

The Hawaii population of *Drosera anglica* — a tropical twist on a temperate theme

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Of two species of CPs growing in the wild in the Hawaiian Islands, one is a naturalized introduced aquatic bladderwort (*Utricularia gibba*), while the other is the only indigenous Hawaiian CP species: *Drosera anglica*. Although most treatises on world CPs describe the distribution of *D. anglica* as “widespread temperate”, and overlook the tropical Hawaiian population, in recent years the tropical-adapted variety of *D. anglica* from Hawaii has found its way into a number of ID’ growers’ collections. One interesting attribute of the Hawaii variety is its apparent ability to forgo winter dormancy. This article describes the distribution, habitat and likely origins of Hawaiian *D. anglica*, and discusses the transition from a cold temperate habitat to a tropical one. It ends with a few cultivation notes from my successful efforts to raise and propagate this variety under tropical conditions.

The Hawaiian populations of *D. anglica* are found only in the bogs of the Alakai plateau on the island of Kauai. These bogs occur in a virtually trackless part of the island’s interior, at elevations from 4,000 to about 6,000 feet above sea level, putting them well within the Hawaiian montane zone. This zone, while generally frost-free, may see nocturnal winter temperatures just above freezing, and even during summer months, nighttime temperatures often fall to below 45° F. Nonetheless, during the day, conditions can be quite balmy and sunny, exceeding 75° F.

The Kauai bogs are dominated by a variety of Hawaiian sedges, herbs and shrubs. The sedges are generally species of *Carex*, *Rhynchospora*, or *Oreobolus*. While mosses such as *Sphagnum* are absent in most Hawaiian bogs, and thick accumulations of peat are lacking, the highly acid, water-saturated conditions that mark bogs elsewhere in the world certainly apply, as does the stunted nature of plants growing in the bog habitat. Hawaiian sundews, aptly called *mikinalo* in the Hawaiian language (*miki*: to suck + *nalo*: flies) are very common in certain bogs of the Alaka’i plateau. Colonies of tens to hundreds of individuals can be found growing along the edges of mucky pools in depressions protected from the wind but more commonly, the sundews grow in close association with sedge tussocks, sending delicate tentacled leaves out between the pincushion-like blades of *Oreobolus*. In such associations it is impossible to extricate the sundew from the sedge, and most hikers walking along the Alakai Swamp Trail don’t even notice that many of the ubiquitous sedge tussocks they see bear associated sundew partners. The tough sedge protects its sundew associates from weather conditions in the Alakai, which can be quite harsh: heavy rainstorms and sweeping winds at gale velocities. An unprotected sundew would be beaten into the mud, then swept away in a torrent, but the sedge provides the physical support and bears the brunt of the weather.

The location and ambient conditions in the Alakai bogs go a long way toward answering another question: How could a cold-temperate *Drosera* species take to a tropical latitude such as that of Hawaii? The answer may be that the original colonist, far from finding a tropical climate, actually encountered conditions not so dissimilar to its original temperate home: near-freezing winters, cool ambient temperatures at montane elevations, and acidic open sedge bogs. As the colonist established itself in the higher bogs, its descendants could have gradually evolved tolerance of warmer conditions, even forgoing winter dormancy altogether, as they spread into bogs and

acid wetlands at lower elevations on Kauai.

The Hawaiian Islands are over 2500 miles from the nearest continent in any direction, so how did *D. anglica* get to the bogs of the island of Kauai? There are two likely possibilities. The high-altitude jet stream runs directly from Japan to the Hawaiian Islands during parts of the year, and small seeds of the Japanese populations of *D. anglica* may have been blown over that way and settled out on Kauai. The other route involves a migratory bird, the Pacific Golden Plover (*Pluvialis fulva*), that yearly migrates from Alaska and Canada to Hawaii. When the birds arrive in Hawaii, they set up territories on lawns and other open flat habitats. One of their favorite haunts is open sedge bogs. In their non-stop flight from temperate North America to Hawaii, it is easy to envision seeds of *D. anglica* stuck in the mud on the feet of a plover being planted in its first landfall, a bog in the Alakai plateau of Kauai, the northernmost of the main Hawaiian Islands.

Whether by jet stream or plover, the colonization of *D. anglica* to Hawaii must have been a one in a million occurrence. If the introductions were more frequent, there would have been no opportunity to evolve tropical habitat tolerance, since that presumably would have required isolation of the gene pool of *D. anglica* in Hawaii for sufficient generations to allow for divergence. Thankfully for CP enthusiasts in tropical settings, the tropical adaptations of *D. anglica* in Hawaii allows for their cultivation in warm climes without heroic measures, such as seasonal stints in refrigerators.

The correct names for the subspecies of *Sarracenia purpurea* L.

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The article by Reveal (1993), reviewed in CPN 22(3):78, claims that owing to McDaniel's lectotypification (1971), the universally used nomenclature for the northern and southern subspecies of *S. purpurea*, the most widespread of all the American pitcher plants both in the wild and in cultivation, must be radically changed. This article, requested by CPN, examines the issue.

Sarracenia purpurea L., described by Linnaeus (1753: 510) was first treated as two entities by Rafinesque (1840) who treated the northern ('Canada to Virginia') element as *S. gibbosa* and the southern ('Virginia to Florida') variant as *S. venosa*. Wherry (1933) pointed out that the two taxa meet in New Jersey rather than in Virginia. He also noted that, although there are real differences between the two taxa, they are not sufficient for specific status, and treated them as subspecies: *S. purpurea* ssp. *venosa* (Raf.) Wherry and *S. purpurea* ssp. *gibbosa* (Raf.) Wherry. Wherry later (1972) adjusted the nomenclature to follow the International Code of Botanical Nomenclature (the Code), which rules that, where there are more than one infra-specific taxa of the same rank within any species, that to which the nomenclatural type of the species belongs should take the name of the species, that is, it should be autonomic. Thus one of the subspecies of *S. purpurea* must be *S. purpurea* ssp. *purpurea*. The question is, to which subspecies should the type of Linnaeus's species be attributed: the northern or the southern subspecies? Wherry (1972) indicated that 'although Linnaeus preserved no type specimen, his discussion indicates that his