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IN MEMORIAM: MIGUEL ÁNGEL SOTO ARENAS (1963-2009)

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We probably first met at one of the monthly gatherings of the Asociación Mexicana de Orquideología in the early 1980's. He and Gerardo A. Salazar were studying biology at the Faculty of Sciences at the UNAM, the National University in Mexico City. Both made their social service mounting specimens and looking after the live orchid collection at the recently founded Herbario AMO (then a part of the Asociación Mexicana de Orquideología). They both proved to have a deep interest in orchids, and decided to pursue a career in orchid research.

Miguel chose to specialize in ecology and taxonomy, and one of his first projects was the epiphytic flora of the region of the archaeological site of Bonampak, Chiapas, were he became particularly well acquainted with the orchids of this tropical, lowland rain-forest. He later participated in several studies of the mesophilous forests of Omiltemi, Guerrero, another site of high orchid diversity, but this time in the higher mountains of southern Mexico, overlooking the Pacific Ocean.

In was in 1985 that, after finishing their formal undergraduate studies, that they both became formally employed as a research associates in Mexican orchids by the Instituto Chinoín, A.C., in particular in the AMO Herbarium as a base. The objective was to further the knowledge of Mexican orchids from every viewpoint.

Through the years Miguel was able to travel to the most important herbaria in the Americas and Europe, spending sometimes weeks or months at a time, studying and photographing Mexican orchid material. The information contained in the images was transferred to the electronic database at AMO, now covering some 130 thousand records. Most of the slides have been digitalized for easier access. Miguel thus obtained an encyclopedic knowledge of the Mexican orchids. One of his goals was to finish *Orchids of Mexico*, a treatise covering all the taxonomic and ecological information of all the known Mexican orchid species. This work was done in collaboration with Hágsater, who focused on the genus *Epidendrum*, Gerardo A. Salazar, on terrestrial orchids, and Rodolfo Solano in relation to the Pleurothallidinae; Rolando Jiménez worked on *Oncidium*. Unfortunately, this work, now covering some 1,900 pages remains unfinished.

From the early beginning he stood out as someone willing to learn from others, doing team work and sharing his information with others. This can be seen through the number and variety of thesis he directed, not only with students in Mexican universities, but also at Oxford, England and Riverside, California, as well as in the many papers he co-authored.

Miguel tackled many groups of mainly epiphytic genera, and had a special interest in the Mexican *Laelia*, where he worked together with Federico Halbinger and produced a magnificent revision of all the species and lower taxa, having personally visited with Federico practically each and every locality, to understand each entity.

During several years he worked with Mariana Hernández in the state of Michoacán studying the population dynamics of *Laelia speciosa*, studing how the local farmers cropped the plants for the flower market in ways that could be sustainable. They also followed seedlings on oak trees for several years, recording how many survived each successive year, and how many years it took adult plants to flower for the first time. At the time there were a number of such studies with terrestrial orchid species in Europe and the United States, but very few with epiphytic species in tropical countries. Mariana's thesis was recognized as the best thesis of the year by the Mexican Botanical Society.

Once, while studying the material of *Phragmipedium exstaminodium* he exclaimed "you collected this specimen the day I was born!" Indeed

that June day in 1963 I was visiting the lakes of Monte Bello, a two day jeep-ride from Comitán, through cattle ranches and virgin forests in the highlands of Chiapas. The clear-water, colored-lakes where surrounded by Pine-Oak forests covered with epiphytes, including many orchids, and the amazing lady-slipper with two-foot long petals in full bloom! Miguel and I were deeply aware of the destruction of many natural habitats, mainly due to their transformation into farm-land. That forest however was mostly destroyed by the fires of the very hot spring of 1998, after a deep-cold winter the previous year had killed many of the epiphytes in the trees. He made several field trips to Chiapas to evaluate the state of conservation of *Phragmipedium exstaminodium* for the IUCN. A couple score mature plants were found, but no young seedlings, there appeared to be no natural reproduction.

Miguel, with his interest in ecology, participated in numerous conservation conferences, was a member of the IUCN Orchid Specialist Group, and collaborated with numerous governmental agencies regarding orchid conservation. He prepared the revision of the list of endangered orchids for the Mexican government, prepared monographs of each species, the illustrations prepared by several other botanists at AMO.

Curiously, we never went into the field together during these 25 years of working together. We often discussed plans for the future and worked on many projects, one of them being a new system of infrageneric classification in *Epidendrum*, combining floral, vegetative and molecular data. He sequenced over 300 species of the genus throughout most of its range, most of the samples from plants which I had collected during field trips to Costa Rica, Panama, Colombia and Ecuador. We came to have a good understanding of the variation. His sudden departure leaves this project in chaos.

One of our dreams, since we began working together, was to eventually publish an illustrated book on the Orchids of Mexico. We agreed that it should not be a catalogue, nor a scientific reference book, but rather a narration of the many diverse habitats where orchids can be found, a walk through these forests and savannas. Through the years we gathered material, and he became intimately acquainted with each and every habitat. The problem was how to finance the edition. I discussed the issue with several prominent editors without finding any way out. Suddenly, in late 2004, at the pharmaceutical company of which Instituto Chinoin is a part, I found myself discussing how we could commemorate the upcoming 80th anniversary of the introduction of its products to the Mexican market. All things came together; we could publish a book of interest to a cultivated public, which was the result of the accumulated knowledge financed by the Institute. Thus we rushed to put a long cherished dream into action. Miguel was at first in charge of putting everything in writing with the help of Gerardo Salazar. The photographs were to be made mainly by Rolando Jiménez Machorro and Marco López Rosas, the illustrators and photographers at AMO. We contracted one of the top scientific publishers in Mexico for the publishing work and asked them to find a suitable translator. As it was evident that we could not include photographs of all the species known to Mexico, we decided to add a CD with as many as we could get. We asked for and got collaboration from all quarters of the world for suitable slides, three dozen photographers participated. Miguel dropped everything else he was working on, including his doctoral thesis on *Vanilla*. He got involved in everything, including the balance and quality of the color selections, and the lay-out of the entire book. We could not find a suitable translator into English, so he made a first translation which Gerardo Salazar and I then worked on with a final revision by Robert Dressler. The book was printed in Japan and arrived in time for the anniversary of the pharmaceutical company. Miguel had put a full year's work into it, often working until mid-night.

It was an immediate success, within a year the 25,000 copies printed in Spanish were distributd and the edition was sold out; those who received the book did not let go of it. It had, however, a surprising unintended effect; it became the standard show-book for sellers of wild-collected orchid species in the local markets in Mexico City and elsewhere. We were dismayed by this. After years of efforts by Miguel Angel to curb this illegal market which depleted populations of mostly desirable horticultural species, growing and collecting species orchids became popular again, with very few sources of propagated plants.

Probably one of Miguel's most cherished projects was *Vanilla*. Aside from being the subject of his doctoral thesis, for which he sequenced some 500 samples from around the world, he discovered that the plant in commerce for its flavor was basically a single clone probably selected by the Totonaca people of the State of Veracruz. He had special interest in working with local communities in recuperating this valuable crop. He searched for the few individual plants with diverse genetic structures. Working in collaboration with several specialists throughout the world he prepared a proposal for a new generic classification, and described a number of species new to science. Seven papers were prepared for publication, unfortunately only one was sent to the publisher. Others pending details are being finished by the coauthors, and will hopefully be published sometime soon, some in this issue dedicated to Miguel Ángel.

Miguel was working at his home in Torreón, Coahuila, late at night on August 27th. His sister had been helping him till eight o'clock that evening. Suddenly, an assailant entered his house, and after a fierce battle assassinated him. The reasons are still unknown. His body was discovered the following day. He was 47 years old.

His sisters and parents, the whole orchid community, is shocked, as we have all lost a great friend and collaborator, and one of the greatest contributors to the knowledge of orchids in Mexico, not only their diversity, but their ecology and conservation. May he rest in peace.