

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PMORC1N050

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Listera convallarioides* (Sw.) Nutt. ex Ell.

COMMON NAME: broadleaf twayblade, broad-leaved twayblade, broad-lip twayblade, broadlipped listera, broadlipped twayblade

SYNONYMS: *Epipactis convallarioides* Swartz, *Ophrys convallarioides* (Sw.) W. Wight ex House, *Bifolium convallarioides* (Sw.) Nieuwland, *Didhryllum convallarioides* (Swartz) Kuntze, *Listera eschscholziana* Chamisso

FAMILY: Orchidaceae

AUTHOR, PLACE OF PUBLICATION: *Listera convallarioides* (Sw.) Nuttall, Genera North American Plants 2: 191. 1818. Missouri Botanical Garden (<http://mobot.mobot.org>) and Flora of North America (www.efloras.org) reports author and publication as *Listera convallarioides* (Sw.) Elliot, A Sketch of the Botany of South-Carolina and Georgia 2: 494. 1823. *Epipactis convallarioides* Swartz, Kongl. Vetenskaps Academiens Nya Handlingar 21: 232. 1800.

TYPE LOCALITY:

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: In North America, *convallarioides* is 1 of 8 species in the genus *Listera*, and the only one in Arizona.

DESCRIPTION: Slender and stout perennial herb 10 – 20 cm (4-8 in) tall, with terminal raceme. Welsh et al. (1993), and FNA (1993+) reports (5-)6-37 cm tall. Three to eight fibrous roots are 1 to 4 cm long. The stems are green and succulent, and glabrous below the leaves, covered with fine hairs above the leaves. The leaves are opposite midway on the stem, oblong to round, green, each around 4.5 x 3.5 cm, apex obtuse to rarely acute or apiculate. Hickman (1993) and Welsh et al. (1993) reports around 2-7 cm long, and FNA (1993+) reports 2-7 x 1.5-5.8 cm. Inflorescence 5-20-flowered, lax, 20-120 mm; floral bracts semi translucent, lanceolate to rhombic-ovate, 3-5 x 1-2.5 mm, apex acute to acuminate; peduncle and rachis densely whitish glandular-pubescent. One small bract occurs between leaves and flowers. Flowers pale green to yellowish green (sometimes marked with purple in other parts of the U.S.), each approximately 0.4 x 0.8 cm in measurement; pedicels slender, 2.5-7 mm, glandular-pubescent; ovary glandular-pubescent, becoming glabrate as it matures. The sepals and petals are reflexed away from the column and lip; dorsal sepal is ovate-lanceolate to nearly elliptic, 4.5-5 x 1.5-2 mm, apex obtuse to acute, with slightly darker green stripe down the middle. The lateral sepals are lanceolate, slightly falcate, 4.5-5.5 x 1.5-1.8 mm, apex acute to obtuse, with slightly darker green stripe down the middle. The back of the sepals are covered with fine hairs. The petals

are acute clavate, slightly falcate, 4-5 x 0.7-1 mm, with fine hairs covering the back, and a faint darker green stripe down the center; the stout fiddle shaped lip is translucent, 1.0 x 0.5 cm at the broadest spot near the tip. It is slightly notched to barely trilobed at the apex; contracting abruptly as it nears the column, forming a narrow claw about 1 mm wide. The slightly raised ridge down the center of the lip from near the claw, to near the apex, is more prominent than the claw. The curved, slender column is 2.5-4 mm long (the apex is slightly expanded), with two elongated yellow pollinia. The capsule is ellipsoidal to nearly spherical, 2 x 8 mm, and essentially glabrous. (Coleman, 2002; FNA 1993+).

AIDS TO IDENTIFICATION: *Listera convallarioides* is most likely to be confused with other species of *Listera*, but can be distinguished by its relatively large flower, and its cuneate, undivided labellum.

ILLUSTRATIONS: Color photos (Coleman, 2002: plate 15)
B&W line drawing (Cronquist et al., 1977: p. 551)
Color photos (Luer, 1975: plate 20)
Color photo (<http://www.botany.wisc.edu/Orchids/convallarioides.html>)
Color photos (John Game, 1998 in CalPhotos <http://elib.cs.berkeley.edu/>)
Color photos (Joseph Dougherty, 2003 in CalPhotos <http://elib.cs.berkeley.edu/>)
Color drawing (Michael Sherman, 1999 in The Ojibwa Artist Naturalist Orchids <http://sirorfeo.tripod.com/orchids/lconval.htm>)
Line drawing (in FNA 1993+)
Color photo (William & Wilma Follette. USDA NRCS. 1992, in http://plants.usda.gov/cgi_bin/plant_search.cgi)
Line drawing (Britton, N.L. & A. Brown, 1913, in http://plants.usda.gov/cgi_bin/plant_search.cgi)
Color photo (Slichter 1998, in <http://ghs.gresham.k12.us/science/ps/nature/basin/3petal/orchid/listera/listera.htm>)
Color photo (Thayne Tuason 2003, in <http://www.cwnp.org/photopgs/ldoc/lconvallarioides.html>)

TOTAL RANGE: Widely distributed in North America, from southern California into Canada and east to New England. A small distribution heads south along the Rocky Mountains, with a slightly disjunct presence in Arizona.

RANGE WITHIN ARIZONA: It grows in three widely separated areas in Pima, Coconino, and Apache counties. The Pima County population (southern limit for the species) was discovered in 1907 (Santa Catalina Mountains); the Coconino County population (Mogollon Rim) was found in 1986; the Apache County population was documented in 1997.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial forb/herb.

PHENOLOGY: For their range, flowering occurs June-August (-September). In Arizona, it flowers from early July to mid-August. The quality of bloom in Pima County, Arizona, is often influenced by the strength of the summer rains. However, in other parts of its range, it is not subject to variation in the blooming season, based on its growth habits along permanent streams. (Coleman, 2002).

BIOLOGY: The species employs a triggered rostellum to aid in pollination. When a visiting insect bumps a minute projection from the rostellum, the pollen masses are fired onto the intruder, which then transports them to the next flower visited. This plant is relatively diminutive with tiny inconspicuous flowers, which creates a challenge for those searching for it. (Coleman, 2002). *Listera convallarioides* crosses with *L. auriculata* to produce a natural hybrid *L. x veltmanii* Case (FNA 1993+).

HABITAT: Usually found in moist mixed deciduous/coniferous forests, growing in rich humus in open woods to boggy meadows, in pine and fir forests at elevations between 7,000 and 8,600 feet (2100-2600 meters); FNA (1993+) reports elevation between 100-2600 m (328-8,525 ft). In Arizona, it grows along the banks of perennial streams or seeps, in mosses, or directly in the damp soil, often hidden under grasses, ferns, or bushes. (Coleman, 2002). Welsh et al. (1993) reports "along streams, or in aspen, pinyon pine, mountain mahogany, ponderosa pine, and spruce-fir communities."

ELEVATION: 7,000 – 8,600 ft (2100-2600 m). Elevations between 3,279 to 9,607 ft (1000-2930 m) (Hickman, 1993 and Welsh et al., 1993), and 328-8525 ft (100-2600 m) (FNA 1993+) have been reported in other parts of its range.

EXPOSURE: Shady.

SUBSTRATE: Soil circumneutral or at most only mildly acidic; prefers cool soil. (FNA 1993+).

PLANT COMMUNITY: Other orchids that may bloom nearby include several *Platanthera* species, *Malaxis abieticola* (slender-flowered addersmouth-orchid), and *M. soulei* (= *M. macrostachya*, Chiricahua addersmouth-orchid). Species in the area already out of bloom when the twayblades open include: *Corallorhiza maculata* (spotted coralroot), *C. striata* (striped coralroot), *C. wisteriana* (spring coralroot), and *Schiedeella arizonica* (fallen ladies' -tresses). In Apache County, Arizona, *Goodyera oblongifolia* (western rattlesnake plantain) and *G. repens* (dwarf rattlesnake plantain) grow nearby but bloom later. (Coleman, 2002).

POPULATION HISTORY AND TRENDS: Although common throughout much of its range, it is relatively rare in Arizona. In Pima County, it is only found in one small colony, where it was growing when last visited in 1999. It is slightly more common along the

Mogollon Rim where it occurs in four drainages. It is only known from one colony in Apache County. (Coleman, 2002).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: Salvage Restricted (ARS, ANPL 1999)
OTHER STATUS: None

MANAGEMENT FACTORS:

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: USFS – Coconino and Coronado National Forests; Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

The leaves are broad and satiny green, and when not in flower, the plant reminded the Swedish botanist Olof Swartz of the lily-of-the-valley (*Convallaria majalis*), after which he named the species. (Luer, 1975). The specific epithet *convallarioides* is from the Latin meaning “*Convallaria*-like,” because as stated previously, Swartz felt that the leaves resembled those of the genus *Convallaria*.

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