

The Taxonomy of *Echinodorus palaeifolius* (NEES et MART.) MACBR. (*Alismataceae*) and Related Species from Mexico, Central and South America

Taxonomie *Echinodorus palaeifolius* (NEES et MART.) MACBR. (*Alismataceae*)
a příbuzných druhů z Mexika, Střední a Jižní Ameriky

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Abstract — RATAJ K. (1971): The taxonomy of *Echinodorus palaeifolius* (NEES et MART.), MACBR. (*Alismataceae*) and related species from Mexico, Central and South America. — Preslia, Praha, 43 : 10—16. — The paper deals with the taxonomy of 4 related species of the genus *Echinodorus* [*E. palaeifolius* (NEES et MART.) MACBR., *E. andrieuxii* (HOOK. et ARN.) SMALL, *E. pubescens* (MART.) SEUBERT and *E. subulatus* (MART.) GRISEB.] whose elaboration by former authors was unclear. A common character of these species are 12 stamens in the flowers, nutlets having only one gland and a very long beak. The following new nomenclatural combinations have been proposed: *E. palaeifolius* var. *latifolius* (MICH.) RATAJ, *E. palaeifolius* var. *minus* (SEUBERT) RATAJ and *E. andrieuxii* var. *longistylis* (BUCH.) RATAJ.

Introduction

Echinodorus palaeifolius (NEES et MART.) MACBR. and the related species belong to the least perfectly worked out taxa of this genus. MICHELI (1881) quotes this species under the name *E. ellipticus* (MART.) MICH., while he takes the name *Sagittaria palaeifolia* NEES et MART. 1823 for a synonym, although it is older than *Alisma ellipticum* MART. 1830.

MICHELI (1881) distinguished four varieties: α *latifolia* (= *Alisma ellipticum* MART.); β *pubescens* (= *Alisma pubescens* MART.); γ *ovata* (= *Alisma andrieuxii* HOOK. et ARN.) and δ *minor* (= *Alisma ellipticum* MART. β *minus* SEUBERT).

All the quoted taxa are characterized by nutlets with a very long stylar beak (at least 1/4 of the length of the body, often as long as the body) usually provided with a single lateral gland. Although many authors assert that the leaves of this species have distinct pellucid lines in the blades (MICHELI 1881, BUCHENAU 1903), this observations is wrong and the blades are quite without pellucid markings. In the species of this group the pellucid lines occur only with *E. subulatus* and *E. andrieuxii* var. *longistylis*, which is probably the hybrid *E. andrieuxii* $\times$ *E. subulatus*.

The taxonomy

The key to the determination of the species and varieties treated in this paper:

- 1 (12) — blades of leaves without pellucid markings that are sometimes indistinctly visible only after boiling in alcohol 2
- 2 — ribs of sepals pubescent *E. pubescens*
- 3 — ribs of sepals not pubescent, at most scabrous 4
- 4 (7) — blades decurrent to petiole 5
- 5 — inflorescence simple (racemose) *E. andrieuxii* var. *andrieuxii*
- 6 — inflorescence paniculate *E. andrieuxii* var. *longistylis*
- 7 (4) — blades on the base abrupt or lobed 8
- 8 — stem prostrate, blades obovate, on the base abrupt or moderately decurrent, maxim. 6 cm long and 3.5 cm wide *E. palaeifolius* var. *minus*
- 9 — stem upright, blades much larger 10
- 10 — flowers and aggregate fruits sessile or nearly sessile, blades ovate, on base cordately lobed *E. palaeifolius* var. *palaeifolius*
- 11 — flowers and aggregate fruits on distinct, up to 2 cm long pedicels, blades broadly ovate or cordate, on base abrupt *E. palaeifolius* var. *latifolius*
- 12 (1) — blades trimmed with pellucid lines 13
- 13 — stylar beak of the nutlet as long as half of the body or as long as the body *E. andrieuxii* var. *longistylis*
- 14 — stylar beak of the nutlet 1/4—1/3 as long as the body *E. subulatus*

Echinodorus palaeifolius (NEES et MART.) MACBR.

Publ. Field. Mus. Nat. Hist. Chicago, Bot. Ser., 11 : 4, 1931.

Stem erect or prostrate, usually alate, flowers nearly sessile or on pedicels several cm long, bracts equally long as or longer than pedicels, flowers white, as a rule 12 stamens, nutlets 2—4.5 mm long with a long beak and one single gland. Leaves 10—100 cm long, blade 5—25 cm long and 3—18 cm wide, on base cordate, truncate or decurrent, without pellucid markings.

var. *palaeifolius*

Syn.: *Sagittaria palaeifolia* NEES et MART. Nov. Act. Phys. Med. Ac. Nat. Cur. 11 : 21, 1823. — *Alisma palaeifolium* (NEES et MART.) KUNTH Enum. Pl. 3 : 152, 1841. — *Echinodorus ellipticus* (MART.) MICH. in DC. Monogr. Phaner. 3 : 51, 1881, pro parte.

Stem upright, cylindrical, between the whorls triangular, distinctly alate, 40—50 cm long, inflorescence racemose. Flowers in 7—18 whorls, nearly sessile, pedicels very short (2—3 mm) or absent, bracts lanceolately subulate, as long as or longer than flowers, sepals about 4 mm long, densely ribbed with membranaceous margins, corolla white, petals twice as long as sepals. Stamens usually 12, pistils numerous. The body of nutlet about 2 mm long and 1 mm wide, with 3—4 lateral ribs and a single gland, stylar beak upright or moderately bent, reaches about the half of the length of the body. — The length of leaves 13—20 cm, blade 7—8 cm long and 5—6 cm wide, ovate, blunt on the top, moderately cordately lobed on base, with 9 veins. Pellucid markings absent.

Holotype: Via Jelisb., PRINZ MAX. VIDENSIS, 1817, Brazil (BR).

Geographical area: Brazil.

Specimina visa: Brazil: Fazenda Boa Vista, Marechal Floriano, 2. 9. 1948, NETO 109 (BR); Bahia, Fazenda de Lago, entre Iacú e Millarges, 25. 1. 1965, PEREIRA 9748 et PABST 8637 (R, HB); Via Jelisb., PRINZ MAX. VIDENSIS, 1817, holotype (BR).

var. *latifolius* (MICH.) RATAJ comb. n.

Syn.: *Alisma ellipticum* MART. in RÖM. et SCHULT. Spec. Pl. 7 (2) : 1607, 1830. — *Echinodorus ellipticus* (MART.) MICH. var. α *latifolia* MICH. in DC. Monogr. Phaner. 3 : 51, 1881. — *Echinodorus frankoiana* Hort. Catalogue Lotus Osiris, Magé, 1967. — non „*Echinodorus latifolius* (MART.) MICH. var. *latifolius* MICH.“ sensu HAUMAN Anal. Mus. Nac. Bs. As. 27 : 310, 1915, quod est *E. grandiflorus* (CHAM. et SCHLECHT.) MICH. $\times$ *E. longiscapus* ARECH.

Lamina late ovata, apice obtusa vel acuta, basi truncata, 20—25 cm longa et 15—18 cm lata, 7- usque 11-nervia; pedunculi 1—3 cm longi; bracteae subulatae, floribus aequantes vel longiores, maxim. 3 cm longae.

Holotype: Piauí, Brazil, August 1839, GARDNER 2739 (K).

Geographical area: Brazil.

Specimina visa: Brazil: Minas Gerais, Pindaíba, Lagoa, 1964, HERINGER 5228 (UB, US); Bahía, Serrinha, 14. 7. 1964, DUARTE 3759 et CASTELLANOS (HB); Piauí, August 1839, GARDNER 2739, holotype (K).

This variety differs by distinct pedicels of flowers. The type specimen has blades with 11 ribs, the inflorescence is paniculate, the pedicels about 1 cm long, bracts at most 2 cm long and as long as the aggregate fruit with pedicel. The nutlets are much larger and their body is 3 mm long, with the beak they are about 4.5 mm long. A later specimen (HERINGER 5228) has blades with 7—9 veins, inflorescence paniculate, pedicels 2 cm, exceptionally 3 cm long, bracts longer than the aggregate fruit, usually 3 cm long.

In recent years this variety has been delivered by the firm Lotus Osiris (Magé, Brazil) under the commercial name *Echinodorus frankoiana* Hort. The plants cultivated in the Botanical Institute Šumperk-Temenice have leaves about 100 cm long, petioles channelled, swollen at the blade, blade 25 cm long and 15 cm wide, ovate, at base truncate to moderately decurrent. Stem of a length of 100 to 200 cm, inflorescence largely branching; young plants arise in the individual whorls.

var. *minus* (SEUBERT) RATAJ comb. n.

Syn.: *Alisma ellipticum* MART. β *minus* SEUBERT in MART. Fl. Brasil. 8 : 107, 1847. — *Echinodorus ellipticus* (MART.) MICH. δ *minor* (SEUBERT) MICH. in DC. Monogr. Phaner. 3 : 51, 1881.

§ Scapus flexuosus, racemosus; pedunculi 0.5—0.7 cm longi; bracteae floribus aequantes vel longiores, 1—1.5 cm longae; folia 10 cm longa; lamina obovata, apice obtusa, basi ad petiolum decurrens vel abrupta, quinquenervia, 5—6 cm longa et 3—3.5 cm lata; fructus ignotus.

Holotype: Brazil, Rio San Francisco, herb. MARTIUS (M), isotype in M.

This variety is known only by one specimen and it is not impossible that it is an independent species. It differs by the low growth and prostrate stem.

Echinodorus pubescens (MART.) SEUBERT ex WARM.

Kjoeb. Vidensk. Meddel. 113, 1872, quoad basionym, non quoad pl. cit.

Syn.: *Alisma pubescens* MART. in RÖM. et SCHULT. Spec. Pl. 7 (2) : 1608, 1830. — *Echinodorus ellipticus* (MART.) MICH. β *pubescens* (MART.) MICH. in DC. Monogr. Phaner. 3 : 51, 1881. [*Echinodorus pubescens* (MART.) SEUBERT ex WARM. (l. c.) quoad pl. cit. est *Echinodorus grandiflorus* (CHAM. et SCHLECHT.) MICH.]

Stem erect, 40—60 cm long, cylindrical at the bottom, between the whorls triangular, inflorescence simple, flowers in whorls, pedicels 6—10 cm long, bracts as long as pedicels, sepals 0.4 cm long, costate, petals white, twice as long as sepals, corolla 1 to 1.5 cm in diameter, 12 stamens, pistils numerous, nutlets 1.75 mm long and 1 mm wide, with one gland, beak 0.5 to 1 mm long. Leaves 25 to 40 cm long, blade ovate, on cusp acuminate, on base truncate or cordate, 10—14 cm long, 7—10 cm wide or narrowly elliptical, on either side narrowed, decurrent to petiole, 8—15 cm long and 2.5 to 3.5 cm

wide, with 5 to 9 veins, pellucid lines absent; stem, [bracts, pedicels and calyx, sometimes only calyx grey pubescent.

Holotype: Brasilia, MARTIUS 143 (M).

Geographical area: Brazil.

Specimina visa: Brazil: Bahía, St. Antonio, 1840, BLANCHET 3153 (P, K, W, LE, G); Bahía PIRAJÓ 70 (RB); Piauí, Tanque de Arreia, 1914, LÜTZELBURG 375 (M, NY); MARTIUS 143, holotype (M).

This species is very variable in the form of blades, but it can easily be recognized by the dense grey-and-white pubescence of the stem between the whorls, bracts, pedicels and calyx. The leaves of the type specimen are oval to lanceolate, abrupt at base or decurrent to the petiole. The leaves of further specimens have cordate blades with moderately lengthened top, abrupt at base or moderately oval.

***Echinodorus andrieuxii* (HOOK. et ARN.) SMALL**

N. Am. Fl. 17 (1) : 46, 1909.

Leaves upright, long-petioled, blades narrowly lanceolate to elliptic or ovate, at base to petiole decurrent, usually 12–25 cm long and 4–8 cm wide, exceptionally 40 × 22 cm. Leaves with 5–9 veins and without or with pellucid markings. Inflorescence racemose or paniculate, stem upright, below cylindrical, between the whorls triangular, often strongly alate, it reaches a length of 50–100 cm and a thickness of 3–6 mm, rarely 1 cm (JONES 23464 in UC). Flowers in 6–13 whorls on pedicels 5–10 mm long, rarely 15 mm long (HINTON 6978 in US); pedicels sometimes quite absent (JONES 23464 in UC). Bracts 2–5 cm long, shallowly connate and distinctly longer than flowers. Sepals ribbed, about 4 mm long, petals white, about twice as long as sepals, the diameter of corolla 1.2–1.5 cm, 12 stamens. Aggregate fruit globular or ovate, echinate and 5–8 mm long, the body of nutlet about 2 mm long and 1 mm wide, beak about 1/2 as long as the body or as long as the body.

Geographical area: Mexico to Brazil.

var. *andrieuxii*

Syn.: *Alisma andrieuxii* HOOK. et ARN. Bot. Beech. Voy., 311, 1839. — *Echinodorus ellipticus* (MART.) MICH. *γ ovata* MICH. in DC. Monogr. Phaner. 3 : 51, 1881. — non „*Echinodorus ellipticus* (MART.) MICH. var. *ovatus* MICH.“ sensu HAUMAN Anal. Mus. Nac. Bs. As. 27 : 309, 1915, quod est *Echinodorus longiscapus* ARECH. — non „*Echinodorus ellipticus* forma *ovata* F. J. MEYER“ Beih. Bot. Centralbl. 49 (1) : 331, 1932.

Blades without pellucid markings, or with pellucid markings so un conspicuous that they are visible only after the boiling in alcohol; inflorescence racemose.

Holotype: México, Oaxaca, Tehuantepec, 1834, ANDRIEUX 91 (K), isotypes in W, P, M.

Geographical area: Up to the present time the specimens have been known only from Mexico and Central America. The study of the herbarium materials shows much larger distribution of this species southwards up to Brazil. The plants from British Guiana are quite typical for the species (APPUN 2164 in K.) MICHELI (1881) determined this species as „*Alisma andrieuxii* valde affinis“. In Brazil this plant occurs in the state of Ceará (DROUET 2289 in UC, DROUET 2883 in MICH) but in reaches far to the south.

Specimina visa: Mexico: LINDEN 150 (BR); Jinamena, BARSTEN (W); Lizardo, WAWRA 564 (W); Chihuahua: Galeana, Atoyac, 20. 8. 1939, HINTON 14549 (K, US, UC, MICH, LL); Mina, Placeres, 30. 8. 1937, HINTON 10638 (M, US, MICH); Mina, Rancho-Bejuco, 24. 9. 1936, HINTON 9515 (UC, K, US, LL); Sinaloa: San Javier, San Ignacio, ORTEGA 1128 (MEXU); Mazatlán, 1931, ORTEGA 6848 (US, MEXU, F); Mazatlán, 1931, ORTEGA 6846 (MIN); San Ignacio, 13. 3. 1918, MONTES et SALAZAR 199 (US); Mazatlán, 3. 11. 1893, BRANDEGEE (UC); Nayarit: Tepic, 11. 2. 1927, JONES 23464 (UC); Jalisco: Tuxpan, 6. 1. 1926, MEXIA 1065 (UC, MICH, MO) Ixtapa, Puerto Vallarta, 16. 11. 1963, FEDDEMA 2602 A (MICH); Michoacán: Cuernavaca, 29. 8. 1899, PRINGLE 8256 (W, P, BR, Z, MEXU, M, MO, K, VT, S); Cuantla, 1950, JACKSON 73 (MICH); Apatzingan, Aguillila, 14. 10. 1939, HINTON 15336 (UC, LL, US); Huetamo, Tacupa, 14. 11. 1934, HINTON 6978 (K, US, MICH); México: Temascaltepec, Tejupileo, 21. 11. 1932, HINTON 2667 (K); Guerrero: Coyuca, Pungarabato, 11. 6. 1934, HINTON 6935 (MICH, UC, K, US); Acapulco, 23. 12. 1954, PARAY 1493 (MEXU); Oaxaca: Tehuantepec, 1834, ANDRIEUX 91 (holotype K, isotype W, P, M); Chiapas: Arriaga, 5. 10. 1953, FASSETT 29098 (MICH, GH, WIS); Guatemala: Chiquimula, 21. 10. 1939, STEYERMARK 30150 (F); British Honduras: Corozal Distr., 1931—2, GENTLE 373 (MICH, LL); El Salvador: Dpt. Santa Anna, 13. 10. 1950, FASSETT 28281 (US, WIS); Nicaragua: 1867—8, TATE 399 (K); Costa Rica: Prov. Guanacastle, Le Cruz, 12. 2. 1963, WILLIAMS 24537 (F); Venezuela: Pueblo Nuevo, Paraguará, 1939, TAMAYO 792 (VEN); British Guiana: 20. 6. 1867, APPUN 2164 (K); Brazil: Ceará, Soure, 27. 8. 1935, DROUET 2383 (MICH); Pernambuco, 1937, SOBRINHO (BRG).

var. *longistylis* (BUCH.) RATAJ comb. n.

Syn.: *Echinodorus longistylis* BUCH. in ENGLER Pflanzenreich, 15 : 34, 1903.

E. andrieuxii var. *andrieuxii* similis; inflorescentia paniculata; lamina lineis pellucidis instructa.

Holotype: GLAZIOU 12248 destroyed in B; Neotype: GLAZIOU 12248, Brasilia (W), isoneotype in C.

BUCHENAU (1903) described *E. longistylis* according to the specimen GLAZIOU 12248 in B that was destroyed during the war. In the herbarium W there exists the same sheet marked by BUCHENAU autographically as identical with holotype and it is therefore designated as neotype. Although BUCHENAU (1903) states in the diagnosis that the leaves are without pellucid markings, they are, however, quite distinct on the blades of the specimen in W.

I think that *E. andrieuxii* var. *longistylis* includes different populations of hybrids of both species, that is *E. andrieuxii* and *E. subulatus*. Great variability of the mentioned material and the fact that the typical plants of the species *E. andrieuxii* were found in Brit. Guiana and Brazil, where also *E. subulatus* currently occurs, proves it. *E. andrieuxii* has a racemose inflorescence and leaves without pellucid lines, *E. subulatus* has a racemose or paniculate inflorescence and leaves with distinct pellucid lines. Within *E. andrieuxii* var. *longistylis* we can find all the combinations of the mentioned characters.

I include into this variety the plants of very different characters. The specimen COOK 21 (M) from British Guiana with distinct pellucid lines in blades and with racemose inflorescence is the nearest to the type-specimen; further, the specimen MIRANDA 34 (IAN) from Ceará in Brazil with the typical paniculate inflorescence, sessile aggregate fruits, but without pellucid markings in blades; altogether from Brazil: LIMA 60-3504 (BRG); LÜTZELBURG 27082 (M); CUTLER 8325 B (F); GARDNER 1862 (K); LÜTZELBURG 28030 (M); PIRES 58160 (UB). Slightly different characters appear in the plants with paniculate inflorescence and pellucid markings in the leaves; in the general habit these plants are similar to *E. subulatus* (LÜTZELBURG 23743 in M).

Geographical area: British Guiana to South Brazil.

Specimina visa: British Guiana: Dadanawa, rio Rupununi, 24. 10. 1957, COOK 21 (M, K); Brazil: Varzea, 11. 4. 1936, LÜTZELBURG 27082 (M); Brasília-Fortaleza, rio Correntes and Sta. Maria, 4. 7. 1964, PIRES 58160 (UB); Ceará: Senador Pompeu, 28. 2. 1933, LÜTZELBURG 23743 (M); Parnaíba, 16. 4. 1936, LÜTZELBURG 28030 (M); Regiao de Araripe, 1945, MIRANDA 34 (IAN); Sitio Pede Ladeira, Guaramiranga, 24. 3. 1945, CUTLER 8325 B (F); Fortaleza, Lagoa de Tenápe, 16. 8. 1935, DROUET (R, UC); Fortaleza, 28. 7. 1948, DUARTE 1238 (RB); Aracatú, 1838, GARDNER 1862 (K); Rio Grande do Norte, Açu, 11. 7. 1960, LIMA 60—3504 (BRG); Goiás: Tocantinópolis, 2. 8. 1949, PIRES et BLACK 1654 a (IAN); Rio de Janeiro: GLAZIOU 12248, neotype (W), isoneotype (C).

Echinodorus andrieuxii (HOOK. et ARN.) SMALL $\times$ *E. trialatus* FASSETT

The specimens PALMER 1844 from Mexico (Tepic) also demonstrate the hybridization of *E. andrieuxii*. The specimen PALMER 1844 in MICH is quite typical for *E. andrieuxii* (nutlets with complete ribs and long beak); meanwhile the specimen with the same annotation in S and C has leaves on short petioles, nutlets with strong ribs that disappear before the top of the body and a very short or quite absent styler beak. By those characters these plants are very near to *E. trialatus*. As the plants deposited in MICH, S and C were collected on the same day in the same place, we can suppose that they are different populations of hybrids of *E. andrieuxii* $\times$ *E. trialatus* that occurred near by the both species. *E. trialatus*, however, described only in 1955 has not been found in Mexico as yet.

Geographical area and specimina visa: Mexico: Tepic, 1892, PALMER 1844 (S, C, MICH); Central Amerika: ORSTED, 7941 (C).

Echinodorus subulatus (MART.) GRIS.

Cat. Pl. Cub. 218, 1866.

Syn.: *Alisma subulatum* MART. in RÖM. et SCHULT. Syst. Veget. 7 (2): 1609, 1830. — *Alisma subulatum* α majus MART. (l. c.). — *Alisma subulatum* β medium MART. (l. c.). — *Alisma subulatum* γ minus MART. (l. c.). — *Echinodorus rubronervis* Hort. Cat. Lotus Osiris, Magé, 1964. — *Echinodorus rangeri* Hort. Cat. Lotus Osiris, Magé, 1964. — non „*Echinodorus subulatus* ENGELM.“ in GRAY Man. ed. 1: 54, 1904, quod est *Echinodorus tenellus* (MART.) BUCH. var. *parvulus* (ENGELM.) FASSETT. — non „*Echinodorus subulatus* NIEDERLEIN“ Res. Bot. Expl. Miss. Corr. Bs. As. 68, 1890, quod est *Echinodorus uruguayensis* ARECH.

By the variability of leaves and by their form it resembles *E. andrieuxii* from which it differs by distinct pellucid lines in blades, usually paniculate inflorescence and by nutlets with beak that are at most 1/3 as long as the body.

The leaves are on long, canaliculate petioles, the blades are lanceolate, narrowly to broadly ovate, sharp on the top, decurrent or rarely abrupt at the base. The dimensions are 18 $\times$ 2; 20 $\times$ 7 to 24 $\times$ 9 cm. With terrestrial forms they are much smaller, usually 10 $\times$ 2 cm. They have 5—7 veins and striking, line-like pellucid markings in the blades.

Stem below cylindrical, between the whorls triangular, often alate, 35 to 120 cm long with 4—15 whorls, inflorescence racemose or peniculate, bracts on base connate, longer than flowers (up to 3 cm), pedicels 0.5—2 cm long, sepals 4—6 mm long, petals about twice as long, so that the diameter of the corolla is 1.2—1.5 cm. Usually 12 stamens, the dimensions of nutlets 2 $\times$ 1.5 mm, one, rarely two glands separated by a rib, styler beak bent back usually attains 1/4 of the length of the body.

Lectotype: Brasília, MARTIUS 150 (M); holotype for *E. subulatus* $\times$ *majus*.

Geographical area: Central America to Brazil.

Specimina visa: Panamá: Paraiso, 1857, WAGNER fasc. 8 (M); Venezuela: Caracas, 1926, PITTIER 11095 (K); British Guiana: 1838, SCHOMBURGK 563 (K, MB, TCD); fluv. Lucie, 6. 12. 1910, HULK 307 (U); Corentyne River, 1880, THURN 79 (K); Epira, Corentyne River, 1879, JENMAN 27 (BRG); Rio Essequibo, 1881, JENMAN 1079 (K); Brasil: RABEN 320 (BR); LÖFGREEN 938 (RB); GLAZIOU 14288 (P, LE); MARTIUS 150 (M, lectotype, determined by MARTIUS as holotype for *A. subalatum* α *majus*); MARTIUS 151 (M); MARTIUS 152 (M, holotype for *A. subalatum* γ *minus*), MARTIUS 153 (M, holotype for *A. subalatum* β *intermedius*); Pirapora, PORTO 2546 (RB); Campos de Bociana, herb. GLAZIOU 14288, SALDANHA 7515 (R); Cedro, 1912, LÖFGREEN 1137 (R); Riacho do Porco, 25. 4. 1910, LÖFGREEN 687 (R); Pará: Alto Cuminá, 23. 11. 1928, SAMPAIO 5645 (R); Cuminá, 8. 9. 1928, SAMPAIO 5499 (R); Rio Pará do Cuminá, 14. 9. 1928, SAMPAIO 5545 (R); Ceará: Horto florestal Joazeiro, 1912, ZEHNTER (R); Matto Grosso: 1899, PILGER 777 (B, VT); Corrego Salgadinho, 26. 9. 1949, OLIVEIRA (RB); Goiás: BURCHELL 7781 (BR, K, LE); Inter Goiás et Cavalconia, BURCHELL 7855 (BR); Bahia: Rio des Jameas, 1912, LÜTZELBURG 1515 (RB); Lagoa Tiririca, 1914, LÜTZELBURG 796 (M); Minas Gerais: Paranaíba, 1892, ULE 796 (R); Jequetinhonha, MARTIUS 1547 (M); Rio de Janeiro: Jardim. Bot. 4. 5. 1936, OCCHIONI (RB); Sao Paulo: 1833, LUND (C); Rio Grande do Sul: Cachoeira, 28. 8. 1948, NETO 105 (RB).

Souhrn

Práce se zabývá taxonomií 4 příbuzných druhů rodu *Echinodorus* (*Alismataceae*), jejichž zpracování v dosavadní literatuře je nejasné. Společnými vlastnostmi těchto druhů je 12 tyčinek, nažky mají obvykle jedinou žlázku a poměrně dlouhý zobánek. V práci jsou probrány: *Echinodorus palaeifolius* (NEES et MART.) MACBR. se dvěma varietami, *E. andrieuxii* (HOOK. et ARN.) SMALL. s jednou varietou, *E. pubescens* (MART.) SEUBERT a *E. subalatus* (MART.) GRISEB. *Echinodorus longistylis* BUCH. nelze považovat za samostatný druh a je zatím zařazen jako varieta, ačkoli pravděpodobně reprezentuje různé hybridní populace druhů *E. andrieuxii* a *E. subalatus*. Dále jsou popsány hybridní exempláře z kombinace druhů *E. andrieuxii* a *E. trialatus*.

References

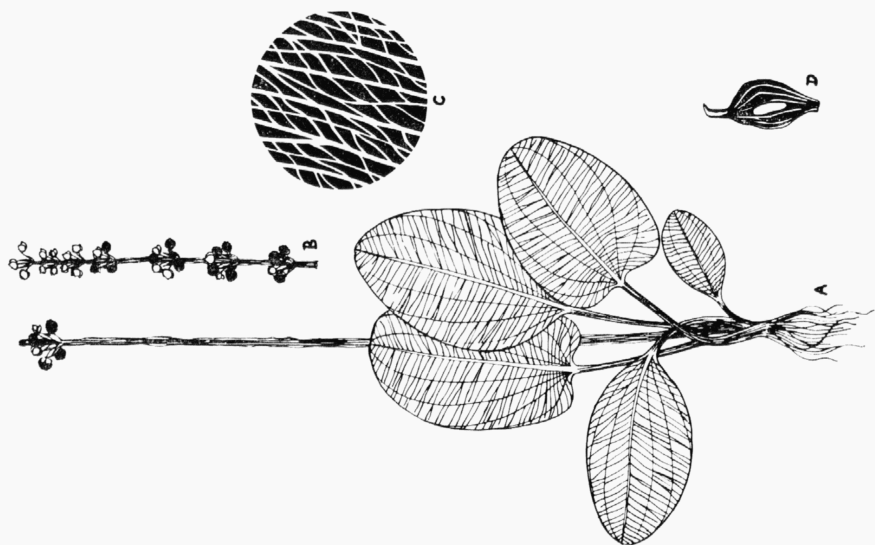
- BUCHENAU F. (1903): Alismataceae. — In: ENGLER A. [ed.]: Das Pflanzenreich 4/15: 1–61. — Leipzig.
FASSETT N. C. (1955): Echinodorus in the American Tropics. — Rhodora, Lancaster (USA), 57: 175–177.
MICHEL M. (1881): Alismataceae. — In: DECANDOLLE A. C.: Monographiae Phanerogamarum 3. — Paris.

Reconsent: J. Holub

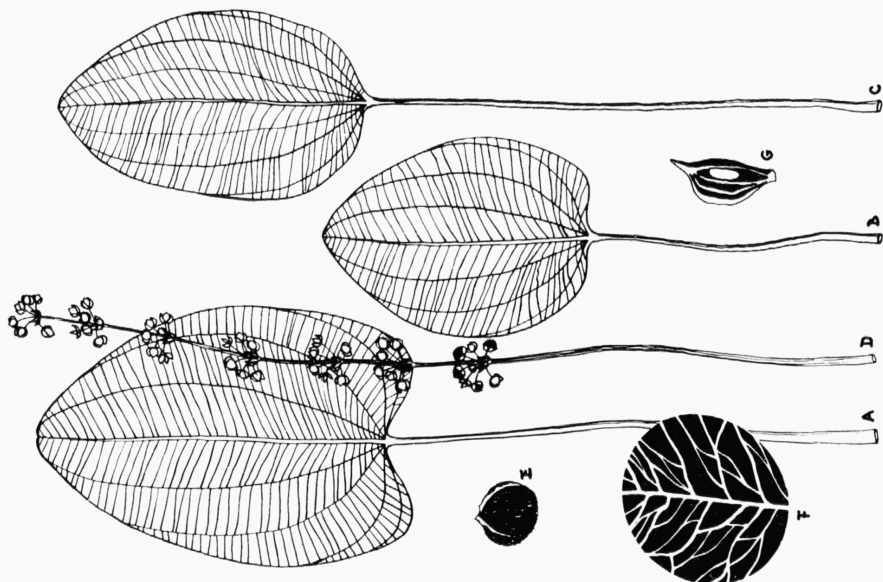
See also plates II.—IV. in the appendix.



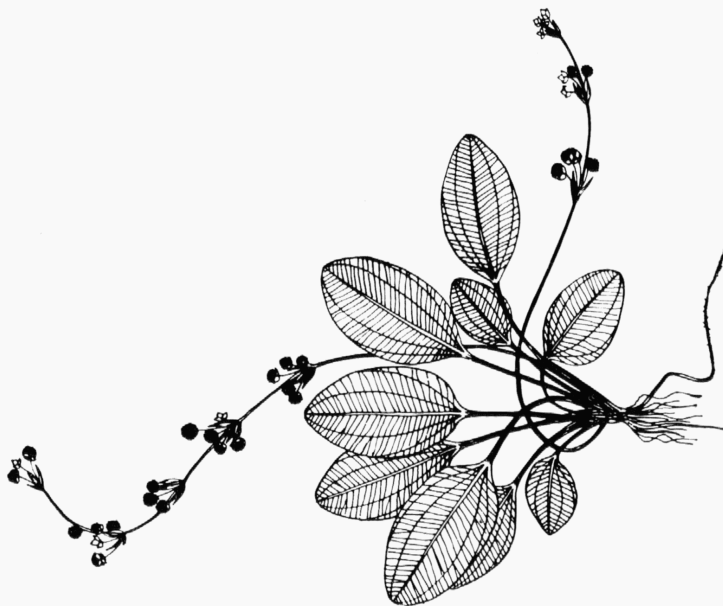
Pl. II., fig. 2. — *Echinodorus palaeifolius* (NEES et MART.)
MACBR. var. *latifolius* (MICH.) RATAJ: A = leaf; B = part of
the inflorescence; C = veins without pellucid markings in the
blade; D = nutlet.



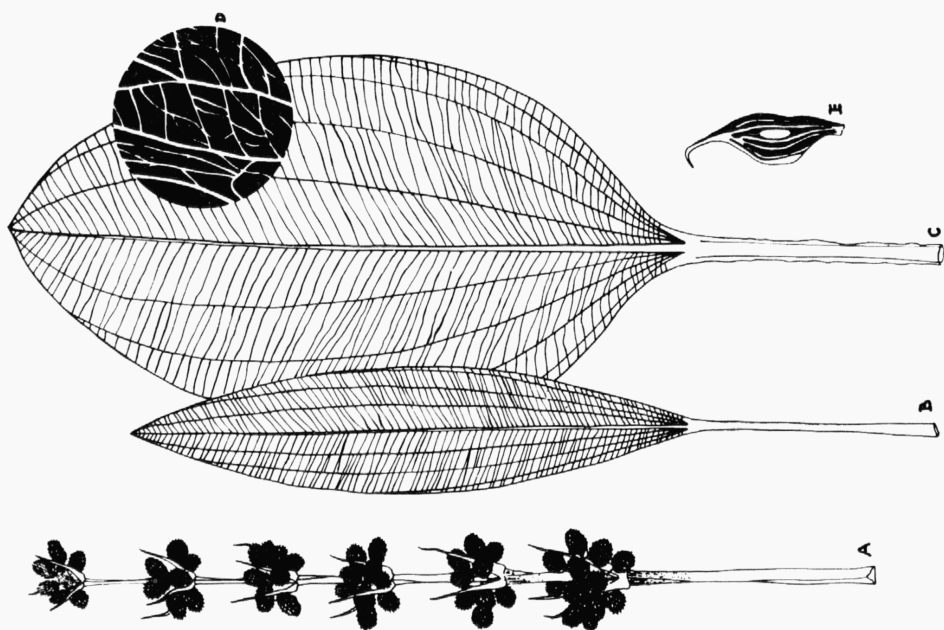
Pl. II., fig. 1. — *Echinodorus palaeifolius* (NEES et MART.)
MACBR. var. *palaeifolius*: A = plant; B = inflorescence;
C = part of a blade with veins and without pellucid markings;
D = nutlet.



Pl. III., fig. 2. — *Echinodorus pubescens* (MART.) SEUBERT:
A, B, C = leaves; D = inflorescence; E = sepals with pubes-
cence; F = veins without the pellucid markings in the blade;
G = nutlet.



Pl. III., fig. 1. — *Echinodorus palaeifolius* (NEES ET MART.)
MACBR. var. *minus* (SEUBERT) RATAJ.



PL. IV., fig. 1. — *Echinodorus andrieuxii* (HOOK. et ARN.) SMALL:
A = inflorescence; B, C = leaves; D = veins without the pellucid markings in the blade; E = nutlet.



PL. IV., fig. 2. — *Echinodorus subalatus* (MART.) GRISEB.:
A = plant; B = inflorescence; C = nutlet; D = veins with the pellucid lines in the blade.