

CYPERACEAE

by

J. C. LINDEMAN and A. L. STOFFERS

(Instituut voor Systematische Plantkunde, Utrecht and
Botanisch Laboratorium, Nijmegen)

Annual or perennial grass-like herbs with short or long rhizomes. Culms trigonous to triquetrous or rarely cylindric and septate (*Cyperus articulatus*). Leaves narrow, with closed sheaths, sometimes with a ligule opposite to the blade. Inflorescence consisting of a solitary spikelet or capitulum, or many spikelets in heads or spikes or simple to compound umbels. The branches often subtended by conspicuous bracts. Flowers in the axil of a glume, bisexual or unisexual, usually consisting of 1—3 stamens and/or one pistil, sometimes provided with a perigon of bristles. Glumes distichous or spirally arranged. Stamens with slender or filiform filaments. Ovary 1-celled; style 2—3-branched. Fruit a nut. Endosperm mealy.

About 3200 species in nearly 80 genera, all over the world.

Key to the genera:

1. Spikelets bisexual; leaves without ligule or plants leafless 2
Spikelets unisexual, the male ones several-flowered, the female one-flowered; leaves with a (contra-) ligule opposite to the blade *Scleria* (p. 118)
2. Glumes distinctly in two rows *Cyperus* (p. 93)
Glumes spirally arranged or rarely subdistichous 3
3. Spikelets with 3 or more empty glumes at the base 4
Spikelets with 1 or 2 empty glumes at the base 5
4. Style with 3 branches; leaves coriaceous, flat, 5—17 mm wide
Cladium (p. 92)
Style with 2 branches or style long and almost simple
Rhynchospora (p. 116)
5. Plant leafless; culms with one terminal spikelet without bracts
Eleocharis (p. 111)
Plants foliate 6

6. Base of the style not swollen, gradually passing into the ovary *Scirpus* (p. 117)
 Base of the style swollen or dilated; distinct from the ovary 7

7. The style-base differentiated as a tubercle, mostly persistent on the nut; leaves filiform, their sheaths hairy at the mouth; spikelets 1—3 *Bulbostylis* (p. 90)
 Style-base not differentiated; style completely deciduous or persistent on the nut; leaf-sheaths not hairy at the mouth *Fimbristylis* (p. 113)

Bulbostylis Kunth, Enum. Plant. 2: 205. 1837

Annual or perennial herbs, without or with short rhizomes. Culms slender. Leaves all basal, narrowly linear or filiform; sheaths hairy in the mouth. Inflorescence consisting of umbellate, capitate, or solitary spikelets. Bracts small, foliaceous. Spikelets many-flowered, often minutely puberulent. Glumes spirally imbricate, rarely subdistichous. Bristles wanting. Stamens 2-3. Style 3-fid, glabrous or rarely ciliate; its base enlarged, usually persistent as a tubercle on the nut. Nut trigonous or lenticular.

About 90 species in tropical and subtropical regions, especially in Africa and America.

Key to the species:

Bulbostylis setacea (Gris.) Svenson

SVENSON, Contr. Ocas. Mus. Hist. Nat. Col. de la Salle 4: 10. 1946; in LEON, Fl. Cuba 1: 205. 1946; in N. Am. Fl. 18: 543. 1957; — *Abildgaardia setacea* GRISEBACH, Cat. Pl. Cub. 238. 1866; — *Fimbristylis grisebachii* GREENMAN, Trans. Acad. Sci. St. Louis 7: 474. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 83. 1900.

Caespitose, annual herb. Culms 5—20 cm tall, filiform, striate, puberulent, slightly scabrous. Leaves filiform, much shorter than the culms, scabrously pubescent; sheaths somewhat pilose at the mouth. Spikelets 1—3-fascicled, 4—6 mm long and 2—2.5 mm wide, ovate to oblong, acute, compressed. Bracts minute or the lower one up to 15 mm long. Glumes subdistichous, ovate, acute, keeled, 3-veined, sparsely and minutely puberulent towards the apex, pale to reddish-brown. Style glabrous, its base trigonous, deciduous with the style. Nut broadly obpyramidal, trigonous, 3-lobulate, 1 mm long, transversely rugulose, straw-coloured; the apex apiculate, sometimes depressed; slightly narrowed towards the base.

Cuba and Curacao.

CURAÇAO: hills near Malpais (Boldingh 4852, fl. & fr. Oct.; 4883, fl. & fr. Oct.); hills near Santa Cruz (Boldingh 5596, fl. & fr. Dec.); hills near Knip (Arnoldo 1020, fl. & fr. Jan.; Stoffers 1151, fl. & fr. Dec.); Seroe Christoffel, 150 m (de Wilde 163A, fl. & fr. [L]).

Bulbostylis curassavica (Britton) Kükenth. & Ekman

KÜKENTHAL & EKMAN in URBAN, Ark. Bot. 22A (17): 6. 1929, citation corrected by H. K. Svenson in N. Am. Fl. 18: 544. 1957; — *Stenophyllum curassavicum* BRITTON, Bull. Torrey Bot. Cl. 43: 445. 1916; — *Scirpus floccosus* C. B. CLARKE var. β (?) *pumilio* C. B. CLARKE in URBAN, Symb. Ant. 5: 290. 1907; BOLDINGH, Fl. Ned. W. Ind. Eil. 135. 1913; Fl. D. W. Ind. Isl. 2: 13. 1914.

Caespitose, annual herb. Culms filiform, striate, up to 10 cm long, somewhat scabrous to setulose. Leaves filiform, somewhat scabrous to setulose, shorter than the mature culms; sheaths puberulent, white woolly-ciliate at the mouth. Spikelets one or more, pseudo-lateral or basal in the axil of a leaf. Bracts 2, filiform, the lower one erect, up to 3 cm long, with scarious woolly-ciliate sheath. Spikelets 3—10 mm long and 2—3 mm wide, compressed. Glumes ovate, acute, stramineous to pale-brown, with reddish lines and prominent green keel. Stamens 2—3. Style slender, elongate; its base dilated. Nut obovoid, trigonous, 0.6—0.7 mm long, punctate-reticulate, iridescent brown; tubercle flattened, brown, persistent, nearly half as broad as the nut.

Curaçao, Aruba, Bonaire, and Haïti.

Dry limestone rocks.

ARUBA: Seroe Alejandro (Stoffers 1975, fl. & fr. Jan.); along western side of Spaans Lagoen (Stoffers 1464, fl. & fr. Jan.); road to Seroe Pretoe (Stoffers 1681, fl. & fr. Jan.); Paloe Marca (Stoffers 1957, fl. & fr. Jan.).

BONAIRE: limestone rocks near Onima (Arnoldo 463, fl. & fr. Dec.); Playa Foenchi (Stoffers 991, fl. & fr. Dec.); limestone coast near Spelonk (Stoffers 696, fl. & fr. Nov.); calcareous soil near Playa Grandi (Boldingh 7260, fl. & fr. Feb.; 7171, fl. & fr. Feb.); calcareous plateau of Klein Bonaire (Boldingh 7488, fl. & fr. Feb.).

CURAÇAO: limestone rocks near Willemstad (Britton & Shafer 2946, fl. & fr. March); without loc. (Suringar s.n., fl. & fr. [L]).

Bulbostylis pauciflora (Liebm.) C. B. Clarke

C. B. CLARKE, Kew Bull. Add. Ser. 8: 26. 1908; SVENSON in LEON, Fl. Cuba 1: 206. 1946; in N. Am. Fl. 18: 543. 1957; — *Oncostylis pauciflora* LIEBMANN, Vidensk. Selsk. Skr. 5: 241. 1851; — *Stenophyllum portoricensis* BRITTON, Torreya 13: 216. 1913; — *Bulbostylis ekmani* KÜKENTHAL, Repert. Sp. Nov. 23: 197. 1926; — *Bulbostylis portoricensis* FERNALD, Rhodora 40: 392. 1938.

Tufted, perennial herb. Culms filiform, striate, 10—20 cm long, slightly scabrous towards the apex. Leaves filiform, about as long as or shorter than the culms, scabrous by protruding cells; sheaths pale-brown, long woolly-ciliate at the mouth. Spikelets one or more, pseudo-lateral, sessile, lanceolate, acute, 5—8 mm long and 1.5 mm wide, compressed, glabrous. Bract one, filiform,

up to 3 cm long with minute, glabrous and scarious sheath. Glumes ovate to lanceolate, acute, the two lower ones mucronate, dark brown-red near the keel and with very pale wings with brown-red lines; the keel 3-veined. Stamens 3. Style elongate, dilated at the base. Nut obovate, trigonous, 1.5 mm long, pale brown, transversely rugulose; tubercle conic, trigonous, dark brown, small, persistent.

Cuba, Puerto Rico, Haïti, St. Croix, Bonaire, and Curaçao.

Dry limestone rocks.

BONAIRE: Seroe Largo (Arnoldo 351, fl. & fr. Jan.).

CURAÇAO: calcareous hills near Hato (Boldingh 5315, fl. & fr. Nov.); calcareous hills near Siberië (Boldingh 5242, fl. & fr. Nov.).

Cladium P. Brown, Hist. Jamaica 114. 1756

Perennial herbs with rhizomes. Stems erect, more or less flattened. Leaves distichous, linear; sheaths not well separated from the blade. Inflorescence consisting of numerous small spikes arranged into elongate, terminal and axillary panicles; spikelets fascicled, 1 to 4-flowered; the 3—6 lower glumes empty. Flowers hermaphrodite. Glumes imbricate, several-ranked. Bristles present or wanting. Stamens 3. Style 3-cleft with dilated base. Nut trigonous.

About 40 species, in temperate and tropical regions.

Cladium restioides (Swartz) Bentham

BENTHAM in BENTHAM & HOOKER f., Gen. Plant. 3: 1066. 1883; C. B. CLARKE in URBAN, Symb. Ant. 2: 135. 1900; URBAN, Symb. Ant. 4: 124. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 29. 1909; Fl. Ned. W. Ind. Eil. 136. 1913; URBAN, Symb. Ant. 8: 70. 1920; SVENSON in LEON, Fl. Cuba 1: 229. 1946; — *Schoenus restioides* SWARTZ, Prodr. Veg. Ind. Occ. 19. 1788; — *Machaerina restioides* (Swartz) VAHL, Enum. Plant. 2: 238. 1806; GRISE-BACH, Fl. Br. W. Ind. Isl. 573. 1864; DUSS, Fl. phan. Ant. franc. 549. 1897; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 106. 1923; — *Mariscus restioides* (Swartz) KUNTZE, Rev. Gen. Pl. 755. 1891; HODGE, Lloydia 17: 148. 1954.

Stem up to 1 m tall, rather stout, compressed. Leaves sword-like, equitant, the basal ones often exceeding the stem in length, 5—17 mm wide, flat, coriaceous, with smooth margin. Panicles 30—60 cm long, often much branched; branches flexuous. Bracts foliaceous, about half as long as the branches. Bractlets dark reddish-brown, sheath-like. Spikelets 4—5 mm long, ovoid, 2—4-flowered. Glumes dark reddish-brown, ovate. Bristles 6, longer than the nut. Nut oblong-obovoid, triquetrous, 1 mm long, stipitate, pale-brown. Style long, dilated towards the base, 3-cleft with linear stigmas.

West Indies from Cuba to St. Vincent.

In wet rocky places at higher elevations.

SABA: The Mountain, 800 m (Boldingh 2210, fl. & fr. July).

Cyperus Linnaeus, Spec. Plant. 44, 1753

Annual or perennial herbs. Culms simple, foliate at the base. Inflorescence simple or compound, umbellate or capitate; rays of the umbels sheathed at the base by a prophyl, usually very unequal, one or more of the heads or spikes commonly sessile. Spikelets with distichous glumes, one or two at the base empty. Glumes deciduous or persistent on the rhachilla and then the rhachilla articulate. Flowers bisexual, with 1—3 stamens and one pistil with a 2—3-branched, deciduous style. Perianth wanting. Nut trigonous or dorsally or laterally compressed.

About 600 species in tropical to temperate regions.

Key to the species:

1. Culms without well developed leaves, only a few sheaths at base without or the upper with a short blade 2
Each culm with one to many leaves with a well developed linear blade 3
2. Culms stout, terete, septate-nodose, inflorescence umbellate with 4—12 rays *C. articulatus* (p. 95)
Culms trigonous, smooth, bearing a pseudo-lateral cluster of 1 to 16 sessile, turgid spikelets *C. laevigatus* (p. 109)
3. Inflorescence consisting of one, rarely two, very short, sessile spikes subtended by 2 or 3 much longer bracts, spikelets 1—1.5 mm wide (when 2—3 mm wide see *C. compressus*) 4
Inflorescence umbellate, often part of the rays very short 7
4. Plant with creeping rhizome; leaves and bracts flat, 1.5—3 mm wide
C. brevifolius (p. 110)
Plant caespitose with short rhizome, leaves and bracts involute, 0.5—1 mm wide 5
5. Spikelets 2—3 mm long, straw-coloured to pale-brown, bracts reflexed
C. nanus (p. 102)
Spikelets 4—15 mm long, deep brown to red-purple, bracts not reflexed 6
6. Spikelets 4—8 mm long, compressed, articulate at base
C. fuligineus (p. 101)
Spikelets 6—15 mm long, terete, articulate above each glume
C. filiformis (p. 108)
7. Spikelets in globose to oblong, usually dense but sometimes rather loose spikes, in the latter case young; spikelets not compressed; inflorescence compound 8
Spikelets in very loose flat spikes or very short spicate to digitate groups, always compressed, not articulate at base; inflorescence usually simple 16

8. Glumes of the spikelets with a recurved mucro or awl 9
 Glumes of the spikelets obtuse or with a minute erect mucro 12
9. Leaves canaliculate to tubular involute and septate, spikelets not articulate at base 10
 Leaves flat, not septate, 2—4 mm wide, spikelets articulate at the base, 4—7 mm long 11
10. Spikelets 10—25 mm long and 3—5 mm wide, 20- to 40-flowered
 C. oxylepis (p. 95)
 Spikelets 5—8 mm long and 2—3 mm wide, 8- to 12-flowered
 C. elegans (p. 96)
11. Spikelets 8- to 16-flowered, glumes $1\frac{1}{4}$ mm long with a $\frac{2}{3}$ mm long awl 13
 C. aristatus (p. 97)
 Spikelets 4- to 10-flowered, glumes with an about 3 mm long mucro
 C. confertus (p. 103)
12. Spikelets 3—6 mm long, 1- to 4-flowered 13
 Spikelets 8—30 mm long, 6- to 25-flowered 14
13. Umbel simple with 4—8 rays varying from 0—2.5 cm; spikelets 3 mm long, 1- to 2-flowered 13
 C. flavus (p. 107)
 Umbel compound with 7—12 rays, bearing an oblong spike with 2 globose spikes at the base, spikelets 4—6 mm long, 2- to 4-flowered
 C. ligularis (p. 106)
14. Sheaths trabeculate, spikelets disarticulating above each glume, the internodes of the rhachilla 2 mm long, enclosing the nut by broad wings; glume persistent at the apex, 3—3.5 mm long 13
 C. ferax (p. 107)
 Sheaths not trabeculate, spikelets with continuous rhachilla with hyaline margins, not enclosing the 1.5 mm long nuts; glumes 2 mm long, imbricate when young, afterwards spreading 15
15. Spikes dense, spikelets articulate at base, brown, in age 3 mm wide
 C. planifolius (p. 104)
 Spikes rather loose, spikelets not articulate at base, in age 1.5 mm wide
 C. distans (p. 97)
16. Perennials with many-foliate culms and slender tubiferous stolons; leaves 2—6 mm wide, spikelets in very loose, flat spikes 17
 Annuals with few-foliate culms, without stolons; leaves 1—3 mm wide, spikelets in very short spicate to digitate groups 18
17. Leaves longer than the culm, spikelets 5—15 mm long, golden-yellow; glumes 2—2.5 mm long with 7 evenly distributed veins
 C. esculentus (p. 99)
 Leaves shorter than the culm; spikelets 10—40 mm long, brown, variegated with purple; glumes 3 mm long, with 3 central veins in a green band and 2 lateral veins in each wing 19
 C. rotundus (p. 100)

18. Spikelets 2—3 mm wide, subquadrangular; glumes 3 mm long, stiff
C. compressus (p. 99)
 Spikelets 1—1.5 mm wide, compressed; glumes 1.5 mm long, membranaceous 19
19. Spikelets digitate, golden brown, nuts trigonous, with 3 styles
C. amabilis (p. 98)
 Spikelets in very short spikes, pale-brown, nuts flattened with the narrow side towards the rhachilla and with 2 styles *C. guanipensis* (p. 109)

***Cyperus articulatus* L.**

LINNAEUS, Spec. Plant. 44. 1753; GRISEBACH, Fl. Br. W. Ind. Isl. 564. 1864; C. B. CLARKE, J. Linn. Soc. 20: 291. 1883; J. Linn. Soc. 21: 155. 1884; Duss, Fl. phan. Ant. franç. 538. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 33. 1900; URBAN, Symb. Ant. 4: 112. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 10. 1914; URBAN, Symb. Ant. 8: 56. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 85. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 77. 1936; O'NEILL in LEON, Fl. Cuba 1: 191. 1946.

Almost leafless, perennial herb with thick rhizomes, covered by ovate, brown scales. Culms up to 2 m tall and 10 mm in diam. at the base, robust, terete, striate, and strongly septate-nodose when dry. Sheaths about 5, membranaceous, the lower ones loose, the upper 1 or 2 elongate, and often with a small blade. Bracts 2—3, stiff, lanceolate, up to 1.5 cm long. Umbels more or less compound; rays 4—12, sometimes up to 10 cm long with a tubular sheath, its mouth truncate on one side, produced with often bifid tip on the other side. Spikelets linear, acute, 8—30 mm long and 1—2 mm wide, 12- to 40-flowered, subcompressed, 5—15 together in short, flattened spikes. Rhachilla straight, with hyaline, deciduous wings. Glumes imbricate, ovate-elliptic, subobtuse, 2—2.5 mm long, hardly keeled, obscurely veined, straw-coloured with reddish streaks and hyaline margins. Stamens 3. Style elongate, 3-fid. Nut nearly half as long as the glume, oblong, trigonous, acuminate, black, smooth.

Tropical and subtropical regions.

In marshes and muds at lower and middle elevations.

Vernacular name: oenkoe (Leeward Group).

CURAÇAO: Malpais (Boldingh 4869, fl. & fr. Jan.); Hato (Stoffers 50, fl. & fr. Sept.); without loc. (Aschenberg s.n., fl. & fr.).

***Cyperus oxylepis* Nees**

NEES, Linnaea 9: 285. 1835; C. B. CLARKE in URBAN, Symb. Ant. 2: 29. 1900; BOLDINGH, Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 11. 1914; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 165. 1936; QUESTEL, Fl. Isl. St. Bartholomew 84. 1941.

Perennial herb with short, woody rhizome. Culms densely caespitose, up to 35 cm tall, rigid, subterete, sulcate, with few leaves at the base. Leaves about as long as the culms, tubular-involute, spongy, septate-nodose, grey-green when dry; sheaths long, up to 9 cm, with broad, hyaline, very thin margin,

purpurent. Bracts 3—5, of which the 3 larger ones much longer than the inflorescence, up to 40 cm long, and a few smaller ones. Umbels simple or compound; rays 3—6, up to 12 cm long, compressed trigonous, stiff, spreading, very unequal. Spikes subglobose, 1.5—2.5 cm in diam. Spikelets radiating, 10—25 mm long and 3—5 mm wide, 20—40-flowered, compressed. Rhachilla straight and slender, not winged. Glumes elliptic, about 3 mm long, hardly imbricate when young, afterwards spreading, with involute margins, the keel very broad, green, several-veined, produced in a thick, slightly recurved mucro, the wings yellow to brownish with one prominent vein; the insertion between keel and wings impressed. Stamens 3 (-2). Style rather long, the lower half persistent; branches 3, long. Nut $\frac{2}{3}$ as long as the glumes, obovate-oblong, trigonous, attenuate at the base, long apiculate, black, scurfy-punctulate.

West Indies and tropical South Africa.

Marshy and coastal places.

BONAIRE: Kralendijk (Burgers 539, fl. & fr. Ap.); Onima (Arnoldo 362, fl. & fr. Jan.); Sabana (Arnoldo 471, fl. & fr. Jan.; 513, fl. & fr. Feb.); seashore between Tolo and Kralendijk (Boldingh 7440, fr. Feb.); coast of Karpata (Stoffers 613, fl. & fr. Nov.; 614, fl. & fr. Nov.; 615, fl. & fr. Nov.).

CURAÇAO: saline soil near Willemstad (Britton & Shafer 2924, fl. & fr. March); seashore near St. Michiels Baai (Boldingh s.n., fl. & fr. Nov.); Domi (Arnoldo 6, fl. & fr.); saltponds of St. Willebrordus (Stoffers 346, fl. & fr. March).

ST. MARTIN: Rolands Canal (Arnoldo 1244, fl. & fr. March; Stoffers 2251, fl. & fr. March; 2259, fl. & fr. March).

Cyperus elegans L.

LINNAEUS, Spec. Plant. 45. 1753; C. B. CLARKE in URBAN, Symb. Ant. 2: 28. 1900; URBAN, Symb. Ant. 4: 111. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 26. 1909; Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 10. 1914; URBAN, Symb. Ant. 8: 55. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 88. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 164. 1936; QUESTEL, Fl. Isl. St. Bartholomew 83. 1941; O'NEILL in LEON, Fl. Cuba 1: 192. 1946; HODGE, Lloydia 17: 140. 1954; — *Cyperus viscosus* SWARTZ, Prodr. Veg. Ind. Occid. 20. 1788; Fl. Ind. Occ. 1: 113. 1797; GRISEBACH, Fl. Br. W. Ind. Isl. 563. 1864; C. B. CLARKE, J. Linn. Soc. 21: 114. 1884; Duss, Fl. phan. Ant. franç. 537. 1897.

Caespitose, perennial herb, with short, woody rhizome. Culms rigid, 20—60 cm tall, trigonous, striate, foliate at the base. Leaves as long as the culms, canaliculate, transversely septate, glaucous, viscid in the lower part, with remotely dentate margins; their sheaths wide, pale, reddish towards the base. Bracts foliaceous, 2 or 3 much exceeding the inflorescence and one or two smaller ones. Umbels 5—9-rayed; the rays spreading, stiff, unequal, 0—10 cm long. Umbellules often capitate, sometimes with up to 2 cm long rays; bractlets short setaceous. Spikelets 3—12, capitate, oblong, 5—8 mm long and 2—3 mm wide, slightly compressed, 8—12-flowered. Rhachilla exalate. Glumes imbricate, 2.5 mm long, broadly ovate, with a broad, green keel, excurrent in a more or less recurved mucro, straw-coloured, usually tinged with purple, obsoletely 7—9-veined. Stamens 3. Style rather short with 3 long, slender branches. Nut broadly obovate, $1\frac{1}{3}$ mm long, triquetrous, blackish, acuminate.

Central America up to western Texas, and the West Indies.

Wet saline soil.

BONAIRE: coast of Karpata (Stoffers 610, fl. & fr. Nov.); Fort (Suringar s.n., fl. & fr. Feb. [L]).

CURAÇAO: Lagoen Labadira (Suringar s.n., fl. & fr. March [L]); Brievengat (Suringar s.n., fl. & fr. Feb. [L]).

ST. MARTIN: Cul de Sac - Marigot Hill, 0-200 m (Boldinh 2625, fl. & fr. Aug.); along Great Salt Pond (Boldinh 2447, fl. & fr. Aug.); without loc. (Boldinh 2906, fl. & fr.).

Cyperus aristatus Rottb.

ROTTBOELL, Descr. et Icon. 23, t. VI, fig. 1. 1773; C. B. CLARKE, J. Linn. Soc. 21: 91. 1884; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 502. 1936; O'NEILL in LEON, Fl. Cuba 1: 197. 1946; — *Cyperus uncinatus* auct. non Poit.: BOLDINGH, Fl. Ned. W. Ind. Eil. 132. 1913; Fl. D. W. Ind. Isl. 2: 11. 1914; — *Cyperus uncinatus* P. BROWN, Prodr. 215. 1810.

Annual herb, with fibrous roots. Culms more or less tufted, 5—20 cm tall, slender, triquetrous, glabrous, with 2 or 3 basal leaves. Leaves as long as or shorter than the culms, flat, 2 mm wide, flaccid; sheaths purple. Bracts 2—5, exceeding the inflorescence. Umbel simple, with 2—6 rays, up to 4 cm long, or capitate; rays slender, triquetrous, with truncate sheath. Spikes ovoid, dense, 6—10 mm wide, with many spikelets; the latter linear-oblong, 3—7 mm long and 1.5—2.5 mm wide, compressed, 8—16-flowered. Rhachilla slender with sharp edges, articulate at the base. Glumes slightly imbricate when young, soon freely spreading, sometimes at last deciduous after loosing the nut, oblong, 1½ mm long, straw-coloured to reddish-brown, prominently 7—9-veined, cuspidate by the green keel excurrent in a recurved, ⅔ mm long arista. Stamen 1. Style elongate, 3-fid. Nut about half as long as the glume, obovate-oblong to oblong, trigonous, obtuse, shortly apiculate, purplish-brown, iridescent punctulate.

All tropical regions.

Open places, on calcareous soil.

ARUBA: calcareous hills and plateau near Balashi (Bolding 6424c, fl. Jan.); Companashi (Arnoldo 67, fl. & fr. Dec.); along roads in Oranjestad (Stoffers 2139, fl. & fr. Feb.).

BONAIRE: calcareous plateau near Tolo (Bolding 7277c, fr. Feb.); Sabana (Arnoldo 398, fl. & fr. Jan.); Playa Foenchi (Stoffers 986, fl. & fr. Dec.).

CURAÇAO: calcareous hills near Santa Cruz (Bolding 5590a, fr. Nov.).

Cyperus distans L. f.

LINNAEUS f., Suppl. 103. 1781; GRIEBACH, Fl. Br. W. Ind. Isl. 565. 1864; C. B. CLARKE, J. Linn. Soc. 20: 290. 1883; J. Linn. Soc. 21: 144. 1884; DUSS, Fl. phan. Ant. franc. 540. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 32. 1900; URBAN, Symb. Ant. 4: 112. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 26. 1909; JOHNSTON, Proc. Bost. Soc. Nat. Hist. 34(7): 190. 1909; BOLDINGH, Fl. Ned. W. Ind. Eil. 131. 1913; URBAN, Symb. Ant. 8: 56.

1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 82. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 138. 1936; HODGE, Lloydia 17: 140. 1954.

Perennial herb with short rhizomes. Culms rather slender, stiff, up to 100 cm tall, triquetrous, smooth, many-foliate at the base. Leaves about as long as the culms, 4—8 mm wide, flat, the margins scabrous towards the apex; sheaths long, purplish towards the base. Bracts 3—7, foliaceous, the lower ones much longer than the inflorescence. Umbel compound, lax; rays 4—12, slender, up to 12 cm long, unequal, with tubular sheaths, subfoliaceous prolonged on one side, up to 4 cm long, the blade usually deeply bifid. Spikes elliptic to ovate, loose. Spikelets 10—20 mm long, 8—24-flowered, at first filiform, 0.5 mm wide, slightly spreading, afterwards becoming divergent or the lower even reflexed, linear-lanceolate, 1.5 mm wide; the lowest ones subtended by a setaceous bractlet; rhachilla with narrow, hyaline margins, gradually flexuous. Glumes at first slightly imbricate, gradually spreading, elliptic, obtuse, nearly 2 mm long, with hyaline margins near the apex, the keel rounded, greenish, 3—5-veined, the wings veinless, straw-coloured with a few reddish lines. Stamens 3. Style short with 3 rather long branches. Nut oblong, trigonous, 1.5 mm long, obtusely pointed, brown, punctulate.

Tropical regions.

Moist places at lower and higher elevations.

St. EUSTATIUS: without loc. (Boldingh 1057, fl. & fr.).

Cyperus amabilis Vahl

VAHL, Enum. Plant. 2: 318. 1806; C. B. CLARKE, J. Linn. Soc. 20: 283. 1883; J. Linn. Soc. 21: 85. 1884; in URBAN, Symb. Ant. 2: 24. 1900; URBAN, Symb. Ant. 8: 54. 1920; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 265. 1936; O'NEILL in LEON, Fl. Cuba 1: 193. 1946; — *Cyperus oligostachys* auct. non H.B.K.: BOLDINGH, Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 11. 1914.

Tufted, annual herb. Culms 5—15 cm tall, slender, trigonous, with 1—2 leaves at the base. Leaves shorter than the culms, 1—2 mm wide, flat with involute margins; sheaths with reddish veins. Bracts 3—6, foliaceous, usually shorter than the inflorescence. Umbel simple or compound, rarely reduced to a single head; rays up to 10, spreading, 0—8 cm long, slender, flattened, with an up to 5 mm long tubular, bi-keeled sheath, at the apex truncate and each keel excurrent in a mucro. Spikelets 3—14, linear, acute, digitately fascicled, 5—18 mm long and about 1 mm wide, compressed, many-flowered; rhachilla slender, not winged. Glumes at first slightly imbricate, afterwards more or less spreading, 1.5 mm long, ovate-oblong, truncate at the apex, golden brown, keeled by the green midvein and with 2 lateral veins; the midvein excurrent in a suberect, short mucro. Stamen 1. Style rather long, the three stigmas shortly exserted. Nut $\frac{2}{5}$ of the glume, obovate-oblong, trigonous, minutely apiculate, pale brown, iridescent punctulate.

Tropical America, Afrika, and Asia.

Sandy and stony places at lower and middle elevations.

ARUBA: calcareous hills near Savaneta (Bolding 6523, fr. Jan.).

BONAIRE: Brandaris (Stoffers 977, fl. & fr. Dec.); Hobau (Stoffers 1025, fl. & fr. Dec.); Seroe Dos Pos (Arnoldo 437, fr. Feb.); Bolivia (Arnoldo 370, fl. & fr. Jan.); Hofje of Bacuna (Boldingh 7473, fl. & fr. Feb.); calcareous plateau of Montagne (Boldingh 7413, fl. & fr. Feb.); Rincón (Boldingh 7115, fr. Jan.).

CURAÇAO: coastal hill near St. Joris Baai (Britton & Shafer 3095, fl. & fr. March); Brakkeput (Burgers 164, fl. & fr. Feb.; 170, fl. & fr. Feb.); hills near Knip (Stoffers 1161, fl. & fr. Dec.); Hofje of Knip (Boldingh 5540, fl. & fr. Dec.); calcareous hills near Santa Cruz (Boldingh 5592, fr. Dec.).

Cyperus compressus L.

LINNAEUS, Spec. Plant. 46. 1753; **GRISEBACH**, Fl. Br. W. Ind. Isl. 562. 1864; **C. B. CLARKE**, J. Linn. Soc. 20: 284. 1883; J. Linn. Soc. 21: 97. 1884; **DUSS**, Fl. phan. Ant. franç. 535. 1897; **C. B. CLARKE** in **URBAN**, Symb. Ant. 2: 31. 1900; **URBAN**, Symb. Ant. 4: 112. 1903; **BOLDINGH**, Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 10. 1914; **URBAN**, Symb. Ant. 8: 56. 1920; **BRITTON & WILSON**, Sci. Surv. Porto Rico & Virgin Isl. 5: 82. 1923; **KÜENTHAL** in **ENGLER**, Pflanzenreich IV (20): 156. 1936; **O'NEILL** in **LEON**, Fl. Cuba 1: 194. 1946; **HODGE**, Lloydia 17: 140. 1954.

Annual herb with fibrous roots. Culms 5—35 cm tall, slender, weak or rather stiff, compressed-triangular, canaliculate at one side, with a few leaves at the base. Leaves slightly longer or shorter than the culms, 1—3 mm wide, flat or complicate, greyish-green. Sheaths purplish, pluri-striate. Bracts 3—4, exceeding the inflorescence. Umbel simple; rays 2—4, unequal, up to 10 cm long, spreading, with tubular, obliquely truncate sheaths, or the inflorescence capitate and reduced to one sessile spike. Spikelets linear-lanceolate, 8—25 mm long and 2—3 mm wide, compressed, subquadangular, 12- to 30-flowered, 3—10 together in very short, flattened spikes. Rhachilla straight, with thin margins. Glumes densely imbricate, rigid, ovate, acuminate, with a suberect mucro, 3 mm long, keeled, pale green with reddish or brownish sides and yellowish to hyaline margins. Stamens 3. Style elongate, 3-fid. Nut 1½ mm long, broadly obovate, triangular, obtuse, brown to black, smooth and shining.

Tropical and subtropical regions.

Waste and cultivated grounds at lower and middle elevations.

CURAÇAO: Hofje of Knip (Boldingh 5487, fr. Dec.).

Cyperus esculentus L.

LINNAEUS, Spec. Plant. 45. 1753; **GRISEBACH**, Fl. Br. W. Ind. Isl. 565. 1864; **C. B. CLARKE**, J. Linn. Soc. 21: 178. 1884; **DUSS**, Fl. phan. Ant. franç. 540. 1897; **C. B. CLARKE** in **URBAN**, Symb. Ant. 2: 33. 1900; **BOLDINGH**, Fl. Ned. W. Ind. Eil. 131. 1913; Fl. D. W. Ind. Isl. 2: 10. 1914; **BRITTON & WILSON**, Sci. Surv. Porto Rico & Virgin Isl. 5: 84. 1923; **KÜENTHAL** in **ENGLER**, Pflanzenreich IV (20): 116. 1936; **O'NEILL** in **LEON**, Fl. Cuba 1: 195. 1946.

Perennial herb with long, slender, brown-scaly stolons, bearing small tubers. Culms solitary, rather stout, triquetrous, 20—70 cm tall, incrassate at the base, many-foliate. Leaves usually longer than the culm, flat, 3—6 mm wide, rather stiff, scabrous towards the apex, keeled; sheaths pale, those of the upper leaves very long, closed by a scarious band, the lower ones not becoming fibrous.

Bracts 3—6, the lower ones surpassing the inflorescence. Umbel simple or compound; rays 5—10, slender, up to 12 cm long, very unequal; their sheaths pale, obliquely truncate, up to 8 mm long. Spikes ovate, lax, with 5—17 spikelets. Spikelets distichous, spreading, lanceolate, subacute, 5—15 mm long, 2 mm wide, 8—20-flowered, subcompressed. Rhachilla with broad, hyaline wings. Glumes membranous, at first laxly imbricate, afterwards slightly spreading, ovate, obtuse, sometimes mucronulate, 2—2.5 mm long, with 7 evenly distributed veins, slightly keeled by the green midvein, usually golden-yellow with a narrow hyaline margin towards the apex. Stamens 3, with linear, 1.5 mm long, exserted anthers. Style long, with 3 long branches. Nut about half as long as the glumes, obovate-oblong, trigonous, greyish-brown, shining.

Tropical and subtropical regions.

Coastal sands and waste places.

Vernacular name: yerba di kooko, kooko di amienna.

ARUBA: calcareous hills near Baicuri (Boldингh 6342, fl. Dec.).

BONAIRE: Onima (Arnoldo 364, fl. Jan.); calcareous hills near Fontein (Boldингh 7333, fl. & fr., Feb.); coast of Karpata (Stoffers 609, fl. & fr. Nov.); Kralendijk (Stoffers 906, fl. & fr. Dec.); Sabana (Stoffers 957, fl. & fr. Dec.); dam near Jatoe Bacoe (Stoffers 634, fl. & fr. Nov.; 658, fl. Nov.); Karpata near Goto (Stoffers 1073, fl. Dec.; 1090, fl. & fr. Dec.); Rincón (Boldингh 1731, fl. Jan.; 7140, fl. & fr. Jan.; 7148, fl. & fr. Jan.); Slagbaai Plantation (Stoffers 600, fl. & fr. Nov.).

Cyperus rotundus L.

LINNAEUS, Spec. Plant. 45. 1753; GRISEBACH, Fl. Br. W. Ind. Isl. 564. 1864; DUSS, Fl. phan. Ant. franç. 538. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 34. 1900; URBAN, Symb. Ant. 4: 112. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 27. 1909; Fl. Ned. W. Ind. Eil. 132. 1913; Fl. D. W. Ind. Isl. 2: 11. 1914; URBAN, Symb. Ant. 8: 56. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 84. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 107, fig. 13. 1936; QUESTEL, Fl. Isl. St. Bartholomew 83. 1941; O'NEILL in LEON, Fl. Cuba 1: 195. 1946; HODGE, Lloydia 17: 141. 1954.

Perennial herb, with slender, wiry stolons, thickened into woody, ovoid tubers. Culms solitary, slender but rather stiff, up to 40 cm tall, triquetrous, incrassate at the base, many-foliate. Leaves usually shorter than the culm, 2—5 mm wide, flat, scabrous towards the apex; sheaths brownish, the upper ones closed by a scarious band, the lower ones deteriorating into fibres. Bracts 3—4, foliaceous, spreading, the lower ones surpassing the inflorescence. Umbels simple or decomound, rays 3—8, very unequal, slender, up to 6 cm long; their sheaths obliquely truncate, pale, about 7 mm long. Spikelets loosely spicate, 3—10, subdistichous, linear-lanceolate, acute, 1—4 cm long and 1.5—2 mm wide, 12—40-flowered, slightly compressed; rhachilla with broad hyaline wings. Glumes boat-shaped, ovate, obtuse, 3 mm long, pale straw-coloured, variegated with purple to deep red-purple, 7-veined, the 3 central veins in a green band hardly forming a keel, sometimes very slightly mucronate, the margins more or less hyaline. Stamens 3, with linear, up to 2.5 mm long, partly exserted anthers. Style long with 3 long-exserted branches. Nut $\frac{2}{5}$ as long as the glume, obovate-oblong, trigonous, dark-brown.

Tropical and subtropical regions.

A common noxious weed; moist and cultivated grounds and waste places at lower and middle elevations.

Vernacular name: nutgrass (Windward Group).

ARUBA: Hills near Fontein (Boldingh 6475, fl. Jan.); San José (Arnoldo 313, fl. Dec.); Fontein (Stoffers 1720, fl. Jan.; 1721, fl. Jan.); without loc. (Boldingh s.n. fl. & fr.).

BONAIRE: Sabana (Arnoldo 507, fl. May); Rooi pagaai (Stoffers 514, fl. Nov.); Onima (Arnoldo 365, fl. Jan; Burgers 532, fl. March); dam near Jatoo Bacoe (Stoffers 661, fl. Nov.; Suringar s.n., st. Feb. [L]).

CURAÇAO: road near Blein (Boldingh 4747, fl. Oct.); Casparito (Lens 822, fl. Dec.); St. Joris Baaï (Britton & Shafer 3097, fl. March); Wishi (Arnoldo 7, fl.); Mu-seum garden, Mundo Nobo (Arnoldo 1674, fl. Oct.); Patattentuin (Burgers 62, fl. Jan.); Hofje of Siberië (Boldingh 5054w, fl. Nov.); Willemstad (Arnoldo 60, fl. Dec.); Klein Santa Marta (Stoffers 87, fl. Sept.); Klein St. Michiel (Stoffers 262, fl. Oct.); Experimental Garden, Cas Corá (Stoffers 246, fl. Oct.); without loc. (Aschenberg s.n., fl.).

SABA: The Bottom (Arnoldo 857, fl. Aug.); Booby Hill (Boldingh 1603, fl. July); slope of The Mountain, 800 m (Boldingh 2186, fl. July); Hellsgate (Burgers 519a, fl. March).

St. EUSTATIUS: Oranjestad (Stoffers 3901, fl. July; 3903, fl. July; 1074, fl. June); without loc. (v. Groll-Meyer 159, fl.).

St. MARTIN: Experimental Garden, Cul de Sac (Burgers 472, fl. March; Humme-linck s.n., fl. May); near Bellevue (Boldingh 2828, fl. Aug.); near Bethlehem (Boldingh 2936, fl. Aug.); without loc. (Boldingh 3085, fl.).

Cyperus fuligineus Chapman

CHAPMAN, Fl. South. Unit. States 511. 1872; **BRITTON & WILSON**, Sci. Surv. Porto Rico & Virgin Isl. 5: 86. 1923; **KÜKENTHAL** in **ENGLER**, Pflanzenreich IV (20): 470. 1936; **O'NEILL** in **LEON**, Fl. Cuba 1: 198. 1946: — *Mariscus fuligineus* C. B. CLARKE in **URBAN**, Symb. Ant. 5: 290. 1907; **BOLDINGH**, Fl. Ned. W. Ind. Eil. 133. 1913; Fl. D. W. Ind. Isl. 2: 12. 1914.

Perennial herb with very short rhizomes. Culms densely tufted, 15—30 cm tall, slender, trigonous, stiff, foliate at the base. Leaves shorter than the culms, about 1 mm wide, involute, triquetrous and scabrous towards the apex; sheaths narrow, purple, the upper one closed, up to 4 cm long. Bracts 2, foliaceous, very unequal, up to 18 cm long, one much surpassing the capitate inflorescence, formed by a single, dense, subglobose, up to 1.5 cm wide spike. Spikelets lanceolate, acute, 4—8 mm long and 1—1.5 mm wide, 4—9-flowered, compressed, many. Rhachilla with narrow hyaline wings. Glumes laxly imbricate, ovate, obtuse, mucronulate, $1\frac{2}{3}$ —2 mm long, deep brown to red-purple, 9—11-veined, slightly keeled by the pale midvein. Stamens 3. Style short, with 3 long branches. Nut $\frac{2}{3}$ as long as the glume, oblong-elliptic, trigonous, purplish-black, shortly apiculate, punctulate.

Florida, Bahamas, Cuba, Hispaniola, Puerto Rico, Bonaire, and Curaçao.

Limestone, often in salt habitats.

Vernacular name: yerba maisji sjikitoe (Leeward Group).

BONAIRE: Pedro Keli (Arnoldo 417, fl. & fr. Dec.); calcareous hills of Rooi Samboe (Boldingh 7439, fl. Feb.); Soebi Rincón (Boldingh 7261b, fl. & fr. Jan.; 7295, fl. & fr. Jan.); Santa Barbara (Arnoldo 435, fl. & fr. Dec.; Stoffers 797, fl. & fr. Nov.); Punt Vierkant (Stoffers 704, fl. & fr. Nov.); Karpara near Goto (Stoffers 1080, fl. & fr. Dec.); calcareous plateau near Lac (Boldingh 7477a, fl. & fr. Feb.; Stoffers 485, fl. & fr. Nov.); Lima (Stoffers 497, fl. & fr. Nov.); Flambaaiput (Stoffers 461, fl. & fr. Oct.); Airfield (Stoffers 770, fl. & fr. Nov.); road to saltponds (Stoffers 723, fl. & fr. Nov.; 706, fl. & fr. Nov.; 715, fl. & fr. Nov.); Playa Foenchi (Stoffers 994, fl. & fr. Dec.).

CURAÇAO: Rif Hill (Boldingh 4656, fl. & fr. Oct.); calcareous hills near St. Jan (Boldingh 5640, fl. & fr. Dec.); near Willemstad (Britton & Shafer 2947, fl. March); Ronde Klip (Arnoldo s.n., fl.; Boldingh 5402, fl. & fr. Nov.); seashore near saltponds of St. Willebrordus (Stoffers 365, fl. & fr. Oct.; 364, fl. & fr. Oct.).

Cyperus nanus Willd.

WILLDENOW, Spec. Plant. 1: 272. 1798, excl. tab. Pluk.; **KÜENTHAL** in ENGLER, Pflanzenreich IV (20): 535. 1936; **QUESTEL**, Fl. Isl. St. Bartholomew 83. 1941; **O'NEILL** in LEON, Fl. Cuba 1: 194. 1946; — *Mariscus capillaris* VAHL, Enum. Plant. 2: 372. 1806; **C. B. CLARKE** in URBAN, Symb. Ant. 2: 48. 1900; **BOLDINGH**, Fl. D. W. Ind. Isl. 1: 27. 1909 p.p.; **URBAN**, Symb. Ant. 8: 58. 1920; — *Schoenus capillaris* SWARTZ, Prodr. Veg. Ind. Occ. 20. 1788; Fl. Ind. Occ. 1: 106. 1797; — *Kyllinga capillaris* GRISEBACH, Veg. Karib. 120. 1857; — *Cyperus tenuis* GRISEBACH var. *capillaris* (Swartz) KÜENTHAL in FEDDE, Report. 23: 188. 1926; — *Mariscus gracilis* auct. non Vahl: **BOLDINGH**, Fl. Ned. W. Ind. Eil. 134. 1913 p.p.; Fl. D. W. Ind. Isl. 2: 12. 1914 p.p.

var. nanus

Perennial herb, with short rhizome. Culms caespitose, 5—15 cm tall, filiform, trigonous, very slightly scabrous towards the apex, foliate at the base. Leaves filiform, smooth, shorter than the culms; sheaths brown-purplish. Bracts 2, foliaceous, much longer than the inflorescence, sometimes a minute third one, reflexed at anthesis, becoming divergent after loosing the spikelets. Inflorescence consisting of one terminal, sessile, dense, globose spike, 4—5 mm in diam. Spikelets spreading in all directions, the lower ones reflexed, oblong, acute, 2—2.5 mm long, 1—3-flowered. Rhachilla straight, with hyaline wings. Glumes slightly imbricate, afterwards spreading, broadly ovate, obtuse, with a minute mucro, 1½ mm long, straw-coloured to pale brown with green keel, about 9-veined. Stamens 3. Style short, with 3 rather long branches. Nut about as long as the glume, oblong-elliptic, trigonous, apiculate, blackish-brown, minutely punctulate.

Greater Antilles, Bonaire, Curaçao, and Saba.

On limestone or steep slopes at lower and middle elevations.

BONAIRE: Onima (Arnoldo 360, fl. & fr. Jan.; 465, fl. & fr. Dec.); Hobau (Stoffers 1043, fl. & fr. Dec.); Brandaris (Stoffers 973, fl. & fr. Dec.; Boldingh 7322, fl. & fr. Feb.); slope of Macutuao (Boldingh 7119, fl. & fr. Feb.); hills near Fontein (Boldingh 7255, fl. & fr. Feb.); calcareous plateau near Tolo (Boldingh 7277b, fl. & fr. Feb.); calcareous plateau of Klein Bonaire (Boldingh 7490, fl. & fr. Feb.).

CURAÇAO: Santa Marta (Britton & Shafer 2971, fl. & fr. March); Seroe Christoffel (Boldingh 4996, fl. Nov.); near Hato? (Boldingh 5109, fl. & fr. Nov.); Seroe Christoffel (Suringar s.n., fl. & fr. Jan. [L]); without loc. (Arnoldo s.n. fr.).

SABA: Spring Bay Gut (Boldingh 2101, fl. & fr. July; 2097, fl. July); Fort Gut, 150-200 m (Boldingh 1632, fl. & fr. July); slope of The Mountain, 600 m (Boldingh 1738, fl. July).

var. *subtenuis* Kükenth.

KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 536. 1936; O'NEILL in LEON, Fl. Cuba 1: 198. 1946; — *Cyperus tenuis* GRISEBACH, Fl. Br. W. Ind. Isl. 563. 1864; — *Mariscus tenuis* (Grisebach) C. B. CLARKE in URBAN, Symb. Ant. 2: 48. 1900.

Culms 10—30 cm tall. Leaves often flattish. Spikelets 3—5-flowered, 3 mm long. Glumes strongly veined. Nut slightly shorter than the glumes.

Greater Antilles, St. Martin, Curaçao, and Bonaire.

Roadside weed.

BONAIRE: along the road from Kralendijk to Rincón (Stoffers 899, fl. & fr. Dec.).

CURAÇAO: Hofje of Knip (Boldingh 5504, fl. & fr. Nov.); hills near Siberië (Boldingh 5191, fl. & fr. Nov.).

ST. MARTIN: along the road from Grande Case to Marigot (Bolding 3101, fl. & fr. Sept.).

***Cyperus confertus* Swartz**

SWARTZ, Prodr. Veg. Ind. Occ. 20: 1788; Fl. Ind. Occ. 1: 115. 1797; GRISEBACH, Fl. Br. W. Ind. Isl. 563. 1864; Duss, Fl. phan. Ant. franç. 536. 1897; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 87. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 497. 1936; QUESTEL, Fl. Isl. St. Bartholomew 83. 1941; O'NEILL in LEON, Fl. Cuba 1: 197. 1946; — *Mariscus confertus* C. B. CLARKE in URBAN, Symb. Ant. 2: 50. 1900; URBAN, Symb. Ant. 4: 114. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 133. 1913; Fl. D. W. Ind. Isl. 2: 11. 1914; URBAN, Symb. Ant. 8: 59. 1920.

Annual or perennial herb with short rhizome. Culms slender, 5—40 cm tall, more or less tufted, triquetrous, incrassate at the base. Leaves equaling or longer than the culms, 2—4 mm wide, flat, flaccid, slightly scabrous along the margins; sheaths pale purplish, the lower ones often bladeless. Bracts 3—6, foliaceous, the lower ones much surpassing the inflorescence, up to 20 cm long, spreading. Umbel simple, 2—6-rayed; rays 0—9 cm long, very unequal, flattened; their sheaths inconspicuous. Spikes subglobose, 8—12 mm in diam., rather dense. Spikelets oblong, 4—7 mm long and 2—3 mm wide, compressed, (3-)4—10-flowered. Rhachilla slightly flexuous, narrowly winged, articulate near the base. Glumes ovate, at first distinctly, in fruit hardly imbricate, about 3 mm long, with a broad, green keel excurrent in a rigid, slightly recurved awl; the wings often auriculate at the apex, greenish when young, afterwards shining golden, with 4 prominent veins. Stamens 3 (-2). Style rather long with 3 long branches. Nut obovoid, 1—1¼ mm long, trigonous, apiculate, black when mature, shining, punctulate.

West Indies, northern South America, and Galapagos.

Dry and moist places at lower elevations.

Vernacular name: coco djamina, coco djamina machu (Leeward Group).

ARUBA: Matoguerai (Stoffers 1427, fl. & fr. Jan.); Andicouri (Stoffers 1807, fl. & fr. Jan.); hills north-east of Andicouri Plantation (Stoffers 1825, fl. & fr. Jan.); Tanki Leendert (Stoffers 1449, fl. Jan.); road to Westpunt, near Noord (Stoffers 1775, fl. & fr. Jan.; 1554, fl. & fr. Jan.; 1559, fl. & fr. Jan.; 1563, fl. & fr. Jan.); Palu Marca (Stoffers 1959, fl. & fr. Jan.); along roads near Oranjestad (Stoffers 2072, fl. & fr. Feb.); Seroe Pretoe (Stoffers 1671, fl. & fr. Jan.); top of Matavidiri (Stoffers 2026, fl. & fr. Feb.); top of Hooiberg (Stoffers 2095, fl. & fr. Feb.); slope of Hooiberg (Stoffers 2103, fl. & fr. Feb.; 2110, fl. & fr. Feb.); Santa Cruz (Stoffers 1739, fl. Jan.); Savaneta (Stoffers 1763, fl. & fr. Jan.; 1759, fl. & fr. Jan.; 1762, fl. & fr. Jan.); Boldingh 6557, fl. & fr. Jan.); along roads near Kleine Jamanota (Stoffers 2008, fl. & fr. Jan.); north-east of Jamanota (Stoffers 1651, fl. & fr. Jan.); Jamanota (Stoffers 1629, fl. & fr. Jan.); Sivi-Sivi (Boldingh 6304, fr.); slope of Jaburibari (Boldingh 6272, fl. & fr. Dec.); Seroe Blanco (Boldingh 6483, fl. & fr. Jan.); calcareous hills and plateau near Balashi (Boldingh 6424, fl. & fr. Jan.); Companashi (Arnoldo 65, fl. & fr. Dec.; 75, fl. & fr. Dec.); slope of Seroe Soempinjana (Boldingh 6392, fl. & fr. Jan.); without loc. (v. Koolwijk, sub Suringar s.n., fr.).

BONAIRE: Hobau (Stoffers 1030, fl. & fr. Dec.); Seroe Grandi (Arnoldo 44, fl. & fr. Nov.; Stoffers 924, fl. & fr. Dec.); Slagbaai Plantation (Stoffers 592, fl. & fr. Nov.); ibid., near Brandaris (Boldingh 7314a, fr. Feb.); Airfield (Stoffers 789, fl. & fr. Nov.); Playa Foenchi (Stoffers 992, fl. & fr. Dec.); Sabana (Arnoldo 363, fl. & fr. Jan.).

CURAÇAO: Limestone plateau between Willemstad and Jan Thiel (Stoffers 381, fl. & fr. Oct.); Westpunt (Boldingh 4926, fr. Nov.); St. Jan (Burgers 14, fl. & fr. Dec.); Willemstad (Went 1091, fl. & fr. Nov.); Brakkeput (Burgers 167, fl. & fr. Feb.); calcareous plateau near Hato (Boldingh 5320, fl. & fr. Nov.); Casparito (Lens 812, fl. & fr.); near Willemstad (Britton & Shafer 2907, fl. & fr. March); Cas Chiquito (Versluys 1416, fl. & fr.); Santa Cruz (Britton & Shafer 3028, fl. & fr. March); Seroe Christoffel (Burgers 142b, fl. & fr. Feb.; 140, fl. & fr. Feb.); Hofje of Knip (Boldingh 5505, fl. & fr. Dec.).

SABA: The Bottom (Arnoldo 905, fl. & fr. Aug.).

St. EUSTATIUS: Oranjestad (Stoffers 3861, fl. & fr. July); without loc. (v. Groll-Meyer 266h, fl. & fr.).

Cyperus planifolius L. C. Richard

L. C. RICHARD, Act. Soc. Hist. Nat. Paris 1: 106. 1792; VAHL, Enum. Plant. 2: 354. 1806; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 88. 1923; KÜENTHAL in ENGLER, Pflanzenreich IV (20): 447. 1936; O'NEILL in LEON, Fl. Cuba 1: 195. 1946; HODGE, Lloydia 17: 141. 1954; — *Mariscus planifolius* (L. C. Richard) URBAN, Symb. Ant. 2: 165. 1900; Symb. Ant. 4: 114. 1903; BOLDINGH, Fl. Ned. W. I. Eil. 134. 1913; Fl. D. W. Ind. Isl. 2: 12. 1914; — *Cyperus brunneus* SWARTZ, Fl. Ind. Occ. 1: 116. 1797; GRIEBACH, Fl. Br. W. Ind. Isl. 565. 1864; DUSS, Fl. phan. Ant. franç. 539. 1897; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 88. 1923; QUESTEL, Fl. Isl. St. Bartholomew 83. 1941; — *Mariscus brunneus* C. B. CLARKE in URBAN, Symb. Ant 2: 51. 1900; URBAN, Symb. Ant. 4: 114. 1903; BOLDINGH, Fl. Ned. W. I. Eil. 133. 1913;

Fl. D. W. Ind. Isl. 2: 11. 1914; URBAN, Symb. Ant. 8: 59. 1920; — *Cyperus planifolius* L. C. RICHARD var. *brunneus* (Swartz) KÜKENTHAL in FEDDE, Repert. 23: 189. 1926; in ENGLER, Pflanzenreich IV (20): 448. 1936; HODGE, Lloydia 17: 142. 1954; — *Cyperus brizaeus* VAHL, Enum. Plant. 2: 316. 1806; — *Mariscus brizaeus* (Vahl) C. B. CLARKE in URBAN, Symb. Ant. 2: 52. 1900; URBAN, Symb. Ant. 4: 115. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 27. 1909; Fl. Ned. W. Ind. Eil. 133. 1913; — *Cyperus ottonis* BOECKELER, Linnaea 36: 350. 1870; Duss., Fl. phan. Ant. franç. 539. 1897; — *Cyperus planifolius* L. C. RICHARD var. *ottonis* (Boeckeler) KÜKENTHAL in FEDDE, Repert. 23: 188. 1926; ibid. 32: 74. 1933; in ENGLER, Pflanzenreich IV (20): 447. 1936.

Perennial herb, very varying in size and habit, with short rhizome and many fibrous roots. Culms 15—90 cm tall, triquetrous, usually robust, smooth, thickened and many-leaved near the base. Leaves often longer than the culm, (1.5-) 2.5—10 mm wide, grey-green, coriaceous, flat with scabrous margins and keel; sheaths brown to reddish-brown. Bracts 3 to 5, foliaceous, the lower two surpassing the inflorescence, up to 50 cm long. Inflorescence umbellate, simple or compound. Rays 3—12, slender, 2—9 cm long, with reddish-brown, tubular, truncate-apiculate sheaths at the base. Spikelets several to many in rather lax to dense, ovate spikes, linear or lanceolate when young, 8—30 mm long and 1—2 mm wide, slightly compressed, 8—25-flowered. Rhachilla articulate near the base, straight, with distinct, hyaline wings either free with the achene exposed or connate with the next glume and partly including the achene. Glumes appressed imbricate when young, more or less spreading in fruit, ovate-oblong, obtuse or slightly mucronate, 7—11-veined, the midvein sometimes green and prominent, brown to brown-red, 2 mm long. Stamens 3. Style rather short, with 3 long branches. Nut obovoid to ellipsoid, 1.5 mm long, trigonous, apiculate, black, punctulate.

West Indies

Dry and moist places in lower and middle elevations, especially on coastal sands.

Vernacular names: kamoe, korta man, yerba di koetsjoe (Leeward Group).
bullgrass (Windward Group).

ARUBA: Pova Beach (Stoffers 1417, fl. & fr. Jan.; 1415, fl. & fr. Jan.); San José (Arnoldo 309, fl. & fr. Dec.); Hofje of Fontein (Arnoldo 342, fr. Dec.; Suringar s.n., fl. & fr. Feb. [L]; Stoffers 1697, fl. & fr. Jan.; 1716, fl. & fr. Jan.); Rif (Suringar s.n., fl. & fr. Feb. [L]).

BONAIRE: Pedro Keli (Arnoldo 456, fl. & fr. Dec.; 418, fl. & fr. Dec.; very slender specimen with narrow leaves and small, more or less capitate inflorescence); Karpata, near Goto (Stoffers 1088, fl. & fr. Dec.); along saltpans, near Witte Pan (Stoffers 467, fl. & fr. Oct.); seashore near saltpans of southern Bonaire (Boldingh 7498, fl. & fr. Feb.; Suringar s.n., fl. & fr. Feb. [L]); road to saltpans, near Blauwe Pan (Stoffers 728, fl. & fr. Nov.; 717, fl. & fr. Nov.); Burgers 520, fl. & fr. March); near Pekelmeer (Stoffers 724, fl. & fr. Nov.); Punt Vierkant (Stoffers 703, fl. & fr. Nov.); seashore near Playa Grandi (Boldingh 7176, fl. & fr. Feb.); Lima (Stoffers 495, fl. & fr. Nov.); Flambaaiput (Stoffers 463, fl. & fr. Oct.); along the coast of Karpata (Stoffers 605, fr. Nov.); calcareous hills of Root Samboe (Boldingh 7435, fl. & fr. Feb.).

CURAÇAO: St. Jan Baai (Burgers 151, fl. Feb.); saltpans of St. Willebrordus (Stoffers 339, fl. & fr. Oct.); seashore near saltpans of St. Willebrordus (Stoffers 367, fl. & fr. Oct.; 369, fl. & fr. Oct.); Boca Santa Marta (Arnoldo 2173, fl.

& fr. Feb.); coral sea-beach near Willemstad (Britton & Shafer 2938, fl. & fr. March); Seroe Christoffel Boldingh 5004, fl. & fr. Nov.; Suringar s.n., fl. & fr. Jan. [L]); ibid. 200 m (Stoffers 232, fr. Oct.); Rood Behoenda (Boldingh 5558, st. Nov.); seashore near San Pedro (Boldingh 5289, fl. & fr. Nov.); Brakkeput (Suringar s.n., fl. & fr. Jan. [L]); Rif (Suringar s.n., fl. & fr. Jan. [L]); Hospitaal (Suringar s.n., fl. & fr. Jan. [L]); without loc. (Aschenberg s.n., fr.).

SABA: Great Hill (Suringar s.n., fl. & fr. Ap. [L]); along the road between The Bottom and Windwardside, 200 m (Boldingh 1343, fl. & fr. July; Arnoldo 697, fl. Aug.; Stoffers 4627, fl. & fr. March); Flat Point (Boldingh 2129, fr. July); between The Bottom and The Saddle (Stoffers 3111, fl. & fr. Ap.); between Windwardside and Hellsgate (Stoffers 3362, fl. & fr. May); Ladder Gut, 0-40 m (Stoffers 4355, fl. & fr. Aug.); Hellsgate (Burgers 515, fl. & fr. March).

ST. EUSTATUS: slope of The Quill near Bengalen, 100 m (Boldingh 671, fr. June); ibid. 250 m (Boldingh 699, fl. & fr. June); without loc. (v. Groll- Meyer, fl. & fr.).

ST. MARTIN: Low Lands (Stoffers 2690, fl. & fr. Ap.); ibid., near Mullet Pond (Boldingh 2786, fl. & fr. Aug.); Tintamarre (Boldingh 3369, fl. Sept.).

Cyperus ligularis L.

LINNAEUS, Amoen. Acad. 5: 391. 1759; GRISEBACH, Fl. Br. W. Ind. Isl. 566. 1864; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 87. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 474. 1936; O'NEILL in LEON, Fl. Cuba 1: 194. 1946; HODGE, Lloydia 17: 141. 1954; — *Mariscus ligularis* (Linnaeus) URBAN, Symb. Ant. 2: 165. 1900; URBAN, Symb. Ant. 4: 114. 1903; JOHNSTON, Proc. Bost. Soc. Nat. Hist. 34(7): 191. 1909; BOLDINGH, Fl. Ned. W. Ind. Eil. 134. 1913; Fl. D. W. Ind. Isl. 2: 12. 1914; URBAN, Symb. Ant. 8: 59. 1920; — *Mariscus rufus* HUMBOLDT, BONPLAND & KUNTH, Nov. Gen. et Spec. 1: 216. t. 67. 1815; DUSS, Fl. phan. Ant. franç. 542. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 48. 1900.

Perennial herb; rhizome short or wanting. Culms stout, up to 100 cm tall, trigonous, dull, many-foliate. Leaves often longer than the culms, 6—12 mm wide, coriaceous grey-green, trabeculate between the veins, flat or induplicate, margins and keel very scabrous denticulate; lower sheaths reddish-brown, coriaceous, the upper ones closed by a scarious band, truncate at the mouth. Bracts 5—8, the lower ones much longer than the inflorescence. Umbel compound; rays 7—12, spreading, rigid, triquetrous, unequal, up to 10 cm long, with a tubular, up to 12 mm long, reddish-brown sheath and each with a terminal, cylindric, 1.5—2 cm long and 10—12 mm wide spike and a few sessile, subglobose, divaricate or reflexed, lateral ones; all spikes very dense. Spikelets spreading, oblong-lanceolate, acute, 4—6 mm long, about 1 mm wide, subquadangular, 2- to 4-flowered. Rhachilla very flat, with hyaline wings, articulate. Glumes imbricate, ovate, obtuse or acute, 2.5—3 mm long, stiff, 9-veined, pale brown variegated with red, the midvein green, slightly keeled towards the apex. Stamens 3. Style long, with 3 long branches. Nut obovoid-oblong, $\frac{1}{2}$ — $\frac{2}{3}$ as long as the glume, about 1.5 mm long, apiculate, trigonous, purplish-black, dull.

Tropical America and Africa.

Marshes and ditches at lower elevations.

CURAÇAO: Santa Cruz (Britton & Shafer 3017, fl. & fr. March); Zuurzak (Boldingh 5390, fl. & fr. Nov.); without loc. (Boldingh s.n., fl. & fr.).

SABA: The Bottom (Arnoldo 737, fl. & fr. Aug.).

Cyperus flavus (Vahl) Nees

NEES, Linnaea 19: 698. 1847; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 530. 1936; O'NEILL in LEON, Fl. Cuba 1: 195. 1946; — *Mariscus flavus* VAHL, Enum. Plant. 2: 374. 1806; C. B. CLARKE in URBAN, Symb. Ant. 2: 41. 1900; BOLDINGH, Fl. D. W. Ind. Isl. 1: 27. 1909; Fl. Ned. W. I. Eil. 133. 1913; — *Cyperus flavamariscus* GRISEBACH, Fl. Br. W. Ind. Isl. 567. 1864 p.p.; Duss, Fl. phan. Ant. franç. 542. 1897; — *Mariscus cayennensis* URBAN, Symb. Ant. 2: 165. 1900; Symb. Ant. 4: 113. 1903; Symb. Ant. 8: 57. 1920.

Perennial herb, with short rhizome. Culms slender and stiff, 20—60 cm tall, triquetrous, many-foliate, incrassate at the base. Leaves as long as or shorter than the culm, 3—6 mm wide, flat, keeled, the margins scabrous; sheaths long, pale purplish, those of the upper leaves closed by a scarious band. Bracts 4—6, foliaceous, spreading to reflexed, much longer than the inflorescence. Umbel simple, contracted, with 4—8 spikes, sessile or in part with rays up to 2.5 cm long, oblong-cylindric, obtuse, 1—2 cm long and 5—7 mm wide, dense. Spikelets in age divariccate, oblong, acute, 3 mm long and 1 mm wide, subtended by an up to 3 mm long, setaceous, scabrous bractlet, 1—2-flowered, turgid, trigonous. Rhachilla with broad hyaline margins and ending in a reduced, sterile glume. Glumes ovate, subobtuse, mucronulate, with a green keel, straw-coloured to rufous, about 11-veined, about 3 mm long. Stamens 3. Style rather long, the lower part persistent, with 3 rather long branches. Nut about half as long as the glume, obovoid, trigonous, with concave sides, brown to brownish-black, long apiculate, punctulate.

West Indies; from Texas and Mexico to Patagonia.

Grassy places and waste grounds at lower and middle elevations.

SABA: Slope of The Mountain, 600 m (Boldingh 1749, fl. & fr. July).

Cyperus ferax L. C. Richard

L. C. RICHARD, Act. Soc. Hist. Nat. Paris 1: 106. 1792; C. B. CLARKE, J. Linn. Soc. 20: 295. 1883; ibid., 21: 191. 1884; Duss, Fl. phan. Ant. franç. 541. 1897; BOLDINGH, Fl. D. W. Ind. Isl. 2: 12. 1914; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 88. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 615. 1936; HODGE, Lloydia 17: 142. 1954; — *Torulinium ferax* (L. C. Richard) URBAN, Symb. Ant. 2: 165. 1900; Symb. Ant. 4: 115. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 134. 1913; Fl. D. W. Ind. Isl. 2: 12. 1914; URBAN, Symb. Ant. 8: 60. 1920; — *Torulinium confertum* DESVAUX in HAMILTON, Prodr. Plant. Ind. Occ. 15. 1825; C. B. CLARKE in URBAN, Symb. Ant. 2: 53. 1900; BOLDINGH, Fl. D. W. Ind. Isl. 1: 28. 1909; — *Cyperus ferox* VAHL, Enum. Plant. 2: 357. 1806; — *Cyperus odoratus* auct. non Linnaeus: GRISEBACH, Fl. Br. W. Ind. Isl. 565. 1864.

Perennial herb with a very short rhizome. Culms firm, 30—60 cm tall, triquetrous, smooth, foliate and slightly incrassate at the base. Leaves about equaling the culms in length, flat, 4—7 mm wide; sheaths long, pale-brownish

or purplish with connections between the veins. Bracts 4—7, spreading, foliaceous, the lower ones much exceeding the compound umbel, up to 30 cm long. Rays (3-) 7—12, very unequal, 0—9 cm long, bearing 1—6 spikes; their sheaths obliquely truncate, bicuspidate. Spikes divergent, oblong, 2—3 cm long, with numerous divergent spikelets; the latter 8—25 mm long, 1—1.5 mm wide, linear and acute, 6—16-flowered, terete. Rhachilla disarticulating above each glume, broadly winged, lateron incrassating, enclosing the nut, flexuous, especially when in fruit. Glumes oblong, obtuse, 7—9-veined, not keeled, imbricate when young, slightly spreading in fruit, 3—3.5 mm long, persisting on the internode of the rhachilla; the latter as long as the fruit, about 2 mm long. Stamens 3. Style rather long, with 3 branches. Nut oblong, slightly trigonous, dark purplish-brown, apiculate, minutely punctulate.

All tropical and subtropical countries.

Wet soil at lower and middle elevations.

ARUBA: Savaneta (Arnoldo 285, fl. & fr. Dec.); vicinity of Noord (Stoffers 1547, fl. Jan.; 1540, fl. & fr. Jan.); plantation near Washington (Stoffers 1498, fl. & fr. Jan.); Companashi (Arnoldo 63, fl. & fr. Dec.); without loc. (Koolwijk sub. Suringar s.n., fl. & fr. Feb. [L]).

BONAIRE: Sabana (Arnoldo 405, fl. & fr. Jan.).

CURAÇAO: Malpais (Britton & Shafer 3114, fl. & fr. March); without loc. (Arnoldo s.n., fl. & fr.).

SABA: Behind the Mountain (Hummelinck s.n., fl. July); Booby Hill, 400 m (Stoffers 4334, fl. Aug.); road to The Mountain (Arnoldo 949, fl. Aug.; 817, fl. Aug.); slope of The Mountain, 600 m (Boldinh 1773, fl. July); in depression near the top of The Mountain (Stoffers 3475, fl. June).

ST. EUSTATIUS: western slope of The Quill (Suringar s.n., fl. & fr. Ap. [L]).

Cyperus filiformis Sw.

SWARTZ, Prodr. Veg. Ind. Occ. 20. 1788; Fl. Ind. Occ. 1: 120. 1797; GRISBACH, Fl. Br. W. Ind. Isl. 565. 1864; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 88. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 624. 1936; O'NEILL in LEON, Fl. Cuba 1: 194. 1946; — *Mariscus filiformis* ROEMER & SCHULTES, Syst. Veg. 2: 242. 1817 p.p.; — *Torulinium filiforme* (Swartz) C. B. CLARKE in URBAN, Symb. Ant. 2: 57. 1900 excl. syn. *Cyperus unifolius* Boeck.; URBAN, Symb. Ant. 4: 115. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 134. 1913; Fl. D. W. Ind. Isl. 2: 13. 1914; URBAN, Symb. Ant. 8: 60. 1920.

Perennial herb with short rhizomes. Culms caespitose, filiform, often curved, 5—20 cm tall, trigonous, striate, smooth. Leaves shorter than the culms, involute, 0.5—1 mm wide, sheaths purplish-brown. Bracts 2—3, the lower 2 often much surpassing the inflorescence. Spikes 1—2, sessile, lax. Spikelets 2—7, suberect, at last spreading, linear, acute, 6—15 mm long and 1 mm wide, subterete, 4—10 flowered. Rhachilla flexuous; the internodes nearly 1 mm long, tardily disarticulating with their apical glume and with a thick convex body and broad, pale wings. Glumes 2 mm long, rigid, adpressed, ovate, sub-obtuse, mucronulate, concave, with a green back and purple-brown to deep purple wings, 7—9-veined. Stamens 3. Style rather long, with 3 long branches.

Nut $\frac{2}{3}$ as long as the glume, elliptic, trigonous, apiculate, subcurved, blackish-brown, punctulate.

West Indies.

Moist sandy and rocky places at lower and middle elevations.

ARUBA: calcareous hills and plateau near Balashi (Boldingh 6423, fl. & fr. Jan.); Balashi (Arnoldo 264, fl. & fr. Dec.); Seroe Alejandro (Stoffers 1972, fl. & fr. Jan.); west of Spaans Lagoen (Stoffers 1464a, fl. & fr. Jan.); north of Spaans Lagoen (Stoffers 1462, fl. & fr. Jan.).

BONAIRE: Santa Barbara (Arnoldo 434, fl. & fr. Dec.); Lima (Stoffers 996, fl. & fr. Dec.).

CURAÇAO: Road from Knip to Westpunt (Boldingh 5573, fl. Nov.); hills near Knip (Stoffers 1159, fl. & fr. Dec.).

Cyperus laevigatus L.

LINNAEUS, Mant. 179. 1771; C. B. CLARKE, J. Linn. Soc. 20: 282. 1883; J. Linn. Soc. 21: 77. t. 3, fig. 29, 21. t. 4, fig. 33. 1884; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 81. 1923; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 321. 1936; O'NEILL in LEON, Fl. Cuba 1: 196. 1946; — *Juncellus laevigatus* C. B. CLARKE in HOOKER f., Fl. Br. India 6: 596. 1893; C. B. CLARKE in URBAN, Symb. Ant. 2: 21. 1900; URBAN, Symb. Ant. 4: 110. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 26. 1909; Fl. Ned. W. Ind. Eil. 132. 1913; URBAN, Symb. Ant. 8: 54. 1920; — *Cyperus mucronatus* β *albidus* VAHL, Enum. Plant. 2: 306. 1806.

Perennial herb with woody, short, or long rhizome. Culms numerous, 10—50 cm tall, trigonous, smooth, with 2—3 sheaths at the base ending in a mucro or a short, stiff, canaliculate, blunt blade. Bracts 2, one foliaceous and continuing the culm, the second one very short. Spikelets 1—16, pseudo-lateral, capitate, sessile, oblong-lanceolate, acute, 4—10 mm long, 2—2.5 mm wide, more or less turgid, 12—24-flowered. Rhachilla straight, sharply tetragonal. Glumes concave, ovate, obtuse, or subacute, nearly 2 mm long, straw-coloured, sometimes with brown spots. Stamens 3, with flat filaments and linear anthers. Style short, with 2 shortly exserted stigmas. Nut ovate, plano-convex, $1\frac{1}{3}$ mm long, pale-brown, apiculate, minutely punctulate.

Tropical and subtropical regions.

Moist or wet soil, mostly in saline habitats.

ST. MARTIN: near Great Salt Pond (Boldingh 2444, fr. Aug.).

Cyperus guanipensis Schnee

SCHNEE, Bol. Soc. Venez. Cienc. Nat. 9(57): 23. 1944.

Annual herb with fibrous roots. Culms 10—35 cm tall, filiform, trigonous, smooth, few-foliate at the base. Leaves linear, shorter than the culms, slightly scabrous towards the apex, 1—2 mm wide; sheaths purplish. Bracts 3—5, foliaceous, the lower ones much longer than the inflorescence, up to 16 cm

long, spreading. Inflorescence consisting of 3—10 short spikes, on 0—7 cm long rays with narrow, obliquely truncate, bicuspidate sheaths. Spikes composed of 3—15 spikelets; the latter divergent, linear, 5—20 mm long and 1—1.5 mm wide, compressed, 10—30-flowered. Rhachilla slender, flexuous, with narrow, hyaline wings. Glumes deciduous, slightly imbricate, oblong, 1.5 mm long, emarginate, with a small excurrent mucro, brownish-yellow; keel often green, with a prominent vein on each side. Stamen one. Style short, bi-branched. Nut oblong, about 1 mm long, flattened with the narrow side towards the rhachilla, with a shallow groove on the broad side, obliquely rounded and apiculate at the apex, slightly stipitate at the base, pale brown or greyish, minutely punctulate.

Venezuela, Aruba, and Bonaire.

On roadsides in the non-calcareous area.

ARUBA: road near Ajó (Boldingh 6343A, fl. Dec.); Companashi (Arnoldo 77, fl. Dec.; 61, fl. & fr. Dec.).

BONAIRE: road from Slagbaai to Brandaris (Boldingh 7314, fl. Feb.); Seroe Grandi (Arnoldo 47, fl. Nov.; 48, fl. Nov.; 49, fl. Nov.); ibid., 100-115 m (Stoffers 922, fl. & fr. Dec.).

CURAÇAO: Seroe Christoffel, 200 m (Burgers 30, fl. Dec.).

Cyperus brevifolius (Rottb.) Hassk.

HASSKARL, Catal. Hort. Bogor. 24. 1844; KÜKENTHAL in ENGLER, Pflanzenreich IV (20): 600. 1936; O'NEILL in LEON, Fl. Cuba 1: 190. 1946; HODGE, Lloydia 17: 139. 1954; — *Kyllinga brevifolia* ROTTBOELL, Descr. et Icon. 13, t. 4, fig. 3. 1773; GRISBACH, Fl. Br. W. Ind. Isl. 568. 1864; DUSS, Fl. phan. Ant. franç. 543. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 11. 1900; URBAN, Symb. Ant. 4: 109. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 28. 1909; Fl. Ned. W. Ind. Eil. 135. 1913; URBAN, Symb. Ant. 8: 52. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 79. 1923.

Perennial herb with creeping rhizome. Culms slender, 10—40 cm tall, trigonous, smooth, with a few bladeless brownish sheaths, and 2—4 leaves at the base. Leaves usually shorter than the culm, 1.5—3 mm wide, shortly acuminate, flat; sheaths long. Bracts 3—4, spreading, foliaceous, up to 7 cm long. Head 4—8 mm long, dense, with rarely more than one spike. Spikelets numerous, divergent, elliptic, 3—3.5 mm long, one-flowered, and one empty glume above. Glumes membranaceous, straw-coloured and sometimes with reddish lines; the green keel more or less rough, excurrent in a mucro. Nut obovate, 1 mm long, yellow-brown, apiculate.

Tropical and subtropical regions.

Wet or moist grounds at lower and middle elevations.

SABA: Windwardside (Arnoldo 643, fl. & fr. Aug.); slope of The Mountain near Windwardside, 400-475 m (Stoffers 3325, fl. May); ibid., „Under the Cliff”, 680 m (Stoffers 3231, fl. & fr. May; 4243 A, fl. & fr. Aug.); ibid., near Santa Cruz, 500-600 m (Stoffers 4350, fl. Aug.).

ST. MARTIN: Mount Paradise, 200-400 m (Boldingh 3206, fl. & fr. Sept.); hills along the northern side of Cul de Sac (Boldingh 2977, fl. & fr. Aug.).

Eleocharis R. Brown, Prodr. 224. 1810

Leafless, annual or perennial herbs. Culms erect, with a few sheaths at the base, of which the uppermost tubular, and at the apex one terminal, few- to many-flowered spikelet without a subtending bract. Glumes spirally imbricate, usually deciduous, with one or two empty glumes at the base of the spikelet. Flowers perfect. Stamens 1—3. Bristles 6 (-8) or reduced in number to 0. Style 2- or 3-cleft with an enlarged base, frequently constricted and persistent on the achene. Achene trigonous to lenticular.

About 150 species of world-wide distribution; aquatic or in moist situations.

K e y to the species:

1. Culm stout, triquetrous; spikelets more than 1.5 long *Eleocharis mutata*
Culms filiform; spikelets less than 1 cm long 2
2. Nut 0.7—1 mm long; glumes ovate-orbicular *Eleocharis geniculata*
Nut 0.5 mm long; glumes ovate, obtuse *Eleocharis atropurpurea*

Eleocharis mutata (L.) R. & S.

ROEMER & SCHULTES, Syst. Veg. 2: 155. 1817; C. B. CLARKE in URBAN, Symb. Ant. 2: 61. 1900; URBAN, Symb. Ant. 4: 116. 1903; Symb. Ant. 8: 61. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 90. 1923; SVENSON, Rhodora 31: 133. 1929; in LEON, Fl. Cuba 1: 200. 1946; in N. Am. Fl. 18: 511. 1957; — *Scirpus mutatus* LINNAEUS, Amoen. Acad. 5: 391. 1759; GRISEBACH, Fl. Br. W. Ind. Isl. 571. 1864.

Perennial herb, usually with a short rhizome, roots numerous, slender, soft. Culms triquetrous, 40—100 cm tall, stout, not septate. Sheaths light- to purplish-brown, membranous, up to 35 cm long, pointed at the apex. Spikelets 1.5—5 cm long and 5—7 mm wide, cylindric, usually obtuse. Glumes straw-coloured, orbicular to broadly obovate, thin with a hyaline, erose upper margin, imbricate when young, spreading afterwards. Stamens 3. Bristles 6 (-7), irregular, equalling the nut, lustrous brown, with coarse but soft teeth. Style 3-fid. Nut 2.5 mm long, elliptic to obovate, shining, rather smooth, yellow to brown, with about 24 rows of shallow, transversely, rectangular cells with often slightly raised margins, surmounted at the apex by an annular thickening which merges gradually into the short style-base.

West Indies, tropical Central and South Africa.

Pioneer in (salt) pools and swamps.

BONAIRE: Put Bronswinkel (Arnoldo 1417, fl. & fr. March; Stoffers 682, fl. & fr. Nov.).

CURAÇAO: Museum-garden, Mundo Nobo (Arnoldo 1675, fl. & fr. Oct.).

Eleocharis geniculata (L.) R. & S.

ROEMER & SCHULTES, Syst. Veg. 2: 150. 1817; KOYAMA, J. Fac. Sci. Univ. Tokyo Ser. III, 8: 93. 1961; — *Scirpus geniculatus* LINNAEUS, Spec. Plant. 48. 1753; — *Scirpus caribaeus* ROTTBOELL, Descr. Pl. Rar. 24. 1772; — *Eleocharis caribaea* (Rottboell) BLAKE,

Rhodora 20: 24. 1918; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 91. 1923; SVENSON, Rhodora 31: 225. 1929; in LEON, Fl. Cuba 1: 201. 1946; in N. Am. Fl. 18: 520. 1957; — *Scirpus capitatus* LINNAEUS, Spec. Plant. 48. 1753; — *Eleocharis capitata* (Linnaeus) R. BROWN, Prodr. 225. 1810; DUSS, Fl. phan. Ant. franç. 545. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 66. 1900; BOLDINGH, Fl. D. W. Ind. Isl. 1: 28. 1909; Fl. Ned. W. Ind. Eil. 135. 1913; Fl. D. W. Ind. Isl. 2: 13. 1914.

Caespitose herb. Culms firm, filiform, 3—40 cm tall, terete, striate when dry. Sheaths prominent, herbaceous, usually with a brown to purplish base and an obliquely truncate apex with a one-sided point. Spikelets subglobose or ovoid, obtuse, many-flowered. Glumes ovate-orbicular, thin, yellow to pale-brown with a green midvein. Stamens 2—3. Style bi-fid. Bristles 6—8, coarse, pale-brown, shorter than the nut or occasionally lacking. Nut obovoid, 0.7—1 mm long, lustrous purplish-black, almost smooth; tubercle spongy, pale, variable in shape, but usually much depressed.

Tropical and subtropical regions.

Wet grounds at lower and middle elevations.

BONAIRE: Pos Baca Grandi (Hummelinck s.n., fl. & fr. Feb.; s.n., fl. & fr. Sept. [L]); Sabana (Arnoldo 413, fl. & fr. Feb.); Lac (Stoffers 929, fl. & fr. Dec.); Klein Bonaire, rand Salinja (Hummelinck s.n., fl. & fr. Sept. [L]).

CURAÇAO: Tanki Martha Koosje (Burgers 134, fl. & fr. Feb.); Santa Cruz (Boldingh 5584, fl. & fr. Dec.; Britton & Shafer 3014, fr. March); St. Patrick (Britton & Shafer 3078, fr. March); Ascencion (Boldingh 5296, fr. Nov.); Hofje of Malpais (Boldingh 4867, fr. Oct.); Choloma (Stoffers 21, fl. & fr. Sept.); foot of Seroe Christoffel (Arnoldo 1687, fl. & fr. Nov.); Saltpans of St. Willebrordus (Stoffers 340, fl. & fr. Oct.); without loc. (Aschenberg s.n., fl. & fr.).

ST. MARTIN: along saltpond near Philipsburg (Boldingh 2451, fr. Aug.).

Eleocharis atropurpurea (Retzius) Kunth

KUNTH, Enum. Plant. 2: 151. 1837; C. B. CLARKE in URBAN, Symb. Ant. 2: 65. 1900; URBAN, Symb. Ant. 4: 116. 1903; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 91. 1923; SVENSON, Rhodora 31: 227. 1929; in N. Am. Fl. 18: 521. 1957; — *Scirpus atropurpureus* RETZIUS, Obs. 5: 14. 1789; — *Isolepis atropurpurea* ROEMER & SCHULTES, Syst. Veg. 2: 106. 1817.

Dwarf, caespitose, annual herb. Culms 3—12 cm tall, very slender, filiform, erect or arcuate. Sheaths herbaceous, dark-brown to purplish towards the base, the apex obliquely truncate with an one-sided point. Spikelets oblong to ovoid, subacute, many-flowered, 2—6 mm long. Glumes ovate, obtuse, membranous, with a broad, green midvein and green or purple sides. Stamens 2—3. Style bi-fid. Bristles slender, translucent, shorter than the nut, often reduced or wanting. Nut obovate-triangular, lenticular, smooth, shining, purplish-black, 0.5 mm long; tubercle minute, depressed conic, white, constricted, about $\frac{1}{4}$ the width of the nut.

Tropical and subtropical regions, Italy, and Switzerland.

Wet grounds.

BONAIRE: behind a dam west of Jatoo Bacoe (Stoffers 663, fl. & fr. Nov.).

Fimbristylis Vahl, Enum. Plant. 2: 285. 1805

Annual or perennial herbs. Stems leafy at the base. Leaves narrowly linear, flat with obtuse or triangular apex; sheaths glabrous. Inflorescence umbellate or capitulate. Bracts more or less foliaceous. Spikelets several- to many-flowered. Glumes concave, spirally arranged, imbricate, gradually deciduous, all fertile. Bristles wanting. Stamens 1—3. Style 3—2-fid, persistent or deciduous including the dilated base, branches flat and usually villous. Nut lenticular or trigonous, reticulate with quadrangular to horizontally (never vertically) elongate cells.

About 130 species in tropical and subtropical regions.

K e y to the species:

1. Style-branches 3; spikelets 1—3 *F. monostachya*
Style-branches 2; spikelets numerous 2
2. Umbels dense, often nearly capitate *F. spathacea*
Umbels loose, spikelets strictly solitary 3
3. Spikelets and leaf-sheaths dark brown and shining *F. spadicea*
Spikelets light brown, not shining 4
4. Spikelets puberulent; nut finely reticulate *F. ferruginea*
Spikelets glabrous; nut longitudinally striate *F. annua*

Fimbristylis spathacea Roth

ROTH, Nov. Pl. Sp. 24. 1821; DUSS, Fl. phan. Ant. franç. 547. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 79. 1900; BOLDINGH, Fl. D. W. Ind. Isl. 1: 28. 1909; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 95. 1923; QUESTEL, Fl. Isl. St. Bartholomew 84. 1941; SVENSON in LEON, Fl. Cuba 1: 209. 1946; in N. Am. Fl. 18: 554. 1957; — *Scirpus glomeratus* RETZIUS, Obs. 4: 11. 1786; — *Fimbristylis glomerata* (Retzius) URBAN, Symb. Ant. 2: 166. 1900; Symb. Ant. 4: 118. 1903; Symb. Ant. 8: 64. 1920.

Tufted, perennial herbs with fibrous roots. Stems 10—40 cm tall, rigid, subterete. Leaves flat, with more or less incurved margins, much shorter than the stems, 1—2 mm wide. Umbels compound, usually less than 4 cm in diam. with solitary, but closely approximated or clustered spikelets, sometimes forming a single head. Bracts short, ovate-lanceolate, long-tipped. Spikelets ellipsoid to short-cylindric, 3—6 mm long and 2 mm wide, up to 60 in an umbel. Glumes ovate, 1.5 mm long, keeled with a thinner vein on each side, brown with hyaline margins. Stamens 1—2. Style as long as the nut, nearly glabrous, bifid. Nut obovate, asymmetric, biconvex, 0.5—0.6 mm long, dark brown, minutely tuberculate.

All tropical countries.

Moist or wet soil at lower elevations, usually under salt-influence.

ARUBA: Boca Grandi (Stoffers 1389, fl. & fr. Jan.).

CURAÇAO: Rif (Arnoldo s.n., fl. & fr.; 59, fl. & fr. Dec.; Stoffers 1227, fl. & fr. Dec.); St. Thomas College, Willemstad (Arnoldo 1895, fl. & fr. Jan.).

St. MARTIN: Simson Bay (Arnoldo 1231, fl. March); between Simson Bay and Simson Bay Lagoon (Stoffers 2499, fl. & fr. March; 2502, fl. & fr. March); saltpond near Point Blanche (Hummelinck s.n., fl. & fr. May); west of Lemoen-tuin Juliana, near Point Blanche (Stoffers 2231, fl. & fr. March; 2236, fl. & fr. March).

Fimbristylis spadicea (L.) Vahl

VAHL, Enum. Plant. 2: 294. 1806; DUSS, Fl. phan. Ant. franç. 546. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 79. 1900; URBAN, Symb. Ant. 4: 118. 1903; Symb. Ant. 8: 64. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 94. 1923; SVENSON in LEON, Fl. Cuba 1: 209. 1946; HODGE, Lloydia 17: 144. 1954; SVENSON in N. Am. Fl. 18: 551. 1957; — *Scirpus spadiceus* LINNAEUS, Spec. Plant. 51. 1753; GRISEBACH, Fl. Br. W. Ind. Isl. 572. 1864.

Perennial herb with short rhizomes. Stems 30—100 cm tall, rigid, glaucous. Leaves half as long as the stems or longer, more or less involute to flattened, 1—3 mm wide; sheaths wide, shining, brown to black. Umbels simple or compound, 6—12-rayed; the rays up to 8 cm long, flat with scabrous margins. Bracts 3—4, the lowest one surpassing the umbel. Spikelets oblong to oblong-cylindric, acute, 8—15 mm long and 4 mm wide. Glumes ovate, obtuse and shortly mucronate, glabrous, rigid, not keeled, shining dark-brown. Stamens 2—3. Style flattened, ciliate, bifid, with long branches; its base slightly dilated. Nut obovate, biconvex, slightly narrowed at the base, about 1 mm long, brown, reticulate.

West Indies; tropical and subtropical continental America.

Coastal sands and marches.

BONAIRE: Lansbergput (Stoffers 464, fl. & fr. Oct.).

Fimbristylis annua (Allioni) R. & S.

ROEMER & SCHULTES, Syst. 2: 95. 1817; URBAN, Symb. Ant. 2: 166. 1900; Symb. Ant. 4: 117. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 136. 1913; Fl. D. W. Ind. Isl. 2: 13. 1914; URBAN, Symb. Ant. 8: 63. 1920; SVENSON in LEON, Fl. Cuba 1: 208. 1946; HODGE, Lloydia 17: 144. 1954; — *Scirpus annuus* ALLIONI, Fl. Pedem. 2: 271. 1785; — *Fimbristylis diphylla* (Retzius) VAHL, Enum. Plant. 2: 95. 1817; C. B. CLARKE in URBAN, Symb. Ant. 2: 77. 1900; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 95. 1923; — *Scirpus brizoides* GRISEBACH, Fl. Br. W. Ind. Isl. 572. 1864.

Annual or perennial herb; stems glabrous to pubescent, tufted, 10—70 cm tall. Leaves linear, flat, 1—3 mm wide, more than half as long as the stems, often serrulate towards the apex, glaucous or pubescent. Umbel simple or compound, loose, with slender rays. Bracts 3—4, foliaceous, the lowest one slightly longer than the umbel. Spikelets oblong to ovoid, acute, 4—10 mm long and 2—3 mm wide. Glumes ovate, shortly apiculate, hardly keeled, brown, glabrous. Stamens 1—2. Style flattened, as long as the nut, ciliate, bifid; its base slightly enlarged. Nut obovate, lenticular, about 1 mm long, white to pale brown, with 6—8 longitudinal, verrucose ribs on each face.

Tropical and subtropical regions.

Grassy places at lower and middle elevations.

BONAIRE: along the lower plateaus near the saltponds in the southern part of Bonaire (Boldingh 7503, fl. & fr. Feb.); Sabana (Arnoldo 397, fl. & fr. Jan.).

CURAÇAO: Seroe Christoffel (Burgers 29, fl. & fr.; very small specimen with culms with filiform leaves and one spikelet).

SABA: road to The Mountain (Arnoldo 879, fl. & fr. Aug.); without loc. (Boldingh 2188, fl. & fr.).

ST. MARTIN: Terres Basses (Boldingh 3298a, st.); Philipsburg (Burgers 459, fl. March).

Fimbristylis ferruginea (L.) Vahl

VAHL, Enum. Plant. 2: 291. 1805; Duss, Fl. phan. Ant. franç. 547. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 78. 1900; Symb. Ant. 4: 118. 1903; JOHNSTON, Proc. Bost. Soc. Nat. Hist. 34(7): 191. 1909; BOLDINGH, Fl. Ned. W. Ind. Eil. 136. 1913; Fl. D. W. Ind. Isl. 2: 14. 1914; URBAN, Symb. Ant. 8: 63. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 94. 1923; SVENSON in N. Am. Fl. 18: 552. 1957; — *Scirpus ferrugineus* LINNAEUS, Spec. Plant. 50. 1753; GRISEBACH, Fl. Br. W. Ind. Isl. 572. 1864; — *Fimbristylis ferruginea* (Linnaeus) VAHL var. *compacta* KÜKENTHAL, Fedde, Repert. 23: 196. 1926.

Perennial herb with short rhizome. Stems clustered, slender, flattened. Leaves short or reduced to membranous sheaths. Umbels short with rather short rays in part with only 2—3 spikelets. Bracts 2—4, filiform with widened base, usually shorter than the umbel. Spikelets 5—15, ovate or oblong, 6—20 mm long and 3—4 mm wide. Glumes ovate, obtuse and mucronate, not keeled, dull, brown, puberulent towards the apex. Stamens 3. Style bifid, flattened, ciliate, its base not dilated; the branches very short. Nut broadly obovate, biconvex, 1.5 mm long, narrowed at the very base into a dark brown stipe; the surface slightly reticulate, shining, brownish-yellow.

Tropical and subtropical regions.

Coastal marshes and sands.

CURAÇAO: Hofje of Santa Cruz (Boldingh 5585, fl. & fr. Dec.); Ascencion (Boldingh 5293, fl. & fr. Nov.); Santa Cruz (Britton & Shafer 3018, fl. & fr. March); without loc. (Aschenberg s.n., fl. & fr.).

Fimbristylis monostachya (L.) Hassk.

HASSKARL, Pl. Jav. Rar. 61. 1848; C. B. CLARKE in URBAN, Symb. Ant. 2: 83. 1900; Symb. Ant. 4: 119. 1903; BOLDINGH, Fl. Ned. W. Ind. Eil. 136. 1913; Fl. D. W. Ind. Isl. 2: 14. 1914; URBAN, Symb. Ant. 8: 64. 1920; HODGE, Lloydia 17: 144. 1954; — *Cyperus monostachyos* LINNAEUS, Mant. 180. 1771; — *Abildgaardia monostachya* (Linnaeus) VAHL, Enum. Plant. 2: 296. 1806; GRISEBACH, Fl. Br. W. Ind. Isl. 569. 1864; Duss, Fl. phan. Ant. franç. 544. 1897; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 96. 1923; SVENSON in LEON, Fl. Cuba 1: 210. 1946; in N. Am. Fl. 18: 556. 1957.

Tufted, perennial herb with very short rhizome. Culms very slender, smooth, up to 40 cm tall. Leaves setaceous, about half as long as the culms, 0.5—0.75 mm wide, the margins slightly involute, somewhat scabrous; sheaths scarious with hyaline margins. Inflorescence consisting of a single terminal spikelet

subtended by 2 setaceous bracts or of one sessile and 1—2 pedicellate spikelets. Spikelets ovate to ovate-lanceolate, 10—20 mm long and 3—5 mm wide, slightly compressed. Glumes ovate, acute and mucronate, keeled, 3-veined, pale-brown, the lower ones subdistichous. Stamens 3. Style villous with three short branches, its base swollen, trigonous. Nut 2—2.5 mm long, obovoid, subacute, slightly trigonous, strongly contracted towards the base, tuberculate, yellowish to pale-brown.

All tropical countries.

Sterile grassy situations and in mud at lower elevations.

BONAIRE: Soebi Rincón (Boldingh 7280, fl. & fr. Feb.); calcareous plateau of Bolivia (Boldingh 7367, fl. & fr. Feb.).

Rhynchospora Vahl, Enum. Plant. 2: 229. 1806

Perennial herbs, caespitose or with rhizomes, varying much in size and habit. Spikelets in one or more heads or in panicles, with many spirally imbricate glumes, the 3—4 lowest empty, smaller, one or few succeeding glumes hermaphrodite, the uppermost male or empty. Perianth-bristles often present. Stamens 2—3. Style long, linear, glabrous, with two long or short branches; its base broad and persistent on the nut as a clearly distinguishable beak. Nut lenticular, smooth or transversely wrinkled.

About 210 species, cosmopolitan.

Key to the species:

1. Spikelets castaneous, 4—5 mm long, in panicles; stems foliate
R. polyphylla
 Spikelets pale straw-coloured, 7—10 mm long, in a terminal head; stems
 without leaves *R. radicans*

Rhynchospora polypyphylla (Vahl) Vahl

VAHL, Enum. Plant. 2: 230. 1806; GRISEBACH, Fl. Br. W. Ind. Isl. 575. 1864; DUSS, Fl. phan. Ant. fran . 551. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 114. 1900; BOLDINGH, Fl. D. W. Ind. Isl. 1: 29. 1909; Fl. Ned. W. Ind. Eil. 136. 1913; SVENSON in LEON, Fl. Cuba 1: 221. 1946; HODGE, Lloydia 17: 147. 1954; — *Schoenus polyphyllus* Vahl, Eclog. Am. 2: 5. 1798; — *Rhynchospora jamaicensis* BRITTON, Bull. Torrey Bot. Cl. 71: 1: 1914.

Rhizomes short, nodose. Stems several, caespitose, rather stout, 50—90 cm tall, slightly triangular, smooth, densely foliate. Leaves stiff, 3—10 mm wide, nearly glabrous; midvein prominent below, margins and upper part of the midvein scabrous; the upper leaves exceeding the stem in length. Sheaths pale brown, truncate at and pilose below the mouth. Inflorescence 20—60 cm long, consisting of 4—7 strongly branched, 2—4 cm wide panicles; branches slender and pilose. Bracts foliaceous, much longer than the panicles, and provided with a long sheath. Bractlets setaceous. Spikelets solitary or 2—3 together,

lanceolate, 4—5 mm long, subsessile, 4—6-flowered, all hermaphrodite. Rhachilla conspicuous. Glumes membranaceous, ovate-lanceolate, mucronate, straw-coloured; the lowest two empty. Bristles few, small or obsolete. Stamens 2—3. Style long, undivided or shortly bipartite at the apex and triangular, yellowish, with rounded basical corners and as wide as the nut at the base. Nut quadrate-ovate, lenticular, 0.75 mm long, striate, rugulose, castaneous, shining, with a short, whitish stipe.

West Indies and tropical continental America.

Moist grounds at middle and lower elevations.

SABA: Slope of the Mountain, 600-800 m (Boldinh 1790, fl. & fr. July); ibid. at „Under the Cliff”, 680 m (Stoffers 3199, fl. & fr. May); without loc. (Lionarons 184, st.).

Rhynchospora radicans (Schlecht. & Chamisso) Pfeiffer

PFEIFFER, Repert. Sp. Nov. 38: 93. 1935; — *Dichromena radicans* SCHLECHTENDAL & CHAMISSO, Linnaea 6: 28. 1831; C. B. CLARKE in URBAN, Symb. Ant. 2: 102. 1900; URBAN, Symb. Ant. 4: 121. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 28. 1909; Fl. Ned. W. Ind. Eil. 136. 1913; URBAN, Symb. Ant. 8: 67. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 99. 1923; SVENSON in Leon, Fl. Cuba 1: 215. 1946; HODGE, Lloydia 17: 147. 1954.

Caespitose perennial herb; roots fibrous. Stems slender, numerous, 15—60 cm tall, compressed-triangular. Basal leaves few and short; stem-leaves 2—3, as long as or shorter than the stem, 2—4 mm wide, glabrous, thin. Spikelets 1—5, arranged into a terminal head, subtended by 4—5 foliaceous, patent bracts which are sometimes slightly ciliate at the base; the lowest one up to 14 cm long. Spikelets discrete, lanceolate, subacute, 7—10 mm long, up to 16-flowered, the upper two male. Glumes numerous, membranaceous, ovate to lanceolate, subacute, 7—10 mm long, pale straw-coloured, glabrous. Bristles wanting. Stamens 3. Style deeply bifid, dilated at the base. Nut broadly obovate, 1—1.5 mm long, narrowed at the base, delicate transversely undulate, with a membranous, semi-lunar beak about as wide as the nut.

West Indies and continental tropical America.

Forests, shaded banks and hillsides at middle and higher elevations.

SABA: between The Bottom and Mary's Point, 300 m (Boldinh 1482, fl. & fr. July); slope of The Mountain, 600 m (Boldinh 1775, fl. & fr. July); ibid. at „Under the Cliff”, 660 m (Stoffers 4243, fl. & fr. Aug.); Windwardside (Arnoldo 664, fl. & fr. Aug.).

Scirpus Linnaeus, Spec. Plant. 47. 1753

Annual or perennial herbs of very various size and habit. Spikelets terete or somewhat flattened, solitary, capitate, spicate or umbellate, usually subtended by 1 to several bracts. Glumes spirally imbricate, usually all fertile, the 1—3 lower ones empty. Flowers perfect. Bristles present or wanting. Stamens 2—3. Style 2- or 3-cleft, not swollen at the base, wholly deciduous from the nut or

the base persistent as a subulate tip. Nut triangular, lenticular or plano-convex. Species about 200, cosmopolitan.

Scirpus micranthus Vahl

VALH, Enum. Plant. 2: 254. 1806; C. B. CLARKE in URBAN, Symb. Ant. 2: 94. 1900; BOLDINGH, Fl. Ned. W. Ind. Eil. 135. 1913; Fl. D. W. Ind. Isl. 2: 13. 1914.

Tufted, glabrous, annual herb. Culms filiform, 3—20 cm tall. Leaves linear, 0.5—3 cm long, less than 1 mm wide; lower sheaths bladeless. Spikelets 3—1 in a pseudo-lateral head, 2—5 mm long, ovate, obtuse, 30—50-flowered. Bracts 1—3; the lower one 1—5 cm long, erect, scabrous towards the apex. Glumes ovate, acuminate with often recurved, green tip, pale brown to purplish, with more or less prominent veins. Stamen 1. Style very short, bifid. Nut 0.5 mm long, ovoid-oblong, reticulate, pearl-grey with a purple lustre; style-base persistent as a small mucro.

Tropical South America, West Indies, and Angola.

Wet and dry, open grounds.

ARUBA: Balashi (Arnoldo 260, fl. & fr. Dec.); calcareous seashore near Manchebo (Boldingh 6279a, fr. Jan.); road near Ajó (Boldingh 6343, fr. Jan.; 6341, fl. & fr. Jan.); Oranjestad (Arnoldo 171, fl. & fr. Dec.).

BONAIRE: road from Slagbaai to Brandaris (Boldingh 7314b, fl. & fr. Feb.); calcareous plateau near Tolo (Boldingh 7277a, fr. Feb.); seashore near Playa Grandi (Boldingh 7174a, fr. Feb.); Seroe Grandi (Arnoldo 45, fl. & fr. Nov.); behind a dam, west of Jatoo Bacoo (Stoffers 641, fl. & fr. Nov.; 684, fl. & fr. Nov.); Rincón (Boldingh 7139, fl. & fr. Feb. [L]).

Scleria Bergius, Vet. Akad. Handl. Stockh. 26: 142. 1765

Monoecious, perennial herbs, with creeping rhizomes, sometimes annual. Stems triquetrous, erect or branched and climbing. Leaves 3-ranked, linear; sheaths closed. Ligule present, opposite the blade. Inflorescence consisting of small unisexual spikelets arranged into terminal and axillary panicles or interruptedly spicate. Male spikelets many-flowered; perianth wanting; stamens 1—3. Female spikelets one-flowered; gynophore present; hypogynium usually distinct, more or less 3-lobed, sometimes obscure or obsolete, persistent. Ovary 1-celled; style 1; stigmas 3—2; nut globose or ovoid, smooth or reticulate.

About 200 species in tropical and warm temperate regions of both hemispheres.

K e y to the species:

1. Leaves 0.5—1.5 cm wide, ligule 4—10 mm long; inflorescence paniculate

S. pterota

Leaves 1—3 mm wide; ligule up to 2 mm long; inflorescence spicate

S. lithosperma

Scleria pterota Presl

PRESL in OKEN, Isis 21: 268. 1828; C. B. CLARKE in URBAN, Symb. Ant. 2: 146. 1900; URBAN, Symb. Ant. 4: 125. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 29. 1909; Fl. Ned. W. Ind. Eil. 137. 1913; URBAN, Symb. Ant. 8: 71. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 108. 1923; SVENSON in LEON, Fl. Cuba 1: 235. 1946; — *Scleria melaleuca* SCHLECHTENDAL & CHAMISSO, Linnaea 6: 29. 1831; HODGE, Lloydia 17: 149. 1954; — *Scleria pratensis* NEES in MARTIUS, Fl. Bras. 2(1): 179, t. 23. 1843; GRISEBACH, Fl. Br. W. Ind. Isl. 577. 1864.

Perennial herb; rhizome thick, nodose. Stems rather slender, erect, glabrous, sharply triquetrous, slightly rough at the angles, 30—80 cm tall. Leaves 0.5—1.5 cm wide; midrib prominent below, the lateral veins prominent above; margins retrorsely scabrous. Ligule triangular, 4—10 mm long, margin thickened and ciliate. Inflorescence consisting of one, up to 10 cm long, terminal panicle and 2—3 shorter axillary ones; branches sharply triquetrous, usually narrowly winged. Bracts foliaceous, equaling the stem. Bractlets filiform. Spikelets greenish-brown or purplish tinged. Male glumes lanceolate, acuminate. Female glumes broadly ovate, abruptly acuminate. Hypogynium depressed, 3-lobed, lobes broad, rounded, ciliate when young, becoming glabrous afterwards. Nut 1.5—2.5 mm long, depressed-globose with pointed apex, white, smooth and shining, sometimes with a few hairs in the lower part.

West Indies and continental tropical America.

In boggy meadows and moist clearings.

SABA: Road to The Mountain (Arnoldo 1858, fl. & fr. March; 812, fl. Aug.); Windwardside (Arnoldo 667, fl. & fr. Aug.); lower part of the Bottom Hill (Boldingh 1432, fl. & fr. July); slope of The Mountain, 600 m (Boldingh 1747, fl. & fr. July; 1750, fl. & fr. July); ibid. above Rendez Vous, 600 m (Stoffers 3264, fl. & fr. May); between Crispine and Small Rendez Vous (Stoffers 3060, fl. & fr. Ap.); along the road from The Bottom to Windwardside (Stoffers 4609, fl. & fr. March); near The Saddle, 350-400 m (Stoffers 4124, fl. & fr. Aug.); Castle Hill, seaside (Stoffers 4154, fl. & fr. Aug.); without loc. (Lionarons 132, st.).

Scleria lithosperma (L.) Swartz

SWARTZ, Prodr. Veg. Ind. Occ. 18. 1788; DUSS, Fl. phan. Ant. franç. 555. 1897; C. B. CLARKE in URBAN, Symb. Ant. 2: 141. 1900; URBAN, Symb. Ant. 4: 125. 1903; BOLDINGH, Fl. D. W. Ind. Isl. 1: 29. 1909; JOHNSTON, Proc. Bost. Soc. Nat. Hist. 34(7): 192. 1909; BOLDINGH, Fl. Ned. W. Ind. Eil. 137. 1913; URBAN, Symb. Ant. 8: 70. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 110. 1923; SVENSON in LEON, Fl. Cuba 1: 231. 1946; HODGE, Lloydia 17: 148. 1954; — *Scirpus lithospermus* LINNAEUS, Spec. Plant. 51. 1753; — *Scleria filiformis* SWARTZ, Prodr. Veg. Ind. Occ. 19. 1788; GRISEBACH, Fl. Br. W. Ind. Isl. 579. 1864.

Perennial herb, with rather short, nodose rhizomes. Stems slender triquetrous, smooth, 30—60 cm tall. Leaves in the lower part only consisting of a sheath with a small tip, the upper ones with well-developed blades, 10—25 cm long and 1—3 mm wide, involute, glabrous, margins and keel slightly scabrous; sheaths pubescent or nearly glabrous, purplish, especially the lower ones. Ligule short-triangular, ciliate. Inflorescence consisting of a terminal and 1 to 2

axillary, slender, simple or branched, interrupted, few-flowered spikes. Bracts narrow, foliaceous. Bractlets filiform, longer than the spikelets. Spikelets 4—5 mm long, brown. Male glumes lanceolate, acuminate. Female glumes with a green midvein, ovate-lanceolate. Hypogynium wanting. Nut 2—2.5 mm long, ovate-elliptic, subacute, white, smooth and shining; the base attenuate, trigonous with 3 dints.

All tropical maritime regions.

Dry thickets and woods at lower and middle elevations.

Vernacular name: mountain grass (Windward Group).

St. EUSTATIUS: slope of The Quill between Glass Bottle and White Wall, 100-200 m (Stoffers 4088, fl. & fr. Aug.); top of The Quill above Glass Bottle, 380-400 m (Stoffers 3566, fl. & fr. July; 8596, fl. & fr. July; Boldingh 277, fl. June); ibid. 450 m (Stoffers 3932, fl. & fr. July); western slope of The Quill, 250-300 m (Stoffers 4704, fl. Aug.); without loc. (v. Groll-Meyer 269, fl. & fr.).