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Page(s): Page 10, Page 11

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closely *Opuntia engelmannii* than any other species. The type is preserved under my inventory number 10,560, collected near Owens Post Office, Arizona, May 3, 1912.

***Opuntia intricata* sp. nov.**

Plants large, half prostrate, with long tangled arms often nearly a m. in length, mostly lying in a mass, one on top of the other; joints obovate, commonly 11 by 20 cm. glaucous blue-green, variable in size but outline quite uniform, pruinosity lost with age; areoles obovate, 3 mm. long on sides, and 4 mm. on edges of joints, with conspicuous wool, brown and tawney white at margin when young, changing in age to dirty gray; spicules rather bright yellow in a compact triangular tuft in upper portion of areole, about 2 mm. long, increasing in age, and at 2 or 3 years filling entire areole which becomes enlarged and subcircular; spines scattering, only on edges of joints, at apex 1 to 3, mostly 1 to 2, basal portion light yellowish brown, fading to white at about half its length, 2 to 3 cm. long, flattened, twisted, not consistently but frequently annular; flowers light purplish, filaments pinkish above, greenish below, style white with a tinge of reddish above, stigma light green, 8-parted; fruit obovate, pyriform, light purplish-red with abundant bloom, rind and pulp tinting tardily, about 4 by 6½ cm.

This species is rather common in the lower parts of the mountain valleys, and upon the sandy alluvial bottoms at the mouths of washes above San Bernardino, California, and in similar positions southward. Old, mature plants have the habits described above. When grown under cultivation, however, the plants may be erect, or ascending until the arms reach a length of 50 to 75 cm., when they begin to bend over in a tangled mass upon the ground; or as is frequently the case in cultivation, break off at the articulations. This species is found in some of the European collections, and there is not much doubt but that their material was secured originally from A. H. Alvord of San Bernardino, California, who made extensive collections in the region. It has been referred by European collectors as a variety of *Op. basilaris* but it does not belong to that group. This description has been prepared from various notes made in the field, and from cultivated plants grown at Chico, California. The type bears my collection number 10,372 from near San Bernardino, California, May, 1912.

***Opuntia aciculata* sp. nov.**

A low hemispherical shrub, 1 m. high, and 1½ to 2 m. in spread of branch, erect or main arms ascending or even resting on edge, and the secondary erect from them; joints ovate to obovate, mostly pointed above and below, 15 by 20 cm., but the older joints on our plants only 12 by 17 cm., dark green with some bloom; leaves circular in section, subulate, cuspidate, 7 mm. long, gradually recurved as they age; areoles subcircular, varying from 4 to 6 mm. in diameter with the conspicuous brown wool 1 mm. or more above the surface of the joint, about 2½ cm. apart on sides of joints; spicules bright brown, conspicuous and formidable, 5

to 7 mm. long, and tips lighter colored, nearly uniformly scattered throughout the areoles, the tips of the tufts measuring 10 to 12 mm. in spread; spines very few, only an occasional one on an occasional areole, brown, sloping down, 1 to 2 cm. long; flowers yellow with greenish centre 9 cm. in diameter, filaments greenish tinged, style white, stigma dark green, subglobose, 8 to 10-parted; fruit pyriform, deep purplish-red all the way through, having a little bloom up to early maturity.

The type is preserved under my inventory number 10,300, and was collected near Laredo, Texas, June 26, 1911. The description was drawn from cultivated plants grown at Chico, California, May 21, 1914. The distinguishing characters of the species are prominent, brown, abundant spicules, pointed joints, and remarkably few spines. It differs from *Opuntia tardospina* in being smaller in stature throughout, in being almost spineless even in age, and in having differently shaped joints.

***Opuntia cretochaeta* sp. nov.**

Plants tall, arborescent, open-branched, 4 m. high or more in nature, with a distinct cylindrical trunk a meter or more long; joints obovate, 17 by 32 cm., widest at or above the middle, usually broadly rounded above and narrowed below, yellowish-green at maturity, but dark green when young, especially in shaded portions, smooth; areoles obovate, about 4 by 5 mm. and 3 to 3½ cm. apart, at first prominent, turning gray; leaves conical, 4 mm. long, cuspidate; spicules light-yellow, not conspicuous until toward close of growing season but then becoming formidable in a large compact tuft, 5 mm. long in the upper portion of areoles, increasing greatly in length and numbers in age; spines white, at first, single porrect, then 2 and spreading, but at 1 year of age 3 to 5 spreading, the longest 4 or 5 cm. in length, the others shorter, flattened, twisted, and variously bent, increasing greatly in length and numbers in age, often becoming 6 or 7 cm. in length, and 12 to 18 in number, often in transversely elongated areoles a cm. in width at 4 years of age; flowers deep orange-red when opened, dark greenish red with tinge of purple in bud, 5½ cm. in diameter when fully opened; filaments greenish below and white with very faint reddish tinge above, style bright glossy red, with tinge of purple at top, stigma very light greenish with slight purplish tinge on side of dorsal groove, 6-parted; ovary obovate to clavate, 28 by 50 mm., tubercular-raised at areoles, with small brown areoles 1½ mm. in diameter, 8 mm. apart; fruit light purplish-red, the entire surface areolated, bearing commonly 1 white spine in upper areole, obovate, about 3½ by 5 cm.

This species was collected originally near Dublan, Mexico, August 31, 1906, under my inventory number 8465. It has been grown at Chico, California, as well as at Brownsville and San Antonio, Texas.

***Opuntia eocarpa* sp. nov.**

A reclining to ascending, spreading shrub, 75 cm. high and 150 cm. or more in spread, the main branches commonly resting on their edges and