

TWO NEW OPUNTIAS FROM THE
GRAND CANYON REGION IN
ARIZONA

By J. PINCKNEY HESTER

The two *Opuntias* here proposed as new have been studied carefully in the field and both herbarium specimens and photographs prepared for distribution to several institutions. Areas of considerable extent have been explored in order that their range and the degree of variation within the species might be thoroughly worked out.

Opuntia hualpaensis sp. nov.

Plants 1.5 m. high or less, sometimes short-caulescent, usually openly branched from the ground, spreading; roots fibrous; leaves green, terete, caducous, 2-4 mm. long, with acute, pinkish tips; old stems woody; ultimate joints clavate, terete, strongly tuberculate, 5-10 cm. long, 1.5-2 cm. in diameter; tubercles overlapping, arranged in spiralled rows, yellowish green, 1-1.5 cm. long, 4-6 mm. broad and deep; areoles oblong, with short, yellowish felt, glandular on new growth; glochids on terminal joints few, on fruit many, yellowish, in short, compact clusters; spines unequal, 2-4 of them sheathed, gray or brownish, 1-3 cm. long, 3-6 spines acicular, gray, 5-8 mm. long; flowers open one day only from 10 a. m. to sundown in July and August, greenish yellow, irregularly funnelform, 4 cm. wide, about 2 cm. long, terminal; sepals 8-10, obovate, some minutely apiculate, greenish below, Heather (45K1)* around the tip; petals 1.5 cm. wide, and 2 cm. long, obovate to obovate-obcordate, sometimes apiculate, entire below but usually minutely erosulate distally, greenish yellow (17H1), the tip sometimes tinged with Heather; style stout, 1.7 cm. long, yellowish (17H1); stigma-lobes 6, usually in 2 erect, slightly divergent rows, attenuate, obtuse, 3 mm. long, 17H1; filaments 10-12 mm. long, spreading, somewhat attenuate, attached to wall of conical cup near base of style, 17H1; anthers hastate, minute, 0.5-1 mm. long, 17H1; ovary clavate to fusiform, 2.5-3 cm. long and 1.5 cm. in diameter, Danube Green (31A10), tuberculate, the short-felted areoles bearing many short, yellowish glochids and sometimes 2-4 short, gray, acicular, deciduous spines; fruit large, fleshy, clavate to fusiform, persistent for 1 year or more, 3.5 cm. in diameter, 4 cm. long, sometimes proliferous but not more than 2 fruits seen in one chain, remarkably variable in color, the sunny side varying from Peruvian Brown (13L11) to Heather, the shaded side about Bistre Green (13L5), the con-

cal umbilical scar, left by the caducous perianth, 7-9 mm. deep and 9-12 mm. in diameter; seeds about 30, smooth, compressed, 2-3 mm. broad and 1.5 mm. thick; about India Buff (12E5) with a narrow band around the perimeter; hilum an indistinct line across perimeter with a basal dimple on either side; the seeds of mature fruit are on the walls of a cavernous area 1.5 cm. in diameter.

Planta perennis ad 1.5 m. alta laxae patentisque ramulosa; radices fibrosae; folia teretia caduca 2-4 mm. longa apice acuta rosea; caudex maturus lignosus; articuli clavati teretes 1.5-2 cm. lati 5-10 cm. longi tuberculati; tuberculis 4-6 mm. latis altisque 1-1.5 cm. longis spiralis; areolae oblongae tomentum flavidum et glochidia flava ferunt; spinae inaequales, 2-4 spinae 1-3 cm. longae cinereae vel brunneae vaginas chartaceas ferunt, 3-6 spinae aciculares cinereae 5-8 mm. longae; flores infundibuliformes virido-flavi diurnales circa 2 cm. longi 4 cm. lati; sepalis 8-10 obovatis minute apiculatis base viridibus apice roseo-purpureis; petalis circa 1.5 cm. longis apice erosulatis virido-flavidis vel apice roseo-purpureis; stylis robustis 1.6 cm. longis flavidis; lobis stigmatibus 6, obtusis circa 3 mm. longis; staminibus numerosis 10-12 mm. longis; antheris hastatis circa 1 mm. longis; ovarium clavatum vel fusiforme 1.5 cm. diametro 2.5-3 cm. longum viride tuberculatum; areole ovariorum glochidia numerosa breviter flava et 2-4 spinae cinereae aciculares diciduosas ferunt; fructus carnosus clavatus vel fusiformis persistens 3.5 cm. diametro 4 cm. longus; semina circa 30, glabra compressa 2-3 mm. lata lutea-brunnea.

Type: Deposited in the Dudley Herbarium, Stanford University, No. 285575, collected along U. S.-Arizona Highway No. 66, 11 or 12 miles east of Peach Springs and 2 or 3 miles west of Hyde Park, Arizona, by J. Pinckney Hester, July, 1942.

Distribution: In widely separated colonies in northwestern Arizona.

The small glands in the areoles that excrete a clear nectar, only during flowering, probably promote pollination, for many small ants dash madly from areole to areole, pausing at each for the nectar, if any.

As *O. hualpaensis* is a member of the Series 3, THURBERIANAE the key is modified to show its relationship to other species in that series, as follows:

*The color names and keys are from McGraw-Hill Book Company's "Dictionary of Color" by Maerz and Paul.

Bushy or arborescent species, 6 dm. high or higher.

Tubercles narrowly oblong, 1 cm. long or more.

Joints readily detached, - - - - - *O. vivipara.*

Joints not readily detached.

Longer spines 2.5 cm. long or longer.

Flowers orange to scarlet, - - - - - *O. tetracantha.*

Flowers not orange or scarlet.

Flowers purple, - - - - - *O. recondita.*

Flowers yellow with reddish tips, - - - - - *O. hualpaensis* sp. nov.

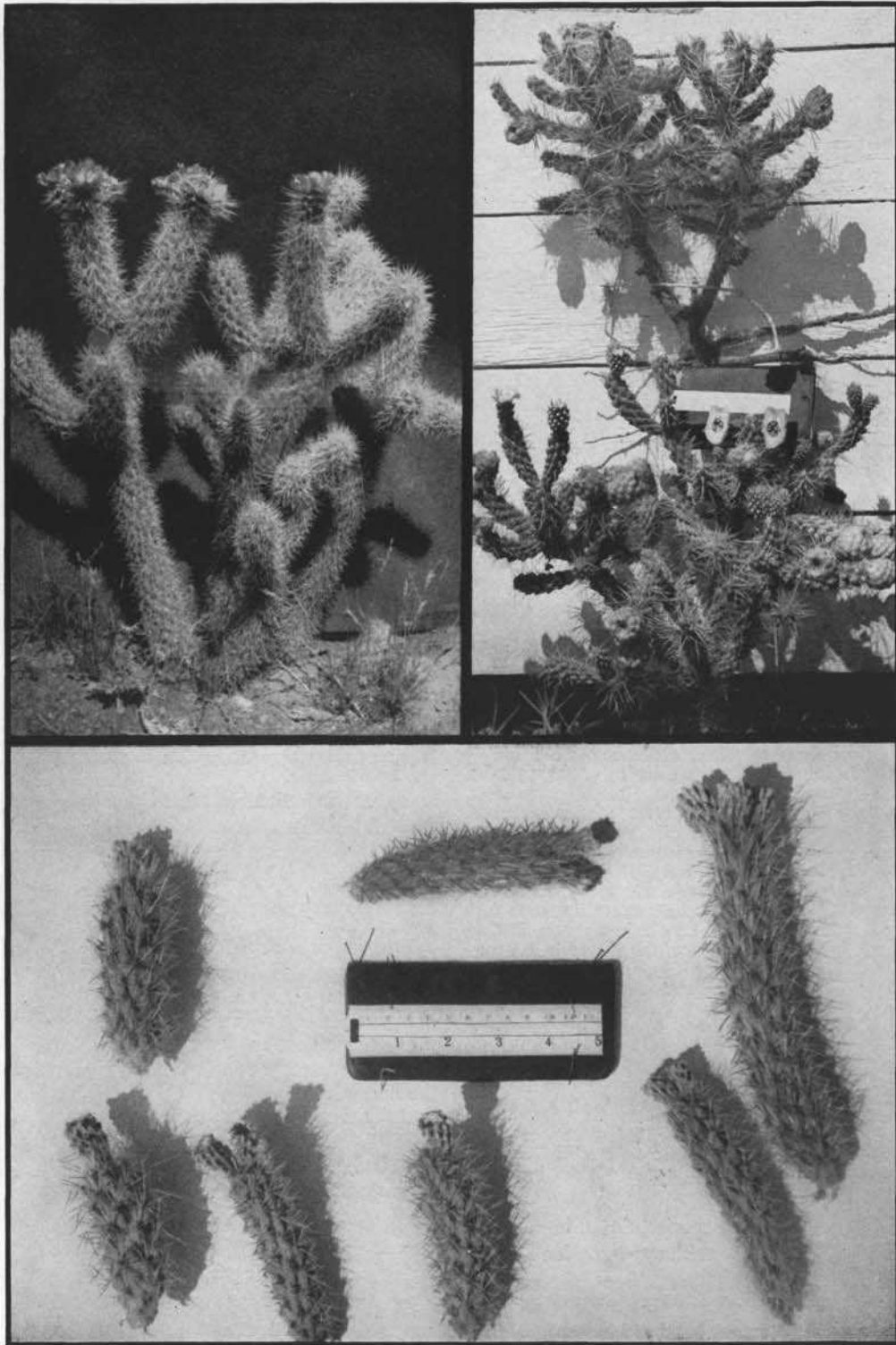


FIG. 94

UPPER LEFT: Flowering plant of *Opuntia abyssii*. UPPER RIGHT: Two plants of *Opuntia hualpaensis* showing fruit and one flower. Note the 5-inch rule between the 2 plants behind a divided fruit. BELOW: Fruit and joints of *Opuntia abyssii*. Photos by author.

The author first saw and collected these plants in 1934 in Peach Springs Canyon, some of which are growing under accession No. p 33 at the Boyce Thompson Southwestern Arboretum, at Superior, Arizona, where cuttings from the type locality are growing under No. Q42. These plants, so far as known, grow only in sandy soil, from the Juniper belt at about 5000 feet elevation down to 3000 feet or even lower, for a large colony of similar plants with seemingly identical fruit and seeds, was found in Boulder Dam Recreation Area at about 2000 feet elevation.

This species is found on and near the Hualpai Indian Reservation, hence the specific name, *hualpaensis*, the availability of which was passed upon by Dr. Ira L. Wiggins, Director of the Dudley Herbarium, Stanford University, to whom the author is indebted for the Latin diagnosis.

Herbarium material, including cuttings, fruit and photographs, was sent to the Arnold Arboretum, Mr. Ira W. Clokey, the Huntington Botanical Gardens, the Missouri Botanical Garden, and the type to the Dudley Herbarium, Stanford University, California.

The reason for writing such a detailed description is the well known and notorious fact that most of the confusion in the Cactus World has its origin in the abbreviated, incomplete, or erroneous original descriptions, too often based on insufficient, fragmentary, or inadequate material.

Opuntia abyssii sp. nov.

A low, spreading, caulescent, openly branched bush 9 dm. high or less; trunk short, cylindrical, woody, 7 cm. in diameter or less; branches terete, jointed, tuberculate, not readily detached, usually set at an acute angle to the trunk; ultimate joints cylindrical, 11-15 cm. long and 2.5-3 cm. in diameter; tubercles firm, gray-green, overlapping, usually in 7 spirally arranged rows, about 1.8 cm. long, 6-8 mm. thick, and 4-5 mm. tall; areoles oblong, bearing short gray wool in youth only, spinescent below, glandular on the ovaries, about 2 mm. wide, 4 mm. long, glochids absent on new growth; spines 10-14 in each areole, white or gray, acicular, radiating, unequal, the larger ones in the center sheathed, 5-20 mm. long; leaves terete, 4-5 mm. long, green, with acute, pinkish tips; flowers opening in April and May, rotate, terminal, yellow-green, 3.5-5 cm. in diameter, 3 cm. long or less, each remaining open continuously for several days, finally wilting and closing around the style; sepals 8-12, apiculate, obovate to obovate-obcordate, entire, 1 cm. wide or less, midsection greenish, base rather fleshy; petals 5-12, not fleshy, about Javel Green (19L2), obovate or obovate-obcordate, sometimes minutely apiculate, entire below, erose or finely fringed around the outer end, about 2 cm. long and 8-13 mm. wide, the dried perianth caducous; filaments spreading, attached to walls of conical cup, 5 mm. long, Aureolin (10L2); anthers 2 mm. long, Light Chrome (10L4); style robust, attenuate, Endive (17L3), 2 mm. in diameter, about 1.6 cm. long;

stigma-lobes 4, about 3 mm. long, attenuate, slightly spreading, usually obtuse, sometimes abruptly apiculate, Aureolin; ovary Forest Green (12L6), somewhat clavate, about 2 cm. long, 1.5 cm. in diameter, tuberculate, the tubercles usually in 7 spirally arranged rows, 2 cm. long or less, 2.5 mm. wide and high; areoles circular or short-oblong, bearing a few short, white glochids above, many weak, caducous spines to 1.5 cm. long below, and minute glands in center that exude a clear nectar; fruit persistent, yellow-green, somewhat clavate, tuberculate, glabrate, 2.5 cm. long, 1.5 cm. in diameter; umbilical pit conic, 1 cm. deep; seeds numerous, sometimes 100 per fruit, flattened, gray, smooth, 3-4 mm. broad, 1.5 mm. thick; circular in outline around the perimeter which bears a narrow band, hilum sometimes minutely beaked, usually a mere line 1 mm. deep across the basal perimeter.

Planta perennis humilis patente ramosa 9 dm. alta, ramulis teretibus articulatis tuberculatis, articulis cylindricis 2.5-3 cm. diametro 11-15 cm. longis; tuberculi cinereo-virides circa 18 mm. longi 6-8 mm. lati 4-5 mm. alti; areolae oblongae 2 mm. latae 4 mm. longae spinas inferiore et areolae juveniles tomentum brevum cinereumque ferunt; spinae 10-14 albides vel cinereae aciculares inequales 5-20 mm. longae, spinae longiores centralesque vaginas chartaceas ferunt; folia teretia 4-5 mm. longa viridia acuta apice rosea; flores rotati 3.5-5 cm. lati circa 3 cm. longi flavidovirides, sepalis 8-12 apiculatis obovatis vel obovato-obcordatis integris circa 1 cm. latis base carnosiss; petalis 5-12, flavido-viridis 8-13 mm. latis circa 2 cm. longis obovatis vel obovato-obcordatis per occasionem minute apiculatis base integris apice erosulatis; stamina numerosi, antheris 2 mm. longis; stylus robustus circa 1.6 cm. longus, lobis stigmatis 4 circa 3 mm. longis; ovarium clavatum 1.5 cm. latum 2 cm. longum, circa septem series tubercularum fert; fructus clavatus flavido-viridis tuberculatus glabratus 1.5 cm. latus 2.5 cm. longus; semina 3-4 mm. lata compresso-orbicularia cinerea.

Type: Deposited in the Dudley Herbarium Stanford University, No. 285624, collected in Peach Springs Canyon, which empties into Diamond Creek about 3 miles from the Colorado River in Grand Canyon, Hualpai Indian Reservation, northwestern Arizona, by J. Pinckney Hester, in 1939.

Distribution: Known only from the type locality where it first appears about 7 miles north of Peach Springs Post Office; thence northward, being most numerous about 13 miles down the canyon, whence it extends to Diamond Creek in ever diminishing numbers. The rocky hill-sides and boulder-strewn floor of the canyon are the favored haunts of this distinctive species which flourishes with what appears to be *O. acanthocarpa*, from which it is a probable mutant. *Opuntia basilaris* and *Phelosperma tetran-cistra* also grow here, with *Ferocactus Lecontei* (?), *F. xeranthemoides*, *Pentstemon Palmeri*, and *O. hualpaensis* flourishing much higher in the upper end of the canyon.

Britton and Rose's key to the Series 4. ECHINOCARPAE modified to include the new species follows:

Tubercles short, less than twice as long as wide.	Fruit short-spiny, little tuberculate.
Spines with yellow-brown sheaths	- - - - - <i>O. serpentina.</i>
Spines with white or straw-colored sheaths.	- - - - - <i>O. echinocarpa.</i>
Tubercles elongated, 2 to 3 times as long as wide.	
Fruit long-spiny.	- - - - - <i>O. acanthocarpa.</i>
Fruit short-spiny.	
Fruit strongly tuberculate, caducous-spiny or glabrate.	- - - - - <i>O. abyssi.</i>
Fruit little tuberculate, short-spiny.	- - - - - <i>O. Parryi.</i>

Herbarium material, including cuttings and photographs, was sent to the Huntington Botanical Gardens, the Missouri Botanical Garden, Mr. Ira W. Clokey, and the type, including pressed flowers, to the Dudley Herbarium, Stanford University. Several of the plants collected in 1939 are now growing at the Boyce Thompson Southwestern Arboretum, Superior, Arizona,

under accession No. P32.

The specific name *abyssi* was selected as the proper form of the name suggested by the author upon the advice of Dr. Ira L. Wiggins, who also wrote the Latin diagnosis.

Ranchito Bella Vista,
Saint George, Utah.

MEETING EASTERN CACTOPHILES IN 1943

I had some important reasons to take a trip back east last spring. I was there only three weeks but between the other matters I managed to have a good time with a few cactophiles. I like cactus people and feel at home with them. Most of us do. Most of my past contacts with them have been by letter, now I saw some of them in person.

I spent a week close to Philadelphia. During that time I visited four collectors and their plant pets. Mrs. Fenton of Upper Darby is an old friend by correspondence. She lives in a row of small, comfortable houses with a tiny square of front yard. It was late in May. Her plants were all in the front yard. Some were on a stand, others setting about in strategic spots in the yard. They were all still potted. Mrs. Fenton likes variety, prefers cacti to succulents. So does her friend, Mrs. Barnes of East Lansdowne, another Philadelphia suburb. Mrs. Barnes had her plants sitting on a bench in the back yard. Visiting Mrs. Barnes that day was Mrs. Carlitz, so I must visit her collection, also. She lives in an apartment with good south windows. Her plants are in beautiful containers and she has a flair for arrangement. She prefers all very small types of plants. Mr. Boone, another correspondent, prefers Haworthias and is gradually accumulating a nice collection. He lives in a small house in a city block. There is only a tiny back yard. His Haworthias were in a living room window and showed his great care for them. Later he sets them out in the yard he told me.

I had six days in New York. I met two good collectors there, one a former correspondent, the other a new friend by way of the JOURNAL. The former is Dr. H. E. Anthony, whose home is in Englewood, N. J. Dr. Anthony and his daughter took me to see the famous New York Botanical Gardens. I was much impressed by the fine collection of succulents there. The Mesemb. stemless types, were a sight to see. So were the Haworthias, and kindred plants. The latter are my favorites of the succulents. On another day I visited the Anthony's in their home and saw the Doctor's nice little greenhouse built with its back to the garage. He is collecting Epiphyllums, Echeverias, and Stapelias. The greenhouse is heated by a small stove in the garage with heat piped to it. Dr. Anthony says that there is no cactus club in New York. I wonder if this is really true. I never heard of one, but it could easily hide in that huge city. The other collector I visited was sixteen-year-old Eileen Curran

of Staten Island. She has about two hundred plants of the small types. She is very fond of Haworthias, also. She knows her plants by name, and many things about them. She has the best collection of books I have ever seen in the hands of a private collector and *she studies them*. She has quite a problem, that most of us do not have: living so close to the sea, the air is extremely humid and watering is a real problem.

I also visited the Botanical Gardens in Washington, D.C. Not knowing any cactophiles in Washington, I went alone. The collection is small and I would guess rather new. I'd like to know more about it.

And last but not least I spent three days in Chicago. This was a real treat, also. It just happened that I had a chance to visit both the Cactus Society, and the Cactus Club. There are a few members that belong to both organizations. I made my headquarters with Mrs. Radden, a good correspondence friend. Mrs. Radden has a lean-to greenhouse on the south side of her home with some five hundred species. She prefers small cacti such as Lobivias, Stenocacti, and Gymnocalyciums. She also likes Euphorbits. Her collection is outstanding in this part of the country. I also saw two other collections; those of Mrs. Berry and Mrs. Glawe. These folks both have small glasshouses. The Cactus Society met at Garfield Park, so I got to meet a number of them. I was roped into making a few remarks at both organizations. Mr. Balthis showed some of us through the Garfield Park conservatory—a most fascinating place. The Club met at the home of Mrs. Hunter. It was evening, and I didn't get there in time to see very many of her plants.

Some day I'm going back over this ground. It was just a taste. And when I go again I want lots of time to see more people and cacti. I was deeply impressed by the devotion of cactophiles to their living collections. This is more than a hobby. As Mr. Cutak has said recently, "It is a cult, in the sense of its being a devotion to a fine idea." ELINOR T. SUTTON.

FROM AMBOY, ILLINOIS

My cactus garden was a riot of color this year, 206 different kinds bloomed for me. We have enjoyed one of those typical, beautiful, warm falls with plenty of sun. Our first killing frost was Oct. 16th, and have only had 2 more since then. Have all my plants, about 1500, put away for the winter. Some of my pots (14-inch) weighed 150 lbs. What we Cactophiles won't do for our hobby?

PROF. ARTHUR BLOCHER.