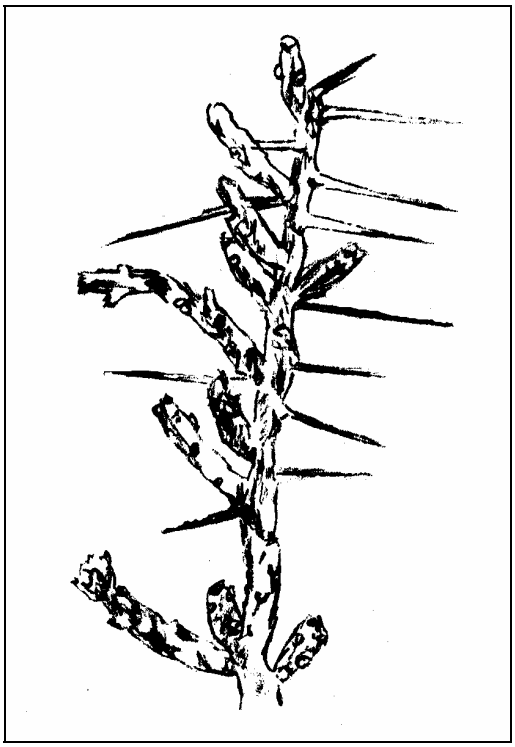
***Opuntia leptocaulis* DC.** desert Christmas cactus
CACTACEAE

Synonyms: *Cylindropuntia leptocaulis* (DC.) D.M. Knuth
Opuntia ramulifera Salm Dyck
Cylindropuntia leptocaulis var. *stipata* Coulter
Cylindropuntia leptocaulis var. *longispina* Berger



General Description.—The common name for *Opuntia leptocaulis* is desert Christmas cactus. This name is likely to have originated because the green - colored fruits turn a very festive red color in December just in time for Christmas. Other common names include slender-stem cactus, turkey pear, tasajillo, aguijilla and garrambulla (Taylor and others 1997, Weniger 1991). In the indigenous language of Nahuatl it is called tzazahuistli (Crook and Mottram 1999). A widely applied name that includes all the long jointed cylindropuntia cacti, of which desert Christmas cactus is one, is cholla. The genus name, *Opuntia*, is taken from the name given to succulent plants that were originally from the old Greek town of Opus. The species name, *leptocaulis* means slender stemmed in Greek (Crook and Mottram 1999). Desert Christmas cactus is an erect shrub that is usually less than 1.5 m tall but can grow up to 2.8 m in shady, protected environments such as under trees (Earle 1990). Although relatively compact, it is extensively branched from a main trunk that is covered by scaly bark in old age. It has pencil-like woody joints that are 12 to 40 cm long and 5 mm in diameter and can be easily detached from the plant. The tubercules, usually less than 1 cm long, may be indistinct and the joints smooth. The areoles, which are the small, clearly defined raised areas on the surface, are oval or almost diamond-shaped with short white wool. The areoles may be spineless or have from one to three spines that are from 19 to 51 mm long. There are few, usually short, yellowish-brown glochids, or minute bristles, in one to three small clusters in the upper part of the areole. The leaves are green, less than 1.3 cm long, and are early deciduous. The greenish-yellow flowers are approximately 1.3 to 1.9 cm in diameter and up to 2.5 cm tall. The fruits are up to 2.5 cm long, and smooth with brown glochids in the areoles. There are usually less than 12 seeds per fruit (Earle 1990, Weniger 1991, Vines 1986). Desert Christmas cactus is a diploid species where n = 11 (McGregor and others 1986).

Range.—Desert Christmas cactus occurs in Arizona, New Mexico, Oklahoma, and Texas in the U.S.A. and in Sonora and Chihuahua in northern Mexico (Bowers 1993, McGregor and others 1986, Powell 1998).

Ecology.—Desert Christmas cactus is a water storer and employs a type of photosynthesis called crassulacean acid metabolism that allows them to make efficient use of available water (Burgess 1995, Nobel 1988). The species is found at elevations below 1,524 m. It grows in most soil types but appears to be most successful in gravelly, sandy, and heavier bottomland soils (Taylor and others 1997, Epple 1995, Rondeau and others 1996, Bowers and McLaughlin 1987, Kearney and others 1960). It is commonly in the same habitat with creosotebush, *Larrea tridentata* (DC) Colville, with which it has a cyclical relationship in the Chihuahuan desert (Yeaton 1978). Creosotebush colonizes sites and modifies microhabitat and edaphic conditions for

desert Christmas cactus establishment and is eventually replaced by it. However, a combination of burrowing rodents and soil erosion increases the mortality rate of desert Christmas cactus while having little effect on creosotebush. The openings left by the dead cactus are then re-colonized by creosotebush.

Reproduction.—Desert Christmas cactus reproduces both sexually by seed and vegetatively. Flowers generally appear in May to July depending upon regional and environmental conditions. In response to wet weather, they can flower as early as April and again in August. The flowers open wide in late evening (Taylor and others 1997). The fruit ripens in December and persists on the plant until approximately February. Seeds may sprout while in the fruit and have a shoot of up to 7 cm long while still on the plant (Weniger 1991). Detached joints root and grow into plants. The terminal stem segments detach particularly easily and readily take root near the parent plant so that natural populations that appear to be dense monocultures of clonal individuals develop (Rebman and Pinkava 2001). Cuttings taken from woody stems do not root easily (Earle 1990). Hybrids between cholla species are common in nature (Rondeau and other 1996). An example herbarium specimen of such a hybrid, *O. leptocaulis* x *O. spinosior* (cane cholla), can be seen on the Internet (Pinkava 2001).

Growth and Management.—Desert Christmas cactus is frequently abundant on overgrazed range (Powell 1998). It tends to form thickets that can become almost impenetrable to humans and livestock. Individual plants can be long-lived and may be more than 53 years old (Goldberg and Turner 1986). In a study over a 72-year period, 40 percent of plants were determined to survive at least 7 years (Goldberg and Turner 1986). Survival after fire is dependent upon the intensity and frequency of the fire (Thomas 1991, Cave and Patten 1994). Plants can re-sprout after the fire kills the above ground parts (Bunting and others 1980). However, desert Christmas cactus appears more susceptible to direct damage from fire than some other *Opuntia* species (Bunting and others 1980). After a fire in a mixed-grass prairie in Texas, mortality was 65 percent in the first year and reached a cumulative value of 80 percent by the fourth year (Bunting and others 1980). Desert Christmas cactus recovery appeared particularly sensitive to the amount of precipitation. Precipitation was required before plants would re-sprout. Plants tolerate minimum temperatures of 7.3 ^{o}C in cultivation (Innes and Glass 1991). In cultivation, desert Christmas cactus is susceptible to the cochineal bug and periodic oil spray is recommended (Earle 1990).

Benefits.—Weniger (1991) describes it as a major pest and "probably one of the most hated cacti in our area [Texas]." This is an unfortunate sentiment because, although the spines can impale people and livestock that venture too close, it provides significant food, protected nesting sites, and cover for a variety of wildlife (Earle 1990, Dayton 1931). Most birds, including the bobwhite quail and wild turkey, as well as small mammals, favor the fruit (Powell 1998, Taylor and others 1997). Some animals, such as white-tailed dear, consume the joints as well as the fruit (Everitt and Drawe 1993). There is apparently no seasonal variation in the crude protein content of the stems, which is similar to the fruits; both are 8 percent (Taylor and others 1997). The larger shrubs provide cover and nesting sites, especially for the cactus wren. In addition, there is now a commercial value to maintaining these shrubs. Land management for wildlife has become increasingly important to livestock producers in the Western U.S.A. because of fluctuations in livestock prices. In some parts of Texas, income generated from consumptive (e.g., hunting) and non-consumptive (e.g., bird watching) wildlife activities already exceed revenue obtained through livestock operations (Hernandez and others 1999). Under these circumstances upland gamebirds, such as northern bobwhites and Rio Grande wild turkeys, have become particularly important. Recommendations have been made that low, thorny brush composed of species such as lotebush [*Ziziphus obtusifolia* (Hook. ex Torr. & Gray) Gray] and desert Christmas cactus should be protected in order to enhance nesting cover (Hernandez and others 1999) and provide a food source. Desert Christmas cactus also provides refugia to native plant species. A clear example of this on a landscape scale is in Arizona where clumps of tobosa grass are almost completely restricted to refugia that are most commonly under the desert Christmas cactus canopy where it is inaccessible to livestock (McAuliffe 1995). Native Americans gathered the fruits and ate them raw or cooked them into a jam (Earle 1990). The Apache tribes mixed the crushed fruits with a beverage to produce narcotic effects (Moerman 1998).

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