 14, 1893] (S). New London Co.: Jansson s.n. [Ledyard, July 21, 1929] (Go); Ryon 39 (Dt); W. A. Setchell s.n. [Ledyard, July 19, 1883] (Ca—2417). Tolland Co.: N. L. Britton s.n. [Mansfield, Aug. 1879] (N). Windham Co.: J. L. Sheldon s.n. [Central Village, 1893] (Ws). County undetermined: Lucian 136 [Black Rock State Park] (N); C. Wright s.n. [Conn., 1887] (Lb—20642). NEW YORK: Dutchess Co.: "L. H. H." 93 (Ws); Myron s.n. [Web Twp., summer of 1924] (Ms—15461); Wiegmann s.n. [Stissing Mt., 14 Sept. 1921] (N). Essex Co.: Muenschler & Lindsey 3145 (Dt). Franklin Co.: W. A. Matthews 3919 (Ca—841777); Muenschler, Manning, & Maguire 309 (Ca—512856). Fulton Co.: Muenschler & Lindsey 3150 (Ca—552916). Hamilton Co.: W. A. Matthews 2964 (Ca—841778); Muenschler & Lindsey 3149 (Ws); Muenschler & Maguire 2120 (Ca—512774). Herkimer Co.: W. A. Matthews 2948 (Hi), 2964 (Hi, Ur); Muenschler & Maguire 2119 (Ws). Monroe Co.: Baxter & Dewing s.n. [July 11, 1909] (Ca—841781). Nassau Co.: W. P. Stiles 16 (Ms—3511). Oneida Co.: Haberer 2244 (Ca—841783); Muenschler & Brown 21667 (S). Orange Co.: Raup 7748 (Mi). Oswego Co.: Fernald, Wiegand, & Eames 14204 (N); Wiegand & Hoy s.n. [Fulton, September 11, 1897] (Ca—841802). Rockland Co.: Lehr 923 (N). Saint Lawrence Co.: G. F. Atkinson s.n. [Childwold, September 2, 1896] (Ca—841801). Suffolk Co.: S. A. Cain 1085 (N), 1533 (N), 1717 (N), 1751 (N); Muenschler & Curtis 6817 (Ca—727633), 6818 (N); Muenschler, Winne, & Isely 20695 (Ca—906913). Sullivan Co.: E. G. Whitney 5214 (Ca—841803); Wiegmann s.n. [Highland Lake, July 13, 1913] (N). Warren Co.: T. S. Brandegee s.n. [Adirondacks, 1884] (Ca—115167); D. D. Keck 6460 (Ca—24143, N). Westchester Co.: S. B. Mead s.n. [Peach Pond] (Ws). County undetermined: W. Cooper s.n. [near New York] (S); Herb. Schreber s.n. [Prope Novum Eboracum] (Mu—236); J. Torrey s.n. (B, Ms—15481). NEW JERSEY: Atlantic Co.: Bartram s.n. [Sept. 9, 1906] (Vi). Bergen Co.: A. Brown s.n. [July 31, 1880] (N). Burlington Co.: O. Reed s.n. [July 23, 1950] (We), s.n. [August 6, 1950] (We). Camden Co.: J. W. Adams 49-333 (Hi—54971). Cumberland Co.: J. B. Ellis s.n. [Maurice River, July 23, 1872] (Ca—372291); Kral 22590 (N). Monmouth Co.: Leiderman s.n. [Aug. 7, 1932] (Ws). Morris Co.: J. K. Small s.n. [Budd's Lake, August 12—14, 1890] (Ok);

U. C. Smith s.n. [Budd's Lake, Sept. 1st, 1899] (S). Ocean Co.:
K. K. Mackenzie 3692 (S). Sussex Co.: Clausen & Edwards 2289
 (Ca--841807); J. L. Edwards s.n. [Sept. 17, 1949] (N). County un-
 determined: C. F. Austin s.n. [Oct. 1862] (N). PENNSYLVANIA: Lu-
 zerne Co.: A. A. Heller s.n. [Lily Lake, July 29, 1889] (Ms--
 15485); Heller & Halbach s.n. [September 16-17, 1892] (B, Dt);
Heller & Heller 691 (Ca--2420), s.n. [September 16-17, 1892] (Ms--
 15487); J. K. Small s.n. [Lily Lake, August 15-16, 1889] (S).
 VIRGINIA: Arlington Co.: E. S. Steele s.n. [Four Mile Run, July
 31, 1896] (S). NORTH CAROLINA: Bladen Co.: R. K. Godfrey s.n.
 [White Lake, 6-20-1937] (No--2620); Hueske s.n. [White Lake, 5/
 24/47] (H1--29586). Henderson Co.: Wherry s.n. [1 m. s. of Flat
 Rock Sta., 5-30-1927] (N). Perquimans Co.: A. E. Radford 6535
 (H1--54297). Tyrrell Co.: A. E. Radford 5074 (H1--47825). OHIO:
 Portage Co.: Ashcroft 6766 (Ws), 9428 (Ws). INDIANA: Porter Co.:
M. W. Lyon s.n. [26.VII.1925] (Mi), s.n. [23.VIII.1925] (Mi); Um-
 bach 10499 (Ws), 22617 (Ws), 31965 (Ws). Steuben Co.: C. C. Deam
 55391 (Ws). MICHIGAN: Alger Co.: J. Bailey 181 (Mi); E. G. Voss
 2494 (Mi). Allegan Co.: D. L. Allen 6 (Mi); D. C. Chandler 174
 (Mi); Cheatum 161 (Mi). Baraga Co.: Beckman 76 (Mi). Benzie Co.:
Bobb 822 (Ws). Cass Co.: Eschmeyer 473 (Mi); Roelofs 264 (Mi).
 Cheboygan Co.: J. H. Ehlers 1109 (H1--144272, Ws), 5153 (Ca--
 498930), 6286 (Ca--841782, Mi); F. C. Gates 14899 (Ca--841805,
 S). Chippewa Co.: E. G. Voss 2452 (Mi). Crawford Co.: E. G.
 Voss 3217 (Mi). Gogebic Co.: Kilpela 123 (Mi); E. G. Voss 12303
 (Mi). Grand Traverse Co.: Dieterle 1395 (Mi, S). Gratiot Co.:
C. A. Davis s.n. [Alma, August 13, 1895] (H1--143520, N). Hough-
 ton Co.: Beckman 132 (Mi), 150 (Mi); C. D. Richards 1183 (Mi, S);
E. G. Voss 12286 (Mi). Iosco Co.: Dreisbach 8505 (B). Iron Co.:
Kilpela 289 (Mi), 358 (Mi). Kalkaska Co.: Hyypio 822 (Mi). Kent
 Co.: Bazuin 1702 (Mi). Keweenaw Co.: W. S. Cooper 289 (Ca--
 980289); Houghton s.n. (Ws); Mains s.n. [Aug. 24, 1934] (Mi); G.
 M. Moore 18 (Mi), 22 (Mi); C. D. Richards 1062 (Mi, Ur); Stuntz &
 Allen 1356 (Ws). Lake Co.: J. Bailey 69 (Mi). Lapeer Co.: Dreis-
 bach 8238 (Mi). Luce Co.: R. McVaugh 9514 (Mi, Vi), 14781 (Mi);
D. E. Miller 202 (Mi). Marquette Co.: Beckman 98 (Mi), 107 (Mi),
 115 (Mi); Hazzard s.n. [August 15, 1941] (Mi); Hyypio 1129 (Mi).
 Mason Co.: E. G. Voss 3255 (Mi). Muskegon Co.: E. G. Voss 2843
 (Mi). Newaygo Co.: Bazuin 3724 (Mi). Ontonagon Co.: H. T. Dar-
 lington s.n. [8/21/1923] (Mi); Grether 8203 (Ws). Osceola Co.:
R. C. Ball 946 (Mi); Shelter 1144 (Mi); Van Deusen 3 (Mi). Ot-
 sego Co.: R. McVaugh 9671 (Mi, Vi). Presque Isle Co.: J. H. Eh-
 lers 6150 (S); F. J. Herman 7012 (Ws). Schoolcraft Co.: Cain,
 Raymond, & Kucyniak 580 (Mg, S, Vi); Laskowski 1095 (Mi); L. K.

Ludwig 4471 (Mi); R. G. Mills 43-90 (Ur); Van Deusen s.n. [July 21, 1942] (Mi); E. G. Voss 2982 (Mi). Wexford Co.: Reolofs 468b (Mi); E. G. Voss 3280 (Mi). County undetermined: Umbach 7360 [Magician Lake] (Ca--46048), 7472 [Dewey Lake] (Ws), 19769 [Magician Lake] (Ws). Sugar Island: E. G. Voss 11246 (Mi). WISCONSIN: Douglas Co.: Goessl 8603 (B). Marquette Co.: Fassett 22516 (Ca--921778). Rusk Co.: L. S. Cheney s.n. [Aug. 13, 1933] (Ca--539286). Vilas Co.: Greenley s.n. [Sept. 3, 1949] (Ca--903650). Waupaca Co.: Hotchkiss & Martin 4436 (Ca--565778). Outer Island [Ashland Co.]: F. C. Lane 2507 (Ut--85710). MINNESOTA: Aitkin Co.: J. H. Sandberg s.n. [Aug. 1890] (Ca--2418). Carlton Co.: Lakela 4167 (Ca--841779). Chisago Co.: E. C. Taylor 3067 (Ws), 5324 (Ws), s.n. [Linn Lake, Aug. 1892] (S). Cook Co.: Herb. Univ. Wisc. s.n. [Lake Seiganagah, July 23, 1891] (Ws). Morrison Co.: J. H. Sandberg 887 (Ws). Saint Louis Co.: Bednar s.n. [July 14, 1957] (Ur); Moore & Moore 10329 (Ca--797218, S, VI); Moyle 2388 (Ca--22751). JAPAN: Hokkaido: W. P. Brooks s.n. [southern Hokkaido, 1884] (Ca). LOCALITY OF COLLECTION UNDETERMINED: Brongniart s.n. [Terre nueve] (B); S. C. Brooks s.n. [Locke's Pond, July 24, 1909] (Ca--376824); R. A. Harper s.n. [12/8/1891] (Ws); Herb. Chapman 3966 [Dean Lake] (E); Herb. Kummer s.n. [America boreali] (Mu--237); Herb. Lemmon s.n. [Drumochty Lake] (Ca--366733); Herb. Schreber s.n. (Mu--237, Mu--238); Herb. Zuccarini s.n. [hab. in America septentrionalis paludibus, 1816] (Mu--203); Scouler s.n. (Ms--15462).

ERIOCAULON PERPLEXUM Satake & Hara

Synonymy: Eriocaulon nipponicum Tatew. ex Satake & Hara, Bot. Mag. Tokyo 52: 400, in syn. 1938 [not E. nipponicum Maxim., 1893]. xEriocaulon perplexum Satake & Hara ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949.

Bibliography: Tatew., Veg. Apoi 119 & 131. 1928; Nakai, Veg. Apoi 76. 1930; Miyabe & Kudo, Fl. Hokkaido & Saghal. 3: 286. 1932; Satake & Hara, Bot. Mag. Tokyo 52: 400--401. 1938; Honda, Nom. Pl. Jap. 462. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, 13, 40, 41, 79, & 87, fig. 1D, 2J, & 17. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 28--29, pl. 4, fig. 8. 1940; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949; Moldenke, Phytologia 3: 340. 1950; Moldenke, Résumé 173, 290, & 482. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 180, 182, & 430, fig. 123 (3). 1964; Moldenke, Phytologia 17: 454. 1968.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, & 41, fig. 1D, 2J, & 17. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 4, fig. 8. 1940; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 180, fig. 123 (3).

1964.

The type of this rare species was collected by Hiroshi Hara on Mt. Apoi, in the province of Hidaka, Hokkaido, Japan, in August, 1937, and is deposited in the herbarium of the University of Tokyo. The species is said to be endemic to Mt. Apoi and the only vernacular name recorded for it is "ezo-inunohige". The *E. nipponicum* Maxim., referred to in the synonymy above, is regarded as a valid species by me.

Citations: WESTERN PACIFIC ISLANDS: JAPAN: Hokkaido: Hultén s. n. [Mt. Apoi, IX.20.1961] (S).

ERIOCAULON PERUVIANUM Ruhl.

Synonymy: *Eriocaulon glabrum* Pennell ex Moldenke, Résumé 288, in syn. 1959 [not *E. glabrum* Salzm., 1959, nor Steud., 1959].

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 58, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Moldenke, Known Geogr. Distrib. Erioc. 7 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 72 & 205. 1949; Moldenke, Résumé 83, 288, & 482. 1959.

Collectors have found this plant growing in pools at altitudes of 2320--2400 meters, flowering and fruiting in May and July, and describe the heads and flowers as white. Wurdack notes "locally frequent, forming colonies in seepage areas". It was erroneously recorded by me (1959) from San Martín, Peru. Apparently it is known thus far only from Amazonas. The *E. glabrum* ascribed to Salzmänn and referred to in the synonymy above actually belongs in the synonymy of *Syngonanthus gracilis* var. *glabriusculus* Ruhl., while the homonym ascribed to Steudel is typical *S. gracilis* (Körn.) Ruhl.

Citations: PERU: Amazonas: Mathews s.n. [Chachapoyas; Macbride photos 10564] (B--isotype, Br--type, N--isotype, N--photo of isotype, W--photo of isotype); F. W. Pennell 15904 (N); Wurdack 514 (N, S, W-2403669).

ERIOCAULON PTEROSEPALUM Hayata

Bibliography: Hayata, Icon. Pl. Formos. 10: 55. 1921; S. Sasaki, List Pl. Formos. 99. 1928; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Moldenke, Known Geogr. Distrib. Erioc. 25 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 205. 1949; Moldenke, Résumé 172 & 482. 1959.

The vernacular name, "inunohige-modoki", has been recorded for this species.

ERIOCAULON PICTUM Fritsch

Synonymy: *Eriocaulon amphibium* Rendle, Journ. Linn. Soc. Lond. Bot. 27: 475. 1906.

Bibliography: Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1102--1105. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 63, 79, & 286. 1903; Rendle, Journ. Linn. Soc. Lond. Bot. 27: 475. 1906; Prain, Ind. Kew. Suppl. 3: 70. 1908; Arwidsson, Bot. Notiser 1934: 83. 1934; Moldenke, Known Geogr. Distrib. Erioc. 22 & 38. 1946;

Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 205. 1949; Moldenke, Phytologia 3: 181. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 138—145, pl. 8, fig. 3, 4, 7, & 8. 1955; Moldenke, Résumé 147 & 482. 1959; Moldenke, Phytologia 17: 387 (1968), 17: 479 (1969), and 18: 256. 1969.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: pl. 8, fig. 3, 4, 7, & 8. 1955.

Because of the way taxonomists have bandied E. amphibium Rendle about in the past, the thorough discussion by Hess (1955) is perhaps worthy of being quoted in large part here: "Aus einer Sammlung, die von P. Eugenio Dekindt in der Umgebung von Huila (Angola) zwischen 1899 und 1902 angelegt und dem Botanischen Museum der Universität Wien zugesandt wurde, hat Fritsch (1901) Eriocaulon pictum beschrieben. Er vergleicht die Art mit E. striatum Lam. und mit E. huillense Engl. et Ruhl. und findet, dass E. pictum der Farbe der Sepalen und Brakteen wegen deutlich von den beiden erwähnten Arten geschieden sei. Die Untersuchung am Typus-Material von Dekindt (Nr. 703) haben gezeigt, dass Fritsch bei der Analyse der Blüten die spatha-ähnlich verwachsenen Sepalen der ♂ und ♀ Blüten übersehen hat. Dieses charakteristische Merkmal ist nur zu beobachten, wenn sehr sorgfältig präpariert wird, sonst zerreißen die verwachsenen Sepalen und erscheinen frei. Nach dieser Feststellung fällt ein Vergleich mit E. striatum und E. huillense dahin, da die beiden Arten freie Sepalen haben. Damals was aus Afrika noch keine Eriocaulon-Art mit verwachsenen Sepalen in den ♀ Blüten bekannt.

"Eine andere Art mit verwachsenen Sepalen beschrieb Rendle (1906) unter dem Namen Eriocaulon amphibium. Herkunft: Gebiet von Matopo Hills in Süd-Rhodesien. Das Typus-Material dieser Pflanze ist im British Museum, und ich habe es nicht gesehen. Die Diagnose samt Anhang ist aber so eingehend, dass E. amphibium damit sicher bestimmt werden kann. Rendle erschreibt, dass E. amphibium E. lacteum Rendle ähnlich sehe; E. amphibium unterscheidet sich aber durch verwachsene Sepalen in den ♂ und ♀ Blüten von allen bekannten Eriocaulon-Arten Afrikas.

"Später hat Ruhland Eriocaulon amphibium unter die Synonymie von E. lacteum Rendle gestellt; von Arwidson (1934) wurde sie aber wieder als eigene Art anerkannt. In Moldenke (1949) ist E. amphibium unter den gültigen Namen nicht zu finden. In einer andern Publikation aus dem gleichen Jahre (Moldenke, 1949a) zitiert er bloss die oben erwähnte Literatur.

"Nach den eigenen Untersuchungen sind Eriocaulon pictum und E. amphibium identisch und der Name Eriocaulon pictum Fritsch hat von E. amphibium Rendle die Priorität.

"Das Material von Eriocaulon pictum aus Angola ist umfangreich; an 11 Fundorten wurden meist mehrere Bogen dieser Pflanze gesammelt. Dazu kommen noch die Nummern von P. Damann, H. Humbert und Baum."

He cites the following collections: ANGOLA: Benguela: Damann

D52/3001 & D52/3002; H. Hess 51/145, 52/836, & 52/1511a. Eib: Baum 324; H. Hess 52/510a, 52/613, 52/2060, & 52/2087. Huambo: H. Hess 52/886. Huila: H. Hess 52/1811, 52/2148, & 52/2149; Humbert 16651.

He gives the following very interesting discussion about the occurrence of this species: "Eriocaulon pictum wurde nur auf moorig-sandigem Boden entlang Flüssen und Bächen oder auf gleichem Boden an Quelltümpeln oder an stehenden Gewässern beobachtet. Die Pflanze wächst auf Moorboden auch noch auf trockeneren Standorten, ist aber häufig und besser entwickelt auf den nassen und auch zur Trockenzeit noch 1—5 cm tief überschwemmten Böden. Oft finden sich E. pictum auch in Bächen, wobei die Blätter während der ganzen Entwicklung untergetaucht bleiben. Wie die Daten unter den Fundorten zeigen, blüht und fruchtet die Pflanze im Süden von Angola das ganze Jahr. Dies hängt mit der Wasserführung der Moore zusammen: während der Regenzeit entwickeln sich an der Peripherie der Moore die Pflanzen sehr rasch in der nur wenige Zentimeter tief überschwemmten Zone; nach der Regenzeit, wenn der Wasserstand stetig langsam sinkt, kommen die Pflanzen in der vorher tiefer überschwemmten Gebieten zur Blüte. Am Ende der Trockenzeit ist E. pictum nur noch am Rande der Gewässer und auf deren Grund in Blüte zu finden.

"Baum (1903) schreibt zum Standort: 'sumpfige Stelle am Fluss; Wasserpflanze, teils über, teils unter Wasser.'

"Fast immer ist Eriocaulon pictum mit E. Teusczii Engl. et Ruhl. vergesellschaftet. Oft findet sich an diesen Standorten auch Syngonanthus Wahlbergii (Wikstr.) Ruhl.....

"Was den Blütenbau anbelangt, ist das ganze Material sehr einheitlich. Die grossen Abweichungen in der Höhe der Pflanzen und in der Länge der Blätter sind durch den Standort bedingt: Pflanzen an relativ trockenen Standorten entwickeln nur kurze Blätter und weniger hohe Halme. Die üppigsten Exemplare sind jene, deren Blattrosette bis nach der Blüte submers bleibt.....

"Bisher ist Eriocaulon pictum nur durch das Original-Material aus Angola (Gebiet von Huila) bekannt geworden. Berücksichtigt man die Synonymie, so ergibt sich eine weitere Angabe aus Süd-Rhodesiens. Nach der nun festgestellten weiten Verbreitung im Süden von Angola ist ein zusammenhängendes Areal bis Süd-Rhodesien zu erwarten. E. pictum ist neben E. Teusczii im Süden von Angola wohl die häufigste und weitverbreitetste Art dieser Gattung.....

"Eriocaulon pictum Fritsch wird der habituellen Ähnlichkeit wegen immer wieder mit E. Teusczii Engl. et Ruhl. verwechselt. E. pictum hat aber verwachsene Sepalen in den ♂ und ♀ Blüten, während die Sepalen bei E. Teusczii vollständig frei sind. Durch die Präparation können die verwachsenen Sepalen reissen und freie Sepalen vortäuschen. Es besteht aber auch ein Unterschied an den Sepalen der beiden Arten: E. pictum hat dünne fast häutige Sepalen, während sie bei E. Teusczii gegen die Spitze hin holzig verdickt sind. Der Unterschied ist natürlich nur an Blüten mit

reifen Früchten oder an abgeblühten ♂ Blüten sicher festzustellen. Auch die Brakteen der Blüten werden bei E. pictum nie knorpelig verdickt wie es bei E. Teusczii die Regel ist. Bei einiger Übung lassen sich die beiden Arten auch an den Blättern unterscheiden: E. pictum hat gelb-grüne, vom Grunde an verschmälerte, steife und ± spitze Blätter. Bei E. Teusczii sind sie blau-grün oder grau-grün, nicht vom Grunde an verschmälert, weniger steif und vor der stumpfen, knorpeligen Spitze etwas eingeschnürt."

ERIOCAULON PILGERI Ruhl.

Bibliography: Ruhl. in Pilg., Engl. Bot. Jahrb. 30: 147. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 55, & 286. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Moldenke, Known Geogr. Distrib. Erioc. 8 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 205. 1949; Moldenke, Résumé 89 & 482. 1959.

This species is known thus far only from the original collection. The original publication of the name is sometimes cited as "1902", but the part in question was actually issued on July 2, 1901 — "1902" is merely the volume title-page date.

Citations: BRAZIL: Mattogrosso: Pilger 239 [Macbride photos 10565] (B--type, N--photo of type, W--photo of type, Z--isotype).

ERIOCAULON PILIFLORUM Ruhl.

Synonymy: Eriocaulon ciliatum Ruhl. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959 [not E. ciliatum Bong., 1831].

Bibliography: Ruhl. in Engl., Bot. Jahrb. 27: 80. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 72, & 286. 1903; Thisel-Dyer, Ind. Kew. Suppl. 2: 70. 1904; Moldenke, Known Geogr. Distrib. Erioc. 22 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 205. 1949; Moldenke in Humbert, Fl. Madag. 36: 25--26. 1955; Moldenke, Résumé 156 & 482. 1959; Moldenke, Résumé Suppl. 1: 16. 1959.

Hypogeous stems short, the epigeal portions also short; leaves cespitose-spreading, few, linear, 10--11 cm. long, 2--4 mm. wide at the midpoint, flat or often conduplicate, acuminate at the apex, not pellucid, scarcely or not at all fenestrate, about 7-veined with the veins somewhat prominent beneath, glabrous above, rather densely hirsute beneath and along the margins with short rather rigid very spreading hairs in irregularly appressed lines; peduncles solitary, 6- or 7-costate, 12--14 cm. long, scarcely surpassing the leaves, not twisted, glabrous; sheaths rather loose, venose-costate, very spreading-hirsute, deeply and obliquely split, the blade elongate, somewhat recurved, acuminate at the apex; heads finally globose, 5--6 mm. wide, densely whitish-villous throughout; involucre bractlets subcuneate-obovate, gray, olivaceous at the apex, ciliate, acute at the apex; receptacle pilose; receptacular bractlets oblong-cuneate, olive-green at the apex, navicular, apiculate at the apex, pilose at the summit on the back; staminate florets: sepals 3, connate about to the middle into an anteriorly split spathe, pale-olivaceous, obovate, roun-

ded-obluse at the apex, ciliate; petal-tube with 3 subequal lobes at its apex, the lobes white-ciliate, with a large dark gland at the middle of each; anthers yellowish-white; pistillate florets: sepals 3, separate, broadly obovate, lax, olive-green above, navicular, very obtuse at the apex, puberulous on the back at the apex; petals 3, oblong-spatulate, whitish, obtuse at the apex, long-pilose, with a dark gland below the apex of each.

The species is known thus far only from the original collection, the locality of which is discussed in Proc. Zool. Soc. Lond. 1896: 971—981. The E. ciliatum Bong., referred to in the synonymy above, is a synonym of Paepalanthus ciliatus (Bong.) Kunth, a valid species.

Citations: MADAGASCAR: Forsyth-Major 17 (B--type, Z--isotype).

ERIOCAULON PILIPHORUM Satake

Synonymy: Eriocaulon piliphorum Satake ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205, sphalm. 1949. Eriocaulon sikokiamum var. piliphorum (Satake) Satake ex Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 182. 1964.

Bibliography: Satake, Bot. Mag. Tokyo 51: 285—287 [Shib. Comm. Art. 17: 103—105], fig. 1. 1937; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 13, 42, 43, 79, & 87, fig. 18. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 30—31, pl. 5, fig. 10. 1940; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 205. 1949; Moldenke, Résumé 173, 291, 419, & 482. 1959; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 182 & 430. 1964; Moldenke, Résumé Suppl. 12: 10. 1965.

Illustrations: Satake, Bot. Mag. Tokyo 51 [Shib. Comm. Art. 17]: fig. 1. 1937; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 43, fig. 18. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 5, fig. 10. 1940.

The only recorded vernacular name for this species is "nagatoshikusa". The species is known thus far only from Honshu, Japan.

ERIOCAULON PILOSISSIMUM Van Royen

Bibliography: Van Royen, Blumea 10: 134—135, fig. 1G. 1960; G. Taylor, Ind. Kew. Suppl. 13: 52. 1966; Moldenke, Résumé Suppl. 17: 6. 1968.

Illustrations: Van Royen, Blumea 10: 129, fig. 1G. 1960.

This taxon has recently been described from Celebes, on the basis of Eyma 4009 as the type. Also cited by Van Royen (1960) from the same island are Eyma 1238 & 4009bis.

ERIOCAULON PINARENSE Ruhl.

Bibliography: Ruhl. in Fedde, Repert. Spec. Nov. 22: 32. 1925; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Moldenke, N. Am. Fl. 19 (1): 19 & 25—26. 1937; Moldenke, Phytologia 1: 321—322. 1939; León, Fl. Cuba 1: 281. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4 & 38. 1946; Moldenke, Known Geogr. Distrib. Verben-

ac., [ed. 2], 43, 45, & 206. 1949; Moldenke, *Phytologia* 3: 340. 1950; Moldenke, *Résumé* 51, 53, & 482. 1959.

Recent collectors have found this plant growing at the edge of ponds, flowering and fruiting in November.

Additional citations: CUBA: Pinar del Río: Ekman 18769 (S—type). ISLA DE PINOS: Britton, Britton, & Wilson 15008 (S); Killip 45212 (Mu, Z).

ERIOCAULON PLUMBEUM Colla

Bibliography: Colla, *Herb. Pedem.* 5: 484. 1836; A. W. Hill, *Ind. Kew. Suppl.* 9: 105. 1938; Moldenke, *Résumé Suppl.* 17: 3. 1968.

The original description of this species is as follows: "Mart: in sched: (Brasil:). Priori [E. densum Colla] fere duplo elatius caulescens, folia sparsa lineari-lanceolata acuminata margine ciliolata, scapi ut in priori sed glaberrimi, capitulum duplo minus densissimum squamis omnibus arcte adpressis plumbeis tomentosis."

Nothing else is known to me of this plant. The name is unaccounted for in the works of Martius, Körnicke, Ruhland, and others who have worked monographically on this family of plants, nor have I found the name written on any Martius label so far seen by me.

ERIOCAULON PLUMALE N. E. Br.

Synonymy: Eriocaulon rufum H. Lecomte, *Bull. Soc. Bot. France* 55: 644. 1909. Eriocaulon heterochiton A. Chev. ex Moldenke, *Résumé* 288, in syn. 1959 [not E. heterochiton Körn., 1867, nor "sensu Lecomte", 1968].

Bibliography: N. E. Br. in *Thiselt.-Dyer*, *Fl. Trop. Afr.* 8: 251. 1901; Ruhl. in *Engl., Pflanzenreich* 13 (4-30): 103, 106, & 286. 1903; Prain, *Ind. Kew. Suppl.* 3: 70. 1908; H. Lecomte, *Bull. Soc. Bot. France* 55: 644, 646, & 647. 1909; Prain, *Ind. Kew. Suppl.* 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, *Known Geogr. Distrib. Erioc.* 20, 35, 38, & 39. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 109, 111, & 206. 1949; Moldenke, *Phytologia* 3: 340. 1950; Bourdu, *Bull. Soc. Bot. France* 104: 158. 1957; Moldenke, *Résumé* 133, 136, 288, 292, & 482. 1959; Moldenke, *Résumé Suppl.* 4: 6. 1962; Berhaut, *Fl. Sénégal*, ed. 2, 311. 1967; Moldenke, *Résumé Suppl.* 17: 4, 10, & 11. 1968; Moldenke, *Phytologia* 17: 454 (1968) and 18: 111 & 245. 1969.

The E. heterochiton Körn., referred to in the synonymy above, is a valid species, while the homonym "sensu Lecomte" belongs in the synonymy of E. irregulare Meikle.

Recent collectors have found this plant in flower and fruit in August. Berhaut (1967) cites Berhaut 1258 & 3266 from Sénégal. The Schnell 2154, distributed as E. plumale and so cited by me in my 1950 work, is actually E. buchananii Ruhl.

Additional citations: MALI: Senegambia: Heudelot 148 (B—iso-type, Z—iso-type). SÉNÉGAL: J. G. Adam 15422 (Z). REPUBLIC OF GUINEA: Pitot s.n. [9.X.1950] (An, An, An), s.n. [5.IV.1951] (An).

SIERRA LEONE: P. Adames s.n. [Jordan 554] (B).

ERIOCAULON PLUMALE subsp. JAEGERI (Moldenke) Meikle

Synonymy: Eriocaulon jaegeri Moldenke, *Phytologia* 5: 338—339. 1956. Mesanthemum necopinatum Moldenke, *Phytologia* 8: 389. 1962. Mesanthemum necopinnatum Moldenke ex Hocking, *Excerpt. Bot. A.6:* 455, sphalm. 1963.

Bibliography: Moldenke, *Phytologia* 5: 338—339. 1956; Anon., *Assoc. Etud. Tax. Fl. Afr. Trop. Index* 1956: 28. 1957; Moldenke, *Résumé Suppl.* 4: 6. 1962; Moldenke, *Phytologia* 8: 389—390. 1962; Anon., *Assoc. Etud. Tax. Fl. Afr. Trop. Index* 1962: 29. 1963; Moldenke, *Biol. Abstr.* 42: 1517. 1963; Hocking, *Excerpt. Bot. A.6:* 455. 1963; G. Taylor, *Ind. Kew. Suppl.* 13: 52. 1966; Moldenke, *Résumé Suppl.* 17: 4, 10, & 11. 1968; Meikle, *Kew Bull.* 22: 142. 1968.

The type of this taxon was collected by Paul Jaeger (no. 4917) — in whose honor it was named — on the very summit of Mont l'Oursa, at an altitude of 1000 meters, a short distance northwest of Dabola (Fouta-Djallon), Republic of Guinea, on September 7, 1954, and is deposited in my personal herbarium at Plainfield, New Jersey. The type of Mesanthemum necopinatum was collected by James Chillou (no. 846) on inundated sandstone on the plantation of Mayon-Couré, Friguiajbé, in the same country, and is deposited in the herbarium of the Institut Francaise d'Afrique Noire at Dakar.

I am adopting the subspecific rank for this plant even though I heartily disapprove of the use of the "subspecies" category in taxonomic nomenclature. I have always felt that the categories of "variety" and "form" should be sufficient to designate any populations beneath the category of "species" that are worthy of nomenclatural designation. Nomenclature is complicated unnecessarily by the use of the terms "subvariety", "subform", "subspecies", "subgenus", "subfamily", "suborder", etc. Populations with sufficient distinguishing characters to warrant the erection of any of the above-mentioned categories could far better be regarded as separate forms, varieties, species, genera, families, or orders. However, in deference to the experts at Kew who feel otherwise and who are certainly far more up-to-date than I in the vagaries of the adopted rules of nomenclature, I am in this case accepting the subspecific status for the plant in question.

Citations: REPUBLIC OF GUINEA: Arrieu 230 [*Herb. Chillou* 3139] (An); Chillou 846 (An), 906 (Ac, An, Z); Jaeger 4917 (Z—type).

ERIOCAULON PLUMALE subsp. KINDIAE (H. Lecomte) Meikle

Synonymy: Eriocaulon kindiae H. Lecomte, *Bull. Soc. Bot. France* 55: 646. 1909. Mesanthemum chillouii Moldenke, *Résumé Suppl.* 4: 6, nom. nud. June 5. 1962; *Phytologia* 8: 389, December 10. 1962.

Bibliography: H. Lecomte, *Bull. Soc. Bot. France* 55: 646. 1909; Prain, *Ind. Kew. Suppl.* 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, *Phytologia* 8: 389. 1962; Moldenke, *Résumé Suppl.* 4: 6