

fruit, etc., nearly as in *Melanthium*. — Somewhat pubescent perennials, with simple stems from a thickened base producing coarse fibrous roots (very poisonous), 3-ranked, plaited and strongly veined leaves, and racemed-panicled dull or dingy flowers; in summer. (Name from *vere*, truly, and *ater*, black.)

1. *V. viride*, Ait. (AMERICAN WHITE HELLEBORE. INDIAN POKE.) Stem stout, very leafy to the top (2–7° high); leaves broadly oval, pointed, sheath-clasping; panicle pyramidal, the dense spike-like racemes spreading; perianth yellowish-green, moderately spreading, the segments ciliate-serrulate; ovary glabrous; capsule many-seeded. — Swamps and low grounds, common.

2. *V. Woodii*, Robbins. Stem slender, sparingly leafy (2–5° high); leaves oblanceolate, only the lowest sheathing; panicle very narrow; perianth greenish-purple, with entire segments; ovary tomentose, soon glabrate; capsule few-seeded. — Woods and hilly barrens, S. Ind. to Mo.

### 31. STENÁNTHIUM, Gray.

Flowers polygamous. Perianth spreading; the sepals narrowly lanceolate, tapering to a point from the broader base, where they are united and coherent with the base of the ovary, not gland-bearing, persistent, much longer than the short stamens. Anthers, capsules, etc., nearly as in *Veratrum*. Seeds nearly wingless. — Smooth, with a wand-like leafy stem from a bulbous base, long and grass-like conduplicate-keeled leaves, and numerous small flowers in compound racemes, forming a long terminal panicle; in summer. (Name composed of *στενός*, narrow, and *άνθος*, flower, from the slender sepals and panicles.)

1. *S. angustifolium*, Gray. Stem leafy (3–4° high), very slender; leaves 2–3" broad; panicle elongated, nearly simple, very open, with slender flexuous branches; flowers nearly sessile or the fertile on short pedicels; sepals linear-lanceolate (white), 2–3" long; capsule strongly reflexed, narrowly oblong-ovate, with spreading beaks. — In the Alleghanies from Va. to S. C.

2. *S. robustum*, Watson. Resembling the last; stem stout, leafy, erect (3–5° high); leaves 4–10" broad; panicle or raceme often 2° long, frequently compound with numerous slender branches; sepals (white or green) 3–4" long; capsule erect, ovate, with recurved beaks. — Penn. to S. C., Ohio and Tenn.

### 32. ZYGADENUS, Michx.

Flowers perfect or polygamous. Perianth withering-persistent, spreading; the petal-like oblong or ovate sepals 1–2-glandular near the more or less narrowed but not unguiculate base, which is either free, or united and coherent with the base of the ovary. Stamens free from the sepals and about their length. Anthers, styles, and capsule nearly as in *Melanthium*. Seeds angled, rarely at all margined. — Very smooth and somewhat glaucous perennials, with simple stems from creeping rootstocks or coated bulbs, linear leaves, and rather large panicled greenish-white flowers; in summer. (Name composed of *ζυγός*, a yoke, and *άδην*, a gland, the glands being sometimes in pairs.)

\* Glands on the perianth conspicuous.

+ Rootstock creeping; glands 2, orbicular, above the broad claw.

1. *Z. glaberrimus*, Michx. Stems 1–3° high; leaves grass-like, channelled, conspicuously nerved, elongated, tapering to a point; panicle pyramidal,

many-flowered; flowers perfect; sepals nearly free ( $\frac{1}{2}$ " long), ovate, becoming lance-ovate, with a short claw. — Grassy low grounds, Va. to Fla. and Ala.

+ + Root bulbous; glands covering the base of the sepals.

2. *Z. elegans*, Pursh. Stem 1–3° high; leaves flat, carinate; raceme simple or sparingly branched and few-flowered; bracts ovate-lanceolate; base of the perianth coherent with the base of the ovary, the thin ovate or obovate sepals marked with a large obcordate gland, the inner abruptly contracted to a broad claw. (*Z. glaucus*, Nutt.) — N. Eng. to N. Ill., Minn., and westward.

3. *Z. Nuttallii*, Gray. Like the last; raceme rather densely flowered, with narrow bracts; perianth free; sepals with an ill-defined gland at base, not at all clawed; seeds larger (3" long). — Kan. to Tex. and Col.

\*\* Glands of the perianth obscure; perianth small, rotate; bulb somewhat fibrous.

4. *Z. leimanthoides*, Gray. Stem 1–4° high, slender; leaves narrowly linear; flowers small ( $\frac{1}{4}$ " in diameter) and numerous, in a few crowded panicled racemes; only a yellowish spot on the contracted base of the divisions of the free perianth. — Low grounds, pine-barrens of N. J., to Ga.

### 33. AMIÁNTHIUM, Gray. FLY-POISON.

Flowers perfect. Perianth widely spreading; the distinct and free petal-like (white) sepals oval or obovate, without claws or glands, persistent. Filaments capillary, equalling or exceeding the perianth. Anthers, capsules, etc., nearly as in *Melanthium*. Styles thread-like. Seeds wingless, oblong or linear, with a loose coat, 1–4 in each cell. — Glabrous, with simple stems from a bulbous base or coated bulb, scape-like, few-leaved, terminated by a simple dense raceme of hand-some flowers, turning greenish with age. Leaves linear, keeled, grass-like. (From *άμλαντος*, unspotted, and *άνθος*, flower; a name formed with more regard to euphony than to good construction, alluding to the glandless perianth.)

1. *A. muscætoxicum*, Gray. (FLY-POISON.) Leaves broadly linear, elongated, obtuse ( $\frac{1}{2}$ –1" wide); raceme simple; capsule abruptly 3-horned; seeds oblong, with a fleshy red coat. — Open woods, N. J. to Fla., west to Ky. and Ark. June, July.

### ORDER 117. PONTEDERIACEÆ. (PICKEREL-WEED FAMILY.)

Aquatic herbs, with perfect more or less irregular flowers from a spathe; the petal-like 6-merous perianth free from the 3-celled ovary; the 3 or 6 mostly unequal or dissimilar stamens inserted in its throat. — Perianth with the 6 divisions colored alike, imbricated in 2 rows in the bud, the whole together sometimes revolute-coiled after flowering, then withering away, or the base thickened-persistent and enclosing the fruit. Anthers introrse. Ovules anatropous. Style 1; stigma 3-lobed or 6-toothed. Fruit a perfectly or incompletely 3-celled many-seeded capsule, or a 1-celled 1-seeded utricle. Embryo slender, in floury albumen.

1. *Pontederia*. Spike many-flowered. Perianth 2-lipped, its fleshy persistent base enclosing the 1-seeded utricle. Stamens 6.

2. *Heteranthera*. Spathe 1–few-flowered. Perianth salver-shaped. Stamens 3. Capsule many-seeded.



## 1. PONTEDERIA, L. PICKEREL-WEED.

Perianth funnel-form, 2-lipped; the 3 upper divisions united to form the 3-lobed upper lip; the 3 lower spreading, and their claws, which form the lower part of the curving tube, more or less separate or separable to the base; after flowering the tube is revolute-coiled from the apex downward, and its fleshy-thickened persistent base encloses the fruit. Stamens 6; the 3 anterior long-exserted; the 3 posterior (often sterile or imperfect) with very short filaments, unequally inserted lower down; anthers versatile, oval, blue. Ovary 3-celled; two of the cells empty, the other with a single suspended ovule. Utricle 1-celled, filled with the single seed. — Stout herbs, growing in shallow water, with thick creeping rootstocks, producing erect long-petioled mostly heart-shaped leaves, and a 1-leaved stem, bearing a spike of violet-blue ephemeral flowers. Root-leaves with a sheathing stipule within the petiole. (Dedicated to *Pontedera*, Professor at Padua at the beginning of the last century.)

1. *P. cordata*, L. Leaves arrow-heart-shaped, blunt, or sometimes triangular-elongated and tapering and scarcely cordate (var. *ANGUSTIFOLIA*, Torr.); spike dense, from a spathe-like bract; upper lobe of perianth marked with a pair of yellow spots (rarely all white); calyx-tube in fruit crested with 6 toothed ridges. — N. Scotia to Fla., west to Minn. and Tex. July–Sept.

## 2. HETERANTHERA, Ruiz &amp; Pav. MUD-PLANTAIN.

Perianth salver-form with a slender tube; the limb somewhat equally 6-parted, ephemeral. Stamens 3, in the throat, usually unequal; anthers erect. Capsule 1-celled or incompletely 3-celled by intrusion of the placentæ, many-seeded. — Creeping, floating or submerged low herbs, in mud or shallow water, with a 1–few-flowered spathe bursting from the sheathing side or base of a petiole. (Name from *ἑτέρα*, different, and *ἀνθήρα*, anther.)

\* Stamens unequal; 2 posterior filaments with ovate yellow anthers; the other longer, with a larger oblong or sagittate greenish anther; capsule incompletely 3-celled; leaves rounded, long-petioled; creeping or floating plants.

1. *H. reniformis*, Ruiz & Pav. Leaves round-kidney-shaped to cordate and acute; spathe 3–5-flowered; flowers white or pale blue. — Conn. to N. J., west to Ill. and E. Kan., and southward. (S. Am.)

2. *H. limosa*, Vahl. Leaves oblong or lance-oblong, obtuse at both ends; spathe 1-flowered; flowers larger, blue. — Va. to Mo. and La. (S. Am.)

\*\* Stamens alike, with sagittate anthers; capsule 1-celled, with 3 parietal placentæ; leaves linear, translucent, sessile; submerged grass-like herbs, with only the flowers reaching the surface.

3. *H. graminea*, Vahl. The slender branching stems clothed with leaves and bearing a terminal 1-flowered spathe (becoming lateral); flowers small, pale yellow, with a very long thread-like tube. (*Schollera graminifolia*, Willd.) — N. Eng. to N. C., west to Minn. and E. Kan.

## ORDER 118. XYRIDACEÆ. (YELLOW-EYED-GRASS FAMILY.)

Rush-like herbs, with equitant leaves sheathing the base of a naked scape, which is terminated by a head of perfect 3-androus flowers, with extrorse

anthers, gumaceous calyx, and a regular colored corolla; the 3-valved mostly 1-celled capsule containing several or many orthotropous seeds with a minute embryo at the apex of fleshy albumen.

## 1. XYRIS, Gronov. YELLOW-EYED GRASS.

Flowers single in the axils of coriaceous scale-like bracts, which are densely imbricated in a head. Sepals 3; the 2 lateral glume-like, boat-shaped or keeled and persistent; the anterior one larger and membranaceous, enveloping the corolla in the bud and deciduous with it. Petals 3, with claws, which cohere more or less. Fertile stamens 3, with linear anthers, inserted on the claws of the petals, alternating with 3 sterile filaments, which are cleft and in our species plumose or bearded at the apex. Style 3-cleft. Capsule oblong, free, 1-celled, with 3 parietal more or less projecting placentæ, 3-valved, many-seeded. — Flowers yellow, produced all summer. Ours apparently all perennials. (*Xyris*, a name of some plant with 2-edged leaves, from *ξύρις*, a razor.)

1. *X. flexuosa*, Muhl. Scape slender (10–16' high), barely flattened at the summit, often from a bulbous base, very smooth, much longer than the narrowly linear leaves, both commonly twisted with age; head roundish-ovoid (3–4" long); lateral sepals oblong-lanceolate, finely ciliate-scarious on the narrow wingless keel, usually with a minute bearded tuft at the apex, shorter than the bract. — Sandy or peaty bogs, Mass. to Fla., west to Minn. and Mo.

Var. *pusilla*, Gray. Small and very slender, seldom twisted, 2–9' high, the base not bulbous; head 2–3" long. — White Mts. to Penn., west to L. Superior.

2. *X. torta*, Smith. Scape terete, with one sharp edge, slender, 9–20' high, from a dark bulbous base, and with the linear-filiform rigid leaves becoming spirally twisted; head ovoid, becoming spindle-shaped, or oblong and acute (5–9" long); sepals exceeding the bract; lateral sepals winged on the keel and fringed above the middle. — Pine barrens, in dry sand, N. J. to Fla., Tex. and Ark.

3. *X. Caroliniana*, Walt. Scape flattish, 1-angled below, 2-edged at the summit, smooth,  $\frac{1}{2}$ –2° high, the base hardly bulbous; leaves linear-sword-shaped, flat, 2–4" broad; head globular-ovoid (5–7" long); lateral sepals obscurely lacerate-fringed above on the winged keel, rather shorter than the bract. — Sandy swamps, near the coast, Mass. to Fla.

4. *X. fimbriata*, Ell. Scape somewhat angled, 2-edged above, rough (2° high), rather longer than the linear-sword-shaped or strap-shaped leaves, the base not bulbous; head oblong-ovate (6–10" long); lateral sepals lanceolate-linear, nearly twice the length of the bract, above the middle conspicuously fringed on the wing-margined keel, and even plumose at the summit. — Pine-barrens, N. J. to Fla. and Tex.

## ORDER 119. MAYACEÆ. (MAYACA FAMILY.)

Moss-like aquatic plants, densely leafy, with narrowly-linear sessile pelucid leaves, axillary naked peduncles terminated by a solitary perfect 3-androus flower, herbaceous calyx, white corolla, and a 3-valved 1-celled several-seeded capsule.



## 1. MAYACA, Aublet.

The only genus. Perianth persistent, of 3 herbaceous lanceolate sepals, and 3 obovate petals. Stamens alternate with the petals. Ovary with 3 parietal few-ovuled placentæ; style filiform; stigma simple. — Creeping or floating in shallow water; the leaves 1-nerved, entire, notched at the apex; the peduncle solitary, sheathed at base. (An aboriginal name.)

1. *M. Michauxii*, Schott & Endl. Peduncles not much exceeding the leaves, nodding in fruit. — Va. to Fla. and Tex.

## ORDER 120. COMMELINACEÆ. (SPIDERWORT FAMILY.)

Herbs, with fibrous or sometimes thickened roots, jointed and often branching leafy stems, and chiefly perfect and 6-androus, often irregular flowers, with the perianth free from the 2-3-celled ovary, and having a distinct calyx and corolla; viz., 3 persistent commonly herbaceous sepals, and 3 petals, ephemeral, decaying or deciduous. Stamens hypogynous, some of them often sterile; anthers with 2 separated cells. Style 1; stigma undivided. Capsule 2-3-celled, 2-3-valved, loculicidal, 3-several-seeded. Seeds orthotropous. Embryo small, pulley-shaped, partly sunk in a shallow depression at the apex of the albumen. Leaves ovate, lanceolate or linear, parallel-veined, flat, sheathed at base; the uppermost often dissimilar and forming a kind of spathe. — Chiefly tropical.

1. *Commelina*. Cyme sessile within a cordate or connate bract (spathe). Petals unequal. Perfect stamens 3; filaments naked.
2. *Tradescantia*. Bracts leaf-like or small and scarious. Petals equal. Perfect stamens 6; filaments bearded.

## 1. COMMELINA, Dill. DAY-FLOWER.

Flowers irregular. Sepals somewhat colored, unequal; the 2 lateral partly united by their contiguous margins. Two lateral petals rounded or kidney-shaped, on long claws, the odd one smaller. Stamens unequal, 3 of them fertile, one of which is bent inward; 3 of them sterile and smaller, with imperfect cross-shaped anthers; filaments naked. Capsule 3-celled, two of the cells 2-seeded, the other 1-seeded or abortive. — Stems branching, often procumbent and rooting at the joints. Leaves contracted at base into sheathing petioles; the floral one heart-shaped and clasping, folded together or hooded, forming a spathe enclosing the flowers, which expand for a single morning and are recurved on their pedicel before and afterwards. Petals blue. Flowering all summer. Ours all with perennial roots, or propagating by striking root from the joints. (Dedicated to the early Dutch botanists J. and G. Commelin.)

\* Ventral cells 2-ovuled (usually 2-seeded), the dorsal 1-ovuled.

1. *C. nudiflora*, L. Slender and creeping, glabrous; leaves lanceolate, small (1-2' long); spathe cordate, acute, with margins not united; seeds reticulated. (*C. Cayennensis*, Richard.) — Alluvial banks, Del. to Fla., west to Ind., Mo. and Tex.

2. *C. hirtella*, Vahl. Stout, erect (2-4° high); leaves large, lanceolate, the sheaths brown-bearded; spathes crowded, with margins united; seeds smooth.

(*C. erecta*, Gray, Man., not L.) — River-banks, Penn. to Fla., west to Mo. and Tex.

\* \* Cells 1-ovuled, 1-seeded; seeds smooth; spathe cucullate; roots sub-tuberos.

3. *C. erecta*, L. Slender, often low; leaves linear; cells all dehiscent. — Penn. to Fla.

4. *C. Virginica*, L. Slender, usually tall; leaves lanceolate to linear; dorsal cell indehiscent, scabrous. — Damp rich woods and banks, southern N. Y. to Fla., west to Mich., Iowa, and Mo.

## 2. TRADESCANTIA, L. SPIDERWORT.

Flowers regular. Sepals herbaceous. Petals all alike, ovate, sessile. Stamens all fertile; filaments bearded. Capsule 2-3-celled, the cells 1-2-seeded. — Perennials. Stems mucilaginous, mostly upright, nearly simple, leafy. Leaves keeled. Flowers ephemeral, in umbelled clusters, axillary and terminal, produced through the summer; floral leaves nearly like the others. (Named for the elder *Tradescant*, gardener to Charles the First of England.)

\* Umbels terminal or sometimes lateral, sessile, subtended by 1 or 2 leaf-like bracts; leaves linear to narrowly lanceolate; flowers blue.

1. *T. Virginica*, L. (COMMON SPIDERWORT.) Roots fleshy-fibrous; smooth or only slightly villous, more or less glaucous, often tall and slender and with linear leaves, rather rarely with 1 or 2 long lateral peduncles; bracts usually a pair. — Rich ground, N. Y. to Fla., west to Minn., Tex., and the Rocky Mts. Very variable. — Var. *VILLÖSA*, Watson. Often dwarf, more or less villous throughout as well as pubescent. Mississippi valley and Gulf States. — Var. *FLEXUÖSA*, Watson. Stout and dark green, with large linear-lanceolate pubescent leaves, the stem usually flexuous, and with several short lateral branches or sessile axillary heads. (*T. flexuosa*, Raf.) — Ohio to Ky. and Ga. *T. pilosa*, Lehm., is an intermediate form.

\* \* Umbel pedunculate, subtended by small subscarious bracts; flowers small, rose-color.

2. *T. rosea*, Vent. Small, slender (6-10' high), smooth, erect from a running rootstock; leaves very narrowly linear, grass-like. — Sandy woods, Md. to Fla., west to Ky. and Mo.

## ORDER 121. JUNCACEÆ. (RUSH FAMILY.)

Grass-like or rush-like herbs, with small flowers, a regular and hypogynous persistent perianth of 6 similar glumaceous sepals, 6 or rarely 3 stamens with 2-celled anthers, a single short style, 3 filiform hairy stigmas, and an ovary either 3-celled or 1-celled with 3 parietal placentæ, forming a loculicidal 3-valved capsule. Seeds anatropous, with a minute embryo enclosed at the base of the fleshy albumen. — Flowers liliaceous in structure, but sedge-like in aspect and texture.

1. *Juncus*. Capsule 3-celled (or imperfectly so), many-seeded. Plants never hairy, in moist ground or water.

2. *Luzula*. Capsule 1-celled, 3-seeded. Plants often hairy, in dry ground.



## 1. JUNCUS, Tourn. RUSH. BOG-RUSH.

Capsule many-seeded, 3-celled, or 1-celled by the placenta not reaching the axis. Stamens when 3 opposite the 3 outer sepals. — Chiefly perennials, and in wet soil or water, with pithy or hollow and simple (rarely branching) stems, and panicle or clustered small (greenish or brownish) flowers, chiefly in summer. Plant never hairy. (The classical name, from *jungo*, to join, alluding to the use of the stems for bands.)

§ 1. *Stems leafless and scape-like, from matted running rootstocks, sheathed at base; the sheaths sometimes bearing terete knotless leaves like the scape; flowers in sessile apparently lateral panicles, the involucre leaf being similar to and continuing the scape.* — JUNCUS proper.

\* *Flowers solitary on the pedicels or ultimate ramifications of the panicle.*

— *Sheaths at base of the stem leafless.*

++ *Stamens 3.*

1. *J. effusus*, L. (COMMON or SOFT RUSH.) Scape soft and pliant (2–4° high); inner sheaths awned; panicle diffusely much branched, many-flowered; flowers small (1½" long), greenish; sepals lanceolate, very acute, as long as the narrow triangular-obovate retuse and pointless greenish-brown capsule; anthers as long as the filaments; style very short; seeds small (about ¼" long), with short pale points. — Marshy ground, very common. (Eu.) — Var. *CONGLOMERATUS*, Engelm. Scape more distinctly striate; panicle closely crowded; capsule short-pointed. In sphagnous swamps.

++ ++ *Stamens 6.*

2. *J. filiformis*, L. Scape very slender (1–2° high), pliant; panicle few-flowered, almost simple; flowers 1½" long; sepals lanceolate, the inner a little shorter and less acute, longer than the broadly ovate obtuse but mucronate greenish capsule; anthers shorter than the filaments; style very short; seed (less than ⅓" long) short-pointed at both ends, indistinctly reticulated. — N. Eng. to Mich., Neb., and northward. (Eu.)

3. *J. Smithii*, Engelm. Scape rather slender (2–3° high); panicle few-flowered, nearly simple; flowers brown (1½" long); outer sepals lanceolate, acute, the inner a little shorter, obtusish, shorter than the broadly ovate rather triangular acute deep chestnut-brown capsule; anthers as long as the filaments; style short; seeds large (½" long or more), obtuse, short-appendaged at both ends, many-ribbed and reticulated. — Sphagnous swamps, on Broad Mt. and in Lebanon Co., Penn.

4. *J. Bálticus*, Dethard, var. *littoralis*, Engelm. Scape rigid (2–3° high); panicle loose; flowers larger (2" long), chestnut-brown with green; sepals ovate-lanceolate, the outer sharp-pointed, the inner obtusish, as long as the elliptical rather triangular obtuse and mucronate deep brown capsule; anthers much longer than the broad filaments; style about the length of the ovary; seeds rather large (½" long or more), nearly obtuse, delicately ribbed and cross-lined. — Sandy shores, Newf. to Mass., west to Penn., along the Great Lakes, and westward. — Var. *MONTANUS*, Engelm. Sepals nearly equal; anthers 4 times longer than the filament; capsule ovate-pyramidal, angled, beaked; seeds smaller, narrower, apiculate. — Minn., west and northward.

— *Innermost sheaths leaf-bearing; stamens 6.*

5. *J. setaceus*, Rostkovius. Scape slender (1–3° high); panicle loose, rather few-flowered; flowers greenish (2" long); sepals lanceolate, sharp-pointed, especially the 3 shining exterior ones, spreading in fruit, as long as the nearly globose beak-pointed greenish or light-brown capsule; anthers as long as the filaments; style conspicuous; seeds (⅓" long) almost globose, ribbed and cross-lined. — Va. to Fla., west to Mo. and La.

\* *Flowers in clusters, 6-androus; innermost sheaths at base of stem leaf-bearing.*

6. *J. Rømerianus*, Scheele. Scape stout and rigid (2–3° high), its apex as well as the leaves pungent; panicle compound, open and spreading, brown; 3–6 greenish or light-brown flowers (1½" long) in a cluster; outer sepals lanceolate, sharp-pointed, longer than the obtusish inner ones, as long as the elliptical rather triangular obtuse mucronate brown capsule; anthers much longer than the broad filaments; styles shorter than the ovary; seeds (½" long) oval, obtuse, very delicately ribbed. — Brackish marshes, N. J. to Fla. and Tex.

7. *J. maritimus*, L. Resembling the last, but with a rigid contracted green panicle, an ovary attenuated into a style of nearly its own length, a greenish acute capsule which usually exceeds the acute sepals, and seeds with distinct tails and stronger ribs. — Known in this country only from Coney Island, N. Y., where it is apparently indigenous. (Eu.)

§ 2. *Stems simple (rarely branched), leafy at base or throughout; leaves flat, or somewhat terete or setaceous and channelled, never knotted; panicle or head terminal.* — GRASSY-LEAVED JUNCUS.

\* *Flowers in close heads (produced in late summer).*

— *Leaves thread-like, hollow; stamens 6; seeds few, large and caudate; the single head (sometimes 2) 1–4-flowered.*

8. *J. stýgius*, L. Stems slender (6–16' high) from slender branching rootstocks, 1–3-leaved below, naked above; heads 1 or rarely 2, of 3–4 flowers, about the length of the sheathing scarious awl-pointed bract; flowers pale and reddish (2½–3" long); sepals lanceolate, the inner obtusish, ½ the length of the oblong acuminate capsule, as long as the slender stamens; filaments many times longer than the oblong anthers; recurved stigmas shorter than the style; seeds oblong, with a very loose coat prolonged at both ends (1½" long). — Peat-bogs, Newf. to northern N. Y., west to Mich. and N. Minn. (Eu.)

9. *J. trifidus*, L. Stems densely tufted from matted creeping rootstocks, erect (5–10' high), sheathed and mostly leafless at base, 2–3-leaved at the summit, the upper thread-like leaves subtending the sessile head; flowers brown (1½–2" long); sepals ovate-lanceolate, acute, equalling or rather shorter than the ovate beak-pointed deep brown capsule; anthers much longer than the filaments; seeds few, oblong, angled (1" long), short-tailed. — Alpine summits of N. Eng. and N. Y., and far northward; also in N. J. (Eu.)

— *Leaves flat and grass-like; stamens 3; stems flattened, simple, leafy.*

10. *J. repens*, Michx. Stems ascending (4–6' high) from a fibrous annual root, at length creeping or floating; leaves short, linear, those of the stem nearly opposite and fascicled; heads few in a loose leafy panicle, 3–12-flow-



ered; flowers green (3" long); sepals rigid, lance-subulate, slender-pointed, the 3 outer as long as the linear triangular obtuse capsule, the inner much longer; stamens as long as the outer sepals; filaments many times longer than the oblong anthers; seeds small ( $\frac{1}{4}$ " long), obovate, slightly pointed, very delicately ribbed and cross-lined. — Miry banks, Md. to Fla. and La.

11. **J. marginatus**, Rostk. Stem erect, from a bulbous and stoloniferous base (1-3° high); leaves long-linear; heads 3-8-flowered, paniced; flowers purplish with green ( $1\frac{1}{4}$ " long); sepals oblong, the 3 outer acute and slightly awned, the inner longer, mostly obtuse, as long as the almost globular scarcely mucronate capsule; stamens exceeding the outer sepals; purple anthers shorter than the filaments; style very short; seeds ( $\frac{1}{4}$ - $\frac{1}{2}$ " long) slender, pointed at both ends and strongly ribbed. — Moist sandy places, S. New Eng. to Fla., west to Mich., Mo., and Tex. — Var. **PAUCICAPITATUS**, Engelm., has few large 8-15-flowered heads; and var. **BIFLORUS**, Engelm., has numerous small 2-3-flowered heads in much-branched panicles.

\* \* Flowers solitary, paniced; stamens 6.

+ Stems slender, simple, tufted, leafy below; root perennial (fl. early in summer).

++ Seeds tail-pointed at both ends.

12. **J. Vaseyi**, Engelm. Stems rigid (1-2½° high); leaves nearly terete, very slightly channelled on the inner side; panicle longer than the involucre leaf, loose; flowers few, often one-sided, greenish or light brown (2" long or more); sepals lanceolate, acute, appressed, shorter than the oblong and retuse green-brown capsule; anthers as long as the filaments; style very short; seeds slender ( $\frac{1}{2}$ - $\frac{3}{4}$ " long), closely ribbed. — N. Maine (Pringle); Mich. to Iowa and westward.

13. **J. Greenii**, Oakes & Tuckerm. Stems rigid (1-2° high); leaves nearly terete, very deeply channelled (almost involute) on the inner side; panicle usually much shorter than the principal erect involucre leaf, dense, the numerous flowers often one-sided ( $1\frac{1}{4}$ " long); sepals lanceolate, acute, light greenish-brown, appressed, shorter than the ovoid-oblong obtuse greenish-brown capsule; anthers as long as the filaments; style very short; seeds ovoid ( $\frac{1}{2}$ - $\frac{3}{4}$ " long), ribbed and delicately cross-lined. — Sandy coast of N. Eng., N. Y., and N. J., and about the head of Lake Michigan.

++ Seeds merely apiculate at both ends.

14. **J. tenuis**, Willd. Stem wiry (9-18' high); leaves flat or channelled; panicle shorter than the involucre leaves, loose, or rarely crowded; flowers green (2" long or more); sepals lanceolate, very acute, spreading in fruit, longer than the ovoid retuse scarcely pointed green capsule; anthers nearly equal to the filaments; style very short; seeds small (about  $\frac{1}{4}$ " long), delicately ribbed and cross-lined. — Fields and roadsides, very common. (Eu.) — Var. **SECUNDUS**, Engelm.; flowers smaller, secund along the incurved branches. N. Eng. to Penn. and Del. — Var. **CONGESTUS**, Engelm.; branches contracted into a head and the flowers darker-colored. Minn. and westward.

15. **J. dichotomus**, Ell. Stems rigid ( $1\frac{1}{2}$ -2° high) from a tumid base; leaves filiform, nearly terete, slightly grooved on the inner side; panicle loose, often with 1-sided forked branches, mostly longer than the involucre leaf; flowers greenish (2" long or more); sepals lanceolate, sharp-pointed, spread

ing in fruit, as long as the globular beaked light mahogany-colored capsule; anthers nearly as long as the filaments; style short; seeds small ( $\frac{1}{4}$ - $\frac{1}{2}$ " long), coarsely cross-lined. — Low sandy grounds, N. J. to Fla.

16. **J. Gerardi**, Loisel. (BLACK-GRASS.) Stems scarcely flattened, rigid (1-2° high); panicle contracted, usually longer than the bracteal leaf; flowers chestnut-brown with green ( $1\frac{1}{4}$ " long); sepals oval-oblong, obtuse, incurved, as long as the oval obtuse and mucronate capsule; anthers much longer than the short filaments; style as long as the ovary; seeds (nearly  $\frac{1}{2}$ " long) obovate, delicately ribbed and cross-lined. — Salt marshes; common along the coast and in W. New York; rare about the Great Lakes. (Eu.)

+ + Stems branched, diffuse, leafy; root annual, fibrous.

17. **J. bufonius**, L. Stems low and slender (3-9' high), leafy, often branched from the base; panicle spreading, mostly with one-sided dichotomous branches; flowers remote, greenish (2-3½" long); sepals linear-lanceolate, awl-pointed, the 3 outer much exceeding the inner and the oblong obtuse capsule; stamens short; filaments scarcely longer than the anthers; seeds elliptical, obtuse ( $\frac{1}{2}$ - $\frac{3}{4}$ " long). — Low grounds, by roadsides; common. (Eu.)

§ 3. Stems leafy; leaves terete or laterally flattened, more or less distinctly knotted by internal transverse partitions; panicle terminal, with flowers chiefly in heads. — KNOTTY-LEAVED JUNC.

\* Seeds barely pointed, not caudate.

+ Flowers solitary or 2 together, paniced; stamens 6.

18. **J. pelocarpus**, E. Meyer. Stems slender and erect from a slender running rootstock (6-18' high), bearing few thread-like slightly knotted leaves, branching above into a compound spreading panicle, bearing the flowers in the forks and along one side of the branches; often with the flowers or in place of them are tufts of leaves; flowers small (1-1½" long), greenish with red; sepals oblong, obtuse, the 3 inner ones longer, but shorter than the oblong taper-beaked, 1-celled capsule; anthers much longer than the filaments; style slender; seeds ( $\frac{1}{4}$ " long) obovate, short-pointed. — Sandy, wet or swampy places, Newf. to Fla., west along the Great Lakes to Minn. The proliferous plants are usually sterile and much larger, with larger diffuse panicles. — Var. **SUBTILIS**, Engelm. Creeping or floating, with a single pair of flowers at the end of the short stems. — Somerset Co., Maine (C. E. Smith); Canada.

+ + Heads numerous, of 3-12-flowers (rarely more); in early summer

++ Stamens 6.

19. **J. articulatus**, L. Stems ascending or erect (9-15' high), tufted from a short creeping rootstock, with 1 or 2 slender leaves; panicle short, spreading, the crowded heads 3-8-flowered; flowers brown, rarely pale ( $1\frac{1}{4}$ -1½" long); sepals lance-oblong, acute or mucronate, or the 3 inner obtuse and a little longer, shorter than the ovate-oblong acute or abruptly mucronate-pointed incompletely 3-celled commonly deep chestnut-brown shining capsule; anthers as long as the filaments; ovary attenuate into a short style; seeds (less than  $\frac{1}{2}$ " long) obovate, attenuate below, abruptly pointed above. — Wet grounds, Newf. to Del., west to western N. Y. and Mich. (Eu.)



20. *J. alpinus*, Villars, var. *insignis*, Fries. Stems erect (9-18' high) from a creeping rootstock, with 1 or 2 slender leaves; panicle meagre, with erect branches bearing distant greenish or light-brown heads, each of 3-6 flowers ( $1\frac{1}{4}$ - $1\frac{1}{2}$ " long); sepals oblong, obtuse, the outer mucronate or cuspidate and usually longer than the rounded inner ones, as long as or shorter than the obtuse short-pointed incompletely 3-celled light-brown capsule; anthers as long as the filaments; style short; seeds ( $\frac{1}{8}$ " or more in length) spindle-shaped. — Wet sandy banks, L. Champlain, Cayuga Lake, along the Great Lakes, and far west and northward. (Eu.)

21. *J. militaris*, Bigel. Stem stout (2-4° high) from a thick creeping rootstock, bearing a solitary stout erect leaf ( $\frac{1}{2}$ - $3\frac{1}{2}$ " long) below the middle, which overtops the crowded and rather contracted panicle; heads numerous, 5-12 (rarely 25-) flowered; flowers brownish ( $1\frac{1}{2}$ " long); sepals lanceolate, the outer awl-pointed, as long as the ovate-oblong triangular taper-beaked 1-celled capsule; anthers longer than the filaments; ovary attenuate into a slender style; seeds ( $\frac{1}{4}$ - $\frac{1}{3}$ " long) globose-obovate, obtuse, abruptly pointed. — In bogs and streams, Maine to Md. Sometimes producing, in flowing water, numberless capillary submersed leaves, 2-3° long, from the rootstock.

++ ++ Stamens 3.

22. *J. acuminatus*, Michx. Stems tufted, erect, slender (1-2° long), bearing about 2 leaves and a very loose spreading panicle; heads rather few and large, 5-many-flowered, greenish, at length straw-colored or darker; sepals lance-awl-shaped, sharp-pointed, equal ( $1\frac{1}{2}$ -2" long), as long as the triangular-prismatic short-pointed 1-celled straw-colored or light brown capsule; anthers a little shorter than the filaments; style almost none; seeds small ( $\frac{1}{8}$ - $\frac{1}{4}$ " long), acute at both ends, ribbed-reticulated. — N. Eng. to Ga., Minn. and Tex. May, June. Very variable. Heads often proliferous in autumn.

Var. *débilis*, Engelm. Stems slender (9-18' high); heads green, 3-6 flowered, in a loose panicle; flowers smaller ( $1\frac{1}{4}$ - $1\frac{1}{2}$ " long); capsule longer than the sepals. — Wet sandy soil, N. J. to S. C., west to Ohio, Mo., and Miss. Stem sometimes decumbent and rooting.

Var. *robustus*, Engelm. Stems stout, tall (2-4° high), bearing numerous 5-8-flowered light-brown heads in a large much-branched panicle; flowers small ( $1-1\frac{1}{2}$ " long); ovoid capsule scarcely longer than the sepals. — Deep swamps, Ill. to Mo. and La.

++ ++ Heads few, crowded, of numerous flowers.

++ Stamens 3; stem rigid from a thick white horizontal rootstock.

23. *J. brachycarpus*, Engelm. Stem erect (1-2½° high), bearing about 2 leaves and 2-10 densely flowered spherical heads (4-5" wide) in a slightly spreading crowded panicle much exceeding the involucre leaf; flowers pale green (2" long); sepals lance-linear, awl-pointed, the 3 outer much longer than the inner, and the ovoid pointed 1-celled capsule rather shorter; anthers much shorter than the filaments; style very short; seeds ( $\frac{1}{3}$ " long) abruptly apiculate. — Moist places in open woods and prairies, Ohio and Mich. to Mo., Miss., and Tex.

24. *J. scirpoides*, Lam. Stem erect (1-3° high), rather slender, bearing about 2 terete leaves with wide and open sheaths, and a panicle of few or

many densely-flowered pale-green spherical heads, much longer than the involucre leaf, its branches erect and often elongated; heads (3-4" wide) 15-40 flowered; flowers  $1\frac{1}{4}$ - $1\frac{1}{2}$ " long; sepals rigid, awl-shaped and (especially the outer) bristly pointed, at length pungent, as long as the stamens and nearly equalling the oblong-triangular taper-pointed 1-celled capsule; anthers very small; style elongated or very short; seeds ovoid, abruptly pointed at each end ( $\frac{1}{4}$ " long). — Wet sandy soil, Mass. to N. J. and S. C., west to Ind., Mo., and Tex.

Var. *echinatus*, Engelm. Stouter; leaves terete; branches of the compact panicle short; heads larger (5-6" wide), 40-80-flowered; flowers  $1\frac{1}{4}$ -2" long; sepals narrower and more sharply pointed, the outer a little longer than the inner; stamens shorter and anthers longer than in the preceding, and seeds rather smaller and more slender. — Md. to Fla.

Var. *polycéphalus*, Engelm. Much stouter; leaves laterally flattened (3-6" wide); panicle spreading, branched, bearing many distant heads as large as in the last; flowers 2-2½" long; the 3 outer sepals the longer; anthers about as long as the filaments; seeds larger ( $\frac{1}{3}$ " long). — S. Va. to Fla., west to Mo. and Tex.

++ ++ Stamens 6.

25. *J. nodosus*, L. Stem erect (6-15' or 2° high), slender from a creeping thread-like and tuber-bearing rootstock, mostly with 2 or 3 slender leaves; heads few or several, rarely single, 8-20-flowered ( $3\frac{1}{2}$ -4" wide), overtopped by the involucre leaf; flowers brown ( $1\frac{1}{2}$ -2" long); sepals lance-linear, awl-pointed (the 3 outer mostly a little shorter), nearly as long as the slender triangular taper-pointed 1-celled capsule; anthers oblong, shorter than the filaments; style very short; seeds (about  $\frac{1}{4}$ " long) obovate, abruptly mucronate. — Swamps and gravelly banks, N. J. and Penn. to N. Ind. and Iowa, and northward. — July, Aug. — Var. *MEGACÉPHALUS*, Torr. Stem stout (1-3° high), with thick leaves; heads few and large (6-8" wide), 30-80-flowered; flowers pale green ( $2\frac{1}{4}$ - $2\frac{3}{4}$ " long); outer sepals longest; anthers linear, shorter than the filaments. — Western N. Y. to Minn. and Mo., and westward.

\* \* Seeds caudate.

++ Stamens 3.

26. *J. Canadensis*, J. Gay. Tufted stems erect, terete, smooth, bearing 2-3 leaves; heads few or many-flowered, paniculate; sepals lanceolate, the 3 outer shorter than the inner, not much longer than the stamens, equal to or shorter than the triangular-prismatic almost 1-celled usually short-pointed capsule; style mostly short; seeds more or less distinctly tail-pointed, delicately many ribbed. — Common almost everywhere. Aug., Sept. Easily distinguished by its late flowering from the similar n. 22. Very variable.

Var. *longicaudatus*, Engelm. Stem stout and rigid ( $1\frac{1}{2}$ -3° high), bearing in a decomposed somewhat spreading panicle the numerous 5-50 flowered heads; flowers greenish or light brown ( $1\frac{1}{2}$ -2" long); sepals awl-pointed, mostly shorter than the abruptly short-pointed capsule; seeds slender ( $\frac{3}{8}$ -1" long), conspicuously tail-pointed. — Maine to S. C., west to Minn. and La. The most common form.

Var. *subcaudatus*, Engelm. Stem slender, often decumbent (1-2° high), bearing in simpler spreading panicles fewer 8-20-flowered heads;



flowers greenish, as large as in the last; sepals awl-shaped, but not so rigid; capsule mostly tapering; seeds large ( $\frac{1}{4}$ – $\frac{3}{8}$ " long), with short white membranous appendages, not reticulated. — Conn. to Penn. and Ga.

Var. *brachycéphalus*, Engelm. Stem slender ( $1\frac{1}{2}$ – $2\frac{1}{2}$ ' high), bearing numerous small 3–5-flowered heads in a large spreading panicle; flowers greenish or light brown ( $1\frac{1}{4}$ – $1\frac{1}{2}$ " long); sepals mostly obtuse, shorter than the brown abruptly short-pointed capsule; style longer than in other forms; seeds smaller ( $\frac{1}{4}$ – $\frac{1}{2}$ " long), slender, with rather short appendages. — Penn. and western N. Y., to Wisc. and Ill.

Var. *coarctatus*, Engelm. Stem slender, shorter (9–18' high), bearing fewer deep-brown 3–5-flowered heads in a somewhat erect contracted panicle; flowers as large as in the last; sepals acute, or rarely obtusish, much shorter than the prismatic abruptly pointed deep-brown capsule; seeds as in the last. — N. Eng. to N. J., N. Minn., and westward.

+ + Stamens 6.

27. *J. áper*, Engelm. Stems tufted, erect (2–3° high), terete, stout, rigid, and with the rigid leaves rough; panicle with rigid slightly spreading branches, bearing scattered few- (2–6-) flowered heads; flowers greenish with brown ( $2\frac{1}{4}$ " long); sepals ovate-lanceolate, awl-pointed, rigid and strongly nerved, the outer much shorter than the inner, these a little shorter than the triangular-ovoid beaked incompletely 3-celled brown capsule; ovary tapering into a conspicuous style; seeds large, oblong, with white or often reddish appendages ( $1\frac{1}{4}$ " long). — Sphagnous swamps, N. J. Aug.

## 2. LŪZULA, DC. WOOD-RUSH.

Capsule 1-celled, 3-seeded, one seed to each parietal placenta. — Perennials, often hairy, usually in dry ground, with flat and soft usually hairy leaves, and spiked-crowded or umbelled flowers. (From *Gramen Luzula*, or *Luzula*, dim. of *lux*, light, — a name given to one of the species from its shining with dew.)

\* Pedicels 1-flowered, in a loose compound cyme or umbel.

1. *L. vernalis*, DC. Plant 6–9' high; leaves lance-linear, hairy; umbel mostly simple; sepals pointed, shorter than the obtuse capsule; seeds with a curved appendage. (*L. pilosa*, Willd.) — Woods and banks, Newf. to the mountains of N. C., west to Minn. (Eu.)

2. *L. spadicea*, DC., var. *melanocarpa*, Meyer. Nearly smooth (1–3° high); leaves broadly linear; corymb decomposed, loose; pedicels drooping; sepals pointed, straw-color, about the length of the minutely pointed and brown capsule; seeds not appendaged. (*L. parviflora*, var. *melanocarpa*, Gray.) — Mountains of Maine, Vt., and northern N. Y., to Mich. and N. Minn. (Eu.)

\*\* Flowers crowded in spikes or close clusters. (Plants 6–12' high.)

3. *L. campéstris*, DC. Leaves flat, linear; spikes 4–12, somewhat umbelled, ovoid, straw-color, some of them long-peduncled, others nearly sessile; sepals bristle-pointed, longer than the obtuse capsules; seeds with a conical appendage at base. — Dry fields and woods, common. May. (Eu.)

4. *L. arcuata*, Meyer. Leaves channelled, linear; spikes 3–5, on unequal often recurved peduncles, ovoid, chestnut-brown; bracts ciliate-fringed; sepals

taper-pointed, longer than the obtuse capsule; seeds not appendaged. — Alpine summits of the White Mts. and far northward. (Eu.)

5. *L. spicata*, Desvaux. Leaves channelled, narrowly linear; flowers in sessile clusters, forming a nodding interrupted spiked panicle, brown; sepals bristle-pointed, scarcely as long as the abruptly short-pointed capsule; seeds merely with a roundish projection at base. — With the last, and more common. (Eu.)

## ORDER 122. TYPHACEÆ. (CAT-TAIL FAMILY.)

Marsh or aquatic herbs, with nerved and linear sessile leaves, and monœcious flowers on a spadix or in heads, destitute of proper floral envelopes. Ovary 1–2-celled, with as many persistent styles and (usually elongated) 1-sided stigmas; cells 1-ovuled. Fruit nut-like when ripe, 1-seeded, rarely 2-seeded. Seed suspended, anatropous; embryo straight in copious albumen. Root perennial.

1. *Typha*. Flowers in a cylindrical compact terminal spike; spathe-like bract deciduous.
2. *Sparganium*. Flowers in globular heads with foliaceous bracts.

### 1. TYPHA, Tourn. (CAT-TAIL FLAG.)

Flowers in a long and very dense cylindrical spike terminating the stem; the upper part consisting of stamens only, inserted directly on the axis, and intermixed with long hairs; the lower part consisting of stipitate 1-celled ovaries, the stipes bearing club-shaped bristles, which form the copious down of the fruit. Nutlets minute, very long-stalked. — Spathes merely deciduous bracts, or none. Root-stocks creeping. Leaves long, sheathing the base of the simple jointless stems, erect, thickish. Flowering in summer. (Τύφη, the old Greek name.)

1. *T. latifolia*, L. (COMMON CAT-TAIL.) Stout and tall (4–6° high), the flat sheathing leaves 3–10' broad, exceeding the stem; the staminate and dark brown pistillate parts of the spike (each 3–6' long or more) usually contiguous, the latter at length 1' in diameter; pistillate flowers without bractlets; stigma rhombic-lanceolate; pollen-grains in fours. — In marshes, throughout N. Am. (Eu.)

2. *T. angustifolia*, L. Leaves narrower (3–6" broad), taller, somewhat convex on the back; pistillate and staminate inflorescence usually separated by a short interval, the light brown spike becoming 5–6" in diameter; pollen-grains simple; pistillate flowers with a linear stigma and a hair-like bractlet slightly dilated at the summit. — N. Eng. to N. J., west to Mich. and Mo.; less frequent, and mainly near the coast. (Eu.)

### 2. SPARGANIUM, Tourn. BUR-REED.

Flowers collected in separate dense and spherical leafy-bracted heads, which are scattered along the summit of the stem; the upper sterile, consisting merely of stamens, with minute scales irregularly interposed; the lower or fertile larger, consisting of numerous sessile 1–2-celled pistils, each surrounded by 3–6 scales much like a calyx. Fruit wedge-shaped or club-shaped, more or less corky toward the summit, the hard endocarp perforated at the apex. —