

## *Spiranthes*: Terrestrial Orchid with Ornamental Potential

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Terrestrial orchids are rarely cultivated (Bailey 1914; Oszkinis 1991). The genus *Spiranthes* L.C. Rich. is represented by 150–200 species, mostly in the subtropical and tropical regions of the American Continent (Orpet 1914; Peña 1990). Some species are hardy and are found in the United States and Poland (Bailey 1914; Orpet 1914; Szafer et al. 1953; Peña 1990). None of the species has found horticultural application in Mexico, although the wealth of terrestrial orchids, their presence in a range of contrasting environmental conditions, and their esthetic values suggest various ornamental uses.

### BOTANY

The genus *Spiranthes* (Orpet 1914), is characterized as “hardy native, easily transplanted, flowering biennially, late summer and early autumn.” Bailey (1914) concludes that “few species have any value; some of the hardy species are advertised by dealers of the native plants and by collectors.” The name *Spiranthes* derives from Greek and refers to the twisted spikes (Bailey 1914), hence the common name “Ladies’ Tresses.” Martínez (1979) mentions a common name *ya áxchi* (Mayan) for *S. acaulis* (Sm.) Cog. and Rzedowski and Equihua (1987) report two names *coyol cimarrón* and *cutzis* for *S. aurantiaca* (Llave & Lex.) Hemsl from the Valley of Mexico. Peña (1990) describes 17 species of *Spiranthes* from the Valley of Mexico. Among them is *Spiranthes cinnabarina* (Llave & Lex.) Hemsl. [syn. *Dichromanthus cinnabarinus* (Lex.) Garay and *Stenorrhynchos cinnabarinus* (Lex.) Lindl.]. *Spiranthes cinnabarina* (Llave & Lex.) Hemsl. occurs in the Valley of Mexico, in sod and in dry brush land, at 2250–2600 m above sea level (Peña 1990). The scape and inflorescence are attractive and suggest uses as a bedding plant, pot plant, or cut flower (Fig. 1).

Wild plants of *S. cinnabarina* were examined that were growing inside the property of the Universidad Popular Autonoma del Estado de Puebla, in Cholula, Puebla, Mexico (19°N 2100 m above sea level) where the Centro de Investigación Universitaria and the Germplasm Bank of Flowering Bulb Species are located. The climate is temperate, subhumid, with rainfall in the summer. Precipitation in the driest month is below 40 mm. The winter precipitation is less than 5% of the annual total (798 mm). The temperatures of the coldest month range from –3° to 18°C. The dry season has spells of precipitation, sometimes extending for three days. The wet season presents frequent spells of hot weather, lasting from two to three weeks. Rainfall is usually brief and intense. Evaporation rate exceeds precipitation almost three times, resulting in rapid development of soil water deficit due to sandy volcanic soils.

The first group of wild *S. cinnabarina* was found in partial shade accompanied by pasture plants, under *Eucalyptus* trees. The dry remains of grasses were burned yearly, leaving ashes and unburned remains, an old system of agriculture in Mexico, still commonly used by farmers and gardeners. The second group of wild plants, in the pasture in the open field at the same location, were growing in a layer of 5–10 cm of accumulated organic matter which contained residues from a steel factory. The third group, forming part of the collection in the Germplasm Bank, was situated in the same area, in beds, in the open field, in sandy, volcanic soil containing some added organic matter.

*Spiranthes cinnabarina* is an herbaceous, perennial plant that is adapted to a range of soil physical conditions. This species, when found in localities with frequent rainfall or where water accumulates, gave higher shoots, larger inflorescences and more brilliant orange coloration. It is adapted to xerophytic conditions and extended spells of drought during the vegetative season, suggesting landscaping uses especially in urban areas. This species develops fleshy, fasciculated roots at a depth of 20 to 30 cm. The fleshy root system may explain the species tolerance to transplanting, characteristic of the genus (Orpet 1914).



**Fig. 1.** Flowering stem of *Spiranthes cinnabarina*.

## CULTURE AND USE

The growing season is determined by the start of the rainy season, and the dormancy of the bud located upon a short, underground shoot. The dormancy period usually begins in the second half of October and lasts until May or June.

Trimmed bare root plants in the flower bud stage or with 30% of flowers opened can be air dried for 3 days, and then successfully transplanted. At the beginning of the growing season when plants were transplanted at the rosette stage (5–6 leaves) only one out of 108 plants was lost; when transplanted at the flowering stage bare root all 50 plants survived.

Plants grown in pots, flowered yearly for three years. The plant diameter at flowering stage ranges from 20–30 cm. The scape is covered with several bracts, being longer at their base. The inflorescence is a spike whose dimensions vary with the soil, water conditions, and solar radiation.

The plant can be grown in mass in parks, gardens, and urban areas in beds or pots. The medium height flowering scapes have orange flowers that turn to coffee-black starting at the base of the spike. Although this is a disadvantage for cut flowers, in group plantings the black flowers provide a contrast to the upper orange flowers which is attractive. At the end of the growing season the dead, above ground parts, should be trimmed.

The stems are resistant to winds. Both the “bud,” and the open flower are attractive in color and form. The inflorescence, slowly opens from the base to the apex but its esthetic value is lost when more than 70–75% of the spike is opened. The remains of the flowers do not abscise but remain attached to the spike. Low scape height for group planting and, for use as a pot plant would be desired. A low scape genotype has been found and is currently under observation.

The stem can be used as a cut flower and for arrangements. The stem should be cut above the third leaf. The individual flowers opened continually. The stems held in water, without preservative, in a room of northern exposition (19°C day, 16°C night), lasted 10–14 days. Inflorescences wilted, after the stem was cut at noon, in full sun, but regained normal rigidity easily when the stem was placed in water within an hour. However, the inflorescence bent if the time from cutting to placing in a vase exceeded 1 h.

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