

- 9a. Plant wiry, stems less than 1.5 mm wide and not (or barely) winged; calcareous shores—*Sisyrinchium mucronatum*
- 9b. Plant more stout, stems 1.5–3 mm wide and winged; moist fields and clearings, mostly NM—*Sisyrinchium montanum*

## ORCHIDACEAE, The Orchid Family

Perennial herbs. Flowers irregular, perfect; sepals 3, two may be fused; petals 3, the two lateral petals similar to each other and often resembling the sepals, while the third petal, known as the *lip*, is normally the lowest petal and differs from the others in size, shape, and sometimes color (including being variously inflated or prolonged into a spur); stamen(s) 1(2), adherent to the style, forming the *column*; pistil 1, style 1, ovary inferior, 1-celled. Fruit a capsule which opens by vertical slits.

The more common species are included here. See Case (1987) for a comprehensive treatment of Michigan orchids.

Some of Michigan's native plants are protected by Public Act 182 of 1962, commonly called the "Christmas-tree law". Under this law, it is illegal to remove or cut orchids from any area without a bill of sale or written permission from the owner. A number of Michigan orchids are also rare, threatened, or endangered species and therefore should be collected only under special circumstances.

- 1a. Lip conspicuously sac-like, inflated—2
- 1b. Lip neither sac-like nor inflated, often flattened—12
- 2a. Flowers one to three, lip slipper-shaped—3
- 2b. Flowers three to many, lip basally sac-like, not slipper-shaped—8
- 3a. Plant with a single, basal leaf; woods, NM (scape 10–20 cm high; late spring)—*Calypso*, *Calypso bulbosa*
- 3b. Plant either with a leafy stem or with 2 basal leaves (late spring and early summer) (*Cypripedium* spp., **Lady's-slipper**)—4
- 4a. Plant with two basal leaves; lip pink, rarely white (scape 20–40 cm high, spring)—**Pink** or **Stemless Lady's-slipper**, *Cypripedium acaule*
- 4b. Plant with leafy stem; lip yellow to white—5
- 5a. Lip yellow (20–80 cm high; spring to early summer)—**Yellow Lady's-slipper**, *Cypripedium calceolus*
- 5b. Lip white, with or without crimson or purple markings—6

- 6a. Outside of the lip entirely white; bogs and meadows, SLP (15–40 cm high; late spring)—**White Lady's-slipper**, *Cypripedium candidum*
- 6b. Outside of the lip white, with crimson or purple markings—7
- 7a. Lip 2.5 cm long or less; the two lower sepals separate, greenish-brown; wooded dunes, NM (10–40 cm high; late spring)—**Ram's-head Lady's-slipper**, *Cypripedium arietinum*
- 7b. Lip 3 cm long or more; the two lower sepals united, white; bogs and swamps (40–100 cm high; summer)—**Showy Lady's-slipper**, *Cypripedium reginae*
- 8a. Leaves alternate on the stem; flowers greenish to purple; woods (to 80 cm high; summer)—**Helleborine**, *Epipactis helleborine*
- 8b. Leaves all basal (or nearly so), prominently net-veined, and frequently blotched with white; flowers whitish; woods, esp. coniferous (summer) (*Goodyera* spp., **Rattlesnake-plantain**)—9
- 9a. Perianth 6–10 mm long; lip with elongated point; leaves with a white or pale green midvein; NM (scape 20–40 cm high)—*Goodyera oblongifolia*
- 9b. Perianth 6 mm long or less; lip sac-like; other leaf veins white or pale green—10
- 10a. Inflorescence a densely flowered raceme, the flowers appearing at all angles around the stem (scape 20–40 cm high)—*Goodyera pubescens*
- 10b. Inflorescence either one-sided or loosely flowered—11
- 11a. Inflorescence a strongly one-sided raceme; mostly NM (scape 10–20 cm high)—*Goodyera repens*
- 11b. Inflorescence a loosely flowered, spiraled raceme (scape 15–35 cm high)—*Goodyera tessellata*
- 12a. Plants appear to lack chlorophyll, with most vegetative parts brown, purple, or yellow; leaves scale-like—13
- 12b. Plants with chlorophyll, vegetative parts green—17
- 13a. Surface of lip with 3 parallel ridges, margin of lip toothed and rolled upward; woods, mostly LP (scape 30–60 cm high, late spring)—**Putty-root**, *Aplectrum hyemale*
- 13b. Surface of lip with one or two parallel ridges, margin of lip entire, barely toothed, or lobed, not rolled upward (*Corallorhiza* spp., **Coral-root**)—14
- 14a. Lip with two lateral lobes or teeth—15
- 14b. Lip entire, or barely toothed—16

All orchids have specialized associations with fungi called *mycorrhizae*. Usually, mycorrhizal fungi are associated with the roots in a mutualistic relationship in which the photosynthetic orchid supplies carbohydrate. The coral-root orchids, *Corallorhiza* spp., contain no chlorophyll and have lost their photosynthetic capability. According to Zelman and Currah (1995) *Corallorhiza trifida* derives its nutrition from the digestion of fungal hyphae contained in its yellowish coralloid rhizomes. The fungus was also part of an ectomycorrhizal association with *Pinus contorta*. Ectomycorrhizal fungi are known to assist trees and shrubs in uptake of phosphorus, receiving photosynthate in return. In this case, the orchid evidently derives carbohydrate nutrition from the tree via the fungus which is associated with both plants.

- 15a. Stems yellowish or greenish; sepals and petals one-nerved (petals may be weakly three-nerved); lip usually less than 4.5 mm long, white, spotted or not; woods and swamps (10–30 cm high; spring and early summer)—**Early Coral-root**, *Corallorhiza trifida*
- 15b. Stems purplish or yellowish; sepals and petals three-nerved; lip over 4.5 mm long, white, usually purple-spotted; woods (20–60 cm high; summer)—**Spotted Coral-root**, *Corallorhiza maculata*
- 16a. Flower, exclusive of ovary, to 4 mm long; sepals and petals not purple-striped; dry woods, SLP (10–20 cm high; late summer)—**Fall Coral-root**, *Corallorhiza odontorhiza*
- 16b. Flower over 8 mm long; sepals and petals purple-striped; woods and swamps, NM (20–45 cm high; spring and early summer)—**Striped Coral-root**, *Corallorhiza striata*
- 17a. Flowers in a spike-like obviously twisted raceme; small, yellowish or greenish-white (10–40 cm high; late summer and autumn) (*Spiranthes* spp., **Ladies'-tresses**)—18

Nine species of *Spiranthes* occur in Michigan. Identification of the species is difficult and often relies on careful inspection of the tiny lip; see Case and Catling (1982) for a technical key, Case (1987) for a simpler one. Habitat provides a good clue in identification; species known to inhabit dry areas are rarely found in wet areas and vice versa. The three most widely distributed species are included here.

- 17b. Flowers solitary or in clusters, but never in a twisted raceme—20
- 18a. Plants in dry sandy areas or fields; flowers often in one row;—**Slender Ladies'-tresses**, *Spiranthes lacera*
- 18b. Plants in moist or wet areas; flowers in two or three rows—19
- 19a. Lip constricted near the apex—**Hooded Ladies'-tresses**, *Spiranthes romanzoffiana*
- 19b. Lip oblong, not constricted—**Nodding Ladies'-tresses**, *Spiranthes cernua*

- 20a. Base of the lip prolonged into a spur, 2–50 mm long—21  
 20b. Lip not prolonged into a spur—36
- 21a. Leaves one to three, all basal—22  
 21b. Leaves all on the stem (*Habenaria* spp., **Rein Orchid**, in part)—27
- 22a. Flowers purple or magenta, or with white markings (*Orchis* spp.)—23  
 22b. Flowers greenish, yellowish, or white (*Habenaria* spp. in part)—24

The names used here follow Voss (1972) and reflect a conservative approach both to species and to generic limits. Case (1987) used nomenclature which reflects the views of many orchid specialists, in which *Habenaria* and *Orchis* are split into smaller genera. Since many recent orchid texts use these newer names, we have included them in brackets.

- 23a. Plant with one leaf; bogs, NM (scape 10–20 cm high; early summer)—**Round-leaved Orchid**, *Orchis rotundifolia* [*Amerorchis rotundifolia*—Case]
- 23b. Plant with two leaves; woods, SLP and western UP (scape 10–25 cm high; late spring)—**Showy Orchid**, *Orchis spectabilis* [*Galearis spectabilis*—Case]
- 24a. Plant with a single leaf, at least twice as long as broad—25  
 24b. Plant with two often orbicular leaves, less than twice as long as broad—26
- 25a. Lip apex rounded, not toothed; coniferous woods and bogs, NM (scape 10–30 cm high)—**Blunt-leaf Orchid**, *Habenaria obtusata* [*Platanthera obtusata*—Case]
- 25b. Lip with three lobes or teeth at apex; moist woods, ditches (10–40 cm high)—**Club-spur Orchid**, *Habenaria clavellata* [*Platanthera clavellata*—Case]
- 26a. Flower stalk without bracts below the raceme; flowers yellowish-green; woods (scape 20–40 cm high)—**Hooker's Orchid**, *Habenaria hookeri* [*Platanthera hookeri*—Case]
- 26b. Flower stalk bearing bracts below the raceme; flowers greenish-white; woods (scape 30–60 cm high)—**Round-leaved Orchid**, *Habenaria orbiculata* [*Platanthera orbiculata*—Case]
- 27a. Lip fringed (edge deeply cut many times); wet areas, esp. bogs and marshes—28  
 27b. Lip not fringed—32
- 28a. Lip fringed and clearly three-lobed—29

- 28b. Lip fringed but not three-lobed (40–100 cm high; summer)—31
- 29a. Flowers purple (30–150 cm high)—**Purple Fringed Orchid**, *Habenaria psycodes* [*Platanthera psycodes*—Case]
- 29b. Flowers white, yellowish, or greenish—30
- 30a. Spur 2 cm long or more; sepals over 6 mm long; mostly SLP (40–100 cm high; summer)—**Prairie Fringed Orchid**, *Habenaria leucophaea* [*Platanthera leucophaea*—Case]
- 30b. Spur 2 cm long or less; sepals less than 6 mm long (30–80 cm high; summer)—**Ragged Fringed Orchid**, *Habenaria lacera* [*Platanthera lacera*—Case]
- 31a. Flowers orange; SLP—**Orange Fringed Orchid**, *Habenaria ciliaris* [*Platanthera ciliaris*—Case]
- 31b. Flowers white; bogs, LP—**White Fringed Orchid**, *Habenaria blephariglottis* [*Platanthera blephariglottis*—Case]
- 32a. Lip with two to three evident teeth at apex—33
- 32b. Lip without apical teeth—34
- 33a. Stem leaves three or more; rich woods (20–50 cm high; spring and summer)—**Bracted Orchid**, *Habenaria viridis* [*Coeloglossum viride*—Case]
- 33b. Stem leaves one or two; moist woods, ditches (10–40 cm high; summer)—**Club-spur Orchid**, *Habenaria clavellata* [*Platanthera clavellata*—Case]
- 34a. Lip oblong, truncate at the apex; wet woods, LP (30–70 cm high; summer)—**Tuberclad Orchid**, *Habenaria flava* [*Platanthera flava*—Case]
- 34b. Lip lanceolate, tapering toward the apex; moist areas—35
- 35a. Flowers white (to 100 cm high)—**Tall White Bog Orchid**, *Habenaria dilatata* [*Platanthera dilatata*—Case]
- 35b. Flowers greenish-yellow (30–100 cm high; summer)—**Tall Northern Bog Orchid**, *Habenaria hyperborea* [*Platanthera hyperborea*—Case]
- 36a. Flowering plant leafless, with leaves reduced to tubular sheaths, or with one linear to ovate leaf—37
- 36b. Flowering plant with two or more oblong to ovate leaves—43
- 37a. Flowers one to two, pink to purple—38
- 37b. Flowers more than two, yellowish or greenish-white—40

- 38a. Leaf lanceolate to elliptic; lip fringed and bearded with yellow hairs; bogs (10–40 cm high; late spring and early summer)—**Rose Pogonia**, *Pogonia ophioglossoides*
- 38b. Leaf linear or linear-lanceolate or absent; lip not fringed, bearded or not—39
- 39a. Lip is the uppermost petal, bearded with yellow hairs; bogs and swamps (30–70 cm high; summer)—**Grass-pink**, *Calopogon pulchellus* [*C. tuberosus*—CQ]
- 39b. Lip is the lowermost petal, not bearded; bogs and swamps (10–30 cm high; late spring)—**Arethusa**, *Arethusa bulbosa*
- 40a. One ovate or elliptic leaf attached to the stem beneath the flowers; flowers (including lips) greenish-white (scape 10–30 cm high; summer) (**Malaxis** spp., **Adder's-mouth**)—41
- 40b. One elliptic leaf, if present, adjacent to flower scape; scape leaves reduced to tubular sheaths; flowers yellowish, the lips white—42
- 41a. Lip apex narrowly pointed; mature pedicels less than 3 mm long—**White Adder's-mouth**, *Malaxis monophylla* [*M. monophyllos*—CQ]
- 41b. Lip apex is two- to three-toothed; mature pedicels more than 3.5 mm long—**Green Adder's-mouth**, *Malaxis unifolia*
- 42a. Basal elliptic leaf present (or not); flowers apically purple-tinged; surface of lip with 3 parallel ridges, margin of lip toothed and rolled upward; woods, mostly LP (scape 30–60 cm high, late spring)—**Putty-root**, *Aplectrum hymemale*
- 42b. Basal leaf absent; surface of lip with one or two parallel ridges, margin of lip has two lobes, not rolled upward; woods and swamps (10–30 cm high; spring and early summer)—**Early Coral-root**, *Corallorhiza trifida*
- 43a. Leaves a whorl of five; bogs, LP (20–40 cm high; late summer)—**Whorled Pogonia**, *Isotria verticillata*
- 43b. Leaves two, opposite (10–30 cm high; summer)—44
- 44a. Leaves opposite and sessile near the middle of the stem (**Listera** spp., **Twayblade**)—45
- 44b. Leaves basal (**Liparis** spp., **Twayblade**)—46
- 45a. Lip deeply two-cleft; flowers greenish to purplish; bogs and swamps, NM—**Heartleaf Twayblade**, *Listera cordata*
- 45b. Lip wedge-shaped, with two round shallow lobes; flowers greenish-yellow; wet woods, NM—**Broad-leaved Twayblade**, *Listera convallarioides*