

IN SEARCH OF ANDEAN *PINGUICULA*

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During January 2018, my girlfriend and I had the chance to travel on holidays to southern Argentina for two weeks. We were able to plan the journey, paths to take, and places to visit. Of course, setting aside time to search for carnivorous plants was essential. We were counting on the previous experience of local acquaintances, with whom we had already found, allegedly, *Pinguicula chilensis*. After a taxonomic revision, Gluch (2017) showed that the name of *P. chilensis* was invalid due to an incorrect lectotype. Therefore, Gluch chose a new holotype and named it *P. australandina*. In addition, Gluch described a new species from the Nahuelbuta mountain range in Chile that was formerly considered to also be *P. chilensis* and named it *P. nahuelbutensis*. Two *Pinguicula* species are known to occur in Argentina: the well-known *P. antarctica*, and *P. australandina*.

We knew that plants of *P. australandina* (Fig. 1) are found above 1400 m above sea level. Therefore, we planned our ascent of two *cerros* (peaks): Cerro Catedral in San Carlos de Bariloche, where we had already found specimens two years ago helped by friends from the area; and to Cerro Lindo in El Bolson, which we had never climbed before, but of which we had heard about sites of *Pinguicula* reported by the locals.



Figure 1: *Pinguicula australandina*.

Cerro Catedral

Backpacks on our shoulders and water bottles full, we began our ascent to the Frey shelter on the shore of Toncheck Lagoon at some 1600 m a.s.l. We hiked across the *lenga* beech forest (where *Nothofagus pumilio* -Nothofagaceae- and *Chusquea culeou* -Bambusoideae- predominates) until reaching a zone where the arboreal vegetation recedes, and grasses and rocks start to be seen in greater abundance. Climbing through the last large-sized rocks, we managed to see the shelter in the distance. But some 15 minutes before our arrival, we encountered a stream across our path and finally saw our first *Pinguicula*. At approximately a meter away from the water, growing in the substrate deposited between the rocks and its cracks, mostly sheltered from the sun, beneath and in-between the grasses, we found the first colonies spreading across several meters (Fig. 2). We had to look thoroughly as they were no larger than 5 cm in diameter each.



Figure 2: *Pinguicula australandina* on the Cerro Catedral.

Sadly, at the end of January their flowering season was coming to an end and most of the corollas had fallen, and the fruits were young so we had no chance to see any seeds.

After having combed the first area, we crossed the stream and climbed a hundred meters more, and at 1700 m a.s.l., far from any body of water (that we could see at least), we found another colony (Figs. 3 & 4). I had already found this colony in 2016 and I was pleased to see how it had expanded by noting the presence of minuscule seedlings and new specimens in the surroundings, where two years ago there were none.

Cerro Lindo

Located in the south of the Rio Negro province, in El Bolson, the Cerro Lindo is seldom visited, and its shelter is found at 1500 m a.s.l. We began our ascent crossing the Azul River and a plain to go deep into the Valdivian laurifoliate forest (temperate Valdivian forest or Valdivian jungle as the locals call it), hiking without rest until our destination. This forest, where arboreal formations of laurifoliate leaves predominate (*Luma apiculata* -Myrtaceae-, *Nothofagus dombeyi* -Nothofagaceae- or *Weinmannia trichosperma* -Cunoniaceae- are some species we observed), is considered a biogeographic island because it is an isolated ecosystem and presents a multitude of endemisms.

Approximately at 1400 m a.s.l., we found a lagoon where we could see sphagnum moss. After hiking a bit longer, the forest opened, revealing a plain crossed by a stream (Fig. 5). And there, we first found some scattered *P. australandina* specimens. After finding no more than a few of them, we resumed our journey to the shelter, where a waterfall flows over a formation of stone and sharp slate just a few meters away. As we climbed these rocks and inspected the surroundings, we found *Pinguicula* in practically every available corner. At this time of year, the substrate was quite moist as it was near the waterfall. The stream and waterfall exists only in summer and comes from melting snow and ice from the summit. During winter the stream and waterfall is frozen.

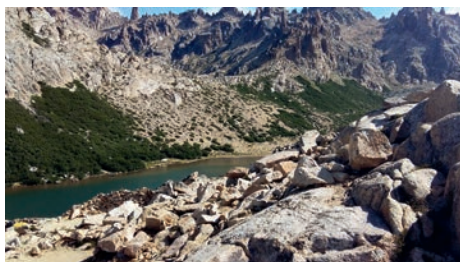


Figure 3: The rocks on the Cerro Catedral at right are where the plants were found at an elevation of 1700 m. Toncheck Lagoon is behind.



Figure 4: The higher elevation population at 1700 m on the Cerro Catedral, far from visible water streams.



Figure 5: Landscape on Cerro Lindo where we found the first specimens of *Pinguicula australandina* before reaching the shelter.

None of the plants had flowers and we noticed that the coloration of their leaves was more orange or yellowish in comparison to those found in Cerro Catedral, probably because of a higher exposure to sunlight since small succulent-leaved plants predominate in the area where they grow, not grasses.

Going higher up on the opposite side of the waterfall wall at 1600 m a.s.l., a bog spreads from a lagoon, and at its shores there are dense colonies of *Pinguicula australandina*.

Morphological Diversity

Pinguicula australandina is a species that presents a wide range of shapes and colors, both in its leaves and its flower.

In general, the individuals found in the Cerro Lindo have a more yellowish or orange color than those in the Cerro Catedral, possibly because of a greater solar exposure, since they are not protected between grass, but the other variations are common to both locations with apparently same growing conditions.

The flowers have a color variation from soft violet with purple lines, to purple in the petals and yellowish white in the spur (Fig 6). We saw that the spur had different lengths, from almost absent to few millimeters (3-4 mm).



Figure 6: *Pinguicula australandina* flower color varies from soft violet to purple.



Figure 7: Some *Pinguicula australandina* open their leaves more, while others keep them more rolled up.

Some *Pinguicula australandina* open their leaves more (Back Cover), while others keep them more rolled up (Fig. 7). The coloration of the leaves varies with solar exposure, becoming reddish when the plants are more exposed to the sun. On a cultivated specimen with the highest exposure possible, the coloration becomes almost completely red.

Environment, Climate, and Substrate

We found all plants were always above 1400 m a.s.l. in open, well-lit spaces, and in most cases between pastures, partially protected from direct solar exposure. However, some plants were exposed and in perfect condition. The climate is alpine, and because of the latitude and elevation, it's also a glacial and snowfall area, which means that in winter the plants are buried underneath several meters of snow and, occasionally, ice. Perhaps this is the reason why they only grow in cracks and holes, places where air pockets form so the snow doesn't make direct contact with the leaves, avoiding frost damage.

The substrate is composed of dust, gravel, rock particles from wind erosion, and pumice stone, pressed together and permanently moist but not waterlogged.

Researchers: Danel Josu Aranoa, Rocio Belén Arce, Juan Merino, and Ignacio Merino.

References

Gluch, O. 2017: Revision of *Pinguicula* (Lentibulariaceae) in Chile and Argentina. Carnivorous Plant Newsletter 46(4): 121-131.



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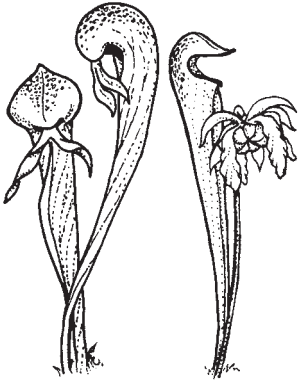
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Front Cover: *Pinguicula planifolia* under several centimeters of water in Liberty County, Florida. A crayfish has decided its leaves make for good cover. Photo by Barry Rice. Article on page 117.

Back Cover: *Pinguicula australandina* growing in the Cerro Catedral, Argentina. Photo by Danel Josu Aranoa. Article on page 101.

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