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Additional species of *Opuntia*

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(WITH PLATE 30)

Plants of the following species have been growing in our collections for the past five to eight years. Some of them have been held under provisional names for a long time in the hope that they might eventually be referred to species already described. They can not, however, be so referred and must receive new names.

✓ *Opuntia columbiana* sp. nov.

A low, half prostrate species, seldom over 15 cm. high; the distal joints mostly erect, the ones on the ground rooting freely; joints narrowly obovate, about 5 × 15 cm. in last year's growth, at first yellowish to medium light green but the second year becoming decidedly yellowish green, slightly raised at areoles, fragile, and easily broken, making it very difficult to grow plants to maturity; areoles subcircular to obovate, 2 mm. long, enlarging in age and prominent, 2 mm. high on account of the profuse development of wool, light brown; spicules yellow at first, in a compact tuft 1 to 1.5 mm. long in upper part of areole, later, especially the second year, becoming unequal and scattering, and 5 mm. or more in length; spines yellowish to white, centrals one to three with one long, porrect or sloping down 3-4 cm. long and the other one or two 2 cm. long and widely spreading, and commonly three or four about 1 cm. long in the lower angle of the areole tightly recurved, often there are two or three porrect-spreading, long spines, and the others (three short and about two 2 cm. in length) all tightly recurved; flowers light yellow, filaments reddish brown, style white, stigma light green.

This species is apparently confined to the sandy lands along the Columbia and Snake River valleys, and is particularly abundant near Pasco, Washington. The above description applies to my inventory No. 10041, from Pasco, Washington, but the spines vary greatly in color, and associated with this difference in color of the spines is a comparable difference in coloration of the plant body. Specimens collected under my inventory No. 10042 have

darker colored spines; the joints commonly about 4×9 cm. and the spines in part brown, especially on apex of joints.

Opuntia cucumiformis sp. nov.

A low, branched, cylindrical-oval-jointed plant, 18 cm. high and 35–50 cm. in diameter; at first yellowish green, turning gray; joints 10 cm. long, 3.5 cm. in diameter, broadly pointed to rounded above, cylindrical, tubercular, raised at areoles, the low, rounded ridge extending downward 1.5–2 cm.; areoles obovate, 2.5 mm. long, gray, rather sunken, 1.5–2 cm. apart, only upper ones armed; leaves conical, ascending, 5 mm. long, slightly flattened on inside; spicules yellowish, at first not visible but at one year of age filling entire areole, which becomes subcircular, the spicules developing in successive lengthening zones from center of pulvinus; spines yellowish, translucent, bone-like, 1–2.5 cm. long, porrect, diverging but slightly, one to five in upper areoles only, not sheathed; flowers deep yellow, lighter within, having faint tinge of red in upper edges, about two rows of petals opening to 4 cm. in diameter; filaments white, style white, stigma white, variable, six-parted, small; bud distinctly reddish tinged at apex which is bluntly pointed and subtended by spicules, 3–5 mm. long, from the marginal areoles of the ovary; fruit oval to obovate, about 16 by 38 mm., deeply pitted at apex with small cavity about 4 by 8 mm. containing numerous small, atrophied ovules, its areoles small and distant below but closer above, bearing around top of ovary one or two yellowish spines 12–15 mm. long, and a small tuft of spicules 4–5 mm. long.

This species has been received from European collections as *Opuntia ciribe* Engelm., a native of the peninsula of Lower California, but it has little relation to that species and in all probability is native to the Cordillera region of South America. Several plants of it have been grown to maturity, but in no case have the fruits, which are produced in considerable abundance, matured seeds. The pulp cavity is always empty and the fruit remains attached to the plants indefinitely.

Opuntia calantha sp. nov.

A low, creeping, prostrate species, 15 cm. high and a meter in spread; joints obovate, sub-pointed above and below, inequilateral, about 4×11 cm., tuberculate-wrinkled, mostly deep green; areole small, 1–1.5 mm. long, obovate, at first tawny, turning gray; leaves small, subulate, cuspidate, red, 1 mm. long;