

ADDITIONAL NOTES ON THE ERIOCAULACEAE. XXIX

Harold N. Moldenke

ERIOCAULON SOLLYANUM Royle

Additional bibliography: Steud., Nom. Bot., ed. 2, 1: 586. 1840; Moldenke, Phytologia 19: 418--420. 1970.

Steudel (1840) reduces E. trilobum Hamilt. to the synonymy of E. quinquangulare L.

ERIOCAULON SPARGANIOIDES Bong.

Emended synonymy: Eriocaulon sparganoides Bong. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 334, sphalm. 1855.

Additional & emended bibliography: Bong., Ess. Monog. Erioc. 37. 1831; Steud., Nom. Bot., ed. 2, 1: 586. 1840; Kunth, Enum. Pl. 3: 579--580 & 614. 1841; D. Dietr., Syn. Pl. 5: 268. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 283 & 334. 1855; Moldenke, Phytologia 19: 424. 1970.

ERIOCAULON SPHAGNICOLA Ohwi

Additional bibliography: Moldenke, Phytologia 19: 424. 1970.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 6: 64, fig. 30. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] fig. 17. 1940.

The type of this endemic species was collected by Jisaburo Ohwi (no. 2843) at Kanjan-muri, in Kanhoku province, Korea and is deposited in the herbarium of the University of Tokyo. The only vernacular name recorded for it is "koke-hosikusa". The so-called "correction" of the original spelling of the specific epithet of this taxon was unjustified because Latin words ending in -icola are indeclinable.

ERIOCAULON SPONGIOSIFOLIUM Alv. Silv.

Synonymy: Eriocaulon spongiosum Alv. Silv., Fl. Mont. 1: 19 & 398. 1928.

Bibliography: Alv. Silv., Arch. Mus. Nac. Rio Jan. 23: 161. 1921; Alv. Silv., Fl. Mont. 1: 16--17, 19, & 398, pl. 4. 1928; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Moldenke, Known Geogr. Distrib. Erioc. 8 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Résumé 89, 293, & 483. 1959.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 4. 1928.

Under E. spongiosum Silveira cites A. Silveira 424 from Rio Clara, São Paulo, Brazil, collected in 1888, and this is apparently the type on which both binomials are based.

ERIOCAULON SPRUCEANUM Körn.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 488--489. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl.

in Engl., Pflanz. Reich 13 (4-30): 43, 54, & 287. 1903; Herzog in Fedde, Repert. Sp. Nov. 29: 203--204. 1931; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 5, 8, & 40. 1946; Moldenke, Alph. List Cit. 2: 609. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 60, 77, & 206. 1949; Moldenke, Phytologia 3: 399. 1950; Moldenke, Résumé 66, 89, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Phytologia 18: 342. 1969.

Körnigke, in his original description (1863), states that the leaves of this species are 12--30 cm. long and the scapes 20--30 cm. long, equaling or shorter than the leaves. The type apparently is Spruce 2607, from Panuri on the Rio Uaupes, Amazonas, Brazil. Recent collectors describe the flower-buds as white and found the plant growing in the water or on rocks in rapids, on sandy savannas, and on boulders with Podostemon, at altitudes of 700 to 2100 feet, flowering in June, September, and November. The vernacular name, "wów-wee-ree", is recorded for it. The Killip 34260, previously cited as this, is actually f. viviparum Moldenke.

Citations: COLOMBIA: Vaupés: P. H. Allen 3079 (W--1951945); Schultes, Baker, & Cabrera 18555 (Ss, W--2113114, W--2172200); Schultes & Cabrera 17314 (W--2171879), 17595 (N, Ss, W--2171953, Z), 19637 (Ss, W--2172463), 19907 (Ss). BRAZIL: Amazonas: Spruce 2607 [Macbride photos 25159] (B--isotype, Br--type, N--isotype, N--photo of isotype).

ERIOCAULON SPRUCEANUM f. AMPHIBIUM Herzog

Synonymy: Eriocaulon spruceanum f. amphibia Herzog in Fedde, Repert. Sp. Nov. 29: 203--204. 1931.

Bibliography: Herzog in Fedde, Repert. Sp. Nov. 29: 203--204. 1931; Moldenke, Known Geogr. Distrib. Erioc. 8 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Phytologia 3: 399. 1950; Moldenke, Résumé 89 & 483. 1959.

This form was originally published as "amphibia" in accord with Herzog's policy of having all subspecific epithets agree in their gender with the words "varietas" or "forma" rather than the generic name. The form is based on Luetzelburg 22796, 23007, 23017, 23870, and 23882, all from Papari, Alto Amazonas, Amazonas, Brazil -- 22796 being from Cururú, 23007 & 23017 from Cupim, 23870 from Janareté, and 23882 from Yapú. Luetzelburg reports that it grows in the water of waterfalls with plants of the Podostemonaceae and that its flowers are grayish-white when fresh.

Citations: BRAZIL: Amazonas: Luetzelburg 22796 (Mu--cotype), 23007 (Mu--cotype), 23017 (Mu--cotype), 23177 (Mu), 23870 (Mu--cotype), 23882 (Mu--cotype).

ERIOCAULON SPRUCEANUM f. FLUITANS Herzog

Bibliography: Herzog in Fedde, Repert. Sp. Nov. 29: 203--204. 1931; Moldenke, Known Geogr. Distrib. Erioc. 8 & 40. 1946; Molden-

ke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Phytologia 3: 399. 1950; Moldenke, Résumé 89 & 483. 1959.

Herzog (1931) says "Die f. fluitans entspricht der Beschreibung Ruhland's um 'Pflanzenreich' (S. 54) vollkommen. Das hier im Bestimmungsschlüssel verwendete Merkmal der die Blütenschäfte an Länge übertreffenden oder erreichenden Blätter kann aber nur auf diese flutenden, ausgesprochenen Wasserformen bezogen werden. Bei den Zeitweilig trockengestellten Pflanzen, die ich als f. amphibia unterschieden habe, sind die Blätter wesentlich kürzer, bei n. 23882 werden sie sogar von den Schäften um das 3--4-fache an Länge übertroffen. Diese aus das obere Rio Negrogebiet beschränkte Art kommt also in mehreren von den Natur ihres Standortes abhängigen und habituell recht verschiedenen Formen vor, wie dies ja auch von anderen amphibischen Pflanzen zur Genüge bekannt ist. Es wäre darauf bei der Bestimmung kurzblättrigen Formen zu achten, die nur nach ihrem Blütenbau sicher erkannt werden können."

The form is apparently based on Luetzelburg 23251 and 23257, the labels of which indicate that they were collected in northern Brazil at Cururu, Cachoeira, Uaupes, on granite rock in the waterfalls, flowering and fruiting in November. It is probable that these localities are in Pará, Brazil.

Citations: BRAZIL: Pará: Luetzelburg 23251 (Mu--cotype), 23257 (Mu--cotype).

ERIOCAULON SPRUCEANUM f. VIVIPARUM Moldenke

Bibliography: Moldenke, Phytologia 3: 399 (1950) and 18: 342. 1969.

Collectors describe this plant as a semi-aquatic growing in very wet places or under water of small streams in dense forests or on savannas, forming rosettes, at altitudes of 235 to 700 meters, flowering and fruiting from January to March. The Killip collection cited below was previously cited by me (1950) as typical E. spruceanum Körn., but is better placed here.

Citations: COLOMBIA: Méta: Killip 34260 (N, S). Vaupés: García Barriga & Jaramillo Mejía 17096 (N--type, Z--isotype), 17128 (N).

ERIOCAULON STEINBACHII (Moldenke) Moldenke

Synonymy: Paepalanthus steinbachii Moldenke, Phytologia 2: 231--232. 1947.

Bibliography: Moldenke, Phytologia 2: 231--232 & 364--365. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 96 & 206. 1949; Moldenke, Phytologia 3: 399. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953.

ERIOCAULON STELLULATUM Körn.

Synonymy: Eriocaulon stellulatum Koen. ex Razi, Journ. Mysore Univ. 11 (1): 6, sphalm. 1950.

Bibliography: Körn., Linnaea 27: 620. 1854; C. Müll, in Walp., Ann. 5: 926 & 935 (1860) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 475. 1863; Hook. f., Fl. Brit. Ind. 6: 579. 1893;

Maxim., Diagn. Pl. Nov. Asiat. 8: 8. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 65, 97, & 287. 1903; Fyson, Journ. Indian Bot. 2: 317. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1606 & 1618. 1931; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Moldenke, Known Geogr. Distrib. Erioc. 24 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 127, & 206. 1949; Razi, Journ. Mysore Univ. 11 (1): 6. 1950; Moldenke, Phytologia 3: 399-400. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 2, 8 [3]: 1120, 1126, & 1333. 1956; Moldenke, Résumé 159, 162, 178, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 2: 6 & 15. 1960; Moldenke, Biol. Abstr. 35: 2177. 1960; Hocking, Excerpt. Bot. A. 4: 593. 1962; Thanikaimoni, Pollen & Spores 7: 186. 1965; Moldenke, Phytologia 17: 383 (1968), 18: 53 (1968), and 19: 334. 1970.

Fyson (1921) describes this species as "Leaves broad and thin 2--3 in. acute. Scapes several slender 3--6 in. Heads 1/3 in. Involucral bracts lanceolate-acute, reflexed. Floral similar, spreading, much longer than the flowers, making the head a glistening stellate globe. Female sepals 2, strongly crested on the back; petals 3, oblanceolate, very hairy. Male flowers normal, 3-merous. Bombay and Malabar; on the western Ghats. Abundant on lake side at Mahabaleshwar in Oct. (Sedgwick)." Razi (1950) lists "E. wallichiana ?" as a possible synonym, but that binomial belongs in the synonymy of E. sexangulare L. Bunnak reports the plant as "a common herb with white flowers in damp places" and "herb common in savannas" in Thailand, where it is known as "chuk nok yung". Bole describes it as an herb 2--4 inches tall, with white heads, and says that it is "very common" in Bombay. It has been collected at altitudes of 130 to 666 meters, flowering in September and October, fruiting in October.

The Fyson 3819, distributed as E. stellulatum, is actually E. dianae var. longibracteatum Fyson. Ritchie 1242 is a mixture with E. achiton Körn. and E. thwaitesii Körn.

Additional citations: INDIA: Bombay: P. V. Bole 300 (Xa), 1184 (Xa), 1204 (Xa); Meebold 9894 (S); Santapau 11744 (Xa), 11857 (Xa), 11858 (Xa), 11861 (Xa). Mysore: Herb. Presid. Coll. Madras s.n. [Anatapura, 21 October 1926] (S); Hugel 2127 (B--isotype, Mu--256--isotype); Stocks, Law & c. 27 (B). State undetermined: Ritchie 1242, in part (T). THAILAND: Bunnak 219 [Herb. Roy. Forest Dept. 9516] (Z), 571c [Herb. Roy. Forest Dept. 18265] (Bk).

ERIOCAULON STELLULATUM var. LAOSENSE Moldenke

Bibliography: Moldenke, Phytologia 7: 119. 1960; Moldenke, Biol. Abstr. 35: 2177. 1960; Moldenke, Résumé Suppl. 2: 6 & 15. 1960; Hocking, Excerpt. Bot. A. 4: 593. 1962.

Citations: INDOCHINA: Laos: Poilane 28225 bis (Mg--type, Z--isotype).

ERIOCAULON STENOPHYLLUM R. E. Fr.

Bibliography: R. E. Fr., *Wiss. Ergebn. Schwed. Rhod.-Kong.-Exped. 1911-12 Bot.* 1: 218, pl. 16. 1916; A. W. Hill, *Ind. Kew. Suppl.* 6: 79. 1926; Stapf, *Ind. Lond.* 3: 91. 1930; Moldenke, *Résumé* 148 & 483. 1969.

Illustrations: R. E. Fr., *Wiss. Ergebn. Schwed. Rhod.-Kong.-Exped. 1911-12 Bot.* 1: pl. 16. 1916.

The type of this species was collected in Zambia, where the species appears to be endemic.

ERIOCAULON STEYERMARKII Moldenke

Bibliography: Moldenke, *Alph. List Cit.* 2: 461 & 530 (1948) and 3: 975. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 63, 67, & 206. 1949; Moldenke, *Phytologia* 3: 400. 1950; Moldenke, *Fieldiana* 28: 117--118. 1951; J. A. Steyer., *Fieldiana* 28: 1157. 1957; Moldenke, *Résumé* 71, 75, 77, & 483. 1959; G. Taylor, *Ind. Kew. Suppl.* 12: 55. 1959; J. A. Steyer., *Act. Bot. Venez.* 1: 195. 1966.

Recent collectors describe this plant as a submerged or emerged aquatic herb with pale-green flaccid leaves and white heads, the involucre blackish, found in moist places under overhanging cliffs, in water, in swampy depressions in wet savannas, in shallow open streams in savannas, and in bordering swales along rivers in scrub forests, at altitudes of 1200 to 2600 meters, flowering and fruiting in February and March. Maguire & Fanshawe refer to it as "frequent" in Guyana, while Steyermark & Wurdack refer to it as "frequent" or "locally frequent" in Bolívar, Venezuela.

Additional citations: VENEZUELA: Bolívar: B. Maguire 33512a (N); Steyermark & Wurdack 341 (Mu, N), 763 (N); Vareschi & Maegdefrau 6942 (Ve--42507, Ve--42908). GUYANA: Maguire & Fanshawe 33182 (N).

ERIOCAULON STOLONIFERUM Welw.

Synonymy: *Eriocaulon stoloniferum* "Welw. ex Rendle" apud H. Hess, *Bericht. Schweiz. Bot. Gesell.* 65: 147. 1955.

Bibliography: Rendle, *Cat. Afr. Pl. Welw.* 2: 101--102. 1899; Fritsch, *Bull. Herb. Boiss.*, sér. 2, 1: 1105. 1901; Ruhl. in *Engl., Pflanzenreich* 13 (4-30): 65, 97, & 287. 1903; Thiselt.-Dyer, *Ind. Kew. Suppl.* 2: 70. 1904; Moldenke, *Known Geogr. Distrib. Erioc.* 22 & 40. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 118 & 206. 1949; H. Hess, *Bericht. Schweiz. Bot. Gesell.* 65: 147--150, fig. 1 & 2, pl. 8, fig. 6. 1955; Moldenke, *Résumé* 147 & 483. 1959; Moldenke, *Phytologia* 19: 16 & 73 (1969) and 19: 345. 1970.

Illustrations: H. Hess, *Bericht. Schweiz. Bot. Gesell.* 65: 148, fig. 1 & 2, pl. 8, fig. 6. 1955.

Rendle (1899) says of this plant: "A perennial entirely submerged herb, with flower-heads just emerging when mature. Plentiful in cold rather rapidly flowing mountain streams at Morro de Lopollo, but somewhat rarely flowering. Forms a widely spreading

very green carpet beneath the water. A few fruiting specimens in Dec. 1859; in middle of May 1860. No. 2458." He also says of it "Near E. rivulare Don, but distinguished by its narrow leaves, larger flowers with glabrous sepals, etc."

Hess (1955) tells us that "Im Gebiet des locus classicus wurden etwa 50 Exemplare dieser Art gesammelt. Um die Bestimmung zu sichern, sandte man mir von der Universidade Lisboa das Typus-Material dieser Art. Es wurde von Welwitsch bei Huila (Morro de Lopollo) unter Nr. 2458 im Mai 1860 gesammelt. Der Bogen ist von Welwitsch eigenhändig beschriftet. Weiter habe ich aus dem Muséum National d'Histoire Naturelle, Paris, einen Bogen mit einer unbestimmten Eriocaulacee zugestellt erhalten, die von H. Humbert an einen gleichen Standort, ebenfalls in der Umgebung von Huila, gesammelt wurde. Diese Pflanzen sind gut entwickelt und sind mit dem Typus von Eriocaulon stoloniferum identisch.....Bereits Brown (1901) hat die Fehler in der Original-Diagnose von Rendle korrigiert (Rendle schrieb, die Sepalen der ♀ Blüten seien kahl und die Antheren 'dark')"

Hess cites H. Hess 52/1844 and Humbert 16680 from Huila, Angola. He continues: "Eriocaulon stoloniferum wächst in den Gebirgebächen um Huila. Auf Sand- und Schlammhängen bildet die Pflanze submers dichte Rasen im 10--20 cm tiefen, schnell fließenden Wasser. Während der ersten Entwicklung sind auch die Blütenköpfe untergetaucht, später ragen diesen aus dem Wasser. Die Art gedeiht besonders gut unter mächtigen und überhängenden Horsten von Gramineen oder im Schatten von Sträuchern und Bäumen.....Das ganze Material ist einheitlich. Welwitsch bemerkt auf der Etikette unter dem Fundort: 'Sed rarius florens, pauca specim. fructiferum Decemb. 1859'....Die Art nur aus der Umgebung von Huila bekannt.....Auf die morphologische Verwandtschaft von Eriocaulon stoloniferum mit E. Woodii N. E. Br. hat Brown (1901) hingewiesen, ist dabei aber nicht auf die trennenden Merkmale eingegangen. Ruhland (1903) hat diese Tatsache ganz verkannt und E. stoloniferum neben der australischen E. lividum F. Mueller untergebracht. Diese Arten stehen morphologisch weit auseinander.

"Von Eriocaulon Woodii konnte ich ein umfangreiches Material aus dem Botanischen Museum der Universität Zürich untersuchen. Davon wurden zwei Bogen von J. M. Wood 1909 bei Durban und 1910 bei Rheenen in Natal gesammelt. Weitere vier Bogen liegen von H. Rudatis vor, der die Pflanzen unter Nr. 1420 am 20.6.1911 in Natal, im Ifofa-Tal, auf ca. 500 m Höhe sammelte. Alle Proben stammen von Bachufern oder aus Bächen, wo die Blattrosetten untergetaucht waren. Die Blätter von E. Woodii sind auch an den untergetauchten vollentwickelten Exemplaren nur bis etwa 7 cm lang und 2 mm breit. Sie sind stumpf unter nur ganz kurz zugespitzt. Dies scheint das einzige Merkmal zu sein, um E. Woodii von E. stoloniferum zu unterscheiden. Habituell stimmen die Arten sonst überein. In den Blüten sind nur unbedeutende Unterschiede zu finden: Die drei Sepalen der ♀ Blüten von E. Woodii sind fast gleich groß; sie sind tiefer konkav als bei E. stolon-

iferum und oft helmförmig entwickelt. Die Zähne an der Spitze sind weniger grob und die Behaarung auf dem Rücken ist dichter als bei E. stoloniferum. Die Petalen der beiden Arten stimmen überein. Der Blütenboden ist bei beiden Arten kahl....Eriocaulon Woodii und E. stoloniferum stellen gleiche Ansprüche an den Standort.

"Etwas anders verhält es sich mit dem Original-Material von Eriocaulon Woodii aus dem Herbarium Kew, das nach brieflicher Mitteilung von Herrn Milne-Redhead als authentisch zu betrachten ist. Es wurde von Hutchinson und Gilett unter Nr. 4324 in Nord-Rhodesien gesammelt. Die Blätter an diesen Pflanzen sind bis 25 cm lang und allmählich zugespitzt. Sie sind also denen von E. stoloniferum ähnlich, sind aber derber. In den Blütenköpfen sind die Früchte noch unentwickelt, und auch die Antheren sind noch von den Sepalen umgeben. Die Sepalen der Blüten lassen sich noch flach ausbreiten oder sind nur wenig konkav. Sie haben die bereits angegebene Behaarung und Zähmung an der Spitze. Ob es sich bei diesen Pflanzen um E. Woodii oder E. stoloniferum handelt, kann nicht entschieden werden. Brown (1897) schreibt über E. Woodii, die Sepalen der ♀ Blüten seien u. a. flach oder nur wenig konkav; es ist möglich, dass Brown auch nur Material mit unreifen Früchten untersucht hat. Die Größenunterschiede in den Sepalen zwischen E. Woodii und E. stoloniferum, die Brown angibt, sind nicht vorhanden. Leider fehlt Kew das Typus-Material von E. Woodii nicht aus, sonst wäre es wahrscheinlich möglich, festzustellen, ob E. stoloniferum Welw. ex Rendle ein Synonym des um 2 Jahre älteren Namens E. Woodii ist. Die Varietät minor Ruhl. wäre dann als eigene Art aufzufassen und mit neuem Namen zu versehen."

Mr. Meikle is of the opinion that E. stoloniferum is conspecific with E. antunesii Engl. & Ruhl., but, according to a letter to me from E. Milne-Redhead, dated June 12, 1969, this decision was reached without comparison with the type collection of the latter species.

Eriocaulon stoloniferum has been collected at altitudes of 1850—1870 meters.

Citations: ANGOLA: Huila: H. Hess 52/1844 (B, Z); Welwitsch 2458 (B—isotype, Mu—isotype, Mu—isotype, Mu—isotype).

ERIOCAULON STRAMINEUM Körn.

Synonymy: Eriocaulon anceps Körn., in herb. [not E. anceps Sessé & Moc., 1893, nor Walt., 1788].

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 478. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 37, & 287. 1903; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 8 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Résumé 89, 112, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3,

1: 879. 1960; Moldenke, Phytologia 18: 363 (1969) and 19: 337. 1970.

The E. anceps credited to Sessé & Mociffo and referred to in the synonymy above is a synonym of E. ehrenbergianum Klotzsch, while the homonym credited to Walter is Lachnocaulon anceps (Walt.) Morong. Körnicke's E. anceps appears to be based on the same collection which is the type of E. stramineum, viz., Weddell 2130, and is probably a name he first intended to use and later discarded because it was preoccupied.

Material of E. stramineum has been misidentified and distributed in herbaria as E. guyanense Körn. On the other hand, the Wallich 6069, distributed as E. stramineum, is actually the type collection of E. oryzetorum Mart.

Collectors have found E. stramineum in flower and fruit in September.

Citations: BRAZIL: Goiás: Weddell 2130 (B--isotype, Br--isotype, N--photo of isotype, Z--photo of isotype). Maranhão: Murça Pires & Black 2538 (N). Marajo Island: V. C. de Miranda 3072 (S, Ut--1641).

ERIOCAULON STRIATUM Lam.

Synonymy: Eriocaulon stupeum J. Sm. in Rees, Cyclop. 13: Eriocaulon. 1809. Eriocaulon borbonicum Willd. ex Kunth, Enum. Pl. 3: 560--561. 1841. Eriocaulon striatum Körn. apud Benth. & Hook. f., Gen. Pl. 3 (2): 1021, sphalm. 1883.

Bibliography: Lam., Encycl. Méth. Bot. 3: 275. 1789; Lam., Tabl. Encycl. [Ill.] 1: 213, pl. 50, fig. 1. 1791; J. Sm. in Rees, Cyclop. 13: Eriocaulon. 1809; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 863. 1817; Steud., Nom. Bot. Phan., ed. 1, 313. 1821; Poir. in Cuvier, Dict. Sci. Nat. 24: 239--240. 1822; Steud., Nom. Bot., ed. 2, 1: 586. 1840; Kunth, Enum. Pl. 3: 560--561, 612, & 614. 1841; D. Dietr., Syn. Pl. 5: 264--265. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 272, 333, & 334. 1855; Körn., Linnaea 27: 272. 1856; C. Müll. in Walp., Ann. 5: 926 & 940--941 (1860) and 6: 1141 & 1170. 1861; Benth. & Hook. f., Gen. Pl. 3 (2): 1021. 1883; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877 & 879. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 67, 70, & 77. 1899; Britten, Journ. Bot. 38: 482 & 483. 1900; Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1102--1104. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 63, 79, 285, & 287. 1903; H. Lecomte, Bull. Soc. Bot. France 55: 571. 1908; Stapf, Ind. Lond. 3: 91. 1930; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877 & 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 22, 33, & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123, 124, & 206. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 141. 1955; Moldenke in Humbert, Fl. Madag. 36: 26--27. 1955; Moldenke, Résumé 156--158, 286, 293, & 483. 1959; Straka, Erdkunde 14: 90. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr.

3, 1: 877 & 879. 1960; Moldenke, Phytologia 18: 389--391. 1969.
Illustrations: Lam., Tabl. Encycl. [Ill.] 1: 213, pl. 50, fig. 1. 1791.

Acaulescent herb, probably perennial; rhizome many-branched, sordid-lanuginous between the leaves at the apex; leaves ensiform-linear, membranous, green, 5--6.5 cm. long, 2--4 mm. wide, flat, slightly surpassing the sheaths, acute at the apex, scarcely pellucid, lightly fenestrate-many-veined, mostly 9--13-veined, glabrous; sheaths rather close or loose, membranous or thin-membranous, greenish-stramineous, 2.4--6.4 cm. long, glabrous, acuminate or acute at the apex and there wide-open and loose; peduncles 9--20 cm. long, eventually spirally twisted; heads hemispheric, white-villous, about the size of a pea; involucre bractlets obovate, grayish, much shorter than the disk, rounded at the apex, glabrous; receptacle pilose; receptacular bractlets spatulate-cuneate or subrhomboid-cuneate, olivaceous-gray, acuminate at the apex, white-pilose with rather thick opaque hairs on the outside toward the apex; staminate florets: long-pedicellate, slightly surpassing the receptacular bractlets; sepals 3, separate, obovate-spatulate or -cuneate, plumbeous-gray or olivaceous-gray, rather acutish and white-pilose with rather thick opaque hairs at the apex, cucullate-coherent on the back but easily separating, the 2 lateral ones carinate-navicular, the posterior one slightly narrower and flatter; petals 3, connate below, the tube slender and solid, somewhat ampliate above, glabrous, its limb bilabiate-trifid, the lobes obtuse at the apex, pilose-ciliate at the apex, with a sessile black linear-oblong gland above the middle and below the apex within, the anterior lobe oblong, the posterior ones much smaller and narrowly oblong; stamens 6 (rarely 4), inserted at the top of the corolla-tube, 3 alternate with the corolla-lobes, the other 3 opposite the lobes and adnate to their base, the 2 opposite the smaller lobes sometimes obsolete; anthers didymous-subrotund, olivaceous-black; pistil-rudiments 2 or 3, sessile in the center of the top of the corolla-tube, subglobose-clavate or subconic, black; pistillate florets: short-pedicellate; sepals approximate beneath the ovary, subspatulate, sordid olivaceous-gray or plumbeous-gray, acute at the apex, broadly navicular-carinate, white-pilose above, the posterior one slightly narrower and flatter; petals 3, very remote from the sepals, linear- or lanceolate-spatulate, white or whitish, rather thick-textured, equaling the sepals in length, pilose toward the tip within, black-glanduliferous with an oblong gland beneath the apex, the anterior petal slightly larger; ovary sessile, ovate, 3-celled; style rather long or short; stigmas 3, elongate, capillary, simple; fruit depressed-globose, membranous, brown, 3-seeded, crowned with the persistent style and stigmas, dehiscing longitudinally; seeds subglobose-elliptic, ferruginous, rounded at both ends, with a punctiform tubercle at the hilum, densely white-pulverulent with minute obtuse hyaline hair-like cellular outgrowths, longitudinally rugose when young.

The type of this species was collected by Bory de St. Vincent

on the island of Réunion and is deposited in the herbarium of the Muséum National d'Histoire Naturelle in Paris. The type of E. borbonicum is Herb. Willdenow 2357, also from Réunion and also collected by Bory de St. Vincent; it may well be the Herb. Kunth s.n. specimen cited below from the herbarium of the Botanisches Museum at Berlin, and of which Kunth (1841) says "Differt ab E. striato praesertim sepalis masculis exterioribus postice cohaerentibus; fructus illius haud suppetunt". Steudel (1821, 1840) reduces E. striatum to the synonymy of E. quinquangulare L.

In Humbert's Fl. Madag. (1955) the date of publication for the name E. stupeum is given as "1890" instead of "1809" and the date of Lamarck's illustration of E. striatum is given as "1789" instead of "1791".

The species has been found growing on riverbanks and in ravines, flowering and fruiting in July. The initial letter of the specific epithet is uppercased by Müller (1860). A common name recorded for the species is "joncinelle cançhe". The Pourret s.n. collection, cited below, was originally identified as Statice maderaspatana Pluk. "t. 21 f. 7", but that name belongs in the synonymy of E. quinquangulare L.

Citations: MADAGASCAR: K. R. Afzelius s.n. [Tamatave, 26.7. 1912] (S); Thouin 12 (S). MASCARENE ISLANDS: Mauritius: Commer-son s.n. [ile de france] (N, P). RÉUNION: Boivin 1019 (P); Bory de St. Vincent s.n. [isle bourbon; herb. Poiret] (N--photo of type, P--type, Z--photo of type); Commerson s.n. [isle de bourbon] (N, P); Decken s.n. [Bourbon] (B); Delessert s.n. (V--86951); Frapplier 181 (P); Geay 9182 (P); Herb. Kunth s.n. [Insula Borboniae] (B); L'Isle 112 (P); Pourret s.n. (P); Richard 583 (P).

ERIOCAULON STRICTUM Milne-Redhead

Bibliography: Milne-Redhead in Hook., Icon. Pl. 34: pl. 3388. 1939; Moldenke, Known Geogr. Distrib. Erioc. 21. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117 & 206. 1949; Moldenke, Phytologia 3: 400. 1950; Moldenke, Résumé 144, 149, & 483. 1959; Moldenke, Résumé Suppl. 2: 6. 1960.

Illustrations: Milne-Redhead in Hook., Icon. Pl. 34: pl. 3388. 1939.

Collectors describe this plant as a slender erect annual, the leaves green, few, in a basal rosette, 3-veined, with pellucid veins and pellucid papillose margins; the inflorescence spherical; the sheaths and scapes pale-green; the bractlets very pale grayish-biscuit-color; and the flowers blackish. They have found it growing in swamps and "dambo", in flat riverside recently swamped meadows, and on the alluvium of the Niger River in inundated prairies, at 4000 feet altitude, flowering and fruiting in January, April to June, and December. Milne-Redhead & Taylor found it in damp sandy ground between grass tussocks near the edge of secon-

dary Brachystegia-Uapaca woodlands and boggy grasslands.

Raynal & Raynal 5306 bis is said, according to the collectors' notes, to be identical with Herb. Centre Recherche Zootechniques 1339 and with Raynal 5218 ter & 5229, not as yet seen by me. The Robinson specimens in the Munich herbarium were identified there as E. strictum and seem to agree well with the other material cited here and with the original illustration of this species. However, several letters to me from the Royal Botanic Gardens at Kew on this matter are certainly very relevant. A letter, dated July 4, 1969, from Sir George Taylor, but signed by J. P. M. Brennan, says "With reference to the enquiry in your letter of June 2nd, our material of E. A. Robinson 6827 from Zambia has not been identified, but it is unquestionably an Eriocaulon species, clearly allied to, and perhaps not specifically distinct from your Eriocaulon inundatum. Until the material has been critically examined, it is impossible to give you a precise report on its identity, but I am satisfied that it is not a Syngonanthus."

This was followed, on July 30, 1969, by a letter from Brennan, but signed by E. Milne-Redhead, saying "I am surprised to read that the workers on the Flora of South-West Africa at Munich have identified E. A. Robinson 6827 as Eriocaulon strictum Milne-Redhead, and feel that there must be an error somewhere, possibly because this particular number is a mixed gathering. The Kew specimen is certainly not E. strictum."

Citations: MALI: Soudan: Raynal & Raynal 5306 bis (Z). TANZANIA: Tanganyika: Milne-Redhead & Taylor 9939 (B, S, Z). ZAMBIA: E. A. Robinson 2241 (Mu), 2852 (Mu), 6827, in part (Mu, N). RHODESIA: Brain 3781 (N).

ERIOCAULON STUHLMANNI N. E. Br.

Synonymy: Eriocaulon stuhlmannii N. E. Br. apud H. Lecomte, Fl. Gén. Indo-Chine 7: 14, sphalm. 1912.

Bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 255. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 111 & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; H. Lecomte, Fl. Gén. Indo-Chine 7: 14. 1914; Moldenke, Résumé 293. 1959; Moldenke, Résumé Suppl. 1: 9 & 25 (1959), 3: 15 & 16 (1962), and 4: 6. 1962; Moldenke, Phytologia 17: 459 (1968), 19: 25 (1969), and 19: 328. 1970.

Ruhland (1903) reduced this species to synonymy under what is now called E. cinereum R. Br. and so annotated the Berlin isotype. Until recently I followed him in this disposition of the name, but after having seen the type collection and the other specimens cited below, now feel that this position is untenable.

Material has been misidentified and distributed in herbaria under the names E. heudelotii N. E. Br., E. sexangulare L., and E. sieboldianum Sieb. & Zucc.

Citations: SÉNÉGAL: Raynal & Raynal 6573 (Z). REPUBLIC OF GUINEA: Pitot 26 (An). TANZANIA: Tanganyika: Stuhlmann 3552 (B—

isotype, Z--isotype).

ERIOCAULON SUBGLAUCUM Ruhl.

Synonymy: Eriocaulon atratum Thwaites apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 83 & 284, in syn. 1903 [not E. atratum Körn., 1856, nor Nakai, 1968]. Eriocaulon glaucum Körn. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959 [not E. glaucum Griff., 1851].

Bibliography: Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Hook. f. in Trimen, Handb. Fl. Ceylon 5: 3. 1900; Ruhl. in Engl., Pflanzenreich 13 (4-30): 60, 68, 83, 284, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Journ. Indian Bot. 3: 18. 1922; Moldenke, Known Geogr. Distrib. Erioc. 24 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130 & 206. 1949; Moldenke, Résumé 167, 286, 294, & 483. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Moldenke, Phytologia 18: 99 & 172 (1969) and 19: 324 & 325. 1970.

The Eriocaulon atratum Körn., mentioned in the synonymy above, is a valid species, while the homonym accredited to Nakai is a synonym of E. atrum Nakai; E. glaucum Griff. is a valid species. The E. glaucum of Körnicke appears to be based on Thwaites C.P. 61 in the herbarium of the Botanisches Museum at Berlin — the same specimen on which Ruhl's E. subglaucum is based. Thwaites & Hooker (1864) reduce E. atratum Körn. in part to E. sexangulare L. and in part to E. truncatum Hamilt. Hooker (1900) regarded E. atratum Thwaites as a synonym of E. ceylanicum Körn.

Eriocaulon subglaucum is apparently endemic to Ceylon, where it has been found at 7000 feet altitude.

Citations: CEYLON: Herb. Decaisne 3289 (Br); Thwaites C.P. 61 (B--type, Br--isotype, N--isotype, N--photo of type, Z--photo of isotype).

ERIOCAULON SUBMERSUM Welw.

Synonymy: Eriocaulon submersum "Welw. ex Rendle" apud H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 130. 1955.

Bibliography: Rendle, Cat. Afr. Pl. Welw. 2: 100--101. 1899; Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1105. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 18, 64, 91, & 287. 1903; Thiseit.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; J. M. Black, Fl. South. Austr. 3: 101. 1926; Alv. Silv., Ft. Mont. 1: 13. 1928; Moldenke, Known Geogr. Distrib. Erioc. 22 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 206. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 129--130, pl. 7, fig. 4. 1955; Moldenke, Résumé 147 & 483. 1959; Moldenke, Résumé Suppl. 16: 21. 1968; Moldenke, Phytologia 17: 456 (1968) and 18: 81. 1969.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 129, pl. 7, fig. 4. 1955.

Rendle (1899), quoting Welwitsch, describes the occurrence of

this species as "Here and there by a large pond near the banks of the river Mupanda. A few poor specimens collected during flight; Feb. 1860. No. 2456. Somewhat rare in gently flowing rather deep streams between Lopollo and Nene, flowering in autumn. Produces both flower and fruit beneath the water; end of April 1860. All the specimens seen grew at the bottom of a stream 2 to 3 ft. deep, and the plant thus seems to flower and fruit beneath the surface. On the muddy bottom of slowly flowing streams between Humpata and Lopollo, in one place only, but plentiful there; end of April 1860. No. 2457."

The Eriocaulon submersum Tate is a synonym of E. carsoni F. Muell.

Citations: ANGOLA: Huila: Welwitsch 2457 (B--cotype, Mu--cotype, Mu--cotype, Z--cotype).

ERIOCAULON SUBULATUM N. E. Br.

Bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 255. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 66, 100, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Marloth, Fl. S. Afr. 4: 66. 1915; Stapf, Ind. Lond. 3: 91. 1930; Moldenke, Known Geogr. Distrib. Erioc. 22 & 40. 1946; J. Hutchinson, Botanist in South. Afr. 480. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 119, 120, & 206. 1949; Moldenke, Phytologia 3: 400. 1950; Wild, Victoria Falls Handb. 124. 1953; Moldenke in Humbert, Fl. Madag. 36: [7] & 10--11, fig. 1 (24--28). 1955; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 158--162. 1955; Moldenke, Résumé 148--150, 156, 293, & 483. 1959; Moldenke, Phytologia 18: 95, 97, & 98 (1969), 19: 43 (1969), and 19: 418 & 420. 1970.

Illustrations: Marloth, Fl. S. Afr. 4: 66. 1915; Moldenke in Humbert, Fl. Madag. 36: [7], fig. 1 (24--28). 1955.

The E. subulatum accredited to Bojer is a synonym of E. sollyanum Royle.

According to Perrier de la Bâthie, E. subulatum grows in "Tourbe humide et émergée; boues, mares plus ou moins profondes, vers 500 m. alt.; fl.: avril--août." Wild (1953) cites Engler s.n., Eyles 125, R. E. Fries 62, Gibbs 175, J. Hutchinson 3447, Keay s.n. [F. H. I. 21406], Keilhack s.n., Kirk s.n., Kolbe 3141, Rendle 380 & 381, and Rogers 5806 from Victoria Falls, Rhodesia. It seems rather difficult to believe that the Madagascar specimens cited below represent the same species as the one that is otherwise known only from Victoria Falls.

Drummond, on the label of R. B. Drummond 5597, avers that E. subulatum is only a form of E. gilgianum Ruhl. and that E. welwitschii Rendle may also be just another form of the same species. Hess (1955) actually unites E. subulatum with E. gilgianum under the latter name and gives detailed reasons for so doing [cfr. under E. gilgianum in these notes, Phytologia 18: 95].

Additional citations: RHODESIA: R. B. Drummond 5597 (S); Fries, Norlindh, & Weimarck 2750 (S); Keilhack s.n. [Victoria Fäll-

le des Sambesi] (B, B); Setchell & Setchell 31 (Ca--312745). MADAGASCAR: Perrier de la Bâthie 7248 (N, P), 7257 (N, P), 13760 (N, P).

ERIOCAULON SUISHAENSE Hayata

Synonymy: Eriocaulon suishaense Hayata apud A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929. Eriocaulon suishaense var. okinawense Satake, Journ. Jap. Bot. 15: 141. 1939. Eriocaulon nigrum var. suishaense Hatusima & Koyama ex Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3 (2): 123. 1962.

Bibliography: Hayata, Icon. Pl. Formos. 10: 55--56 & 272, fig. 31. 1921; Mak. & Nemoto, Fl. Jap., ed. 1, 1308. 1925; Sasaki, List Pl. Formos. 99. 1928; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Sasaki, Cat. Govt. Herb. 119. 1930; Mak. & Nemoto, Fl. Jap., ed. 2, 1515. 1931; Masamune, Short Fl. Formos. 263. 1936; Nemoto, Suppl. Fl. Jap. 1040. 1936; Satake, Journ. Jap. Bot. 15: 141. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, 9, 11, 12, 24, 78, & 87, fig. 1E, 2B, & 5E. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 15--16, pl. 1, fig. 2. 1940; Moldenke, Known Geogr. Distrib. Erioc. 25 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133, 140, & 206. 1949; Moldenke, Résumé 172, 181, 290, & 483. 1959; Hatusima, Mem. South. Indust. Sci. Inst. Kagoshima Univ. 3 (2): 123. 1962; Moldenke, Résumé Suppl. 17: 11. 1968.

Illustrations: Hayata, Icon. Pl. Formos. 10: fig. 31. 1921; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 7, & 11, fig. 1E, 2B, & 5E. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 1, fig. 2. 1940.

The type of this species was collected by Bunzō Hayata at Suisya, in the province of Taityu, Formosa, in April, 1916, and is deposited in the herbarium of the University of Tokyo. The species has been found at the edges of abandoned fields, and common names for it are "okinawa-mizutamaso" and "suisya-hosikusa".

Satake (1940) cites the following collections: RYUKYU ISLAND ARCHIPELAGO: OKINAWAN ISLANDS: Kosiki-zima: Kanasiro 1416 & 1616; Sakaguti s.n.; Tawada 781. Okinawa: Ito 1035; Kanasiro 501; Miyagi s.n.; Sakaguti 25 & s.n.. FORMOSA: Faurie 176, s.n. [Jun. 1903], & s.n. [May 1914]; Hayata s.n.; Kawakami s.n.; Kitamura 1356; Kudo & Sasaki 15631.

Citations: WESTERN PACIFIC ISLANDS: RYUKYU ISLAND ARCHIPELAGO: OKINAWAN ISLANDS: Kunigami: Walker, Tawada, & Amano 6458 (W--2093758). Okinawa: Kanashiro 2118 (W--2070828, Z).

ERIOCAULON SUMATRANUM Ruhl.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 88, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Moldenke, Known Geogr. Distrib. Erioc. 27 & 40. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 143 & 206. 1949; Van Royen, Nov. Guin., new ser., 10: 35. 1959; Moldenke, Résumé 188 & 483. 1959; Molden-

ke, *Phytologia* 19: 85. 1969.

ERIOCAULON TAKAE Koidz.

Bibliography: Koidz. in Matsumura, *Icon. Pl. Koisikav.* 1: 157, pl. 79. 1913; Prain, *Ind. Kew. Suppl.* 5, pr. 1, 97. 1921; Mak. & Nemoto, *Fl. Jap.*, ed. 1, 1308. 1925; Stapf, *Ind. Lond.* 3: 91. 1930; Mak. & Nemoto, *Fl. Jap.*, ed. 2, 1515. 1931; Nemoto, *Suppl. Fl. Jap.* 1040. 1936; Honda, *Nom. Pl. Jap.* 463. 1939; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 13, 44, 60, 79, & 87. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 31--32, pl. 6, fig. 11. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 26 & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 134 & 206. 1949; Moldenke, *Résumé* 173 & 483. 1959; Prain, *Ind. Kew. Suppl.* 5, pr. 2, 97. 1960; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Japan* 3: 183 & 430. 1964.

Illustrations: Koidz. in Matsumura, *Icon. Pl. Koisikav.* 1: pl. 79. 1913; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] pl. 6, fig. 11. 1940.

The type of this species was collected by Gen-Iti Koidzumi on Mount Azuma-Takayama, in the province of Iwasiro, Honshu, Japan, in August, 1912, and is deposited in the herbarium of the University of Tokyo. Satake (1940) cites also Yuki 58811 from the same locality, where the species is said to be endemic and is known as "azuma-hosikusa". Satake says that it "Resembles Eriocaulon Miquelianum or E. hondoense, but is distinguished from both species in having thin calyx without the 2-celled clavate hairs, glabrous petals, and the narrow leaves".

ERIOCAULON TANAKAE Ruhl.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 64, 84, & 287. 1903; Prain, *Ind. Kew. Suppl.* 3: 70. 1908; Hand.-Mazz., *Symb. Sin.* 7: 1245. 1936; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 1, 77, & 87. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 64. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 26 & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 134 & 206. 1949; Moldenke, *Résumé* 173 & 483. 1959.

Citations: JAPAN: Island undetermined: Tanaka s.n. [Comm. Navara] (B--isotype).

ERIOCAULON TAQUETII H. Lecomte

Bibliography: H. Lecomte, *Not. Syst.* 1: 192. 1910; Prain, *Ind. Kew. Suppl.* 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 57 & 87. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 25 & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 133 & 206. 1949; Moldenke, *Résumé* 171 & 483. 1959.

Citations: KOREAN COASTAL ISLANDS: Quelpart: Taquet 1539 (B--isotype, Z--isotype). MOUNTED CLIPPINGS: original description (B).

ERIOCAULON TENUIFOLIUM Klotzsch

Synonymy: Eriocaulon tenifolium Klotzsch ex Moldenke in Maguire,

Mem. N. Y. Bot. Gard. 8: 97, sphalm. 1953. Eriocaulon tenuifolium Körn., in herb.

Bibliography: Klotzsch in Schomb., Faun. & Fl. Brit. Guian. 1116. 1848; C. Müll. in Walp., Ann. 5: 931 (1860) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 496 & 498. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 42, 50, & 287. 1903; Alv. Silv., Fl. Mont. 1: 398. 1928; Moldenke, Known Geogr. Distrib. Erioc. 6, 8, 41, & 60. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Alph. List Cit. 3: 945 (1949) and 4: 1079 & 1132. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 63, 66, 77, & 206. 1949; Moldenke, Phytologia 3: 182 (1949) and 3: 400. 1950; Moldenke in Maguire, Mem. N. Y. Bot. Gard. 8: 97. 1953; Moldenke, Résumé 71, 75, 89, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Phytologia 18: 188 (1969) and 19: 339 & 341. 1970.

Recent collectors describe this species as having white or chalky-white heads and as growing in damp patches in savannas or as being "locally abundant" or "frequent" in wet savannas, at altitudes of 120 to 200 meters, flowering and fruiting in January and October.

It should be pointed out that the Rob. Schomburgk 107 (in part) specimens cited below from the Berlin herbarium look very much like the rest of this collection in other herbaria which is the type collection of E. brevifolium Klotzsch [now known as E. klotzschii Moldenke] except that the heads are much larger. They match perfectly the cotype collections of E. tenuifolium and so I assume that a mixture in labeling took place. The two species are certainly closely related. The Berlin specimens were, in fact, originally identified by Ruhland as E. brevifolium, later changed by him to E. tenuifolium. Schomburgk 285, a cotype of E. tenuifolium, was photographed in the Delessert Herbarium at Geneva by Macbride as his type photograph number 25160. The other cotype collection is Rob. Schomburgk 448.

Since the first effective publication of the binomial, Eriocaulon tenuifolium Klotzsch, was a nomen nudum, the correct citation for this name is "Eriocaulon tenuifolium Klotzsch ex Schomb., Faun. & Fl. Brit. Guian. 1116, nom. nud. (1848); Körn. in Mart., Fl. Bras. 3 (1): 496. 1863".

Gleason, in his unpublished Flora of British Guiana, describes E. tenuifolium as follows: "Leaves cespitose, narrowly linear, 3--6 mm. wide, 1--2 (rarely 3) dm. long, lax, glabrous; peduncles 2--several, 3--6 dm. high, glabrous, striate, not twisted, their basal sheaths about equaling the leaves; heads whitish, subglobose, 5--8 mm. in diameter; bracts rhombic-ovate, the subtending bracts similar, the tip inflexed. On savannas, without definite locality, Schomburgk 285, 448, Loyed, Jenman 7279; Rupununi district, Jenman 5165; Roraima district, Quelch & McConnell 307, Loyed 18, Tate 3 (Endemic)". Silveira (1928) cites A. Silveira 619.

Material of this species has been misidentified and distributed in herbaria as E. atabapense Moldenke and E. humboldtii Kunth. On the other hand, the G. H. H. Tate 3, 267, & 329, distributed as E. tenuifolium by Gleason, are actually E. humboldtii Kunth. The A. C. Smith 2280, cited below, was previously regarded by me as E. atabapense and was so cited in error in previous installments of these notes.

Additional citations: VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 30984 (F, K, N, Ve, W); Maguire, Wurdack, & Keith 41890 (N, S, S). GUYANA: C. D. K. Cook 126 (S, S); Guppy 641 [Forest Dept. Br. Guian. 7656] (K, K, K); Little 16924 (Z); Rob. Schomburgk 107, in part (B), 285 [Macbride photos 25160] (N--photo of cotype, Z--photo of cotype), 448 (B--cotype); A. C. Smith 2280 (N, S). BRAZIL: Roraima: Prance, Steward, Ramos, & Farias 9177 (Ac, N).

ERIOCAULON TENUISSIMUM Nakai

Synonymy: Eriocaulon miquelianum Mori apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 59 & 87, in syn. 1940 [not E. miquelianum Auct. Jap., 1940, nor Koeck., 1933, nor Körn., 1867, nor Miyabe & Kudo, 1940, nor Miyabe & Tatew., 1940].

Bibliography: Nakai, Bot. Mag. Tokyo 31: 97. 1917; Mori, Enum. Pl. Corea 80. 1922; A. W. Hill, Ind. Kew. Suppl. 6: 79. 1926; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 13, 58, 59, 80, & 87, fig. 27. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 49--50, pl. 7, fig. 14. 1940; Moldenke, Known Geogr. Distrib. Erioc. 26 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 206. 1949; Moldenke, Résumé 171, 290, & 483. 1959; Moldenke, Phytologia 18: 182 & 311. 1969.

Illustrations: Satake in Nakai & Honda, Nov. Fl. Jap. 59, fig. 27. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 7, fig. 14. 1940.

The type of this species was collected by Takanoshin Nakai (no. 6118) in wet places by Tyozon, in the province of Kogen, Korea, and is deposited in the herbarium of the University of Tokyo. Satake (1940) says of this endemic species: "This species is characterized by the calyx of the female flower which has hairs on the outer side, broader petals, and densely haired bracts". He records the vernacular name "hoso-hosikusa" for it.

The E. miquelianum Körn., referred to in the synonymy above, is a valid species, with E. miquelianum Koeck. as a synonym, but the homonyms accredited to "Auct. Jap.", to Miyabe & Kudo, and to Miyabe & Tatewaki all belong in the synonymy of E. hondoense Satake.

ERIOCAULON TEPICANUM Moldenke

Bibliography: Moldenke, N. Am. Fl. 19 (1): 20 & 36. 1937; Moldenke, Phytologia 1: 327. 1939; Moldenke, Known Geogr. Distrib. Erioc. 4 & 41. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 86.

1947; Moldenke, Alph. List Cit. 3: 788. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 30 & 206. 1949; Moldenke, Résumé 36 & 483. 1959.

Additional citations: MEXICO: Nayarit: Edw. Palmer 2029 (S-isotype).

ERIOCAULON TEUSCZII Engl. & Ruhl.

Synonymy: Eriocaulon huillense Engl. & Ruhl. ex Ruhl. in Engl., Bot. Jahrb. 27: 73. 1899 [not E. huillense Rendle, 1899]. Eriocaulon lacteum Rendle, Cat. Afr. Pl. Welw. 2: 99. 1899. Eriocaulon huillense Engl. ex Moldenke, Résumé 289, in syn. 1959. Eriocaulon teuczsi Engl. & Ruhl., in herb.

Bibliography: Ruhl. in Engl., Bot. Jahrb. 27: 68, 70, 73, & 77--78. 1899; Rendle, Cat. Afr. Pl. Welw. 2: 99. 1899; Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1102--1104. 1901; Thiselt.-Dyer, Fl. Trop. Afr. 8: 245. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 40, 63, 80, 81, 286, & 287. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; H. Lecomte, Bull. Soc. Bot. France 55: 647. 1909; Moldenke, Known Geogr. Distrib. Erioc. 21, 22, 35, 36, & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 206. 1949; Moldenke, Phytologia 3: 328. 1950; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 128, 129, 139, 141, 144, 145, 151--155, 157, & 167, fig. 1--3, & pl. 7, fig. 10--12. 1955; Moldenke, Résumé 138, 144, 147--150, 289, & 483. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Astle, Kirkia 7: 95. 1968; Moldenke, Phytologia 18: 244, 245, 256, 320, 321, & 389 (1969), 19: 82 & 98 (1969), and 19: 423. 1970.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 128, fig. 1--3, & pl. 7, fig. 10--12. 1955.

Recent collectors describe this plant as an erect annual, 0.5 m. tall, with fleshy leaves, growing in permanently wet "dambo". Milne-Redhead & Taylor, however, refer to it as a tufted perennial, with white soft fleshy roots; leaves erect, from pale-green or green to bright-green but white below, very soft, semi-terete or semicircular in section, with rounded edges; sheaths pale-green, buff, or green and turning pinkish-buff, slightly swollen; scapes green or pale-green, obtusely ribbed; involucre bractlets pale-green to pale-brown or pale orange-buff; heads white; perianth white; anthers dark blackish-green or brown, growing in flooded grassland on gray sand or in boggy grasslands and in bogs, often under 1.5 dm. of water, in Brachystegia-Uapaca woodlands. The Dehn 342, cited below, includes a fine color painting of the plant on the same sheet.

The Fries, Norlindh, & Weimarck 2331 collection, also cited below, has leaves only 3 cm. in length and much broader than the Milne-Redhead & Taylor collections from Tanganyika (which exhibit leaves to 20 cm. long) and may represent a different taxon.

Rendle (1899), in describing his E. lacteum, comments that it is "Near E. Sonderianum Körn., but distinguished by its blunt leaves, the absence of keel or wing on the sepals, etc. Huilla.--

Widely caespitose, with tall sheaths and milk-white heads. Plentiful in damp meadows, growing among Droseraceae and species of Utricularia, and very plentiful in swampy places round Lopollo; Feb. to May 1860. Collected by Welwitsch in swampy meadows not farther than 300 paces from his house in April 1860. No. 2452. Growing somewhat sparsely in the very lofty spongy pastures of Morro de Lopollo along with Swertia stellarioides and small Leguminosae; end of April 1860. No. 2452b. On the higher spongy slopes of Serra de Oiahoia in the Humpata district; towards the end of April 1860. No. 2453." These collections cited by him are doubtless the cotypes of E. lacteum. Rendle's binomial is cited to "Rendle, in Hiern, Cat. Afr. Pl. Welw." by some authors like Hess (1955), who, by the way, says on p. 151 of his work that his illustrations of this species are on p. "138", but actually they are on page 128.

Eriocaulon huillense Engl. & Ruhl. is based on Antunes s.n. from Huila, Angola, deposited in the herbarium of the Botanisches Museum in Berlin; E. teusczii is based on Mechow 231 from Malanga, Loanda, Angola, also deposited in the Berlin herbarium. The E. huillense of Rendle, referred to in the synonymy above, is a synonym of E. mutatum N. E. Br. Thiselton-Dyer (1904) and Hess (1955) erroneously cite E. huillense Engl. & Ruhl. to page "78" of the Bot. Jahrb., instead of to p. 73.

Eriocaulon teusczii has been collected at altitudes of 960 20 2080 meters, flowering and fruiting from February to October and in December.

Hess (1955) discusses the species as follows: "Eriocaulon Teusczii besiedelt die gleichen Standorte wie E. pictum Fritsch; sie sind unter E. pictum beschrieben. Die beiden Arten kommen fast immer miteinander vor. Als häufiger Begleiter ist Syngonanthus Wahlbergii (Wikstr.) Ruhl. zu nennen. E. transvaalicum N. E. Br., E. mutatum N. E. Br. und Mesanthemum radicans wurden nur ausnahmsweise in derselben Gesellschaft gefunden.....

"Am gesamten Material ist der Blütenbau einheitlich. Einzig die Farbe der Spitzen der Sepalen und der Brakteen variiert zwischen weisz, gelb-braun und schwärzlich, wobei die Extreme selten sind. Die Farbmerkmale sind nicht konstant, teilweise auch vom Alter der Pflanze abhängig, so dass sie in der Systematik nicht Verwendung finden können. Die verschiedenen Farben der Blütenköpfe sind vom Entwicklungsstadium abhängig. Die Höhe der Halme und die Länge der Blätter haben eine grosse Streuung, die auf den Standort zurückzuführen sein dürfte.....

"Eriocaulon Teusczii ist angegeben (as E. lacteum Rendle) aus Nord-Nigerien, Tanganyika, Nord- und Süd-Rhodesien und Moçambique. Im Süden von Angola ist sie nach eigenen Beobachtungen nebst E. pictum Fritsch die häufigste Eriocaulon-Art. Die Verbreitungsangaben von E. Teusczii sind nicht gut gesichert, da die Art oft mit E. pictum verwechselt wird.....

"Auf die trennenden Merkmale zwischen Eriocaulon Teusczii und der habituell kaum davon zu unterscheidenden E. pictum Fritsch ist unter letzterer Art hingewiesen.

"Rendle (1906) hat aus Süd-Rhodesien (Matopo Hills) eine neue Art, Eriocaulon matopense, beschrieben. Nach diesem Autor soll die Art mit E. lacteum Rendle verwandt sein, soll sich aber durch weniger scharfe Spitzen auf den Brakteen, kleineren Wuchs und durch schmalere Blätter von E. lacteum unterscheiden. Ich habe von E. matopense kein Material gesehen." The comparisons with E. pictum to which Hess refers are quoted by me in full in the present series of notes under that species. Hess cites for E. teusczii the following of his own collections in Angola: Hess 51/156, 51/293, 52/838, & 52/1514 from Benguela, 52/280, 52/745, 52/1805, 52/2047, & 52/2150 from Huila, and 52/510 & 52/2058 from Bié. Astle (1968) cites Astle 3300 from Zambia.

Additional citations: TANZANIA: Tanganyika: Milne-Redhead & Taylor 7785 (B), 8734 (B), 9163 (B). ANGOLA: Huila: Antunes s.n. [Huilla] (B); H. Hess 52/280 (B); Welwitsch 2452 (Mu), 2453 (B, Mu, Mu, Z). Loanda: Mechow 231 (B--type, Mu--382--isotype, Z--isotype). ZAMBIA: E. A. Robinson 5716 (Mu). RHODESIA: N. C. Chase 1874 (Rh--27069); Dehn 342 (Mu); Fries, Norlinth, & Weimarck 2331 (S). SOUTHWEST AFRICA: Baum 324 (Mu--375).

ERIOCAULON TEXENSE Körn.

Bibliography: Körn., Linnaea 27: 594. 1856; C. Müll. in Walp., Ann. 5: 925 & 929 (1860) and 6: 1171. 1861; Körn. in Mart., Fl. Bras. 3 (1): 476. 1863; Morong, Bull. Torrey Bot. Club 18: 355--356. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Coult., Contrib. U. S. Nat. Herb. 2: 459. 1894; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 35, & 287. 1903; J. K. Small, Fl. Southeast. U. S., ed. 1, 236 (1903) and ed. 2, 236. 1913; Cory, Texas Agr. Exp. Sta. Bull. 550: 29. 1937; Moldenke, N. Am. Fl. 19 (1): 18 & 25. 1937; Moldenke, Phytologia 1: 327. 1939; Karling, Torreya 41: 106. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 7. 1942; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 3 & 41. 1946; Moldenke, Alph. List Cit. 1: 166. 1946; Moldenke, Phytologia 2: 153. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 22 & 206. 1949; Moldenke, Alph. List Cit. 3: 784 & 850 (1949) and 4: 1107, 1170, & 1291. 1949; Moldenke, Phytologia 3: 400 (1950) and 3: 468--469. 1951; [Wiltshire], Rev. Appl. Myc. Ind. Fungi 1: 39, 50, & 393. 1954; Moldenke, Résumé 27 & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 3: 7 (1962) and 12: [1]. 1965; Kral, Sida 2: 304, 305, & 307. 1966; Shinnars, Sida 2: 441. 1966; Moldenke, Résumé Suppl. 16: 2. 1968; Moldenke, Phytologia 17: 490 & 502 (1968), 18: 45 (1968), 18: 268 & 378--380 (1969), and 19: 330 & 333. 1970.

Illustrations: Kral, Sida 2: 304. 1966.

The initial letter of the specific epithet of this species is often uppercases by older writers, e.g., Müller (1860). Recent collectors have found the plant growing in bogs, in hardwood forests in sandy bottoms, and in seepage areas in scrub oak - pine-land associations, at altitudes of about 50 feet, flowering and fruiting in April and May. The only reported common name for it is "pipewort". In Louisiana Kral & Ricks found it "on muck of sphagnum Sarracenia-type bogs, forming mats of rosettes, the heads a startling white", "in peaty depressions in longleaf pine savanna bogs", "in hillside bogs in longleaf pine sandhills", and "in sphagnum mucky pockets in association with Sarracenia alata". Kral (1966) gives its general distribution as "Acid, sphagnum (Sarracenia-type) bogs, coastal plain, southwestern Alabama west to eastern Texas."

Kral also says "This rather rare Eriocaulon is part of the complex including E. lineare, E. septangulare.....I have not seen it in other than sphagnum Sarracenia-type bogs, and hence have no idea what habitat changes it expresses when submerged. It is locally abundant in central Louisiana, coating bog pot-holes with its small but showy white heads. Unlike the two other species of the complex, this Eriocaulon is a spring bloomer; by early summer no trace of it is to be seen, even the leaves appearing to vanish. The type locality for this species is Texas (Drummond 409, an isotype at NY) where it often is to be found in association with E. decangulare. In fact small specimens of Texas E. decangulare are often identified as E. texense. However, the heads of E. texense are soft in contrast to the harder heads of E. decangulare; the involucre bracts of E. texense are rounded to acute, sometimes squarrose, and quite dark in contrast to the more rigid, stramineous, narrowly acute to acuminate, bracts of E. decangulare; the scapes of E. texense are more slender and with less ridges than those of E. decangulare; E. texense has usually flowered, set fruit, and is dying back by the time the heads of E. decangulare are full."

Karling (1941) and Wiltshire (1954) refer to a fungus, Entophlyctis texana Karling, found on dead leaves of a pipewort in Texas. They identify the host as E. septangulare With., but it seems much more probable that, if it had characters which would lead to that identification, it was probably E. texense.

Material of E. texense has been misidentified and distributed in herbaria as E. compressum Lam., E. decangulare L., and Lachnocaulon anceps (Walt.) Morong. On the other hand, the F. A. Barkley 13543, distributed as E. texense, is the type collection of E. decangulare var. minor Moldenke; F. A. Barkley 13556, Herb. Zuccarini s.n. [Texas], Rowell 8071, and Tharp 44344b are also this variety; F. A. Barkley 13034, Correll & Correll 13516, E. Hall 675 ["635"], Painter & Barkley 13540, Rowell 8136, and Webster & Wilbur 3199 are E. decangulare f. parviceps Moldenke, of

which Tharp 44342 is actually the type collection; E. J. Palmer 13185 and O. Sanders 132 are E. compressum Lam., while Correll & Correll 12522 and Cory 57125 are Lachnocaulon anceps (Walt.) Morong.

According to Kral, F. A. Barkley 13543 & 13556, Painter & Barkley 13540, Rowell 8050 & 8136, and Tharp 4434c, 4434d, & 44344b are all immature specimens of E. decangulare L. In view of the fact that many of the specimens cited below were identified and annotated by me many years ago [some as far back as 1951] and that E. decangulare var. minor and E. decangulare f. parviceps were not recognized by me until 1968 and 1969, it seems very probable that some of these collections may actually represent one of the two latter taxa. Since they are now scattered in seven different herbaria, it will take some time to verify their identification, but this must eventually be done.

Additional citations: LOUISIANA: Beauregard Par.: Kral 20158 (N); Kral & Ricks 16992 (N). Vernon Par.: Kral 20078 (N); Kral & Ricks 16772 (N). TEXAS: Anderson Co.: Tharp s.n. [7-7-35] (Mi). Angelina Co.: Correll & Correll 27216 (Ld). Jefferson Co.: G. L. Fisher s.n. [Nome, Apr. 27, 1938] (S). Milam Co.: Tharp 44343 (S). Tyler Co.: Correll, Johnston, & Edwin 22333 (Ld); Tharp, Turner, & Johnston 54954 (Ws). Van Zandt Co.: H. Gentry 2481 (We). MOUNTED ILLUSTRATIONS: drawings & notes by Körnigke (B).

ERIOCAULON THAILANDICUM Moldenke

Bibliography: Moldenke, Phytologia 7: 88. 1959; Moldenke, Résumé Suppl. 1: 13 & 25. 1959; Moldenke, Biol. Abstr. 35: 1688. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; G. Taylor, Ind. Kew. Suppl. 13: 52. 1966.

Collectors describe this species as an herb, with white or whitish flowers, common in savannas or gregarious in wet localities and paddy fields, at altitudes of 50 to 200 meters, flowering and fruiting in October and December.

Citations: THAILAND: Sangkha Chand 571a [Herb. Royal Forest Dept. 18262] (Z-type); Smitinand 3605 [Herb. Roy. Forest Dept. 18261] (Sm).

ERIOCAULON THOUARSII H. Lecomte

Bibliography: H. Lecomte, Bull. Soc. Bot. France 55: 571-573. 1908; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1958; Moldenke, Résumé Suppl. 17: 5. 1968; Moldenke, Phytologia 18: 432. 1969.

Since this taxon is not accounted for in any way in my treatment of the family for Humbert's Flora of Madagascar (1955), it may be worthwhile repeating the description of it as given by Lecomte (1908): "Folia caespitosa, erecto-patentia, lanceolata, acuta vel subacuta, glabra, pellucida, non fenestrata, 13-14-nervia, 14-5 [=14-15 ? or 4-5 ?] cm. longa, medio 2,5-3 mm.

lata. Pedunculi numerosi, glabri, 5--6-costati, torti, 7--11 cm. alti; vaginae laxae, oblique fissae, glabrae, 2--2,5 cm. longae; capitula cylindrico-globosa, alba, puberula, 4--5 cm. lata, bracteae involucentes disco breviores, obovatae, obtusissimae, glabrae, flavescentes, bracteae flores stipantes obovato-acuminatae, concavae, fiscae, apice dorsi puberulae; receptaculum pilosum; flos ♂: sepala 3 in spatham antice fissam, 3-lobatam. apice ciliatam, connata; petalorum tubus lobis 3 minutis aequalibus, glanduligeris, apice pilosiusculis instructus; flos ♀: sepala 3 lanceolata, navicularia, 2-carinata, nigrescenti-fusca, apice ciliolata, ceterum glabra; petala 3, spathulata, obtusa, apice pilosa, glandulosa.....Elle se rapproche beaucoup de l'E. Hanningtonii N. E. Br. Mais cette dernière plante a les pétales dépourvus de glandes ou munis de glandes très peu développées, tandis que le plante recueillie par Du Petit-Thouars possède des glandes bien caractérisées."

A sheet of Petit-Thouars 2 in the herbarium of the Muséum National d'Histoire Naturelle in Paris is inscribed "Eriocaulon Thouarsii H. Lecomte" and may be the actual type of the species. I have identified and annotated it as E. quinquangulare L. There is no locality of collection indicated on the sheet.

ERIOCAULON THUNBERGII Wikstr.

Synonymy: Eriocaulon natans Afzel. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959.

Bibliography: Körn., Linnaea 27: 677. 1854; C. Müll. in Walp., Ann. 5: 926 & 944--945 (1860) and 6: 1171. 1861; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 67, 71, & 81. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 70, & 287. 1903; H. Lecomte, Bull. Soc. Bot. France 55: 645 & 646. 1909; Moldenke, Known Geogr. Distrib. Erioc. 21 & 41. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111 & 206. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 136 & 137. 1955; Moldenke, Résumé 136 & 483. 1959; Moldenke, Résumé Suppl. 1: 17. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

The initial letter of the specific epithet of this species is uppercased by Müller (1860) and other writers. Eriocaulon natans appears to be based on the same Afzelius collection preserved in the Berlin herbarium as serves also as the type of E. thunbergii.

Citations: SIERRA LEONE: Afzelius s.n. [Sierra Leone] (B-type, Z--isotype). MOUNTED CLIPPINGS: Ruhl. in Engl., Pflanzenreich (B).

ERIOCAULON THWAITESII Körn.

Synonymy: Eriocaulon twaitesii Körn. apud Ruhl. in Engl., Bot. Jahrb. 27: 68, sphalm. 1899. Eriocaulon thwaitesii Hook. f. ex Fyson, Fl. Nilg. & Puln. Hill-tops 3: 119, sphalm. 1921.

Bibliography: Körn., Linnaea 27: 627. 1856; C. Müll. in Walp.,

Ann. 5: 926 & 936 (1860) and 6: 1171. 1861; Hook. f., Fl. Brit. Ind. 6: 583—584. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 68. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 102, 105, 116, & 287. 1903; Fyson, Kew Bull. Misc. Inf. 1914: 331. 1914; Fyson, Fl. Nilg. & Puln. Hill-tops 1: 48, 427, & 432 (1915), 2: pl. 277 (1915), and 3: 119. 1921; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; Fyson, Journ. Indian Bot. 2: 202 & 318 (1921) and 3: 18. 1922; Stapf, Ind. Lond. 3: 91. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 46. 1930; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1617 & 1620. 1931; Moldenke, Known Geogr. Distrib. Erioc. 23, 24, 37, & 41. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126, 127, 130, 205, & 206. 1949; Moldenke, Phytologia 3: 331 (1950), 3: 469 (1951), and 4: 339. 1953; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 2, 8 [3]: 1126, 1128, & 1333. 1956; Moldenke, Résumé 163, 167, 188, 190, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Thanikaimoni, Pollen & Spores 7: 186. 1965; Moldenke, Résumé Suppl. 15: 8 & 20. 1967; Kammathy, Rao, & Rao, Bull. Bot. Surv. India 9: 233. 1967; Moldenke, Phytologia 17: 383 (1968), 18: 264 & 325 (1969), 19: 11 & 242 (1969), and 19: 343. 1970.

Illustrations: Fyson, Fl. Nilg. & Puln. Hill-tops 2: pl. 277. 1915.

Jackson (1893) dates Körnicke's original publication of E. thwaitesii as "1854", but this is an error — pages 129—799 of this volume did not appear in print until 1856. The title-page of Fyson, Fl. Nilg. & Puln. Hill-tops, volume 3, is dated "1920", but the volume was not actually issued until 1921. The initial letter of the specific epithet of this taxon is naturally often uppercased, e.g., by Müller (1860). Kammathy and his associates (1967) cite Barnes s.n. from Mysore, India.

The species has been collected in flower and fruit in September. Because of the unavailability of Fyson's publications in so many libraries, it may be worth repeating his discussions here: "E. Thwaitesii Koern. (C. P. 790 and 769 in Herb. Kew. and 790 in Herb. Calc.);.....Leaves $1\frac{1}{2}$ — 2 in. oblong acute, flat. Scapes many, 1—6 in. of various heights. Heads $\frac{1}{4}$ — $\frac{1}{3}$ in at first obconic, later truncate, dark gray. Involucral bracts very obtuse, pale. Receptacle hairy. Female sepals 3, equal and boat-shaped or 1 smaller or 2 only. Petals 3, very slender and bearing long hairs from near the base. Seeds oblong, brown. Ceylon; South India on the Pulneys; Anamalais and Nilgiris. The plants vary much in size. Those from higher levels on the Pulneys are much smaller than the type, even only $\frac{1}{2}$ in. high. They were described by me in Kew Bulletin 1914 as a new species, E. Mariae, and figured in my Flora of the Nilgiri and Pulney Hill-tops under that name, since the female sepals are 3 equally boat shaped instead of 2. But I find a plant C.P. 790 in Herb. Calc. the collection quoted by Koerniche Linnaea xxvii p. 627 as

in part his type, has the female sepals 3 but unequal, one being flat; and plants from 5,000 ft. on the Pulneys, in no other way distinguishable from what purports to be Koerniches type at Kew, with 3 sepals equal. It seems therefore that this is another instance of the sepals varying within the species (c.f. E. truncatum Ham.). At the same time since I do not find them spongy at the back, as described by Koerniche I may be wrong in so identifying these plants."

His description of E. mariae should also be noted here: "Scapes several, 1 to 2 inches, slender: sheath $1/2$ inch: mouth single, very acute, slightly enlarged. Leaves $1/2$ to $3/4$ inch by $1/12$ to $1/8$ inch, strongly ribbed, glabrous. Heads $1/8$ to $1/6$ inch: involucral bracts light brown, glabrous. Floral bracts acute, black with tufts of white hairs. Villi of receptacle very long and copious. Male flowers: -- Sepals $1/25$ inch united in a spathe split in front. Corolla tube and lobes very small, glands large. Female flowers $1/16$ inch: petals divided almost to the base into a number of fine hairs. t. 277. Fyson 2086. Pulneys: at 7,500 feet, in a marsh on the downs above Kodaikanal. Not known elsewhere. The very dwarf habit, yet broad leaves, and the remarkably divided female petals make this distinct from any other."

The E. thwaitesii credited to Hooker (1900) is a synonym of E. neesianum Körn. Material of E. thwaitesii Körn. has been misidentified and distributed in herbaria as E. cinereum R. Br. and E. truncatum Hamilt. On the other hand, the Kuntze 5686, distributed as E. thwaitesii, is actually E. hookerianum Stapf; Bem-bower 31 is E. leucomelas Steud.; and E. Barnes B.9a, Blume s.n. Karta 317, Koorders 39495b, and Toroës 4441, 4572, & 5024 are all E. truncatum Hamilt. The Barnes, Koorders, and Toroës collections were incorrectly cited as E. thwaitesii by me in previous installments of these notes. Ritchie 1242 is a mixture with E. achiton Körn. and E. stellulatum Körn., while Thwaites C.P. 790 is a mixture with E. truncatum Hamilt.

Additional citations: INDIA: Madras: Fyson 4471 (S). State undetermined: Ritchie 1242, in part (T). CEYLON: Thwaites 790, in part (B--type, Z--isotype).

ERIOCAULON TOFIELDIIFOLIUM Schinz

Synonymy: Eriocaulon tofieldianum Schinz ex Moldenke, Bull. Jard. Bot. Brux. 27: 123, sphalm. 1957. Eriocaulon tofieldiifolium Schinz ex Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 2. 1967.

Bibliography: Schinz, Bull. Herb. Boiss., sér. 2, 1: 779. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 69 & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 158 & 265--269, fig. 1 & 5. 1955; Moldenke, Bull. Jard. Bot. Brux. 27: 123. 1957; Moldenke, Résumé 153 & 483.

1959; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Südw. Afr. 159: 1 & 2. 1967; Moldenke, Résumé Suppl. 16: 8 & 21. 1968; Moldenke, Phytologia 19: 323. 1970.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 265, fig. 1 & 5. 1955.

Volk describes this plant as "rare in marsh about well" in Southwest Africa, flowering and fruiting in December. Friedrich-Holzhammer (1967) cites the type collection, Dinter 378, and also Dinter 1757 and Volk 2744 from the same country.

Hess (1955) gives a detailed discussion of this taxon and its relationships, probably worth repeating here for the benefit of workers in libraries which do not have the original publication: "Bei der Durchsicht des Materials von Eriocaulon africanum Hochstetter fand ich dort eingeordnet zwei Bogen sehr gutes Material von Eriocaulon tofieldifolium H. Schinz. Schinz...hat nach Exemplaren von Dinter die Art als neu beschrieben und beigefügt, dass sich E. tofieldifolium durch weniger breit abgerundete, eher braune als schwarz Tragblätter von E. africanum unterscheidet. Die beiden Herbarbogen mit vollständig einheitlichem Material, auf die Schinz seine Diagnose stützte, tragen beide die gleiche Anschrift: 'Plantae africae austro-occidentalis, ex reg. Hereroland. Eriocaulon tofieldifolium Schinz, det. Hans Schinz, leg. K. Dinter, 1899, Nr. 378'. Auf den einen Bogen steht auf separatem Zettel der handschriftliche Vermerk Dinters: "378, sumpf. Stellen Waterberg, 31.III.1899'. Schinz.....hat im Anhang an die Diagnose diese Fundortsangaben zitiert (unter dem Datum steht zwar 31.II.1899). Es besteht kein Zweifel, dass es sich bei den beiden Bogen um das Typus-Material von E. tofieldifolium H. Schinz handelt.

"Ruhland (1903) führt in seiner Monographie Eriocaulon tofieldifolium unter Zitierung der obgenannten Fundort als Synonym von E. africanum Hochst. an. Dies ist sicher nicht richtig; denn die beiden Arten stehen systematisch weit auseinander. Ruhland hat wahrscheinlich das Typus-Material von E. tofieldifolium nicht gesehen und nur auf die summarische Diagnose von Schinz abgestellt, in der die ausschlaggebenden Merkmale nicht angeführt sind. Schinz hat dann auf den beiden Bogen mit Eriocaulon tofieldifolium eigenhändig geschriebene Revisionsetiketten angebracht, die den Vermerk 'Eriocaulon africanum Hochst. det. H. Schinz, 24.10.1905' tragen.....

"Von Eriocaulon africanum wurde das von Ruhland (1903) zitierte Material untersucht, das von Tyson unter Nr. 2551 in Grigueland, nahe Clydesdale, gesammelt wurde. Auch diese Proben stammen aus dem Botanischen Museum der Universität Zürich; sie stimmen mit den Angaben in Ruhland....überein. Weiter wurden aus den botanischen Sammlungen der Eidgenössischen Technischen Hochschule die Einlagen, ausgegeben von Macovan und Bolus, Nr. 1203, verglichen. Nach der Anschrift stammen die Pflanzen ebenfalls aus

Grigualand, nahe Clydesdale. In der Monographie von Ruhland..... ist aber unter derselben Nummer und den gleichen sammlern Handcock's Drift als Fundort angegeben.

"Zur Diagnose von Eriocaulon africanum in Ruhland....ist zu ergänzen, dass die Brakteen der Blüten meist an der Spitze spärlich behaart sind. Weiter sind die Sepalen der ♂ und ♀ Blüten gegen die Spitze hin gezähnt, wie dies für E. Woodii N. E. Br. angegeben ist (E. Woodii ist aber durch tief konkave Sepalen, die sich nicht in einer Ebene ausbreiten lassen, unschwer von E. africanum abzutrennen)."

He then summarizes the differences between the two species as follows: E. africanum -- leaves to 4 mm. wide at the base; sheath to 4 cm. long, cylindric, the split mouth usually somewhat divergent; floriferous scape solitary, not twisted, 1--4 additional scapes recurved and with viviparous heads; heads flat, 6--8 mm. in diameter, blackish-brown; receptacle glabrous; receptacular bractlets blackish-brown, 2.3--2.6 mm. long, 0.8--1 mm. wide; pistillate sepals obovate, keeled, fleshy, acute or obtuse, always irregularly dentate toward the apex, pilose on the back and margins, gray-black, 1.4--1.6 mm. long, 0.9--1 mm. wide; staminate sepals 3, united for about 1/3 their length, otherwise just like the pistillate ones; pistillate petals 1.6--1.9 mm. long, 0.4--0.5 mm. wide; staminate petals just like the pistillate ones; anthers white or light-yellow.

Eriocaulon tofieldifolium -- leaves to 8 mm. wide at the base; sheath to 3 cm. long, split, usually somewhat swollen below the mouth; scapes all floriferous, 8--20, twisted; heads spherical, 4--6 mm. in diameter, gray; receptacle pilose; receptacular bractlets yellow-brown, 2.4--2.6 mm. long, 1.2--1.4 mm. wide; pistillate sepals navicular, the ventral one somewhat smaller and only this one keeled, acute, narrowly winged on the keel, pilose on the back toward the apex, blackish-brown, 1.5--1.8 mm. long, the greatest width from the keel to the margin 0.3 mm., the wing to 0.05 mm. wide; staminate sepals united into a slit tube, the apex acute, pilose on the margins, yellow; staminate petals 3, free, elongate-cuneate, only 1.4--1.6 mm. long and 0.1--0.2 mm. wide, white, pilose only at the apex, with very small brown glands; staminate petals 3, very small, often glandless, ciliate; anthers blackish-brown.

He concludes "dass Eriocaulon africanum Hochst. und E. tofieldifolium Schinz nicht miteinander verwandt oder gar identisch sind. Eriocaulon tofieldifolium steht aber E. transvaalicum N. E. Br. nahe. Für diese Untersuchung stand mir das Cotypus-Material von Eriocaulon transvaalicum N. E. Br. ebenfalls aus dem Botanischen Museum der Universität Zürich, zur Verfügung. Es umfasst zwei Bogen, die von N. E. Brown eigenhändig beschriftet sind. Die Pflanzen stammen aus der Sammlung Dr. A. Rehmann und tragen die Nr. 4787. Sie wurden von ihm in Transvaal bei Bosch Veld (näherer Fundort Buchenhouts Kloof Spruit) gesammelt.

"Habituell kann Eriocaulon tofieldifolium von E. transvaalicum

nicht unterschieden werden. Bei genauerer Untersuchung zeigt sich, dass bei E. tofieldifolium die Brakteen der Blüten auf den Rücken gegen die Spitze hin immer ziemlich dicht behaart sind, während jene von E. transvaalicum kahl sind oder nur wenige und kurze Haare tragen. Dadurch erscheinen die Blütenköpfe von E. tofieldifolium grau-braun und matt, während jene von E. transvaalicum dunkelbraun und glänzend sind. Ein faszierender Unterschied zwischen den beiden Arten in der Form der Sepalen ist nicht vorhanden. Die Petalen stimmen ebenfalls überein. In den ♀ Blüten von E. transvaalicum trägt meist nur die dorsale Petale eine braune Drüse; in den ♂ Blüten ist fast immer an jeder der ungleichen, zu winzigen Lappen reduzierten Petalen eine kleine hellbraune Drüse zu finden. Zur Diagnose von Eriocaulon transvaalicum in Ruhland (1903) ist nachzutragen, dass der Blütenboden lang wollig behaart ist. Soviel mir bekannt ist, wurde Eriocaulon tofieldifolium noch unter keinem andern Namen beschrieben. Das Typus-Material zu dieser Art ist im Botanischen Museum der Universität Zürich."

Citations: SOUTHWEST AFRICA: Volk 2744 (Mu, Z).

ERIOCAULON TOGOËNSE Moldenke

Synonymy: Eriocaulon xeranthemoides Heurck & Muell.-Arg. in Van Heurck, Obs. Bot. 103. 1870 [not E. xeranthemoides Bong., 1831]. Eriocaulon xeranthemoides Heurck ex Haines, Bot. Bihar & Orissa 6: 1070, in syn. 1924. Eriocaulon barteri Engl. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959.

Bibliography: Van Heurck, Obs. Bot. 103. 1870; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 880. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 72 & 84. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 12, 65, 96, & 288, fig. 12. 1903; Engl. & Drude, Veget. Erde 9 (2): 264. 1908; Fyson, Journ. Indian Bot. 2: 200. 1921; Haines, Bot. Bihar & Orissa 6: 1070. 1924; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 44. 1930; Stapf, Ind. Lond. 3: 91. 1930; Moldenke, Known Geogr. Distrib. Erioc. 20, 21, 41, & 42. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 880. 1946; Moldenke, Phytologia 2: 134. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 109, 112, 113, & 206. 1949; Moldenke, Phytologia 3: 469. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 133, 137, 138, 294, & 483. 1959; Moldenke, Résumé Suppl. 1: 16 (1959) and 2: 6. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 880. 1960; Jaeger & Winkoun, Bull. Inst. Franç. Afr. Noir 24 [sér. A, no. 1]: 100. 1962; Moldenke, Résumé Suppl. 4: 6 (1962) and 17: 11. 1968; Moldenke, Phytologia 19: 410. 1970.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 96, fig. 12. 1903; Engl. & Drude, Veget. Erde 9 (2): 264. 1908.

Barter 778, collected at Borgu in Northern Nigeria, is the type collection of all four names involved in the nomenclature of this taxon. The E. xeranthemoides Bong., referred to in the synonymy above, is a synonym of Syngonanthus xeranthemoides

(Bong.) Ruhl. On the sheet of Barter 778 in the Munich herbarium Schultes has written "Proximum videtur Eriocaulini xeranthemo Mart." Hooker (1893) and Haines (1924) actually place the name, E. xeranthemoides Heurck, in synonymy under E. xeranthemum Mart. of India, an entirely untenable disposition of it!

Collectors have found E. togoëse growing at 300 meters altitude, flowering and fruiting in September and November. The Raynals say that Raynal & Raynal 5148 ter is identical with their 5131 ter & 5204. They found the plant growing in the alluvium of the Niger River on inundated prairies. Material has been misidentified and distributed in herbaria as E. pulchellum Körn. On the other hand, the Winkoun 23, distributed as E. togoëse, is actually E. antunesii Engl. & Ruhl.

Citations: MALI: Soudan: Jaeger 5224 (Gg); Raynal & Raynal 5148 ter (Z), 5204 (Z-illustr., Z-illustr.). REPUBLIC OF GUINEA: Boismare 408 [Herb. Chillou 3926] (An). TOGO: Schroeder 162 (Ac, B). NIGERIA: Northern: Barter 778 (B--type, Mu--297--isotype, S--isotype, Ut--327--isotype).

ERIOCAULON TONKINENSE Ruhl.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 72, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Moldenke, Known Geogr. Distrib. Erioc. 26 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 206. 1949; Moldenke, Résumé 176 & 482. 1959; Moldenke, Phytologia 19: 40. 1969.

Thus far this species is known only from the type collection, cited below.

Citations: INDOCHINA: Tonkin: Balansa 247 (B--type, Br--isotype, N--isotype, N--photo of isotype, Z--photo of isotype).

ERIOCAULON TORTUOSUM F. Muell.

Bibliography: F. Muell., Fragm. 1: 91--92. 1859; Benth., Fl. Austral. 7: 191, 196, & 792. 1878; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 66, 98, & 287. 1903; Moldenke, Known Geogr. Distrib. Erioc. 41 & 61. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 206. 1949; Moldenke, Résumé 209 & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

Citations: AUSTRALIAN REGION: AUSTRALIA: Northern Territory: N. Holtze s.n. [near Darwin, 3.1904] (S, Z).

ERIOCAULON TOUMOUENSE Moldenke, Résumé Suppl. 17: 4 & 10, hyponym (1968), nom. nov.

Synonymy: Eriocaulon guineëse Moldenke, Résumé Suppl. 4: 6, nom. nud. (1962), Phytologia 8: 386. 1962 [not E. guineense Steud., 1855].

Bibliography: Moldenke, Résumé Suppl. 4: 6. 1962; Moldenke, Phytologia 8: 386--387. 1962; Hocking, Excerpt. Bot. A.6: 455. 1963; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1962: 29.

1963; Moldenke, Biol. Abstr. 42: 1517. 1963; Moldenke, Résumé Suppl. 17: 4 & 10. 1968.

The E. guineense Steud., referred to in the synonymy above, is a synonym of Mesanthemum radicans Körn.

Citations: REPUBLIC OF GUINEA: Boismare 386 [Herb. Chillou 3904] (An--type, Z--isotype).

ERIOCAULON TRANSVAALICUM N. E. Br.

Bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Cap. 7: 54. 1897; Rendle, Cat. Afr. Pl. Welw. 2: 100. 1899; Ruhl. in Engl., Bot. Jahrb. 27: 71 & 81. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 63, 81, & 287. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; Moldenke, Known Geogr. Distrib. Erioc. 22 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122 & 206. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 148, 155--158, 267, & 269, fig. 3, & pl. 8, fig. 10. 1955; Moldenke, Résumé 147, 153, & 483. 1959; Moldenke, Résumé Suppl. 3: 16 (1962), 16: 8 (1968), and 17: 4, 9, & 10. 1968; Meikle, Kew Bull. 22: 143. 1968; Moldenke, Phytologia 16: 8 (1968), 17: 454 (1968), 18: 49 (1968), and 19: 15. 1969; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1968: 24 & 25. 1969.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 248, fig. 3, & pl. 8, fig. 10. 1955.

This species has been found growing at altitudes of 960 to 1650 meters, flowering and fruiting from March to May and in December. Milne-Redhead & Taylor describe it as having green or rather yellow-green leaves, many-veined, paler below, with large cells showing, turning brown when dead, the sheaths green or rather pale-green, the scapes pale-green and terete, the heads greenish-black, the bractlets greenish-black, the filaments white, and the anthers greenish-black, growing at the edge of small pools in marshy valleys and on boggy slopes of bare areas with iron-rich water seeping over muddy soil. Rendle (1899) states that it is closely related to E. andongense Welw., while Meikle (1968) avers it to be related, rather, to E. deightonii Meikle. For a detailed comparison of E. transvaalicum with E. tofieldifolium Schinz, see under the latter species in these notes.

Hess (1955) discusses the species thoroughly, saying, in part: "Diese Art wurde an 6 teilweise weit auseinander liegenden Stellen im Süden von Angola gesammelt. Als Vergleichs-Material standen mir die Cotypen aus dem Botanischen Museum der Universität Zürich zur Verfügung. Es handelt sich dabei um zwei Bogen, die von N. E. Brown eigenhändig angeschrieben wurden. Sie stammen aus der Sammlung von Dr. A. Rehmann und tragen die Nummer 4787. Fundort: Bosh Veld in Transvaal.

"Die Original-Diagnose von Brown (1897) ist recht vollständig und genau, dagegen ist jene von Ruhland (1903) zu summarisch.....

"Eriocaulon transvaalicum wurde nur an offenen, kelinen Quell-tümpeln, auf schlammigen, sandig-lehmigem Boden gefunden. Junge

Pflanzen sind meist von Rieselwasser überflutet. Die Art bildet lockere Bestände. Als gelegentlich mit Eriocaulon transvaalicum vorkommende Eriocaulaceen wurden E. Teuschii Engl. et Ruhl., E. pictum Fritsch und Syngonanthus Wahlbergii (Wikstr.) Ruhl. notiert.....

"Habituell stimmen die Pflanzen aller Nummer mit dem Original-Material überein. Minimale und kleineswegs konstante Abweichungen zeigen die ♀ Blüten der Nr. 51/293a: die Sepalen tragen oft 1—3 kurze, weisse Haare. Die ventrale Sepale ist oft etwas kürzer und weniger scharf gekielt als die beiden lateralen Sepalen. Meist ist sie auch nicht geflügelt. Die Farbe der Blüten ist mehr grau als die am Original-Material." He continues with minute details of other differences shown by his various collections, and then concludes "Die Beschreibungen zeigen, dass zwischen dem Material der verschiedenen Fundorte kleine Abweichungen bestehen, die aber nie konstant und nur unbedeutend sind. Keine Probe zeigt eine vollständige Übereinstimmung mit dem Original-Material von Brown. Am gesamten Belegmaterial aus Angola fehlt meist die Drüse an der dorsalen Sepale, während sie am Original-Material meist vorhanden ist. Zudem ist die Farbe der Brakteen und der Sepalen an den Pflanzen aus Angola grau bis schwärzlich. Bei Eriocaulon transvaalicum findet man aber graubraune bis schwarz-braune Farbtöne. Dazu ist zu bemerken, dass das Material von Brown zur Zeit, als er es bearbeitete, bereits 20 Jahre alt war. Es ist durchaus möglich, dass der Farbton nach Jahren im Herbar umschlägt; ich möchte deshalb aus diesen Unterschied nicht zuviel Gewicht legen. Diese Formen sind deshalb zu Eriocaulon transvaalicum zu stellen.....

"Eriocaulon transvaalicum wurde bisher nur aus Transvaal angegeben; diese Art dürfte in Angola weiter verbreitet sein, als dies aus den 4 Fundstellen hervorgeht,...Eriocaulon transvaalicum steht morphologisch E. tofieldifolium Schinz nahe. E. tofieldifolium hat gegen die Spitze hin dicht behaarte Brakteen und Sepale (vgl. dazu Hess [1954]). Dadurch unterscheidet sich diese Art, die im Hereroland (südlich an Angola angrenzend) vorkommt, von E. transvaalicum. Es wäre nun durchaus möglich, dass in Süd-Westafrika E. transvaalicum und E. tofieldifolium nebeneinander vorkommen, Bastarde bilden, und dass diese Bastardschwärme nach Norden, nach Angola, eingewandert sind. Jene Proben aus Angola, die an den Sepalen 1—3 kleine Haare aufweisen, lieszen sich so als hybridogene Zwischenformen deuten. Dies ist aber bloß eine Hypothese; ihre Richtigkeit könnte nur experimentell bewiesen werden."

He cites from Benguela H. Hess 51/293a, 51/318, 51/386, 52/1436, & 52/1512 and from Huambo H. Hess 52/884. The Stolz 1344, distributed as E. transvaalicum, is actually E. buechananii Ruhl.

Citations: BURUNDI: Lewalle 1419 (Rf). TANZANIA: Tanganyika: Milne-Redhead & Taylor 9945 (B), 10481 (B). ANGOLA: Benguela: H. Hess 52/1436 (B, Z).

ERIOCAULON TRANSVAALICUM var. HANNINGTONII (N. E. Br.) Meikle

Synonymy: Eriocaulon hanningtonii N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 253. 1901. Eriocaulon branningtonii N. E. Br. ex Moldenke, Résumé Suppl. 10: 5, in syn. 1964.

Bibliography: N. E. Br. in Thiselt.-Dyer, Fl. Trop. Afr. 8: 253. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 74, & 285. 1903; Prain, Ind. Kew. Suppl. 3: 69. 1908; H. Lecomte, Bull. Soc. Bot. France 55: 573. 1908; C. H. Wright, Kew Bull. Misc. Inf. 1919: 264. 1919; Moldenke, Known Geogr. Distrib. Erioc. 21 & 35. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 117 & 204. 1949; Moldenke, Résumé 144, 150, & 481. 1959; Moldenke, Résumé Suppl. 10: 5 (1964) and 17: 4, 9, & 10. 1968; Meikle, Kew Bull. 22: 142. 1968; Moldenke, Phytologia 18: 49. 1968; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1968; 24 & 25. 1969.

Recent collectors have found this plant growing at 750 feet altitude, flowering and fruiting in May and July. Fisher & Schweickerdt report it as frequent in wet sand of roadsides. The type was collected by James Hannington -- in whose honor it was named -- at Kwa Chiropa, Tanganyika, in 1883, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Mooney, on the label of Mooney 9012, suggests that E. dembianense A. Chiov. is conspecific with E. hanningtonii. Schlieben 2332a is a mixture with Diplacrum africanum C. B. Clarke.

Citations: TANZANIA: Tanganyika: Schlieben 872 (B), 2332a, in part (S). MOZAMBIQUE: Niasa: Leach & Rutherford-Smith 10953 (Mu). Quelimane: Faulkner K.22 (K, N, S, S, Z). Province undetermined: Fisher & Schweickerdt 252 (Rh-22812).

ERIOCAULON TRILOBATUM Ruhl.

Bibliography: Ruhl. in Engl., Bot. Jahrb. 27: 71 & 81--82. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 63, 82, & 287. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; H. Lecomte, Bull. Soc. Bot. France 55: 571. 1908; Moldenke, Known Geogr. Distrib. Erioc. 22 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 206. 1949; Moldenke, Phytologia 3: 469. 1951; Moldenke in Humbert, Fl. Madag. 36: [23] & 28--29, fig. 3 (10--16). 1955; Moldenke, Résumé 156 & 483. 1959.

Illustrations: Moldenke in Humbert, Fl. Madag. 36: [23], fig. 3 (10--16). 1955.

Leaves cespitose, linear-lanceolate or parallel-linear, elongate, 14--28 cm. long, 7--8 mm. wide at the midpoint, rather obtuse at the apex, wider at the base, many-veined, fenestrate, otherwise not pellucid, erect or spreading, glabrous; peduncles aggregate, many or rather many, dark olive-green in the sulcations in drying, 25--50 cm. long, 5- or 6-costate, twisted; sheaths rather loose, 7--16 cm. long, about half as long as the leaves, very densely and persistently spreading-villose, obliquely split, entire and acute at the mouth; heads finally semi-globose, rather hard, 7--9 mm. wide, white-villous at the summit; involucre bractlets broadly obovate, brunnescent, slightly keeled, rather acutish at the apex, subglabrous or sparsely pilose; receptacular

bractlets narrower, rather rigid, acute at the apex, pilose at the summit; staminate florets: sepals connate at the base into an anteriorly split spathe, obovate, olivaceous or fuscous-green, rounded-obtuse at the apex, ciliate; petal-tube with 3 small sub-equal lobes at the apex, the lobes ciliate, slightly glanduliferous; anthers black; pistillate florets: sepals 3, broadly ovate, green, somewhat concave, very abruptly acute at the apex, pilose on the back at the apex; petals 3, oblong-spatulate, much broader than the sepals, greenish-white, pilose at the apex and margins, glanduliferous.

This species is endemic to Madagascar, where it is known as "fotsivolo". Collectors have found it in marshes, swamps, and bogs in rainforests. Humbert's Flora of Madagascar (1955) says "Marais, tourbières, rocaillies humides, jusqu'à 1.600 m. alt.; fl.: septembre—novembre."

The species is based on Hildebrandt 3715 and s.n., both from Androgoloaka, in central Madagascar, collected in November, 1880, and probably both parts of the same collection. Ruhland (1899) says "Die ansehnliche Form steht dem ebenfalls aus Madagascar stammenden E. piliflorum Ruhland am nächsten."

Additional citations: MADAGASCAR: Afzelius s.n. [Moramanga, 12.10.1912] (S); Armand 76 (P); Baron 488 (P); D'Alleizette 623m (P), s.n. (P); Decary 6120 (P), 18384 (P); R. Heim s.n. [24 sept. '34] (P), s.n. [fin sept. 1934] (P); Herb. Jard. Bot. Tananarive 1040 (S); Hildebrandt 3715 (B—cotype, Mu—385—cotype, P—cotype, P—cotype, P—cotype), s.n. [Nov. 1880] (Mu—378—cotype); Humbert 11140 (P); Humbert & Cours 23857 (Z); Perrier de la Bâthie 2244 (P), 7242 (P), 7244 (P, P), 14282 (P), 18255 (P); Scott-Elliott 2271, in part (P); Viguier & Humbert 907 (N, P). CULTIVATED: Madagascar: Herb. Jard. Bot. Tananarive 1204 (S), 1205 (S).

ERIOCAULON TRILOBATUM var. GLABRESCENS Moldenke

Bibliography: Moldenke, Phytologia 3: 417. 1951; Moldenke in Humbert, Fl. Madag. 36: [23] & 29—30, fig. 3 (17). 1955; Moldenke, Résumé 156 & 483. 1959.

Illustrations: Moldenke in Humbert, Fl. Madag. 36: [23], fig. 3 (17). 1955.

This variety differs from the typical form of the species in having its leaves and sheaths completely glabrous throughout at all times.

In Humbert's Flora of Madagascar (1955) the habitat of this endemic variety is described as "Dépressions humides sur latérite de gneiss et basalte; rocaillies humides et ombragées; fl.: aout—novembre". Perrier de la Bâthie 7243 exhibits proliferating viviparous heads.

Citations: MADAGASCAR: Cours 788 (P); Decary 75 (P); Humbert 18055 (N—photo of type, P—type, Z—photo of type); Perrier de la Bâthie 7243 (P), 7251 (N, P).

ERIOCAULON TRISECTUM Satake

Bibliography: Satake, Journ. Jap. Bot. 15: 144, fig. 2. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 12, 33, 78, & 87, fig. 13. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 23-24. 1940; Hill & Salisb., Ind. Kew. Suppl. 10: 86. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 206. 1949; Moldenke, Résumé 172 & 483. 1959.

Illustrations: Satake, Journ. Jap. Bot. 15: 144, fig. 2. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 33, fig. 13. 1940.

The only common name recorded for this endemic Formosan species is "rengeti-hosikusa". Satake (1940) cites from Formosa only the type collection, gathered by Yoshihiko Yamamoto and K. Mori in November, 1932, at Rengeti, in the province of Taityu, and deposited in the herbarium of the University of Taihoku, and the following additional collections: Hasioka s.n., Hibino & Suzuki s.n., and Kudo s.n., all from the same locality.

ERIOCAULON TRUNCATUM Hamilt.

Synonymy: Eriocaulon truncatum Buch.-Ham. ex Mart, in Wall., Fl. Asiat. Rar. 3: 29. 1832 [not E. truncatum Harms, 1959].
Eriocaulon truncatum Mart. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 334. 1855. Eriocaulon glabriflorum Ridl., Journ. Fed. Malay States Mus. 10: 154-155. 1920. Eriocaulon truncatum var. vera Fyson, Journ. Indian Bot. 2: 199. 1921. Eriocaulon truncatum "Ham. ex Mart." apud Milne-Redhead in Hook., Icon. Pl. 34: pl. 3389. 1939. Eriocaulon truncatum Wall. ex Moldenke, Known Geogr. Distrib. Erioc. 41, in syn. 1946. Eriocaulon capitulum Miq. ex Moldenke, Résumé Suppl. 1: 16, in syn. 1959. Eriocaulon truncatum f. longiculmis Teijsm. ex Moldenke, Résumé Suppl. 1: 18, in syn. 1959. Eriocaulon truncatum var. α Körn. ex Moldenke, Résumé Suppl. 1: 18, in syn. 1959. Eriocaulon truncatum "Buch.-Ham. ex Mart." apud Backer & Bakh., Fl. Java 3: 25. 1968. Eriocaulon truncatulum Hamilt. apud K. Larsen, Dansk Bot. Ark. 23: 397, sphalm. 1966. Eriocaulon luzulaefolium var. minus Mart., in herb. Eriocaulon truncatum Wight, in herb.

Bibliography: Mart. in Wall., Fl. Asiat. Rar. 3: 29. 1832; Wall., Numer. List 207. 1832; Steud., Nom. Bot., ed. 2, 1: 586. 1840; Kunth, Enum. Pl. 3: 555 & 614. 1841; D. Dietr., Syn. Pl. 5: 264. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 270 & 334. 1855; Körn., Linnaea 27: 631-633. 1856; C. Müll. in Walp., Ann. 5: 926 & 937 (1860) and 6: 1171. 1861; Benth., Fl. Hongk. 382. 1861; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 24-26. 1888; Hook. f., Fl. Brit. Ind. 6: 578 & 585. 1893; Maxim., Diagn. Pl. Nov. Asiat. 8: 6 & 14. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 68. 1899; Hook. f. in Trimen, Handb. Fl. Ceylon 5: 2, 7-8, & 412. 1900; Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 103, 107, & 287. 1903; Prain, Beng. Pl., ed. 1, 1127. 1903; C. H. Wright,

Journ. Linn. Soc. Lond. Bot. 36: 201. 1903; H. Lecomte, Journ. de Bot. 21: 89, 93—94, & 131. 1908; Hosseus, Beih. Bot. Centralbl. 28 (2): 372. 1911; H. Lecomte, Fl. Gén. Indo-Chin. 7: 3 & 16. 1912; H. Lecomte, Not. Syst. 2: 214 & 393. 1913; H. Hallier, Beih. Bot. Centralbl. 34 (2): 46. 1916; Palm, Svensk. Bot. Tidsk. 14: 264. 1920; H. N. Ridl., Journ. Fed. Malay States Mus. 10: 154—155. 1920; E. D. Merr., Bibl. Enum. Born. Pl. 110—111. 1921; Hayata, Icon. Pl. Formos. 10: 55 & 272. 1921; Fyson, Journ. Indian Bot. 2: 199, 200, & 202 (1921) and 3: 17 & 18. 1922; E. D. Merr., Enum. Philip. Flow. Pl. 1: 193. 1922; Haines, Bot. Bihar & Orissa 6: 1067 & 1070 (1924) and 1: 80. 1925; H. N. Ridl., Fl. Malay Penins. 5: 135. 1925; A. W. Hill, Ind. Kew. Suppl. 6: 78 (1926) and 7: 89. 1929; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 46 & 49. 1930; C. E. C. Fischer in Gamble, Fl. Presid. Madras 9: 1613 & 1619. 1931; Milne-Redhead in Hook., Icon. Pl. 34: pl. 3389. 1939; Nakai & Honda, Nov. Fl. Jap. 6: 20 & 87. 1940; Erlandsson, Arkiv Bot. 30 B (2): 2—4, fig. 1 b & 1 d. 1942; Masamune, Trans. Nat. Hist. Soc. Taiwan 33: 13. 1943; Moldenke, Known Geogr. Distrib. Erioc. 24—27, 35, 41, & 61. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Alph. List Cit. 1: 268 (1946), 2: 455, 461, 576, & 625 (1948), 3: 659, 727, 879, & 971 (1949), and 4: 1011, 1201, 1205, 1260, & 1288. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 127, 129, 132, 134—136, 138, 139, 141, 143—146, & 206. 1949; Moldenke, Phytologia 3: 469. 1951; M. R. Henderson, Malay. Wild Fls. 212. 1954; Santapau & Raizada, Indian For. Rec. 4 (6): 167. 1955; Koyama, Philip. Journ. Sci. 84: 374. 1956; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 2, 8 [3]: 1123—1124, 1127, & 1333. 1956; Moldenke, Résumé 159, 163, 165, 167, 170, 173, 174, 176, 178, 180, 184, 188, 190—193, 293, 480, & 483. 1959; Moldenke, Résumé Suppl. 1: 12, 16, & 18. 1959; Van Royen, Nov. Guin., new ser., 10: 23, 26, 36, 38, & 44, fig. 4 R. 1959; Van Royen, Blumea 10: 130. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 3: 17, 18, 20, & 28 (1962) and 6: 8. 1963; Prain, Bengal Pl., ed. 2, 2: 848. 1963; Legris, Trav. Sect. Scient. Inst. Franç. Pond. 6: 549 & 565. 1963; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Brunig, Govt. Sarawak Sympos. Ecol. Res. Humid Trop. Veg. 311. 1965; Van Royen, Nov. Guin. Bot. 14: 467. 1965; Thanikaimoni, Pollen & Spores 7: 186. 1965; K. Larsen, Dansk Bot. Ark. 23: 378, 380, 381, & 397, fig. 16. 1966; Datta & Majumdar, Bull. Bot. Soc. Bengal 20: 39. 1966; Tingle, Check List Hong Kong Pl. 54. 1967; Santapau, Bull. Bot. Surv. India 8: 48. 1967; Ornduff, Reg. Veg. 55: 13 & 118. 1968; Backer & Bakh., Fl. Java 3: 25—26. 1968; Vajravelu, Joseph, & Chandrasekaran, Bull. Bot. Surv. India 10: 81. 1968; Arora, Bull. Bot. Surv. India 10: 65. 1968; Moldenke, Résumé Suppl. 16: 9 (1968) and 17: 11. 1968; Moldenke, Phytologia 17: 461 (1968), 18: 52, 57, 98, 177, 189, 274, 303, 309, 435, & 441 (1969), 19: 13, 26, 36, 76, & 86 (1969), and 19: 239, 243—246, 250, 329, 337, 341, 343, 348, 414, & 424. 1970.

Illustrations: Fyson, Journ. Indian Bot. 2: 199. 1921; Erlands-

son, Arkiv Bot. 30 B (2): 2, fig. 1 b & 1 d. 1942; Van Royen, Nov. Guin., new ser., 10: 36, fig. 4 R. 1959; K. Larsen, Dansk Bot. Ark. 23: 380, fig. 16. 1966.

Eriocaulon truncatum is based on Hamilton s.n. from the Monghir Mountains in Bihar, India, which is Wallich 2368. Eriocaulon luzulaefolium var. minus appears to be based on H. Bruce 18 from Assam, deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels, E. truncatum Mart. is based on Wallich 6071, in part, in the herbarium of the Botanisches Museum at Berlin, E. truncatum Wight on Wight 2368 in the same herbarium (probably a case of mislabeling of Wallich 2368), and E. truncatum f. longiculmis on Teijsmann s.n. from Java, deposited at Utrecht. The E. truncatum credited to Harms, referred to in the synonymy above, is a synonym of E. sexangulare L.

Eriocaulon glabriflorum was based on Ridley 8144 & 15671 from Tuaga Tujoh, Burau, in the Langkawi Islands, C. B. Robinson 6239 also from Burau, C. B. Robinson s.n. from Teluk Wau on Tereu Island, and Annandale s.n. from Singgora. Ridley says of this plant "This little plant belongs to the same set as E. truncatum, Ham., but is always much more slender with narrower leaves and smaller heads. It differs also in its perfectly glabrous perianth of which the segments also are much narrower." Van Royen (1959), however, regards the two taxa as conspecific. He describes E. truncatum in detail, giving its overall distribution as "India, China, Indo China, Malay Peninsula, Sumatra, Borneo, Luzon, Java, Karimun Djawa Islands, Misool, Tanimbar Islands, New Guinea", and the habitat as "Growing in mud of a marshy gully in grass plains at low altitudes". He misdates K rnicke's (1856) work as "1954", and cites Van Royen 3399, 3600, & 4467 from New Guinea in the Leiden herbarium. Other collectors have found the species in rice fields and paddies, wet and open wet places, and springy places at altitudes to 240 meters above sea level, flowering and fruiting in January, May, June, and August to November. Vernacular names reported for it are "babawabgan", "doehoet si hopo", and "pipewort". Steward, Chiao, & Cheo report that the "scales" are chalky-white. Thwaites reports it growing in small dense bunches in wet crevices of rocks on hillsides in Ceylon. Santapau & Raizada (1955) say of it: "In moist soil, somewhat more abundant than the other two species, but rare in the area" in Saurashtra, India, citing Santapau 16362 & 16363.

Backer & Bakhuizen van den Brink (1968) give as their partial description of this species "Interfloral bracts obtuse, oblong-obovate; receptacle glabrous; basal bract of peduncle loosely appressed, with an oblique, acute, often 2--3-dentate mouth. Heads oblate-hemispheric, 4.5--5.5 mm across; involucral bracts oval-oblong-obovate, obtuse to broadly rounded, subdentate: ♂: sepals free or connate into a unilaterally split sheath, with a dark-coloured top; petals minute, apically pubescent; ♀: sepals 2, linear-spatulate to lanceolate-spatulate; petals 3, near the top

with a gland. Leaves linear-lanceolate, rather obtuse, 2--6 cm by 1--8 mm. 0.05--0.20; I--XII; W. C., Mad.; 15--1300; swampy rice- and grass-fields, brook borders, ditches, boulders in rivers; locally often numerous" in Java.

Kunth (1841) says of E. truncatum: "E. luzulaefolio simillimum, bracteis sat distinctum" and throws out the query "An certe acaulis?" He bases his description entirely on Wight 2368 (by which is doubtless meant Wallich 2368, the type collection). The same distinguished author says under E. xeranthemum Mart. "E. nepalensi et truncato proximum, licet involucrium radians", Milne-Redhead (1939) avers that it is closely related to E. annum Milne-Redhead from Africa.

Thwaites & Hooker (1864) regarded both E. thwaitesii Körn. and E. atratum Körn. as in part synonymous with E. truncatum and in part synonymous with E. sexangulare L. Hooker (1893) gives E. cinereum Hamilt. and Leucocephala spathacea Roxb. as synonyms of E. truncatum, but I regard the former as E. hamiltonianum Mart. and the latter as E. cinereum R. Br. Prain (1903) follows Hooker in regarding Leucocephala spathacea as a synonym of E. truncatum, reporting that the latter grows "In all the provinces [of Bengal]. A herb of rice-fields and marshy ground." Sebastine & Ramamurthy (1966) record it as "common" in Kerala, India, and cite their no. 15315. Vajravelu & his associates (1968) also state that it is common in Kerala, citing Vajravelu 19120.

Fyson (1921) restricts the typical form of this species to "Tipperah, Mts. of Monghir", Bihar, India, because the type collection is from that locality and is described by Martius (1832) as having three sepals to each floret, while Körnische, Hooker, Ruhland, and, in fact, all later writers describe the flowers as having only two sepals. He feels that all material from elsewhere and ascribed to E. truncatum belongs actually to var. disepalum Fyson. His description of the species, however, is a composite one so as to include both the typical and the separated forms: "leaves usually 1-3 in. flat, narrowed from the base. Scapes several. Heads hemispheric. Involucre horizontal, scarious, not or hardly projecting beyond the head. Receptacle glabrous. Floral bracts very obtuse, nearly glabrous. Female sepals narrow, 2 boat-shaped, toothed at the apex, and third sepal if present acute; or 2 only. Petals 3 narrow. Bengal, Assam, North Burma and southwards to Malacca; S. India and Ceylon. Var. a vera, Tipperah, Mts. of Monghir. This I take to be the true species, for Mart.....describes the flower as having a third sepal. But Koerniche in Linnaea xxvii, p. 633, Hooker in F. B. I. l.c. and Ruhl. l.c. both give the commoner 2-sepalled flower of the next variety.....Var. b di-sepala. Female sepals 2, otherwise as in the type. The wider distribution given for the species. For a similar variation in the female sepals see E. Thwaitesii Koern. Two sheets in Herb. Calc. unfortunately without precise locality but one marked C. India, are similar in many respects, but the floral bracts are cuneate acute, not round-

ed. The female sepals vary in the same head, 3 equally boat-shaped or one linear, or two only. Except for the glabrous receptacles these plants might be of E. Dianae."

The Erlandsson (1942) reference in the bibliography of this species is sometimes cited as "1940", but the part of the work involved here was not actually issued until February 25, 1942. Larsen (1966) states that E. truncatum is found "throughout Tropical Asia" and in regard to its chromosomes he reports that "In several good plates the number $2n = 30$ was established. It is small chromosomes as in E. achiton. Erlandsson (1942) reports the numbers $n = 16$ and $2n = 29-32$ from Java."

Merrill (1921) cites Schlechter 13221 from Labuan, Winkler 3358 from Borneo, and Clemens & Clemens 9595 & 9698, Gibbs 2597 & 2602, Haslam s.n., and Topping 1478 & 1938 from Sabah. Van Royen (1959) cites Van Royen 3599, 3600, & 5822 from New Guinea. Arora (1968) describes the species as "common in sandy wet soil" and cites his no. 6778. Maximowicz (1893) cites Hance s.n. from Macao and from Canton, Wright s.n. from Hongkong, Cuming s.n. from Malacca, Thwaites s.n. from Ceylon, Heyne s.n. from India, Wight s.n. from Deccan, and Bélanger s.n. from Malabar.

Hooker & Thomson s.n. [Silhet, alt. 0] and T. Thomson s.n. [Plan. Ganget. Sup.] are both mixtures with E. cinereum R. Br., at least insofar as the Munich herbarium specimens are concerned; Thwaites 790 is in part E. truncatum and in part E. thwaitesii Körn.; T. Philippi s.n. in the Berlin herbarium is said to have been mixed with T. Philippi 18 [which is E. achiton Mart.] and was identified by Körnicke as E. truncatum var. α . Zollinger 1220 in the Berlin herbarium seems to have had its collection number corrected to "1210", but not clearly so. The E. Barnes B. 9a, Koorders 3949b, and Toroes 4441, cited below, were previously incorrectly cited by me as E. thwaitesii Körn.

Material of E. truncatum has been misidentified and distributed in herbaria under the names E. cinereum R. Br., E. lanceolatum Miq., E. longifolium Nees, E. luzulaefolium Mart., E. merrillii Ruhl., E. quinquangulare L., E. sexangulare L., E. sieboldianum Sieb. & Zucc., E. sieboldii S. & Z., E. sikokianum Maxim., E. thwaitesii Körn., E. truncatum var. malaccense Hook. f., E. xeranthemum Mart., Leucocephala spathacea Roxb., and Xyris microcephala Hassk. As an example of the confusion in herbaria, the Collector undesignated 2065 H.B. specimen, cited below, was identified by various workers in sequence as E. capitulum Miq., E. argenteum Mart., E. quinquangulare L., E. heterolepis Steud., E. luzulaefolium Mart., and E. heterolepis var. nigricans Körn.

On the other hand, the Loher 13901 and Verterdal 465, distributed as E. truncatum, are actually E. cinereum R. Br., Hosseus 117 and Meebold 10320 are E. dianae Fyson, Hosseus 102 is E. dianae

var. longibracteatum Fyson, Shantha 68 is E. humile Moldenke, Hosseus 492 and Lindhard s.n. [8 Jan. 1904] are E. luzulaefolium Mart., H. H. Bartlett 7457, Bünne Meyer 5203, and Loher 12947 are E. merrillii Ruhl., Chang & En 2907 is E. robustius (Maxim.) Mak., Chung 2711, 3747, & 3825, Herb. Lingnan Univ. 17173, Tai 11617, and Tak 424 are E. sexangulare L., Chang & Metcalf 163 is E. solyanum Royle, and Lindhard 20 is E. soucherei Moldenke, while M. Ramos s.n. [Herb. Philip. Bur. Sci. 41340] is in part E. echinulatum Mart., in part E. infirmum var. puberulentum (Moldenke) Van Royen, and in part something non-eriocaulaceous.

Citations: PAKISTAN: East Bengal: W. Griffith 5566 (C), 5576 (Cp); Hooker & Thomson s.n. [Chittagong, alt. 0--1000 ped.] (Mu--260), s.n. [Silhet, alt. 0] (Mu--247). INDIA: Assam: H. Bruce 18 (Br); Collector undesignated 129 (S); Herb. Bot. Surv. India s.n. [27.9.56] (Mu); Wallich 6071, in part (B). Bihar: Hamilton s.n. [Wallich 2368] (B--type, N--isotype, N--photo of type, Z--photo of type); Wight 2368 (B). Bombay: Santapau 10853 (Xa), 15897 (Xa). Kerala: E. K. Janaki 467 (Mi). Khasi States: Hooker & Thomson s.n. [Mont. Khasia, 0--6000 ped.] (Mu--215). Madras: E. Barnes N.9a (F--photo, K, N, N--photo, Sg--photo, Z--photo); Iyengar 80 (Bn--3157). Mysore: Begum 3 (Mf); E. K. Janaki 328 (Mi); S. N. Ramaswamy 5 (Rf); Sivan 30 (Bn--3151). Saurashtra: Santapau 16362 (Xa, Z), 16363 (Xa). Uttar Pradesh: Strachey & Winterbottom 2 (Br). West Bengal: J. W. Helfer 136 (B, Go, N, S); Hooker & Thomson 5 (B). State undetermined: T. Thomson s.n. [Plan, Ganget. Sup.] (Mu--248). CEYLON: Börgesen s.n. [Kandy, 11/3/1928] (Cp); Thwaites 790, in part (B, Br), C. 54 (N). BURMA: Tenasserim: T. Philippi s.n. (B). CHINA: Anhwei: R. C. Ching 4449 [Herb. Univ. Nanking 8829] (Ca--263145). Chekiang: Faber 206 (N). Fukien: Chang & En 2926 (Mu); C. H. Cheng 3042 (Ca--299325, Mu). Hupeh: Sun 851 (N). Kiangsu: Chiao s.n. [Herb. Univ. Nanking 22344] (Ws). Kweichow: Steward, Chiao, & Cheo 441 (S, W--1659105). CHINESE COASTAL ISLANDS: Honam: E. D. Merrill 9830 (Ca--291720). THAILAND: Franck 184 (Cp), 1463 (Cp); Hansen, Seidenfaden, & Smitinand 11098 (Cp); Sørensen, Larsen, & Hansen 3122 (Cp), 3830 (S), 5345 (S), 5626 (S), 5899 (Cp). INDOCHINA: Tonkin: Pételot 8093 bis (N). MALAYA: Malacca: W. Griffith s.n. [Malacca] (B). Singapore: H. N. Ridley 3920 (Ca--266913, Ca--267662). WESTERN PACIFIC ISLANDS: JAPAN: Kiushiu: Ichikawa 200846 (Ca--320869). PHILIPPINE ISLANDS: Luzon: Bacani s.n. [Herb. Philip. Forest. Bur. 16458] (W--709525); M. S. Clemens 18023 (Ca--295830); Loher s.n. [Rizal Province, Dec. 1910] (Ca--229618), s.n. [Rizal Province] (Ca--229619); C. B. Robinson s.n. [Herb. Philip. Bur. Sci. 9500] (W--629616). Island undetermined: Cuming 2326 (B, Mu--344). INDONESIA: GREATER SUNDA ISLANDS:

Borneo: H. Hallier 1172, in part (Ca--265588). Java: Bakhuizen van den Brink 67 (Ut--59770), 2336 (Ut--25479a); Blume s.n. (N); Hackenberg 3 (Bi); H. Jensen s.n. (Cp); Karta 317 (N); Koorders 39495b (Ca--308145); E. O. A. Nyman s.n. [Buitenzorg, 25.VIII. 1897] (Gg--401154); Savinierre 1663 (Br); Teijsmann s.n. (Ut--322); Zollinger 1220 (B), 1920 (Ca--348903). Sabah: Clemens & Clemens 29706 (N). Sarawak: Clemens & Clemens 20528 [field no. 6559] (N), 20997 [field no. 7616] (N). Sumatra: Boeea 6688 (Mi, W--1861523), 7403 (Mi, W--1861574), 7468 (Mi), 8007 (Mi, W--1682390), 8642 (Mi), 8764 (Mi); Toroes 2581 (Mi, N), 2895 (Mi), 2995 (W--1680084), 4441 (S, W--1680840, W--1680841), 4572 (Bi, N), 5024 (Bi, N). CULTIVATED: Java: Slooten s.n. [Buitenzorg, 1937] (S). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 2065 H.B. [Sianja] (Ut--320).

ERIOCAULON TRUNCATUM var. DISEPALUM Fyson

Synonymy: Eriocaulon truncatum var. di-sepalum Fyson, Journ. Indian Bot. 2: 199. 1921.

Bibliography: Fyson, Journ. Indian Bot. 2: 199. 1921.

Fyson (1921) proposed this variety for the many specimens identified as E. truncatum Hamilt. which have female florets with only 2, instead of 3 sepals. He does not indicate a type, but says merely "Female sepals 2, otherwise as in the type. The wider distribution given for the species", i.e., "Bengal, Assam, North Burma and southwards to Malacca; S. India and Ceylon", except for the Tipperah, in the mountains of Monghir in the region of Bihar, India, where the type of the 3-sepaled form of E. truncatum was collected by Hamilton. He notes that in the Calcutta herbarium there are two sheets which have three types of female florets in the same head, with 2 sepals only, with 3 equal sepals, and with 2 boat-shaped and one linear sepal. It is not clear from his discussion how he intended to identify these two specimens. All other authors record only 2 sepals for the pistillate florets of E. truncatum Hamil., although Kunth (1841) adds the comment "potius 3, duo cohaerentia?".

ERIOCAULON TRUNCATUM var. MALACCENSE Hook. f.

Bibliography: Hook. f., Fl. Brit. Ind. 6: 578. 1893; Milne-Redhead in Hook., Icon. Pl. 34: pl. 3389. 1939; Moldenke, Known Geogr. Distrib. Erioc. 26 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 138, 139, & 206. 1949; Moldenke, Résumé 180 & 483. 1959.

Hooker (1893) describes this variety as follows: "floral bracts broader, flowers of both sexes sessile, petals broader and more coriaceous, gland apical, ovary with petals stipitate, seeds larger. -- Malacca, Griffith (Kew Distrib. 5567); at Kwala Pe-hang, Ridley. -- Possibly a different species."

The H. N. Ridley 3920, distributed as this variety, is cited

by me in this series of notes under typical E. truncatum Hamilt.

ERIOCAULON TRUNCATUM var. QUADRICOSTATUM H. Lecomte

Synonymy: Eriocaulon truncatum var. quadricostata H. Lecomte, Not. Syst. 2: 214. 1912.

Bibliography: H. Lecomte, Not. Syst. 2: 214 (1912) and 2: 393. 1913; Moldenke, Known Geogr. Distrib. Erioc. 26 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 206. 1949; Moldenke, Résumé 176, 293, & 483. 1959.

Lecomte (1912, 1913) spells the varietal epithet for this taxon "quadricostata" on page 214 and as "quadricostatum" on page 393 of his work, describing the plant as "hampe à quatre côtés, capsules sphériques. — Annam: Djiring à Phan-tiet, no. 1596 [Lecomte et Finet]."

ERIOCAULON TUBIFLORUM Van Royen

Synonymy: Eriocaulon brevipedunculatum var. angustifolium Moldenke, Phytologia 4: 127—128. 1952.

Bibliography: Moldenke, Phytologia 4: 127—128. 1952; Moldenke, Biol. Abstr. 27: 984. 1953; Moldenke, Bull. Jard. Bot. Brux. 27: 131. 1957; Van Royen, Nov. Guin., new ser., 10: 23, 36—37, & 44, fig. 4 S. 1959; Moldenke, Résumé 201 & 480. 1959; Moldenke, Résumé Suppl. 1: 14. 1959; Van Royen, Blumea 10: 128. 1960; Moldenke, Phytologia 17: 453 (1968) and 19: 21. 1969.

Illustrations: Van Royen, Nov. Guin., new ser., 10: 36, fig. 4 S. 1959.

Van Royen (1959) describes this species as follows: "Herb up to 3 cm, forming dense cushions. Leaves linear, 0.5—2 by 0.05—0.15 cm, acute, 4- or 5-nerved, fenestrate, glabrous but with long white hairs in the axil. Peduncles 1—3 cm. long, 4- or 5-ribbed, glabrous, sheath 6—8 mm long, glabrous. Heads obovoid or ellipsoid, 2—2.5 by 2—3 mm, involucre bracts suborbicular or elliptic, 1.7—2.2 by 1—2 mm, rounded, glabrous, floral bracts obovate, 2—2.2 by 1—1.5 mm, rounded, glabrous; receptaculum with few long white hairs. ♂ Flowers: sepals 3, tubuliformly united, but the lateral ones united up to 2/3 only, boatshaped, obovate, 2—2.5 by 0.7—1 mm, median one flat, all sepals obtuse, glabrous, blackish in upper half; petals 3, tubuliformly united, sometimes with a few white hairs at apex, with a black gland at inside; stamens 6, anthers black. ♀ Flowers: sepals 3, tubuliformly united, boatshaped, c. 3 mm long, acute or obtuse, blackish except for the apex, glabrous; petals 3, free, oblanceolate, 1.8—2 mm long, acute, with a black gland below the apex and white hairs at inside; ovary 3-celled; style 1 with 3 branches. Seeds ellipsoid, with a large number of transverse rows of small hairs. Distribution. Endemic. Local distribution. North Central New Guinea, Nassau Range, near Lake Habbema, alt. 3225 m (Brass 9288, 9318, both in A, L and NY). Ecology. In boggy grasslands, on edges of pools and in bogs at high altitudes. Remarks. Originally this species (based on Brass 9288) has been described as a variety of E. brevipedunculatum Merrill, but she

differs from that species in the connate, glabrous and suffused black sepals. These details warrant this variety to be regarded as a separate species. The combination E. angustifolium (Koernicke, 1863) exists already and therefore the specific epithet tubiflorum is chosen referring to the connate sepals".

Collectors have found this species at altitudes of 7000 to 9675 feet, flowering and fruiting in August, describe its inflorescence as "black", and found it growing "amphibious in bogs and pools, boggy marshes and open alpine places".

The M. S. Clemens 5584 & 9368, previously cited by me in this series of notes as this taxon, have recently been shown to represent E. alpinum Van Royen instead, while Brass 9231 & 9282 and Brass & Meyer-Drees 9997 are E. pulvinatum Van Royen.

Emended citations: MELANESIA: NEW GUINEA: Dutch New Guinea: Brass 9288 (N—type), 9318 (N). Northeastern New Guinea: M. S. Clemens 5655a (B).

ERIOCAULON UBONENSE H. Lecomte

Synonymy: Eriocaulon ubonensis H. Lecomte apud Koyama, Philip. Journ. Sci. 84: 378, sphalm. 1956.

Bibliography: H. Lecomte, Journ. de Bot. 21 [sér. 2, 1]: 89, 92, 103, & 109, fig. 1. 1908; H. Lecomte, Fl. Gén. Indo-Chin. 7: 2 & 11—12. 1912; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, Known Geogr. Distrib. Erioc. 26, 41, & 61. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136, 137, & 206. 1949; Koyama, Philip. Journ. Sci. 84: 373—375 & 378, pl. 6 C ["5" C]. 1956; Moldenke, Résumé 176, 178, & 483. 1959.

Illustrations: H. Lecomte, Journ. de Bot. 21: 103, fig. 1. 1908; Koyama, Philip. Journ. Sci. 84: pl. 5 C. 1956.

This species is based on Thorel 1593, in part, from Ubon, Mekong, Annam, and Pierre s.n. from Cambodia. Lecomte (1908) comments that "Cette plante diffère de E. longicuspis Hook. f. par la structure de ses feuilles à cloisons transversales beaucoup plus rapprochées, par les bractées florales qui sont villeuses dorsalement près du sommet, mais qui ne sont pas acuminiées, par la hampe qui est plus courte et beaucoup moins forte, etc."

Koyama (1956) cites B. Hayata s.n. from Thailand. Before that the species was known only from Annam and Cambodia. Koyama's paper is dated "1955", but was actually not issued until 1956. In it he cites Lecomte's original publication as "H. Lecomte in Morot. Journ. Bot." which is an alternative manner of citing the "Journ. de Bot." (originally edited by Louis Morot) to distinguish it from the equally famous English "Journ. Bot." He comments that "This is a large-sized fine Eriocaulon well characterized by flaccid thick leaves and large heads composed of dark gray floral bracts and densely bearded white disk flowers. This taxon is known only from Indo-China and Thailand. We have very little taxonomical data on Eriocaulon from Thailand. Only two species are represen-

ted by herbaria from Thailand. They are the present species and E. glabriflorum, the latter one being first reported from Malay Peninsula by Ridley." It should be noted that now 31 species and one variety of Eriocaulon are known from Thailand -- an indication of how rapidly our knowledge of this group has increased during the last decade..

ERIOCAULON ULAEI Ruhl.

Synonymy: Eriocaulon ulaei Ruhl. ex Moldenke, *Résumé Suppl.* 1: 18, in syn. 1959.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 4, 17, 18, 42, 47, & 287. 1903; Prin, Ind. Kew. Suppl. 3: 70. 1908; Moldenke, *Known Geogr. Distrib. Erioc.* 8 & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77 & 206. 1949; Moldenke, *Résumé* 89, 417, & 483. 1959; Moldenke, *Résumé Suppl.* 1: 6 & 18. 1959.

Citations: BRAZIL: Rio de Janeiro: Ule 1315 [Macbride photos 10566] (B--type, N--photo of type, W--photo of type, Z--isotype).

ERIOCAULON ULAEI var. RADIOSUM Ruhl.

Synonymy: Eriocaulon ulaei var. radiosa Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 48 & 287. 1903.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 48 & 287. 1903; Moldenke, *Known Geogr. Distrib. Erioc.* 8 & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77 & 206. 1949; Moldenke, *Résumé* 89, 293, & 483. 1959; Moldenke, *Résumé Suppl.* 1: 6. 1959.

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

Citations: BRAZIL: Santa Catarina Island: Ule 639 (B--type, Z--isotype).

ERIOCAULON USSURIENSE Körn.

Bibliography: Regel, *Tent. Fl. Ussur.* 157. 1861; Maxim., *Diagn. Pl. Nov. Asiat.* 8: 6 & 16. 1893; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 879. 1893; Komarov, *Fl. Mansh.* 1: 419. 1901; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 66, 100, & 288. 1903; Komarov & Alis., *Opred. Rast. Dal'nevost. Kr.* 1: 340. 1931; Steinberg in Komarov & Schischkin, *Fl. U. S. S. R.* 3: 496--497, pl. 27, fig. 5 a & b. 1935; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 879. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 20, 24, & 41. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 108, 130, & 206. 1949; Moldenke, *Phytologia* 3: 469. 1951; Moldenke, *Résumé* 132, 167, & 483. 1959; Moldenke, *Résumé Suppl.* 1: 8. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 879. 1960; Steinberg in Komarov & Schischkin, *Fl. U. S. S. R.*, Engl. transl., 3: 393--394. 1964.

Illustrations: Steinberg in Komarov & Schischkin, *Fl. U. S. S. R.* 3: pl. 27, fig. 5 a & b. 1935.

Maximowicz (1893) cites only Maack s.n. from Lake Hanka in Manchukuo. He notes that "Habitu nostratibus E. kiusiano m. v. E. alpestris Hk. f. et Th. exemplis typicis angustifoliis simile, 1.

c. fusius descriptum. Bracteae florales 2 mm. longae florem ♀ paulo excedentes ♂ aequantes."

Additional citations: UNION OF SOCIALIST SOVIET REPUBLICS: Far Eastern Territory: Melvil s.n. [31/VIII/1926] (N—photo, Z—photo). Siberia: Collector undetermined 2373 (N, S), s.n. [5.IX. 1950] (Go); Kiss s.n. [Primorskaja, 15.VIII.1917] (Mi). South Ussuria: Kusnezow 179 (N).

ERIOCAULON VANHEURCKII Muell.-Arg.

Synonymy: Eriocaulon van heurckii Muell.-Arg. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 103, 105, & 288. 1903. Eriocaulon thomasi Fyson, Journ. Indian Bot. 1: 50 (1919) and 2: 318. 1921. Eriocaulon vanheureckii Muell.-Arg. apud Razi, Journ. Mysore Univ. 7 (4): 77, sphalm. 1946. Eriocaulon indicum Moldenke, Phytologia 3: 163—164. 1949.

Bibliography: Muell. & Van Heurck in Van Heurck, Obs. Bot. 98. 1870; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 103, 105, & 288. 1903; Fyson, Journ. Indian Bot. 1: 50 (1919), 2: 318 & 320 (1921), and 3: 18. 1922; A. W. Hill, Ind. Kew. Suppl. 6: 79 (1926) and 7: 89. 1929; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1610—1611 & 1619. 1931; Moldenke, Known Geogr. Distrib. Erioc. 24, 41, & 61. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127, 128, & 206. 1949; Moldenke, Phytologia 3: 163—164 (1949) and 3: 328. 1950; Razi, Journ. Mysore Univ. 11 (1): 7. 1950; Moldenke, Phytologia 3: 470. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 2, 8 [3]: 1122—1123, 1127, & 1333. 1956; Moldenke, Résumé 163, 165, 289, 293, & 483. 1959; Razi, Rec. Bot. Surv. India 18: 19 & 20. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 3: 17. 1962; G. L. Shah, Bull. Bot. Surv. India 4: 237. 1962; Thanikaimoni, Pollen & Spores 7: 186. 1965.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 41. 1921.

The type of E. indicum is Santapau 2924 from Khandala, on the Kuve Plateau, India, collected on October 4, 1943, and deposited in the Britton Herbarium at the New York Botanical Garden. Eriocaulon thomasi is based on Meebold 9104 & 9899 in the Calcutta herbarium. Fyson's description (1921) of it is worth repeating here: "Habitus speciei E. Thwaitesii Hook. f. similis, sed capitulum globosum, involucrium reflexum, sepala duo. Caulis per-brevis. Folia caespitosa, lanceolata acuta, mucronata, glabra, 5—10 cm. longa, 0.4 to 1.0 cm. lata. Pedunculi paulo ad duplici longiores, glabri; sub-capitulo paulo crassi. Capitula globosa. Bractae involucriantes breviores, reflexae. Bractae flores superantes rhomboideocuneata summodorso puberulae. Flos ♂ sepala 2, naviculari-concava; petala 3, angustissima linearia, longis pilosis barbata magnis glandulis instructa. Semina, oblonga, fusca. Flos ♂ sepala 2, angusta; petala 3; antherae nigrae.....Peninsular India;

on the Western Ghats, Salsette, Khandala, Castle Rock, Tirthalli. Stems tufted. Leaves glabrous, lanceolate or oblanceolate acute or mucronate. 2—5 in. by 1/3 in. at widest. Scapes twice as high or less, thickened below the very globose or truncate heads, which are white by the thickly puberous exposed back of the floral bracts. Receptacle tall hairy. Sepals in both sexes 2 only; deeply boat-shaped and thickened along the keel. Female petals linear with long basal hairs. Anthers black. A very distinct species, allied probably to *E. sexangulare* L. but with the keel of the female sepals less developed. The slight but distinct thickening of the peduncle just below the head is very striking."

Santapau describes the species as "locally abundant in rock pools", growing to 20 cm. tall, while Shah says that it is "common, forming large patches on rocks during rains". Razi (1950) records it from Mysore and (1959) from Travancore. It has been collected in flower and fruit in August and September.

Citations: INDIA: Bombay: Blatter, Hallberg, & McCann 28071 (N); R. R. Fernandez R.299 (Xa); Herb. Blatter 2372 (N, Xa), 2373 (N, Xa), 2566 (N, Xa); Santapau 470a (N, Xa), 2183 (N, Xa), 2924 (N), 4843 (N, Xa), 10264 (N, Xa), 13025 (Xa), 14980 (Xa), 14988 (Xa), 15021 (Xa), 15844 (Xa), 15847 (Xa), 15907 (Xa), 15939 (Xa), 21167 (Xa), 21168 (Xa); G. L. Shah 340 (Xa), 4759 (Xa).

ERIOCAULON VANHEURCKII f. MINIMUM Moldenke

Bibliography: Moldenke, *Phytologia* 5: 84. 1954; Moldenke, *Résumé* 163 & 483. 1959.

This form differs from the typical form of the species in being in all only 3—4 cm. tall.

Citations: INDIA: Bombay: Santapau 15849 (Xa--type, Z--isotype).

ERIOCAULON VAUPESENSE Moldenke

Bibliography: Moldenke, *Bot. Mus. Leaflet*. Harvard Univ. 18: 124. 1958; Moldenke, *Résumé* 66 & 483. 1959; G. Taylor, *Ind. Kew. Suppl.* 13: 52. 1966; Moldenke, *Phytologia* 19: 324. 1970.

A small probably annual herb; stem much abbreviated; leaves tufted, very thin-membranous and fragile, apparently erect when fresh, spreading or reflexed in age, linear and grass-like, uniformly pale-green on both surfaces, 3.5—6 cm. long, 1.5—2 mm. wide below the middle, attenuate-subulate at the apex, fenestrate, glabrous on both surfaces; peduncles usually one per plant, 7—14 cm. long, very slender or filiform, weak, stramineous, 3--5-costate, often green within the sulcations; sheaths slender, closely appressed, 2--2.5 cm. long, glabrous throughout, split at the apex, the blade about 5 mm. long, erect or the tip very slightly spreading, subulate-tipped, glabrous; heads small, white, 3--5 mm. wide; involucre bractlets obovate, thick-textured, stramineous, closely appressed and imbricate, about 1.6 mm. long and wide, shiny, rounded at the apex, glabrous; receptacular bractlets similar but appressed white-pilose on the back and shortly white-barbate toward and at the apex with stiffly erect hairs, yellowish, broadly round-

ed at the apex, firm, rigid, shiny; staminate florets: sepals 3, connate at the base, cuneate-spatulate, about 0.8 mm. long and 0.4 mm. wide, rounded and white-barbate at the apex with stiffly erect hairs; petals 3, connate into a slender stramineous tube about 0.8 mm. long, the free tips densely white-barbate like the sepals; stamens 6; filaments very short, about 0.16 mm. long, glabrous; anthers oblong, dark-brown, about 0.2 mm. long and 0.12 mm. wide; pistillate florets not seen.

The type of this species was collected by Richard Evans Schultes, Richard E. D. Baker, and Isidoro Cabrera (no. 18274) at Caffo del Caribe (between Isla del Venado and San José) and vicinity, at an altitude of about 850--900 feet, Río Guainía, Vaupés, Colombia — at about latitude 2°45' N. and longitude 67°50' W., — on November 2, 1952, and is deposited in the United States National Herbarium at Washington. The plant has been misidentified and distributed in some herbaria as E. atabapense Moldenke.

Citations: COLOMBIA: Vaupés: Schultes, Baker, & Cabrera 18274 (W--2172096--type, Z--isotype).

ERIOCAULON VITTIFOLIUM H. Lecomte

Bibliography: H. Lecomte, Bull. Soc. Bot. France 55: 645--646. 1909; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 127 & 133--137, fig. 1, pl. 7, fig. 6--9 (1955) and 67: 89. 1957; Moldenke, Résumé 136, 147, & 483. 1959; Moldenke, Résumé Suppl. 1: 9 (1959) and 3: 16. 1962; Moldenke, Phytologia 18: 259. 1969.

Illustrations: H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 127, fig. 1, & pl. 7, fig. 6--9. 1955.

Hess (1955) gives a very detailed description of this species, with illustrations, and makes the following interesting comments: "Lecomte.....hat Eriocaulon vittifolium aus französisch Guinea beschrieben. Seither wurde die Art meines Wissens nie mehr zitiert. In Angola fand ich zwei Fundorte von Eriocaulon vittifolium. Weil die Unterschiede gegenüber E. latifolium Sm. aus den Diagnosen nicht klar hervorgehen, habe ich das Typus-Material von E. vittifolium aus dem Muséum National d'Histoire Naturelle, Paris, und das Original-Material von E. latifolium aus dem Herbarium Kew miteinander verglichen.

"In der Diagnose von Eriocaulon vittifolium sind keine Angaben über Abmessungen in den Blüten zu finden. Die Diagnose wird hier, gestützt auf das Original-Material, das von Dr. Macclaud bei Dinguevay (Nov. 1898) und von A. Chevalier bei Kindia, Nr. 12787, gesammelt wurde, neu gefasst und mit dem Material aus Angols verglichen, welches aber noch keine reifen Früchte besitzt. Weiter wird im Anhang zum Vergleich auf die Morphologie von E. latifolium Sm. eingegangen.....

"Eriocaulon vittifolium wurde am beiden Stellen in schnell fließendem Wasser gefunden. Die Wassertiefe betrug (nach Mitte der Trockenzeit) 20--50 cm. Der Grund ist kiesig. Als Begleiter ist einzig Boottia sp. zu nennen.....

"Vergleicht man die ♀ Blüten von Eriocaulon vittifolium von Dinguevay mit denen aus Kindia (Nr. 12787), so glaubt man, es mit zwei ganz verschiedenen Arten zu tun zu haben. Die Sepalen der Blüten aus Dinguevay sind spitz, undeutlich gekielt, um 1,8 mm lang. Die Petalen sind meist spitz, gelegentlich abgerundet, so lang wie die Sepalen und 0,4--0,5 mm breit. Die Blüten aus Kindia haben nur um 1,5 mm lange, aber etwa 1 mm breite, gestutzte, nicht spitze Sepalen; sie sind zudem tief konkav und auf dem Rücken rund. Die Petalen sind an der stets breit abgerundeten Spitze um 0,6 mm breit. Es würde sich deshalb scheinbar rechtfertigen, zwei Arten zu unterscheiden. Nun habe ich aber aus dem Conservatoire Botanique de Genève noch eine Pflanze untersucht, die mit Eriocaulon latifolium angeschrieben ist, aber zweifellos zu E. vittifolium gehört. Sie stammt ebenfalls aus Kindia und wurde dort von Roberty (Nr. 10747) am 14.2.1948 gesammelt. Diese Pflanze hat nun Sepalen in den ♀ Blüten, die etwa so breit sind wie die der Nr. 12787 aus Kindia; sie sind aber zugespitzt. Weiter gibt es an diesen Blüten auch schmalere und spitze Sepalen. Die Petalen haben meist die Form wie bei Nr. 12787; es gibt aber auch schmalere mit stumpfer Spitze. Nach diesem Material zu schlieszen, ist eine Unterteilung der Art Eriocaulon vittifolium nicht gerechtfertigt. Die Untersuchung eines umfangreichen Materials kann vielleicht zu andern Ergebnissen führen.

"Wie bereits gesagt, haben die Pflanzen aus Angola noch keine reifen Früchte; ein genauer Vergleich mit dem Original-Material ist also nicht möglich. Die Form der Sepalen und Petalen der ♀ Blüten stimmt mit denen an den Pflanze aus Dinguevay überein. Die Petalen sind in diesem Entwicklungsstadium noch etwas länger als die Sepalen.....

"Eriocaulon vittifolium ist aus zwei Gebieten in französisch Guinea bekannt (Dinguevay und Kindia). Die neuen Fundorte in Angola sind ca. 150 km voneinander entfernt.....

"Eriocaulon vittifolium ist noch gegen die verwandten Arten E. latifolium Sm. und E. Thunbergii Wikstr. abzugrenzen, die beide aus Sierra Leone angegeben sind. Von E. latifolium habe ich das Original-Material untersucht, das von Barter bei Vatemba Road gesammelt wurde (aus Herbarium Kew):.....Der Vergleich der beiden Diagnosen zeigt, dass die Arten gut getrennt sind: E. latifolium bildet keinen Stengel; die Brakteen sind nur 1/3 bis 1/2 so lang wie bei E. vittifolium; die Sepalen sind weisz und sehr lang behaart, ebenso die Petalen. In den ♀ Blüten sind die Drüsen meist rückgebildet oder fehlen; in den ♂ Blüten sind sie aber stets vorhanden.

"Von Eriocaulon Thunbergii Wikstr. habe ich kein Material gesehen; bei diese Art sollen die Drüsen in den ♀ Blüten immer fehlen, in den ♂ Blüten aber vorhanden sein. Die Petalen seien wenig behaart." He cites H. Hess 50/237 from Benguela and 52/2146 from Huila, Angola.

In his 1957 work Hess records E. vittifolium also from Congo.

This author dates the original publication of Lecomte as "1908", but the pages here involved actually were not issued until 1909. Fanshawe describes the plant as an "aquatic with only the heads showing above water". It has been found growing at altitudes of 1450 to 1700 meters, flowering in July and August. It is sometimes infested by the fungus, Tolyposporium eriocauli Clint.

Citations: ANGOLA: Benguela: H. Hess 50/237 (B, Z). ZAMBIA: Fanshawe F.3532 (B).

ERIOCAULON VOLKENSII Engl.

Bibliography: Engl., Pflanzenw. Ost-Afr. C: 133. 1895; Ruhl. in Engl., Bot. Jahrb. 27: 72 & 82. 1899; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 2, 63, 71, 82, & 288, fig. 8A. 1903; Engl. & Drude, Veget. Erde 9 (2): 263. 1908; Stapf, Ind. Lond. 3: 91. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 21 & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 116, 117, & 206. 1949; Moldenke, Phytologia 3: 470. 1951; Hedberg, Symb. Bot. Upsal. 15 (1): 60--61 & 263. 1957; Moldenke, Résumé 143, 144, 146, & 483. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé Suppl. 1: 15, 18, & 25. 1959; Hedberg, Webbia 19: 526. 1965; Moldenke, Phytologia 19: 95 & 96. 1969.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 71, fig. 8A. 1903; Engl. & Drude, Veget. Erde 9 (2): 263. 1908.

Rauh notes concerning his collection, cited below: "Pflanze kleiner als 532; Blätter graugrün; Köpfchen sitzend". He found it growing in swampy places at 3000 meters altitude. It has been found at altitudes of 2500 to 3900 meters, flowering from January to March, July, and September. It is based on Volgens 2032 from Kibo, on the north slope of Mt. Kilimanjaro, at 3400 meters altitude, deposited in the herbarium of the Botanisches Museum in Berlin, with duplicates at Brussels and Kew. Hedberg (1957) describes the plant as a "Scapigerous perennial herb. On moist ground in fens and along streams" and states that it is only known from Kilimanjaro, Aberdare, the Cherungani Hills, and Mt. Kenya. He cites Battiscombe 834 (K), Dale 3262 (K), Fries & Fries 1226 (K, S, Us), 1226a (Us), 2393 (S, Us), 2584 (K, Us) from Kenya, and Schlieben 4923 (Br, P, S) and Volgens 2032 (Br, K) from Tanganyika. He comments that "Eriocaulon volkensii Engl. seems to be the only species of this very critical genus reaching the alpine belt in Tropical East Africa, though it is usually confined to the ericaceous belt and the upper part of the montane forest belt. It must be closely related to E. schimperi Körn. and E. friesiorum Bullock, which also reach fairly high levels, although they have not been recorded higher than 3450 m and 3100 m, resp."

Goetze 293 is a mixture with E. mesanthemoides Ruhl.

Additional citations: TANZANIA: Tanganyika: Goetze 293, in part (B); Schlieben 4923 (Mu, S). KENYA: Fries & Fries 1226 (S), 2393

(S); Rauh 532a (Mu). MOUNTED ILLUSTRATIONS: Engl., Pflanzenreich 13 (4-30): 71, fig. 8 A (B).

ERIOCAULON WALKERI Hook. f.

Synonymy: Eriocaulon quinquangulare var. argenteum Thwaites apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 86 & 287. 1903. Eriocaulon quinquangulare var. walkeri Hook. f. apud Fyson, Journ. Indian Bot. 2: 204. 1921.

Bibliography: Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Hook. f., Fl. Brit. Ind. 6: 583. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 5: 2, 9, & 412. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 86, 287, & 288. 1903; Fyson, Journ. Indian Bot. 2: 204. 1921; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 24, 39, & 41. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130 & 206. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé 167, 291, & 483. 1959; Van Royen, Blumea 10: 135. 1960; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Moldenke, Phytologia 18: 434. 1969.

Fyson (1921) says: "Var. b. Walkeri Hook. f. F. B. I. vi 583, No. 39; Ruhl. No. 123. Very similar to E. quinquangulare vera but differing in the much more hairy receptacle and other parts. Ceylon. This should certainly be considered only a variety, for although Hooker in the F. B. I. states it to be a very distinct species, the type sheet in the Ceylon Herbarium is almost, if not exactly, matched by Clarke's No. 20849, collected in Bengal, and intermediates occur."

Material of E. walkeri has been misidentified and distributed under the name, E. argenteum Mart.

Citations: CEYLON: Thwaites C.P. 3562 (B—isotype, Z—isotype).

ERIOCAULON WELWITSCHII Rendle

Synonymy: Eriocaulon pseudopygmaeum Dinter in Fedde, Repert. Sp. Nov. 17: 260. 1921. Eriocaulon welwitschii Rendle apud H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 270, sphalm. 1955. Eriocaulon pseudopygmaeum Dinter ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959.

Bibliography: Rendle, Cat. Afr. Pl. Welw. 2 (1): 97—98. 1899; Fritsch, Bull. Herb. Boiss., sér. 2, 1: 1105. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 66, 99, 102, 281, & 288, fig. 13 D. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 70. 1904; Engl. & Drude, Veget. Erde 9 (2): 265. 1908; Dinter in Fedde, Repert. Sp. Nov. 17: 260. 1921; A. W. Hill, Ind. Kew. Suppl. 7: 89. 1929; Stapf, Ind. Lond. 3: 91. 1930; Moldenke, Known Geogr. Distrib. Erioc. 22 & 42. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 118 & 206. 1949; H. Hess, Bericht. Schweiz. Bot. Gesell. 65: 161 & 270. 1955; Moldenke, Résumé 147, 149, 153, & 483. 1959; Moldenke, Résumé Suppl. 1: 10, 17, 18, & 25 (1959) and 3: 15 & 16. 1962; Friedrich-Holzhammer in Merxmüller, Prodr. Fl. Sudw. Afr.

159: 2. 1967; Moldenke, Phytologia 17: 389 (1968), 19: 12, 17, & 97 (1969), and 19: 338. 1970.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 99, fig. 13 D. 1903; Engl. & Drude, Veget. Erde 9 (2): 265. 1908.

Rendle (1899) regarded Dichrolepis pusilla Welw. as conspecific with E. welwitschii, but it is now regarded as a synonym of E. gilgianum Ruhl. instead. He states for E. welwitschii: "Near E. abyssinicum Hochst. but distinguished by its narrower and narrowly pointed bracts, markedly hairy receptacle, etc. Pungo Andongo. -- Plentiful, but seen in one place only, in boggy scantily grassed places with species of Lythraceae between Lombe and Candumba. In fl. and immature fr. end of March 1857. No. 2441." His var. pygmaeum is now regarded as a synonym of E. aristatum H. Hess.

Hess (1955) says "Unter den unbestimmten Nummern von Eriocaulon lag ein Bogen mit Pflanzen, die am 10.3.1894 unter Nr. 4652 von R. Schlechter bei Blouwborg in Transvaal gesammelt wurden. Diese Exemplare gehören zu Eriocaulon welwitschii Rendle. Die Art unterscheidet sich von der weit verbreiteten Eriocaulon abyssinicum Hochst. durch einen behaarten Blütenboden. Am Material von Nr. 4652 ist zwar die Behaarung nicht so dicht wie am Original-Material von Welwitsch (Nr. 2441 aus Angola, Pungo Andongo). Es finden sich aber sonst keine Unterschiede, somit sind die von R. Schlechter gesammelten Pflanzen zu E. welwitschii zu stellen. Eriocaulon welwitschii Rendle was bisher nur von einer Stelle aus Angola bekannt." In another place he states that E. welwitschii grows intermixed with E. gilgianum Ruhl. in Angola.

Milne-Redhead describes the species as follows: "minute annual, roots white, leaves pale-green, scapes erect and spreading, spathes and scapes pale-green, bracts scarious, dirty white, flowers gray, anthers black, in damp sandy ground at edge of Brachystegia-Uapaca woodland and boggy grassland" in Tanganyika. It has been found growing at altitudes of 990 to 1200 meters, flowering and fruiting in March and April.

Friedrich-Holzhammer (1967) cites only the type collection, Dinter 958, for E. pseudopygmaeum, and notes that this is a very poorly described taxon.

Material of E. welwitschii has been misidentified and distributed in herbaria as E. heudelotii N. E. Br. On the other hand, the Welwitsch 2441, distributed as E. welwitschii, is actually E. aristatum H. Hess.

Citations: MALI: Soudan: Jaeger 5247 (Gg). TANZANIA: Tanganyika: Milne-Redhead 9847 (B, S). ANGOLA: Loanda: Welwitsch 2441 (B-isotype, Mu-isotype, Z-isotype). RHODESIA: Wild 3791 [Govt. Herb. Salisbury 36007] (N). SOUTHWEST AFRICA: Dinter 958 (B, B, Z), 7220 (B, B). MOUNTED ILLUSTRATIONS: Engl., Pflanzenreich 13 (4-30): fig. 13 D (B).

ERIOCAULON WHANGII Ruhl.

Bibliography: Ruhl., Notizbl. Bot. Gart. Berlin 10: [1040]—1041 & 1060. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Moldenke, Known Geogr. Distrib. Erioc. 25 & 42. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 132 & 206. 1949; Moldenke, Résumé 170 & 483. 1959.

ERIOCAULON WIGHTIANUM Mart.

Synonymy: Eriocaulon sericans Heyne ex Mart. in Wall., Pl. Asiat. Rar. 3: 29. 1832 [not E. sericans Hook. f., 1894]. Eriocaulon sericans Mart. apud Steud., Nom. Bot., ed. 2, 1: 586. 1840. Eriocaulon sericans Mart. & Wall. ex D. Dietr., Syn. Pl. 5: 265. 1852. Eriocaulon wightianum Mart. & Wall. ex D. Dietr., Syn. Pl. 5: 265. 1852. Eriocaulon sericeus Mart. apud C. Müll. in Walp., Ann. 6: 1171, sphalm. 1861. Eriocaulon wightianum Meet. ex Moldenke, Known Geogr. Distrib. Erioc. 42, in syn. 1946. Eriocaulon pilosum Wall., in herb. [not E. pilosum Humb., 1959, nor Humb. & Bonpl., 1817, nor H.B.K., 1816, nor Kunth, 1822]. Eriocaulon weightianum Mart., in herb. Eriocaulon wightianum var. minus Mart., in herb.

Bibliography: Mart. in Wall., Pl. Asiat. Rar. 3: 28 & 29. 1832; Wall., Numer. List 207. 1832; Steud., Nom. Bot., ed. 2, 1: 586. 1840; Kunth, Enum. Pl. 3: 563, 568, & 614. 1841; D. Dietr., Syn. Pl. 5: 265. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 271, 272, & 334. 1855; C. Müll. in Walp., Ann. 5: 926 & 942 (1860) and 6: 1171. 1862; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Hook. f., Fl. Brit. Ind. 6: 576—577. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879 & 880. 1893; Hook. f. in Trimen, Handb. Fl. Ceylon 5: 2, 8—9, & 412. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; C. H. Wright, Journ. Linn. Soc. Lond. Bot. 36: 202. 1903; Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 75, 76, 285, 287, & 288. 1903; H. Lecomte, Journ. de Bot. 21: 109. 1908; Fyson, Journ. Indian Bot. 2: 262, 264, & 266, pl. 21 & 22. 1921; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 24, 35, 40, & 42. 1946; Moldenke, Alph. List Cit. 1: 268. 1946; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879 & 880. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 125, 127, 129, 130, & 206. 1949; Moldenke, Phytologia 3: 470. 1951; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé 159, 163, 165—167, 288, 292, 294, & 483. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879 & 880. 1960; Moldenke, Résumé Suppl. 3: 17. 1962; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Thanikaimoni, Pollen & Spores 7: 186. 1965; Moldenke, Résumé Suppl. 15: 20 (1967) and 17: 11. 1968; Moldenke, Phytologia 18: 82, 100, 102, 171, 178, 309, 342, & 352 (1969) and 19: 243, 244, 339, & 415. 1970.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 21. 1921.

According to Kunth (1841) this species is based on Wallich 6068 from "Moalmyne in Martabania", Burma, but he cites also Regnaud

s.n. from Pegu, Burma. He comments that "Huic speciei pro aliis habitu accedit E. decangulare Linn."

It is probably worth repeating Martius' description of E. sericans here: "Rhizomate annuo; scapis (spithamaeis) 7-angulis, pilosis, folia linearia acuminata glabra vaginasque ad medium apertas pilosulas quadruplo superantibus; capitulis hemisphaericis; bracteis involucribus testaceis, ellipticis; interioribus subrhombeis, acutis perianthisque albis et superne dense albo-barbatis." He based the species on W. Gomez 19 from Tavoy, Tenasserim, Burma -- a collection which is apparently also the type of E. pilosum Wall. and of E. wightianum var. minus Mart. Actually, this collection may be worth making the type of a variety because of its short leaves and small stature; if so, then Martius' varietal designation ought to be adopted for it.

Thwaites & Hooker (1864) actually describe, but do not name, another variety of this species: "var. capitulis nigro-cinereis, parce pilosis. -- C.P. 3382. Hab. Ambagamowa District", Ceylon.

Fyson's (1921) description of E. wightianum is as follows: "F. B. I. vi. 576, No. 17 in part; Ruhl. No. 92. Perennial (Mart.) Scapes 6--10 in. Leaves half as long, by 1/2 -- 3/4 in., slightly hairy; as also the scapes. Heads 1/2 in., globularly by the reflexed involucre, snow white, with white floral bracts, the lower of which are nearly glabrous. Female petals ovate lanceolate distinctly clawed, with small or no gland, and spongy..... Burma. Moulmein etc. Tavoy. Hooker in F. B. I. l.c. included the Peninsular plant, E. robusto-brownianum Ruhl. in this species." Hooker (1893) also regarded E. gracile Mart. and E. infirmum Steud. as synonyms of what he called E. sericans Mart. Körnicke considered E. nilagirensis Steud. as closely related to E. wightianum. Ruhland (1903) included var. helferi in the synonymy of E. wightianum and cites Kurz s.n., Stocks s.n., Wallich 6068a from India, Helfer 5584 from the Andaman Islands, and Thwaites 378 & 3382 from Ceylon. The initial letter of the specific epithet is, of course, very often uppercased by various authors.

It should be pointed out here that the E. wightianum credited to Hooker f. and referred to in the synonymy above, is in part E. brownianum Mart. and in part E. robusto-brownianum Ruhl. The E. sericans of Hooker is actually E. infirmum Steud. The E. pilosum variously credited to Humboldt, to Humboldt & Bonpland, to Kunth, or to Humboldt, Bonpland, & Kunth is a synonym of what is now known as Paepalanthus pilosus (H.B.K.) Kunth. Eriocaulon sexangulare Heyne, previously regarded as a synonym of E. wightianum, is based on Wallich 1827, a collection which is also given as the type of E. gracile Mart. -- now known as E. infirmum Steud.

Material of E. wightianum has been misidentified and distributed in herbaria under the name, E. wallichianum Mart. On the other hand, the Meebold 9734 and Ritchie 1244, distributed as E.

wightianum, are actually E. robusto-brownianum Ruhl., while Stocks, Law, etc. s.n. [Malabar, Concon &c.] is the type collection of E. wightianum f. viviparum Moldenke.

Additional citations: INDIA: Mysore: S. N. Ramaswamy 10 (Z). West Bengal: Helfer 135 (Go, N, S), 374 (Mu--374). CEYLON: Macrae s.n. [Lindley com.] (Br, Br, N, N, N--photo, Z--photo). BURMA: Tenasserim: Herb. Kummer s.n. [Moolmyne] (Mu--324); W. Gomez 19 (Br, N, N--photo, Z--photo); W. Griffith 5591 (C), s.n. [Moulmain] (W--1084791); Reynaud s.n. [Pegu] (B); Wallich 6067 (B, M), 6067a (B), 6068 (Br--isotype, N--photo of isotype, Z--photo of isotype).

ERIOCAULON WIGHTIANUM var. HELFERI Hook. f.

Synonymy: Eriocaulon helferi Hook. f., Fl. Brit. Ind. 6: 583. 1893.

Bibliography: Hook. f., Fl. Brit. Ind. 6: 583. 1893; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 76 & 285. 1903; Fyson, Journ. Indian Bot. 2: 266, pl. 22. 1921; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 35. 1946; Moldenke, Résumé 166 & 484. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé Suppl. 15: 20. 1967.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 22. 1921.

Fyson (1921) says: "Var. Helferi Hook. f. (Helfer 1584 in Herb. Calc.) F. B. I. vi, 583 No. 38, Ruhl. l.c. A much smaller plant. Scapes 5--8 in., slender. Leaves 2--3 by 1/4 in., acute. Heads 1/4 in. Female petals shorter and broader than in the type. Plate 22. Andamans. Founded as a distinct species by Hooker but certainly a geographical form and reduced as such by Ruhland. He thus uses the varietal designation for this taxon, accredited to Hooker f., and avers that it was published in Fl. Brit. Ind. 6: 582, but actually Hooker there proposed it as a species, not as a variety. Fyson also says that Ruhland (1903) agrees in this disposition of varietal rank for the taxon, but actually Ruhland in his monograph reduces E. helferi to complete synonymy under typical E. wightianum and does not consider it a separate variety thereof. Fyson claims that the type is Helfer 1584, but Ruhland cites it correctly as Helfer 5584. Hooker (1893) actually says for the type and only collection that he cites: "Tenasserim, Helfer (Kew Distr. 5584)".

ERIOCAULON WIGHTIANUM f. VIVIPARUM Moldenke

Bibliography: Moldenke, Phytologia 18: 342. 1969.

Citations: INDIA: Kerala: Stocks, Law, &c. s.n. [Malabar, Concan &c.] (Mu--262--type, S--isotype).

ERIOCAULON WILLDENOVIANUM Moldenke

Synonymy: Eriocaulon longifolium Nees ex Kunth, Enum. Pl. 3: 567--568 & 613. 1841 [not E. longifolium Raf., 1840]. Eriocaulon

sexangulare Willd. ex Kunth, Enum. Pl. 3: 567 & 614, in syn. 1841 [not E. sexangulare Auct., 1903, nor Burm. f., 1826, nor Heyne, 1832, nor L., 1753, nor Mart., 1893]. Eriocaulon sexangulare var. longifolium (Nees) Hook. f., Fl. Brit. Ind. 6: 580. 1893. Eriocaulon sexangulare var. longifolium Hook. f. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 41 & 287. 1903. Eriocaulon longissimum Nees ex Usteri, Beitr. Kenntn. Philip. Veg. 131, hyponym. 1905. Eriocaulon longifolium Nees apud H. Lecomte, Fl. Gén. Indo-Chin. 7: 3, sphalm. 1912. Eriocaulon longissimum Nees ex Moldenke, Known Geogr. Distrib. Erioc. 36, in syn. 1946. Eriocaulon sexangulare Fyson ex Moldenke, Résumé 292, in syn. 1959. Eriocaulon longissimum Usteri apud Van Royen, Nov. Guin., new ser., 10: 24, in syn. 1959. Eriocaulon sexangulare Ridl. apud Van Royen, Nov. Guin., new ser., 10: 24, in syn. 1959. Eriocaulon longifolium "Nees ex Kunth" apud Punt, Reg. Veg. 36: 9. 1964.

Bibliography: Raf., Autikon Bot., pr. 1, 188. 1840; Kunth, Enum. Pl. 3: 567--568, 613, & 614. 1841; D. Dietr., Syn. Pl. 5: 265. 1852; Körn., Linnaea 27: 690. 1854; Steud., Syn. Pl. Glum. 2: [Cyp.] 268--269 & 334. 1855; C. Müll. in Walp., Ann. 5: 927 & 947. 1860; Körn. in Mart., Fl. Bras. 3 (1): 474. 1863; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 1, 341. 1864; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25 & 27. 1888; Hook. f., Fl. Brit. Ind. 6: 580. 1893; Maxim., Diagn. Pl. Nov. Asiat. 8: 28. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893; Ruhl. in Engl., Bot. Jahrb. 27: 69, 73, & 580. 1899; Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 33, 40, 41, 106, 110, 286, & 287, fig. 5. 1903; Hochr., Ann. Conserv. & Jard. Bot. Genève. 11/12: 51. 1908; H. Lecomte, Bull. Soc. Bot. France 55: 571. 1908; H. Lecomte, Journ. de Bot. 21: 89--90, 94, 104, & 131. 1908; Koord., Exkursionsfl. Java 1: 273. 1911; H. Lecomte, Fl. Gén. Indo-Chin. 7: 2--4. 1912; H. Hallier, Beih. Bot. Centralbl. 34 (2): 45. 1916; E. D. Merr., Bibl. Enum. Born. Pl. 110. 1921; Fyson, Journ. Indian Bot. 2: 318 & 320. 1921; H. N. Ridl., Fl. Malay Penins. 5: 130. 1925; Ruhl., Notizbl. Bot. Gart. Berlin 10: 1042. 1930; Stapf, Ind. Lond. 3: 91. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 49. 1930; Erlandsson, Arkiv Bot. 30 B (2): 3 & 4. 1942; Raf., Autikon Bot., pr. 2, 188. 1943; Moldenke, Known Geogr. Distrib. Erioc. 22, 24--27, 36, & 40. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878. 1946; Moldenke, Alph. List Cit. 2: 461 (1948) and 4: 1191. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123, 129, 130, 132, 135, 136, 138, 139, 141, 142, 145--147, & 205. 1949; Moldenke, Phytologia 3: 330. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke in Humbert, Fl. Madag. 36: 14, 15, & 19--21, fig. 2 (21--27). 1955; Moldenke, Résumé 156, 157, 165--167, 170, 174, 176, 180, 184, 186, 191--193, 196, 201, 289, 290, 292, & 481. 1959; Van Royen, Nov. Guin., new ser., 10: 23, 24, 32, 33, & 44, fig. 3 M. 1959; Moldenke, Résumé Suppl. 1: 13, 14, 17, & 18 (1959) and 2: 7. 1960; Van Royen, Nov. Guin., new ser., 10: 236. 1960; Moldenke, Biol.

Abstr. 35: 1688. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878. 1960; Hocking, Excerpt. Bot. A.4: 592. 1962; Moldenke, Résumé Suppl. 3: 20 & 22--24 (1962), 7: 6 & 8 (1963), and 11: 6. 1964; Punt, Reg. Veg. 36: 9. 1964; Thwaites & Hook. f., Enum. Pl. Zeyl., pr. 2, 341. 1964; Van Royen, Nov. Guin. Bot. 14: 467. 1965; Backer & Bakh., Fl. Java 3: 25. 1968; Moldenke, Résumé Suppl. 17: 5, 6, 10, & 11. 1968; Moldenke, Phytologia 18: 44 (1968), 18: 82, 309, & 433 (1969), 19: 18, 238, 242, 244, & 246 (1969), and 19: 325, 327, 339, & 477. 1970.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 40, fig. 5. 1903; Koord., Exkursionsfl. Java 1: 273. 1911; Moldenke in Humbert, Fl. Madag. 36: 15, fig. 2 (21--27). 1955; Van Royen, Nov. Guin., new ser., 10: 32, fig. 3 M. 1959.

An acaulescent herb; leaves linear or grass-like, acute or submucronate at the apex, 12--70 cm. long, 2--4 mm. wide, membranous, often nigrescent, scarcely pallucid, much surpassing the sheaths, very lightly fenestrately many-veined; sheaths 5--11.5 cm. long, wide-spreading, nigrescent, entire, acute at the apex, glabrous; peduncles rigid, 11.5--60 cm. long, deeply 5-angled and -sulcate, glabrous; heads subglobose, truncate at the base, conspicuously white-powdery; involucre bractlets obovate or elliptic, rather flat, fuscous-stramineous, rounded at the apex, rather shiny, glabrous; receptacular bractlets broadly rhomboid-cuneate, surpassing the florets, closely imbricate, pale fuscous-olivaceous, rather acutish at the apex, rather shiny, inflexed at the apex and there conspicuously white-powdery on the outer surface, but this pulverulence easily rubbing off; staminate florets: short-stalked, flattened; sepals 2, broadly navicular-carinate, stramineous-whitish, rounded at the apex, glabrous, rather shiny, the keel narrowly alate, often 1-toothed at the middle on the back, the tooth ascending and acute; petals 2, connate into a slender tube which is slightly thickened above, glabrous, its limb 2-lobed, the lobes ovate-lanceolate, non-glanduliferous, barbellate at the apex, the anterior one somewhat longer; stamens 4, inserted at the apex of the corolla-tube, 2 opposite each corolla-lobe and adnate to it; anthers didymous-subrotund, gray or olivaceous-black; pistil-rudiments 2, in the center of the top of the corolla-tube, subclavate, black; pistillate florets: short-stalked, flattened; sepals 2, approximate, inserted beneath the ovary, lateral, broadly navicular-carinate, pale-olivaceous, narrowed and somewhat recurved toward the apex, obtuse at the apex, rather shiny, glabrous, closed together in fruit, the keel dorsal and alate, the wing rounded, ciliate, with easily rubbed-off very short rather thick white hairs, finally rather spongy-thickened; petals 2, shorter, linear, hyaline, non-glanduliferous, barbellate at the apex, the anterior one slightly larger; ovary subsessile, subrotund, 2-celled; style elongate; stigmas 2, simple, subulate; fruit subrotund, 2-seeded, membranous, brownish; seeds subglobose-elliptic, rounded at both ends, bright-brown, rather shiny, tuberculate at the hilum, conspicuously covered with short truncate weak hyaline hair-like cellular growths in many longitudinal lines.

This species apparently occurs from Madagascar (the type locality) and Mauritius through Ceylon, the Andaman Islands, and Burma, to CochinChina, Pahang, Malacca, and Singapore, northward into China, Hongkong, and the Philippine Islands and eastward to the Caroline Islands, Labuan, Borneo, Sarawak, and the Sunda Islands. Superficially plants of this species are very similar to those of E. sexangulare L. and are distinguished from them with the utmost difficulty unless the flowers are dissected. Hooker (1893) reduced the taxon to varietal status under E. sexangulare, and Fyson (1921) has gone so far as to unite them completely under the latter name, maintaining that they comprise merely one variable taxonomic entity. He admits, however, that in India, at least, they each have a different geographic area of greater abundance. Ruhland, the most recent monographer of and expert on the family (1903), considers the 2-merous character of the florets of E. willdenovianum (which he calls E. longifolium) so important taxonomically and so distinct from the 3-merous florets of E. sexangulare, that he places the two species in widely separated sections of the genus, -- a disposition which Fyson ridicules.

Van Royen's (1959) description of the species should also be repeated here for comparison with the one given above: "Herb up to 65 cm, often viviparous. Leaves linear, 8--40 by 0.2--0.9 cm, mucronate or obtuse, many-nerved, fenestrate, glabrous. Peduncles 15--65 cm, twisted, 4--6-nerved, glabrous, sheath 3--12 cm. Heads globose, obovoid to ellipsoid or cylindric, 2.5--8.5 by 2.5--7 mm, involucre bracts broadly ovate or obovate, 2--2.5 by 2--2.5 mm, obtuse or subacute, glabrous, floral bracts obovate or panduriform-cuneate, 2.5--3 by 2.5--3 mm, rounded and acuminate, whitish puberulous at outside in the apical part, dark brownish in the apical half; receptaculum glabrous. ♂ Flowers: sepals 2, tubuliformly united, boat-shaped, 2--2.5 by c. 1 mm, crested in the apical part, glabrous; petals 2, rarely 3, tubuliformly united, with (sometimes without) a black gland, whitish puberulous at apex; stamens 4, anthers black. ♀ Flowers: sepals 2, boat-shaped, 2--2.5 by c. 1.5 mm, broadly winged and coarsely dentate, glabrous; petals 2, linear, c. 2 mm long, with a black gland at apex, some hairs along apical part of margin and at apex; ovary 2-celled; style 1 with 2 branches. Seeds ellipsoid, slightly oblique, with longitudinal rows of hairs. Distribution. Mauritius, Madagascar, Ceylon, Andamans, continental Asia, Honkong, Malay Peninsula to New Guinea. Local distribution. Until now it has not yet reported from the Territory and from Papua but only from Netherlands New Guinea (Anta 30 in BO, Van Royen 4501, 4838, 4909 all in L.). Ecology. This species is found growing in humid plains and marshes at low altitudes up to 300 m."

Still later, Backer & Bakhuizen van den Brink (1968) describe the plant as follows: "All leaves in a radical rosette. Terrestrials. Interfloral bracts in their upper halves or on their tops with numerous short white hairs. Involucre bracts, peduncles, and leaves glabrous, heads less than 8 mm across. Larger leaves 12--30 cm long. Heads globose or ellipsoid, hard, 5--8 mm long, bluish

grey; interfloral bracts very dark-coloured, very obtuse, apically clothed with very minute white hairs; involucre bracts of old heads widely patent; receptacle glabrous; peduncle 15--80 cm, often much twisted; sepals 2, navicular, pale, glabrous; petals 2, pubescent, below the top whether or not with a gland; ♂: anthers 4, very dark-coloured; ♀: style-arms 2. 0.15--0.80; erroneously reported to have been collected long ago near Ambarawa (C)."

The species has been found growing in ditches, at altitudes of 10--300 meters, flowering and fruiting in January, May, September, and December. Brass describes it as "plentiful under cover of swamp grasses and sedges.....common on sour savanna slopes and wet grass plains.....common among grass on hummocks of wet savanna plains.....abundant on wet flats.....common in damp situations on savannas....[and] plentiful in shallow margins of small swamps on savannas" in New Guinea. Van Royen's statement that it is not known from Papua is now not true, since this is where Brass found it in such abundance.

There is much confusion and diversity of opinion about this taxon. Thwaites & Hooker (1864) place it (as E. longifolium Nees) in the synonymy of what they call E. wallichianum Mart. (now known as E. sexangulare L.). It is certainly very similar in habit also to E. australe R. Br., but cannot be conspecific with the latter, since this, according to Ruhland (1903), is a trimerous species.

The name, Eriocaulon longifolium Nees (1841), is invalidated by E. longifolium Raf. (1840), a validly published binomial now regarded as a synonym of the eastern North American E. decangulare L. Eriocaulon longissimum Nees is not recorded in the Index Kewensis and was not validly published under the present edition of the Rules of Botanic Nomenclature. Usteri (1905) merely says: "973. Eriocaulon longissimum Nees. Jaró am Ufer eines Meerarmes bei Jlo-Jlo" and "Bestimmt von Herrn C. B. Clarke in London". It seems obvious that the specific epithet used here is merely an error for E. longifolium Nees. Usteri's binomial is at best a hyponym and does not invalidate the use of the name E. willdenowianum for this taxon.

Kunth (1841) cites Herb. Willdenow 2359, in part, "Eriocaulon e Madagascaria Willd. herb. n. 2370", and Chapelier s.n., also from Madagascar, as the material on which the species is based -- although he also states that his description is drawn from only two of these collections, the major portions from the Chapelier collection (which, if any of the three is to be designated as type, probably is the one that should be so regarded). His words regarding the Herb. Willdenow material are: "specimen intermedium plantam juvenilem offert, sinistrum (pedunculus capitulifer) vero fortasse aut ex eadem stirpe carptum, quam cel. Nees ab Esenbeck sub n. 2370 suppetit; sepala interiora tamen prioris". Regarding his lengthy description of the species he says "Descr. secundum specimen Chapelier, ea seminum juxta specimen Willd. n. 2370".



Moldenke, Harold N. 1970. "ADDITIONAL NOTES ON THE ERIOCAULACEAE-M PART 29." *Phytologia* 19, 440–496.

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