Genlisea aurea St.Hil.

Fernando Rivadavia • Rua Inacio Pedroso 230 • Sao Paulo, S.P. 05612-050 • Brazil • fe_rivadavia@hotmail.com

Keywords: observations: Genlisea aurea, Genlisea pygmaea.

Genlisea aurea St. Hil. (Lentibulariaceae) was discovered and described by the French botanist Auguste de Saint-Hilaire in the early 19th century (Saint-Hilaire, 1833). This species is endemic to Brazil, where it is widespread on sandstone highlands from the states of Mato Grosso in the west, to Bahia in the northeast, and to Santa Catarina in the southeast (Fromm-Trinta, 1979).

This species is a perennial herb typically found at altitudes varying from 550 m to 2550 m, often among grasses. It occurs in waterlogged seeps, which usually remain boggy even during the dry season, and where the soil is black, humus-rich, and usually mixed with sand. A film of cold flowing water usually covers the compact leaf rosettes, and I have even observed specimens growing in streams, beneath several centimeters of water. The black soil is humus-rich, and is often mixed with sand.

Genlisea aurea is one of the largest species in its genus (Taylor, 1991), and its unique rosettes consist of dozens of almost linear leaves only about 2 mm wide. Although the leaves are usually 5-50 mm long, the rosettes are at most 5 cm in diameter, because only the leaf tips emerge from the soil. The rest of the leaves (long white petioles) are buried underground. The leaf bases all connect to a beige stem about half a centimeter thick, and two or three centimeters long.

Even though *Genlisea aurea* may flower at any time of the year, it is not easy to catch flowering specimens in the wild. This is strange, considering it is not a rare species and large populations are common. Fortunately, on a few occasions I have been blessed with the view of grassy fields covered with *G. aurea*'s large bright-yellow to golden-yellow blooms. What a view!

The flower scapes are very robust and are usually 10-30 cm in height, but sometimes surpass 55 cm. Each inflorescence commonly bears one to three open flowers at its apex, but may produce a total of eleven flowers. The entire inflorescence is densely covered with both simple and glandular hairs (Fromm-Trinta, 1979).

The largest-flowered *G. aurea* I know are at the Chapada dos Veadeiros National Park (in northern Goiás state, central Brazil). These plants probably have the largest flowers in the genus, and measure nearly 3 cm in length and over 2 cm in width (Figure 1). The lower lip is a wide apron, instead of deeply trilobed as in other locations. The flowers of this form are a spectacular, rich golden-yellow color!

The inverted Y-shaped traps of *Genlisea* apparently come in two types in most species. As drawn by Studnicka (1996), some traps are short and grow more or less horizontally beneath the soil surface, while others are longer and grow straight downwards. Unfortunately these descending traps are extremely difficult, if not nearly impossible, to collect whole in nature. They are very brittle and break exasperatingly easily when you try to wash off the soil around the plants. Fromm-Trinta (1979) recorded traps up to 10 cm in length for *G. aurea*, measured from herbarium specimens, but I believe this may be highly underestimated. As for prey, *G. aurea*,



Figure 1: A hand-held bundle of *G. aurea* flowers from Chapada dos Veadeiros National Park.



Figure 2: Mucilage-covered *G. aurea* rosette, Grão Mogol.

G. margaretae, and *G. violaceae* (and thus possibly all *Genlisea* species?) have been discovered recently to be specialized in the capture of protozoans (Barthlott *et al.*, 1998).

Genlisea pygmaea seems to be the Brazilian species most closely related species to *G. aurea*—both have inflorescences densely covered in simple and glandular hairs. The smaller forms of *G. aurea* are often very similar in flower shape, size and color to larger forms of *G. pygmaea*—they have often confused me in the field! Other than the overall size of the plants, there are not many field characteristics that one can use to separate these two species—unless one has a microscope handy. Some useful tips in the field are that *G. pygmaea* usually grows in sandier soils; it has fewer, shorter, wider, darker green leaves; flower scapes are a thinner and a darker green (almost black) in color; and the flowers are smaller and narrower.

Other Brazilian *Genlisea* species that occur south of the Amazon Basin are easily distinguishable from *G. aurea*. Both *G. repens* and *G. filiformis* have yellow flowers, but are much smaller in size. Furthermore, *G. repens* is the only *Genlisea* species which has elongated underground stems (like most *Utricularia*), and its small flowers are produced on thin glabrous flower scapes. *G. filiformis* has even tinier flowers with an obtuse-tipped spur, borne on delicate inflorescences that are covered by long glandular hairs only (i.e. simple hairs are absent). Finally, *G. guianensis*, *G. violacea*, *G. uncinata*, and *G. lobata* have purplish to white flowers with an orange-yellow to whitish patch at the base of the lower lip. Furthermore, the latter three taxa have pedicels that become pendulous when in fruit (versus erect) and

the seed capsules split into two longitudinal valves (versus circumscissile) (Taylor, 1991).

When not in flower, *G. aurea* is the easiest Brazilian *Genlisea* species to recognize, because of its distinctive, large rosettes composed of dozens of narrow leaves covered by a thick layer of gelatinous transparent mucilage (Figure 2). This mucilage is particularly obvious on plants in shady habitats and it is also usually present on *G. pygmaea*, to a lesser degree. I still do not know what the function of this mucilage is. Protection against fires is unlikely since *G. aurea* habitats are usually wet year-round and so do not burn—while the annual *G. pygmaea* is usually dead by the time the (dry season) fires begin. Furthermore, the *G. aurea* rhizome—located a few centimeters below the soil surface—is safely protected from fires. I believe the mucilage probably serves as a mechanical or chemical barrier against predation from snails or other small invertebrates.

Whenever botanizing in Brazil I always like to herborize specimens of the carnivorous plants I find. Special care is needed to herborize *G. aurea*, since the mucilage glues to the paper as it dries. The delicate leaves become nearly impossible to pry off afterwards. However, if you wipe the *G. aurea* rosettes against your trousers several times, most of the mucilage is removed and the number of leaves that become glued to the paper is decreased. No damage is done to your clothes, in case you are wondering—and after all the hiking, they will be covered in dirt by the end of the day, anyway!

I have never been able to keep *G. aurea* in cultivation for more than a year. In fact, these picky plants usually rot soon after being brought from the wild—if not during the long trip from its natural habitat to my hometown São Paulo. The seeds of this species have so far proved nearly impossible to germinate in cultivation. I have never been able to germinate any myself and have only heard of a few success reports from friends around the world. I believe giberellic acid may help induce seed germination in several *Genlisea* species. The only mature *G. aurea* plants I know of in cultivation are growing at the Bonn Botanic Garden in Germany, which I saw during the 1998 ICPS Conference. Unfortunately they are cultivating the most unattractive of all *G. aurea* races: a small form with pale-yellow flowers, native to the Diamantina area of Minas Gerais state.

References:

Barthlott, W., Porembski, S., Fischer, E., and Gemmel, B. 1998, First Protozoa-Trapping Plant Found, Nature, 392: 447.

Fromm-Trinta, E. 1979, Revisão das Espécies do Gênero *Genlisea* St.Hil. (Lentibulariaceae) das Regiões Sudeste e Sul do Brasil, Rodriguésia, Rio de Janeiro 31/49: 17-139.

Saint-Hilaire, A. de. 1833, Voyage dans le District du Diamans du Brésil 2: 428-432.

Studnicka, M. 1996, Several Ecophysiological observations in *Genlisea*, Carniv. Pl. Newslett. 25: 14-16.

Taylor, P. 1991, The Genus *Genlisea*, Carniv. Pl. Newslett. 20: 20-26.