

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

Plant Abstract

Element Code: PMORC1C040

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Hexalectris spicata* (Walter) Barnhart

COMMON NAME: Crested coral root, Crested coralroot, Spiked crested coralroot, cock's comb, dragon's claw, Raíz-de-coral crestada [Spanish]

SYNONYMS: *Arethusa spicata* Walter, *Corallorhiza arizonica* (Walter) Tidestrom

FAMILY: Orchidaceae

AUTHOR, PLACE OF PUBLICATION: *Hexalectris spicata* (Walter) Barnhart, *Torreyia* 4(8): 121. 1904. *Arethusa spicata* Walter, *Flora Caroliniana* 222. 1788.

TYPE LOCALITY: Probably eastern North Carolina.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: In North America, species *spicata* is 1 of 5 in the genus *Hexalectris*, and 1 of 3 in Arizona. Two varieties of *Hexalectris spicata* occur in Arizona, and include *H.s.* var. *spicata* and *H.s.* var. *arizonica*.

DESCRIPTION: Mycotrophic plant, with a leafless, spicate inflorescence, 27-65 cm (11-26 in) tall, nearly 1 cm thick at base. Roots consist of branched, circumferentially ridged rhizomes with few if any fibrous roots. This leafless plant has 3-5 bracts sheathing the stem (leaves reduced to stiff, purplish, sheathing scales). Floral bracts are lanceolate to oblanceolate, 5-10 x 2-6 mm. Flowers 9-20(5-25), 1.5-2.5 x 2-2.5 cm; pedicels 8-20 mm; lateral sepals oblong-ovate to oblong-lanceolate, falcate, apex acute; petals weakly to strongly recurved, elliptic, oblong-obovate, oblanceolate, or obovate, falcate. Sepals and petals are dark pink to tan to brown with faint veining. The lip is white with purple dots, stripes, and ridges, ovate to obovate, clawed, shallowly 3-lobed, fissure between lobes less than 2 mm deep, 1.4 cm wide x 1.6 cm long, with five to seven raised purple ridges down the central lobe with purple lines in lateral lobes. The middle lobe ovate to suborbiculate, margins undulate, lateral lobes incurved, broadly rounded to obtuse, margins entire, apically triangular to rounded. The lamellae 5(-7), central, purple to white; the column is white to yellowish white, apically winged, 11-18 mm, with a slight hour-glass shape and curved when viewed from the side; anthers whitish to yellow; pollinia are yellow. The capsule is ellipsoidal, 1.2 cm long and 0.6 cm in diameter. (Coleman, 2002; FNA 1993+).

AIDS TO IDENTIFICATION: *Hexalectris spicata* is sometimes confused with *Corallorhiza striata*, but can be distinguished by the three-lobed shape of the lip and the raised ridges down the central lobe. The lip of *C. striata* is entire, with fused lamellae on only about the basal third.

Hexalectris spicata is closely related to *H. revoluta*, which shares the same habitat. The sepals are recurved on *H. spicata*, but less than 90 degrees. The petals lean forward over the column and are only slightly, if at all, recurved. The sepals and petals of *H. revoluta* recurved more than 360 degrees, forming tight circles at the apex. (Coleman, 2002).

There are two varieties of *Hexalectris spicata*, and include *H.s. var. spicata* and *H.s. var. arizonica*. The variety *arizonica* grows in Arizona and New Mexico, and is described as self-pollinating, due to the fact that it lacks a rostellum. Since the function of the rostellum is to separate the pollen in the stigma, the lack of one enables autogamy. *Hexalectris spicata* var. *arizonica* can be identified fairly accurately while still in early spike. The spikes have a pinkish brown cast, while *H. spicata* var. *spicata* is much more tan to brownish. (Coleman, 2002). Flowers of var. *arizonica* are cleistogamous or nearly so, occasionally chasmogamous; rostellum as indicated are absent or nearly so; lamellae 0.2-0.7 mm; petals less than 16 x 5 mm. Flowers of var. *spicata* are chasmogamous; rostellum present; lamellae 0.7-1 mm; petals greater than 14 x 5 mm. (FNA 1993+).

ILLUSTRATIONS: Color photos of both varieties (Coleman, 2002: plates 13 and 14)
Color photo of flower (V.S. Engel in Catling and Engel, <http://the-light.com/orchids/ldl1.html>, accessed 2002)
Color photos (D. Mettler and K. Mettler, <http://www.iosoc.com/>)
Color photo (Vankley in <http://www.fp.sfasu.edu/jamesvankley/images/>)
Color photos (Leur, 1975: plate 74)
Color photos (Thomas G. Barnes, in http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=HESP3)
Line drawing (Britton, N.L., and A. Brown, 1913. in http://plants.usda.gov/cgi_bin/plant_profile.cgi?symbol=HESP3)
Line drawing (in Todsens and Spellenberg, 1999 at <http://nmrareplants.unm.edu/reports/hexspi.htm>)
Color photos (J. Mygatt, also Victor S. Engel, in Todsens and Spellenberg, 1999 at <http://nmrareplants.unm.edu/photoimages/collage/hexspi.htm>)

TOTAL RANGE: Scattered in the United States from Florida to Maryland and westward to Arizona and New Mexico, and down into parts of Mexico.

RANGE WITHIN ARIZONA: Cochise, Santa Cruz, Pima (var. *arizonica* only) and Yavapai (var. *spicata* only) counties.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial forb/herb.

PHENOLOGY: *Hexalectris spicata* var. *spicata* flowers from mid-June to early July, while *H.s.* var. *arizonica* flowers from late July to late August (May to July in New Mexico, Todsén and Spellenberg, 1999). The plants of both varieties seldom flower 2 years in a row and often skip several years before reappearing. Plants that emerge with spikes and buds may not proceed to flowering. In both varieties a significant percentage (10-80%, depending on the year) of spikes and buds abort without fully developing, and others are browsed upon. (Coleman, 2002).

BIOLOGY: According to Coleman (2002), this plant “appears above ground only to flower as a stout, leafless, spicate inflorescence. Since these mycotrophic plants lack significant amounts of chlorophyll, the flower stalks are shades of brown, ranging from a yellowish tan to rich, almost reddish dark brown.” This orchid has an obscure symbiotic relationship with mycorrhizal fungi, which is wrapped around the branching rhizomes. They are thought to live in this symbiosis until sufficiently mature for flowering.

HABITAT: In the southwest at the lower end of their elevation range, they grow in oak woodlands, on the wooded sides of canyons, and on canyon bottoms. At the upper end of their elevation range, they grow in mixed oak and conifers. Rarely are the plants out in the open. Typically they are in heavy leaf litter under the drip line of the oaks, pines, and companion shrubs. They are adaptable to a wide range of lighting conditions; from direct sun much of the day to deep shade. (Coleman, 2002).

ELEVATION: 3,480 – 6,950 ft (1061-2118 m) in Arizona and New Mexico. Up to 7,500 ft (2288 m) for their whole range.

EXPOSURE: Shaded.

SUBSTRATE: Limestone, to calcareous sandy or organic soils.

PLANT COMMUNITY: Associated orchids that bloom in the same habitat as *H. spicata* include *Corallorhiza wisteriana* (spiny coralroot), *H. revoluta* (Chisos coral-root), *H. warnockii* (purple-spike coralroot), *Malaxis corymbosa* (Huachuca Mountain Adder’s-mouth), and *M. soulei* (= *M. macrostachya*, Mountain Adder’s-mouth). (Coleman, 2002). In Cochise County, Arizona, known to grow under *Pinus leiophylla* (Chihuahuan pine), and *Quercus arizonica* (Arizona oak) with associated plants including: *Arctostaphylos pungens* (Mexican manzanita), *Brickellia betonicifolia* (Betony-leaf Brickell-bush), *Garrya wrightii* (Wright’s silktassel), *Nolina* (bear-grass), and *Rhus trilobata* (sumac). In Yavapai County, associated species include: *Abutilon parvulum* (dwarf abutilon), *Agave parryi* (Parry’s agave), *Berberis* (= *Mahonia*) *fremontii* (Fremont Mahonia), *Cercocarpus montanus* (Colorado birch-leaved mountain-mahogany), *Cheilanthes* (lipfern), *Coryphantha* (= *Escobaria*) *vivipara* (Foxtail pincushion cactus), *Juniperus osteosperma* (Utah juniper), *Nolina microcarpa* (Sacahuista bear-grass), *Opuntia engelmannii* (New Mexican prickly pear), *Pinus edulis* (Two-needle pinyon pine), and *Yucca baccata* (fleshy-fruit Yucca). (SEINet, accessed 2005).

POPULATION HISTORY AND TRENDS: In Arizona, *Hexalectris spicata* is relatively rare, and in New Mexico, it is considered rare and endangered. When looking at the trend for both states, *H.s.* var. *spicata* is less common than *H.s.* var. *arizonica*. It grows in small colonies, and only a few plants bloom each year. Although still rare, *H.s.* var. *arizonica* is slightly more common, where it is found as widely scattered individuals, though some small colonies develop up to a half-dozen plants. (Coleman, 2002).

SPECIES PROTECTION AND CONSERVATION

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

MANAGEMENT FACTORS: *H. spicata* is sensitive to soil disturbance and compaction. In the southwest, the habitat of this species is at risk to mining activities. According to the Southern Appalachian Species Viability Project (2002), "*Hexalectris spicata* is a wide ranging but infrequently occurring species that is somewhat threatened by land-use conversion, habitat fragmentation, and forest management practices."

PROTECTIVE MEASURES TAKEN: Some plants of both varieties grow within the Chiricahua National Monument, where they are safe from development.

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: NPS – Chiricahua National Monument; USFS – Coronado and Prescott National Forests; State Land Department; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

The species name *spicata*, is from the Latin *spicatus*, “spiked”, referring to the spicate inflorescence.

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