Lithophytic culture of Mexican *Pinguicula*

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Abstract: Attempts to replicate in cultivation the natural lithophytic growth habit of many Mexican *Pinguicula* seem to have taken off in popularity in recent years. Herein I describe my own experience with this technique and the approaches that I have found to be successful in the long-term.

Introduction

Lithophytic plants grow in or on rock. Broadly speaking, they may be facultative (meaning they may also occur in other substrates) or obligate (meaning they only grow on rock). Quite an impressive number of Mexican *Pinguicula* demonstrate lithophytic growth tendencies in habitat; the sight of dozens of specimens clinging vertically to the surface of sheer limestone walls is wonderful! Naturally, horticulturists have attempted to replicate this mode of growth in cultivation, and many have achieved very impressive results. I have experimented with growing a variety of Mexican *Pinguicula* on rocks for several years and have come up with a list of factors that I believe are crucial to success with this technique. By no means are my *Pinguicula* rock plantings the most spectacular out there, but I do hope that my experiences will be helpful to all those who wish to create one!

Growing *Pinguicula* on rocks

Lithophytic Mexican *Pinguicula* are frequently found growing in crevices of limestone or gypsum where water can accumulate (Mata-Rosas *et al*. 2020). To replicate this effect in cultivation, the rock selected for the substrate should be porous and allow for water to wick upwards toward the plants' roots (Fig. 1). Vesicular volcanic rocks, especially pumice and scoria, are ideal for this purpose. These rocks are pitted with numerous cavities that facilitate water retention and provide

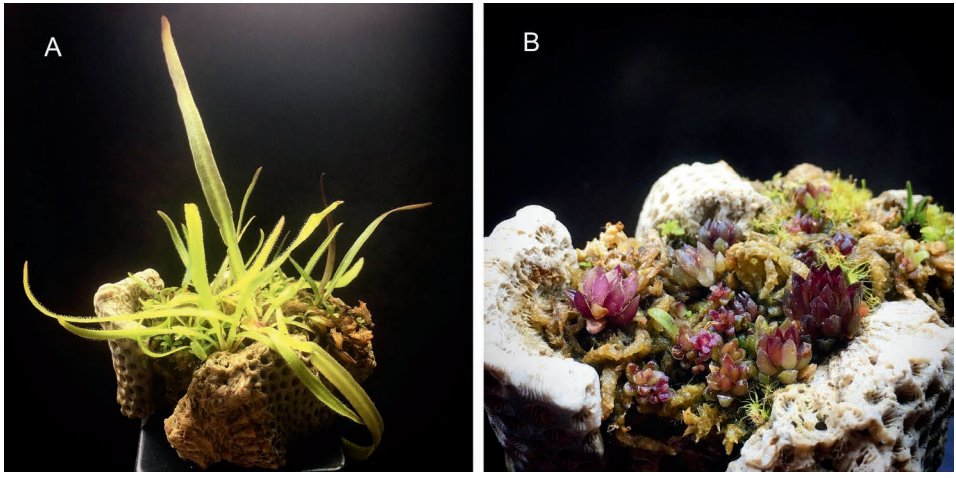

Figure 1: *Pinguicula calderoniae* (Llano del Conjeo, San Luis Potosí) growing on chunks of old coral paperweights glued together with epoxy resin. (A) Plants in vegetative growth. (B) Winter succulent rosettes.

convenient little crevices for plant roots to establish themselves. Pumice has smaller, more numerous vesicles, while scoria is denser and has larger vesicles with thicker walls. I have observed that pumice tends to wick water more reliably, but they are both very suitable substrates. Since growing *Pinguicula* on rocks is, at heart, an artistic endeavor, be sure to select a rock that you find aesthetically pleasing with indentations or pockets where plants will fit. If no such crevices are present, feel free to take initiative and drill holes. The rock should not be too tall, otherwise water may not wick upward efficiently. Also be sure that the rock has a somewhat flat base or is stable when left up by itself. It would be embarrassing for your brand-new planting to suddenly tip over! Sit the rock in a shallow tray of water overnight to ensure that the location where you want to place plants receives sufficient moisture.

It is certainly possible to grow *Pinguicula* on non-porous stone. However, to ensure that the plants do not desiccate, they will either have to be watered very frequently (perhaps even multiple times a day), or a wick will have to be provided to draw up water to the root zone. I recommend the wick approach. I would not trust myself to remember to water the plants frequently enough without one.

With your favorite rock selected, you can now begin adding plants. Wash the old media from the roots and maneuver the plant into the proper hole or crevice. Fortunately, most Mexican *Pinguicula* have very little in the way of roots so this should not be too difficult. I have found that partially stuffing the hole with a small amount of organic matter like *Sphagnum* moss helps anchor the plants. Once all the plants are placed, place the rock in a shallow tray of distilled or deionized water and grow the plants as you would in standard pots. Avoid tap water high in dissolved solids—the minerals will form crusty, unpleasant deposits on the rock. During the growing season, the water level should be kept below the plants' leaves but high enough so that the roots receive moisture. The water will likely have to be periodically replaced to remove algal growth. High amounts of light are necessary to have the plants look their best and prevent the growth of mold; rock plantings are easily managed on very bright windowsills or under high-powered LEDs or fluorescent bulbs. If you live in an area with very intense summers, be careful to avoid placing the rocks in direct sunlight for too long, especially if you are using darker rocks such as basaltic scoria. They can heat up very quickly and bake your plants.

In terms of plant selection, the species that frequently occur as lithophytes such as *P. gypsicola* and *P. agnata* are obvious candidates. However, I have also been successful with species that tend grow in mosses or as epiphytes in tropical oak or pine forest, including *P. laueana* (Fig. 2) and mem-

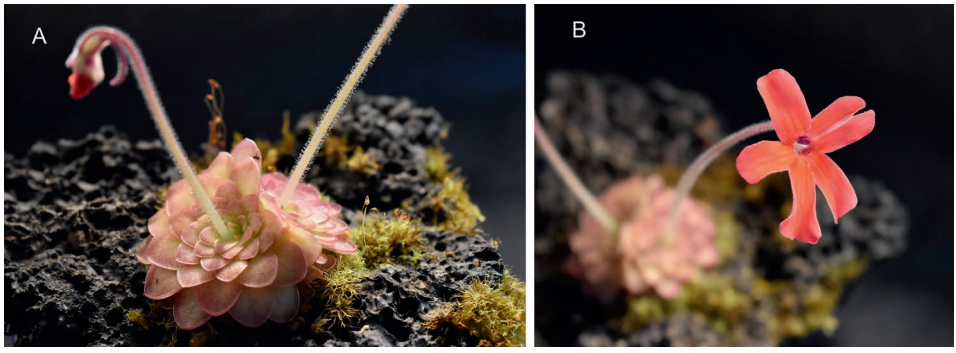

Figure 2: *Pinguicula laueana* is quite at home growing on scoria. (A) Fresh rosettes of carnivorous leaves produced in spring. (B) This species is often noted for its brilliant red bloom.

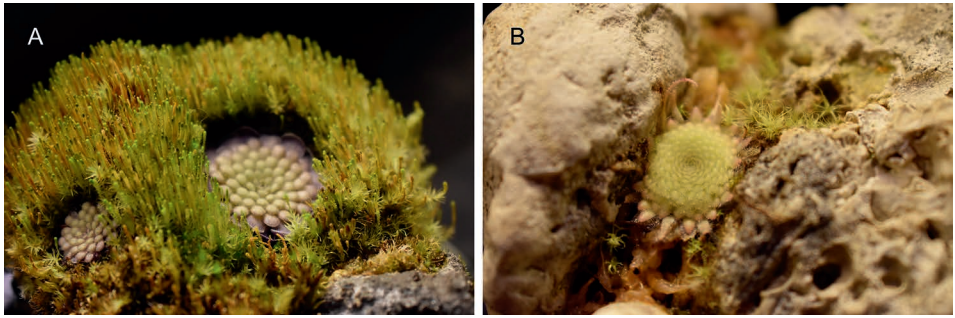

Figure 3: Winter succulent rosettes of Mexican *Pinguicula*. (A) *Pinguicula cyclosecta* grown on scoria. (B) *Pinguicula gypsicola* grown on limestone.

bers of the *P. moranensis* complex. My perusals of other growers' plantings also indicate success with even inhabitants of tropical rain or cloud forests like *P. gigantea*. It appears that most, if not all, Mexican *Pinguicula* are highly amenable to this form of culture, so do not hesitate to try it out!

Correct managing of the plants' annual winter resting period is critical to maintaining rock plantings long-term (Fig. 3). As with plants grown in traditional media in pots, water should be greatly reduced when the plants begin replacing their carnivorous leaves with succulent ones in the autumn. This should begin to happen when a reduction in photoperiod is observed. If you grow your plants under artificial lights all year, you may wish to periodically adjust the timer to approximate sunrise and sunset times. Species like *P. medusina* that grow in more xeric, arid habitats (Ruiz & Studnika 2000) are particularly sensitive to rot during their resting period and should be kept completely dry. Water should only be supplied again once the plants begin producing carnivorous leaves.

Over time, it is very likely that your rocks will come to be covered in a thick layer of moss (Fig. 4). I periodically trim and remove moss to prevent suffocation of the *Pinguicula* rosettes but otherwise leave it alone. The moss layer is very effective at wicking water and will ensure that the surface of the rock is permanently moist, so long as the water level is maintained. The moss can also serve as a convenient propagation mat if you wish. *Pinguicula* leaf pullings, especially with succulent leaves, are a well-documented and effective method to vegetatively propagate plants. Pullings that I have inserted into the moss covering my rock plantings have had high strike rates.

Figure 4: *Pinguicula rotundiflora* (Aramberri, Nuevo León) nestled in a moss-covered piece of scoria.

I mentioned previously that growing *Pinguicula* on rocks may be considered an artistic endeavor. I say this because there is really no advantage to this mode of culture over traditional media and pots other than the aesthetic aspects. There do appear to be some draw-

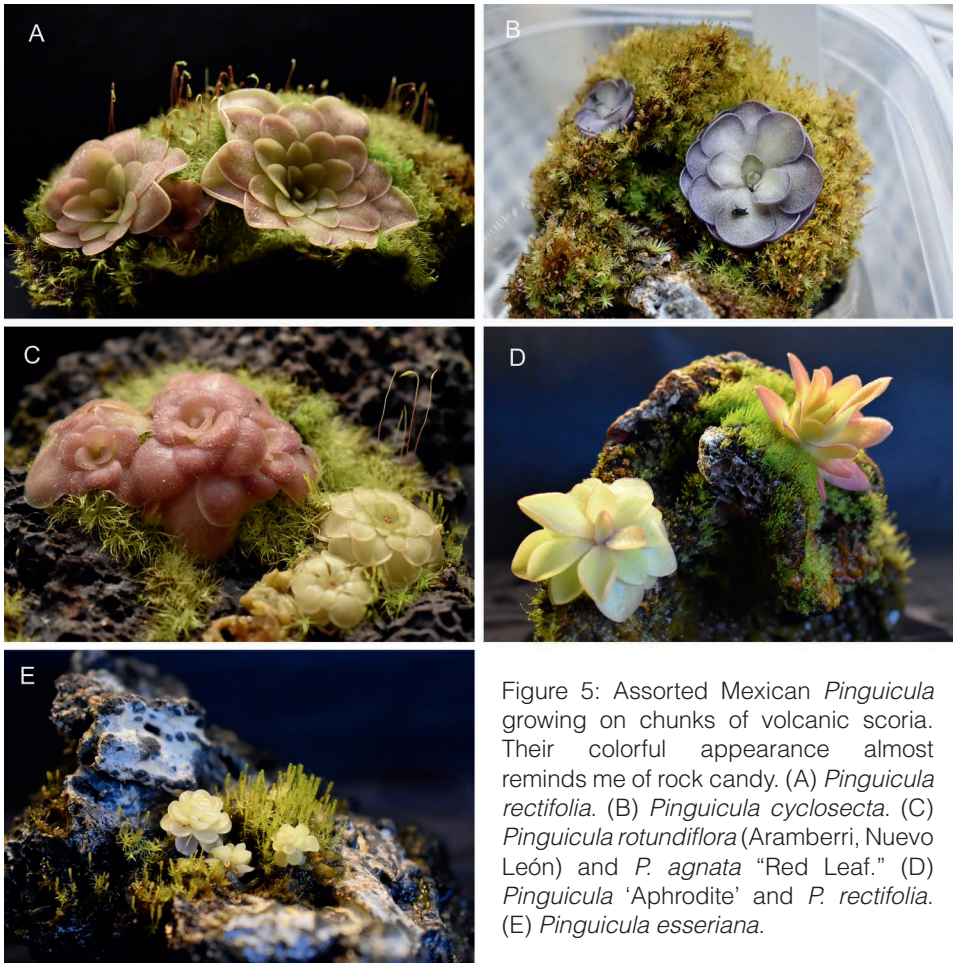

Figure 5: Assorted Mexican *Pinguicula* growing on chunks of volcanic scoria. Their colorful appearance almost reminds me of rock candy. (A) *Pinguicula rectifolia*. (B) *Pinguicula cyclosecta*. (C) *Pinguicula rotundiflora* (Aramberri, Nuevo León) and *P. agnata* "Red Leaf." (D) *Pinguicula* 'Aphrodite' and *P. rectifolia*. (E) *Pinguicula esseriana*.

backs to lithophytic culture—the plants tend to be a bit smaller, most likely due to limited space, and rock plantings are far less space-efficient than pots. That said, *Pinguicula* rock plantings are a wonderful way to create an attractive, relatively low-maintenance display (Fig. 5).

References

Mata-Rosas, M., Hernández-Rendón, J., and Salinas-Rodrígues, M. M. 2020. In pursuit of Mexican *Pinguicula*: A journey to northwestern Oaxaca. Carnivorous Plant Newsletter 49: 17-27.

Ruiz, S.Z. and Studnicka, M. 2000. Nueva especie gipsícola de *Pinguicula* (Lentibulariaceae) del estado de Oaxaca, México. Acta Botanica Mexicana 53: 67-74.