A Photographic Primer of the Pinguiculas of the Southeastern United States

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This is the fourth in the annual primer series, and we are leaving the pitcher plants. Many readers and fellow CP students have asked for an article discussing the southeastern United States Pinguiculas, and we will attempt to provide some guidance.

For economic reasons, we try to limit these primers to two facing pages, usually for a total of eight photos maximum so that they will not be too small to be of use. Therefore, I have selected photos to emphasize certain points of differentiation. The interested reader should look into the general references listed below for more details and complete coverage of each of the six species (Godfrey and Stripling, 1961; Schnell, 1976; Godfrey and Wooten, 1981).

In order to identify a plant of the six species in the general region under consideration, one must consider: 1) Location, whether Atlantic coastal, Gulf coastal or peninsular Florida; 2) Leaf characters, particularly size and color; and most importantly 3) Flower characters. To identify any one plant with certainty, examination of flowering material is most often necessary.

Geographically, only *P. caerulea, P. lutea* and rarely *P. pumila* are found along the Atlantic coast. They tend most often to grow in sandy savanna soils; sometimes two species will be adjacent but only rarely admixed. *P. lutea* seems capable of colonizing slightly drier areas, while *P. caerulea* will be found in somewhat more moist habitat. *P. pumila* is of course characterized by its very small size in this locale, and a white flower. *P. lutea* has a yellow flower (Fig. 1) and *P. caerulea* has a large violet flower with deeply colored veins (Fig. 5). It is almost impossible to tell *lutea* and *caerulea* apart vegetatively. Of course, variations always rear their heads. A white flowered variant of *P. caerulea* has been recently described (Schnell, 1980) and is proving to be rather widespread.

What does one do about the floral color variants? Godfrey and Stripling (1961) and Godfrey and Wooten (1981) have excellent drawings of the plant hairs of the internal corolla. Examination of the three types in combination and comparison with the illustrations allows one to identify a species very accurately. This requires a low power dissecting microscope, but with some experience is a very easy process. One can also correlate such factors as geographic location, plant size, leaf character, etc. We would strongly urged serious *Pinguicula* students to become familiar with this type of examination.

In the broad aspect, all six species are found along the Gulf coast, although practically, *P. pumila* is the only species found in southern peninsular Florida. *P. caerulea, P. lutea* and even *P. pumila* generally are larger plants in their southern extremes, and this larger size carries over in culture side by side with Atlantic coast plants. *P. pumila* leaf rosettes will be larger, have flatter leaves and often some venation near the rosette center (Fig. 7). In addition, although flowers are "typically" white, yellow flowered and pink to rose flowered variants are commonly found and indeed become most prominent in hummocks of the Everglades and in the Big Cypress Swamp (Fig. 8). The inexperienced have excitedly reported *P. lutea* and *P. caerulea* in the latter areas, and here is an ideal situation for plant hair examination as noted above.

P. ionantha has the smallest range of all in the Florida panhandle, tending to occur in very wet areas with standing water. The leaves are always green (so far!), and the flower is white with a pink to rose center (Fig. 6, right). *P. planifolia* has a much wider

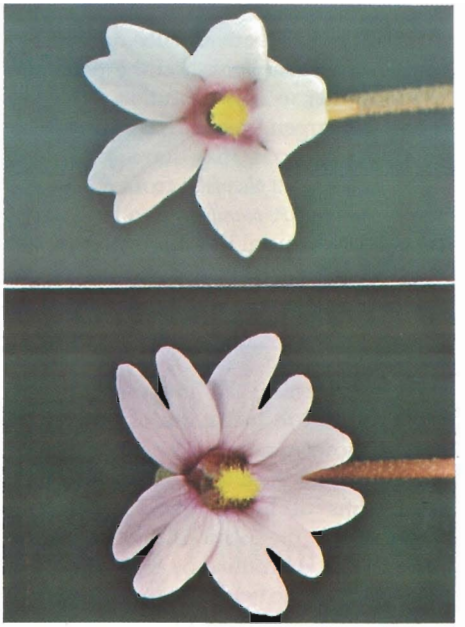
1) *Pinguicula lutea* with large bright yellow flower

2) *Pinguicula planifolia* in flower. The large flat leaves of this rather large plant will most often be dark red, but sometimes green.

3) *Pinguicula primuliflora*. The typical flower has a white center with rose colored petal tips.

4) *P. primuliflora*, showing vegetative budding at leaf tips, a rather specific feature in nature for this species, although in culture several other species can occasionally exhibit this process.

5) *Pinguicula caerulea* with typically purple veined flower. Color variants from diffuse dark purple to white have been found.



6) Flowers of *P. planifolia* (left) and *P. ionantha* (right) for comparison. Note difference in color of petal tips and depth of clefts in petal tips as well.

7) *Pinguicula pumila* in southern peninsular Florida. In this area, the rosettes are larger and frequently partially pigmented if growing in full sun in moist habitat.

8) *P. pumila*, showing yellow (v. *buswellii*) and pink flower forms.

Gulf coastal distribution and is a huge plant (rosettes 15-20 cm across when mature). The leaves are usually dark red to purple in full sunlight, and the plant prefers a sandier to marly location. However, forms with green leaves are also found and the inexperienced may have a problem differentiating *P. planifolia* from *P. ionantha*. The flowers of *P. planifolia* also have a dark center, *but* the petal tips are lighter pink to rose rather than white, and the clefts in the petal tips are deeper (Fig. 6, left). Figure 2 shows a mature, typical specimen of *P. planifolia* in flower.

P. primuliflora is an interesting species often difficult to locate out of flower. The species grows in rather wet areas, usually in shaded places such as streamsides or beneath tufts of bunch grass and sedges. Vegetatively, the plant is interesting because it can reproduce by budding at leaf tips (Fig. 4) in the field, and thus the species often occurs in clusters of many plants of variable size with the larger toward the center in "hen and chick" fashion. The flower is very distinctive, having a white center and rose petal tips (Fig. 3).

Hybridization between species in the field has never been confirmed, nor have valid hybrids been obtained in culture. However, the various color variant forms of a species (such as white and typical *P. caerulea*) do commonly hybridize. So far, there have been no floral variants of any significance described for *P. planifolia, P. ionantha, P. primuliflora* or *P. lutea*, although anecdotally several of us have seen a rather lighter straw-colored floral form of *P. lutea* along some Florida panhandle roadsides. The yellow-flowered form of *P. pumila* has been described and named v. *buswellii* (Moldenke, 1934).

Barnhart, J.H. 1933. *Pinguicula caerulea*. Addisonia 18:21-22, Pl. 587.

Godfrey, R.K. and H.L. Stripling. 1961. A synopsis of *Pinguicula* (Lentibulanaceae). in the southeastern United States. Am. Midl. Naturalist 66: 395-409.

Godfrey, R.K. and J.W. Wooten. 1981. Aquatic and wetland plants of the southeasteran United States: Dicotyledons. University of Georgia Press, Athens. 933 pp.

Moldenke, H.N. 1934. *Pinguicula pumila* var. *buswellii* Moldenke, var. nov. Phytologia 1: 98-99.

Schnell, D.E. 1976. Carnivorous plants of the United States and Canada. John F. Blair Publisher, Winston-Salem, NC. 125 pp.

Schnell, D.E. 1980. *Pinguicula caerulea* Walt. forma *leucantha*: A new form. Castanea 45: 56-60.

Question: How about a photographic primer sometime on the variants of *S. alata* that have been described? I understand that there are as many forms as in *S. rubra*.

Answer: Trying to sort out *true* forms of the genetic species *Sarracenia alata* can be extremely difficult since the range of the species encompasses the range of several other species and the area is well-known for extensive hybridization with interesting backcrosses that often puzzle even the most experienced "Sarraceniologist" as to parenthood.

After many years of looking and growing and crossing, my tentative thought is that there is actually little intrinsic variation in the species, that being color. The most common expression is yellow-green with light venation, but individuals with deep maroon coloration of the upper pitcher and hood interior can be seen scattered in the same bog.

Of the examples you cited in your letter, the short, stocky plant with pubescent exterior is almost certainly a backcross. I have seen these in the field and have grown plants sent to me. The "stocky" appearance and external pubescence speak for a *S. purpurea* ssp. *venosa* influence, such as the possible formula (*S. alata* × *S. purpurea* ssp. *venosa*) × *alata*. Backcrossing of a fertile hybrid back into a parent is more likely in the field than two hybrids crossing. The lid of *S. alata* is typically round, and a "wavy" margin with larger hood, and a tall slender pitcher would speak for a similar backcross with *S. leucophylla*.

In a complex field situation such as many Gulf coastal U.S. locations, one must be extraordinarily careful to sort out hybrids from true variants of a species. (DES)