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Cactaceae of the boundary / by George Engelmann.

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remotis griseo-tomentosis; setis flavis rigidis valde inæqualibus sparsis; aculeis paucis (in areolis superioribus plerumque 2-3) validis compressis seu angulatis rectis seu subinde curvatis deflexis seu varie divergentibus stramineis corneisve basi rufis, cum adventitiis inferioribus 1-2 gracilioribus pallidioribus sæpe deficientibus; floribus flavis intus rubellis; ovario obvato-subglobozo seu rarius elongato subclavato sepalis e basi lata subulatis et pulvillis 20-25 griseo-sue fulvo-tomentosis parce setosis instructo; sepalis tubi sub-13, exterioribus ovato-lanceolatis acuminatis, interioribus orbiculato-obovatis cuspidatis; petalis 8-10 obovatis subspathulatis obtusis mucronatis; stylo crasso parum tumido; stigmatibus 8-10 erectis; bacca globoso-obovata seu rarius pyriformi late umbilicata; seminibus minoribus sub-irregularibus plerumque anguste marginatis. (Tab. LXXV, fig. 1-4.)

From the Canadian river, *Bigelow*, to New Braunfels, in Texas, *Lindheimer*, and to the mouth of the Rio Grande; westward to the Pecos and Presidio, *Bigelow*, El Paso, *Wright*, and perhaps to the Pacific, *Parry*, south to Chihuahua, *Wislizenus*: fl. May and June.—A stout, coarse-looking plant, 4-6 feet high; lower part of old stems woody with loosely reticulated ligneous fibres, and with grey bark often covered with lichens, about 6 inches in diameter. Joints, in the larger specimens, one foot long, 9 inches in diameter; leaves subulate, 3-4 lines long, patulous; pulvilli $1\frac{1}{4}$ - $1\frac{1}{2}$ inch apart, 3-4 lines in diameter; bristles coarse, sparse and very unequal; longer ones on the upper edge of the pulvillus sometimes 4-6 lines long; spines $1-1\frac{1}{2}$ inch long, lower smaller ones 6-9 lines long. Flower $2\frac{1}{2}$ -3 inches in diameter, characterized by the usually quite short ovary, and the comparatively narrow and not emarginate petals; ovary commonly $1-1\frac{1}{4}$ inch long, almost globose; in some instances, however, I have seen it clavate and nearly 2 inches long, (perhaps then sterile and inclined to become proliferous.) Fruit subglobose, somewhat contracted at base, nearly 2 inches long; umbilicus about an inch in diameter, flat or a little depressed; fruit dirty purplish, usually with a bright purplish pulp, of an insipid or even nauseous taste. Seeds usually less than 2 lines, in most specimens only 1.5-1.7 line in diameter, of a regular (from Matamoras) or commonly more irregular twisted shape, with an obtuse or acutish, rather narrow margin. Young plants, raised from seed, are characterized by the fascicles of very long ($\frac{3}{4}$ -1 inch) fine woolly hairs on the pulvilli, which appear in the second season, and remain for several years. Among the numerous varieties of this species, the var. *cyclodes*, from the Upper Pecos, has been described in Capt. Whipple's Pacific Railroad Report; another one was collected, by Mr. Wright, on the Limpia, with 1-6 stout, curved spines on the upper pulvilli, and none at all on the lower ones.

Dr. Bigelow distinguishes from this species another plant, which he has frequently observed near Presidio del Norte and Eagle Pass. From his notes, and from the meagre material on hand, I venture to describe it, without asserting its specific difference from the last species.

O. DULCIS (sp. nov.): adscendens, patula; articulis obovatis; pulvillis remotis; setis fulvis difformibus, exterioribus confertis tenuioribus brevioribus subæqualibus, interioribus uniseriatis robustioribus multo longioribus; aculeis 2-3 angulatis sæpius tortis pallidis deflexis, sæpe cum 1-3 gracilioribus; bacca ovata late umbilicata pallida; seminibus minoribus regularibus anguste marginatis. (Tab. LXXV, fig. 5-7.)

A sub-erect, spreading bush, lower and with smaller joints than the last species, and always with a very sweet and pleasant-tasted fruit. Plant about 2 feet high; joints $\frac{1}{2}$ foot long; spines $1-1\frac{3}{4}$ inch in length, almost white; a semicircle of short spines or long bristles distinctly separates the spiniferous from the bristly part of the pulvillus; the bristles themselves are much

more numerous, finer, and more crowded than in *O. Engelmanni*; this arrangement of the bristles I find again only in *O. chlorotica*, Eng. & Big., from the Western Colorado. The spines resemble *O. tortispina*, Eng. & Big., the flower and fruit *O. Engelmanni*, and the seed seems different from all these. Fruit $1\frac{1}{2}$ – $1\frac{3}{4}$ inch long, one inch in diameter; umbilicus $\frac{3}{4}$ inch wide, shallow. Seeds 1.5–2.0 lines in diameter.

O. OCCIDENTALIS, E. & B. in P. R. R., found by *Dr. Bigelow*, "in immense patches, 40 miles east of Los Angeles," California, was also observed by *Mr. Schott* in the high valleys of San Pascual and Santa Isabel, northeast of San Diego, "covering extensive tracts of land." It is probably a good species, and quite distinct from *O. Engelmanni*; young plants, raised from *Dr. Bigelow's* seeds, do not show the peculiar capillary spines of that species mentioned above.

Another *Opuntia* grows on the hillsides and plains near San Diego, *Parry*, and on the sea beach there, *Schott*; an erect plant, 4–6 feet high; spines 2–4, stout, compressed yellowish or brownish, also forming large thickets; joints 6–8 inches long and 4–6 inches wide; ovary subglobose, with 16–20 bristly pulvilli; 15–18 broadly obovate cuspidate sepals; about 8 (?) orbiculate petals; 8–10 stigmata; a large yellowish or purple fruit, of pleasant taste, much relished by the inhabitants. Whether this is a form of *O. Engelmanni* or *O. Tuna*, which, from having for a long while been cultivated about the settlements, may have become naturalized, I cannot at present determine.

4. *O. MACROCENTRA* (sp. nov.): adscendens; articulis magnis suborbiculatis tenuibus sæpe purpurascens; foliis gracilibus lineari-subulatis; pulvillis subremotis orbiculato-ovatis setas graciles breves fulvas tomentum griseum vix superantes gerentibus plerisque inermibus, summis et marginalibus solum armatis; aculeis 1–2 rarius pluribus prælongis rectis seu varie flexuosis fusco-atris sursum pallidoribus sæpe annulato-notatis, superiore terete inferiore subbreuiore compresso seu canaliculato; flore flaro; ovario ovato; pulvillis 20–25 villosis et fulvo-setosis versus superiorem ovarii partem congestis; sepalis tubi 13 lanceolatis seu interioribus obovatis acuminatis cuspidatisve; petalis sub-8 obovatis obtusis mucronatis; stigmatibus 8; seminibus majusculis late obtuseque undulato-marginatis. (Tab. LXXV, fig. 8.)

Sandy ridges in the bottom of the Rio Grande near El Paso, also on the Limpia, *Wright*: fl. in May.—A remarkably striking plant 2–3 feet high—with large, almost rounded, thinly compressed, often purplish joints, and very long nearly black spines—of which it would be very desirable to obtain living plants, as none of those sent home by *Mr. Wright* have survived. Joints 5–8 inches long, 4–7 inches wide; leaves $2\frac{1}{2}$ –3 lines long, remarkably slender; pulvilli $\frac{3}{4}$ –1 inch apart; lower ones smaller and closer together, unarmed; spines on the upper ones 2–3 inches long, lower half almost black; ovary $1\frac{1}{4}$ inch long, 8 lines in diameter; flower 3 inches in diameter when fully open. The seeds sent by *Mr. Wright* as belonging to this species are 2.0–2.2 lines in diameter, much twisted, their border undulating, very similar to seeds of some form of *O. phæacantha*. From this species our plant seems to be distinguished by its larger, thinner, more orbicular joints, the closer and more woolly pulvilli, the slenderer leaves, and the small number of very long spines; the ovary also is more elongated, the sepals narrower, the flower larger.

5. *O. PHÆACANTHA*, E. in Pl. Fendl.: diffusa, adscendens; articulis obovatis seu suborbiculatis crassis glaucescentibus; foliis e basi crassa subulatis; pulvillis subremotis orbiculato-ovatis setas graciles stramineas seu fuscatas tomento griseo plerumque longiores gerentibus