

Drosera graminifolia

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Drosera graminifolia is one of the largest *Drosera* species in all of the Western Hemisphere, together with *D. ceendensis* (from northeastern Venezuela), *D.*



Figure 1. *Drosera graminifolia* growing in orange *Sphagnum* sp. at Caraca, Brazil, altitude ca. 1800 m. Photo by Fernando Rivadavia.

meristocaulis (from the Neblina Peak on the border between Brazil and Venezuela), and *D. chrysolepis* (from the Cipó Range in southeastern Brazil). *D. graminifolia* was described in 1824 by Auguste de Saint-Hilaire, based on material collected during his travels through Brazil in the early nineteenth century (Saint-Hilaire, 1824). *D. graminifolia* is like a robust *D. filiformis* and is only known to grow on the Serra do Espinhaço (Espinhaço Range), an ancient sandstone formation which cuts the state of Minas Gerais (southeastern Brazil) from north to south. Erosion is very high on these mountain tops and the vegetation consists mostly of low plants growing on rocks and/or in sand. In Brazil we call this "campo rupestre" vegetation (see CPN 22:4), which can be found on other highlands around the country and even extending north to the famous tepuis of the Roraima Highlands in northern Brazil plus southern Venezuela and Guyana. Some angiosperm families common in these harsh habitats are: Eriocaulaceae, Velloziaceae, Gramineae, Cyperaceae, Xyridaceae, Compositae, Melastomataceae, Bromeliaceae, Orchidaceae, and Cactaceae, not forgetting Droseraceae and Lentibulariaceae (including both *Utricularia* and *Genlisea*).

D. graminifolia is a perennial which often forms short, stocky stems, which in rare cases of very old plants may be up to 15cm in length. Leaves can grow over 30cm in length (the petiole being only around

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Figure 2. *Drosera graminifolia* peduncle with four open flowers at Grao Mogol, Brazil, ca. 1000 m altitude. Photo by Fernando Rivadavia.

2cm long) and under strong sunlight often become reddish with age. I've never been able to reproduce this species by leaf cuttings nor have I observed leaves close to the ground budding naturally (neither in cultivation nor in the wild), as I have for other native species. Large, triangular, translucent, golden-bronze stipules cover the base of each leaf and envelop the new ones emerging in the center. The peduncles and sepals are covered with short, sticky, gland-tipped hairs. In northern Minas Gerais I've observed an occasional long, red tentacle on the sepals, like the ones present on the leaves.

D. graminifolia thrives in seepages and next to streams in live *Sphagnum*, common mosses, sand, sand mixed with rocks, or in small cracks on bare sandstone. I recently discovered why this species is most numerous on "islands" of vegetation among rocks or on the bare rocks themselves (both these types of habitats being irrigated by trickling water during the wet season), instead of occupying the apparently more homely habitats in wetter soils nearby. Bushfires are common in the dry season and will easily barbecue *D. graminifolia*, since each plant is usually surrounded by a tangled, black mass of highly-flammable dead leaves. Though new plants can grow back from the roots, these shoots probably take a few years to mature and flower, not to mention that new fires may render the effort useless.

Thus pockets of isolated vegetation on rocks are likely to be safer from raging wildfires, as are the plants clinging to the open sandstone surfaces. It still surprises me though how this species can survive the dry season on bare rocks, when their natural irrigation is cut off for a few months. I imagine the shadow of the dead leaves helps maintain the base of the plants cooler. They probably also help concentrate dew at night and dissipate it slowly during the day, keeping the air around the base of the plants less dry.

D. graminifolia peduncles can be over 50cm in height and are almost always bifurcated a few times at the top. Thus a few flowers may often be found open at the same time on a single flower scape (I've seen up to six). The flowers are around 2cm in diameter and are pink-lilac when in full sunlight, losing some of the pink in shadier conditions. In September '94 I discovered a few white-flowered *D. graminifolia* in northern Minas Gerais, growing among typical pink-lilac-flowered plants. This was around the village of Grão Mogol and the leaves of these albino-flowered specimens had the normal red pigmentation.

D. graminifolia can be found in flower all year long, but there is a well-defined flowering season in late winter and early spring (July to September), which is the end of the dry season. Each peduncle bears numerous flower buds (up to around 45) and each fruit produces a large amount of seeds. The total output of seeds per peduncle is superior to that of any other *Drosera* species I know of (with the probable exception of *D. capensis*), not to mention that every plant usually sends up two peduncles during the flowering season and maybe more out of season.

Geographically there seem to be three separate populations of *D. graminifolia*, which could probably be classified as three distinct subspecies in the future. The above paragraphs describe mostly the northern population, but may be applied to the other two populations, except for a few details mentioned below. I studied the northern plants around the villages of Grão Mogol, Itacambira, and Botumirim, growing from around 850 to 1300m in altitude. The TYPE *D. graminifolia* represent the southern population and were collected by Saint-Hilaire at the Serra do Caraça, probably my favorite place for hikes and where I saw my first wild CPs in Brazil, during my high school senior trip in May '90 (see CPN 20:3 and 20:4). This southern population is smaller than the northern one and can be found between 1700 and 2000m of altitude

on peaks of the Caraça Range and other ranges extending a bit further west (all subranges of the Espinhaço Range). The following description is based on plants from Caraça, assuming plants from the rest of the southern population are uniform with those studied during my five trips to Caraça and brought into cultivation.

The southern plants flower almost exclusively from February to March, though there's a secondary and less important flowering period around August and September. The flowers of this southern form are lighter in color and the petals are narrower, making the flowers more star-shaped than those of the northern plants which have rounder petals. A few other differences have been observed, including that the leaves of the southern plants don't turn red with age and the tentacles on the leaves are either smaller or not as red themselves.

The third form of *D. graminifolia* occupies a central position in relation to the two other possible subspecies described above. I know very little about this population, which is concentrated around the historical town of Diamantina, since I've only studied these *D. graminifolia* in the wild once in early '92 (see CPN 22:4). The specimens I collected there and cultivated for a few years provided additional information plus herbarium seen at the University of São Paulo helped give an idea of the geographic extension of this and the other two *D. graminifolia* populations. I know there is gap between the central and southern populations, but I'm not sure if this gap exists between the central and northern ones.

D. graminifolia probably grows between 950 and 1300m in altitude in this central region and doesn't seem to be nearly as abundant locally as the northern and southern populations are in their respective areas. The few specimens I found were growing in sandy soil in two colonies by the same stream. The plants themselves are more similar to those of the northern form while the flowers (which I later saw in cultivation), are more similar to those of the southern form. The plants from Diamantina flowered every few months in cultivation, but I suspect that in the wild their flowering season is concentrated at the end of the dry season, like the northern plants.

Together with *D. graminifolia* plus other species of *Drosera*, Saint-Hilaire published a *D. spiralis* (Saint-Hilaire, 1824), based on plants he'd collected in the Diamantina region. Later on, in 1874, Von Martius described a *D. brasiliensis* from the same area. Both of these were synonymized to *D. graminifolia* by Diels (Diels 1906), but show that I wasn't the first to observe differences between the TYPE specimens from Caraça and the specimens from the Diamantina region.

I believe that, as a taxonomist, Saint-Hilaire must have been a genius. After a few years botanizing here in Brazil, I've come to the conclusion that most of his original publications on Brazilian *Drosera* will turn out to contain much more truth than the publications of the "couch taxonomists" who came after him and made a big mess of *D. montana*, *D. villosa*, *D. graminifolia*, and all the taxons presently included under these species, by believing that the simple analyses of Saint-Hilaire's and other author's TYPE herbarium was taxonomically sufficient!

Saint-Hilaire's taxonomical work was based on profound understanding of plant ecology, which he probably acquired during the years he spent travelling through the interior of Brazil. Very often, field work is sadly still not recognized as an essential part of taxonomy. As I see it, how can one work on herbarium alone when he has no idea how those few specimens from whole plant populations once functioned in nature? What characteristics of theirs are variable and under what conditions? At least cultivating the plants would be a big help! Ecology is a very complicated area and it seems to me that taxonomists tend not to give much importance to ecology simply because they're afraid of it! It's not easy to pick out the "bad" taxonomists since

taxonomy is a very subjective science and will probably continue thus as long as we don't come up with a good definition for a species, which might never exist.

Unfortunately, there's another variety of the "couch taxonomists" called the "vulture taxonomists", who are continuously circling over other people's honest hard work, competing aggressively with each other while searching for remains where they can rob species for "themselves" (they're very possessive!) and save all the sweat. To give more credibility to their own names, we often see these "vultures" attempting to throw as much mud as possible on the publications of others. After all, criticizing is easy, but creating is a whole different story.



Figure 3. Fernando Rivadavia next to *Drosera graminifolia* colony at Caraca, Brazil, ca. 1900 m altitude. Note other colonies in shallow soils on these rocks.

To finalize, how can you not help admiring an adventurer like Saint-Hilaire who faced years of hardship and unknown diseases in the wild interior of Brazil almost 200 years ago, opening trails through hostile, unexplored lands? People think I'm crazy when they hear the stories of my 1990's expeditions, so imagine what it must've been like back then!!

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Figure 4. *Drosera graminifolia* growing in dry stream bed ca. 1050 m altitude at Grao Mogol, Brazil. Photo by Fernando Rivadavia.