

Dr. George Engelmann

Smithsonian Contributions to Knowledge.

Dr. George Engelmann
from his friend the author
ON THE

DARLINGTONIA CALIFORNICA,

A NEW PITCHER-PLANT,

FROM NORTHERN CALIFORNIA.

BY JOHN TORREY, F. L. S.

Dr. Geo. Gardner
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1853

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ON THE
DARLINGTONIA CALIFORNICA,
A NEW PITCHER-PLANT,
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THIS new Pitcher-plant was first detected by Mr. J. D. Brackenridge, Assistant-Botanist to the United States' Exploring Expedition, under Captain Wilkes, while passing overland from Oregon to San Francisco, in the year 1842. He found it in a marsh, bordering a small tributary of the Upper Sacramento, a few miles south of Shasta Peak. Owing to the lateness of the season (it was October), the flowers had passed; and not even a seed vessel was found, but only the leaves and tall scapes, with the remains of a single capsule. The leaves, however, were so peculiar, that no doubt was entertained of the plant being either a *Sarracenia*, or a near ally of that genus. Without the flowers, nothing further could be determined respecting it; but from the bracteate scape and deeply parted lamina or appendage of the leaves, it seemed more probable that it was distinct from *Sarracenia*. Long had I been hoping to receive the plant in a more complete state, when it was at last brought to me by my friend, Dr. G. W. Hulse, of New Orleans, who found it in flower in May, 1851, in the same region, and perhaps in the very spot where it was discovered many years before by Mr. Brackenridge. The plant proves to be generically distinct from *Sarracenia*, as well as from the genus *Heliamphora* of Bentham; and I take great pleasure in dedicating it to my highly esteemed friend Dr. William Darlington, of West Chester, in Pennsylvania, whose valuable botanical works have contributed so largely to the scientific reputation of our country. The genus dedicated to this veteran botanist by De Candolle has been reduced to a section of *Desmanthus* by

Bentham; and a Californian plant, on imperfect specimens of which, I had recently indicated a genus under this name, proves to be only a species of *Styrax*.* The following are the characters of the new genus:—

DARLINGTONIA, Nov. Gen.

Calyx ebracteolatus, 5-sepalus; sepalis distinctis subpetaloideis. Corolla 5-sepala; petalis latissime unguiculatis; lamina ovata ungue multo minore. Stamina 12–15, uniserialia; filamentis brevibus subulatis; antheris oblongo-linearibus; loculis inæqualibus. Ovarium turbinatum, 5-loculare, 5-lobatum; apice dilatatum concavum. Stylus brevis, columnaris, 5-fidus; laciniis linearibus, divergentibus, apice intus stigmatosis. Ovula plurima anatropa, placentas dilatatas obtegens. Capsula . . . —Herba perennis, Californica, uliginosa, foliis *Sarraceniæ*; lamina profunde biloba; lobis divergentibus: scapis unifloris, bracteatis; bracteis infimis distantibus, supremis approximatis imbricatis: flore nutante purpureo.

* Having recently obtained good flowering specimens of this plant, the following description of it is appended:—

STYRAX CALIFORNICUM (*n. sp.*): foliis ovatis utrinque obtusis subcoriaceis integerrimis ramulisque glabriusculis vel subtus minute stellato-tomentosis; racemis terminalibus 2–4-floris; pedicellis flore multo brevioribus incrassatis cum calyce brevissime 6-dentato subtomentosis; corollis sexpartitis; filamentis ad medium usque monadelphis.

HAB.—Upper Sacramento: Col. Frémont. Near the upper crossing of the Sacramento, about lat. 40° 30': Dr. G. W. Hulse. Foot-hills of the Yuba River: Dr. Stillman. Flowers in March and April.

An upright branching shrub, seldom attaining a height of more than six feet. The leaves vary from an inch to two and a half inches in length, and are more or less broadly ovate in outline. The under surface is paler, and either nearly glabrous or clothed with a close stellate pubescence; on the upper side they are usually quite smooth. The racemes are produced at the extremity of short leafy branches, and are mostly about three-flowered; occasionally the flowers are solitary. The pedicels are from three to six lines long, and are thickened upward. The campanulate calyx is furnished with six very short subulate teeth. Corolla about three fourths of an inch long, nearly white, or slightly cream-color; constantly 6-parted, with oblong-lanceolate rather obtuse segments. Stamens 10–14; the filaments monadelphous to near the middle. Ovary 3-celled, with several ovules in each cell; but the dissepiments soon separate from the walls. Style slender, longer than the stamens; stigma minutely 3-cleft. Immature fruit one-celled, with a single seed.

Of the numerous American species of *Styrax* only two have been found on the west side of the Continent, as far north as Mexico. This is the most northern species of the genus found in any part of the world. It has a strong resemblance to *S. officinale* of Southern Europe, from which it is chiefly distinguished by its fewer-flowered racemes, thickened pedicels, and longer staminal tube. There is a well-marked, unpublished species (*S. PLATINFOLIUM*, *Engelm. ined.*, gathered on the Guadalupe, north of New Braunfels, Texas, by Mr. Lindheimer), the corolla of which is more commonly 6-parted. Its dilated and subcordate leaves are glabrous and shining on both sides.

DARLINGTONIA CALIFORNICA, TAB. XII.

HAB.—Head waters of the Sacramento; Northern California, near Shasta Peak; growing in marshes, and flowering in May. Mr. J. D. Brackenridge, and Dr. G. W. Hulse.

A perennial herb. Root-stock short and thick, producing numerous, stout, dark brown, fibrous roots. Leaves all radical; the adult ones from eighteen inches to two feet or more in length; the petiole or pitcher tubular, gradually tapering downward, and singularly twisted on its axis about half a turn, marked with strong parallel and longitudinal veins which are connected by very slender veinlets. The summit is vaulted, and formed into a sac about the size of a hen's egg, on the under side of which is an oval orifice, about half an inch in diameter, opening into the cavity of the pitcher. The areolæ of the sac, and also of the back of the tube, on the upper part, are discolored (of a dull orange color in the dried specimens), as in *Sarracenia variolaris* and *S. Drummondii*. Along the inside of the petiole is a narrow wing, which is single, except at the base, where it separates into two plates that clasp the scape and the base of the superior leaves. The lamina is narrow at the base, and deeply divided into two somewhat unequal widely-spreading lobes, which are oblong-lanceolate, rather acute, bent downwards and often also backwards; the inner (or properly upper) surface very minutely pubescent. The pitcher inside the hood is retrorsely hirsute with short conical hairs; from thence downward it is glabrous; but towards the base it is lined with long slender hairs, also pointing downwards: at the bottom remains of insects were found. Neither these hairs, nor those of the lamina, appeared to be of a secreting character.* The scape is from one to four feet long, flexuous, angular, glabrous, and furnished with sessile clasping straw-colored scales. These scales are foliaceous and alternate; the lower ones distant and lanceolate, the upper more and more approximated and broader, while those near the flower are oblong-ovate and imbricate. They are marked with longitudinal veins, which are forked above. The upper surface is paler than the lower, and under a lens shows minute conical papillæ. The flower, when fully expanded, is nearly two inches in diameter. The calyx consists of five oblong, rather acute sepals, which are of pale straw-color, and are quincuncially imbricated. There are no calyculate bractlets at their base. The corolla is five-petalled, about the length of the calyx, and its æstivation is likewise quincuncial. The petals are oblong, pale purple, marked with deeper reticulated veins, and are apparently not connivent over the pistil. They are furnished with a small ovate, concave lamina, and a very broad, obovate claw, which is two or three times larger than the lamina. Stamens from twelve to fifteen, hypogynous,

* The orifice of the Pitcher, being placed directly under the vaulted summit, cannot receive either rain water or dew; and yet Mr. Brackenridge thinks he found some of the leaves containing water. Still I cannot think the water was secreted by the hairs in the tube. In *Sarracenia psittacina* the orifice is likewise concealed and protected by the hood, so that the leaf can hardly be said to have any lamina; the arched summit belonging to the petiole, as in *Darlingtonia*.

inserted in a single series, and partly concealed by the dilated summit of the ovary: filaments short and rather stout: anthers oblong, with the cells very unequal and opening longitudinally, turned by the twisting of the filament so that the cells are anterior and posterior, the smaller cell lying against the ovary. Pollen simple and spherical. The ovary is turbinate, five-celled and somewhat five-lobed, concave and dilated at the summit, so as to exhibit a sort of margin which projects over the stamens: the columnar style is short, and five-cleft at the summit; the narrow segments diverging, and stigmatose at the extremity, on the inside. Ovules very numerous, anatropous, covering the large placentæ, which project into the cells of the ovary. No fruit was found; but, on one of the specimens collected by Mr. Brackenridge, there was a small portion of a capsule, which was evidently five-celled.

From *Sarracenia*, this genus differs in the calyx not being calyculate; in the form of the petals; in the somewhat definite and uniserial stamens; in the dilated turbinate ovary; and especially in the absence of the large umbrella-shaped summit of the style, which is so conspicuous in the former genus. The forked lamina of the leaf, and the bracteate scapes, are also characters not found in any *Sarracenia*.

From *Heliamphora*, it is still more distinct. In that genus, the scapes are several-flowered, and the flowers are destitute both of calyculate bracts and petals; the style is entire and not dilated at the summit, and the ovary is three-celled. The leaves, also, differ in their greatly dilated orifice, in the very small lamina, and in the doubly-winged pitchers.

The geographical distribution of *Sarraceniaceæ* is worthy of notice. This small order consists of but three genera, which are all exclusively natives of America. The oldest or typical genus is confined to North America; and, of the six species, one only (*Sarracenia purpurea*) has an extensive range, being found from lat. 48°, north, to Southern Florida, but westward only as far as Ohio; the remaining species being confined to the Southern States. *Heliamphora*, a genus of a single species, is a native of British Guiana, and has not been found elsewhere. *Darlingtonia* is the only representative of the order west of the Rocky Mountains, and even there it seems to be extremely rare.

The affinities of *Sarraceniaceæ*, notwithstanding the discovery of *Heliamphora*, and now of another genus belonging to the same family, are nearly as obscure as ever. Its resemblance to *Nymphæaceæ* and *Papaveraceæ* has been pointed out by several botanists; and Dr. Lindley, without hesitation, places it between the latter order and *Ranunculaceæ*. A more remote affinity to *Droseraceæ* has also been indicated; but this, however, is chiefly seen in the structure of the leaf of *Dionæa*.

The most recent opinion respecting the affinity of *Sarraceniaceæ* is that of M. Planchon,* who thinks these plants are very closely related to *Pyrolaceæ*. This acute botanist points out some striking characters in which *Sarracenia* resembles

* Hooker's London Journal of Botany, 5, p. 252.

the genus *Moneses* (*Pyrola uniflora*, *Linn.*); in addition to which, it may be remarked that the seeds of *Heliampora* are furnished with a loose winged testa and a minute embryo, as in *Pyrolaceæ*. Between *Moneses* and *Darlingtonia* the comparison may be drawn still more closely: in the floral envelopes and the almost definite stamens, in the structure of the ovary and in the radiating stigmas, as well as in habit, the likeness of our new genus to *Moneses* is quite remarkable. In many points, too, we may trace in *Darlingtonia* an approach to *Monotropa*, of the nearly related family *Monotropaceæ*. *Heliampora*, in its several-flowered scapes, is more like *Pyrola*. The singular pitchers of *Sarraceniaceæ* might seem to show a wide difference between the families thus compared, but characters drawn from the abnormal condition of a single organ are not of high importance in determining affinities. In conclusion, I would remark that, while offering a few additional considerations that seem to strengthen the views of M. Planchon, I do not wish to be considered as yet adopting those views. When we obtain the fruit of the *Darlingtonia*, perhaps it may give us some better knowledge of the place that its family should occupy in the Natural system.

EXPLANATION OF THE PLATE.

PLATE XII. DARLINGTONIA CALIFORNICA, PAGE 5.

- FIG. 1. Plan of the flower.
2. A petal, of the natural size.
 3. A stamen, considerably magnified.
 4. Grains of pollen, highly magnified.
 5. Longitudinal section of the ovary, having portions of the floral envelopes, and two of the stamens; considerably magnified.
 6. Style and stigmas, more magnified.
 7. An ovule, more magnified.
 8. Hairs from the inside of the tubular petiole, near its base; highly magnified.
 9. Hairs from the hood, just within its orifice; equally magnified.



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Sprague del.

DARLINGTONIA CALIFORNICA

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Signed: *W. W. Wall*

Date: *7-15-16*