

ADDITIONAL NOTES ON THE ERIOCAULACEAE. LIII

Harold N. Moldenke

PAEPALANTHUS HYMENOLEPIS Alv. Silv., Fl. Mont. 1: 183--184, pl. 118. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 183--184, pl. 118. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 118. 1928.

This species is based on A. Silveira 584, collected "In campis arenosis in Serra do Cabral", Minas Gerais, Brazil, in May, 1920, and is deposited in the Silveira Herbarium. The collector says of it "Specie a P. lombense A. Silv. bracteis glabris [sic] et forma earum praecipue differt". Hatschbach found it growing in a wet sandy campo, at 1800 meters altitude, flowering in August.

Citations: BRAZIL: Minas Gerais: Hatschbach 30119 (Z).

PAEPALANTHUS IBITIPOCENSIS Alv. Silv., Fl. Serr. Min. 41. 1908.

Synonymy: *Paepalanthus ibitiporensis* Alv. Silv. apud Wangerin in Just, Bot. Jahresber. 57 (1): 476, sphalm. 1937.

Bibliography: Alv. Silv., Fl. Serr. Min. 41. 1908; Alv. Silv., Fl. Mont. 1: 54--55 & 408, pl. 30. 1928; A. W. Hill, Ind. Kew. Suppl. 8: 169. 1933; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 30. 1928.

This species is based on A. H. Magalhães Gomes 267 from "In campis arenosis in Serra de Ibitipoca", Minas Gerais, Brazil, collected in June, 1896, and deposited in the Silveira Herbarium. Silveira (1928) says that the "Species *P. leucoblepharo* Koern. proxima, a quo foliis eciliatis, pubescentibus, vagina tota pubescenti, bracteis involucrantibus acutiusculis et antheris haud rotundis differt".

PAEPALANTHUS IMPLICATUS Alv. Silv., Fl. Mont. 1: 158--160, pl. 100. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 158--160, pl. 100. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49.

1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 100. 1928.

This species is based on A. Silveira 510, which was found "Sub rupibus, locis umbrosis arenosisque, in campis praealtis secus margines viae inter Pouso Alto et Camillinho, districtu Diamantinense", Minas Gerais, Brazil, collected in April of 1908, and deposited in the Silveira Herbarium. On page 408 of his work (1928) Silveira gives the type locality merely as "Pouso Alto (Serro)". He comments that the "Species propter ramificationem implicatam et diffuso-confertam caespitem valde distincta".

Citations: BRAZIL: Minas Gerais: Mexia 5756, in part (N).

PAEPALANTHUS INCANUS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 380. 1863.

Synonymy: Eriocaulon incanum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 623. 1831. Paepalanthus incanus Körn. in Mart., Fl. Bras. 3 (1): 277. 1863. Paepalanthus incanus var. α Körn. in Mart., Fl. Bras. 3 (1): 380. 1863. Paepalanthus incanus var. β Körn. in Mart., Fl. Bras. 3 (1): 380. 1863. Dupatya incana (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya incana Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus frigidulus Mart. ex Ruhl. in Engl., Pflanzenreich 13 (4-30): 168 & 290, in syn. 1903.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 623. 1831; Bong., Ess. Monog. Erioc. 23. 1831; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 573 & 613. 1841; D. Dietr., Syn. Pl. 5: 266. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 275 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 277, 380, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 9, 10, 168--170, 172, [283], 286, & 290, fig. 3A. 1903; Alv. Silv., Fl. Mont. 1: 408. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 42. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 36, 48, & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Alph. List Cit. 3: 731. 1949; Moldenke, Phytologia 4: 146. 1952; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 280, 289, 325, & 487. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 167 & 190. 1969; Moldenke, Phytologia 20: 36. 1970; Moldenke, Fifth Summ. 1: 163 & 481 (1971) and 2: 501, 583, 584, & 952. 1971; Moldenke, Phytologia 25: 241 (1973), 26: 46, 144, 145, & 184 (1973), and 29: 302.

1974.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 9, fig. 3A. 1903.

Bongard's original description (1831) of this species is "Caule adscendente, ramoso, folioso; foliis amplexicaulibus, adpressis, lanceolatis, villosis; pedunculis fasciculatis, longissimis, sericeo-incanis; vaginis villosis, bifidis". It is so short because he intended it merely to supplement his illustration ["t. 61"], but the latter, unfortunately, was never published and doubtless exists only in the Leningrad herbarium or library. The type of the species is an L. Riedel collection from sandy places at Tejuco, Minas Gerais, Brazil, deposited in the Leningrad herbarium. Macbride photographed a Martius collection from Cocaes, Minas Gerais, as his type photograph number 18705, but this collection is not a type of anything, although Paepalanthus frigidulus is apparently based on a Martius s.n. about which the collector notes on the label "Habitat in altis frigidiusculis districtu Serro Frio in Bras. prov. Minarum. Affinis P. canescenti Bong. sed omni modo major et ramosior", deposited at Munich.

Körnigke (1863) proposed two varieties: "var. α ,: caule perbrevis....in Brasilia orientali: Princ. Neovid.; et in prov. Minarum altis frigidiusculis districtus Serro Frio: M[artius]" and "var. β ,: caule elongato....in prov. Minarum altis supra saxum Itacolumiten ad Cocaes: M[artius]; in arenosis distr. ademantini prope Tejuco, Decembri, et in prov. Bahiensi prope Ilheos et Camamu: Riedel". His var. ϕ is obviously the typical form of the species, but his other proposed variety does not seem worthy of nomenclatural designation; in fact, he himself says of it "Var. α . vel si mavis forma α ."

Recent collectors describe this species as an erect herb, 1 to 1.5 m. tall, or procumbent, the inflorescences to 35 cm. tall, the peduncles erect, and the flowering-heads white, light-gray, or gray-white. It has been found growing in wet ground of rocky cerrado, on campos, in moist sand on open rocky slopes, in cerrado of cerrado and low gallery forest areas, and in wet places in cerrado in narrow valleys or on steep rocky slopes with thin gravelly soil, at altitudes of 685 to 1350 meters, flowering from January to May and December, and fruiting in January, February, April, and May.

Anderson and his associates encountered the plant in the open on sandy soil near a stream in an area of gently sloping open hillside with sandy soil and sandstone boulders, mostly wet with seeping water, and a rocky area along a rushing stream at the base of the hill. Mrs. Mexia describes it as an "herb with whitish flowers common locally in colony in open grasslands." Irwin and his associates found it in wet places on campos in an area of disturbed slope forest and adjacent rocky campo.

Ruhland (1903) cites from Bahia: L. Riedel s.n. [bei Ilheos und Camamu], and from Minas Gerais: Glaziou 19994, Martius s.n. [an hoch und kühl gelegenen Standorten des Gebietes von Serro Frio] and s.n. [an hohen Standorten oberhalb des Itavolumy bei Co-

caes], L. Riedel s.n. [an sandigen Stellen bei Tejuco], and Schwacke 8477. Silveira (1928) cites Collector undesignated 260 from Serra dos Crystaes, Minas Gerais.

Material has been misidentified and distributed in some herbaria as P. canescens (Bong.) Körn. and as Lachnocaulon sp. On the other hand, the Irwin, Reis dos Santos, Souza, & Fonsêca 22586, distributed as P. incanus, is actually P. actinocephaloides Alv. Silv.

Citations: BRAZIL: Bahia: L. Riedel s.n. (B). Minas Gerais: Anderson, Stieber, & Kirkbride 35467 (Ld, N); M. A. Chase 10365 (Mi, W--1495693); Duarte & Graziela Barroso s.n. [A. P. Duarte 7934; Herb. Brad. 27771] (Ld, N); Glaziou 19994 (Br, W--1194856); Irwin, Maxwell, & Wasshausen 20803 (Ld, N, N); Irwin, Reis dos Santos, Souza, & Fonsêca 22363 (Ac, Ca--1369769, N, S), 22662 (Ld, Mi, N, S), 22909 (N, Z); Martius s.n. [ad Cocaes; Macbride photos 18705] (Mu, N--photo, W--photo), s.n. [Serro Frio] (Mu, Mu), s.n. [Habitat in altis frigidiusculis districtu Serro Frio] (Mu); Mexia 5748 (B, Ba, Ca--509762, Gg--286185, Go, Mi, N, Qu, S, Ug, Ut--50243a, W--1571901), s.n. [May 3, 1931; Herb. Leonard 7655] (B); Schwacke 8477 [Herb. Magalhães Gomes 2967; Herb. Jard. Bot. Belo Horiz. 26664, in part] (N), 8482 [Herb. Jard. Bot. Belo Horiz. 26665] (N); Williams & Assis 6901 (Ca--744438, Er, N, S, W--1932837). State undetermined: R. E. Pohl s.n. [in Brasilia] (Mu). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS INSIGNIS Alv. Silv., Fl. Mont. 1: 193--194, pl. 127. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 193--194 & 408, pl. 127. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 127. 1928.

The type of this species was collected by Alvaro Adolpho da Silveira (no. 778) "In campis siccis in Serra dos Crystaes, prope Diamantina", Minas Gerais, Brazil, in June of 1925, and is deposited in the Silveira Herbarium. On page 408 of his work, Silveira (1928) gives the type locality and date as "Diamantina, 1908"; whether this is a misprint or is intended as a correction of the date given in the original description - or even refers to another collection - is not clear. He notes that the "Species ob caulem fertile in sectione Actinocephalo valde insignis".

Citations: BRAZIL: Minas Gerais: Tryon & Tryon 6812 (Z).

PAEPALANTHUS INTERMEDIUS Körn. in Mart., Fl. Bras. 3 (1): 371--372. 1863.

Synonymy: Dupatya intermedia (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya intermedia Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 371--372 & 508. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 173--175, [283], & 290. 1903; Ruhl. in Urb., Symb. Ant. 7: 173. 1912; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 280, & 487. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 953. 1971; Moldenke, Phytologia 26: 142 & 261. 1973.

According to Körnicke's original description (1863) this species is based on a specimen from "Brasilia? Herb. Hort. Petrop. acceperat (ex Herb. Fischer) a cl. Fielding cum schedula numerum 1407 Julio nec patriam nec collectorem pronunciante". Ruhland (1903) adds "Specimen originarium non vidi. Secundum Koernicke inter P. repentem Koern. et P. Bongardi Kunth intermedia".

Irwin and his associates describe the plant as having stems to 50 cm. long and white flower-heads. They found it growing in running water in burned-over cerrado, at 1100 meters altitude, flowering and fruiting in September.

Citations: BRAZIL: Distrito Federal: Irwin, Souza, & Reis dos Santos 8729 (N, Z).

PAEPALANTHUS ITACAMBIRENSIS Alv. Silv., Fl. Mont. 1: 123--124, pl. 75. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 123--124 & 408, pl. 75. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 487. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 75. 1928.

This species is based on A. Silveira 813 from "In campis humidis arenosis prope Itacambira", Minas Gerais, Brazil, collected in July of 1926, and deposited in the Silveira Herbarium.

Citations: BRAZIL: Minas Gerais: J. E. Oliveira 1316 [Herb. Jard. Bot. Belo Horiz. 45178] (N).

PAEPALANTHUS ITAMBEENSIS Alv. Silv., Fl. Mont. 1: 46--47, pl. 24. 1928.

Synonymy: Paepalanthus itambeensis Alv. Silv. apud A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938.

Bibliography: Alv. Silv., Fl. Mont. 1: 46--47 & 408. 1928; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 24. 1928.

This species is based on A. Silveira 708 from "In campis ad basin montem Itambé do Serro", Minas Gerais, Brazil, collected in April of 1918, and deposited in the Silveira Herbarium. On page 408 of his work (1928) Silveira gives the type locality as "Serra do Itambé do Serro". Hatschbach found the plant growing at "margens rochosas sombrias de rio encachoeirado", flowering and fruiting in September.

Citations: BRAZIL: Minas Gerais: Hatschbach 27512 (S, W--2706773, Z).

PAEPALANTHUS ITATIAIENSIS Ruhl. in Engl., Pflanzenreich 13 (4-30): 211. 1903.

Synonymy: Paepalanthus itatiayensis Ruhl. ex Moldenke, Phytologia 25: 241, in syn. 1973.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 211, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 408. 1928; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Phytologia 20: 368. 1970; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1158, map 1778, & Ind. 20. 1972; Moldenke, Phytologia 25: 241 (1973) and 26: 243. 1973.

This species is based on Ule s.n., collected on campos in the Serra do Itatiaia, Rio de Janeiro, Brazil, in March of 1894, and deposited in the herbarium of the Botanisches Museum in Berlin. Ruhland (1903) comments that the "Species foliis densissime ciliatis, utrinque hirsutis, pedunculis angustis, et vagina arcta, ore breviter bifida insignis". It appears to be related to P. batocephalus Ruhl. Silveira (1928) cites A. Silveira 607 from the same Serra do Itatiaia, collected in 1913.

The Tryons found the plant growing "in shrubby grassland and sedgeland with local elfin-woods dominated by granitic rocks", the Eitens "in moist black humusy soil among outcropping rocks on planalto of steep hilly terrain, many hills topped with mountainous outcrops of bare sienite quartz". Smith found it in hard soil along trails. It has been collected at altitudes of 2100--2500 m., in flower in February, March, May, November, and December, and in fruit in March and December. The abbreviation for the surname of the author of the binomial name for this taxon is misspelled

"Ruhl." on the labels of the Tryons' collection.

Citations: BRAZIL: Rio de Janeiro: Atala 271 [Herb. Cent. Pesq. Florest. 85] (Ac); Brade I.14 (Bd--25450); Cabrera & Fabris 14206 (Mu); Dusén 2143 (S, S), 4321 (S); Eiten & Eiten 6549 (W--2688354); Glaziou 6744 (B, Z); N. Santos 5758 [239-20] (Ja, Ja); Segadas-Vianna 750 (Ja), 5030 [Brade 20370] (Ja); Segadas-Vianna, Clausen, Lorêdo, & Chagas 1128 (Ja), 1130 (Ja), 1131 (Ja); Segadas-Vianna, Dau, Ormond, & Machline 1425 (Z); L. B. Smith 1732 (N, N--photo, S, W--1571777, Z--photo); Strang 767 [A. Castellanos 25761; Herb. Brad. 49654] (Ac, Ld); Tryon & Tryon 6721 (Ac, N, N); Ule s.n. (B--type). São Paulo: Lutz & Lutz 1727 [Herb. Lutz 1727] (Ja).

PAEPALANTHUS ITATIAIENSIS var. GLABER Ruhl. in Engl., Pflanzenreich 13 (4-30): 21 [as "var. glabra"]. 1903; Moldenke, Known Geogr. Distrib. Erioc. 13. 1946.

Synonymy: Paepalanthus itatiaiensis var. glabra Ruhl. in Engl., Pflanzenreich 13 (4-30): 211. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 211 & 290. 1903; Moldenke, Known Geogr. Distrib. Erioc. 13. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 487. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971; Moldenke, Phytologia 25: 241. 1973.

This variety is described by Ruhland (1903) as "Differt a forma typica foliis dense ciliatis, utrinque citissime glaberrimis, pedunculis latioribus, vaginis calvulis" and is based on Glaziou 5456 from damp campos at Itatiaia, Rio de Janeiro, Brazil, deposited in the herbarium of the Botanisches Museum in Berlin.

Citations: BRAZIL: Rio de Janeiro: Glaziou 5456 (B--type, Z--isotype); Segadas-Vianna 5170 (Ja).

PAEPALANTHUS ITHYPHYLLUS (Mart.) Mart. ex Walp., Ann. 1: 890. 1849.

Synonymy: Eriocaulon (Paepalanthus) ithyphyllum Mart., Flora 24, Beibl. 2: 35--36. 1841. Paepalanthus (Eriocaulon) ithyphyllum Mart. ex Walp., Ann. 1: 890. 1849. Eriocaulon ithyphyllum Mart. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 274. 1855. Eriocaulon ithyphyllum Mart. ex Steud., Syn. Pl. Glum. 2: [Cyp.] 334. 1855. Paepalanthus ithyphyllus Mart. apud Körn. in Mart., Fl. Bras. 3 (1): 334. 1863. Dupatya ithyphylla (Mart.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Paepalanthus ithyphyllus Walp. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894. Dupatya ithyphylla Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Eriocaulon ithyphyllum Steud. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 196, in syn. 1903. Dupatya ithyphylla Kuntze ex Moldenke, Known Geogr. Distrib. Erioc. 30, in syn. 1946.

Bibliography: Mart., Flora 24, Beibl. 2: 35--36. 1841; Walp., Ann. 1: 890. 1849; Steud., Syn. Pl. Glum. 2: [Cyp.] 274 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 281, 334--335, 499, & 507, pl. 46, fig. 1 I. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 12, 190, 196, 197, 284, 286, & 290. 1903; Stapf, Ind. Lond. 4: 518. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 41. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 36, & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99, 280, 289, & 487. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 158. 1969; Moldenke, Résumé Suppl. 18: 9. 1969; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 503 & 953. 1971; Moldenke, Phytologia 25: 238, 239, & 241. 1973.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 46, fig. 1 I. 1863.

Martius' original description (1841) of this species is "caule ramoso foliisque villosa-canescens, tandem glabrescentibus; ramis patulis; foliis lanceolatis acuminatis acutis, caulinis ramosisque dense appressis; pedunculis umbellatis dense pilosis, vaginis obtusis glabriusculis. In ferruginosis ad Capão, Pires, in Serra do Caraça rel., prov. Minas. Oreas. Affine praesertim divaricato, a quo directione foliorum et pube facile dignoscitur". Ruhland (1903) says that the collector of the above unnumbered type specimen was George Gardner. He cites also G. Gardner 5240 and Sellow C.277 from Minas Gerais and Martius s.n. and Pohl s.n. [near Caratão] from Goiás. Macbride photographed an unnumbered Schott collection in the Munich herbarium as his type photograph number 18706, but it isn't a type of any named taxon.

Walpers (1849) apparently regarded Martius' "Eriocaulon (Paepalanthus) ithyphyllum" as an attempt by Martius to publish a binomial both in the genus Eriocaulon and in the genus Paepalanthus at the same time. This has been done by several other botanists at various times, although it is now illegal under the present edition of the International Code of Botanical Nomenclature. At least, Walpers definitely accredits the binomial, Paepalanthus ithyphyllum, to Martius and I am following him in this.

The Holway & Holway 1868 and Martius 990, distributed as P. ithyphyllum, are actually P. polyanthus (Bong.) Kunth.

Citations: BRAZIL: Goiás: Martius 104 (Mu, Z). Minas Gerais: G. Gardner 5240 (B, N, W--1067046); Hatschbach, Smith, & Ayensu 28951 (Z); J. E. Pohl s.n. [Minas, 1839] (Br); Sellow C.277 (B, B), s.n. [Brasília] (Br). State undetermined: Herb. Jard. Bot.

Brux. s.n. (Br); Schott s.n. [Macbride photos 18706] (Mu, N--photo, W--photo). MOUNTED ILLUSTRATIONS: drawings by Körnicke (B, B); Körn. in Mart., Fl. Bras. 3 (1): pl. 46, fig. 1 I. 1863 (N, Z).

PAEPALANTHUS JAUENSIS Moldenke, Résumé Suppl. 17: 2, nom. nud. (1968) and in Steyerl., Maguire, & al., Mem. N. Y. Bot. Gard. 23: 850--852, fig. 5. 1972.

Bibliography: Moldenke, Résumé Suppl. 17: 2. 1968; Moldenke, Fifth Summ. 1: 125 (1971) and 2: 953. 1971; Moldenke in Steyerl., Maguire, & al., Mem. N. Y. Bot. Gard. 22: 850--852, fig. 5. 1972; Hocking, Excerpt. Bot. A. 23: 290. 1974.

Illustrations: Moldenke in Steyerl., Maguire, & al., Mem. N. Y. Bot. Gard. 23: 851, fig. 5. 1972.

Citations: VENEZUELA: Bolívar: J. A. Steyermark 97906 (Z--type, Z--drawings of type).

PAEPALANTHUS JORDANENSIS Alv. Silv., Fl. Mont. 1: 92--93, pl. 56 & 57. 1928.

Synonymy: Paepalanthus jordadensis Alv. ex Alv. Silv., Fl. Mont. 1: pl. 57, sphalm. 1928. Paepalanthus jordadensis Alv. Silv. ex Moldenke, Fifth Summ. 2: 584, in syn. 1971.

Bibliography: Alv. Silv., Fl. Mont. 1: 92--93 & 408, pl. 56 & 57. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Phytologia 2: 380. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99, 326, & 487. 1959; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1158 & Ind. 20. 1970; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 584 & 953. 1971; Moldenke, Phytologia 25: 241. 1973.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 56 & 57. 1928.

This species is apparently based on two collections according to Silveira (1928), who says "In campis secus rivulos in Campos do Jordão, Serra da Mantiqueira, Minas Geraes: Alvaro Silveira, Oct. 1909; n. 263 in herbario Silveira; in campis prope Marim, Serra da Mantiqueira, altitudine 2.000 m, Minas: dr. Benedicto Quintino, jul. 1922". On page 408 of the same work Silveira cites "G. Ed-wall s.n., Campos do Jordão, S. Paulo, 1909", apparently a third collection, but since it is not cited with the original description, it cannot be regarded as another cotype. Silveira comments that the "Species ob colorem bractearum involucrantium et vaginam oblique truncatam ab affinibus valde distincta".

PAEPALANTHUS KARSTENII Ruhl. in Engl., Pflanzenreich 13 (4-30): 155--156. 1903.

Synonymy: Dupata karstenii (Ruhl.) Gleason, Bull. Torrey Bot. Club 52: 195, sphalm. 1925. Dupatya karstenii Gleason apud A. W. Hill, Ind. Kew. Suppl. 7: 79. 1929. Paepalanthus karstenii Ruhl. ex Acosta-Solis, Divis. Fitogeogr. Ecuad. 89, sphalm. 1968. Pae-

palanthus karstenii Pohl ex Moldenke, Résumé Suppl. 4: 12, in syn. 1962. Paepalanthus karsteni Ruhl. ex Moldenke, Phytologia 25: 241, in syn. 1973. Eriocaulon capitatum Tessene ex Moldenke, Phytologia 25: 238, in syn. 1973.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 152, 155--156, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Gleason, Bull. Torrey Bot. Club 52: 195. 1925; Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 60 [42]. 1928; A. W. Hill, Ind. Kew. Suppl. 7: 79. 1929; Moldenke, Known Geogr. Distrib. Erioc. 5 & 50. 1946; Moldenke, Alph. List Cit. 1: 93 & 131--133. 1946; Moldenke, Phytologia 2: 229 & 373. 1947; R. Espinosa, Estud. Bot. Sur Ecuad. 1: 78. 1948; Moldenke, Alph. List Cit. 2: 460 & 611 (1948), 3: 758, 805, 807, 817, 924, & 974 (1949), and 4: 1030, 1060, 1074--1076, 1165, 1166, & 1274. 1949; R. Espinosa, Estud. Bot. Sur Ecuad. 2: 25. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 51, 64, 70, 73, & 210. 1949; Moldenke, Phytologia 3: 80 (1949) and 4: 146. 1952; Moldenke, Résumé 67, 72, 80, 84, 418, & 487. 1959; Moldenke, Résumé Suppl. 3: 12 (1962), 4: 12 (1962), 5: 5 (1962), and 6: 6. 1963; Acosta-Solis, Divis. Fitogeogr. Ecuad. 89. 1968; Moldenke, Phytologia 18: 307. 1969; Moldenke, Résumé Suppl. 18: 9 & 13. 1969; Oberwinkler, Pterid. & Sperm. Venez. 27 & 52. 1970; Moldenke, Fifth Summ. 1: 88, 118, 125, 136, 142, 477, & 482 (1971) and 2: 585, 593, 774, & 953. 1971; Moldenke, Phytologia 25: 126, 228, 238, & 241 (1973), 28: 456 (1974), and 29: 386. 1975.

This species is based on an unnumbered collection of Hermann Karsten — for whom it is named — from the Páramo de Chipaque, Bogotá, Cundinamarca, Colombia, deposited in the Vienna herbarium, where it was photographed by Macbride as his type photograph number 29991. Recent collectors describe the species as a cushion-plant with the leaves "rich green" and the "inflorescence white". They have found it growing in dense mats to 15 cm. in diameter on damp clay banks, in wet swales on open páramos, low tussocks in grassy places, wet open or wet grassy páramos, marshes, limestone outcrops, bushy páramos, alpine meadows, and areas of much Sphagnum, forming dense patches on páramos or mats in swampy places, in the Espeletia graminosa association, and in wet areas surrounded by slopes with grasses, Espeletia, and a few shrubs.

Langenheim refers to the species as "common in hummocks in bogs"; Holm & Iltis describe it as a "common cushion plant in Sphagnum below shrubs in shrub páramo of Chusquea-Hypericum-Vaccinium association"; Fosberg describes it as "forming compact grayish cushions, common on brushy slopes and ridges in páramo above timberline, with occasional seeps of water", "forming dense cushions on exposed ridge-tops on rocky windswept backbone of mountain", and "common in wet spots of open rocky páramo, springy and seeping with water". Fosberg & Valencia call it "rare on grassy wet slopes, forming small dense cushions", while Barclay & Juajibioy encountered it "in wet areas traversed by small streams below Distichia cushions", "in open páramo dominated by Espeletia,"

"in very wet portions of extensive Espeletia-grass cienaga", and "on wet grassy slopes with Sphagnum".

Tessene refers to the plant as "very abundant, forming large dome-shaped mats in open areas near shrubs", while Mori & Anderson found it on open windswept subpáramos where the dominants were ericaceous shrubs, Chusquea subtesselata, Hypericum, Per-nettya, and Vaccinium consanguineum and the characteristic herbs were Poa sp., Brachypodium mexicanum, Agrostis vinosa, Trisetum pringlei, Carex sp., Alchemilla sp., Veronica sp., Eriocaulon microcephalum, and Geranium mexicanum. Kirkbride & Forero refer to it as a "mat-forming herb with white heads along [the] edge of [a] lake" in Magdalena, Colombia.

It has been found growing at altitudes of 2200 to 5500 meters, flowering from January to April and June to December, and fruiting from January to March and in September, November, and December.

The Killip & Smith 15626 collection, cited below, does not represent P. pilosus (H.B.K.) Kunth in spite of the notation accompanying it to the effect that it was compared with the type of P. dendroides by E. P. Killip in the Berlin herbarium and found to be "identical" to it. On the other hand, the Barclay & Juajibioy 10394, also cited below, is very immature but has a decided anomalous appearance; it is placed here tentatively.

Material of P. karstenii has been misidentified and distributed in some herbaria under the names Eriocaulon microcephalum H.B. K., Paepalanthus dendroides (H.B.K.) Kunth, P. muscosus Körn., P. pilosus (H.B.K.) Kunth, and P. pilosus Kunth. On the other hand, the Aristeguieta 2442, Barclay & Juajibioy 5833, 5977, & 9565, E. L. Core 272a, Cuatrecasas 19099, F. R. Fosberg 20654 & 20788, Killip & Ariste-Joseph 11957, and R. E. Schultes 20157, distributed as typical P. karstenii, are now regarded by me as var. corei Moldenke, while the Cuatrecasas & León 26543, Holm & Iltis 460, Mori & Anderson 220, and Tessene 1488 are actually P. kupperi Suesseng. and Cuatrecasas & García Barriga 10301 is P. pilosus (H.B.K.) Kunth.

Ruhland (1903) has this to say about the similarity between P. pilosus and P. karstenii: "Species P. piloso Kunth proxima ab illo indumento et acumine foliorum, bracteis involucrantibus latioribus et dorso glabris et perigoniorum forma diversa".

Additional citations: COLOMBIA: Boyacá: Barclay & Juajibioy 7432 (N), 7629 (N); Cuatrecasas 1559a (F--1321966). Cundinamarca: Barclay & Juajibioy 6097 (N), 7743 (N), 7757 (N); Cuatrecasas 5553 (W--1796658), 10455 (W--1796510); Cuatrecasas, Idrobo, Jaramillo Mejía, & Mora 25574 (Fg, W--2342142); Cuatrecasas & Jaramillo Mejía 25734 (Fg), 25882 (Fg); F. R. Fosberg 21462 (N), 21684 (N); García-Barriga 11681 (W--1952197), 17181 (W--2569584A); Grubb, Curry, & Fernandez-Perez 12 (K, W--2279091); Haught 5619 (W--

1709780); Humbert, Idrobo, Jaramillo Mejía, Perez Arbelaez, & Uribe Uribe 26894 (S, W--2282395); Karsten s.n. [Bogotá, Páramo de Chipaque; Macbride photos 29991] (B--isotype, N--photo of type, N--photo of type, Z--isotype); Köie 4689 (Bs, Cp), 5365 (Cp, Ok, W--2253585); Langenheim, Idrobo, Jaramillo Mejía, & Mora 3688 (W--2266638); F. W. Pennell 2074 (E--843859, F--485468, N, W--1042097), 2085a (N); M. Schneider 628 (S), 1014 (S), 1099 (S), 1177 (S); R. E. Schultes 18780 (W--2172255, W--2198908). Magdalena: Barclay & Juajibioy 6584 (N); Cuatrecasas & Romero Castaneda 25143 (Fg, W--2339487). Nariño: Vareschi 4079 (Ve--41618). Norte de Santander: Cuatrecasas & García-Barriga 10302 (F--1289774, W--1798461). Santander: Araque Molina & Barkley 185014 (W--1985463); Barclay & Juajibioy 10394 (N); Fassett 25929 (E--1570199); Killip & Smith 15626 (N, S), 19557 (S); H. Saint John 20761 (N, N, W--2107548). Department undetermined: Herb. Kegel s.n. (B); Köie 5376 [Páramo de Palacio] (Cp). VENEZUELA: Bolívar: Pannier & Schwabe s.n. [Auyantepui] (Ve). Mérida: Badillo 996 (Ve--18304); Bernardi 681 (N); Jahn 1034 (N); Merxmüller 22918 (Mu, Mu); Oberwinkler & Oberwinkler 12814 (Mu); Ruiz-Terán & López-Figueiras 1490 (Tu), 8318 (Ac); Ruiz-Terán & López-Palacios 6581a (Ld); J. A. Steyermark 55727 (N); Steyermark & Koyama 102359 (Ld); Vareschi 2092 (Mu), 2208 (Ve--43147), 6997 (Ve--43418); Vareschi & Gerstner 2152a (Ve--34214); Vareschi & Pannier 3054 (Mu). Táchira: Ruiz-Terán, López-Figueiras, Wurdack, Wurdack, & Tillett 8153 (Z); J. A. Steyermark 57377 (W--1901729); Vareschi 5374 (Ve), 5579 (Ve). Trujillo: Aristeguieta 3598 (N); J. A. Steyermark 104862 (Ft, S). ECUADOR: Azuay: Barclay & Juajibioy 8656 (N). Carchi: Barclay & Juajibioy 9374 (N).

PAEPALANTHUS KARSTENII var. COREI Moldenke, *Phytologia* 29: 386. 1975.

Bibliography: Moldenke, *Phytologia* 29: 386. 1975.

Barclay & Juajibioy describe this plant as having small rosettes with long hairs on the leaves, the flower "heads on low stalks" or forming "low mats of crowded stems with sharp-pointed leaves; leaves 15 x 3 mm. at base; heads small, reaching 3 cm. in height, whitish" and found it "in cienaga (swamp) by lakeside with grasses, herbs, but no Espeletia, in very wet peaty soil" and forming "very low rosettes, leaves to 1.5 cm. x 3 mm., heads small, white, in very wet portions of extensive Espeletia-grass cienagas" or "under rock overhang on open slopes dominated by Espeletia surrounding lake in basin, some separated by wet quebradas draining into the lake, [on] coarse gravel [with] some large rocks [and] mostly incomplete ground cover". Aristeguieta refers to it as an "herba diminuta, efalpada, flores cremosas", while Cuatrecasas says "Céspedes muy densos, alfombrosos. Hoja

brillante, verde luego amarillenta".

Ruiz-Terán and his associates describe the plant as "Hierba [or hierbita] mínima, cespitosa, rosulada, diminuta, hasta do 5 cm., musciforme, que forma cojines compactos, convexos, densos, de contorno más o menos circular y 5--12 cm. de diámetro" or "que forma almohadillas muy compactas, de contorno $\pm$ orbicular" or "agrupada en almohadillas subhemisféricas, convexas, de 8--20 cm. de diámetro. Hojas adultas pequeñas, sésiles, deltado-lineares, 8--20 mm. de largo, virtualmente glabras, ciliadas, verde claras, concolores, las proximales generalmente secas y estramíneas, mucronulado-subespinascentes, con vaina blanca y limbo verde intenso. Escapos exsertos, más cortos que las hojas" [or "0.6--4 cm. de largo"]. "Capítulos floríferos inclusos o a nivel de ápice de las hojas; capítulos fructíferos cortamente exsertos, hemisféricos, 2,5--4,5 x 4--6 mm., blanquecino grisáceos, pequeños, escapíferos. Flores pequeñas [or muy pequeñas], blanquecinas o blancas [or blanco verdósulos]. Frecuente [or abundante or muy abundante]".

The plant has been found growing at alpine lakesides, on exposed ridge-tops of rocky windswept "backbone of mountains" and "forming dense patches on páramos", at altitudes of 1350 to 4200 meters, flowering in February, March, May, and from July to December, and fruiting in March, August to October, and December. Fosberg reports it as "common in wet spots on open rocky páramo, springy and seeping with water, forming small colonies".

Dr. Core, in a letter to me dated November 27, 1974, says: "It is interesting to know that my collection of the Paepalanthus from Purace has turned out to be a new variety. I well remember the day we climbed to the top of the volcano. Four years later a class of 18 students from the University of Cauca, who must have been standing almost exactly where I stood, met their death in a sudden eruption".

Cuatrecasas & Jaramillo Mejía describe the plant as forming "rosettes in cushions, leaves bright-green, flowers white", while García-Barriga says of it "planta pequeña, inflorescencia blanca".

Material of this taxon has in the past mostly been identified as typical P. karstenii Ruhl. or P. muscosus Körn.

Citations: COLOMBIA: Cauca: Barclay & Juajibioy 5733 (N), 5977 (N); E. L. Core 272 (N--type, We--isotype), 272a (W--2105161); Cuatrecasas 19099 (N); H. Pittier s.n. [February 1906] (W--531755, W--1114760). Cundinamarca: Cuatrecasas & Jaramillo Mejía 25734 (W--2342295), 25882 (W--2373930); F. R. Fosberg 20654 (N, W--2108783), 20788 (N, W--2108825); García-Barriga 17181 (W--2569584A); Killip & Ariste-Joseph 11957 (N, W--1140040); R. E. Schultes 20157 (Ld, W--2198936). VENEZUELA: Apure: Ruiz-Terán & López-Figueiras 8855 (Z). Mérida: Aristeguieta 2442 (N, W--2248796); Barclay & Juajibioy 9565 (N); Ruiz-Terán 7028 (Z), 7235 (Ac), 7325 (Ac); Ruiz-Terán & López-Figueiras 309 (Tu). Trujillo: Ruiz-Terán 9023 (Ld); Ruiz-Terán & López-Figueiras 2142 (Ld), 7518

(Kh). BOLIVIA: La Paz: G. H. H. Tate 382 (N); R. S. Williams 842 (N, N).

PAEPALANTHUS KARSTENII var. MINIMUS Moldenke, Phytologia 30: 15. 1975.

Bibliography: Moldenke, Phytologia 30: 15. 1975.

Pennell comments that in this plant the "bracts [are] short and broad, barely pubescent, [the] petals barely exceeding 1 mm. long, spatulate-oblong", while E. P. Killip notes that the taxon is "near P. karstenii Ruhl. but bracts smaller, leaves more obtuse, involutish".

Collectors describe the plant as a mat-forming herb with white flower-heads and have found it growing on páramos, wet open or bushy páramos, and the edges of alpine lakes, at altitudes of 2400 to 3700 meters, flowering from July to October and fruiting in October and January. Langenheim refers to it as "common on hummocks"; Killip & Arbelaez say of it "formando grupas esféricos"; while Barkley & Araque Molina found it growing "en selvas húmedas y densas en las montañas" and describe it as a "yerba con flores blancas en la suelos húmedos y poco húmedos".

Citations: COLOMBIA: Boyacá: Langenheim 3508 (W-2266624).

Cauca: Cuatrecasas & Willard 26421 (Fg, W-2402606); H. Pittier 1105 (W-631303). Cundinamarca: Ariste-Joseph A.73 (W-888761--type, Z--isotype); Killip & Perez Arbelaez 1142 (W-1517759); F. W. Pennell 2256 (F-485508, N, W-1042205). Magdalena: Kirkbride & Forero 1784 (Ld, N). Santander: Araque Molina & Barkley 18S719 (W-1985511); Barkley & Araque Molina 18S134 (W-1985489); Cuatrecasas & García-Barriga 9980 (Er, F-1289775, N, W-1798459).

PAEPALANTHUS KILLIPII Moldenke, Bull. Torrey Bot. Club 68: 67--68. 1940.

Bibliography: Moldenke, Bull. Torrey Bot. Club 68: 67--68.

1940; Moldenke, Known Geogr. Distrib. Erioc. 5 & 50. 1946; Moldenke, Alph. List Cit. 2: 610 (1948) and 4: 1060. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 61 & 210. 1949; Moldenke, Fieldiana Bot. 28: 124. 1951; Moldenke, Phytologia 4: 146. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 175. 1953; Anon., U. S. Dept. Agr. Bot. Subj. Index 5: 4227. 1958; Moldenke, Résumé 67, 72, & 487. 1959; Moldenke, Résumé Suppl. 4: 4 (1962) and 12: 2. 1965; J. A. Steyerm., Act. Bot. Venez. 1: 94. 1966; Moldenke, Fifth Summ. 1: 118 & 125 (1971) and 2: 953. 1971.

This species is based on Killip & Smith 15299 from marshy land, at 1500 meters altitude, on the Mesa de los Santos, in the Eastern Cordillera, Santander, Colombia, collected between December 11 and 15, 1926, and deposited in the United States National Herbarium at Washington. Recent collectors describe the plant as an herb whose flower-heads are grayish in appearance. They have found it growing in wet white sand in open places, at the base of bluffs, and on wet roadside banks, at altitudes of 3300 to 4500 feet, flowering in November, December, and February, and fruiting in November.

Fosberg found it "forming loose clumps on a small open sandstone ridge decomposing into white sand", while he and Holdridge encountered it "near a stream, between rocks with water trickling between them".

It should be noted here that the original description of this species was validly and officially published on December 31, 1940, not in "1941" as is stated on the title-page of the issue.

Additional citations: COLOMBIA: Boyacá: Grubb, Curry, & Fernandez-Perez 716 (K, W--2322623). Huila: Fosberg & Holdridge 19388 (W--2059696). Méta: F. R. Fosberg 19511 (Ew, N). Norte de Santander: Fassett 26026 (W--2166234, Ws). Santander: Killip & Smith 15299 (Ca--938954--isotype, Mi--isotype, S--isotype). VENEZUELA: Bolívar: Bunting 2969 (Z); Cardona 2702 (W--1997708); Steyermark, Dunsterville, & Dunsterville 92619 (N); Steyermark & Nilsson 722 (N).

PAEPALANTHUS KLOTZSCHIANUS Körn. in Mart., Fl. Bras. 3 (1): 389. 1863.

Synonymy: Paepalanthus (Eupaepalanthus) klotzschianus Körn. ex Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 23. 1888. Dupatya klotzschiana (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya klotzschiana Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 276, 389, 499, & 506, pl. 50. 1863; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 23, fig. 12 E & F. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 126, 141, 284, & 290. 1903; Herzog in Fedde, Repert. Spec. Nov. 20: 83. 1924; Stapf, Ind. Lond. 4: 518. 1930; J. Hutchinson, Fam. Flow. Pl. 2: 66, fig. 21. 1934; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 280, & 487. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Melchior in Engl., Syllab. Pflanzenfam., ed. 12, 2: 556, fig. 230 O & P. 1964; Moldenke, Phytologia 20: 305. 1970; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 953. 1971; J. Hutchinson, Fam. Flow. Pl., ed. 3, [711] & 949, fig. 364. 1973; Moldenke, Phytologia 25: 241. 1973.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 50. 1863; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 23, fig. 12 E & F. 1888; J. Hutchinson, Fam. Flow. Pl., ed. 1, 2: 66, fig. 21. 1934; Melchior in Engl., Syllab. Pflanzenfam., ed. 12, 2: 556, fig. 230 O & P. 1964; J. Hutchinson, Fam. Flow. Pl., ed. 3, [711], fig. 364. 1973.

This species is based on an unnumbered Sellow collection from somewhere in eastern Brazil, probably deposited in the Munich herbarium. Ruhland (1903) cites only the original collection, and,

indeed, it would seem that this is the only known collection of the species, although Herzog (1924) comments that it is closely related to P. albo-tomentosus Alv. Silv. If he made this comment from seeing only the original specimen or bases it on newer material is not clear.

Citations: BRAZIL: State undetermined: Sellow s.n. [Brasilia] (Br--isotype, N--isotype, N--photo of isotype, Z--photo of isotype). MOUNTED ILLUSTRATIONS: Körn. in Mart., Fl. Bras. 3 (1): pl. 50. 1863 (N, Z).

PAEPALANTHUS KUNHARDTII Moldenke, Mem. N. Y. Bot. Gard. 8: 97--98. 1953.

Synonymy: Paepalanthus fraternoides Moldenke, Résumé 325, in syn. 1959.

Bibliography: Moldenke, Mem. N. Y. Bot. Gard. 8: 97--98. 1953; G. Taylor, Ind. Kew. Suppl. 12: 101. 1959; Moldenke, Résumé 72, 325, & 487. 1959; Moldenke, Fifth Summ. 1: 125 (1971) and 2: 583 & 953. 1971.

This species is based on Maguire & Politi 27588 from wet Sphagnum hummocks at Camp Savanna, altitude 4500 feet, in the Cerro Sipapo (Paraque), Amazonas, Venezuela, collected on December 11, 1948, and deposited in the Britton Herbarium at the New York Botanical Garden. It is known thus far only from the type collection.

Citations: VENEZUELA: Amazonas: Maguire & Politi 27588 (Bm--isotype, E--isotype, F--isotype, G--isotype, Gl--isotype, Hn--isotype, Ja--isotype, K--isotype, N--type, Ut--isotype, Ve--isotype, W--isotype).

PAEPALANTHUS KUPPERI Suesseng. in Engl., Bot. Jahrb. 72: 293. 1942.

Bibliography: Suesseng. in Engl., Bot. Jahrb. 72: 293. 1942; Moldenke, Known Geogr. Distrib. Erioc. 4 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39 & 210. 1949; Moldenke, Phytologia 4: 146. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 175. 1953; Moldenke, Résumé 47 & 487. 1959; Moldenke, Fifth Summ. 1: 88 (1971) and 2: 953. 1971; Moldenke, Phytologia 29: 208. 1974.

This species is based on Kupper 1315 from an altitude of 3450 meters at Chirripo Grande, Cartago, Costa Rica, collected on April 27, 1932, and deposited in the herbarium of the Botanische Staatssammlung in Munich. Collectors describe the plant as growing in scattered clumps to 30 cm. in diameter and as a "common cushion plant on Sphagnum below shrubs in shrub páramos of Chusquea, Hypericum, and Vaccinium associations". They have found it at altitudes of 2900 to 3500 meters, flowering in April, July, and November, and fruiting in July.

The species is obviously very closely related to P. karstenii of northern South America and may well prove not to be specifically distinct. Material has been misidentified and distributed in some herbaria as Eriocaulon microcephalum H.B.K. and as Pae-

palanthus karstenii Ruhl.

Citations: COSTA RICA: Cartago: Cuatrecasas & León 26543 (Fg, W--2402780); Holm & Iltis 460 (N, Z); Kupper 1315 (Mu--type, Mu--photo of type, N--isotype); Lent 143 (N); Mori & Anderson 220 (Ws); Tessene 1488 (Ws).

PAEPALANTHUS LAMARCKII Kunth, Enum. Pl. 3: 506--507. 1841.

Synonymy: Eriocaulon fasciculatum Lam., Encycl. Méth. Bot. 3: 276. 1789 [not E. fasciculatum Bong., 1831, nor Rottb., 1778, nor Weig., 1959]. Eriocaulon fasciculare Raeusch., Nom. Bot. 30. 1797. Eriocaulon fasciculatum Lam. apud Willd. in L., Sp. Pl., ed. 4, 1: 486--487. 1797. Eriocaulon fasciculatum "Lam. (et? Rottb.)" apud Steud., Nom. Bot., ed. 1, 312. 1821. Paepalanthus lamarkii Kunth ex Klotzsch in Schomb., Vers. Faun. & Fl. Brit.-Guian. 1116. 1848. Paepalanthus ottonis Klotzsch in Schomb., Vers. Faun. & Fl. Brit.-Guian. 3: 1115, hyponym. 1848. Eriocaulon lamarckii Kunth ex D. Dietr., Syn. Pl. 5: 260. 1852. Eriocaulon lamarckii (Kunth) Steud., Syn. Pl. Glum. 2: [Cyp.] 276. 1855. Paepalanthus lamarckii H.B.K. ex Sauv., Anal. Acad. Ci. Habana 8: 49. 1871. Lasioclepis pilosa Böck., Flora 56: 91. 1873. Dupatya lamarckii (Kunth) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Eriocaulon lamarckii Steud. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878. 1893. Dupatya lamarckii Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus lamarckii Kuntz apud H. Lecomte, Bull. Soc. Bot. France 55: 595, sphalm. 1908. Lasioclepis pilosa Böck. apud Milne-Redhead, Kew Bull. Misc. Inf. 1948: 472, sphalm. 1948. Eriocaulon fasciculatum Willd. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959. Eriocaulon lamarckii Steud. ex Moldenke, Résumé Suppl. 1: 17, in syn. 1959. Paepalanthus lamarckii Kunth ex W. Robyns, Excerpt. Bot. A.1: 215, sphalm. 1959. Eriocaulon fasciculare L. ex Moldenke, Fifth Summ. 2: 500, in syn. 1971. Paepalanthus lamarckii (Schrad.) Kunth ex Moldenke, Fifth Summ. 2: 585, in syn. 1971. Eriocaulon vivum Burchell ex Moldenke, Phytologia 25: 239, in syn. 1973.

Additional & emended bibliography: Lam., Encycl. Méth. 3: 276. 1789; J. F. Gmel. in L., Syst. Nat., ed. 13, 2: 206. 1791; Lam., Tabl. Encycl. Méth. Bot. [Illustr. Pl.] 1: 214, pl. 50, fig. 3. 1791; Henckel, Nom. Bot. 68. 1797; Raeusch., Nom. Bot. 30. 1797; Willd. in L., Sp. Pl., ed. 4, 1: 486--487. 1797; Rottb., Descr. Pl. Surin. pl. 2. 1798; Pers., Syn. Pl. 1: 111. 1805; Roem. & Schult. in L., Syst. Veg., ed. 15 nov., 2: 867. 1817; Pers., Sp. Pl. 1: 284. 1817; Steud., Nom. Bot. Phan., ed. 1, 312. 1821; Poir. in Cuvier, Dict. Sci. Nat. 24: 240. 1822; Spreng. in L., Syst. Veg., ed. 16, 3: 774. 1826; Bong., Ess. Monog. Erioc. 24. 1831; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 505--507, 613, & 625. 1841; Mart., Flora 24, Beibl. 2: 60. 1841; Klotzsch in Schomb., Vers. Faun. & Fl. Brit.-Guian. [Reise Brit.-

Guian.] 3: 1064, 1115, & 1116. 1848; D. Dietr., Syn. Pl. 5: 260. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 276, 333, & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 298, 356, 505, & 507. 1863; Sauv., Anal. Acad. Ci. Habana 8: 49. 1871; Sauv., Fl. Cub. 163. 1871; Böck., Flora 56: 91. 1873; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Gomez de la Maza, Not. Bot. Sist. 49 & 110. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 35 & 402. 1894; Huber, Bol. Mus. Para. 2: 499. 1898; Malme, Bih. Svensk. Vet. Akad. Handl. 27 (3), no. 11: 29. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 153, 159-161, 284-286, 290, & 291. 1903; H. Lecomte, Journ. de Bot. 21 [ser. 2, 1]: 136. 1908; Alv. Silv., Fl. Mont. 1: 408. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 51. 1930; Stapf, Ind. Lond. 3: 90. 1930; Herzog in Fedde, Repert. Spec. Nov. 29: 205. 1931; Moldenke, N. Am. Fl. 19: 40-41. 1937; Vittien & Heyn in Pulle, Fl. Surin. 1 [Meded. Konink. Ver. Ind. Inst. 30, Afd. Handelsmus. 11]: 216 & 218. 1938; Moldenke, Phytologia 1: 319, 333, 350, 351, 353, 355, 356, 360, 361, & 363. 1939; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Ann. Mo. Bot. Gard. 31: 69. 1944; A. Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 76 & 104. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; León, Fl. Cuba 1: 283. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4-7, 13, 30, 34, 36, 42, 50, & 52. 1946; Moldenke, Alph. List Cit. 1: 32, 67, 68, 132, 186, 187, 190, 231, 232, 265, 298, & 326. 1946; Le Cointe, Amaz. Bras. III Arv. & Pl. Uteis, ed. 2, 113. 1947; Moldenke, Phytologia 2: 375. 1947; Moldenke, Alph. List Cit. 2: 412, 429, 486, & 574 (1948), 3: 818 & 902 (1949), and 4: 1074, 1144, 1158, 1209, 1219, & 1304. 1949; Moldenke, Phytologia 3: 143. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 36, 41, 44, 45, 48, 57, 64, 66-68, 95, 111, 112, 114, 117, & 210. 1949; Meikle & Baldwin, Am. Journ. Bot. 39: 45, 48, & 50, fig. 19-27. 1952; Moldenke, Phytologia 4: 146-148. 1952; Moldenke, Mem. N. Y. Bot. Gard. 8: 98. 1953; Moldenke in Humbert, Fl. Madag. 36: 30, 31, & 35-36, fig. 4 (8-17). 1955; Angely, Fl. Paran. 10: 5. 1957; Alain, Revist. Soc. Cub. Bot. 15: 56. 1958; Standl. & Steyerl., Fieldiana Bot. 24: 377 & 378. 1958; Van der Veken, Bull. Soc. Roy. Bot. Belg. 91: 100. 1958; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 43, 48, 52, 54, 57, 63, 67, 72, 75, 77, 78, 99, 112, 136, 137, 140, 145, 156, 280, 288, 289, 309, 327, & 487. 1959; Moldenke, Résumé Suppl. 1: 4, 9, & 17. 1959; Rickett & Stafleu, Taxon 8: 232. 1959; A. Robyns, Excerpt. Bot. A.1: 215. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 35 & 402. 1960; Moldenke, Résumé Suppl. 3: 12 & 34 (1962) and 11: 4. 1964; E. Good, Geogr. Flow. Pl. 227, 440, & 495. 1964; J. A. Steyerl., Act. Bot. Venez. 3: 96. 1968; Lindeman & Görts-van Rijn in Pulle & Lanjouw, Fl. Surin. 1 [Meded. Konink. Inst. Trop. 30, Afd. Trop. Prod. 11]: 331 & 332. 1968; Moldenke, Phytologia 17: 456. 1968; Moldenke, Résumé Suppl. 17: 11 (1968) and 18: 12. 1969; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 184, 187, & 191. 1969; Moldenke, Phytologia 18: 92 & 280 (1969), 19: 20 (1969), and 20:

11, 294, 295, 297, 414, 417, & 418. 1970; Moldenke, Fifth Summ. 1: 82, 91, 97, 99, 103, 112, 118, 125, 130, 132, 134, 163, 180, 217--219, 226, 231, 238, 239, 262, & 482 (1971) and 2: 500, 504, 517, 546, 585, 587, & 953. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1157 & Ind. 20. 1972; Rouleau, Taxon Index Vols. 1-20, part 1: 271. 1972; Stafleu, Internat. Code Bot. Nomencl. 354. 1972; Moldenke, Phytologia 23: 434 (1972), 25: 228 & 239 (1973), and 26: 24, 195, & 196. 1973; Thorne in Meggers, Ayensu, & Duckworth, Trop. For. Ecosyst. Afr. & S. Am. 33 & 36. 1973; Moldenke, Phytologia 29: 211, 298, 304, 311, 317, & 318. 1974.

Illustrations: Lam., Tabl. Encycl. Méth. Bot. [Illustr. Pl.] 1: pl. 50, fig. 3. 1791; Rottb., Descr. Pl. Surin. pl. 2. 1798; Meikle & Baldwin, Am. Journ. Bot. 39: 48, fig. 19--27. 1952; Moldenke in Humbert, Fl. Madag. 36: 31, fig. 4 (8--17). 1955.

Recent collectors have found this plant growing in forests and savannas, moist or inundated campos and exposed swamps, in wet places and wet sand, at the edge of wet campos, in sandy ground in open low forests, in open dry drainage ditches and on low waste ground, along small roads, on sandy creek banks, in cerrado on white sand, in wet open ditches, and in wet places in gallery forests, at altitudes from near sealevel to 1800 meters, flowering in February, March, and from May to December, fruiting in February, June, August, October, and November. They describe it as an annual herb, 5--7 cm. tall, the heads light-gray or grayish-white, with dark bracts, the flowers themselves "gray", "gray-purple", or "white-purple". Vernacular names reported for it are "capim manso" and "joncinelle fasciculée".

Maguire, Cowan, & Wurdack refer to the species as "occasional on moss-covered boulders in rapids"; Wurdack & Monachino report that it is "locally abundant on moist riverbanks" and "frequent in morichal"; Maguire, Wurdack, & Bunting describe it as "locally frequent in moist sand". Lützelburg found it growing "in clumps of Rhynchospora aberrans Clarke in caatinga vegetation on a plateau top"; Prance and his associates found it "in small clumps in small streams on savanna on large plateau", while Goodland encountered it "in wet sandy open savanna grassland with scattered trees, the dominants being Curatella, Byrsonima, Trachypogon, and Fimbristylis". McKee speaks of it as having light-green leaves and white inflorescences, noting that it is "common in very sandy soil with impeded drainage".

It should be noted here that the Eriocaulon fasciculatum of Bongard and that of Weigelt are now known as Paepalanthus bifidus (Schrud.) Kunth, while that of Rottbøll is P. fasciculatus (Rottb.) Kunth. Paepalanthus ottonis is based on Otto 942 from Venezuela, deposited in the Berlin herbarium, while Eriocaulon vivum seems to be based on Burchell 8717 in the Torrey Herbarium. The binomial, Lasioclepis pilosa Böck., is sometimes erroneously cited to page "9" or to page "90" in Flora, volume 56 (1873) instead of "91".

Kunth (1841) comments that P. lamarckii is very similar in ap-

pearance to P. polytrichoides Kunth and to what he called P. congestus Kunth [now known as P. fasciculatus (Rottb.) Kunth]. I would add that it is also very similar to P. viridis Körn., P. cearaensis Ruhl., P. manicatus V. A. Pouls., and P. microcaulon Ruhl.

Good (1964) tells us that P. lamarckii is a good example of "discontinuous tropical zone" species, being found both in America and Africa. However, if the Wegener hypothesis is correct, then its distribution was at one time continuous, since the species is most common in easternmost tropical South America and in westernmost tropical Africa. In the Humbert work (1955) its present known distribution is given as follows: "Espèce à aire très étendue, mais curieusement disjointe (peut-être paraissant telle à cause du petit nombre des récoltes): de Cuba et du Honduras britannique au Brésil au Sud; aussi en Guinée française, Sierra Leone, Liberia, Gabon, Tanganyika et Madagascar".

It should be noted that the Gentle 3780, cited below, is anomalous, being much more husky than is normal for this species. The species apparently often grows in close association with other species of Eriocaulaceae, but, being so small and inconspicuous, is often overlooked and occurs as a mixture with other species in collections. The Collector undetermined 177 collection, cited below, is a mixture with Eriocaulon melanocephalum Kunth; Gentle 4238a is a mixture with E. fuliginosum C. Wright; Cardona Puig 2866 is a mixture with Syngonanthus caulescens (Poir.) Ruhl.; Goodland 254 is a mixture with S. glandulosus Gleason; Boon 1154 is a mixture with Tonina fluviatilis Aubl.; and Blanchet 5 is a mixture with Paepalanthus ramosus var. affinis (Bong.) Ruhl. Gentle 992 was a mixture of P. lamarckii and the type collection of P. gentlei Moldenke -- the P. lamarckii portion later renumbered as "992a".

Because of the considerable difference of opinion as to the interpretation of this taxon, it may be worthwhile to repeat Kunth's original (1841) description of it: "P. Lamarckii. Caulibus erectis, simplicibus, foliosis; foliis rigidulis, subensiformi-linearibus, acutato-mucronatis vel obtusis, glabris, patenti-subrecurvatis; pedunculis per crebros fasciculato-congestis, filiformibus, subhexagonis, villosulis; vaginis acutato-mucronatis, glabriusculis, apice pilosis; capitulis subglobosis, sordide albido-villosis; bracteis sepalisque exterioribus apice albido-hirsutis: fructiferis rigescentibus. - Eriocaulon fasciculatum Lam. Encycl. 3. 276. t. 50. f. 3. (v. s.) Willd. herb. n. 2372. fol. 1. (nec reliq. auct.) - Guiana. - Caules subpollicares. Folia 9--10 lineas longa, 1 lineam lata, basi dilatata, amplexicaulis. Pedunculi 1 -- 1 3/4-pollicares. Vaginae 5 lineas longae. Capitula magnitudine grani cannabis. Bracteeae olivaceae, late cuneatae, apice ciliato-hirsutae. Flores masculi pedicellati: Sepala 3 exteriora olivacea, obovata, apice rotundato-hirsuta; 3 interiora in tubum tubaeformem

connata. Flores feminei pedicellati: Sepala 3 exteriora olivacea, spathulata, apice albido-hirsuta: fructifera rigescentia, ima basi connata, reflexa; 3 interiora parum breviora, tenuiora et pallidiora, apice ciliato-hirsuta. Pili bractearum et calycum obtusiusculi, articulati. Ovarium subrotundo-ovatum, tricoccum. Stylus l. Stagmate....."

Böckeler's description (1873) of Lasiolapis pilosa is also worth repeating here: "Culmo abbreviato, pollicem circ. alto, subcurvato dense foliato, parte subterranea radicante, fibrillis numerosissimis capillaribus fasciculatis; foliis spiraliter dispositis patentissimis evaginatibus basi dilatata amplexantibus, linearilanceolatis obtusiusculis pagina interiore asperulis, 11—5 lin. long. lineam latis flavescenti-viridulis subglabris; pedunculis numerosis in apice culti confertis patentibus setaceis inaequalibus 2 1/2 — 1 poll. longis leviter tortis, teretiusculis vaginisque pilis subtilissimis vestitis; vaginis ore lanceolato-productis acutiusculis 6—4 lin. longis; capitulis exacte globosis 1 1/2 — 1 lin. crassis dense setulosis cinerascenti-bruneis; squamis perdense imbricatis late ovalibus convexiusculis olivaceo-fuscis, superne setis longiusculis subtilibus (fragillimis) albidis obsitis; perigynii foliolis interioribus anguste oblongo-linearibus pellucido-albis glabris, exterioribus ternis fuscis anguste cuneiformibus superne dense setuloso-ciliatis; caryopsi (minima) oblonga sulcato-subangulata. — Herb. Musei Warsoviani."

Gleason, in his unpublished Flora of British Guiana, described the species as "Stems 2--12 cm. high, smooth; leaves numerous, often firm in texture, nearly glabrous; peduncles numerous, sparsely hirsute to nearly glabrous, 3--5 (rarely 10) cm. long, their sheaths hirsute and ciliate; heads blackish, subglobose or depressed, 2--3 mm. wide; bracts short, usually concealed, ovate, acute. Wet places, Mazaruni River, Jenman 728, 5803; Kaieteur Falls, Jenman 894; Macreba Falls, Alston 328; without definite locality, Appun 1579, Jenman 7278 (Cuba to Brazil)."

Uittien & Heyn (1938) cite the following collections from Surinam: Boon 1154, Collector undetermined s.n., Focke 124 & 480, Hostmann 31 & 977, Kegel 301 & 1472, Lanjouw 750 & 751, Pulle 215, Rombouts 139, Splitgerber 392, Tulleken 78, Versteeg 772, and Wulfschlägel 759, flowering from July to September, November, and December. They comment that Pulle 215 and Versteeg 772 "have broader, yellowish leaves and very long, nearly entirely glabrous peduncles".

Thorne (1973) says that of the 108 species of plants native to both tropical west Africa and tropical America, 45 are aquatic or nearly so. Such plants are wide-ranging generally, readily transported by water and shore birds. Apparently P. lamarckii is regarded by him as one of these.

Silveira (1928) cites Huber 44 from Marajo Island, Brazil; Meikle & Baldwin (1952) cite "Bequaert in Linder 1451" from Liberia; Steyermark (1968) cites his no. 88885 from Venezuela. Van der Veken (1958) cites Bequaert 7623, Coiteaux 1007, and Gillet

s.n. ["anno 102 leg."] from Zaire and refers to the plant as a therophyte, commenting that "En Afrique, l'espèce a été récoltée de la Guinée française au Congo et sur la côte orientale de l'île de Mafia. En Amérique du Sud elle existe des Antilles au Brésil."

The Gentle 992a, cited by me in 1939 as being in the University of Michigan herbarium is now in the Lundell Herbarium.

Material of P. lamarckii has been misidentified and distributed in some herbaria as Eriocaulon caesium Griseb., E. dendroides Kunth, E. gibbosum Körn., Eriocaulon sp., Paepalanthus cearensis Ruhl., P. exiguus (Bong.) Körn., P. polytrichoides Kunth, and P. tortilis Mart. On the other hand, the Luschnath 38 [Martius 555] and Ridley & Lea s.n., distributed as P. lamarckii, are actually P. bifidus (Schrad.) Kunth, Pulle 215 is P. leucocyaneus Tutin, Ackermann s.n. [1832] is P. melaleucus (Bong.) Kunth, Wessels Boer 1460 is P. oyapockensis Herzog; and Irwin, Reis dos Santos, Souza, & Fonsêca 23353 is P. viridis Körn.

The G. Gardner 1170 collection, cited below, is a mixture with P. bifidus (Schrad.) Kunth, while Lützelburg 20687 is a mixture with Eriocaulon neglectum Ruhl. and Syngonanthus gracilis var. tenuissimus Ruhl.

Additional citations: BRITISH HONDURAS: Gentle 3780 (Ld, Mi), 4238 (Ld, Ld), 4238a (Ld), 9486 (Ld), 9631 (Ld, S); McKee 11378 (W--2641488); Schipp S.130 (Ca--465322, F--641532, S). CUBA: Pinar del Río: Ekman 18121 (S). Santa Clara: Ekman 17124 (S). Province undetermined: C. Wright 3742 (S). ISLA DE PINOS: Alain & Killip 2190 (Le); Ekman 12015 (Ca--491271, S); Killip 42864 (Le). HISPANIOLA: Dominican Republic: Meyerhoff s.n. [St. Domingo, 1859] (B). TRINIDAD AND TOBAGO: Trinidad: W. E. Broadway 2145 (W--1047691). COLOMBIA: Amazonas or Vaupés: Schultes & Cabrera 14968, in part (Z). Magdalena: C. Allen 591 (E--1015283), 670 (E--1014519). VENEZUELA: Amazonas: Maguire, Cowan, & Wurdack 29499 (F, K, N, Ve, W); Maguire, Wurdack, & Bunting 36138 (N); J. A. Steyermark 57804, in part (N). Angostura: Bailey & Bailey 1697a (Ba). Bolívar: Cardona Puig 2886, in part (W--2195081); J. A. Steyermark 88885 (N), 90849 (Ca); Wurdack & Monachino 39831 (Mu, N), 39950 (N), 41031 (N, S). Guaricó: Guyon 141 (P). State undetermined: Otto 942 (B, Br, N--photo, Z--photo). GUYANA: Goodland 254, in part (W--2546169); V. Graham 168 (K); Jenman 5803 (N); Sandwith 1256 (S). SURINAM: Boon 1154, in part (Ut--367); Dirven LP.419 (Ut--29223b); Focke 480 (Ut--366); Hostmann 31 (Ut--366), 31a (S), 977 (B, Ut--366); Kappler s.n. (S); Lanjouw 750 (Ut--44067a), 751 (Ut--44066a); Maguire, Schulz, Soderstrom, & Holmgren 53960 (N); Mennega 141 (Ut--93615b); Rombouts 139 (Ut--44068a); Wulfschlägel 759 (Br). FRENCH GUIANA: Barbier s.n. (N);

Bentham s.n. (Ut--366); Collector undetermined 177, in part (N); Degelius s.n. [4/VI/1958] (Go); Herb. Bentham 2 (S); Herb. Mus. Paris. 224 (Br); Leprieur 49 (B), 1808 (N), s.n. [Cayenne] (Br), s.n. [Guyane] (W--2501740), s.n. (B); Mélinon 178 (B); Poiteau s.n. (B); Richard s.n. [Guyane] (B); Sagot 1329 (Br, S, Ut--365). BRAZIL: Amazonas: Lützelburg 20687, in part (Mu). Bahia: A. P. Duarte 5950 [Herb. Brad. 15445] (Lw). Ceará: Dias da Rocha 3508 [Macbride photos 18697] (Mu, N--photo, N--photo, W--photo); Drouet 2243 (Er, Mi, N, S, W--1673759); Ducke s.n. [Herb. Mus. Goeldi 1573] (Gl). Goiás: Irwin, Maxwell, & Wasshausen 21291 (Ld, N), 21628 (N); Weddell 2129 (Br). Maranhão: G. Don 12 (Br); Murça Pires & Black 2011 (N), 2252 (N), 2600 (Be--59019). Mato Grosso: Malme 1661 (S), 3237 (S), 3237a (S). Minas Gerais: Burchell 8717 (Br, T). Pará: Black 51-10009 (Z), 52-15541 (Be--77477); Black & Ledoux 50-10609 (Z); Ducke s.n. [Herb. Mus. Goeldi 11982] (Bs); Murça Pires & Silva 4270 (N); Spruce 608 (Mu), 2742 (B), s.n. [In vicinibus Santarem] (N), s.n. [Prope Santarem, Aug. 1850] (S, S); Tavares 18 (N). Pernambuco: G. Gardner 1169 (N, W--1066502), 1170 (W--1066503); Pickel 2772 (Mi), 2774 (W--1518914). Piauí: Lützelburg s.n. [with no. 1294] (Ac); Martius s.n. [in adscensu M. Serra dos Dois Irmãos, Maio 1819] (Mu). Roraima: Prance, Steward, Ramos, & Farias 9909 (Ac, N, S); Ule 7664 [Herb. Mus. Goeldi 12773] (Bs, K). State undetermined: Allemão 1549 (P); Blanchet 5, in part (S); G. Gardner 1170, in part (N), 2747 (W--1440334); Lützelburg 20547 [Igarapé] (Mu), 21037 [Vera Cruz] (Mu); Martius s.n. (Mu); J. E. Pohl s.n. [in Brasilia] (Mu); Weddell 2129 [Salinas] (N). MARAJÓ ISLAND: Swallen 4930 (W--1592047). REPUBLIC OF GUINEA: Boismare 52 [Herb. Chillou 3482] (An). MADAGASCAR: Perrier de la Bâthie 1736 (N, P), 7253 bis (P). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jard. Bot. Brux. s.n. (Br). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS LANATO-ALBUS Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 342--343, pl. 47 I. 1863.

Synonymy: *Dupatya lanato-alba* (Mart.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. *Dupatya lanato-alba* Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. *Xeractis dubia* Körn. ex Moldenke, Phytologia 25: 245, in syn. 1973.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 299, 342--343, 499, & 507, pl. 47 I. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 213, 215, 284, & 290. 1903; Alv. Silv., Fl. Mont. 1: 408. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 53. 1930; Stapf, Ind. Lond. 4: 518. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941;

Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99 & 488. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Melchior in Engl., Syllab. Pflanzenfam., ed. 12, 2: 556, fig. 230 M & N. 1964; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 158. 1969; Moldenke, Phytologia 20: 357. 1970; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971; Moldenke, Phytologia 25: 245 (1973) and 29: 308. 1974.

Illustrations: Körn. in Mart., Fl. Bras. 3 (1): pl. 47 I. 1863; Melchior in Engl., Syllab. Pflanzenfam., ed. 12, 2: 556, fig. 230 M & N. 1964.

This species is based on an unnumbered collection of Martius, collected "auf dem Gipfel des Berges Itambé", at an altitude of 1700 meters, Minas Gerais, Brazil, flowering in May of 1818 and deposited in the Munich herbarium, where it was photographed by Macbride as his type photograph number 18700. This specimen is apparently also the basis for Martius' unpublished name, Xeractis dubia. Ruhland (1903) cites only the original collection, but Silveira (1928) cites A. Silveira 688 from Chapada do Couto, Minas Gerais, collected in 1918.

Material has been misidentified and distributed in some herbaria as P. dubius Körn.

Citations: BRAZIL: Minas Gerais: Maguire, Mendes Magalhães, & Maguire 49150 (N, Z); Martius s.n. [In summo monte Itambé, 5300' alt., Maio 1818; Macbride photos 18700] (Mu--type, Mu--isotype, N-photo of type, W--photo of type). State undetermined: J. E. Pohl s.n. [in Brasilia] (Mu). MOUNTED ILLUSTRATIONS: Mart., Fl. Bras. 3 (1): pl. 47 I (B, B, N, Z); drawings & notes by Körnicke (B, B).

PAEPALANTHUS LANATUS Alv. Silv., Fl. Mont. 1: 42--43, pl. 21. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 42--43 & 408, pl. 21. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 21. 1928.

This species is based on A. Silveira 804, collected "In campis arenosis siccisque inter Itacambira et Juramento", Minas Gerais, Brazil, in July of 1926, deposited in the Silveira herbarium. Silveira (1928) says that the "Species ob lana nivea copiosaue foliorum et apicis caulis certe distinctissima".

Material has been misidentified and distributed in some herbaria under the name P. falcatus Körn.

Citations: BRAZIL: Minas Gerais: Brade 13599 [Herb. Jard. Bot. Rio Jan. 25381] (B); Glaziou 19966 (Br, N); E. Pereira 7273 [Herb.

Brad. 26312] (Z).

PAEPALANTHUS LANCEOLATUS Körn. in Mart., Fl. Bras. 3 (1): 396—397. 1863.

Synonymy: Dupatya lanceolata (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya lanceolata Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 396—397 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 202, 284, & 290. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Phytologia 4: 148. 1952; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 280, & 488. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 953. 1971; Moldenke, Phytologia 25: 157 (1973) and 26: 240. 1973.

The type of this species was collected by Georg Heinrich von Langsdorff somewhere in Minas Gerais, Brazil, and is probably deposited in the Munich herbarium. Macbride photographed Warming 82 in the Copenhagen herbarium as his type photograph number 22284, but this collection is not a type of any sort.

Recent collectors have found P. lanceolatus growing at 3700 feet altitude, flowering from December to February. The species is very similar in appearance to P. bromelioides Alv. Silv. and P. corymbosus (Bong.) Kunth, as well as to P. melaleucus (Bong.) Kunth, P. rigidulus Mart., and P. vellozioides Körn.

Material has been misidentified and distributed in some herbaria under the name Eriocaulon tuberosum Bong. On the other hand, the Costa 138, Macedo 2995, and Maguire, Maguire, & Murça Pires 44680, distributed as P. lanceolatus, are actually P. vellozioides Körn.

Ruhland (1903) cites only Langsdorff s.n. and Warming s.n. from Minas Gerais.

Additional citations: BRAZIL: Minas Gerais: P. Clausen s.n. [Aug.—April 1840] (Br); Héringer 5268 (Z); Warming 82 [53/2; Macbride photos 22284] (N--photo, W--photo).

PAEPALANTHUS LANGSDORFFII (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 338—339. 1863.

Synonymy: Eriocaulon langsdorffii Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 632. 1831. Dupatya langsdorffii (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Paepalanthus langsdorffii Körn. in Mart., Fl. Bras. 3 (1): 338. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894. Dupatya langsdorffii Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145.

1902. Paepalanthus langsdorfii Körn. ex Alv. Silv., Fl. Mont. 1: 408, sphalm. 1928. Paepalanthus langsdorfii Körn. ex Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960. Paepalanthus langsdorfii Moldenke, in herb.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 632. 1831; Bong., Ess. Monog. Erioc. 13 & 32. 1831; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 577 & 613. 1841; D. Dietr., Syn. Pl. 5: 267. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 282 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 338--339 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 214, 218, 284, 286, & 290. 1903; Alv. Silv., Fl. Mont. 1: 408. 1928; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 36, & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 280, 289, 326, & 488. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 174 & 189. 1969; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 504, 585, & 953. 1971; Moldenke, Biol. Abstr. 56: 3000. 1973; Moldenke, Phytologia 25: 229 & 241. 1973.

This species appears to be based on L. Riedel 396, collected in shady places on Mt. Itacolumi, Minas Gerais, Brazil, and deposited in the Leningrad herbarium. Macbride photographed an isotype in the Berlin herbarium as his type photograph number 10618.

Bongard's original description of the plant (1831) is: "Caulescens; caule simplici, folioso; foliis caulinis vaginantibus, lanceolatis, acuminatis, ciliatis; pedunculo axillari, solitario, pilosiusculo; vagina pilosa". The pl. 51 which he (as well as Jackson, 1893) cites was apparently never actually published and probably is now to be seen only in the Leningrad library or herbarium. His description is so brief because he obviously intended the illustration to supplement it.

Ruhland (1903) cites, besides the type collection, Glaziou 15521a from Campo de Fora at Caraça, Minas Gerais, flowering in June. Silveira (1928) cites A. Silveira 239 from Serra do Lenheiro, Minas Gerais, collected in 1896. Ruhland (1903) comments that the species "Ad sequentem [P. xiphophyllus Ruhl.] proxime accedit".

Citations: BRAZIL: Minas Gerais: Glaziou 15521 (B); L. Riedel 396 [Macbride photos 10618] (B--isotype, N--photo of isotype, N--photo of isotype, W--photo of isotype, Z--isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS LANGSDORFFII var. CARACENSIS Moldenke, Phytologia 25:

430--431. 1973.

Synonymy: Paepalanthus langsdorffii var. chapadensis Moldenke, *Phytologia* 25: 229, nom. nud. 1973. Paepalanthus langsdorffii var. caracensis Moldenke, in herb.

Bibliography: Moldenke, *Phytologia* 25: 229 & 430--431. 1973; Moldenke, *Biol. Abstr.* 56: 3000. 1973.

Citations: BRAZIL: Minas Gerais: Irwin, Harley, & Onishi 29110 (N--isotype, Z--type, Z--drawings of type).

PAEPALANTHUS LATIPES Alv. Silv., *Fl. Mont.* 1: 230--231, pl. 153. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 230--231 & 408, pl. 153. 1928; Wangerin in Just, *Bot. Jahresber.* 57 (1): 476. 1937; A. W. Hill, *Ind. Kew. Suppl.* 9: 199. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 183. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 13 & 50. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Moldenke, *Résumé* 99 & 488. 1959; Moldenke, *Fifth Summ.* 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., *Fl. Mont.* 1: pl. 153. 1928.

This species is based on A. Silveira 730, collected "In campis arenosis in Serra do Cipó", Minas Gerais, Brazil, in April of 1925 and deposited in the Silveira herbarium. On page 408 of his work Silveira (1928) gives the year of collection of the type as "1923"; whether this is meant as a correction of the date given on page 231 or if it represents a misprint is not clear. He comments that the species is "A. P. villosulo Mart. valde affinis, foliis haud pruinosis, pilis basi non bulbosis et bracteis canescentibus precipue differt". Thus far the species is known only from the original collection.

PAEPALANTHUS LAXIFOLIUS Körn. in Mart., *Fl. Bras.* 3 (1): 395--396. 1863.

Synonymy: Dupatya laxifolia (Körn.) Kuntze, *Rev. Gen. Pl.* 2: 746. 1891. Dupatya laxifolia Kuntze apud Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., *Fl. Bras.* 3 (1): 288, 395--396, & 507. 1863; Kuntze, *Rev. Gen. Pl.* 2: 746. 1891; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 2: 402. 1894; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 201, 284, & 290. 1903; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 145. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 13, 30, & 50. 1946; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 2: 402. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 145. 1959; Moldenke, *Résumé* 99, 280, & 488. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 2: 402. 1960; Moldenke, *Fifth Summ.* 1: 163 & 482 (1971) and 2: 953. 1971.

This species is based on Sellow 1297 from Serra de Itambé, Minas Gerais, Brazil, deposited in the Berlin herbarium, where it was photographed by Macbride as his type photograph number 10619. Thus

far it is known only from the original collection.

Citations: BRAZIL: Minas Gerais: Sellow 1297 [Macbride photos 10619] (B--type, B--isotype, N--photo of type, N--photo of type, W--photo of type, Z--isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS LEIOTHRICOIDES Alv. Silv., Fl. Mont. 1: 127--128, pl. 1928.

Synonymy: Paepalanthus leiотrichoides Alv. Silv. ex Rennó, Levant. Herb. Inst. Agron. Minas 70, sphalm. 1960.

Bibliography: Alv. Silv., Fl. Mont. 1: 127--128 & 408, pl. 79. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Résumé Suppl. 3: 34. 1962; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 585 & 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 79. 1928.

This species is based on A. Silveira 839, collected "Sub rupibus, locis arenosis, inter Serrinha et Itacambira", Minas Gerais, Brazil, in July of 1926, and deposited in the Silveira herbarium. On page 408 of his work (1928) Silveira emends the type locality and date to "Serrinha, Grão Mogol, 1926". He comments that the "Species a P. comoso Alv. Silv. forma foliorum et pedunculis pubescentibus praecipue differt". It is also very similar in appearance to P. exiguus (Bong.) Körn. and P. atrovaginatus Ruhl.

Citations: BRAZIL: Minas Gerais: Héringer & Castellanos 6114 (B, Z); Mello Barreto 10686 [Herb. Jard. Bot. Belo Horiz. 32742] (N); J. E. Oliveira 103 [Herb. Jard. Bot. Belo Horiz. 32624] (N).

PAEPALANTHUS LEISERINGII Ruhl. in Engl., Pflanzenreich 13 (4-30): 216--217. 1903.

Synonymy: Paepalanthus leisseringii Ruhl. ex Alv. Silv., Fl. Mont. 1: 408. 1928.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 214, 216--217, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 408. 1928; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 326 & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 585 & 953. 1971; Moldenke, Biol. Abstr. 56: 3000. 1973; Moldenke, Phytologia 28: 439. 1974.

The type of this species was collected by Henrique Carlos de Magalhães Gomes (no. 2195) in the Serra de Ibitipoca, Minas Gerais, Brazil, in April of 1896 and is deposited in the Berlin herbarium, where it was photographed by Macbride as his type photograph number 10621. Ruhland (1903) comments that the "Planta ab affinibus pedunculis brevibus et bracteis flores stipantibus pro ratione latis abhorrens, cl. Dr. Leisering dedicata".

The Smith & Klein 8241, distributed as P. leiseringii, is actually the type collection of var. kleinii Moldenke & Smith. Contrary to my statement in a previous publication (1971), the typical form of this species is not at present known from Santa Catarina.

Citations: BRAZIL: Minas Gerais: H. Magalhães Gomes 2915 [Macbride photos 10621] (B--type, N--photo of type, N--photo of type, W--photo of type, Z--isotype).

PAEPALANTHUS LEISERINGII var. KLEINII Moldenke & Smith ex Moldenke, Phytologia 25: 431. 1973.

Bibliography: Moldenke, Phytologia 25: 431. 1973; Moldenke, Biol. Abstr. 56: 3000. 1973.

This variety is based on Smith & Klein 8241, collected in a bog by the Rio Bandeirinhas, 23 km. north of Lajes, at an altitude of 800--900 meters, in the municipality of Lajes, Santa Catarina, Brazil, on December 4, 1956, and is deposited in the United States National Herbarium in Washington. It was previously misidentified as typical P. leiseringii Ruhl.

Citations: BRAZIL: Santa Catarina: Smith & Klein 8241 (N--isotype, W--2267638--type, Z--isotype).

PAEPALANTHUS LEPIDUS Alv. Silv., Fl. Serr. Min. 57, pl. 19. 1908.

Bibliography: Alv. Silv., Fl. Serr. Min. 57, pl. 19. 1908; Alv. Silv., Fl. Mont. 1: 241--243 & 409, pl. 161. 1928; Stapf, Ind. Lond. 4: 518. 1930; A. W. Hill, Ind. Kew. Suppl. 8: 169. 1933; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13. 1946; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 236--237. 1956; Moldenke, Résumé 99 & 488. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Serr. Min. pl. 19. 1908; Alv. Silv., Fl. Mont. 1: pl. 161. 1928.

This species is based on A. Silveira 374, collected "In campis arenosis prope Capão Redondo in Serra do Cipó", Minas Gerais, Brazil, in April of 1905 and is deposited in the Silveira herbarium. The species has been collected in anthesis in April and from August to October.

Citations: BRAZIL: Minas Gerais: Macedo 3218 (N, S); Mello Barreto 1042 [Brade 14475; Herb. Jard. Bot. Rio Jan. 28453] (B); Mello Barreto & Brade 1042 [Herb. Jard. Bot. Belo Horiz. 10728] (N).

PAEPALANTHUS LEUCOBLEPHARUS Körn. in Mart., Fl. Bras. 3 (1): 388. 1863.

Synonymy: Dupatya leucoblephara (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya leucoblephara Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus leucoblepharus Ruhl. ex Alv. Silv., Fl. Mont. 1: 409, sphalm. 1928. Paepalanthus coriaceus Pouls. ex Moldenke, Résumé Suppl. 1: 20, in syn.

1959.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 293, 388, & 506. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 128, 148, 284, & 290. 1903; Lützelburg, Estud. Bot. Nordest. 3: 149. 1923; Herzog in Fedde, Repert. Spec. Nov. 20: 84 & 85. 1924; Alv. Silv., Fl. Mont. 1: 55 & 409. 1928; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Phytologia 4: 148. 1952; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 281, & 488. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Phytologia 20: 366 & 367. 1970; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 580 & 953. 1971; Moldenke, Phytologia 25: 241. 1973.

This species is based on an unnumbered collection by Ludwig Riedel from somewhere in eastern Brazil, deposited in the Lenin-grad herbarium. Macbride photographed a specimen of Glaziou 15534 in the Berlin herbarium as his type photograph number 22285; this is the type of P. coriaceus Pouls. and is the collection cited by Ruhland (1903) as P. leucoblepharus and as the only one available to him when he wrote his monograph of the family. Ruhland comments that "Cum specimina originaria mihi non suppetant, confirmare atque declarare non possum, plantarum a cl. Glaziou collectam huc ducendam esse. Sed florum structura atque praesertim foliorum et vaginarum indumentum mirabile perbene ad descriptionem Koernicke-anam quadrant. Monendum tamen est, folia in nostra specimine fere obtusiuscula esse et non acuminata, sed persuasum habeo, destructione praematura foliorum acumen jam in illo delapsum esse, quod etiam in aliis speciebus multis haud raro observatur." It should be noted that the Glaziou specimen referred to above bears a printed label reading "RIO DE JANEIRO", but the collection was actually made on Morro da Carapuça, Caraça, Minas Gerais.

Silveira (1928) cites A. Silveira 252 from Serra dos Crystaes, Minas Gerais, collected in 1908. He avers that the species is related to P. ibitipocensis Alv. Silv. Herzog (1924) claims that it is related to P. barbulatus Herzog and closely related to P. lützelburgii Herzog.

Lützelburg collected P. leucoblepharus in moist places at 1600-1700 meters altitude.

Citations: BRAZIL: Bahia: Lützelburg 219 (N), 219a (Mu, Z), 219b (Mu). Minas Gerais: Glaziou 15534 [Macbride photos 22285] (B, N--photo, N--photo, W--photo).

PAEPALANTHUS LEUCOCEPHALUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 200. 1903.

Synonymy: *Thelxinoë leucocephala* Ruhl. ex Moldenke. Résumé Sum-

pl. 3: 23, in syn. 1959.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 12, 199, 200, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 52. 1930; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Bourdu, Bull. Soc. Bot. France 104: 156. 1957; Moldenke, Résumé 99 & 488. 1959; Moldenke, Résumé Suppl. 1: 23. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Phytologia 19: 35. 1969; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 642 & 953. 1971.

This species is based on W. Schwacke 8503, collected on April 4, 1892, in the Serra dos Cristaes, Minas Gerais, Brazil, and deposited in the herbarium of the Botanisches Museum in Berlin — a specimen which Ruhland first annotated as Thelxinoë leucocephala. The species is extremely close to P. scleranthus Ruhl. and I am not at all certain that the two are distinct. Ruhland (1903) notes that the "Species P. sclerantho habitu et florum structura valde affinis, sed optime ab illo jam capitulis albidis etc. diversa est."

Citations: BRAZIL: Minas Gerais: Schwacke 8503 (B--type, Z--isotype).

PAEPALANTHUS LEUCOCYANEUS Tutin, Journ. Bot. 72: 336. 1934.

Synonymy: Paepalanthus tafelbergensis Moldenke, Bull. Torrey Bot. Club 75: 199--200. 1948. Paspalum leucocyaneus Tutin ex Moldenke, Résumé Suppl. 1: 22, in syn. 1959.

Bibliography: Tutin, Journ. Bot. 72: 336. 1934; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Moldenke, Known Geogr. Distrib. Erioc. 6, 7, & 50. 1946; Moldenke, Phytologia 2: 373 & 381. 1947; Moldenke in Maguire & al., Bull. Torrey Bot. Club 75: 198--200. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 66, 67, 210, & 212. 1949; Moldenke, Alph. List Cit. 3: 701. 1949; Moldenke, Phytologia 4: 148. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 176. 1953; Moldenke, Résumé 75, 77, & 488. 1959; Moldenke, Résumé Suppl. 1: 22 (1959), 6: 6 (1963), and 14: 9. 1966; Lindeman & Görtz-van Rijn in Pulle & Lanjouw, Fl. Surin. 1 [Meded. Konink. Inst. Trop. 30, Afd. Trop. Prod. 11]: 331 & 332. 1968; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 130, 132, & 163 (1971) and 2: 591, 593, & 953. 1971.

This species is based on Tutin 481, collected in shallow sandy pools on the riverbank at Amatuk, along the Potaro River, at an altitude of about 300 feet, Guyana, on August 19, 1933, and is deposited in the herbarium of the British Museum (Natural History) in London. The collector says of the plant: "Leaves pale green, crowded at the summit of a short erect stem. Flowers white tinged with purplish-blue".

The type of P. tafelbergensis is Maguire 24485, said to have been frequent in Sphagnum border of seeps on bed rock on Savanna VIII, Tafelberg, Surinam, and collected there on August 25, 1944, deposited in the Britton Herbarium at the New York Botanical Gar-

den. Sandwith describes the plant as having "leaves pale green, flower-heads white".

The species has been found growing in muck soil on savannas, on open rock slabs in Clusia woodlands, in moist sand by pools, and in shallow sandy pools on riverbanks, flowering in August. It is certainly very similar to and probably closely related to P. tatei. A letter to me from Dr. A. Görts-van Rijn, dated April 25, 1966, states "I have been looking to the Paepalanthus species P. maguirei, P. leucocyaneus and P. tatei. As far as I could decide with the material of the Utrecht herbarium I can agree with you on the conspecificity of P. maguirei and P. tatei. I suppose that our isotype specimen of P. tafelbergensis is probably not P. tatei, but a P. leucocyaneus, but I am not quite sure on that because I have only seen this one specimen and cannot say anything on the whole species, but the leaves look mucronate, one of the characters of P. leucocyaneus along with long hairs outside the involucre. The form of the involucral bracts is a difficult character to use. I do not know if it changes within the species or that some of the outermost bractlets fall off rather soon. In Bull. Torrey Bot. Club 75: 198. 1948 you give the length of the female sepals as 2.6 mm. I suppose this to be a typographic error for 1.6 or something like that, at least I could not find any sepal of that length."

Lindeman & Görts-van Rijn (1968) cite the following collections from Surinam: Maguire 24750, Pulle 215, J. P. Schulz 10090, 10126, & 10298, Tutin 481, and Versteeg 772.

Material of P. leucocyaneus has been misidentified and distributed in some herbaria as P. lamarckii Kunth.

Additional citations: GUYANA: Maguire & Fanshawe 23264 (Se--182994); Sandwith 1256 (B, N, Ut--42280a); Tutin 481 (Ut--39784a--isotype); Whitton 127 (K). SURINAM: Pulle 215 (Ut--44069a); Versteeg 772 (Ut--421). BRAZIL: Amapá: Irwin, Egler, & Murça Pires 47133 (N).

PAEPALANTHUS LILLIPUTIANUS Moldenke, Phytologia 3: 115. 1949.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 66 & 210. 1949; Moldenke, Phytologia 3: 115 (1949) and 4: 148. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 175. 1953; Moldenke, Résumé 75 & 488. 1959; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 130 (1971) and 2: 953. 1971.

PAEPALANTHUS LINDENII Ruhl. in Engl., Pflanzenreich 13 (4-30): 206--207. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 206--207. & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 53. 1930; Moldenke, Known Geogr. Distrib. Erioc. 5 & 50. 1946; Moldenke, Alph. List Cit. 2: 611 (1948) and 3: 664. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 61 & 210. 1949; Moldenke, Phytologia 4:

148—149. 1952; Moldenke, *Résumé* 67 & 488. 1959; Moldenke, *Résumé* Suppl. 3: 12 (1962) and 12: 2. 1965; Moldenke, *Fifth Summ.* 1: 118 (1971) and 2: 953. 1971.

This species is based on Linden 1318, collected at 3600 m. altitude on the páramo at Alvaracin, province Tunja, Boyacá, Colombia, deposited in the Berlin herbarium and there photographed by Macbride as his type photograph number 10622. Recent collectors have encountered the species along trails, while Fosberg describes it as "common on rocky banks and ledges of small rocky peak with brushy subpáramo vegetation, single or slightly cespitose, the flowers white with blackish involucres". It has been collected at altitudes of 2440—3600 meters, flowering in March, July, September, and November, and fruiting in July.

Additional citations: COLOMBIA: Boyacá: F. R. Fosberg 22242 (N, N); Grubb, Curry, & Fernandez-Perez 510 (K, W--2322456); Linden 1318 [Macbride photos 10622] (B--type, N--photo of type, N--photo of type, W--photo of type, Z--isotype). Cundinamarca: M. L. Grant 10205 (W--2166105). Santander: Fassett 25557 [Herb. U. S. Nat. Arb. 217370]. (W--2166176, Ws).

PAEPALANTHUS LINEARIFOLIUS Alv. Silv., Fl. Mont. 1: 57—58. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 57—58 & 409. 1928; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Moldenke, *Known Geogr. Distrib. Erioc.* 13 & 50. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Moldenke, *Résumé* 99 & 488. 1959; Moldenke, *Fifth Summ.* 1: 163 (1971) and 2: 953. 1971.

This species is based on A. Silveira 806, collected "In campis argillosis siccisque secus Serra da Moeda", Minas Gerais, Brazil, in July of 1926 and deposited in the Silveira herbarium. On page 409 of his work, however, Silveira (1928) cites A. Silveira 808 from Itacambira, Minas Gerais -- whether this is intended as a correction of the citation given with his type description or actually refers to a second collection, is not clear. He comments that the "*Species a P. Henriquei* Alv. Silv. et Ruhl. proxima, sed foliis subulatis, bracteis involucrantibus subulatis et stigmatibus haud bifidis praecipue differt."

PAEPALANTHUS LINGULATUS (Bong.) Kunth, Enum. Pl. 3: 522. 1841.

Synonymy: Eriocaulon ligulatum Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: 626. 1831. Eriocaulon ligulatum Bong. ex D. Dietr., *Syn. Pl.* 5: 261, sphalm. 1852 [not E. ligulatum (Vell.) L. B. Sm., 1939]. Paepalanthus lingulatus Kunth apud Körn. in Mart., *Fl. Bras.* 3 (1): 376. 1863. Dupatya lingulata (Bong.) Kuntze, *Rev. Gen. Pl.* 2: 746. 1891. Dupatya lingulata Kuntze apud Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902. Eriocaulon ligulatus Bong. ex Moldenke, *Phytologia* 4: 149, in syn. 1952. Eriocaulon lingulatus Bong. ex Moldenke, *Ré-*

sumé 289, in syn. 1959.

Bibliography: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: 626. 1831; Bong., *Ess. Monog. Erioc.* 26 (1831) and 60—61 & 223—224, pl. 12 (sup.), fig. 1—4. 1832; Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 2: 223—224, pl. 12 (sup.), fig. 1—4. 1832; Steud., *Nom. Bot.*, ed. 2, 1: 585. 1840; Kunth, *Enum. Pl.* 3: 522, 544, 574, 613, & 625. 1841; D. Dietr., *Syn. Pl.* 5: 261. 1852; Steud., *Syn. Pl. Glum.* 2: [Cyp.] 279 & 334. 1855; Körn. in Mart., *Fl. Bras.* 3 (1): 376, 507, & 508. 1863; Kuntze, *Rev. Gen. Pl.* 2: 746. 1891; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 123, 130, 284, 286, & 290. 1903; Alv. Silv., *Fl. Mont.* 1: 409. 1928; Stapf, *Ind. Lond.* 3: 90. 1930; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 13, 30, 36, & 50. 1946; Moldenke, *Phytologia* 2: 378. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Moldenke, *Phytologia* 4: 149. 1952; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 145. 1959; Moldenke, *Résumé* 99, 281, 289, & 488. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Moldenke, *Phytologia* 18: 266 (1969) and 20: 421. 1970; Moldenke, *Fifth Summ.* 1: 163 & 482 (1971) and 2: 504, 574, & 953. 1971; Moldenke, *Phytologia* 24: 471 (1972) and 25: 241. 1973.

Illustrations: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 2 (3): pl. 12 (sup.), fig. 1—4. 1832; Bong., *Ess. Monog. Erioc.* pl. 12 (sup.), fig. 1—4. 1832.

This species is based on L. Riedel 1410, collected "in glareosis Serra da Lapa", Minas Gerais, Brazil, flowering in November, and deposited in the Leningrad herbarium. Bongard's original (1831) description of this species is "pusillum; foliis pedunculos subaequantibus confertis lingulatis obtusis, parce ciliatis; pedunculis glabriusculis; vagina glabra albida. Tab. XII. Habitat in glareosis Serra da Lapa. Floret Novembri. Obs. Affine praecedenti [P. blepharophorus], a quo differt, praeter notas in characterem receptas, statura humilior; foliis ad insertionem nudis (nec piloso-lanatis) et margine pilis longis distantibus ciliatis, qui in E. blepharophoro breves et densi."

Ruhland (1903) cites only the original type collection, but affirms that the hairs on the flower-parts are like those in P. blepharocnemis Mart. [a synonym of P. aequalis (Vell.) J. F. Macbr.]. Silveira (1928) cites A. Silveira 811 from Itacambira, Minas Gerais.

Citations: MOUNTED ILLUSTRATIONS: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 2 (3): pl. 12 (sup.). 1832 (N, Z).

PAEPALANTHUS LODICULOIDES Moldenke, *Bull. Torrey Bot. Club* 68: 68—69. 1940.

Bibliography: Moldenke, *Bull. Torrey Bot. Club* 68: 68—69. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 5 & 50. 1946; Molden-

ke, *Alph. List Cit.* 1: 131 (1946) and 4: 1074. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 61 & 210. 1949; Moldenke, *Phytologia* 4: 149. 1952; E. J. Salisb., *Ind. Kew. Suppl.* 11: 175. 1953; Anon., *U. S. Dept. Agr. Bot. Subj. Index* 5: 4227. 1958; Moldenke, *Résumé* 67 & 488. 1959; Moldenke, *Résumé Suppl.* 5: 5 (1962) and 6: 5. 1963; Moldenke, *Fifth Summ.* 1: 118 (1971) and 2: 953. 1971.

Recent collectors describe in inflorescence of this species as white and have found the plant growing on open hills, in very small groups with mosses, between hummocks near the edge of lakes, and with mosses and liverworts on mounds forming the raised edge of small lakebeds, at altitudes of 3000—4300 meters [on one label "4200 feet" appears as the altitude, but this is probably an error in transcription], flowering in February, March, August, September, November, and December, and fruiting in February, August, and September. Barclay & Juaibioy encountered it as "silvery separate cushions on páramo with *Espeletia* and few shrubs on rocky north-facing slopes". Little describes it as a "cushion plant of páramo, 2 cm. tall, scattered in bare places in bunch grass".

Langenheim 3590 bears a label describing the plant as a "cushion plant among grasses on excellent soil, evidence of much burning and clearing for cultivation", but on his no. 3589 it is called a "common small shrub, corolla white-lavender, among grasses on rocky ridges" -- probably this is a case of mixed labels in the mounting process.

It should be noted here that the original description of this species was validly and officially published on December 31, 1940 -- not in "1941" as is stated on the title-page of the issue.

Additional citations: COLOMBIA: Boyacá: Grubb, Curry, & Fernandez-Perez 418 (K), 762 (W--2322662); Langenheim 3589 (Ca--1356276, E--1980543), 3590 (W--2268617, Z). Cundinamarca: Barclay & Juaibioy 6113 (N), 7183 (N); Cuatrecasas & Jaramillo Mejía 25987 (Fg); García-Barriga 17171 (W--2569585a); Uribe Uribe 4672 (Lw). Méta: E. L. Little Jr. 7014 (W--2059694). Santander: Barclay & Juaibioy 10412 (N).

PAEPALANTHUS LOEFGRENIANUS Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 142. 1903.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 5, 126, 142, & 290. 1903; Prain, *Ind. Kew. Suppl.* 3: 126. 1908; Alv. Silv., *Fl. Mont.* 1: 409. 1928; Ruhl. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 2, 15a: 42. 1930; Moldenke, *Known Geogr. Distrib. Erioc.* 13 & 50. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Moldenke, *Résumé* 99 & 488. 1959; Tomlinson in C. R. Metcalfe, *Anat. Monocot.* 3: 190. 1969; Moldenke, *Fifth Summ.* 1: 163 (1971) and 2: 953. 1971; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1158--1159 & Ind. 20. 1972.

This species is based on Löfgren & Edwall 2227, collected in June of 1893 on a campo at São João da Boa Vista, São Paulo, Bra-

zil, on the exploratory expedition of the Comissão Geographica e Geologica de São Paulo, and is deposited in the Copenhagen herbarium, where it was photographed by Macbride as his type photograph number 22287. Silveira (1928) cites a Collector undetermined 421 from the same locality, also collected in 1893 — possibly this represents the field number of Löfgren and/or Edwall, while the number cited by Ruhland may be the expedition record number. If so, then the specimen in the Silveira herbarium is actually an isotype and the species is known thus far only from the original collection.

Citations: BRAZIL: São Paulo: Löfgren & Edwall 2227 [Macbride photos 22287] (B—isotype, N—photo of type, W—photo of type).

PAEPALANTHUS LOMBENSIS Alv. Silv., Fl. Mont. 1: 180--181, pl. 116. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 180--181, 184, & 409, pl. 116. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 116. 1928.

This species is based on A. Silveira 514 from "Secus margines rivulorum in praeditio Lomba vocato, locis arenosis humidisque, prope montem Itambé do Serro", Minas Gerais, Brazil, in April of 1908 and is deposited in the Silveira herbarium. Silveira (1928) comments that the "Species a P. glabrifolio Ruhl affinis, sed habitu robustiore; bracteis involucrantibus ac flores stipantibus dorso pilosis et exteriore florum masculorum sepalorum indumento et sepalis florum femineorum linearibus basique connatis distincta". It belongs in the Subsection Actinocephaloides Ruhl. and is known thus far only from the original collection.

PAEPALANTHUS LONGICAULIS Alv. Silv., Fl. Mont. 1: 236--237, pl. 157. 1928.

Synonymy: Paepalanthus lingicaulis Moldenke, in herb.

Bibliography: Alv. Silv., Fl. Mont. 1: 236--237 & 409, pl. 157. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Hocking, Excerpt. Bot. A.7: 455, 1964; Moldenke, Résumé Suppl. 8: 2 (1964) and 11: 4. 1964; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159 & Ind. 20. 1972.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 157. 1928.

This species is based on A. Silveira 632, collected "In campis humidis in serra do Cipó", Minas Gerais, Brazil, in April of 1915

and deposited in the Silveira herbarium. However, on page 409 of Silveira's work (1928) he cites an A. Silveira 692, collected in the Serra do Cipó in 1905 -- whether this represents a correction of the figures given in his original description or represents another earlier collection is not clear. He comments that the species "A. P. macropode Ruhl. foliis, vaginis et bracteis involu-
crantibus praecipue differt".

PAEPALANTHUS LONGICAULIS var. **GLABER** Moldenke, *Phytologia* 9: 266. 1963.

Synonymy: Paepalanthus longicaulis var. glaber Moldenke, in herb.

Bibliography: Moldenke, *Phytologia* 9: 266. 1963; Hocking, *Excerpt. Bot. A.7*: 455. 1964; Moldenke, *Résumé Suppl.* 8: 2 (1964) and 11: 4. 1964; Moldenke, *Fifth Summ.* 1: 163 (1971) and 2: 953. 1971; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1159 & Ind. 20. 1972.

Irwin, Maxwell, & Wasshausen describe this plant as "decumbent in tall grasses, the stem ends erect, to 1 m. long, heads white" and found it growing along creek margins at 1400 m. altitude, flowering in February.

Angely (1970) seems to imply that I published this trinomial in "*Fl. Mont.* 236. 1928 (a sp.)", but this is incorrect. I first published it in *Phytologia* 9: 266 (1963) and it has nothing whatever to do with the P. glaber of Körnicke, which is actually a synonym of Syngonanthus gracilis var. glabriusculus Ruhl. There is no Paepalanthus glaber mentioned on page 236 of A. Silveira's *Fl. Mont.*, vol. 1 (1928).

Citations: BRAZIL: Minas Gerais: Héringer & Castellanos 6096 (Z--type); Irwin, Maxwell, & Wasshausen 20249 (Ld, N); Tryon & Tryon 6829 (Ac, Ld). São Paulo: Pabst 4777 (Bd--10932).

PAEPALANTHUS LONGIFOLIUS Körn. in Mart., *Fl. Bras.* 3 (1): 333. 1863.

Synonymy: Dupatya longifolia (Körn.) Kuntze, *Rev. Gen. Pl.* 2: 745. 1891. Dupatya longifolia Kuntze apud Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., *Fl. Bras.* 3 (1): 333 & 507. 1863; Kuntze, *Rev. Gen. Pl.* 2: 745. 1891; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 2: 402. 1894; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 190, 196, 284, & 290. 1903; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 2: 402. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 13, 30, & 50. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 145. 1959; Moldenke, *Résumé* 99, 281, & 488. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 2: 402. 1960; Moldenke, *Fifth Summ.* 1: 163 & 482 (1971) and 2: 953. 1971.

This species is based on an unnumbered Riedel collection from

central Brazil, probably deposited in the Leningrad herbarium. It is known thus far only from the original collection.

PAEPALANTHUS LOXENSIS Moldenke, *Phytologia* 2: 229—231. 1947.

Additional bibliography: Moldenke, *Phytologia* 2: 229—231, 373, & 380. 1947; Moldenke, *Alph. List Cit.* 3: 974. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 70 & 210. 1949; Moldenke, *Phytologia* 4: 149. 1952; E. J. Salisb., *Ind. Kew. Suppl.* 11: 175. 1953; Moldenke, *Résumé* 80 & 488. 1959; Moldenke, *Fifth Summ.* 1: 136 (1971) and 2: 953. 1971.

This species has been found growing as a páramo herb in wet spots on mixed shrubby páramos and in dwarf woodland which is moist but subject to drying, at altitudes of 2500—3500 meters, flowering in June, October, and November.

Additional citations: ECUADOR: Loja: D. H. Knight 924 (Id, Ws, Z), 974 (Ws); J. A. Steyermark 54452 (S—isotype).

PAEPALANTHUS LUNDII Körn. in *Mart.*, *Fl. Bras.* 3 (1): 385—386. 1863.

Synonymy: Dupatya lundii (Körn.) Kuntze, *Rev. Gen. Pl.* 2: 74. 1891. Dupatya lundii Kuntze apud Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902.

Bibliography: Körn. in *Mart.*, *Fl. Bras.* 3 (1): 385—386 & 507. 1863; Kuntze, *Rev. Gen. Pl.* 2: 74. 1891; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 2: 402. 1894; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 1, 145. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 127, 140, 145, 284, & 290. 1903; Alv. Silv., *Fl. Mont.* 1: 409. 1928; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 2, 2: 402. 1946; Moldenke, *Known Geogr. Distrib. Erioc.* 13, 30, & 50. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 210. 1949; Durand & Jacks., *Ind. Kew. Suppl.* 1, pr. 3, 145. 1959; Moldenke, *Résumé* 99, 281, & 488. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 3, 2: 402. 1960; Moldenke, *Fifth Summ.* 1: 163 (1971) and 2: 482 & 953. 1971; Angely, *Fl. Anal. & Fitogeogr. Est. S. Paulo*, ed. 1, 6: 1159 & *Ind.* 20. 1972.

Ruhland (1903) cites for this species only the two cotype collections, Lund s.n. and L. Riedel 2204 from "auf Campos, an feuchten Stellen, Sümpfen und ihren Rändern beim Berge Arara-Coara entlang dem Flusse Tieté und bei Villa Franca", São Paulo, Brazil, flowering from May to July. Macbride photographed the Riedel cotype in the Berlin herbarium as his type photograph number 10623. Silveira (1928) cites A. Silveira 495 from Serro Pouso Alto, collected in 1908.

Citations: BRAZIL: São Paulo: L. Riedel 2204 [Macbride photos 10623] (B—cotype, M—cotype, N—photo of cotype, N—photo of cotype, S—cotype, Ut—368—cotype, W—photo of cotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS LUTEOLUS Alv. Silv., *Fl. Mont.* 1: 86—88, pl. 52. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 86—88 & 409, pl. 52.

1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 52. 1928.

This species is based on A. Silveira 766 from "in campis prope Baraunas, in Serra Geral", Minas Gerais, Brazil, collected in June of 1925 and deposited in the Silveira herbarium. Silveira (1928) says that the "Species a P. ruficepse Ruhl. et P. flavo-rutilo Ruhl. foliis acutis et bracteis dorso dense villosa praecipue differt". It is known thus far only from the original collection.

The M. A. Chase 9165, distributed as P. luteolus, is actually Syngonanthus xeranthemoides (Bong.) Ruhl.

PAEPALANTHUS LÜTZELBURGII Herzog ex Lützelburg, Estud. Bot. Nordeste. 3: 138 & 150, hyponym (1923); Herzog in Fedde, Repert. Spec. Nov. 20: 84—85. 1924.

Synonymy: Paepalanthus luetzelburgii Herzog ex Lützelburg, Estud. Bot. Nordeste. 3: 138. 1923. Paepalanthus lutzburgii Herzog. ex Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946.

Bibliography: Lützelburg, Estud. Bot. Nordeste. 3: 138 & 150. 1923; Herzog in Fedde, Repert. Spec. Nov. 20: 84—85. 1924; Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 61 [43]. 1928; A. W. Hill, Ind. Kew. Suppl. 7: 174. 1929; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Phytologia 4: 149. 1952; Moldenke, Résumé 99, 326, & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 585 & 953. 1971; Moldenke, Phytologia 25: 241. 1973.

This species is based on Lützelburg 468 from soil rich in mica, Rio das Contas, in the Serra Tres Irmãos, Bahia, Brazil, at an altitude of 1000 meters, deposited in the herbarium of the Botanische Staatssammlung in Munich, where it was photographed by Macbride as his type photograph number 18707. The original label on the specimen is inscribed "408" but was corrected by pen to "468" and Macbride's label, curiously, reads "4680".

Herzog (1924) notes that the species "Dem P. leucoblepharus Koern. nächst verwandt aber durch kleinere Hüllbrakteen die längeren, auf der Köpfchenoberfläche sichtbaren Blütentragblätter und die sehr stark entwickelten Lappen der Kronblattöhre gut unterschieden". It seems to me closely to resemble P. undulatus Ruhl.

Citations: BRAZIL: Bahia: Lützelburg 468 [Macbride photo 18707] (Mu—type, Mu—isotype, N—photo of type, W—photo of type, Z—
isotype).

PAEPALANTHUS LYCOPODIOIDES Alv. Silv., Fl. Mont. 1: 160—161, pl. 101. 1928.

Synonymy: Paepalanthus lycopodiifolius Alv. Silv., Fl. Mont. 1: 409. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 160—161 & 409, pl. 101. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99, 326, & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 585 & 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 101. 1928.

This species is based on A. Silveira 694, from "In campis siccis arenosis prope Diamantina", Minas Gerais, Brazil, collected in April, 1918, and deposited in the Silveira herbarium. On page 409 of his work, however, Silveira (1928) cites the type number as from "Baraunas 1925", but if this is intended as a correction of the data given in the original description or represents a second collection is not clear.

Recent collectors have found this plant growing in wet sandy campos, flowering in February.

Citations: BRAZIL: Minas Gerais: Hatschbach & Ahumada 31690 (N, Z).

PAEPALANTHUS MACARENENSIS Moldenke, Mutisia 6: 2—3. 1952.

Synonymy: Paepalanthus macarensis Moldenke, Résumé 488, sphalm. 1959.

Bibliography: Moldenke, Mutisia 6: 2—3. 1952; Moldenke, Biol. Abstr. 27: 428. 1953; Moldenke, Mutisia 25: 28. 1956; G. Taylor, Ind. Kew. Suppl. 12: 101. 1959; Moldenke, Résumé 67 & 488. 1959; Moldenke, Résumé Suppl. 5: 5. 1964; Moldenke, Fifth Summ. 1: 118 (1971) and 2: 585 & 953. 1971.

Citations: COLOMBIA: Magdalena: Cuatrecasas & Castañeda 25025 (Z). Méta: Philipson 2295 (Bm--type, N--isotype).

PAEPALANTHUS MACROCAULON Alv. Silv., Fl. Mont. 1: 169—170, pl. 108 & 109. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 169—170 & 409, pl. 108 & 109. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Résumé Suppl. 10: 2. 1964; Moldenke, Bol. Soc. Venez. Cienc. Nat. 26: 411—412. 1966; Moldenke, Fifth Summ. 1: 125 & 163 (1971) and 2: 953. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 108 & 109. 1928.

This species is based on A. Silveira 815 from "In campis, inter saxa quartzosa, prope Serrinha", Minas Gerais, Brazil, collected in July, 1926, and deposited in the Silveira herbarium. On page 409 of his work, Silveira (1928) adds "Grão Mogol" to the descrip-

tion of the type locality. He comments that the "Species a P. refractifolio Alv. Silv. statura, pili acuti et aliis caracteribus differt". Thus far it is known only from the original collection.

PAEPALANTHUS MACROCAULON var. VENAMENSIS Moldenke, Résumé Suppl. 10: 2, nom. nud. (1964); Bol. Soc. Venez. Cienc. Nat. 26: 411. 1966.

Bibliography: Moldenke, Résumé Suppl. 10: 2. 1964; Moldenke, Bol. Soc. Venez. Cienc. Nat. 26: 411. 1966; J. A. Clark, Card-Ind. Gen. Sp. & Var. issue 252. 1966; Moldenke Fifth Summ. 1: 125 (1971) and 2: 953. 1971; Moldenke in Steyermark, Maguire, & al., Mem. N. Y. Bot. Gard. 23: 852. 1972.

This variety is based on Steyermark, Dunsterville, & Dunsterville 92308, collected on semi-open wet ground, at an altitude of 950—1400 meters, in a "bosque enano muscoso, Nor-Este del afluyente derecho (Oeste), subiendo el Río Venamo, arriba de la ladera escarpada de arenisca, Cerro Venamo (parte Sur-Oeste) cerca de los límites con la Guyana Inglesa", Bolívar, Venezuela, on December 28, 1963, deposited in my personal herbarium at present in Plainfield, New Jersey. The plant is described by the collectors as having leaves spreading horizontally, the inflorescence-heads gray-white with blackish at their base, or the "involucre gray-black below, whitish above", and that it is "common" in the type locality. The same collectors also found it growing at the "base of wet spray on vertical calcareous sandstone bluffs" at 1220—1275 meters altitude, flowering in January.

Citations: VENEZUELA: Bolívar: J. A. Steyermark 97921 (Ld); Steyermark, Dunsterville, & Dunsterville 92308 (Z--type), 92761 (Lw).

PAEPALANTHUS MACROCEPHALUS (Bong.) Körn. in Mart., Fl. Bras. 3 (1): 379. 1863.

Synonymy: Eriocaulon macrocephalum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 630. 1831. Paepalanthus macrocephalus Körn. in Mart., Fl. Bras. 3 (1): 378 & 379. 1863. Dupatya macrocephala (Bong.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya macrocephala Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Bong., Ess. Monog. Erioc. 30. 1831; Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 630 (1831) and 5 (2): 25, pl. 33. 1839; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 576 & 613. 1841; D. Dietr., Syn. Pl. 5: 267. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 279 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 378, 379, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 168, 170—171, 284, 286, & 290. 1903; Alv. Silv., Fl. Mont. 1: 149. 1928; Ruhl. in Engl. & Prantl., Nat. Pflanzenfam., ed. 2, 15a: 51. 1930;

Stapf, Ind. Lond. 3: 91. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 36, & 50--52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Alph. List Cit. 4: 1297. 1949; Moldenke, Phytologia 4: 149. 1952; Moldenke, Résumé 99, 281, 290, & 488. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 12: 11. 1965; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 505, 585, & 954. 1961; Moldenke, Phytologia 25: 241 (1973) and 26: 474. 1973.

Illustrations: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 5 (2): pl. 33. 1839.

This species is based on L. Riedel 1036 from "In pretis humidis Serra da Lapa et Serra da Corassa", Minas Gerais, Brazil, deposited in the Leningrad herbarium. Ruhland (1903) has supplied the Riedel number and writes the second locality as "Caraça", telling us that the two Riedel collections, distributed under the same number, were gathered in anthesis in November and in January. He cites also Glaziov 19968 from campos at Formação, near Diamantina, in the same state, flowering in April.

Kunth (1841) claims that Bongard's plate 33 was never published, but actually it was published in the 1839 volume of Bongard's work. Bongard's original (1831) description is "Acaule; pubescens; foliis caespitosis vaginis brevioribus erectis lanceolato-obtusis; pedunculis caespitosis longissimis subincanis; vaginis bifidis; laciniis obtusiusculis....Praecedenti [P. elongatus (Bong.) Körn.] speciei et E. gnaphaloidi Michx. [E. compressum Lam.] affine. A priori distinguendum: 1) foliis brevioribus et obtusioribus; 2) vaginis foliis duplo longioribus bifidis (nec oblique fissis). Alterum differt: foliis subulato-ensiformibus. E. decangulare H. et B. equidem affinis species."

Additional citations: BRAZIL: Minas Gerais: Glaziov 19968 (B); L. Riedel 1036 (B--cotype, Ut--369--cotype, Z--cotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS MACROCEPHALUS var. MINARUM (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 171. 1903.

Synonymy: Paepalanthus minarum Körn. in Mart., Fl. Bras. 3 (1): 378--379. 1863. Dupatya minarum (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya minarum Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus macrocephalus var. minarum Ruhl. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Paepalanthus obtusifolius Mart. ex Moldenke, Phytologia 25: 241, in syn. 1973 [not P. obtusifolius (Steud.) Körn., 1863].

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 314, 378--379, & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew.

Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 7, 171, 284, 290, & 291. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, & 50--52. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 281, 326, 327, & 488. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 12: 11. 1965; Moldenke, Fifth Summ. 1: 163 & 483 (1971) and 2: 585, 586, & 954. 1971; Moldenke, Phytologia 25: 241. 1973.

This variety, as well as the cheironymous *P. obtusifolius* of Martius, are based on an unnumbered Martius collection from "an hochgelegenen Standorten zwischen Ouro Preto und Tejuco", Minas Gerais, Brazil, collected in May of 1818 and deposited in the herbarium of the Botanische Staatssammlung in Munich, where it was photographed by Macbride as his type photograph number 18708.

The variety is thus far known only from the original collection, differing from the typical form of the species in its shorter, completely glabrous leaves, which are 1.5--2.5 cm. long and 3 mm. wide at the midpoint, and in its involucre bractlets being persistently villosulous.

Citations: BRAZIL: Minas Gerais: *Martius s.n.* [In altis inter Va. Ra. et Tejuco, Maio 1818; Macbride photos 18708] (Mu--type, N--photo of type, W--photo of type).

PAEPALANTHUS MACROCEPHALUS var. *PACHYPHYLLUS* (Körn.) Ruhl. in Engl., Pflanzenreich 13 (4-30): 171 [as "*pachyphylla*"]. 1903.

Synonymy: *Paepalanthus pachyphyllus* Körn. in Mart., Fl. Bras. 3 (1): 378--379. 1863. *Dupatya pachyphylla* (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. *Dupatya pachyphylla* Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. *Paepalanthus macrocephalus* var. *pachyphylla* Ruhl. in Engl., Pflanzenreich 13 (4-30): 171. 1903.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 378--379 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 171 & 290. 1903; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 43. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 50, & 51. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 281, 326, 327, & 488. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 160 & 190. 1969; Moldenke, Fifth Summ. 1: 163 & 483 (1971) and 2: 585, 587, & 954. 1971.

This variety is based on an unnumbered Riedel collection from campos somewhere in Minas Gerais, Brazil, deposited in the Lenin-

grad herbarium. It differs from the typical form of the species in its leaves being glabrous except for the barbate apex, shorter, narrower, and very thick, 4--5.3 cm. long, 1.5--2 mm. wide at the midpoint, and the peduncles somewhat twisted and decidedly incanous. Ruhland (1903) notes that the "Rami fertiles in speciminibus nonnullis adeo breves, ut vix appareant".

PAEPALANTHUS MACROPODUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 212. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 212, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 237 & 409. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 53. 1930; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 954. 1971.

This species is based on W. Schwacke 9230, collected at Santa Rita, Minas Gerais, Brazil, in February of 1893 and deposited in the herbarium of the Botanisches Museum in Berlin. Silveira (1928) cites A. Silveira 363 from the Serra do Cipó in the same state, collected in 1905. Thus far, the species is known only from these two collections. Ruhland (1903) notes that the "Species huius subgeneris e maxima caule elongato, aequaliter folioso valde insignis".

Citations: ERAZIL: Minas Gerais: Schwacke 9230 (B--type).

PAEPALANTHUS MACRORRHIZUS (Bong.) Kunth, Enum. Pl. 3: 524. 1841.

Synonymy: Eriocaulon macrorrhizon Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 630. 1831. Eriocaulon macrorrhizon Bong., Ess. Monog. Erioc. 31. 1831. Eriocaulon macrorrhizum Bong. apud Steud., Nom. Bot., ed. 2, 1: 585. 1840. Eriocaulon macrorrhizum Bong. apud Steud., Syn. Pl. Glum. 2: [Cyp.] 334. 1855. Paepalanthus macrorrhizus Kunth ex Körn. in Mart., Fl. Bras. 3 (1): 341. 1863. Dupatya macrorrhiza (Bong.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya macrorrhiza Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus macrorrhizus Kunth ex Alv. Silv., Fl. Mont. 1: 409. 1928. Dupatya macrorrhiza Kuntze ex Moldenke, Known Geogr. Distrib. Erioc. 30, in syn. 1946. Dupatya macrorrhiza (Bong.) Kuntze ex Moldenke, Fifth Summ. 2: 482, in syn. 1971.

Bibliography: Bong., Ess. Monog. Erioc. 31. 1831; Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 630 (1831) and ser. 6, 2: [55]--58 & [219]--221, pl. 11. 1832; Bong., Ess. Monog. Erioc. [55]--58 & [219]--221, pl. 11. 1832; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 524, 577, 613, & 625. 1841; D. Dietr., Syn. Pl. 5: 262. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 279--280 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 341--343 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402.

1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 2, 6, 8, 213, 214, 284, 286, & 290. 1903; Alv. Silv., Fl. Mont. 1: 409. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 42, 44, & 53. 1930; Stapf, Ind. Lond. 3: 91. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 37, & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 99, 281, 290, 326, & 488. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Renné, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Résumé Suppl. 3: 34 (1962), 17: 10 (1968), and 18: 9. 1969; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 148, 159, & 190. 1969; Moldenke, Fifth Summ. 1: 163 & 482 (1971) and 2: 505, 585, & 954. 1971; Moldenke, Phytologia 25: 238 (1973) and 26: 262. 1973.

Illustrations: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 2: pl. 11. 1832; Bong., Ess. Monog. Erioc. pl. 11. 1832.

This species is based on L. Riedel 1045, collected "in glareosis Serra da Lapa", Minas Gerais, Brazil, flowering in November and probably deposited in the Leningrad herbarium. Ruhland (1903) provides the Riedel collection number and cites also Glaziou 19956 and Schwacke 8493 from the same Brazilian state, flowering in April.

Bongard (1831) comments that "In speciebus sub no. 48-51 [his Eriocaulon argenteum, E. elatum, E. macrorrhizon, and E. piliferum] squammas capitulorum involucentes reflexae". His original description is very short (because he illustrates the plant): "acaulis; rhizomate crasso; foliis linearibus pilosis subtus canescentibus; pedunculis piloso-canis; vaginis pilosis". Ruhland (1903), classifying the species in Subgenus Xeractis Mart., comments that the "Specimina a cl. Glaziou collecta foliis obtusiusculis gaudent." He regards the species as closest related to P. dubius Körn., distinguishing the two as follows:

Leaves densely incanous-lanate; stems greatly incrassate at the base. P. macrorrhizus.
 Leaves, especially the young ones, more or less silvery-
 (rarely villous-) lanate. P. dubius.

The assumption is that the stems of the latter are not greatly incrassate at the base.

Silveira (1928) cites Collector undetermined 255 from Serra da Mantiqueira, Minas Gerais.

The original Bongard publication in the Mémoires has not been available to me for examination, although I have seen what purports to be a reprint (or separate?) of the article in question, so I cannot vouch for the spelling ("macrorrhizon") of the specific epithet there. However, Kunth (1841), Steudel (1855), Jackson (1893), and Stapf (1930) quote the spelling adopted here. The Bongard "reprint" spells the epithet "macrorrhizon".

Citations: BRAZIL: Minas Gerais: Glaziou 19956 (B, W—1194908, Z); Schwacke 8493 (B). MOUNTED ILLUSTRATIONS: drawings & notes by Körnigke (B); Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 2: pl. 11. 1832 (N, Z).

PAEPALANTHUS MACROTRICHUS Alv. Silv., Fl. Serr. Min. 43. 1908.

Synonymy: Paepalanthus nacrothrichus Alv. Silv., Fl. Mont. 1: 409, sphalm. 1928.

Bibliography: Alv. Silv., Fl. Serr. Min. 43. 1908; Alv. Silv., Fl. Mont. 1: 69--70 & 409, pl. 40. 1928; A. W. Hill, Ind. Kew. Suppl. 8: 169. 1933; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99, 326, & 488. 1959; Moldenke, Fifth Summ. 1: 163 (1971) and 2: 586 & 954. 1971; Angely, Fl. Anal. & Fitogeogr. Est. S. Paulo, ed. 1, 6: 1159 & Ind. 20. 1972.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 40. 1928.

This species is based on A. Löfgren s.n. [Herb. Com. Geogr. & Geol. S. Paulo 1485] from "In campis prope Corrego Fundo", São Paulo, Brazil, collected in November of 1889 and deposited as no. 416 in the Silveira herbarium. On page 409 of his work, Silveira (1928) cites the type collection as having been gathered by an unspecified collector.

It should be noted here again that the Angely (1972) work cited in the bibliography above is dated "1970" on its title-page but was not actually published until 1972.

Citations: BRAZIL: Rio de Janeiro: Mello Mattos s.n. [Herb. Mus. Nac. Rio Jan. 4834] (N, S). São Paulo: Löfgren s.n. [Herb. Inst. Com. Geogr. & Geol. S. Paulo 1485] (P--isotype, Z--isotype).

PAEPALANTHUS MACULATUS Alv. Silv., Fl. Mont. 1: 167--169, pl. 107. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 167--169 & 409, pl. 107. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Fifth Summ. 1: 164 (1971) and 2: 954. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 107. 1928.

This species is based on A. Silveira 816, collected "In campis, locis pedregosis et quartzosis, prope Itacambira", Minas Gerais, Brazil, in July of 1926 and is deposited in the Silveira herbarium. Silveira (1928) notes that the "Species ab omnibus sectionis mirabile distincta". It is known thus far only from the original collection.

PAEPALANTHUS MAGALHÃESII Alv. Silv., Fl. Serr. Min. 57. 1908.

Synonymy: Paepalanthus magalhaesii Alv. Silv. apud A. W. Hill,

Ind. Kew. Suppl. 8: 169. 1933. Paepalanthus magalhaesii Sellow ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959. Paepalanthus magalhaensis Alv. Silv. ex Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960. Paepalanthus magalhãesii Alv. Silv. ex Moldenke, Phytologia 25: 241, in syn. 1973.

Bibliography: Alv. Silv., Fl. Serr. Min. 57. 1908; A. W. Hill, Ind. Kew. Suppl. 8: 169. 1933; Moldenke, Known Geogr. Distrib. Erioc. 13 & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Résumé 99 & 488. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 70. 1960; Moldenke, Résumé Suppl. 3: 34. 1962; Moldenke, Fifth Summ. 1: 164 (1971) and 2: 585 & 954. 1971; Moldenke, Phytologia 25: 241. 1973.

The type of this species was collected by Henrique Carlos de Magalhães Gomes — in whose honor it is named — in Minas Gerais, Brazil, and is deposited as number 413 in the Silveira herbarium. An isotype in the Berlin herbarium was photographed by Macbride as his type photograph number 10625, but the handwritten label accompanying the photograph accredits the binomial to Sellow.

Irwin and his associates describe the plant as a "sessile herb in wet places among rocks near creek in creek valley", growing at 1175 meters altitude, flowering and fruiting in September. They describe the flower-heads as white.

Citations: BRAZIL: Distrito Federal: Irwin, Souza, & Reis dos Santos 8700 (N, Z). Minas Gerais: Magalhães Gomes s.n. [Herb. Silveira 413; Macbride photos 10625] (B--isotype, N--photo of isotype, N--photo of isotype, W--photo of isotype, Z--isotype).

PAEPALANTHUS MANICATUS V. A. Pouls. ex Malme, Bih. Svensk. Vet.

Akad. Handl. 27 (3), no. 11: 28--29, pl. 2, fig. 3. 1901.

Synonymy: Paepalanthus arachnoides Ruhl. in Engl., Pflanzenreich 13 (4-30): 158, in syn. 1903. Paepalanthus manicatus f. typica Beauverd, Bull. Herb. Boiss., ser. 2, 8: 290, in textu. 1908. Paepalanthus tenellus Alv. Silv. ex Moldenke, Résumé Suppl. 2: 22, in syn. 1959. Paepalanthus manicatus var. typica Beauverd ex Moldenke, Fifth Summ. 2: 586, in syn. 1971.

Bibliography: Malme, Bih. Svensk. Vet. Akad. Handl. 27 (3), no. 11: 28--29, pl. 2, fig. 3. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 152, 158, 289, & 291, fig. 18. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 290 & [291], fig. 11 A 1--8. 1908; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 409. 1928; Fedde & Schust. in Just, Bot. Jahresber. 53 (1): 61 [43]. 1928; Stapf, Ind. Lond. 4: 518. 1930; Moldenke, Known Geogr. Distrib. Erioc. 13, 44, & 50. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 210. 1949; Moldenke, Phytologia 4: 149. 1952; Dawson, Los Angeles Co. Mus. Contrib. Sci. 7: 6. 1957; R. C. Foster, Contrib. Gray Herb. 184: 39. 1958; Moldenke, Résumé 99, 323, & 488. 1959; Moldenke, Résumé Suppl. 1: 22. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 69 & 70. 1960; Moldenke, Fifth Summ. 1: 164 (1971) and 2: 577, 586, 591, & 954. 1971. [to be continued]



Moldenke, Harold N. 1975. "Additional notes on the Eriocaulaceae. LIII." *Phytologia* 30(1), 16–62.

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