

by the prolonged calyx-tube, which varies in length according to the depth of the water. (Name from *ἐλαδής*, marshy.)

1. **E. Canadensis**, Michx. Leaves in 3's or 4's, or the lower opposite, varying from linear to oval-oblong, minutely serrulate; stamens 9 in the sterile flowers, 3 or 6 almost sessile anthers in the fertile. (*Anacharis Canadensis* Planchon.) — Slow streams and ponds, common. July.

2. VALLISNERIA, L. TAPE-GRASS. EEL-GRASS.

Flowers strictly dioecious; the sterile numerous and crowded in a head on a conical receptacle, enclosed in an ovate at length 3-valved spathe which is borne on a very short scape; stamens mostly 3. Fertile flowers solitary and sessile in a tubular spathe upon an exceedingly lengthened scape. Perianth (calyx) 3-parted in the sterile flowers; in the fertile with a linear tube coherent with the 1-celled ovary, but not extended beyond it, 3-lobed (the lobes obovate); also 3 linear small petals. Stigmas 3, large, nearly sessile, 2-lobed. Ovules very numerous, scattered over the walls, orthotropous. Fruit elongated, cylindrical, berry-like. — Stemless plants, with long linear grass-like leaves, wholly submerged. The staminate clusters being confined to the bottom by the shortness of the scape, the flower-buds themselves break from their short pedicels and float on the surface, where they shed their pollen around the fertile flowers, which are raised to the surface by sudden growth at the same time; afterwards the thread-form scapes (2–4 feet long) coil up spirally, drawing the fruit under water to ripen. (Named for *Ant. Vallisneri*, an early Italian botanist.)

1. **V. spiralis**, L. Leaves linear, thin, long and ribbon-like (1–6° long), obscurely serrulate, obtuse, somewhat nerved and netted-veined. — Common in slow waters, N. Eng. to Fla., west to Minn. and Tex.

3. LIMNÖBIUM, Richard. AMERICAN FROG'S-BIT.

Flowers dioecious, (or monœcious?) from sessile or somewhat peduncled spathes; the sterile spathe 1-leaved, producing about 3 long-pedicelled flowers; the fertile 2-leaved, with a single short-pedicelled flower. Calyx 3-parted or cleft; sepals oblong-oval. Petals 3, oblong-linear. Filaments entirely united in a central solid column, bearing 6–12 linear anthers at unequal heights; there are 3–6 awl-shaped rudiments of stamens in the fertile flowers. Ovary 6–9-celled, with as many placentæ in the axis, forming an ovoid many-seeded berry in fruit; stigmas as many as the cells, but 2-parted, awl-shaped. — A stemless perennial herb, floating in stagnant water, proliferous by runners, with long-petioled and round-heart-shaped leaves, which are spongy-reticulated and purplish underneath; rootlets slender, hairy. Sterile flowers rather small; the fertile larger; peduncle nodding in fruit. Petals white? (Name from *λιμνόβιος*, living in pools.)

1. **L. Spóngia**, Richard. Leaves 1–2' long, faintly 5-nerved; peduncle of sterile flower about 3' long and filiform, of the fertile only 1' long and stout. — Stagnant water, N. J. to Fla.; also L. Ontario, Ill., and Mo.

ORDER 109. BURMANNIACEÆ. (BURMANNIA FAMILY.)

Small annual herbs, often with minute and scale-like leaves, or those at the root grass-like; the flowers perfect, with a 6-cleft corolla-like perianth, the

tube of which adheres to the 1-celled or 3-celled ovary; stamens 3 and distinct, opposite the inner divisions of the perianth; capsule many-seeded, the seeds very minute. — A small, chiefly tropical family.

1. BURMANNIA, L.

Ovary 3-celled, with the thick placentæ in the axis. Filaments 3, very short. Style slender; stigma capitate-3-lobed. Capsule often 3 winged. (Named for *J. Burmann*, an early Dutch botanist.)

1. **B. biflora**, L. Stem low and slender (2–4' high), 2-flowered at the summit, or soon several-flowered; perianth (2–3" long) bright blue, 3-winged. — Peaty bogs, Va. to Fla.

ORDER 110. ORCHIDACEÆ. (ORCHIS FAMILY.)

Herbs, clearly distinguished by their perfect irregular flowers, with 6-merous perianth adnate to the 1-celled ovary, with innumerable ovules on 3 parietal placentæ, and with either one or two gynandrous stamens, the pollen cohering in masses. Fruit a 1-celled 3-valved capsule, with innumerable minute seeds, appearing like fine saw-dust. Perianth of 6 divisions in 2 sets; the 3 outer (sepals) mostly of the same petal-like texture and appearance as the 3 inner (petals). One of the inner set differs more or less in figure, direction, etc., from the rest, and is called the *lip*; only the other two taking the name of *petals* in the following descriptions. The lip is really the upper petal, i. e. the one next to the axis, but by a twist of the ovary of half a turn it is more commonly directed forward and brought next the bract. Before the lip, in the axis of the flower, is the *column*, composed of a single stamen, or in *Cypripedium* of two stamens and a rudiment of a third, variously coherent with or borne on the style or thick fleshy stigma; anther 2-celled; each cell containing one or more masses of pollen (*pollinia*) or the pollen granular (in *Cypripedium*). Stigma a broad glutinous surface, except in *Cypripedium*. — Perennials, often tuber-bearing or tuberous-rooted; some epiphytes. Leaves parallel-nerved, all alternate. Flowers often showy, commonly singular in shape, solitary, racemed, or spiked, each subtended by a bract, — in all arranged for fertilization by the aid of insects, very few capable of unaided self-fertilization.

Tribe I. EPIDENDREÆ. Anther terminal, erect or inclined, operculate. Pollinia smooth and waxy, 4 or 8 (2 or 4 in each cell), distinct, or those in each cell (or all in n. 2 and 7) united at base. (Pollinia 8 only in n. 7 of our genera.)

* Green-foliaged plants, from solid bulbs, with 1 or 2 leaves.

+ Column very short; leaf solitary.

1. **Microstylis**. Flowers racemose, minute, greenish. Petals filiform.

+ + Column elongated; leaves radical.

+ + Whole plant (except the flowers) green.

2. **Liparis**. Leaves 2. Raceme few-flowered. Lip flat, entire.

3. **Calypso**. Leaf solitary. Flower large, solitary. Lip saccate.

+ + A single green autumnal leaf; otherwise mainly brownish or purplish.

4. **Tipularia**. Raceme many-flowered; flowers small, greenish; lip 3-lobed.

5. **Aplectrum**. Raceme loose; flowers rather large; lip 3-ridged, not spurred or saccate.

- * * Leafless, with coralloid roots; whole plant brownish or yellowish; flowers racemose.
6. *Corallorhiza*. Pollinia 4, in 2 pairs. Flower gibbous or somewhat spurred, and lip with 1-3 ridges; sepals and petals 1-3-nerved.
7. *Hexalectris*. Pollinia 8, united. Flower not gibbous; sepals and petals several-nerved; lip with 5-6 ridges.
- Tribe II. NEOTTIEÆ.** Anthers erect upon the back of the column at the summit, or terminal and opercular. Pollinia granular or powdery, more or less cohering in 2 or 4 delicate masses, and attached at the apex to the beak of the stigma.
- * Anthers without operculum, erect upon the back of the short column. Flowers small, in spikes or racemes.
8. *Listera*. Stem from a fibrous root, 2-foliate. Lip flat, 2-lobed.
9. *Spiranthes*. Stems leafy below, from tuberous-fascicled roots. Flowers 1-3-ranked in a twisted spike. Lip embracing the column below, with 2 callosities at base.
10. *Goodyera*. Leaves radical, white-reticulated. Lip entire, free from the column, saccate, without callosities.
- * * Anther operculate, erect and jointed upon the short column. Stem stout, very leafy.
11. *Epipactis*. Flowers racemose; perianth spreading; lip dilated above.
- *** Anther terminal, operculate, incumbent; column elongated. Stem scapose or few-leaved; flowers large, solitary or few.
12. *Arethusa*. Leaf and flower solitary. Lip bearded, its base adherent to the linear column. Pollinia 4.
13. *Calopogon*. Leaf solitary, grass-like. Lip bearded, stalked, free. Column winged at the apex. Pollinia 4.
14. *Pogonia*. More or less leafy. Lip crested, free. Column clavate. Pollinia 2.
- Tribe III. OPHYRDEÆ.** Anther without operculum, the cells adnate to the top of the column and often continuous with the beak of the stigma. Pollinia 2, of coarse grains united by an elastic web, each attached at base by a stalk to a viscid gland. Flower (in ours) ringent and spurred, spicate upon a leafy stem.
15. *Orchis*. The two glands or viscid disks enclosed in a common pouch.
16. *Habenaria*. The two glands naked, either approximate or widely separated.
- Tribe IV. CYPRIPEDEÆ.** Perfect anthers 2, lateral, the sterile one forming a dilated fleshy appendage above the terminal stigma. Pollen granular, not in masses.
17. *Cypripedium*. Stems more or less leafy. Perianth spreading; lip an inflated sac.

1. MICROSTYLIS, Nutt. ADDER'S-MOUTH.

Sepals oblong, spreading. Petals thread-like or linear, spreading. Lip auricled or ovate at base, not tubercled, entire or nearly so. Column very small, terete, with 2 teeth or auricles at the summit and the erect anther between them. Pollen-masses 4, in one row (2 in each cell), cohering by pairs at the apex, waxy, without any stalks, threads, or gland. — Low herbs, from solid bulbs, producing simple stems, which bear in our species a single leaf and a raceme of minute greenish flowers. (Name composed of *μικρός*, small, and *στυλís*, a column or style.)

1. *M. monophyllos*, Lindl. Slender (4-6' high); leaf sheathing the base of the stem, ovate-elliptical; racemes spiked, long and slender; pedicels not longer than the flowers; lip long-pointed. — Cold wet swamps, N. New Eng. to Penn., N. Ind., Minn., and northward. July. (Eu.)

2. *M. ophioglossoides*, Nutt. Leaf near the middle of the stem, ovate, clasping; raceme short and obtuse; pedicels much longer than the flowers; lip truncate-3-lobed at the summit, the middle lobe very small. — Low moist ground, N. Scotia to Fla., west to Minn. and Mo. July. — Pollinia (at least sometimes) only 1 in each cell.

2. LÍPARIS, Richard. TWAYBLADE.

Sepals and petals nearly equal, linear, or the latter thread-like, spreading. Lip flat, entire, often bearing 2 tubercles above the base. Column elongated, incurved, margined at the apex. Anther lid-like, terminal; pollen-masses 4, in one row (2 to each cell), slightly united in pairs, without stalk, threads, or gland. — Small, low herbs, with solid bulbs, producing 2 root-leaves and a low scape, which bears a raceme of few purplish or greenish flowers. (Name from *λίπαρός*, fat or shining, in allusion to the smooth or unctuous leaves.)

1. *L. liliifolia*, Richard. Leaves ovate; petals thread-like, reflexed; lip large ($\frac{1}{2}$ long), wedge-obovate, abruptly short-pointed, brown-purplish. — Moist woodlands, N. Eng. to Ga., west to Minn. and Mo. June.

2. *L. Læselii*, Richard. Leaves elliptic-lanceolate or oblong, keeled; lip obovate or oblong (2" long), mucronate, yellowish-green, shorter than the linear unequal petals and sepals. — Bogs, N. Scotia to Md., S. Ill., and Minn. (Eu.)

3. CALÝPSO, Salisb.

Sepals and petals nearly similar, ascending, spreading, lanceolate, pointed. Lip larger than the rest of the flower, sac-shaped, inflated (9" long), 2-pointed underneath the apex. Column broadly winged and petal-like, ovate, bearing the lid-like anther just below the apex; pollen-masses waxy, 2, each 2-parted, all sessile on a square gland. — A little bog-herb; the solid bulbs producing a single ovate or slightly heart-shaped thin leaf, as in *Aplectrum*, and a short (3-5' high) scape, sheathed below, bearing a large and showy (variegated purple, pink, and yellow) flower. (Name from the goddess *Calypso*.)

1. *C. borealis*, Salisb. — Cold bogs and wet woods, the bulbs resting in moss, with a coralloid root beneath; Maine and Vt. to Mich. and Minn., and northward. May. — A very local and beautiful plant. Lip somewhat resembling that of a Lady's Slipper, woolly-hairy inside. (Eu.)

4. TIPULÀRIA, Nutt. CRANE-FLY ORCHIS.

Sepals and petals spreading, oblong; the latter rather narrower. Lip prolonged beneath into a thread-like ascending spur twice or thrice the length of the flower (9-12" long), 3-lobed; the middle lobe linear, a little wavy, as long as the petals, the side lobes short and triangular. Column narrow and wingless. Anther lid-like, terminal; pollen-masses 2, waxy, each 2-parted, connected by a linear stalk with the transverse small gland. — Herb with large solid bulbs connected horizontally, on a distinct pedicel, producing in autumn a single ovate nerved and plaited leaf on a slender petiole, purplish beneath, and in summer a long slender scape, with 1 or 2 sheaths at base, bearing a raceme of many small greenish flowers tinged with purple. (Name from a fancied resemblance of the flowers to insects of the genus *Tipula*.)

1. *T. discolor*, Nutt. Scape 10-18' high; lip blunt at the tip. — Sandy woods, Vt. to N. J. and Fla., west to Mich.; very scarce.

5. APLÉCTRUM, Nutt. PUTTY-ROOT. ADAM-AND-EVE.

Perianth neither gibbous nor with any trace of a spur or sac at the base. Lip free, the palate 3-ridged. Otherwise the flowers and scape (invested be-

low with 3 greenish sheaths) as in *Corallorhiza*; but, instead of a coral-like root, a slender naked rootstock produces each year a thick, globular, solid bulb or corm, often 1' in diameter (filled with exceedingly glutinous matter), which sends up late in summer a large, oval, many-nerved and plaited, petioled, green leaf, lasting through the winter, and early in the succeeding summer its scape is terminated by a loose racemé of dingy rather large flowers. (The name composed of α -privative and $\pi\lambda\eta\kappa\tau\rho\nu$, a spur, from the total want of the latter.)

1. *A. hiemale*, Nutt. Stem 1° high or more; perianth greenish-brown, or the lip whitish, and somewhat speckled with purple, 5-6" long. — Woods, in rich mould; rather rare or local, N. Eng. to Ga., west to Minn. and Mo. — Each corm lasts 2 or 3 years before it shrivels, so that 3 or 4 are found horizontally connected.

6. CORALLORHIZA, Haller. CORAL-ROOT.

Perianth somewhat ringent, oblique and gibbous or obscurely spurred at base; the oblong or lanceolate sepals and petals nearly alike, 1-3-nerved, the upper arching; the lateral sepals ascending, their bases with that of the lip forming the gibbosity or short spur which is mostly adnate to the summit of the ovary; lip slightly adherent to the base of the 2-edged straightish column, bearing a pair of projecting ridges on the face below, spreading or recurved at the apex. Anther terminal, lid-like. Pollen-masses 4, obliquely incumbent, soft-waxy, free. — Brownish or yellowish herbs, destitute of green foliage, with much-branched and toothed coral-like root stocks (probably root-parasitical), sending up a simple scape, with sheaths in place of leaves and bearing a raceme of rather small dull-colored flowers; fruit reflexed. (Name composed of $\kappa\omicron\rho\alpha\lambda\lambda\iota\omicron\nu$, coral, and $\rho\acute{\iota}\zeta\alpha$, root.)

§ 1. *Small spur or sac adnate to the summit of the ovary; flowers small; lip whitish or purplish, often mottled with crimson.*

1. *C. innata*, R. Brown. Plant slender, light brownish or yellowish (3-9' high), 5-12-flowered; pedicels very short; perianth 2-2½" long; lip somewhat hastately 3-lobed above the base, the lamellæ thick and rather short; spur a very small protuberance; capsule oval or elliptical (3-4" long). — Swamps and damp woods, N. Eng. to northern N. J., Ohio, Mich., Minn., and northward, and south in the mountains to Ga. May, June. (Eu.)

2. *C. odontorhiza*, Nutt. Plant light brown or purplish; stem rather slender, bulbous-thickened at base (6-16' high), 6-20-flowered; pedicels rather slender; perianth about 3" long; lip entire or merely denticulate, thin, broadly ovate or obovate, abruptly contracted into a claw-like base, the lamellæ a pair of short projections; the spur represented by a small cavity wholly adnate to the summit of the ovary; capsule at first very acute at base, at length short-oval (4" long). — Rich woods, E. Mass. (*Hitchings*) and Vt. to N. J. and Fla., west to Mich. and Mo. May-July.

3. *C. multiflora*, Nutt. Plant purplish, rather stout (9-18' high), 10-30-flowered; perianth 2½-4" long; lip deeply 3-lobed, with a short narrowed base and with prominent lamellæ; spur manifest and protuberant; capsule oblong (6-9" long), short-pedicelled. — Dry woods, N. Eng. to Md., west to Mo., Iowa, and Minn. July-Sept.

§ 2. *Spur none; the broadly gibbous somewhat saccate base wholly free from the ovary; flowers large for the genus, purple, unspotted, more expanding.*

4. *C. striata*, Lindl. Plant purplish, stout (6-16' high), bearing 15-25 large flowers in a crowded spike, on very short pedicels; perianth 6-7" long; lip oval or obovate, perfectly entire, concave, barely narrowed at the base, where it bears 1-3 short lamellæ; all the parts of the perianth marked with 3 darker nerves; pod oblong (9" long). (*C. Macraei*, Gray.) — Woods, from L. Erie westward along the Great Lakes and to the Pacific.

7. HEXALÉCTRIS, Raf.

Sepals and petals nearly equal, somewhat spreading, several-nerved, not gibbous nor spurred at base, free. Lip obovate, with 5-6 prominent ridges down the middle, 3-lobed above, the middle lobe somewhat concave. Pollen-masses 8, united into a single fascicle. Otherwise as in *Corallorhiza*. (Name probably from $\xi\varsigma$, six, and $\delta\lambda\epsilon\kappa\tau\rho\nu\acute{\alpha}\nu$, a cock, from the crests of the lip.)

1. *H. aphyllus*, Raf. Stem 1-2° high, beset with purplish scales, the lower sheathing; flowers racemed, bracteate, brownish-purple, 6-8" long. (*Bletia aphylla*, Nutt.) — Rich woods, Ky. and Mo. to Fla. and Mex.

8. LISTERA, R. Brown. TWAYBLADE.

Sepals and petals nearly alike, spreading or reflexed. Lip mostly drooping, longer than the sepals, 2-lobed or 2-cleft. Column wingless; stigma with a rounded beak. Anther borne on the back of the column at the summit, erect, ovate; pollen powdery, in 2 masses, joined to a minute gland. — Roots fibrous. Stem bearing a pair of opposite sessile leaves in the middle, and a spike or raceme of greenish or brownish-purple small flowers. (Dedicated to *Martin Lister*, an early and celebrated British naturalist.)

* Column very short; sepals ovate, reflexed; plants delicate, 4-8' high.

1. *L. cordata*, R. Brown. Leaves round-ovate, somewhat heart-shaped (½-1' long); raceme smooth; flowers minute, crowded, on pedicels not longer than the ovary; lip linear, twice as long as the sepals, 1-toothed each side at base, 2-cleft. — Cold woods, N. J. to Mich., Minn., and northward. June. (Eu.)

2. *L. australis*, Lindl. Leaves ovate; raceme loose and slender; flowers very small, on minutely glandular-pubescent pedicels twice the length of the ovary; lip linear, 3-4 times the length of the sepals, 2-parted, the divisions linear-setaceous. — Damp thickets, Oswego Co., N. Y., and from N. J. to Fla. June.

* * Column longer, arching or straightish.

3. *L. convallarioides*, Nutt. Plant 4-9' high; leaves oval or roundish, and sometimes a little heart-shaped (1-1½' long); raceme loose, pubescent; pedicels slender, lip wedge-oblong, 2-lobed at the dilated apex, and 1-toothed on each side at the base, nearly twice the length of the narrowly lanceolate spreading sepals, purplish, ½' long. — Damp mossy woods, N. New Eng. to Mich., Minn., and northward, and south in the mountains to N. C.

9. SPIRÁNTHESES, Richard. LADIES' TRESSES.

Perianth somewhat ringent, oblique on the ovary; the sepals and petals all narrow, mostly erect or connivent, the three upper pieces sticking together

more or less, the two lower covering the base of the lip. Lip oblong, short-stalked or sessile, the lower part involute around the column, and with a callous protuberance on each side of the base; the somewhat dilated summit spreading or recurved, crisped, wavy, or rarely toothed or lobed. Column short, oblique, bearing the ovate stigma on the front, and the sessile or short-stalked (mostly acute or pointed) 2-celled erect anther on the back. Pollen-masses 2 (one in each cell), narrowly obovate, each 2-cleft, and split into thin and tender plates of granular pollen united by elastic threads, and soon adhering at base to the narrow boat-shaped viscid gland, which is set in the slender or tapering thin beak terminating the column. After the removal of the gland, the beak is left as a 2-toothed or 2-forked tip. — Roots clustered-tuberous; stem more or less naked above, leaf-bearing below or at the base. Flowers small (ours all white or greenish-white), bent horizontally, 1-3-ranked in a spike, which is commonly more or less spirally twisted (whence the name, from *σπειρα*, a coil or curl, and *ἄνθος*, flower).

* Flowers in 3 ranks, crowded in a close spike; leaves at the root and base of the stem present at the flowering season.

1. *S. latifolia*, Torr. Low; naked stem or scape 4-9' (rarely 12') high, smooth; leaves all next the base, oblong or lance-oblong (1-4' long, 3-9" wide), 3-5-nerved, contracted into a sheathing base; spike narrow (1-3' long); flowers small (2-3" long); lip quadrate-oblong, yellowish on the face, not contracted in the middle, thin, wavy-crisped at the very obtuse or truncate apex, the small callosities at the base oblong, marginal and adnate for their whole length; gland and beak of the stigma short. — Moist banks, Vt. and W. Mass. to Mich. and Minn., south to Del. and Md.

2. *S. Romanzoffiana*, Cham. Stem leafy below and leafy-bracted above (5-15' high); leaves varying from oblong-lanceolate to grassy-linear; spike dense, oblong or cylindrical (1-4' long); perianth curved and the summit manifestly ringent, pure white (4" long), the sepals and petals all connivent in the upper portion or galea; the lip ovate-oblong, contracted below the rounded wavy-crenulate much recurved summit, otherwise entire, the callosities at base globular and smooth; gland oblong-linear and the 2-horned beak of the stigma short. — High and cool bogs, N. New Eng. to Mich. and Minn., and northward; Norfolk, Conn. (Barbour); central N. Y. July, Aug. (Ireland.)

3. *S. cernua*, Richard. Stem leafy below and leafy-bracted above (6-20' high); leaves linear-lanceolate, the lowest elongated (4-12' long, 2-9" wide); spike cylindrical, rather dense (2-5' long) and with the white fragrant flowers either pubescent or nearly smooth; perianth horizontal or recurving (4-5" long), the lower sepals not upturned or connivent with the upper; lip oblong and very obtuse when outspread, but conduplicate or the margins much incurved, wavy-crisped above the middle, especially at the flattish and recurved-spreading apex, the callosities at the base prominent, nipple-shaped, somewhat hairy; gland of the stigma linear, in a long and very slender beak. — Common in wet places, especially eastward and southward. Sept., Oct. Very variable in size and foliage, often nearly losing its root-leaves at flowering time. — A variety, growing in dry ground but retaining its leaves and blooming somewhat later, has greenish cream-colored or yellowish stronger-scented flowers. E. Mass and Del.

* * Flowers in one straight or spirally twisted rank.

+ Stem bearing elongated leaves at and toward the base, which mostly persist during the flowering season.

4. *S. præcox*, Watson. Root of fleshy or tuberous-thickened fibres; stem 9'-20' high; lower and root-leaves linear or lance-linear (3-8' long, 2-4" wide) gradually tapering to the base, the upper reduced to sheathing bracts; spike linear, dense (2-5' long), usually much twisted, the axis, ovaries, etc., downy-pubescent; bracts ovate and gradually, or rhombic-ovate and abruptly taper-pointed, surpassing the ovary, the margins broadly hyaline; perianth 3" long; lip ovate-oblong when outspread, with rather small callosities at base, crisped at the rounded slightly recurved apex; anther and beak of the stigma very acute. (*S. graminea*, var. *Walteri*, Gray.) — Wet, grassy places, Mass. to N. J. and Fla.

+ Scape very slender, merely bracted; the leaves with a blade all in a cluster at the ground, ovate or oblong, abruptly contracted into a petiole, commonly withering away at or before flowering; flowers small, and whole plant glabrous or nearly so; bracts small, sharp-pointed, not longer than the capsule.

5. *S. gracilis*, Bigelow. Roots clustered, tuberous-thickened; scape 8-18' high, bearing a slender many-flowered one-sided or twisted spike; perianth barely 1½-2" long; lip oval when outspread, narrowly oblong in natural form, thickish and green above with thin white margins, the recurved obtuse or acutish apex wavy-crisped, the callosities at the base nipple-shaped. — Hilly woods and sandy plains, common. July-Oct.

6. *S. simplex*, Gray. Root a solitary oblong or spindle-shaped tuber; no leaves at flowering time; scape 5-9' high, bearing a small narrow (rarely 1-sided) spike (1-3' long) of very short flowers (perianth 1-1½" long); lip thin, white, obovate-oblong, the apex eroded and crisped, the callosities at the base slender. — Dry sandy soil, E. Mass. to N. J., Del., and Md. Aug., Sept.

10. GOODYËRA, R. Br. RATTLESNAKE-PLANTAIN.

Lip sac-shaped, sessile, entire, and without callosities at base. Otherwise as *Spiranthes*. — Root of thick fibres, from a somewhat fleshy creeping root-stock, bearing a tuft of thickish petioled leaves, usually reticulated with white veining. Scape, spike, and the greenish-white small flowers usually glandular-downy. (Dedicated to John Goodyear, an early English botanist.)

§ 1. Lip strongly saccate-inflated and with a short spreading or recurved tip; anther short, borne on a distinct filament attached to the back of the short column, blunt; gland-bearing tip or beak of the stigma very short.

1. *G. repens*, R. Br. Small (5-8' high) and slender; leaves ovate, more or less white-reticulated (about 1' long); flowers several, in a loose 1-sided spike; lip with an ovate recurved tip; sepals ovate. — Woods, under evergreens, common northward and through the Alleghanies. July. (Eu.)

2. *G. pubescens*, R. Br. Larger; leaves strongly white-reticulated; scape 6-12' high, the numerous crowded flowers not one-sided; tip of the globular lip very short; otherwise like the preceding, and too near to it. — Rich woods, Newf. to Fla., west to Mich. and Minn.