Project Update: March 2019

Field expeditions

During the first semester of the project, nine field expeditions were carried out, two to continue taking ecological data from the population of *Tetramicra malpighiarum* located in "El Guafe", Desembarco del Granma National Park, and seven exploration expeditions to try to locate new populations of this orchid species. Of these exploration expeditions, two took place in locations on the north coast of Ciego de Ávila province (Fig. 1a-b), one on the north coast of Camagüey province, one on the north coast of Sancti Spíritus province (in Caguanes National Park , Fig. 1c), and one in the Pilón area (Fig. 1d), Granma province, on the southeastern coast of Cuba. In addition, two expeditions were carried out in the natural geomorphological trail Cueva de Samuel and in Boca del Río Toro, Desembarco del Granma National Park, far from the area of "El Guafe", also in Granma province, southeast coast of Cuba.

Unfortunately, in none of these field trips was possible to locate new populations of *T. malpighiarum*, despite the fact that we found several important patches and isolated individuals of *Malpighia incana* Mill. [Malpighiaceae], the main phorophyte species this orchid associates with (Hernández & Díaz 2000, Llamacho & Larramendi 2005, García-González et al. 2013, García-González et al. 2016). The working team was optimistic about the areas visited in Pilón, as it is a fairly conserved area, located on the periphery of the DGNP. However, the predominant ecosystem found in this area is much drier and more exposed than the typical ecosystem where *T. malpighiarum* grows, and is composed mainly of low altitude xeromorphic coastal scrub and numerous cacti of several species. In Caguanes National Park and in the majority of the localities visited in Ciego de Ávila, Camagüey, Sancti Spíritus and Desembarco del Granma National Park, we found well conserved areas. These areas, with similar characteristics to the habitat occupied by *T. malpighiarum* in "El Guafe" and to the region where the locality "Las Mamitas" is supposed to be located. In this last locality another population of *T. malpighiarum* was reported in 2000 [Hernández & Díaz 2000] but was not found in recent expeditions. In none of these sites, we found new populations of *T. malpighiarum*. It is important to note that during the expeditions on the northern coast of Ciego de Ávila and Camagüey provinces, we observed some areas of semideciduous forest, and transition forest between semideciduous forest and coastal xeromorphic scrubland, highly anthropized as consequence of forest fires (Fig. 1b), livestock production and/or wood extraction.

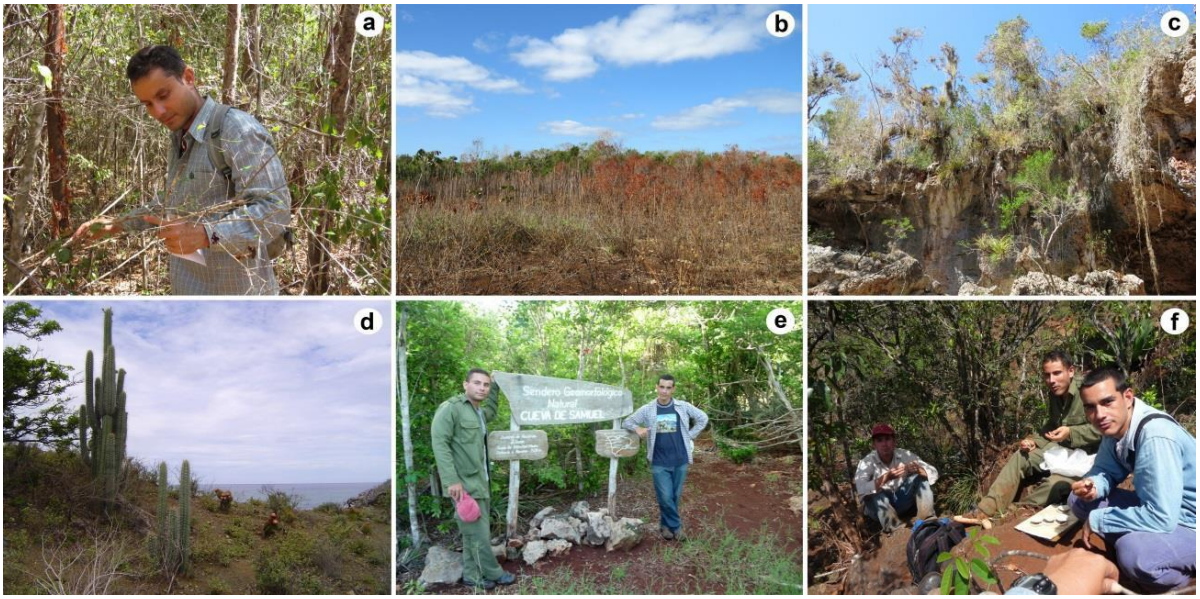

Figure 1. Field expeditions in the coastal regions of central-eastern Cuba, searching for populations of *Tetramicra malpighiarum* [Orchidaceae]. a-b) North coast of Ciego de Ávila province, c) north coast of Sancti Spíritus province [Caguanes National Park], d) Pilón zone, Granma province, southeast coast of Cuba, e-f) natural geomorphological trail Cueva de Samuel and Boca del Río Toro zones, Desembarco del Granma National Park [regions far from "El Guafe"], Granma province, southeast coast of Cuba.

Ecological study and environmental education

During this semester, we continue taking ecological data on the population of *T. malpighiarum* located in "El Guafe", Desembarco del Granma National Park (Fig. 2a). The data collected during the 2nd Rufford Small Grant, combined with the data obtained during the 1st Rufford Small Grant, will provide a more general and realistic view of the population dynamics and ecological characteristics of the only known population to date of *T. malpighiarum*. This knowledge will be fundamental to design and strengthen actions of management and conservation of this population and its habitat.

Some of the results obtained are related to the phorophytes species *T. malpighiarum* is associated with in its habitat [transition forest between semideciduous forest and coastal xeromorphic scrubland] (Fig. 2b-c). In "El Guafe" *T. malpighiarum* has been found growing on nine plant species included in nine genera and seven families (Fig. 3a-j). Of these plants, six are shrubs, two are trees and one is a woody vine.

Likewise, the awareness, environmental education and dissemination activities of the project, initiated during the Rufford Small Grant, continue to be systematized. The principal human communities we are working with are Cabo Cruz, Las Coloradas and Belic, although Alegría de Pío and Boca del Toro communities will be also incorporated. All these communities are located within or on the periphery of the Desembarco del Granma National Park.

Figure 2. a) Field work in the population of *Tetramicra malpighiarum* [Orchidaceae] in "El Guafe", Desembarco del Granma National Park, Cuba. b) Habitat of *T. malpighiarum* in "El Guafe" [transition forest between semideciduous forest and coastal xeromorphic scrubland]. c) *Tetramicra malpighiarum* individuals in their habitat in "El Guafe".

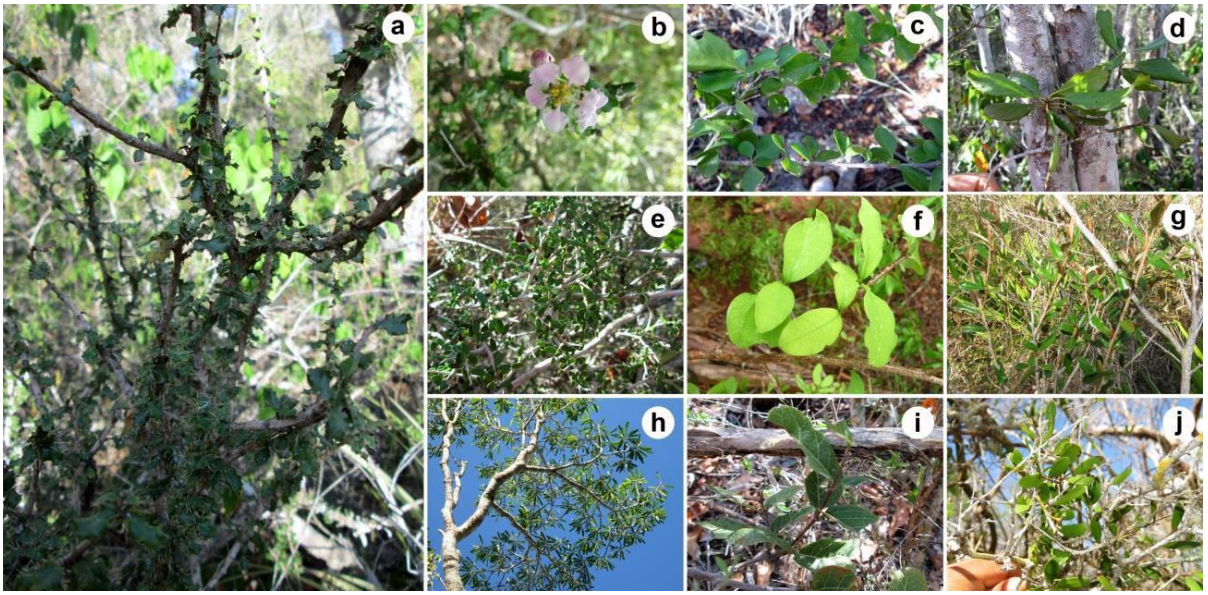

Figure 3. Phorophytes species *Tetramicra malpighiarum* [Orchidaceae] is associated with in "El Guafe", Desembarco del Granma National Park, Cuba. a-b) *Malpighia incana* [Malpighiaceae], c) *Randia aculeata* [Rubiaceae], d) *Guettarda elliptica* [Rubiaceae], e) *Eugenia anthacanthoides* [Myrtaceae], f) *Erythroxylum havanense* [Erythroxylaceae], g) *Croton* sp. [Euphorbiaceae], h) *Plumeria obtusa* [Apocynaceae], i) *Stigmaphyllon sagreanum* [Malpighiaceae], j)

Maytenus buxifolia [Celastraceae].

Next steps

In the next months, we will continue carrying out field expeditions to search for new populations of *T. malpighiarum*, and to take data of flowering, fructification and germination in the population of "El Guafe". Expeditions are being planned to new locations within the Desembarco del Granma National Park, and other areas on the south-east coast of Cuba (mainly in Granma and Santiago de Cuba provinces). Also, to new areas on the north-central coast, mainly in Ciego de Ávila province.

In addition, we will continue the work of education and environmental awareness in the human communities involved. We will make a new edition of the drawing contest and field trips with children and young people.

In addition, we will begin the elaboration of a scientific paper about the ecology and population dynamics of the population of *T. malpighiarum* in "El Guafe". This investigation will combine results obtained during the 2nd Rufford Small Grant and during the 1st Rufford Small Grant. Additionally, a new science dissemination article will be prepared, which will talk fundamentally about the education and environmental awareness work that has been done around *T. malpighiarum*, its conservation and the protection of its habitat.

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