

THE ORCHIDS OF OHIO.

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People in general know little of orchids because they do not come in one's way as plants ordinarily do but must be sought for. They are most widely distributed in the damp and wooded regions of the world, reaching their greatest development in the tropics where many of them are brilliantly flowered epiphytes. In temperate regions they are terrestrial plants drawing their nourishment directly or indirectly from the soil. They are perennial herbs, many with root mycorrhizas, and on this account some of them are without green foliage leaves, depending entirely for their food supply on the fungus growing on their roots. Most of them are rare plants and grow only in special habitats, and because of their mutualistic habits they can not easily be raised in gardens since it is difficult to produce a suitable substratum in which the fungus can develop.

Twenty-one genera and thirty-seven species of orchids are reported from Ohio with two or three others that are doubtful. The species most widely distributed are: *Galeorchis spectabilis*, *Aplectrum spicatum*, *Blephariglottis psychodes*, *Gyrostachys cernua*, *Limodorum tuberosum*, *Perularia flava*, *Pogonia ophioglossoides*, *Triphora trianthophora*, and *Blephariglottis lacera*.

Orchids are valued chiefly because they are beautiful though a few are also useful. Vanilla is extracted from the fruit of a climbing orchid in Mexico; and the leaves of some species in Madagascar are used for making tea. Their flowers are among the most unique in the plant kingdom, and the parts are highly specialized, with peculiar adaptations for insect pollination. Among the Ohio genera having some species with showy flowers the following deserve mention: *Cypripedium*, *Galeorchis*, *Blephariglottis*, *Arethusa*, *Pogonia* and *Leptorchis*. Some of the *Cypripediums* are known to be poisonous to the touch. *C. reginae* is poisonous to the skin much like poison ivy. At least fifty per cent of people are susceptible. *C. parviflorum* is also poisonous but less so than the former, while the variety, *hirsutum*, is said to be as poisonous as *C. reginae*.

ORCHIDACEAE. Orchid Family.

Perennial plants, commonly succulent, arising from bulbs or corms, or from fibrous or tuberous roots, with entire, often grass-like or bract-like leaves.

Flowers perfect, solitary, or in spikes or racemes, epigynous, zygomorphic, pentacyclic, of a modified trimerous type, with a unilocular ovulary, specialized pollen masses, and numerous ovules on three parietal placentae; one of the petals usually

larger and of different form than the others, often spurred, and called the lip; fertile stamens one or two, variously united with the style into an unsymmetrical column; seeds numerous and minute.

KEY TO THE OHIO GENERA.

1. Anthers 2, one on each side of the style, with a trowel-shaped body on the upper side; lip a large inflated sac..... **Cypripedium**
1. Anthers 1, lip not a large inflated sac..... 2
2. Leaves 5, whorled, on a long stalk, flowers terminal; lip spurless; pollen mass powdery-granular..... **Isotria**
2. Leaves not whorled though they may be opposite..... 3
3. Leaves broad in a basal rosette white reticulated, the flowering stems with bracts, the flowers in bracted spikes..... **Peramium**
3. Flowering stem with one well developed leaf (not grass-like) at about the middle..... 4
3. Stems with several leaves, or leafless; if with basal leaves, then not in a rosette..... 5
4. Flowers large, 1 or 2..... **Pogonia**
4. Flowers small, numerous, in a terminal raceme..... **Achroanthus**
5. Flowers single, rose-purple, the lip crested with hairs; leaves linear or reduced to bracts..... **Arethusa**
5. Flowers several or numerous..... 6
6. With 1 or 2 prominent basal leaves, the stem leaves reduced to bracts, or with all the leaves bract-like..... 7
6. With normal leaves on the stem..... 12
7. With 1 or 2 basal foliage leaves..... 8
7. Leaves all reduced to bracts..... 11
8. With 2 basal leaves..... 9
8. With 1 basal leaf..... 10
9. Flowers in a short loose spike with large leaf-like bracts surpassing them, violet-purple mixed with lighter purple and white; lip entire, produced below into a spur..... **Galeorchis**
9. Flowers in a long loose spike, greenish or white, bracts large, nearly equalling the flower; lip linear, or nearly so, spur long and slender..... **Lysias**
9. Flowers in terminal racemes, brownish-purple or yellowish-green, the subtending bracts minute and scale-like; lip flat, entire, not spurred..... **Leptorchis**
10. Flowers in a terminal raceme, the pedicels subtended by small bracts; flowers not spurred..... **Aplectrum**
10. Flowers in a long loose raceme, nodding, bractless; flowers long-spurred..... **Tipularia**
11. Flowers in a spike, without spurs, white, greenish, or yellowish..... **Gyrostachys**
11. Flowers in a raceme, with short spurs, dull purplish, or whitish mottled with crimson..... **Corallorhiza**
12. Flowering stem with a single large grass-like leaf; flowers large, 4-10..... **Limodorum**
12. Flowering stem with several prominent leaves..... 13
13. Leaves not much longer than broad; flowers few, axillary, pale purple, the lip spurless..... **Triphora**
13. Leaves all much longer than broad..... 14
14. Flowers spiked, small, greenish, without a spur, leaves mostly narrow or bract-like..... **Gyrostachys**
14. Flowers with a spur..... 15
15. Lip of the corolla fringed or parted and cut-toothed; spike with foliaceous bracts..... **Blephariglotis**

15. Lip not fringed nor cut-toothed, flowers greenish or whitish. 16
 16. With one large and a much smaller leaf besides smaller bracts on the stem; beak of the stigma with 3 oblong or clavate appendages. **Gymnandeniopsis**
 16. With several large leaves on the stem. 17
 17. Spur slender, straight, longer than the lip; lip hastate, with a tubercle at the base. **Perularia**
 17. Spur much shorter than the lip, blunt, sac-like; lip 3-toothed at apex. **Coeloglossum**
 17. Spur seldom equalling the lip, blunt, slightly incurved, decidedly clavate; lip lanceolate, entire. **Limnorchis**

Cypripedium L.

Glandular pubescent herbs, with leafy stems or scapes, and thick tufted roots. Leaves large, broad, many-nerved. Flowers large, showy, solitary or several. Sepals spreading, separate, or two of them united. Lip a large inflated sac. Column declined, bearing a sessile or stalked anther on each side, and a dilated sterile stamen above, which covers the summit of the style. Pollen masses granular, without a caudicle or gland. Stigma terminal, broad, somewhat 3-lobed.

1. Plant 2-leaved, scape 1-flowered, lip fissured in front. **C. acaule**
 1. Stem leafy to the top, 1-several flowered, lip not fissured in front, but with a rounded, open orifice. 2
 2. Sepals and linear twisted petals acute, longer than the lip. 3
 2. Sepals and petals not twisted, shorter than the lip or nearly equalling it. **C. reginae**
 3. Lip white, sterile stamen lanceolate. **C. candidum**
 3. Lip yellow, sterile stamen triangular. **C. parviflorum**

1. **Cypripedium acaule** Ait. Stemless Lady's-slipper. Stem 16 in. high, very pubescent; leaves 2, basal, 10-20 in. long, 4-8 in. wide, sparsely pubescent; sepals greenish-purple; petals pink with darker veins, or sometimes white. A low plant with 2 large leaves and a showy, fragrant flower, growing in sandy or rocky woods. Medina, Portage, Hocking, Fairfield, Stark and Cuyahoga Counties.
2. **Cypripedium reginae** Walt. Showy Lady's-slipper. Stem 2 ft. high, very pubescent, leafy to the top; leaves elliptic, acute, 5-7 in. long, 2-5 in. wide; flowers 1-3; lip much inflated, over 1 in. long, variegated with purple and white stripes. A tall leafy plant with showy flowers growing in swamps and woods. Fulton, Champaign, Lucas, Geauga, Portage, and Muskingum Counties.
3. **Cypripedium candidum** Willd. Small White Lady's-slipper. Stem 4-12 in. high, slightly pubescent, leafy; leaves 3 or 4, elliptic or lanceolate, acute or acuminate, 3-5 in. long; bracts 1-2 in. long, lanceolate; flowers solitary; lip white, striped with purple inside, about 1 in. long. A small plant with showy flower, growing in bogs and meadows. Wyandot and Erie Counties.

4. **Cypripedium parviflorum** Salisb. Small Yellow Lady's-slipper. Stem 1-2 ft. high, pubescent, leafy; leaves 5, oval, elliptic, or lanceolate, 2-6 in. long; flower solitary; lip golden yellow, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long, purple spotted. Grows in woods and thickets. Lorain, Cuyahoga, Geauga, Stark, Montgomery, Clarke, Franklin and Gallia Counties.

The variety known as **Cypripedium hirsutum** Mill., Large Yellow Lady's-slipper, is a tall showy plant with leafy stem and larger flower than *C. parviflorum*, with pale yellow lip 1 $\frac{1}{2}$ -2 in. long. In woods and thickets. Fulton, Lucas, Wyandot, Medina, Portage, Auglaize, Champaign, Licking, and Gallia Counties.

Galeorchis Rydb.

Rhizome very short with numerous fleshy roots; stem scape-like with 2 large round leaves at the base; flowers in a short loose spike with large leaf-like bracts surpassing them; lip entire, wavy, produced below into a spur.

1. **Galeorchis spectabilis** (L.) Rydb. Showy Orchis. Stem 4-12 in. high, fleshy, 5-angled; leaves with 1 or 2 scales below them, sometimes 8 in. long and 4 in. wide, but usually smaller, clammy to the touch; flowers in a short loose spike with large leaf-like bracts surpassing them, violet-purple mixed with lighter purple and white; lip whitish, divergent, entire, about as long as the petals. A plant with 2 large leaves surpassing the stem and a spike of showy flowers. Grows in rich woods. Defiance, Sandusky, Cuyahoga, Medina, Portage, Wyandot, Stark, Columbiana, Miami, Clarke, Franklin, Licking, Greene, Fairfield, Clinton, Ross, Vinton, Hamilton, Clermont, and Gallia Counties.

Perularia Lindl.

Plant leafy-stemmed with a cluster of thick fibrous roots; flowers small, greenish, in a long open spike with long bracts; lip lanceolate with a tooth on each side at the base and a central tubercle at the middle of the base; spur slender, straight, longer than the lip, but shorter than the ovary.

1. **Perularia flava** (L.) Rydb. Tubercled Orchis. Stem smooth, bracted, 12-24 in. high, stout, leafy; leaves lanceolate or elliptic, acute or obtuse, 4-12 long; flowers greenish, in a long open spike with long bracts; lip lanceolate, with a tooth on each side at the base, and a central tubercle at the middle of the base. A sturdy plant with a leafy stem and small pale green flowers, growing in moist soil. Erie, Cuyahoga, Huron, Lake, Crawford, Knox, Franklin, and Gallia Counties.

Coeloglossum Hartman.

Leafy plants with biennial 2-cleft tubers; flowers greenish, in a long, leafy-bracted spike; lip oblong, obtuse, 2-3 toothed at the apex; spur much shorter than the lip. blunt, sac-like.

1. **Coeloglossum bracteatum** (Willd.) Parl. Long-bracted Orchis. Stem leafy, 6-24 in. high; leaves lanceolate, ovate or oval, or the lowest sometimes obovate, 2-7 in. long, the upper much smaller; bracts longer than the ovaries; flowers green or greenish; lip $\frac{1}{2}$ - $\frac{3}{4}$ in. long, 2-3 toothed or lobed at the apex. A tall sturdy plant with leafy stem and a spike of greenish flowers. Growing in woods and meadows. Lucas, Lorain, Medina, Portage, Franklin, Butler, and Auglaize Counties.

Gymnandeniopsis Rydb.

Leafy plants with fleshy, fibrous, or somewhat tuberous roots, and a short spike of small flowers; lip entire or 3-toothed at the apex, much exceeded by the long filiform or clavate spur.

1. **Gymnandeniopsis clavellata** (Mx.) Rydb. Small Green Wood Orchis. Stem 8-20 in. high, angled, 1-leaved near the base, with several small bract-like leaves above, one of which is larger; basal leaf oblanceolate, 4-6 in. long; flowers in a spike $\frac{1}{2}$ -1 in. long, small, greenish or whitish; lip dilated and 3-toothed at the apex. A tall slender plant with one leaf, growing in moist shady places. Geauga, Trumbull, Portage, Summit, Licking, and Champaign Counties.

Limnorchis Rydb.

Leafy plants with thick fleshy roots and small greenish or whitish flowers in a long spike; lip entire; beak of the stigma without appendages.

1. **Limnorchis hyperborea** (L.) Rydb. Tall Bog-orchis. A stout stem, 8-24 in. high; lanceolate leaves 2-12 in. long; greenish yellow flowers in a narrow spike; lip lanceolate, entire, obtuse. A tall plant with thick fleshy roots, growing in bogs and wet woods. Stark County.

Lysias Salisb.

Plants with scapose stems, tuberous or fleshy roots, and 2 basal leaves; flowers greenish or white; lip entire, linear or nearly so; spur long and slender, generally longer than the elongated straight ovary.

1. Scape with 1 or more bracts; flowers in a loose raceme. **L. orbiculata**
1. Scape bractless; flowers in a strict, rather dense raceme. **L. hookeriana**
1. **Lysias orbiculata** (Pursh.) Rydb. Large Round-leaf Orchis. Stems 12-24 in. high, bracted; leaves orbicular, spreading flat on the ground, 4-7 in. long; flowers in a loosely many-flowered raceme, greenish white; lip $\frac{1}{2}$ in. long. A tall slender plant with a raceme of greenish white flowers on a scape, much surpassing the leaves. Growing in rich woods. Cuyahoga and Geauga Counties.

2. *Lysias hookeriana* (Gr.) Rydb. Hooker's Orchis. Stem 8-16 in. high, not bracted; leaves orbicular, oval, or obovate, fleshy, shiny, spreading or ascending, 4-7 in. long; flowers in a rather loosely many-flowered raceme, yellowish green; lip linear-lanceolate, 3-4 in. long; flowers in a spike 3-6 in. long, greenish; lip 2-3 in. long, 2-3 toothed or lobed at the apex. A sturdier plant than the preceding with a closer raceme and thicker leaves. Medina County.

Blephariglottis Raf.

Plants with tall leafy stems and fleshy or tuberous roots; flowers several or numerous, in an open spike with foliaceous bracts; corolla white, yellow, or purplish; lip variously fringed or 3-parted and cut toothed; spur longer than the lip.

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| 1. Lip not divided or 3-parted, fringed..... | 2 |
| 1. Lip 3-parted, the divisions toothed or fringed..... | 3 |
| 2. Flowers orange or yellow, lip oblong..... | <i>B. ciliaris</i> |
| 2. Flowers white, lip narrowly ovate-lanceolate..... | <i>B. blephariglottis</i> |
| 3. Flowers greenish yellow or white..... | 4 |
| 3. Flowers violet or purplish..... | 5 |
| 4. Flowers greenish yellow; petals entire, fringe of a few threads.. | <i>B. lacera</i> |
| 4. Flowers white; petals minutely cut-toothed, fringe copious..... | <i>B. leucophaea</i> |
| 5. Segments of the lip deeply fringed..... | <i>B. psychodes</i> |
| 5. Segments of the lip cut-toothed..... | <i>B. peramoena</i> |

1. *Blephariglottis ciliaris* (L.) Rydb. Yellow Fringed-orchis. Stem 16-28 in. high, slender, smooth, bracted; leaves lanceolate, acute, 4-8 in. long, the upper smaller; flowers orange or yellow, large, showy, in a close many-flowered spike; lip 5-7 lines long, copiously fringed more than half way to the middle. A tall slender plant with showy yellow-fringed flowers, growing in meadows. Fulton County.
2. *Blephariglottis blephariglottis* (Willd.) Rydb. White Fringed-orchis. Leaves more slender than in the preceding species; flowers pure white, somewhat smaller than those of preceding species, in a densely or rather loosely many-flowered spike; lip narrow, oblong, copiously or sparsely fringed. A tall plant with white fringed flowers, growing in bogs or swamps. Geauga and Portage Counties.
3. *Blephariglottis lacera* (Mx.) Rydb. Ragged Orchis. Stem rather slender, bracted, leafy, 12-24 in. high; leaves firm, lanceolate, $4\frac{1}{2}$ -8 in. long, the upper gradually smaller; flowers greenish yellow in a long loose spike; segments of the lip narrow, deeply fringed, the fringe of a few threads about $\frac{1}{2}$ in. long. A tall slender plant with a ragged looking spike of greenish yellow flowers, growing in swamps and wet woods. Cuyahoga, Portage, Crawford, Wayne, Stark, Licking, and Fairfield Counties.

4. **Blephariglottis leucophaea** (Nutt.) Rydb. Prairie White Fringed-orchis. Stem stout, angled, 20-32 in. high; leaves lanceolate, 4-8 in. long; flowers large, white, fragrant, sometimes tinged with green, in a very thick loosely-flowered spike, 3-4½ in. long; lip 6-7 lines long, the segments broadly wedge-shaped and copiously fringed. A tall plant with white fragrant flowers growing on moist prairies. Auglaize County.
5. **Blephariglottis psycodes** (L.) Rydb. Smaller Purple Fringed-orchis. Stem rather slender, 12-40 in. high; leaves oval, elliptic, or lanceolate, 2-10 in. long; flowers lilac, rarely white, fragrant, in a loosely or densely many-flowered raceme; lip, 3¼-4¼ in. broad, the segments fan-shaped and copiously fringed. A tall showy plant growing in meadows and wet woods. Medina, Erie, Cuyahoga, Ashtabula, Miami, Columbiana, Richland, Auglaize, Franklin, and Hocking Counties.
6. **Blephariglottis peramoena** (Gr.) Rydb. Fringeless Purple Orchis. Stem 12-28 in. high; leaves elliptic or lanceolate, 4-8 in. long, the upper gradually smaller; flowers large, showy, violet-purple, in a densely or rather loosely many-flowered spike; lip 7-9 lines long, the segments fan-shaped, cut-toothed, not fringed, the middle one 2-lobed. A tall showy plant growing in moist meadows. Perry, Gallia, and Clermont Counties.

Pogonia Juss.

Mostly low herbs with slender rhizomes, fibrous roots, alternate leaves, and solitary terminal flowers; lip erect from the base of the column, spurless, crested.

1. **Pogonia ophioglossoides** (L.) Ker. Rose Pogonia. Stem 12-15¼ in. high, 1-3 leaved, not rarely with a long-petioled basal leaf; leaves 1-10 in. long, lanceolate or ovate, erect, bluntly acute; flowers pale rose-color, fragrant, slightly nodding, solitary or occasionally in pairs, subtended by a foliaceous bract; lip 2-3 lines wide, fringed. A striking looking plant with rose-colored flowers, growing in meadows and swamps. Lucas, Cuyahoga, Geauga, Ashland, Portage, Licking and Lorain Counties.

Isotria Raf.

Low herbs, with a rhizome, fibrous roots, terminal flowers, and 5 leaves in a whorl near the top of the plant; lip erect from the base of the column, crested, spurless, sessile.

1. **Isotria verticellata** (Willd.) Raf. Whorled Isotria. Stem 10-12 in. high, from long fleshy roots; leaves 3¼-2¼ in. long, obovate, abruptly pointed at apex, sessile; flower sol-

itary, erect or declined, peduncled; lip 3-lobed, crested along a narrow band, undulate. A tall plant with a conspicuous whorl of leaves near the top, growing in moist woods. Defiance, Cuyahoga, Geauga, Medina, Coshocton, and Fairfield Counties.

Triphora Nutt.

Low herbs with fleshy tubers and axillary flowers; lip erect, slightly clawed, and more or less 3-lobed, not crested, spurless; capsule oval, drooping.

1. **Triphora trianthophora** (Sw.) Rydb. Nodding Triphora. Stem glabrous, 3-12 in. high, from a tuberous root; leaves 2-8, alternate, ovate, 3-9 lines long, clasping; flowers 1-7, axillary, peduncled, pale purple, at first nearly erect, soon drooping; lip clawed, somewhat 3-lobed, crisped above, about as long as the petals. A slender, delicate plant, with nodding flower, growing in rich woods. Huron, Cuyahoga, Summit, Stark, Licking, Franklin and Ross Counties.

Arethusa L.

Low herbs with small bulbs and mostly solitary flowers on slender scapes, the solitary leaf linear, hidden at first in the upper scale, protruding after flowering; lip dilated, recurved and spreading at the apex, crested on the face with straight somewhat fleshy hairs, slightly gibbous at the base.

1. **Arethusa bulbosa** L. Arethusa. Stem, scapose, 4-12 in. high, bearing 1-3 loose sheathing bracts; leaf linear, many-nerved, 4-6 in. long; flower rose-purple, solitary (rarely 2), $\frac{3}{4}$ -2 in. long; lip usually drooping beneath the sepals and petals, the apex broad, rounded, variegated with purple blotches. A low plant with a conspicuous flower, and 1 leaf, growing in bogs. Licking and Portage Counties.

Limodorum L.

Scapose herbs with solid round bulbs which arise from the bulb of the previous year, a leaf appearing the first season succeeded in the following year by the scape; flowers several, in a loose terminal spike or raceme; lip spreading, raised on a narrow stalk, dilated at the apex; bearded on the upper side with long club-shaped hairs.

1. **Limodorum tuberosum** L. Calopogon. Scape slender, naked, 12-33 $\frac{1}{2}$ in. high; leaf linear-lanceolate, 8-12 in. long, 3-12 lines wide, sheathing, with several scales below it; spike 4-16 in. long, 3-15 flowered; lip as long as the column, broadly triangular at the apex. A tall plant with showy, purplish-pink flowers, and one grass-like leaf, growing in bogs and meadows. Fulton, Lucas, Erie, Geauga, Portage, Summit, Ashland, Stark, Clarke, Fairfield and Licking Counties.

Gyrostachys Pers.

Erect herbs with fleshy fibrous or tuberous roots and slender stems or scapes, leafy below or at the base; flowers small, spurless, spiked, 1-3 rowed, the spikes more or less twisted; the lip sessile or clawed, concave, erect, embracing the column and often adhering to it, bearing minute callosities at the base.

1. Flowers apparently in several ranks, stems not twisted, or but slightly so 2
1. Flowers merely alternate, often secund from the spiral twisting of the stem..... 4
2. Sepals and petals more or less connivent into a hood, leaves linear or linear-lanceolate..... *G. stricta*
2. Lateral sepals separate, free..... 3
3. Spike short, about 2 in. or less; leaves rather broad, oblong-lanceolate; callosities none, or mere thickenings of the basal margins of the lip *G. plantaginea*
3. Spike long, 3-6 in.; leaves linear to linear-oblong; callosities of the lip nipple-shaped..... *G. cernua*
4. Stem leafy lower leaves elongated, outer sepals lanceolate.. *G. praecox*
4. Stem with scaly bracts, leaves if present basal..... 5
5. Root a single tuber; spike about 1-1½ in. long..... *G. simplex*
5. Root usually a cluster of tubers; spike 1-3 in. long..... *G. gracilis*

1. **Gyrostachys stricta** Rydb. Hooded Lady's-tresses. Stem 6-14 in. high, leafy below, bracted above; leaves 2¾-8 in. long, linear; flowers in a spike 2-4 in. long, spreading horizontally; lip oblong, crisped at apex, thin and transparent. A bare looking plant, with a loose spike of fragrant flowers, growing in bogs. Ashtabula County.
2. **Gyrostachys plantaginea** (Raf.) Britt. Wide-leaf Lady's-tresses. Stem 4-10 in. high, glabrous or pubescent, bearing 4 or 5 lanceolate or oblanceolate leaves below; leaves 1-5 in. long; flowers in a thick, dense spike, 1-2 in. long, 4-6 lines thick; flowers spreading, white; lip, pale yellow on the face, oblong, the wavy apex rounded, crispate or fringed, the base short-clawed. A small plant with basal leaves, growing on moist banks and in woods, Medina and Portage Counties.
3. **Gyrostachys cernua** (L.) Ktz. Nodding Lady's-tresses. Stem 8-24 in. high (rarely higher), usually pubescent above, bearing 2-6 bract-like stem leaves; basal leaves from linear-oblong to linear, 2¾-12¼ in. long, the blade narrow; flowers in a thick spike, 4-4½ in. long, 5-6 lines thick; flowers white, nodding or spreading, about 5 lines long; lip oblong or ovate, the apex rounded and crisped. A tall showy plant with nodding, fragrant flowers, growing in meadows and swamps. Erie, Lorain, Cuyahoga, Medina, Portage, Stark, Lake, Licking, Fulton, Clermont and Gallia Counties.
4. **Gyrostachys praecox** (Walt.) Ktz. Grass-leaf Lady's-tresses. Stem, 10-24 in. high, leafy; leaves linear, 4-12 in. long, with narrow grass-like blades and long sheathing petioles, per-

sistent through flowering season, the upper smaller; flowers in a twisted spike 2-8 in. long, 4-10 lines thick; lip about 3 lines long, crenulate, short-clawed, dark-striped in the middle. A tall showy plant growing in grassy places. Wayne County.

5. **Gyrostachys simplex** (Gr.) Ktz. Little Lady's-tresses. Stem very slender 5-8 in. high, rising from a solitary spindle-shaped tuber, with small deciduous bracts above; leaves basal, oblong, petiolate, mostly disappearing at or before flowering time; flowers white, in a slender spike, slightly twisted, 9-14 lines long; lip thin, short clawed, crisped at summit. A bare, delicate plant, growing in sandy soil. Fairfield County.
6. **Gyrostachys gracilis** (Bigel) Ktz. Slender Lady's-tresses. Stem 8-24 in. high, slender, rising from a cluster of spindle-shaped, tuberous roots, bearing small deciduous bracts; leaves basal, obovate, or ovate-lanceolate, disappearing mostly before the flowering season; flowers white, in a spike 1-5 in. long, much twisted; lip 2 lines long, wavy, thick and green in the middle. A tall bare plant in dry fields and open woods. Erie, Cuyahoga, Lake, Licking, Muskingum, Fairfield, Adams, Gallia, and Morgan Counties.

Peramium Salisb.

Herbs with bracted, erect scapes; thick, fleshy, fibrous roots, and basal tufted leaves often blotched with white; flowers in bracted spikes; lip sessile, entire, roundish ovate, concave or saccate, without callosities, its apex reflexed.

1. **Peramium pubescens** (Willd.) MacM. Downy Rattlesnake Plantain. Stem densely glandular-pubescent, bearing 5-10 lanceolate scales, 6-24 in. high; leaves basal, $\frac{3}{4}$ -1 in. long, strongly white-reticulated, oval or ovate; flowers in a dense spike, not 1-sided; lip strongly saccate with a short broad recurved or spreading tip. A sturdy plant with conspicuous flowers and showy leaves, growing in dry woods. Adams, Hocking, Lake, Portage, Fairfield and Highland Counties.

Achroanthes Raf.

Low herbs from a solid bulb, our species with 1 leaf and with 1-several scales at the base of the stem; flowers small, white or green, in a terminal raceme; lip cordate or eared at the base, embracing the column.

1. Pedicels nearly equal to the ovaries in length; lip terminating in a long point. (Doubtful for the state).....**A. monophylla**
1. Pedicels much longer than the ovaries, lip truncate, 3-lobed at the summit**A. unifolia**
1. **Achroanthes unifolia** (Mx.) Raf. Green Adder's-mouth. Stem 4-10 in. high, striate; leaf clasping the stem near the middle, oval or nearly orbicular; raceme $\frac{3}{4}$ -3 in. long of

spreading flowers with slender pedicels; lip broad, 2-lobed at the apex, with a small tooth in the sinus. A slender plant with raceme of delicate flowers growing in woods and thickets. Fairfield County.

Leptorchis Thouars.

Low herbs with solid bulbs, the base of the stem sheathed by several scales and 2 broad, shining leaves, flowers in a terminal raceme; lip nearly flat, often bearing 2 tubercles above the base.

1. Lip brownish-purple, $\frac{3}{8}$ - $\frac{1}{2}$ in. long; raceme loose-flowered, 1-2 in. wide **L. liliifolia**
 1. Lip yellowish-green, $\frac{1}{8}$ - $\frac{3}{4}$ in. long; raceme compact, about $\frac{1}{2}$ in. wide **L. loeselii**

1. **Leptorchis liliifolia** (L.) Ktz. Large Twayblade. Stem a scape, striate, 4-10 in. high; leaves 2-4 $\frac{3}{4}$ in. long, oval or ovate, keeled below; numerous showy flowers, in a raceme sometimes 6 in. long; lip conspicuous, erect, 5-6 lines long, wedge-obovate. A delicate showy plant, growing in moist woods and thickets. Portage, Franklin, Fairfield and Clarke Counties.
2. **Leptorchis loeselii** (L.) MacM. Fen Twayblade. Scape 2-8 in. high, strongly ribbed; leaves elliptic or elliptic-lanceolate, 2-6 in. long; flowers few, greenish, smaller than the preceding, in a raceme; lip obovate, pointed, its tip incurved. A tall plant, with greenish inconspicuous flowers, in wet thickets and on springy banks. Champaign, Cuyahoga, Summit, and Stark Counties.

Tipularia Nutt.

Slender scapose herbs with solid bulbs, several generations connected by offsets; the flowers in a long, loose, terminal raceme; leaf solitary, basal, unfolding long after the flowering season, usually after the scape has perished; scape with several thin sheathing scales at the base; flowers green, nodding, bractless; lip 3-lobed with a long slender spur.

1. **Tipularia unifolia** (Muhl.) B. S. P. Crane-fly Orchis. Scape glabrous 16-20 in. high, from a hard, often irregular corm; leaf arising in Autumn from a fresh lateral corm, ovate, 2-2 $\frac{3}{4}$ in. long, dark green; raceme 5-9 in. long, very loose, flowers green tinged with purple; lip mostly shorter than the petals, the middle lobes narrow, prolonged, dilated at the apex, the lateral lobes short, triangular; spur often twice as long as the flower. A tall slender plant with a loose raceme of nodding flowers, growing in woods. Lorain, and Cuyahoga Counties (Oberlin College.)

Aplectrum Nutt.

Scapose herbs from a corm, produced from the one of the previous season by an offset and sometimes with coralloid fibres, the scape clothed with several sheathing scales; leaf solitary,

basal, broad petioled, developed in autumn or late summer; flowers in a terminal raceme, the pedicels subtended by small bracts; lip clawed, somewhat 3-ridged, spur none.

1. **Aplectrum spicatum** (Walt.) B. S. P. Putty-root. Scape glabrous, 12-24 in. high, bearing about 3 sheathing scales; leaf arising from the corm, at the side of the scape, 4-6½ in. long, 1-2½ in. wide, usually lasting over winter; raceme 2-4 in. long, loosely several-flowered; lip shorter than the petals, obtuse, somewhat 3-lobed and undulate. A tall plant with yellowish brown or green flowers, with 1 broad leaf that usually lasts over winter, growing in woods and swamps. Hamilton, Green, Montgomery, Preble, Stark, Adams, Warren, Portage, Auglaize, Sandusky, Franklin, Lake, Clermont, Gallia, Erie and Clarke Counties.

Corallorhiza R. Br.

Scapose herbs, with mycorrhiza or root parasites, with large masses of coralloid branching roots, the leaves all reduced to sheathing scales; flowers in terminal racemes; lip 1-3 ridged; sepals nearly equal, the lateral ones united at the base with the foot of the column forming a short spur or gibbous protuberance adnate to the summit of the ovulary.

1. Lip deeply 3-lobed, white, spotted with red. **C. multiflora**
1. Lip 2-toothed or 2-lobed above the base, white, not spotted. (No locality known) **C. corallorhiza**
1. Lip entire or merely denticulate. 2
2. Flowers about ¼ in. long, lip whitish. **C. odontorhiza**
2. Flowers about ½ in. long, lip white, spotted with red. . . **C. wisteriana**
1. **Corallorhiza odontorhiza** (Willd.) Nutt. Small-flowered Coral-root. A purplish slender scape 6-14 in. high, bearing 3-5 sheathing scales; raceme 2-4 in. long, of 6-20 purplish flowers; lip, broadly oval or obovate, entire or denticulate, narrowed at the base, not notched. A bare looking plant growing under trees. Erie, Cuyahoga, Stark and Madison Counties.
2. **Corallorhiza wisteriana** Conrad. Wister's Coral-root. Stem 8-16 in. high, bearing several sheathing scales; raceme 2-4 in. long, loose, 6-15 flowered; lip broadly oval or obovate, 4-5 lines long and wide, abruptly clawed, white with crimson spots, crenulate, notched at the apex, spur a somewhat conspicuous protuberance adnate to the top of the ovulary. A tall stout plant with scaly stem growing in shady woods. Hamilton County (New York Botanical Gardens).
3. **Corallorhiza multiflora** Nutt. Large Coral-root. Stem 8-20 in. high, bearing several appressed scales, purplish; a raceme of brownish purple flowers with short pedicels; lip oval or ovate, deeply 3-lobed, the middle lobe broader than the lateral ones, its apex curved. A tall bare looking plant growing in woods. Erie, Huron, Fairfield and Franklin Counties.