ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PMORC1C030
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Hexalectris revoluta* Correll
COMMON NAME: Chisos coral-root, Chisos Mountain coralroot, Chisos Mountain crested corair, Chisos Mountain crested coralroot, Recurved crested coralroot, curly coralroot, Correll's cock's comb, Raíz de coral revoluta [Spanish]
SYNONYMS: None
FAMILY: Orchidaceae

AUTHOR, PLACE OF PUBLICATION: D.S. Correll, Botanical Museum Leaflets 10(1): 18-20, f. 2. 1941.

TYPE LOCALITY: Mexico: Nuevo León: Sierra Madre Oriental, lower San Francisco Canyon, ca. 15 mi. SW of Galeana, 7500-8000 ft.

TYPE SPECIMEN: HT: GH-2593. C.H. Mueller and M.T. Mueller 767, 10 June 1934.

TAXONOMIC UNIQUENESS: The genus *Hexalectris* contains 10 species, and is only found in the United States and Mexico; the PLANTS Database (USDA, NRCS 2003) reports 5 species. Three species of *Hexalectris* occur in Arizona.

DESCRIPTION: Herbaceous saprophyte (nutrients obtained from soil) perennial, observed singly or in relatively dense clusters of stems. It is mycotropic, leafless, spicate, 40 to 50 cm (16-20 in) tall, with 10 to 20 flowers. It has no roots, but grows from a thick, coralloid rhizome. There are no leaves, which are replaced by sheathing bracts, on maroon stems. Floral bracts are ovate, 8 mm x 3 mm. Flowers are pale pink to rose-tan to whitish, 2.1 cm x 2.0 cm x 1.8 cm. The sepals are pale rose-tan with light veining, revolute with outer third rolled back to form a complete circle. The dorsal sepal is lanceolate, 2.2 cm x 0.8 cm, while the lateral sepals are elliptic lanceolate, oblique, 2.0 x 0.8 cm. Petals are pale rose-tan with light veining, elliptic to obovate, slightly falcate, 0.6 cm x 1.8 cm; revolute, with outer third rolled back in a full circle. In addition to being revolute, the sepals and petals are free and spreading. The lip is three-lobed, 1.5 cm x 1.2 cm, broadly elliptic in outline, white to pale rose-tan, with purple veining on lateral lobes and purple raised ridges on central lobe. The lateral lobes are oblong, with sinus about 2 mm, while the central lobe has 5 or 7 raised ridges running the entire length. The column is narrow, curved, 1.5 cm high, white with purple shading at the base; anther cap yellow, minute wings near the apex; 8 yellow pollinia in four pairs. Capsule is an ellipsoidal, pendant. (Coleman 1999a, Coleman 2002, Correll 1941).

draft

According to Coleman (2002), "Some plants of *H. revoluta* in Arizona differ from the typical flowers described above. They bloom in the same area and at the same time as the other plants, but on a shorter more sparsely flowered stem of richer tones. These plants are shorter than 25 cm and have five or six flowers. Compared to the larger form of *H. revoluta*, the sepals and petals are perhaps more revolute and reflexed backward to a greater extent, and the flowers have more purplish hues throughout."

AIDS TO IDENTIFICATION: The presentation of the sepals and petals of *H. revoluta* is the best characteristic to use for positive identification of the species. The sepals and petals are free and spreading and rolled back along the outer third of their length more than 360 degrees. This feature is not found on any of the other *Hexalectris* species in Arizona and New Mexico (Coleman 2002). Their background color is light tan to pale rose. The lateral lobes of the lip have distinct purple veining over a whitish-tan to rose-tan base. The central lobe of the lip has the raised ridges characteristic of *Hexalectris* (Coleman 1999b). The lip of *H. revoluta* is deeply 3-lobed, whereas the lip of *H. spicata* is shallowly 3-lobed. The lamellation of the lip is somewhat similar in the two species, but it is not as prominent in *H. revoluta*. *H. spicata* has five prominent keels at the base of the middle lobe, while the lip of *H. revoluta* has four slightly raised keels (Correll 1941). See Correll (1941, page 18), for a line drawing of the lips of these two species.

ILLUSTRATIONS: Photos and line drawings of flower and lip (Coleman 1999b).
Line drawing of flower lip (Correll 1941).
Color photo (C.H. and M.T. Mueller *in* GH at http://brimsa.huh.harvard.edu/cms-wb/specimens.jsp?id=123926)
Color photos (D. Louie, *in* http://cswgcin.nbii.gov/ecoregion/trans-pecos/sensitiveplants/chisoscoralroot.html)

TOTAL RANGE: Southeastern Arizona, the Big Bend area of Texas, and northern Mexico, in Nuevo Leon. The populations in Arizona represent the northern and western most range of this species. It is not known from New Mexico. The range of this species may be broader, however few individuals have been observed. Often the above-ground portions of these orchids are not produced, perhaps due to drought. (NatureServe 2003).

RANGE WITHIN ARIZONA: Occurs in only three widely separated canyons in Pima and Santa Cruz counties. They include the Santa Rita and Baboquivari mountains, Pima County, and the Santa Rita Mountains, Santa Cruz County. A fourth location in Cochise County is suspected, however, in 1998 the spikes all withered before the buds were mature enough to make a positive identification. No plants appeared at the site in 1999, although habitat is the same at all locations. (Coleman 1999b).

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous mycotropic perennial.

PHENOLOGY: Flowers May - June in Arizona. Flowers June - July in Texas (Correll and Johnston 1970); June – August per NatureServe (2003).

BIOLOGY: This is a mycotropic orchid, which depends on fungi for nutrition. The number of above ground stems that appear in a population is apparently very variable and can fluctuate greatly from one year to the next.

HABITAT: *Hexalectris revoluta* grows under trees and shrubs on the edges of the canyon bottoms, and on hillsides leading up from the canyon. Under oaks, *H. revoluta* is found in heavy leaf litter, but closer to the canyon bottom it is found in very thin humus layers. In some areas, this orchid is found among rock outcrops or on the edges of rocky cliffs. (Coleman 2002).

ELEVATION: Approximately 4,500 - 5,200 ft. (1375-1590 m) in Arizona. About 5,000 - 8,000 ft. (1525-2440 m) in Mexico. From 4,100-8,000 ft (1250-1680 m) in Texas (D.A. Louie in USGS, NBII).

EXPOSURE: Various, but usually in moderate to partial shade.

SUBSTRATE: In soil and duff of areas with heavy leaf litter. Found in sandy loam with leaf litter in Baboquivari Mountains.

PLANT COMMUNITY: This species typically occurs in oak and oak-pine-juniper forests within Madrean evergreen woodland communities near the transition zone with semi-desert grassland communities, as defined by Brown (1994). Although oaks dominate in Arizona communities, trees and shrubs in the canyon include juniper (*Juniperus*), mesquite (*Prosopis*), Arizona black walnut (*Juglans major*), acacia (*Acacia*), and desert willow (*Chilopsis linearis*), (Coleman 1999b, Coleman 2002). In Baboquivari Mountains, associated with *Quercus oblongifolia* (Mexican blue oak), *Platanus wrightii* (Wright sycamore), *Galium* sp. (bedstraw), and *Stachys coccinea* (Texas hedgenettle).

POPULATION TRENDS: *Hexalectris revoluta* has not been observed in one of the four known locations since 1981, despite repeated recent searches (Coleman 2002). The 3 known remaining populations from Arizona are small, with less than 100 individuals in each and usually less than 30 plants appearing above ground in any given year. It is extremely rare throughout its range and should be nominated for federal consideration as an endangered species (Coleman 2002).

draft

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: None
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
Bureau of Land Management Sensitive (USDI, BLM AZ 2000)

MANAGEMENT FACTORS: *Hexalectris revoluta* is known from only 3 locations in Arizona. None of these populations are considered large. According to Coleman (2002), "Some of its habitat in Arizona is at extreme risk from mining development. One of its major locations was briefly part of a planned land exchange between the U.S. Forest Service and a mining company until falling copper prices forced postponement of the deal."

CONSERVATION MEASURES TAKEN: *Hexalectris revoluta* was listed "Forest Service Sensitive" in 1999, and "BLM Sensitive" in 2000. It is likely that this species will someday make the Arizona Department of Agriculture's list of protected native plants. It did not make the list in 1997 because it was only recently (~1998) proven that it occurred in Arizona.

SUGGESTED PROJECTS: Monitor known populations and search areas of suitable habitat for new populations.

LAND MANAGEMENT/OWNERSHIP: BIA - Tohono O'Odham Nation; USFS - Coronado National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Brown, D.E., ed. 1994. Biotic communities: southwestern United States and northwestern Mexico. University of Utah Press. Salt Lake City, Utah. 342 pp.

Coleman, R.A. 1999a. Description of *H. revoluta*. Email to L.B. Kirkendall.

Coleman, R.A. 1999b. *Hexalectris revoluta* in Arizona. North American Native Orchid Journal 5(4): 312-315, 372.

Coleman, R.A. 2002. The wild orchids of Arizona and New Mexico. Comstock Publishing Associates, a division of Cornell University Press. Ithaca, New York. Pp. 98-102.

Correll, D.S. 1941. Studies in *Isochilus*, *Mormodes*, and *Hexalectris*. Botanical Museum Leaflets 10(1): 18-20.

Correll, D.S. and M.C. Johnston. 1970. Manual of the vascular plants of Texas. Texas Research Foundation. Renner, Texas. Pp. 446-447.

draft

Integrated Taxonomic Information System (ITIS). Retrieved 3/16/2004 from ITIS, http://www.itis.usda.gov.

Harvard University Herbaria (HUH). 2001. Index of Botanical Specimens. Accessed: 3/16/2004, from http://brimsa.huh.harvard.edu/cms-wb/specimens.

Http://www.orchida.org/ooc/Genera/Hexalectris/revoluta/index.shtml. 1997.

Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Hexalectris revoluta* Correll. http://mobot.mobot.org/cgi-bin/search_vast. Accessed: 16 Mar 2004.

NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life [web application]. Version 1.8. Arlington, Virginia. Available: http://www.natureserve.org/explorer. (Accessed: March 16, 2004).

USGS/NBII. BIBE Rare and Threatened Plants, Chisos Coral-root. Accessed 3/16/2004 from http://cswgcin.nbii.gov/ecoregions/trans-pecos/sensitiveplants/chisoscoralroot.html.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Ron Coleman – Tucson, Arizona.

ADDITIONAL INFORMATION:

The McCleary Canyon location was recently included within the boundaries of land being considered for trade from the Forest Service to a mining developer. That trade is not currently under consideration.

The name *revoluta* refers to the revolute habit of the sepals and petals.

Revised: 1999-11-08 (LBK)
2000-01-13(DJG)
2004-04-08 (SMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department: 20XX (=**year of last revision as indicated at end of abstract)**. X...X (=**taxon of animal or plant)**. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.

draft