

Orchids

of Lakeland 

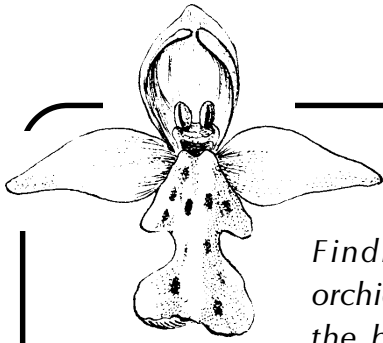
a field guide to
Lakeland Provincial Park,
Provincial Recreation Area
and surrounding region



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Alberta
ENVIRONMENTAL PROTECTION



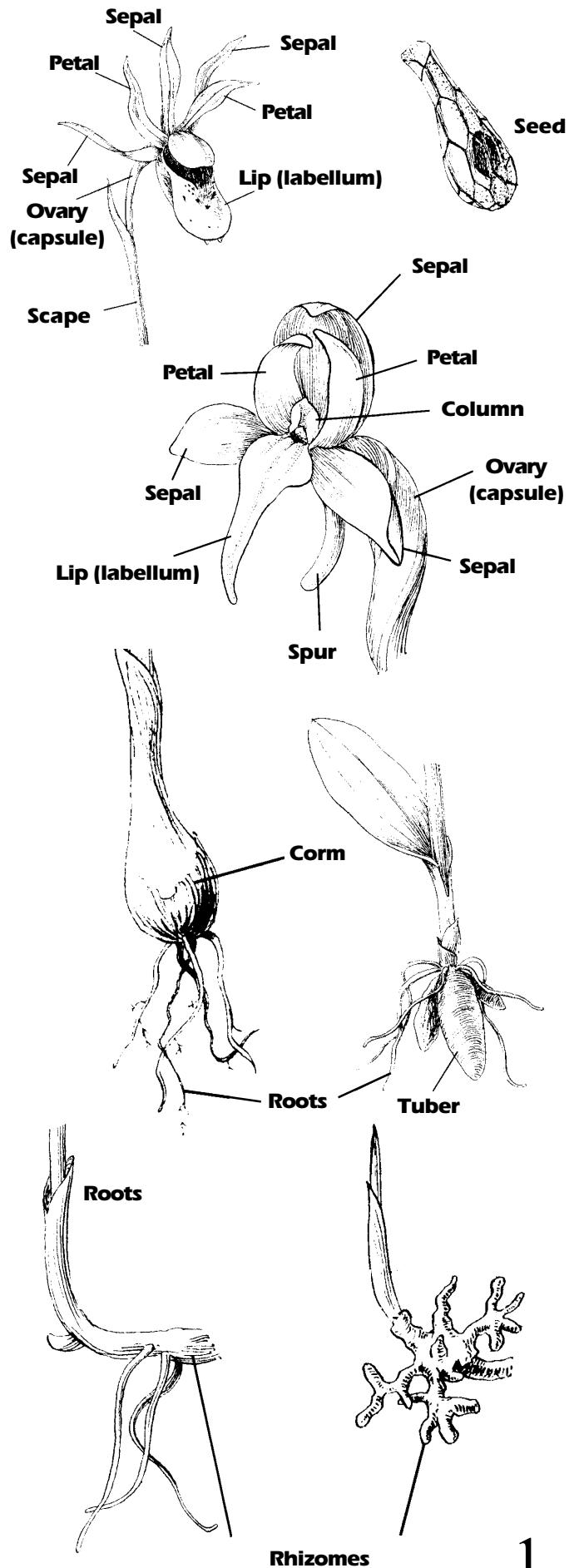
Finding an elusive orchid nestled away in the boreal forest is a thrilling experience for amateur and experienced naturalists alike. This type of recreation has become a passion for some and, for many others, a wonderful way to explore nature and learn more about the living world around us.

But, we also need to be careful when looking at these delicate plants. Be mindful of their fragile nature... keep only memories and take only photographs so that others, too, can enjoy.

Orchids in Alberta

Many people are surprised to learn that orchids grow naturally in Alberta. Orchids are typically associated with tropical rain forests (where indeed, many do grow) or flower-shop purchases for special occasions, exotic, expensive and highly ornamental. Wild orchids in fact are found world-wide (except in Antarctica). They constitute the second largest family of flowering plants (the Orchidaceae) after the Aster family, with upwards of 15,000 species. In Alberta, there are 26 native species. Like all orchids from north temperate regions, these are terrestrial. They grow in the ground, in contrast to the majority of rain forest species which are epiphytes, that is, they grow attached to trees for support but do not derive nourishment from them.

Only a small proportion of Alberta's orchids are showy and only about a third are rare according to the special criteria that botanists use to define rarity. On the other hand, even the commoner ones are often not all that easy to find, and all of them share the mystique that attaches to the orchid family as a whole, a winning combination of beauty and rarity. It is always a thrill to come across them!



What Makes Orchids Different?

Flower Structure

[Orchids belong to the large group of flowering plants called monocotyledons (the other group is dicotyledons) which includes lilies, irises, grasses and sedges and our familiar cultivated daffodils and tulips. Monocotyledons produce seedlings with a single seed leaf (cotyledon), and have flower parts in threes and usually long narrow leaves in which the veins run parallel.]

Orchid flowers are borne vertically on the stem (compare the horizontal, bowl-shaped flower of a buttercup, for example) and the two sides of the flower are identical if the flower is cut vertically down the middle. Its vertical position and lateral symmetry, as well as its shape, structure and color and sometimes scent, make the flower attractive to insects, which are the main agents of pollination in orchids. Many kinds of orchids reward their visitors by providing them with nectar in the flower. Special markings and hairs may guide the movement of the insect when it is at the flower so that it picks up pollen on its body and/or touches against the stigma to bring about pollination. [The pollinating insects may not be the same for any given species but may vary according to the orchid's geographic location.] Cross pollination (or no pollination if cross pollination fails) is likely the norm but some orchids are also able to pollinate themselves with their own pollen (self pollination). A good orchid book, such as *The Native Orchids of the United States and Canada Excluding Florida* by Carlyle Luer, provides fascinating details of orchid flower structure and pollinating mechanisms.

Orchid flowers are built on the same plan as lilies, with flower parts in two rings or whorls of three, the **sepals** outermost and the **petals** inside of them. In many flowering plants the sepals are distinct from the petals, green and forming a cup round them, but in orchids the sepals are usually colored and function as petals. There is an upright (dorsal) sepal and two lateral, usually spreading, sepals. There are two lateral petals, which may stand erect or bend backwards or spread out, and a specially modified lower petal or **lip** (also referred to in many flower guides as a labellum). This is an expanded tongue-like structure that serves as a landing platform for insects. The lip may be extended behind or below as a narrow tubular **spur** in which nectar is stored. In Calypso and the Lady's-slipper orchids, the lip is modified to form a slipper-like pouch. The orchids are unique among flowering plants in the structure of their male and female flower parts. Most plants have stamens separate from the

stigma and style, but in orchids these are united on a single central column. There is usually either a single **stamen** (with a pollen-bearing **anther**) or two stamens above and a broad receptive, often sticky, **stigma** lying in a hollow on the column below. The column may sometimes be large and colored and mistaken for a petal. Another characteristic feature of orchids is that the pollen grains are not loose like dust but adhere together to form waxy balls or large granules known as **pollinia**. These attach to insects' bodies and are carried off to other flowers by them. Pollinia are also an efficient means of delivering in a single packet the very large amounts of pollen needed to pollinate hundreds of ovules inside the ovary. At the base of the flower is the pod-like green **ovary**, which, like the flower stalk, may have spirally twisted ridges or veins. This is because while still in the bud the flower rotates through 180°, bringing the lip from the top of the flower to the bottom. If pollination and fertilization of the ovules takes place, the ovary develops into a fruit, a cylindrical three-chambered **capsule**. Most orchid capsules are held erect on the flower stalk, and are ellipsoid in shape. The mature capsule splits lengthwise to release the very numerous, tiny (less than 1 mm long), spindle-shaped seeds.

Mycorrhizae

Apart from their flowers, a very distinctive feature of the terrestrial orchids is the special relationship they have with fungi in the ground. Many higher plants have fungi associated with their roots or mycorrhizae (*mycor* = fungus, *rhizae* = roots), which help them to thrive by absorbing nutrients such as phosphorus and nitrogen from the soil. Terrestrial orchids, however, are absolutely dependent upon their fungal partners both for germination and growth of their seeds and for healthy growth of the mature plant. Fungal filaments or hyphae invade the cells of the tiny embryo as the seed lies in the ground and coil and branch inside them to form dense balls which are digested for food by the developing plant. The relationship persists in the grown plant where the fungi are confined to roots, rhizomes or tubers underground. The relationship is a precarious one, however, and doesn't always work. The embryo can be killed by the fungus and itself eaten. Also, many orchids grow slowly, taking years to build up enough bulk to flower and produce seed. This dependence on mycorrhizal fungi makes terrestrial orchids difficult to grow in cultivation. Seeds can only be germinated using special techniques, if at all. Transplantation of the wild plant to gardens usually fails because soil conditions are unsuitable (the right fungi must be present and the soil rich in organic matter). Wild orchids only thrive under natural conditions, but even here they are vulnerable to extermination, as more and more of their habitats are destroyed by urbanization, agriculture or resource extraction. **Orchids should never be collected from**

the wild for decoration or transplantation. As one orchid biologist put it, unless an orchid is actually in the path of a bulldozer it should be left alone!

With a little knowledge of orchid biology one begins to see each individual orchid plant as a miracle that has beaten the odds! Of course, all Alberta orchids are perennials which means that once they have survived to maturity they can put up shoots year after year. They over-winter by means of roots, rhizomes, corms and tubers in the soil, from which new growth begins the next season. Although Lady's-slippers and Coralroots can form patches or colonies of shoots from their underground rhizomes, only the Rattlesnake Plantains reproduce vegetatively to any extent, from roots and shoots which sprout along the creeping rhizomes and may eventually become detached as separate plants.



Lakeland Orchids*

Many of the potential orchid habitats in Lakeland Provincial Park and PRA remain to be explored. This presents opportunities for visitors and naturalists to discover new locations for orchids, and to document them. Park staff are interested in hearing of new finds. A good photograph of the orchid and a careful description of its location will help to verify your finding and provide a valid scientific record.

Notes to Readers: The botanical name of a plant species consists of two names in Latin, first the genus name and then the species name, the two together making a unique combination that applies only to that species. The name of one or more people always follows the Latin name indicating the authors who first published a description of the species under that name.

More than one botanical name may have been applied to a plant. Older names (synonyms) are given in brackets.

Much information on flower structure is given in the descriptions of orchids below that will be difficult to see under field conditions, but look for the key distinguishing characteristics printed in bold as well as the illustrations to help in identifying the orchid and distinguishing it from similar species if these exist. Using a 10X magnifying glass or field lens will enable you to see a lot more detail. The information on underground parts is given for interest only: **it is not necessary to disturb the roots of any orchids in order to identify them!**

* Lakeland refers to Lakeland Provincial Park and Provincial Recreation Area near Lac La Biche, Alberta

Small Round-leaved Orchid; Mauve-spotted Orchid

Amerorchis rotundifolia (Banks) Hultén
(*Orchis rotundifolia* Banks ex Pursh)

This is the only Alberta orchid that has **white or mauve flowers with the lip heavily spotted with purple**. The flower stem, which is more properly called a scape because it bears no leaves along its length, grows 10-25 cm high from fibrous roots and a slender rhizome. At its base is a **solitary rounded leaf**, 3-10 cm long. At the top it carries a **raceme (stalked spike) of 2-several showy flowers**, each about 1 cm long. Each flower sits on a short stalk in the angle of a pointed floral bract. The dorsal sepal is erect and with the two lateral petals, which also stand erect, forms a sort of hood over the column. The lateral sepals spread to the side. The lip is large (6-9 mm long), tongue-like and 3-lobed. It continues downward (parallel to the ovary) as a narrow curved spur, about 5 mm long.

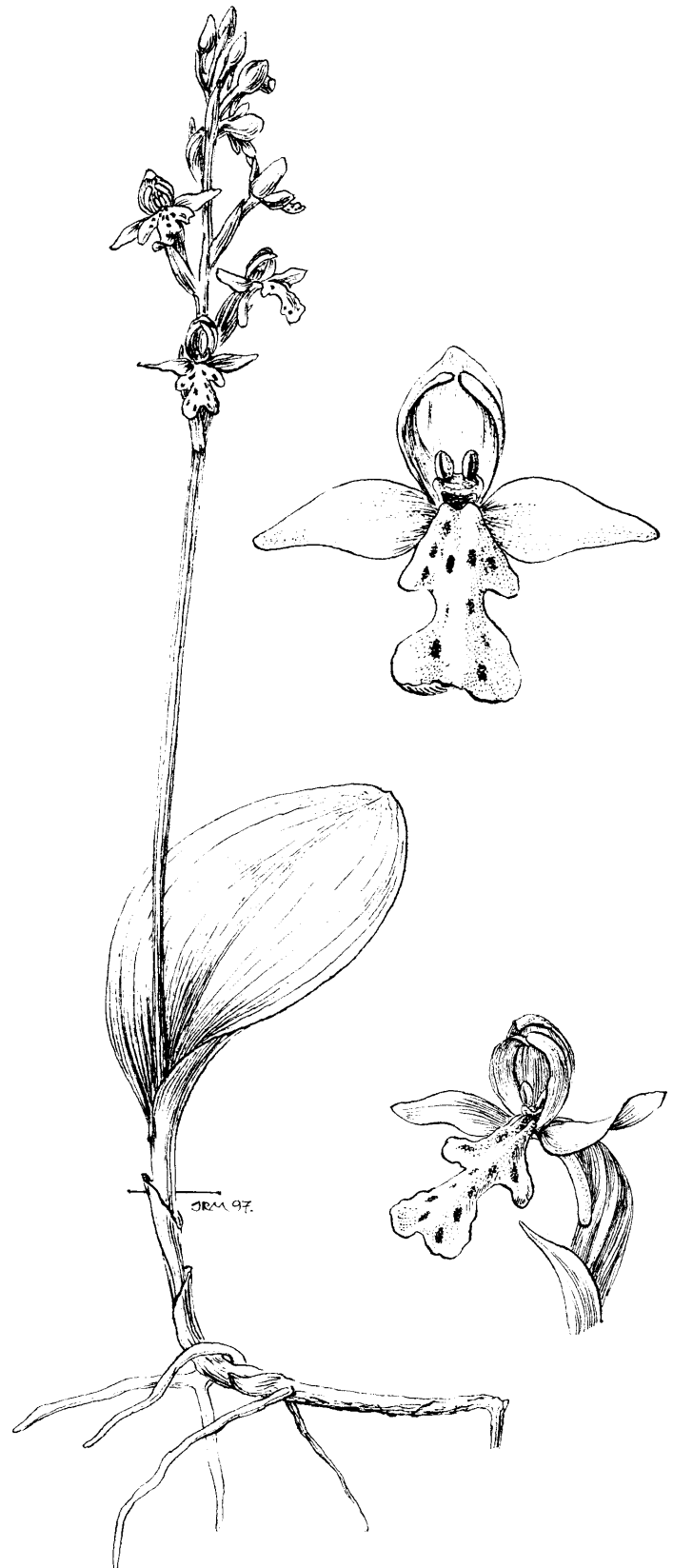
Flowering: Mid-June to early July in Lakeland.

Habitat: Wet, peaty soils whose ground water is calcareous (rich in calcium) under black spruce–tamarack or wet black spruce forests.

Distribution in Alberta: This plant occurs in appropriate habitats in the Cypress Hills, the Rocky Mountains from Waterton to Jasper, in central Alberta, and across the boreal (northern) forest to the Saskatchewan border. It is present in Lakeland.

Comments: The Small Round-leaved Orchid is one of our prettiest orchids. The plants often tend to grow in clumps and in some abundance, creating a mauve carpet amid the deep green of the forest, to the delight of observers and photographers.

Many plant guides refer to this orchid as *Orchis rotundifolia*, but it differs from species in the true genus *Orchis*, which have swollen tubers, by having a slender branched rhizome with fibrous roots. The Greek word *Orchis* means "testicle" and refers to this swollen tuber.



Small Round-leaved Orchid

Venus'-slipper; Fairy-slipper; Calypso; Calypso Orchid

Calypso bulbosa (Linnaeus) Oakes

Undoubtedly one of our most prized orchids, Calypso makes up for what it lacks in stature with the beauty of its dainty slipper-like flowers which are variegated with pink, purple, white and yellow. **A single rounded leaf**, with a pleated appearance, arises from the top of a bulbous corm, which is actually a short, swollen underground stem. It emerges in the fall and over-winters on the ground. In early spring the purplish flower stalk (scape) arises from a different bud on the corm and grows 5-20 cm high. It bears **a single drooping flower**, with erect, spreading, twisted pink or pale purple sepals and petals about 10-15 mm long. The lip is a pouch in the form of a shoe or slipper, 15-25 mm long, streaked with purple on the inside. The upper front portion (top of the slipper) is white and bearded with yellow hairs. The column is a convex rounded pink flap over the opening to the pouch. Under the column is an anther with two pairs of waxy pollinia. The purple-brown capsule is 2-4 cm long, and contains some 10,000 to 20,000 seeds.

Flowering: Mid-May only, in Lakeland. Also found in Sir Winston Churchill Provincial Park.

Habitat: Often growing on well-decayed wood or on slightly acidic to neutral soils, Calypso orchid occurs, in drier forests than some other orchids. Look for it under conifers, e.g., white spruce, or in mixed woods of white spruce and aspen.

Distribution in Alberta: Calypso is most easily seen in the mountains and foothills where it can grow in local profusion. It occurs sporadically across the boreal forest in Alberta and any finds in Lakeland should be hailed with delight and zealously protected.

Comments: Calypso flowers are fragrant, which attracts bees, but produce no nectar as a reward. However, because Calypso flowers mimic other flowers that do, bumblebees are deceived into visiting them. The bee likely learns of its deception, but not until after it has made at least a couple of visits, removing pollen from one flower and depositing it on the stigma of another. In Alberta the pollination rate is low and capsules are hard to come by.

A new corm is produced each year and sometimes an extra one or two are budded off, giving rise to additional flowering scapes.

Calypso bulbosa is the only species in its genus and occurs across North America and Eurasia. Calypso is named after the sea nymph in Homer's Odyssey.



Calypso Orchid

**Bracted Bog Orchid;
Frog Orchid;
Long-bracted Orchid**

Coeloglossum viride (L.) Hartmann
(*Habenaria viridis* (L.) R. Br.)

As its specific name *viride* suggests, this orchid is all-over green looking. From thick roots and fleshy branched tubers arise leafy stems up to 30 cm tall. However, the large leaves and dense raceme of green flowers make this orchid often look chunky and congested. A distinctive feature is the long, lance-shaped flower bracts which are much longer than the flowers above them. The sepals are rounded and concave, about 3-6 mm long and the lateral petals are about as long, but narrower. The oblong lip is 5-10 mm long and has at its tip 2 tiny teeth with a flatter lobe between them. Towards the base the lip has inrolled margins where nectar is secreted and a central ridge leading to a nectar-filled, sac-like spur.

Flowering: June to mid-July in Lakeland region.

Habitat: This plant often grows in drier sites than some other orchids and likes open areas such as burns in forests and open mountain slopes.

Distribution in Alberta: This orchid is definitely most common in western Alberta, along the mountains and foothills, but turns up relatively frequently in central and northern Alberta. In Lakeland, however, it is currently known from only one area, which is Birch Island on Lac La Biche lake.

Comments: It is pollinated by small bees, beetles and wasps.

The characteristic toothed edge of its lip enables this orchid to be distinguished immediately from the similar Northern Green Bog Orchid (*Platanthera hyperborea*), whose lip is not toothed.

Its Latin genus name *Coeloglossum*, "hollow tongue," refers to its spur. Its common name is misleading. This species is also known as *Habenaria viridis* and the common name for the genus *Habenaria* as a whole is bog orchid. Frog Orchid is the common name in Europe. Since the "bog" designation is often inappropriate for its habitat, in North America it is best called Long-bracted Orchid.



Coralroots, Corallorhiza species

The Coralroots have two distinctive features: they lack green leaves and true roots. They have a characteristic white, branched, flattened underground stem or rhizome that resembles a piece of coral. Without leaves they cannot photosynthesize and make food. Rather they obtain their carbohydrates from dead organic matter in the soil, relying heavily on their fungal partners to break down and absorb this material. Because of this manner of feeding they are called saprophytes. They do not depend upon sending up an above-ground shoot every year, and have something of a reputation for not turning up in exactly the same spot year after year. Coralroots have a single anther that lies at the end of the column and bears four pollinia joined together by a single elastic thread with a sticky base. This unit readily sticks to insect visitors such as small bees and wasps.

Spotted Coralroot; Summer Coralroot

Corallorhiza maculata (Rafinesque) Rafinesque

Spotted Coralroot is a striking reddish orchid, whose purple-red flower scapes often grow in clumps, 20-50 cm tall, from the coralloid rhizomes. The scapes are enclosed in tubular sheaths and bear long racemes of up to 40 brownish or purplish flowers spotted with red or purple with a prominent white lip spotted with purple. The sepals are very narrow and about 8 mm long; the petals are slightly shorter and broader. Where the lateral sepals join the base of the lip is a small protruberance or short spur. The lip is 3-lobed, with two tiny lobes at the base and a much longer middle one, about 5-8 mm long and up to 5 mm wide. The column is curved and yellow with purple spots on its lower surface. The capsules are long-ovate and pointed (ellipsoid), about 2.5 cm long, and characteristically droop on reflexed stalks as they reach maturity. These pendent fruits, common to all Coralroots, provide a good means of locating this plant after flowering is over.

Flowering: Mid-June and July in Lakeland region.

Habitat: Spotted Coralroot grows in mature old growth coniferous and deciduous forests in slightly drier soils.

Distribution in Alberta: Although more common in southern Alberta, this species occurs sporadically in the boreal forest. It has been found in Lakeland in older aspen stands.

Comments: Different color forms occur in this species. For example, there is an albino form with lemon-yellow sepals and petals and a white lip, and this has been found in the Lakeland region. The Latin genus name *Corallorhiza* means "coral root", and the specific name, *maculata*, means "spotted", a reference to the lip.



Spotted Coralroot

Striped Coralroot; Hooded Coralroot

Corallorhiza striata Lindley

This orchid also tends to grow in clumps and its purple-red stems and racemes of **pink spreading or drooping flowers striped with purple** make it an awesome sight guaranteed to bring out the cameras. The scape, up to 50 cm high, is enclosed in tubular sheaths but bears no true leaves. The sepals and petals are yellow or pink, about 15 mm long and 5 mm wide and striped with 3 and 5 purple veins, respectively. The **lip is white or purple and heavily striped with purple**. Unlike Spotted and Pale Coralroots the **lip is not lobed** and has no spur. The capsules are ellipsoid and drooping.

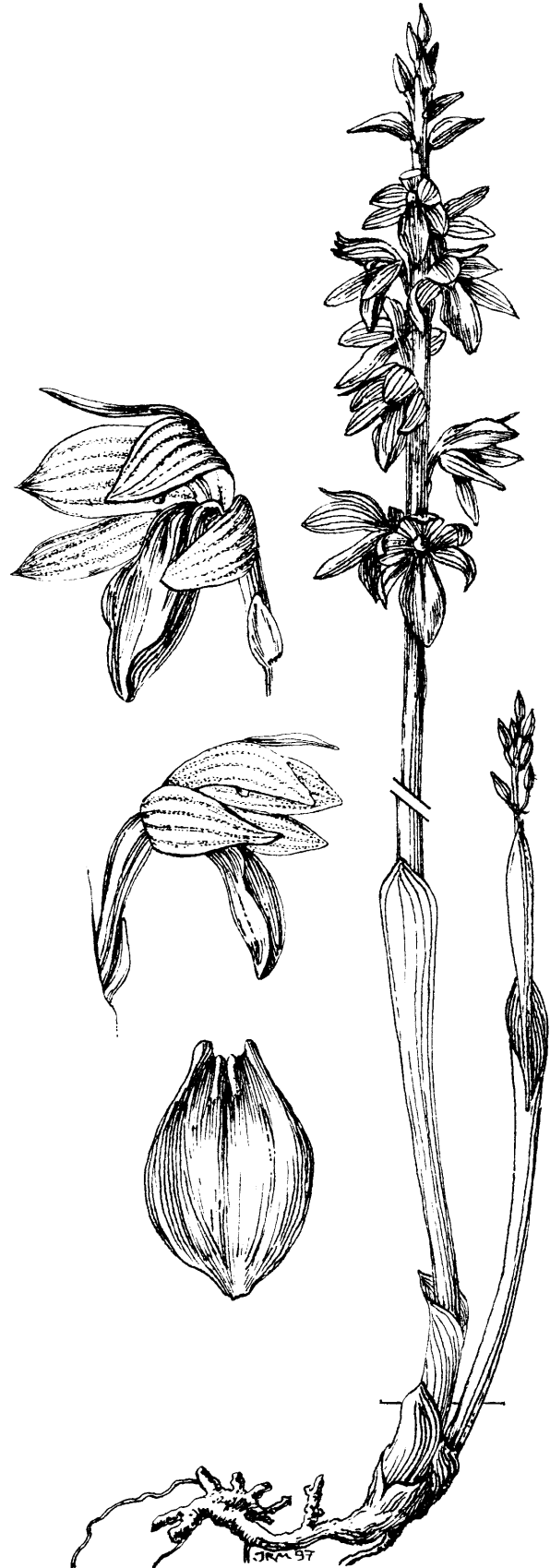
Flowering: Mid-June to end of June or early July in Lakeland region.

Habitat: Striped Coralroot grows in old growth aspen and poplar.

Distribution in Alberta: It occurs sporadically in the southwestern part of the province and in the Cypress Hills. It has also been sighted in the Lakeland region east of Elinor Lake.

Comments: A pure yellow form of this species exists.

The specific name *striata* refers to the stripes on the flower parts.



Striped Coralroot

**Pale Coralroot;
Yellow Coralroot;
Early Coralroot**

Corallorhiza trifida Chatelain

This orchid is "pale" because it is a delicate yellowish green in comparison to the other Coralroots. The pale yellow or green scapes bear only tubular sheaths, not leaves, and a raceme of **small yellowish green flowers**, which have a **white lip**. The scapes can reach 30 cm long and arise singly or in small to large clusters from branches of the coralloid rhizome. The dorsal sepal and the lateral petals, about 5 mm long, converge together to form a hood over the column. They are typically yellow-green but may be brownish in some plants. The lip may be pure white or spotted with purple and is 3-lobed, (hence the name *trifida*, meaning "three-parted"), although the two basal lobes are tiny and difficult to see. The spur is not discernible. About 1200 to 1500 seeds are produced in each pendent capsule.

Flowering: Along with Calypso it is one of the earliest orchids to flower in Lakeland, beginning at the end of May, peaking in early June.

Habitat: Coniferous, mixed and deciduous woodlands, from dry to moist sites.

Distribution in Alberta: This common orchid is widely distributed throughout the province and indeed throughout North America. It forms small clumps sporadically through the forest and is frequently seen in Lakeland, if one looks carefully.

Comments: Because this coralroot has greenish stems and flowers it may photosynthesize to a limited extent. Recent research at the University of Alberta has shown that the mycorrhizal fungi in pale coralroot also form a relationship with the roots of lodgepole pine. This suggests that the orchid may be obtaining carbohydrates from the tree via the fungus. Indeed, this kind of relationship could be quite widespread among plants that have no chlorophyll, to the benefit of all three partners.



Pale Coralroot

Yellow Lady's-slipper; Greater Yellow Lady's-slipper; Yellow Moccasin-flower

Cypripedium pubescens Willdenow
(*Cypripedium calceolus* Linnaeus var. *pubescens* (Willd.) Correll)

Happening upon clumps of this robust orchid in flower with its brilliant yellow "slippers" is one of the great rewards of nature hiking. The leafy flowering stems grow from roots and thick scaly rhizomes underground. They can reach 80 cm tall but are often shorter, are hairy, and bear **one (or two) large yellow flower(s)**. The 2-5 leaves are from 5-10 cm long and about half as wide, with a pleated appearance. They are sparsely hairy and usually some of these hairs are gland-tipped. A leaf-like green bract stands erect behind the flower. The sepals and petals can be yellowish, greenish or even sometimes a beautiful dark brown and are usually veined with purple or brown. In the Lady's-slippers only 5 flower parts are discernible because the lateral sepals have become joined into one, which hangs below the pouch, with just a forked notch at the tip to indicate the extent of the join. **The long lateral petals are relatively narrow, spirally twisted** and wide-spreading. **The lip forms a glossy golden-yellow pouch** veined or spotted with purple. It may be as much as 6 cm long and 4 cm wide, and has inrolled edges. A distinctive feature of the column is that it has a triangular yellow flap partly covering the pouch opening. Unusually among orchids, there are two stamens with exposed pollinia. The erect capsules, 2-4 cm long, brown and easily seen when mature, contain upwards of 15,500 seeds.

Flowering: Mid-June until first week of July in Lakeland region.

Habitat: This orchid can be found growing in patches in moist and dry woods, woodland edges, wet and dry meadows, and roadside ditches.

Distribution in Alberta: Occurring throughout central and west-central Alberta, it may be locally abundant. It is found in Lakeland, and should be looked for especially where there are sources of calcium-rich water.

Comments: The flowers are cross-pollinated by bumblebees and possibly flies. The bee enters through the opening in the pouch but, confined by the inrolled edges and slippery sides of the pouch, it can only escape by crawling to the base of the flower. It is guided by dark lines and by hairs towards two small translucent openings, one on either side of each anther on the column. If the bee is carrying pollen from another flower this scrapes off against the stigma. The bee then picks up pollen as it brushes against one or other anther, ready to pollinate the next flower it visits. The bee has been deceived into visiting the Lady's-slipper because no nectar is offered as a reward for its pollinating services.



Yellow Lady's-slipper

(Yellow Lady's-slipper - continued)

Sometimes populations of noticeably smaller plants occur.

The genus name *Cypripedium* derives from *Kypris*, a Greek goddess of beauty and love, supposedly from Cyprus, and *pedilon*, meaning "foot", a reference to the shape of the lip. The specific name *pubescens* means "hairy" in reference to the stem and leaves. The alternative name *calceolus* is Latin for "slipper".

This species can be propagated by division of the rhizomes and stock is available from various Alberta nurseries. Make sure before you buy, though, that the plants haven't been dug from the wild!



Sparrow's-egg Lady's-slipper

Sparrow's-egg Lady's-slipper; Franklin's Lady's-slipper

Cypripedium passerinum Richardson

This plant, more noticeably **hairy** on the stems and leaves than Yellow Lady's-slipper, usually grows shorter (up to 35 cm tall) than the latter, and its leaves are more elongated and folded. They clasp the stem and overlap each other giving a very leafy appearance to this orchid. A green leaf-like bract stands upright behind the flower and encloses the base of the ovary. The **flower** (usually solitary at the end of the stem) **is small (about 15 mm long) and white**. The **rounded, greenish-yellow dorsal sepal projects like a cap over the lip**; a similar sepal which hugs the lip below is actually two joined sepals. The narrow white sepals, about 10 mm long and shorter than the lip, spread wide. The **white lip**, with infolded margins, **may be suffused with pink near the base or spotted with purple** near the opening. The flap over the column is white or yellow and spotted with red. The rounded-ellipsoid capsule, 2- 3 cm long, contains from 10,000 to 15,000 seeds.

Flowering: End of June and July in Lakeland region.

Habitat: This varies from rich moist woods in boreal and mountain forests to stream banks and lake margins, and river floodplains and rocky slopes in the mountains.

Distribution in Alberta: Sparrow's-egg Lady's-slipper is most common in western Alberta and along the upper reaches of rivers, but it is also a northern species, occurring across the Arctic. It is much more common than Yellow Lady's-slipper in the north and can be found in the Lakeland area.

Comments: Sparrow's-egg Lady's-slipper is self-pollinating. As the flower matures the anthers come in direct contact with the stigma. This results in a high rate of seed set in the capsules.

This orchid was first collected by the botanist John Richardson who accompanied Sir John Franklin on his Expedition to the Polar Sea in 1820. The Latin name *passerinum* refers to the resemblance of the flower to a sparrow's egg.

The **Stemless Lady's-slipper** (*Cypripedium acaule* Aiton) with **large pink flowers** and **leaves restricted to the base of the scape**, occurs in the Fort McMurray and Lake Athabasca areas where it is associated with rocky outcrops of the Canadian Shield. It could possibly turn up in Lakeland. The handsome **Mountain Lady's-slipper** (*Cypripedium montanum*), with a **white pouch and twisted, brownish-purple sepals and petals**, is found only in the Waterton Lakes area.

**Lesser Rattlesnake Plantain;
Dwarf Rattlesnake Plantain; Northern
Rattlesnake Plantain**

Goodyera repens (Linnaeus) R. Brown

This small orchid has a **one-sided** or slightly **twisted spike** of **small, hairy, white flowers**, and a **rosette of ovate, white-mottled leaves**. The underground stem or rhizome grows horizontally (hence the Latin name *repens*, "creeping") and sends up more than one rosette from the ends of its branches. The 1-3 cm long, stalkless leaves are dark- or blue-green with broad white veins suggestive of the markings of a snake. The flower scape arises from the centre of the rosette and can reach 25 cm high. It is "fuzzy-looking" from gland-tipped hairs. The dorsal sepal and lateral petals, about 5 mm long and hairy, form a hood over the column while the lateral sepals are outspreading. The pouch-like lip, about 4 mm long, ends in a characteristic down-curved beak or spout. It lacks a spur. The column has a short beak and a single dorsal anther bearing two granular pollinia. The ellipsoid capsules, about 7 mm long, contain relatively few seeds, from 200-400.

Flowering: Late July and August in Lakeland region.

Habitat: Look for individuals or patches of this orchid in mossy wet or dry coniferous and mixed woods.

Distribution in Alberta: Rattlesnake Plantain is widely distributed in suitable habitat across northern and central Alberta, including the Lakeland area.

Comments: The flowers attract insects by their fragrance. Observations of pollination in this orchid show that at first each flower is open only enough to allow insects, often long-tongued bees, access to the sticky pollinia. Once these have been removed, glued to the bee's mouthparts, the lip descends to allow the next visitor to penetrate deeper and come in contact with the stigma, now ready to receive pollen.

Another **Rattlesnake Plantain**, *Goodyera oblongifolia*, grows in Alberta but is restricted to the mountains and foothills, especially in the south. It is a **taller, more robust plant** with **more elongate leaves** (up to 6 cm long).

The genus was named for John Goodyer, an English herbalist. The "plantain" part of the common name refers to the rosettes of broad leaves.



Lesser Rattlesnake Plantain

The Twayblades; *Listera species*

These are small orchids with a pair of opposite leaves on the delicate stems and tiny greenish-yellow or pinkish flowers that do not stand out against the mossy forest floor. Bend down and search the peat-moss hummocks carefully for these fascinating little plants. [Once you have found the first one, however, finding the next will be easier because you will have developed what biologists call a "search image."]

Northern Twayblade

Listera borealis Morong

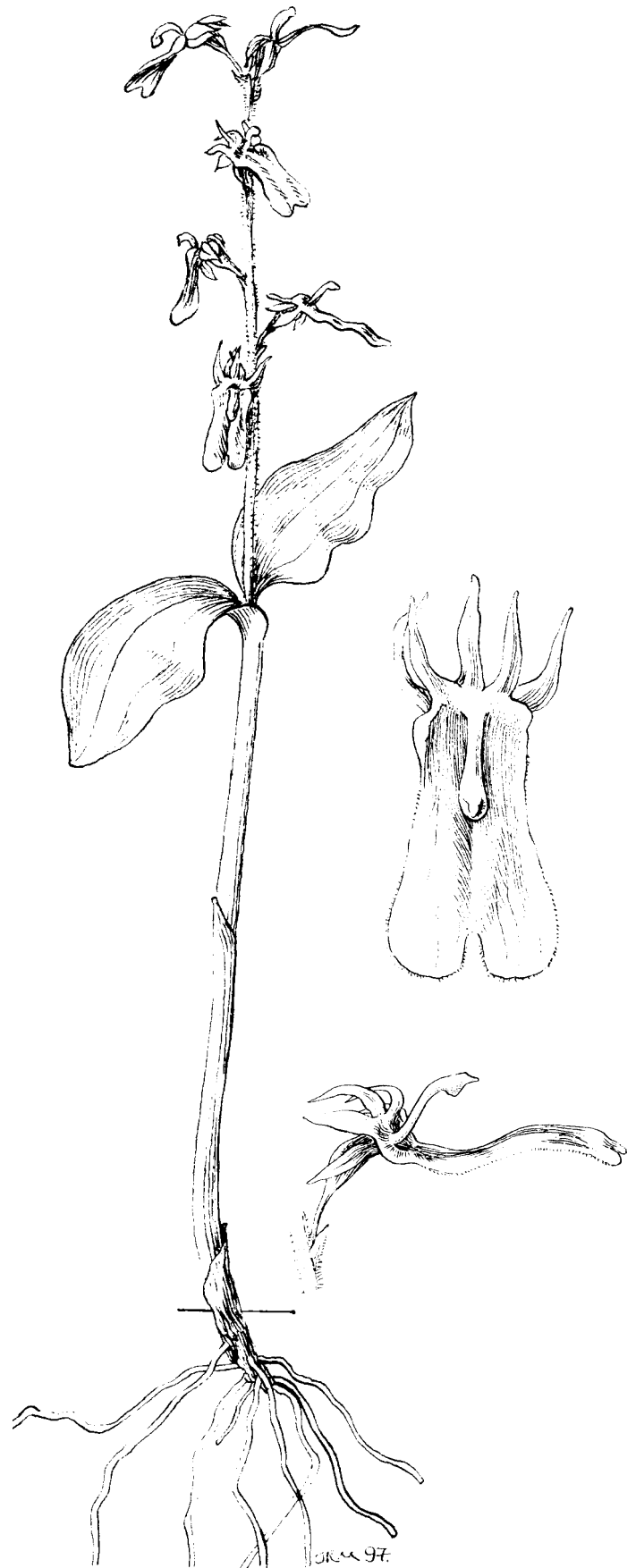
The stems rise 5-25 cm tall from slender fibrous roots and are enclosed at the base by sheaths. A **pair of rounded or ovate leaves**, up to 6 cm long and 3 cm wide, **sit opposite each other about half way up the stem**. At the top is a loose open raceme of **yellowish green flowers**. The sepals and petals, about 5 mm long, are one-nerved and bent backwards. The most striking feature of the flower is the **large, oblong, spreading lip**, 7-10 mm long and about half as wide, which is notched at the tip forming **two rounded lobes**. The lip widens again at the base forming two ear-like lobes around the column. [It is short-hairy over the surface and has longer hairs along the margins.] A shallow groove down the centre of the lip leads the pollinator to the curved column.

Flowering: Mid-June to end of June in Lakeland region.

Habitat: This orchid grows in wet mossy coniferous or mixed woods.

Distribution in Alberta: Its name *borealis* implies that it is northern (*borealis* Greek for "north") but in fact it is most frequently found in the mountains. This orchid is relatively common in the Lakeland area.

Comments: The Twayblade orchids have an intriguing mechanism to assist cross-pollination. It involves the "firing" of a drop of "glue" from a beak-like projection of the column in response to touch by a visiting insect, likely a fungus gnat or a small fly or wasp. This attaches the pollinia to the insect. After the pollinia have gone, attached to the startled and hurriedly departing insect, the stigma is exposed, ready to receive pollen from the next visitor.



Northern Twayblade

Heart-leaved Twayblade

Listera cordata (Linnaeus) R. Brown

This Twayblade is the most wide-ranging of all *Listera* species in the northern hemisphere, although possibly less common than Northern Twayblade in the Lakeland area. Although it is about the same height and has the same **pair of leaves half-way up the stem**, which are more **heart-shaped** than ovate, it can be readily distinguished from Northern Twayblade by its smaller delicate flowers and its differently shaped **lip**, which is **narrow and deeply forked**. Like Northern Twayblade, the slender stems are enclosed by membranous sheaths at the base and are hairless below and slightly hairy above the leaves. The latter are heart-shaped or triangular, 1-2 cm long and wide. There can be up to 25 **greenish or reddish-purple flowers** in a loose raceme. The sepals and petals are ovate and spreading and about 2 mm long. The **lip**, about 4 mm long, is **divided to about half way into 2 narrow prongs**. Two minute horns spread across the base of the lip below the short, thick column. The capsule is short and rounded-ellipsoid, about 5 mm long.

Flowering: May through August. The individual flowers last for a long time.

Habitat: Get down low to look for this plant in wet moss in dense black spruce or black-spruce-tamarack forests.

Distribution in Alberta: Heart-leaved Twayblade occurs in the mountains and the boreal forests of the province. It is likely more common than records show, but is often overlooked because of its diminutive size and preference for mosquito-ridden habitats! It definitely occurs in Lakeland.

Comments: The flowers are pollinated by small insects which are attracted by their odor and the nectar produced in the lips.

The Twayblades were named in honor of Martin Lister, a 17th century English physician and naturalist. The species name *cordata* means "heart-shaped", in reference to the shape of the leaves. The common name "twayblade" is an old word for "two-blade" and refers to the pair of stem leaves.

Two other of the many Twayblade species found in North America occur in Alberta. They are **Western Twayblade** (*Listera caurina*) and **Broad-lipped Twayblade** (*Listera convallarioides*). They both have lips that flare to a broadened tip. They are rare and occur in the mountains of southwestern Alberta.



Heart-leaved Twayblade

Adder's-mouth Orchids, *Malaxis species*

The two species occurring in Alberta are small, dainty plants with greenish flowers, known for their rarity. Certainly they are amongst the most difficult of orchids to find.

White Adder's-mouth; White Malaxis

Malaxis monophyllos (Linnaeus) Swartz
(*Malaxis brachypoda* A. Gray)

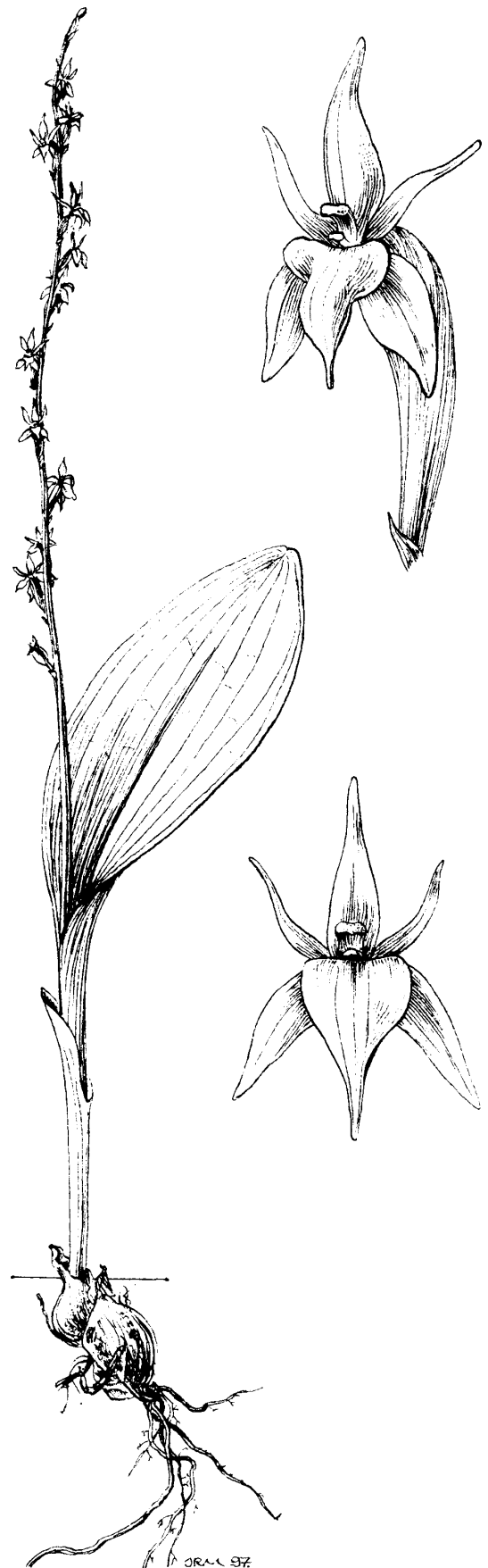
The slender stems grow up to 25 cm tall from an egg-shaped bulb-like corm which has a few fibrous roots at its base. The **single yellow-green leaf**, to 10 cm long and about half as broad, encloses the base of the stem with a sheathing stalk. The flowers form a narrow spike up to 10 cm long and are small and yellow-green. The dorsal sepal is 2-3 mm long, slightly longer than the lateral sepals, and has rolled-under margins. The petals are narrower and shorter than the lance-shaped sepals and like them bend backwards against the capsule as the flower matures. The **slender drooping lip** is about 2 mm long, broadly triangular but narrowing to the tip, with two small lobes at its base. There is no spur. The erect ovoid capsule is about 6 mm long.

Flowering: Mid to late July.

Habitat: This orchid is found in moist woods, wet meadows, fens and bogs.

Distribution in Alberta: It occurs sporadically in central Alberta, in Lakeland Park, and in the Waterton Lakes area.

Comments: *Malaxis* is a Greek word meaning "softening" and refers to the soft, fleshy leaves of some species. *Monophyllos* means "one-leaved."



White Adder's-mouth

Bog Adder's-mouth

Malaxis paludosa (Linnaeus) Swartz

The stems grow up to 15 cm tall (but often less) from a bulb-like corm ensheathed by leaf bases. **Two** prominent fleshy **leaves**, up to 2.5 cm long, sheath the stem at their bases. The tiny yellow-green flowers form a tight spike. The flower is unusual in that during development it twists through 360° so that it is “upside down” in comparison with most other orchids’ flowers. Thus the green-veined **lip stands erect at the top of the flower** and the middle (= dorsal) sepal, which is about 2 mm long, is at the bottom. Both the broad lateral sepals and shorter, narrower petals curve backwards to expose the short erect column.

Flowering: July and August.

Habitat: In wet moss, especially at the edges of black spruce–tamarack forests.

Distribution in Alberta: It has only been recorded from a few locations north and west of Edmonton and, though not yet sighted, is thought to occur in Lakeland Provincial Park and Provincial Recreation Area. Its appeal definitely lies in its rarity for, as one British nature writer put it, coming upon this orchid after a long search, it is “esthetically pathetic.” Undoubtedly rare, it is also notoriously difficult to see, even though it sometimes grows in clumps, because it blends in so well with the moss. Be sure to report any sightings to Park staff!

Comments: Despite its inconspicuity (to humans!), Bog Adder's-mouth seems to be entirely cross-pollinated, by fungus gnats and probably by mosquitoes.

This orchid also has an unusual method of vegetative propagation. It can produce tiny buds at the tips of its leaves which may sprout into new plants and take root.



Bog Adder's-mouth

Bog Orchids, Platanthera species

There are several species of *Platanthera* in Alberta and many more in North America. Many flower guides refer to the bog orchids as *Habenaria* species but most botanists now agree that the true *Habenarias* are confined to the tropics. The name *Platanthera* refers to the flower column's single broad anther which, however, is two-chambered with one granular pollinium in each chamber. These orchids have leafy stems with a raceme of relatively small flowers. The lip of the flower has a spur from which moths and butterflies can suck nectar.

Tall White Bog Orchid; Scent Candle

Platanthera dilatata (Pursh) Lindley
(*Habenaria dilatata* (Pursh) Hooker)

The flower stem can grow up to 1 m tall from below-ground roots and fleshy, spindle-shaped tubers. The leaves are numerous and elongate, though they are reduced in size higher up the stem. The **raceme has short-stalked white flowers** in the angles of fairly long narrow green bracts. The dorsal sepal is about 5 mm long and forms a hood with the petals. The narrower lateral sepals are wide-spreading. The **lip, 5-10 mm long, is broader at the base than the tip** and prolonged below into a narrow tubular spur about as long as the lip. The ellipsoid capsule is more or less erect and about 1 cm long.

Flowering: Late July to August in Lakeland region.

Habitat: Tall White Bog Orchid is found in marshes, bogs, wet coniferous forests and alpine meadows.

Distribution in Alberta: Most easily seen in the west along the mountains and foothills, this orchid also occurs in central Alberta. It is thought to occur in the Lakeland area, but has yet to be sighted.

Comments: The **flowers have a delicate clove-like fragrance** that appeals to pollinating butterflies and moths (and people!). As the flower opens the lip may be looped up, forcing insect visitors to remove only one pollinium at a time from the side of the flower. It is believed that this is an advantage to the plant because it encourages a second visit to the same flower, thereby increasing its chances of cross-pollination.

Tall White Bog Orchid is somewhat similar to Northern Green Bog Orchid (*Platanthera hyperborea*) with which it can hybridize. Intermediate plants may be difficult to tell apart but typical plants should be easy to distinguish by their bright white flowers and their tallness. The Latin word *dilatata* refers to the expanded or dilated base of the lip. Another common name for this orchid, fanciful but appropriate, is Bog Candles.



Tall White Bog Orchid

Northern Green Bog Orchid; Northern Green Orchid

Platanthera hyperborea (Linnaeus) Lindley
(*Habenaria hyperborea* (Linnaeus) R.Br.)

Leafy stems grow from 10 to about 50 cm tall from roots and spindle-shaped tubers underground. The leaves are elongate, pointed and enclose the stem with their folded bases, becoming smaller and bract-like toward the top of the stem. The flower bracts are green and pointed, longer than the **flowers**. These **are green or yellow-green**, small and often fragrant. The dorsal sepal converges with the petals to form a hood over the broad column. The spreading lateral sepals are narrow-ovate and 3-6 mm long. The **lip**, 4-6 mm long, **long-triangular**, with a rounded tip and broadened base. It is bent back or curved and has a slender, but shorter, spur. The nearly erect ellipsoid capsules are up to 1.5 cm long and contain a variable number of seeds, from a few hundred to several thousand.

Flowering: Late June through August.

Habitat: This orchid grows in wet soils of meadows, bogs, roadside ditches, swamps and woods, with a preference for somewhat calcareous soils.

Distribution in Alberta: It is our most common provincial orchid and is easily seen in moist habitats throughout the province except parts of the south-east. It is common in Lakeland.

Comments: Cross-pollination is probably effected by mosquitoes. It seems this species can also pollinate itself, as the pollinium stalk may bend down to bring the pollen mass in contact with the stigma.

Northern Green Bog Orchid may be confused with some other species. Its entire (undivided) lip distinguishes it from Long-bracted Orchid (*Coeloglossum viride*), and its chunkier, greenish spike from the slender white-flowered Tall White Bog Orchid (see the *Comments* for this latter species). It may sometimes be confused with Hooded Ladies'-tresses though the latter has a spirally twisted spike of white flowers.

Widespread across North America, this species comes in several varieties.

Its species name *hyperborea* derives from two Greek words, *hyper*, meaning "above" or "beyond", and *boreas*, meaning "north," or "of the north wind", a reference to its far-northern distribution.



Northern Green Bog Orchid

Blunt-leaved Bog Orchid; Small Northern Bog Orchid

Platanthera obtusata (Banks ex Pursh) Lindley
(*Habenaria obtusata* (Pursh) Richards)

The flower scape grows 5-20 cm tall from cord-like roots and a single tuber. There is **one ovate basal leaf** (rarely 2), rounded at the tip and sheathing at the base. The raceme has narrow green bracts and a loose arrangement of **greenish-white flowers**. The rounded dorsal sepal, about 5 mm long, forms a hood over the broad column with the petals, which are broad at the base but narrowed to a horn-like tip. The lateral sepals, 3-5 mm long, are narrow and curve backwards. The **narrow, tapering lip**, 3-6 mm long, points down and opens into a curved tapering spur nearly as long as itself.

Flowering: Mid-June to end of July in Lakeland region.

Habitat: Blunt-leaf Bog Orchid grows in old growth coniferous forests and bogs, or on calcareous mountain heaths.

Distribution in Alberta: This orchid occurs across Alberta, except in the southeast. It can be fairly readily encountered in old growth white spruce forests and mixed woods in the Lakeland area.

Comments: Pollination is by female mosquitoes which can sometimes be seen with the bright yellow pollinia sticking to them like tiny head lamps.

The Latin name *obtusata* means "blunted," in reference to the rounded leaf.



Blunt-leaved Bog Orchid

Round-leaved Bog Orchid; Large Round-leaved Orchid

Platanthera orbiculata (Pursh) Lindley
(*Habenaria orbiculata* (Pursh) Torr.)

Coming upon this tall, serene orchid in flower in the middle of a shady forest is a breathtaking experience, not likely to be forgotten! The rosette consisting of a **pair of huge, round, dark green, shiny, leaves, pressed flat against the ground**, is unmistakable. The leaves are 5-15 cm long and up to 10 cm wide. The flower scape rises up to 60 cm tall between them from underground roots and tubers. It bears a loose raceme of slender white or greenish-white flowers in the angles of narrow green bracts. The dorsal sepal is rounded or squarish, 4-8 mm long, and the sepals and petals are longer and narrower and bent backwards. The **lip** is **slender and tongue-like**, similar to that of Blunt-leaved Bog Orchid, but opens into an even **longer** (up to 20 mm), narrower, **spur** which often curves up behind the flower. The two anther chambers appear prominently on the column, on either side of the nectar gland. The erect ellipsoid capsule is about 12 mm long.

Flowering: End of June to mid-July.

Habitat: It grows in wet to fairly dry coniferous and mixed woods, usually in deep shade.

Distribution in Alberta: Round-leaved Bog Orchid occurs sporadically across the north-central part of the province, including Lakeland region.

Comments: With its long spur and preference for shady woods one could guess that this lovely orchid might be pollinated by large moths. It is certainly visited by mosquitoes!

Although Round-leaved Bog Orchids grow as individual plants, once one specimen has been found others should be sought nearby.

The name *orbiculata* refers to the rounded shape of the leaves.



Round-leaved Bog Orchid

Hooded Ladies'-tresses

Spiranthes romanzoffiana Chamisso

The leafy stem grows to 50 cm tall (though more commonly around 30 cm or less) from underground roots and fleshy tubers and is glandular-hairy above. The elongate **leaves** (5-25 cm) tend to be **concentrated in the lower part of the stem**. The **dense flower spike** is characteristically **twisted** so that the **creamy-white flowers** appear to be **arranged in three vertical rows**. A prominent pointed flower bract enfolds each ovary. The sepals and petals converge together over the short column to form a **short tube-shaped flower** that is slightly upturned. The sepals are slightly wider than the similar but narrower petals, up to 12 mm long. The **lip**, 8-11 mm long, is ovate or fiddle-shaped with a wavy tip and is **bent sharply downwards**. There is no spur. Nectar is produced in slight protruberances on the upper surface of the lip towards the base. The erect ellipsoid capsule is about 1 cm long.

Flowering: Late July and to end of August.

Habitat: Hooded Ladies'-tresses can be found growing in a variety of moist habitats such as wet grassland, moist places in woodland clearings and the edges of streams and ponds. In the mountains it is often found alongside mineral springs.

Distribution in Alberta: This common orchid can be found throughout most of Alberta (except the southeast), including the Lakeland area.

Comments: The flowers have a sweet spicy scent reminiscent of vanilla. Although not a typical "bee flower" in that the flowers have no landing platform, are white and not especially large, Hooded Ladies'-tresses are pollinated chiefly by bees, especially bumblebees. They land at the base of the spike and move up the ladder of flowers, foraging for the abundant nectar. They deposit pollen on the receptive stigmas of older flowers at the bottom of the spike and pick up pollen from the younger flowers with exposed pollinia higher up. This strategy appears to be effective as rates of pollination and seed set are often high.

Hooded Ladies'-tresses is somewhat similar to Lesser Rattlesnake Plantain, but the two species can be told apart by their leaves and lips. The Rattlesnake Plantain also has a "fuzzy" look due to its hairiness.

Although there are many species in the genus *Spiranthes* worldwide, until recently Hooded Ladies'-tresses was the only species known from Alberta. However, in recent years a new species, from eastern Canada and the U.S., has been found in northeastern Alberta. It is **Northern Slender Ladies'-tresses**, *Spiranthes lacera*. Its leaves are wider than those of Hooded Ladies'-tresses and form a basal rosette. As well,



Hooded Ladies'-tresses

(Hooded Ladies'-tresses - continued)

the flowers are fewer in a looser spiral and the lip has a green centre and a fringed tip. It might one day turn up in Lakeland.

The name *Spiranthes* comes from the Greek words *speira* meaning "coiled" and *anthos*, "flower". The common name is thought to arise from the resemblance of the twisted spike to braided hair, but it may also be a corruption of an older European name, Ladies' Traces, which probably referred to the traces or strings that laced up the bodice of a woman's dress.

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Suggestions for Further Reading

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Note: Common names were taken from a variety of sources but especially from: Alberta Energy, Forestry, Lands and Wildlife, General Services Division, Editorial Services (ed. D. M. Ealey). Alberta Plants and Fungi — Master Species List and Species Group Checklists, Edmonton, 1992. Scientific names follow the usage of Smreciu and Currah, 1989.