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PHOTOGRAPHS BY R. ACEVEDO-ROSAS

On *Graptopetalum marginatum* (Crassulaceae)

Introduction

In previous papers, we provided information on three Mexican species of *Graptopetalum*, namely: *G. amethystinum* (Rose) E. Walther (Chazaro & Flores, 1999); *G. glassii* Acev.-Rosas & Chazaro (Chazaro-Basañez & Acevedo-Rosas, 2008) and *G. mendozae* Glass & Chazaro (Chazaro-Basañez & Acevedo-Rosas, 2009).

This time we discuss *G. marginatum* Kimnach & Moran (Kimnach & Moran, 2002), a narrow endemic and poorly known plant from Nayarit state, Mexico.

The state of Nayarit in western-central Mexico, where this species is found, is not particularly well known for the richness of its succulent plants, in part because the botanical exploration has been meager. The species of Crassulaceae (stonecrop family) for Nayarit reported by Tellez (1994) are:

1. *Echeveria secunda* Booth ex Lindl.
2. *Kalanchoe blossfeldiana* Poelln.
3. *Sedum bourgaei* Hemsl.
4. *Sedum jaliscanum* S. Watson
5. *Sedum minimun* Rose
6. *Sedum tortuosum* Hemsl.
7. *Villadia* sp.

plus those identified during our exploration of Nayarit:

8. *Echeveria dactylifera* E. Walther
9. *Echeveria fulgens* Lem.
10. *Echeveria nayaritensis* Kimnach
11. *Echeveria perezcalixii* Jimeno-Sevilla & P. Carrillo
12. *Graptopetalum marginatum* Kimnach & Moran

Only a few quasi-endemic succulent species exist in Nayarit, such as *Agave geminiflora* (Tagl.) Ker Gawl., *Agave nayaritensis* Gentry, *Echeveria nayaritensis* and *Graptopetalum marginatum*, the topic of this paper.

Eagle's Lookout (Mirador del Águila); the Type Locality.

The Molola river, after passing Tepic city (900 m asl) heads northwest and suddenly descends precipitously to the coastal plain, at the wetlands of San Blas. This is done via an impressive canyon which starts at the Mirador del Águila (Eagle's Lookout) along highway 15, connecting Tepic with Mazatlan, Sinaloa. People often stop to admire part of this ravine, unaware of

1 Mirador del Águila (Eagle's Lookout) canyon at Tepic, Nayarit. Photo by Miguel Chazaro.

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2 *Graptopetalum marginatum* Kimnach & Moran. *3* Flowers of *G. marginatum*. *4* *G. marginatum* in habitat. *5* *G. marginatum*, close up of flowers.

the richness of succulent plants out there. This is part of the Sierra San Juan, the most northwestern part of the Trans-Mexican volcanic belt, a chain of young, high mountains that cross the country, from east (Cofre de Perote volcano, Veracruz) to west (Tequila, Jalisco, Ceboruco, Sanganguey, and Sierra San Juan volcanoes, Nayarit).

Graptopetalum Marginatum Kimnach & Moran

This plant was discovered by accident on the 8th December 1993, by Bernd Ullrich, a German amateur botanist and a devoted student of Mexican Agavaceae, while he was searching for *Agave nayaritensis* Gentry at the type and only

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6 *Graptopetalum filiferum* (S. Watson) Whitehead. *7* *Graptopetalum filiferum*, growing among rocks in habitat. *8* *Graptopetalum fruticosum* Moran, growing in rocks in habitat. *9* *G. fruticosum*, showing the variable color of its leaves.

locality known: Eagle's Lookout ravine, Nayarit (Fig. 1). In 1994, Ullrich sent living material to Myron Kimnach in California and when it flowered; it turned it out to be an undescribed species that Kimnach and Reid Moran published as *Graptopetalum marginatum* (Figs 2–4), owing to the whitish margin of the leaves (Kimnach & Moran, 2002). In 1997, Charlie Glass, at Kimnach's request, went to this same site in search of additional material for the original description. However, neither he nor CANTE, the institution Charlie worked for, had a collecting permit for Nayarit state. Thus, only notes of the environment and an outline of the morphological characteristics were made. Glass also mistakenly believed that it was a rare plant.

In 2000, the site was visited by J. A. Machuca, who collected living material that he cultivated at home (Zapotitlan, Jalisco), where it bloomed. Raul Acevedo, accompanied by Jesus Cortes went to the Eagle's Lookout on 11th December 2000 and collected both living and herbarium material, Acevedo 1733, deposited at XAL (Ecology Institute, Xalapa, Veracruz). This material was used by Acevedo for a molecular phylogenetic study of the genus *Graptopetalum*, as part of his Ph.D. research (see Acevedo et al, 2004 and Acevedo et al., 2004b). In April of 2001, again at the request of Kimnach, who needed habitat photographs, M. Chazaro, J. A. Machuca and O. Valencia also visited Eagle's Lookout, finding the plants in flower. Contrary to Glass' earlier observations, Chazaro reported that the *Graptopetalum* was quite abundant between Mirador del Águila and Buenos Aires, a small village 1.5 km further down highway 15, toward Tepic (Kimnach & Moran, 2002). On 6th May 2001, M. Chazaro, I. Contreras and J. Cortes, revisited the Eagle's Lookout, and collected Chazaro 8129, flowering material, and specimens were sent to the herbaria at CHAPA, ENCB, IBUG, IEB and XAL.

Habit

Graptopetalum marginatum is found into the tropical semi-deciduous forest at an altitude of between 500 and 700 m asl, mostly growing on the wall of the ravines. So far, it is only known from the type locality.

Relatives

Within the genus, only two species possess a submembranous leaf margin which is conspicuously whitish: *G. marginatum* from Nayarit and *G. filiferum* (Figs 5 & 6) from Chihuahua.

Graptopetalum marginatum is included in Section Graptopetalum (Moran, 1984), and it is the species that defines the southeast limit distribution of the genus of this Section (except *G. macdougallii* which is found in Oaxaca, southern Mexico; however *G. macdougallii* has stolons, a kind of modified stem).

According to Acevedo-Rosas et al. (2004, 2004b), *G. marginatum* is closely related to *G. filiferum* from Barranca del Cobre (Copper Canyon) in Chihuahua, based on morphological considerations. On the other hand, using molecular data to develop a phylogenetic analysis, *G. marginatum* is the sister group of *G. fruticosum* (from Jalisco state, Figs. 7–9), so we can conclude that it has some bio-geographic relationship thus far, since both grow close to one another.

Conservation Status

Since *Graptopetalum marginatum* is a poorly known species, it was not included in the federal government list of rare, threatened, endangered or extinct Mexican flora (SEMARNAT, 2002), but in view of the narrow geographical distribution, it must be considered as threatened, in our opinion.

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