

# Xerophilia

the passion for cacti and other succulents

Unfortunately this picture  
is now only history.

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Volume 2, nr. 4 (7) – December 2013

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(Photo Andreas Laras)



Back cover: *Mammillaria herrerae* with pollinator  
(Photo Stefan Nitzschke)

## Xerophilia

The passion for cacti and other succulents

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## Editorial 7



It's been a good and busy year for us, I can't complain. Four regular issues, packed with interesting articles plus two special issues: **The Stone Eaters** (featuring a seminal paper on the relation between plants and soil) and the first description of a very special new species: **Aztekium valdezii**. We have amplified our workload and interactions with different groups of C&S enthusiasts, and as a direct result we had to expand our team. Looking ahead, I'm pretty confident that we will not disappoint our readers. Fact is that producing a free online publication and sharing free knowledge got us a great deal of satisfaction, much more than we bargained for. And it's not surprising at all, that this is the way to go for many like-minded people. What about the traditional printed magazines and books?

I always loved books, that's how I grew up... surrounded by books and it was painful for me to leave most of them behind when moving to New Zealand almost 12 years ago. However, in time, I managed to gather a selection of books, magazines and journals on cacti, succulents and xerophytes. I love the smell of books fresh from the print. I love to flick through their pages. I still learn a lot when reading books. I always have a couple of books on the bedside table, just in case. But, at the same time, I realized that my C&S knowledge is becoming increasingly internet based so to speak, as my collection of electronic books, journals and articles is running in the thousands now (many of them thanks to the extensive *Le Cactus Francophone* e-library). It is the mark of our times, I guess. Over the last 4 or 5 years quite a few free online publications have been established. And more important, high standards have been set right from the start. In 2013 several other new free online publications have emerged: **Crassulacea** and **The Cactician** (written by Roy Mottram and edited by Margrit Bischofberger / *International Crassulaceae Network*), **Echinocereus Online-Journal** (a specialist journal on Echinocerei), **Sansevieria Online** (the latest specialist journal addition published by Dr. Heinz-Günter Budweg and Peter A. Mansfeld) and, last but not least, a spectacular publication of general interest edited by Davide Donati: **Acta Succulenta**, only to mention the most relevant. If the trend will continue in 2014 (and I don't see any reason why it would not), we could speak of a global phenomenon and the impact on printed and / or subscription publications could be considerable.

Some online journals originated from newsletters (e.g. **Avonia-News**, which actually evolved into much more than a newsletter), or from society journals (e.g. : **Boletín electrónico de la Sociedad Latinoamericana y del Caribe de Cactáceas y otras Suculentas**) freely available online; in fact there are several other society newsletters available on the internet as well. Some other are mirroring articles, pictures and data from long running websites (e.g. **Succulentopi@**, the journal of the above mentioned *Le Cactus Francophone*). Some are of general interest (e.g. **The Cactus Explorer** and **Acta Succulenta**), while others are aiming to a very specific audience (e.g. **Echinocereus Online-Journal**, **Schütziana** and the latest addition **Sansevieria Online**). Most of them are condoned to "national borders"... well, this term is becoming increasingly outdated: there are indeed British, French, German, Italian journals, and so on; however, all are accessible to a worldwide audience in an instant. **That is powerful!** In fact – and we know this from our own experience – once you publish in a major language, you attract readers from all over the world, no matter where you are based. Online journals seem to become a worthwhile substitute of printed publications. It was never expected that traditional free websites, blogs and forums (rather shallow and providing usually minimal useful information, if any) or the newcomer trendy socialite platforms such as Facebook will be able to completely replace printed books/magazines any time soon in regards of the quality of the information provided. Well, printed books might still stay around for a very long time, but printed periodicals will face a huge competition in the years to come. Exclusive prints will become less and less attractive with the increasing number of high quality free journals around. I wonder what the cat will bring next year. Mmmm... maybe a *Mammillaria* journal? That would be great!

As always towards the end of the editorial - we want to thank, once again, from the bottom of our hearts, to our loyal readers from all over the world, from over 107 countries and territories, and to all our collaborators for this new issue!

Finally: the *Xerophilia* team wishes you a Merry Christmas along with your loved ones, stay safe and in good health and have a Happy New Year, everyone! Feliz Año Nuevo! La multi ani, cu sanatate! Guten Rutsch ins Neue Jahr! Bonne et heureuse année à tous! Felice Anno Nuovo! Gelukkige verjaardag!

**Eduard**

# Contributions

## About the use and abuse of Peyote (*Lophophora williamsii* (Lem. ex Salm-Dyck) J.M. Coult.)

by [Pedro Nájera Quezada](#), Jovana Jaime Hernández, Claudia López Martínez and Sandy Karina Neri Cardona

[\(Original Spanish file\)](#)

### Abstract

The concern for the conservation of biodiversity in the world is no longer a new subject, and it is gaining more and more emphasis on the protection and regulation of species. In summary, these are found in very small numbers or populations or are excessively exploited by humans; the use of these species is generally prohibited by law or it is strictly regulated, but in particular situations where traditional culture and conservation ideas are contradictory, it is required a specialized analysis of the ecological situation and the possibilities of exploitation, provided sustainable, in order to amalgamate the conservation needs with the needs of the people, their cosmogony, herbology and other uses and customs. In this sense, the present paper is intended to address the issue of the use of Peyote (*Lophophora williamsii* (Lem. ex Salm - Dyck) JM Coult.), presenting a general analysis of the historical and of the current situation, and proposing actions to adequately protect Peyote and cultures that use it.

### Introduction

Let us begin by raising some questions about the causes of the great biodiversity in Mexico as well as the use of this biodiversity by Mexican natives. Among the causes that rendered Mexico to become a country of great biological diversity are topography, the great variety of climates and a complex geological, biological and cultural history. These factors have been contributing to the formation of an assortment of environmental and micro-environmental conditions, prompting as a result a great variety of habitats and life forms. (Sarukhán, Soberón y Larson-Guerra, 1996)

The cacti (Cactaceae family) are characteristic plants from the arid parts of México. The peculiarity of their anatomical characters, adapted to store and preserve water, and the presence of spines and delightful flowers, gives them a particular aspect that brands them as ornamental plants. México is home for 52 genera (47% of the world total) and 850 species of cacti (42%), from which 35% of the genera and 84% of the species are endemic. The Cactaceae family is distributed in xeric areas, thorny shrublands, semi deciduous and deciduous tropical forests, and although in México the collecting of these plants is restricted, the illegal trade is very persistent and the overharvesting has forced cacti to become one of the plants groups in major risk of extinction, along with orchids and cycads. No less than 17% (146 species) of them are threatened and 89% are endemic. Another factor affecting the conservation of cacti in our country is habitat destruction, especially if we consider that many of these plants have a restricted distribution range. (Rosalba Becerra, 1997)



**Fig. 1, 2 An Indian circle; the shape formed resembles Nerika's "God eye"; it's a focal point where our forefathers concentrates their energy to reveal and to instruct the devotes. Tanque de Dolores, Catorce, SLP. A seized Peyote during the last seizure after the raids in the villages of Charco Cercado, Huizache and San Juan Sin Agua.**

Bibliographical sources testify to the importance of various cacti in our territory, the use of stems and fruits as a source of human food is probably the most common use that the ancient inhabitants of México had for the cacti until today. It should be noted that numerous species of the family had a medicinal use or were a source of construction materials, such as organs. Others have come to have a divine meaning, and even today are used in some religious ceremonies or rituals, beliefs and customs of ethnic groups. This is the case with Peyote, *Lophophora williamsii*, one small cactus with hallucinogenic properties. Even to date Peyote is part of the folkloric traditions of various ethnic groups, as the Huichol<sup>3</sup>, Tarahumara<sup>6</sup>, Cora<sup>2</sup> and Tepehuanes<sup>7</sup>. (G. J. Alanís Flores, 2008)

In Indigenous America, the uses of hallucinogenic plants were presented as a customs with deep roots and millennial antiquity. The American continent is the geographical space where the most diversity of plants with psychoactive principles has been registered (over 100 species). These plants contains chemical compounds – Alkaloids - that are capable to induce abnormal states of consciousness that causes visual, auditory, tactile, olfactory and even taste alterations. Because of this reason these plants are regarded by the native cultures as carriers of intelligence and are considered divine instruments, source of deep and profound wisdom, of beauty and inspiration, and also as a mean to maintain cultural integrity. (Batis, A., y M. Rojas. 2002)



**Fig. 3\*, 4 The re-emerging Peyote buttons after a correct harvesting of Peyote.**

**A Peyote driven to death by desiccation due to a bad harvesting method in which the Peyote crown is harvested and the damaged part is left unprotected and exposed to drought and insolation.**

Although America is rich in entheogenic<sup>8</sup> plants, most likely Western European cultures have lost that ancestral knowledge, and carried on with the persistence of Christian tradition to break up with other cults and pagan beliefs and relating or labelling them as negative or demonic customs.

#### Background <sup>[1]</sup>

- **Species description**

Various species of *Lophophora* are known, but none has gained such wide use and fame as the Peyote (*Lophophora williamsii* J.M. Coult.) from which all other existing *Lophophora* species have been named Peyote; similarly, other species that contain the same or similar alkaloids also are called Peyote or variations of this name, as *Ariocarpus retusus* Scheidw., which is called “peyote brujo”, or the *Pelecypora aselliformis* Ehrenb. called Peotillo, as well as many other plants. E. F. Anderson (1980) reports several plants that have been similarly named, in addition to those already mentioned are *Ariocarpus fissuratus* K.Schum. and *Ariocarpus retusus* Scheidw., the so-called “peyote cimarón” or “Chaute”, other species, being very similarly to the genus *Lophophora*, such as *Astrophytum asterias* (Zucc.) Lem., and other cacti. There are also reports of the use of the name for other not related plants that offer similar intoxicating sensations or have medicinal uses, such as *Sophora secundiflora* (Ortega) DC. (fam. Fabaceae) and *Mikania cordifolia* ( L.F. ) Willd. (fam. Asteraceae).

- **Historic-cultural uses**

This species, besides having a great scientific value (for their psychoactive compounds), has a great cultural value as it is part of the worldview for many indigenous groups living in northern México, such as the Huichol (Wixaritari), and in the United States and southern Canada. These groups extract and consume it in religious rituals, following an ancient tradition (Benitez, 1968). Recent analyzes of specimens *L. williamsii* with C14, found in one of the caves of the archaeological Shumla site in Rio Grande Texas, show that the inhabitants of this place already used it since prehistoric times (approx. 3780 BC) for religious purposes (El-Seedi et al, 2005). According to Anderson (1995), Human activities and cultural practices have reduced and modified populations of this cactus in various locations in México and Texas. (Montero Daniela Anaya, 2010)

- **Ethnical use**

Peyote has aroused worldwide interest because of its unique effects produced in the body when ingested. The bitter taste is due to the presence of a high number of alkaloids - about 60. Undoubtedly its main alkaloid is mescaline, reaching usually high levels, ranging from 1-6% of the weight of the dry Peyote "button" (0.1 to 0.6% by fresh weight). (Batis, A., and M. Rojas. 2002) Among the historical tribes who use or have used peyote in ceremonies or as a medicinal plant are the following: Comanche<sup>9</sup>, Cora, Huachichil<sup>1</sup>, Huichol, Kickapoo<sup>10</sup>, Kiowa<sup>11</sup>, Mescalero Apache<sup>12</sup>, Nahuatl<sup>14</sup>, Navajo<sup>15</sup>, Omaha<sup>16</sup>, Opata<sup>17</sup>, Otomí<sup>18</sup>, Pame<sup>1</sup>, Taos<sup>19</sup>, Tarahumara, Tepehuane<sup>7</sup>, Wichita<sup>20</sup>, Winnebago<sup>21</sup>, etc. The Tarahumara consume small amounts of Peyote to combat hunger, thirst and exhaustion while going to hunt and when running after a deer for days without any food, water or rest. (Batis, A., and M. Rojas. 2002)



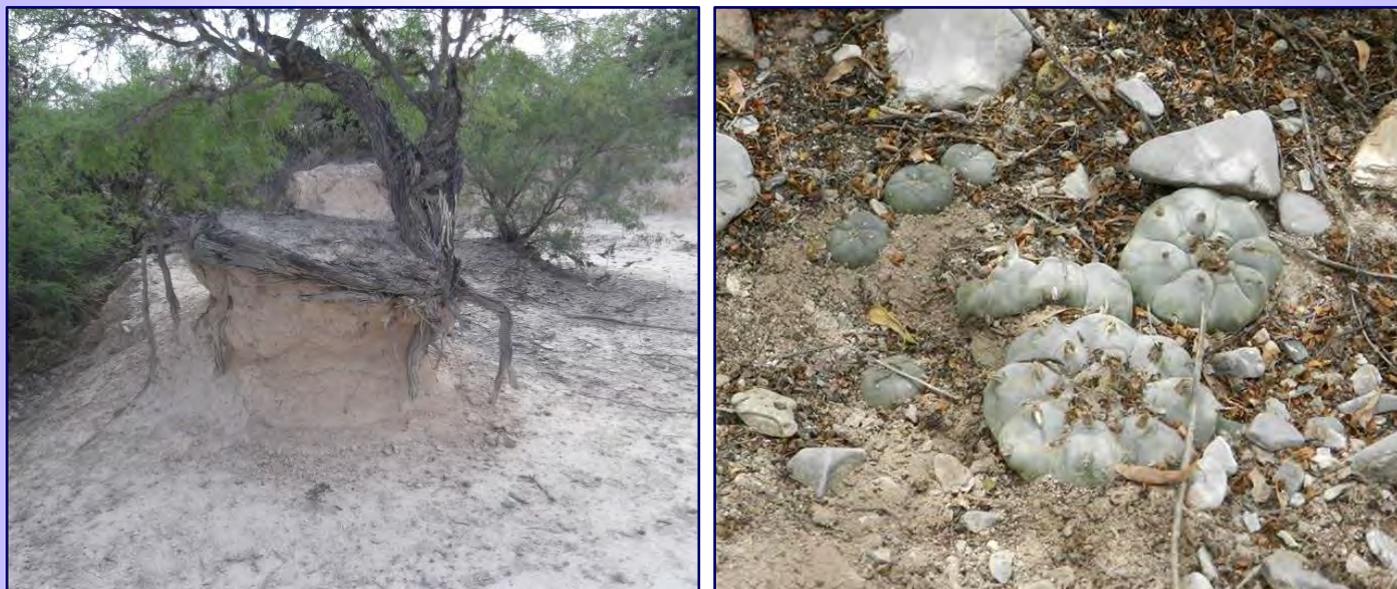
**Fig. 5, 6 *Lophophora williamsii* growing in the open between limestone slabs, SLP.**

**A pedestal formed by soil erosion; the area where the creosote bush (*Larrea tridentata*) and *Mammillaria formosa* are standing is the original height of the soil surface now it has lost over 1 meter depth of soil.**

The earliest account of a Peyote ritual was recorded in the latter part of the seventeenth century, by a Spanish missionary in Nayarit. He reported on the Cora tribe: "Close to the musician was seated the leader of the singing, whose business was to mark the time. Each had his assistants to take his place when he would become fatigued. Nearby was placed a tray filled with Peyote, which is a diabolical root that is ground up and drunk by them so that they may not become weakened by the exhausting effects of so long a function, which they begin by forming as large a circle of men and women as could occupy the space that had been swept off for this purpose. One after the other, they went dancing in a ring or marking time with their feet, keeping in the middle the musician and choir-master whom they invited, and singing in the same unmusical tune that he set them. They would dance all night, from five o'clock in the evening to seven o'clock in the morning, without stopping nor leaving the circle. When the dance was ended, all stood who could hold themselves on their feet; for the majority, from the Peyote and wine which they drank, were unable to utilize their legs." (Hofman, A. and R. E. Schultes 1979/1992)

Huichol Peyote rituals have profound roots in the archaic hunter's view of the world. Huichols follow strict rules when they pilgrimage to collect the sacred plant in the high desert nearly 400 kilometers northeast of their homeland. They

publicly confess their sexual transgressions and abstain from sex and salt. They testify that the Creator was destined to take the form of deer and Peyote. Because Peyote embodies the spirit, and is the heart of Deer-Person, they must hunt him with arrows. When they eat his heart, incarnated in the Peyote cactus, they eat it raw, honoring the precedent set by their elder brothers, the immortal wolves. To commemorate the wolves eating the deer raw, our Peyote hunters must do likewise when they eat his heart (Peyote). As the deer escaped from the ancestor-deities, he took the form of Peyote there in Wiricuta (the holy land where Peyote is collected). (Jay Fikes; 1996)



**Fig. 7, 8\* Another "pedestal" from erosion, the amount of soil loss reaches over one hundred tons of soil per each two acres. New shoots sprouting after adequate harvesting, the adult heads are also a product from an older harvest.**

The Huichol Peyote hunt is seen as a return to Wirikuta or Paradise, the archetypal beginning and end of a mythical past. A modern Huichol "Mara'kame<sup>26</sup>" expressed it as follows: "*One day all will be as you have seen it there, in Wirikuta. The First People will come back. The fields will be pure and crystalline; all this is not clear to me, but in five more years I will know it, through more revelations. The world will end, and the unity will be here again. But only for pure Huichol.*" (Hofman, A. and R. E. Schultes 1979/1992)

The Tarahumara Peyote dance may be held at any time during the year for health, tribal prosperity, or for simple worship. It is sometimes incorporated into other established festivals. The principal part of the ceremony consists of dances and prayers followed by a day of feasting. Oak and pine logs are dragged in for a fire and oriented in an east-west direction. The Tarahumara name for the dance means "*moving about the fire*", and except for Peyote itself, the fire is the most important element. (Hofman, A. and R. E. Schultes 1979/1992)

We have many early, brief descriptions of Peyote use among natives of northwestern México, and two Inquisition reports from Santa Fe, New México, which document Peyote's use in divination, showing that by 1630 it was already being used five hundred miles north of its natural habitat. Serious study of its use, however, did not begin until the 1890s, when James Mooney, an anthropologist from the Smithsonian Institution, researched Peyote meetings among the Kiowa in Oklahoma. From there he went on to study Peyote rituals on other reservations, as well as its use by the Tarahumara in México. In 1918, after testifying in favor of Native American peyotists at Congressional hearings, Mooney advised peyotists from various Oklahoma tribes to obtain a legal charter to protect their religious freedom. With Mooney's help and encouragement, the Native American Church was officially incorporated in 1918. It was the Kiowa and Comanche Indians, who apparently during visits to a native group in northern México, first learned of this sacred American plant. Indians in the United States had been restricted to reservations by the end of the nineteenth century, and much of their cultural heritage was disintegrating and disappearing. Faced with this disastrous inevitability, a number of Indian leaders, especially from tribes re-located in Oklahoma, began actively to spread a new kind of Peyote cult adapted to the needs of the more advanced Indian groups of the United States. (Hofman, A. and R. E. Schultes 1979/1992)



Fig. 9 *Lophophora williamsii* habitat.

Ritual peyote use among North American tribes began in the early 20th century after a process of diffusion from the South. The Carrizo Indians of Southeastern Texas and Northeast México spread peyotism to the Lipan<sup>22</sup>, Apache<sup>13</sup> and Tonkawa<sup>23</sup>, who in turn took it to the Kiowa, Kiowa-Apache, Comanche and other tribes in present-day Oklahoma. The Peyote Religion quickly formed from the earliest peyotists, Lipan Apache Billy Chivat and Pinero, to include the major tribes of Indian Territory. Mythologies of the Peyote plant were incorporated into tribal belief and expressed in the two primary ceremonies of the Peyote Religion: the Half-Moon, originating among the peoples living in the Peyote growth area, and the Big Moon, introduced by John Wilson. Both ceremonies incorporate aspects of Native American culture and Christianity and share many commonalities. "*Both emphasized the divine role of peyote and its power to teach and heal; both opposed the use of liquor and believed that peyote destroyed the taste for it*". (Champagne, Duane 1999)



Fig. 10\*\* A typical ecotone<sup>[4]</sup> where *Lophophora williamsii* grows under creosote bush (*Larrea tridentata*).

Peyote was accepted as a remedy and inspiration by members of many Oklahoma tribes during an era of agonizing cultural disintegration, which reached a peak during the 1880s. By 1874, the Kiowa and Comanche, once proud warriors of the Southern Plains, were confined to reservations in Oklahoma. The loss of liberty intrinsic to reservation life brought great pain and suffering to all Native Americans. Perhaps because it provided a powerful alternative to both ancient tribal religions and missionary-controlled versions of Christianity, the Peyote religion spread like wildfire. In the 1880s, two new religious movements were popular among Native Americans. One of them, the Ghost Dance, tried to renew the old ways. Following the Wounded Knee Massacre <sup>[2]</sup> of 1890, the Ghost Dance practically disappeared. The other, the Peyote religion, allowed members to establish a new identity which combined aboriginal and Christian elements. Except for the secular Pow-Wow <sup>[3]</sup>, Peyote meetings are now the most popular Native American gatherings. (Jay Fikes; 1996)

Success in spreading the new Peyote cult resulted in strong opposition to its practice from missionary and local governmental groups. The ferocity of this opposition often led local governments to enact repressive legislation, in spite of overwhelming scientific opinion that Indians should be permitted to use Peyote in religious practices. In an attempt to protect their rights to free religious activity, American Indians organized the Peyote cult into a legally recognized religious group, the Native American Church. This religious movement, unknown in the United States before 1885, numbered 13,300 members in 1922. Membership of the Native American Church at the present time is claimed to be a quarter of a million Indians. (Hofman, A. and R. E. Schultes 1979/1992)



Fig. 11, 12 Caespitose forms generated after correct harvesting practices and given time for regrowth, pictures taken on the historic-cultural route for the Huichol people.

- **Spanish tabu and inquisition**

Most of the early records in México were left by missionaries who opposed the use of Peyote in religious practice. To them Peyote had no place in Christianity because of its pagan associations. Since the Spanish ecclesiasts were intolerant of any cult but their own, fierce persecution resulted. But the Indians were reluctant to give up their Peyote cults established on centuries of tradition. (Jay Fikes, 1996)

From the very beginning, immigrants to the New World have misunderstood the Native American adoration of Peyote. In 1620, sixty years after the sacramental use of Peyote was first reported by the Franciscan Friar Sahagun, the Spanish Inquisition denounced it as diabolic and made its use illegal. Inquisitional persecution of Mexican Indian peyotists included torture and death. (Jay Fikes; 1996)

In Spanish chronicles is referred to "*those natives who ate Peyote were possessed by terrifying demonic visions.*" The use of Peyote was severely punished by the Inquisition starting with 1617, in 1720 its use being prohibited in México – at that time part of the Viceroyalty of New Spain. In 1997, representatives of 22 ethnic groups of the country sought the decriminalization of the use of plants and animals required for rituals and ending persecution against charges of drug traffic. (Batis, A., and M. Rojas. 2002)

- **General perception**

Industrial societies do not value the transformation of consciousness as positive or adaptive; however, indigenous societies have often resorted to the transformation of consciousness to fulfill various duties in the service of the group or its members and it is often an institutionalized value. Likewise, Western society has defined Peyote, mushrooms and other herbs as recreational drugs with no therapeutic value, while for dozens of different tribes and cultural groups "*mestizos*" these plants are defined as medicines, sacred or prodigious plants. (Nierika, 2011)

The peyoteros' techniques are learned from family members or neighbours. Since the plant lies close to the ground, harvesting - slicing the drug-containing "*buttons*" from the roots - is backbreaking work. Experienced harvesters, however, can pick 1,000 buttons in an hour. Once collected, the buttons are either used immediately or dried naturally on long, slanted tables, a process that can take as long as a month or as little as a week in the searing summer temperatures of south Texas. (The Economist, 1999)

The Texas Department of Public Safety licenses seven peyoteros and monitors them on a quarterly basis. The federal Drug Enforcement Agency keeps an eye on things too, and reports very little abuse of the drug by non-Indians. Advocates of Peyote say it actually reduces alcoholism among Indians, a serious health problem in most tribes. (The Economist, 1999)



**Fig. 13\*, 14\*** People of the Huichol tribe during the harvesting of Peyote on their sacred lands "*Wirikuta*". Harvested Peyote, ready for transport to Huichol homeland.

Salvador Johnson, of tiny Mirando City, is one of the youngest peyoteros; he is 52. He employs up to a dozen labourers, most of them relatives, to pick peyote buttons all year round on about 30,000 acres. His business is booming. "*You can have 100 church members come down in a weekend,*" he says, "*and the least that each of them will take is probably a couple of thousand buttons.*" Mr Johnson himself may not supply all those customers, but at \$150 for 1,000 fresh buttons - or \$170 for 1,000 dried buttons - the maths works out well enough. "*By June, I take a break because I'm exhausted,*" he says. (The Economist, 1999)

With fewer lands available to harvest, the supply of Peyote is shrinking even as church demand increases. There is an easy solution: using Peyote stocks that stretch 300 miles or more into México, a reserve that might produce twice the output of the United States. Yet, ironically for a government that has often run into trouble with American officials for enforcing drug laws too weakly, México continues to stand firm on Peyote, preventing any harvesting or possession of the cactus on its side of the border. (The Economist, 1999)

If México were to liberalize its peyote laws, or if the Native American Church<sup>4</sup> were to buy land and harvest its own Peyote, America's seven licensed peyoteros could suffer from falling prices. But Mr Johnson says he would be willing to put up with that if it meant an increased supply of Peyote for congregants who need it. "*We will never have enough to meet the demand,*" he says. "*There's no way in the world we can meet it. It's sad, because this is something these people use for their church. And without Peyote, there is no church.*" (The Economist, 1999)

Anderson (1995) observed in a population of *L. williamsii* south Texas, that after three years, without the exploitation of "peyoteros", the population showed signs of recovery and high toughness.

- **Traffic, illegal commerce and legal situation**

Although Mexican law allows the potential use of some species, in fact the effect and use fall more in some than in others, the intensity of use is not distributed among all species allowed and this is due to utilization rates that authority determines for each species, on the other hand, it is also a function of the relative abundance of species populations and their own distribution in the national geography, fragmentation of ecosystems, the differential access to areas that were wild before, and finally also depends on the preferences of users and the prevailing market conditions (Pérez-Gil et al., 1995).

Because the Peyote is part of the customs of the Wirrarika<sup>3</sup> (called Huichol), the Tarahumara and Cora, Executive Mexican authorities have in effect provided certain individual rights for these indigenous groups, excluding them felony charges from consuming and port this cactus. (Nierika 2011)

NOM059-SEMARNAT-2010 is the legislation which states the species that are in some degree of protection by the law; this provides the Peyote (*Lophophora williamsii*) as a species subject to special protection (Pr).

The whole legal situation in regard to the plant is remarkably complex, but according to current law, it is prohibited to own any members of the genus *Lophophora* except for members of some Native American religious groups, and whether we as cactus growers and enthusiasts like it or not, that's the law we're stuck with. (Fred Dortort, 2007)

During their DNA sampling Fred Dortort and company chatted about the marginal state of the goat business and local attitudes about Peyote with a local goat shepherd from Wirikuta. He said that in spite of the supposedly strict enforcement of laws to punish outsiders who might extract Peyote from this area (which is protected as Wirikuta, the sacred land where the Huicholes come annually to gather Peyote) there were people who had hauled out great quantities of Peyote from local populations for sale in some unspecified distant market. (Fred Dortort, 2007)

The factors responsible for the rapid growth and tenacity of the Peyote religion in the United States are many and interrelated. Among the most obvious, however, and those most often cited, are: the ease of legally obtaining supplies of the hallucinogen; lack of federal restraint; cessation of intertribal warfare; reservation life with consequent intermarriage and peaceful exchange of social and religious ideas; ease of transportation and postal communication; and the general attitude of resignation toward encroaching Western culture. In 1995 Bill Clinton permitted the use of Peyote to the members of the Native American Church. (Hofman, A. and R. E. Schultes 1979/1992, 2008)



Fig. 15\*, 16\* Harvested Peyote, ready for transport to Huichol homeland.

### Discussion

The conservation of a species, as already mentioned is a purely anthropocentric concept, in which the man anticipates to replace the ecosystem while sustaining the species, rather than seeking to protect the ecosystem as such. We often consider a threatened species as exclusive and independent individuals, while in fact all species are the result of biotic relationships, adaptations, genetic continuity and survival in certain eco-systemic conditions. This is what makes a plant or animal behaving that way because they are a directly proportional outcome of genotype, phenotype and its environment. When trying to protect a species in captivity these factors and its capacity to change, as captive population, and survive the ecosystem become increasingly weaker with every generation because it facilitates genetic dilution of the adaptations needed to survive its environment.

The difference between use and drug addiction is a very thin line, but well defined; the ancestral cultures have used the so called "*plants of power*" for purely productive means of one or another form, either with purposes of spirituality, to exercise labors, or for medical purposes, but never or rarely recreational and of mere entertainment, and never stole, traded or misused them, in the same way a Catholic does not abuse consecrated bread; the abuse of this plant is considered for them something negative for their deity.

After this brief panoramic review we can distinguish different types or categories of Peyote consumers:

**Traditional consumers** are all those who use it traditionally with a religious and cosmogonist mean, and are falling in the following categories:

- Primary Traditional Consumers; as the Huichol, Cora, Tarahumara, etc., and the extinct Chichimeca<sup>1</sup> tribes (Huachichiles, Zacatecos , etc.)
- Secondary Traditional Consumers; as the Yaquis<sup>24</sup> and Tepehuanes that rarely consume it and mainly for medicinal purposes and only obtained by barter with the Huichol.
- Tertiary Traditional Consumers; are all those like the Native American Church members who use Peyote, with only very few historical records of ritual use, but with a growing number of consumers.

This type of use has been practiced since immemorial times, but as never before Peyote faced such a devastating impact on its populations, since from the change in land use and plunder, through the pasture management practices to agricultural, industrial or urban developments and to excessive over-collection is overcoming Peyote. Now, that Peyote twinned with the Native American Church increased consumption, it means that their numbers will be smaller in supply and, in agreement with the preservation of the traditions and customs of the native people, it should be allowed to prioritize consumption for those who use it for their rituals.



**Fig. 17\*, 18\* Here, the modifications on the harvesting habits of the Huichol people is evident; this is due to the plant scarcity in the area that makes them to take more root from each plant in order to fulfill the yearly amount of Peyote they need to take back to their homeland.**

As a result, trafficking Peyote north of its range to supply the members of the Native American Church should stop and be considered illegal, this in order to prevent exacerbate the pressure that could jeopardize Peyote populations and to pressure the U.S. government to encourage management plans for the collection of Peyote that are appropriate for the Texas region, where they occur naturally.

It is estimated a consumption of more than two million Peyote a year (Nierika, 2011) that are legally distributed only to the Native American Church in the U.S. and Canada. Considering that there are between 250,000 and 500,000 members who take part in the ceremonies, this would be something between 4 and 8 pieces per year; in one ceremony is consumed between about 2 and 4 pieces, sometimes even more. This high level of consumption cannot be sustainable at all as a practice that ensures the survival not only for Peyote, but for the culture itself.

**Consumers Imitators** are all those who try to imitate the manners and customs of national or foreign ethnic group; they are generally westernized “*mestizo*” <sup>[5]</sup>, the ones who intend to adopt a type of culture and worldview that is not theirs. Such practices must be stopped immediately since they only help to create a misperception of the intrinsic and cultural value of Peyote; this can be achieved through raising awareness and education in schools.

**Commercial Consumers** - all who provide or obtain any financial reward from its use or exploitation fall into this category:

- Usual Commercial Consumers are consumers who use Peyote repeatedly and are usually carriers and truckers who eat in false cafeterias that are installed along the roads only to sell the famous liquefied Peyote.
- Local Commercial Consumers are those obtaining from the use of Peyote a steady income, whether by direct sale of the plant, as there is the case with inhabitants of the Charco Cercado town, from San Luis Potosi, or as mentioned above, in the form of liquefied Peyote in clandestine "coffee shop" scattered along the highway MEX57.
- Outsider Commercial Consumers are Peyote dealers who come from other parts of México or even from other countries to transport either seeds or plants to other sites for sale.
- Recreational commercial consumers is the most common type, and occurs when people are visiting and consuming Peyote within the distribution areas; this type of consumption is mainly generated by young people between 16 and 30 years and are often supported by local guides or paid tours.
- Ornamental Commercial Consumers are those who collect or buy Peyote and other cacti, only to have them in their home for ornamental purposes. All such use should remain coined as illegal practices and should be indistinctly pursued as long as is not generated by legal reproduction models of this species.
- Research Consumers, although the most challenged, but also the less common, are those who consume or cut Peyote for botanical, medical-therapeutic, social-anthropological or theological purposes; these consumers do so with a clear and specific purpose and generally comprehend the effect of the abuse of natural resources and they just take advantage only for their research. This type of consumers should regularize their research by submitting applications to the previously mentioned instances to carry out their activities, including all botanical and anthropological collections.



Fig. 19 A municipal dumping ground on the area were Anderson decided to take the type specimen of *L. williamsii*, In this place the rubbish is burned constantly to reduce its volume because there is no waste management.

Although people generally don't want to admit the impact of native cultures to the species, this happens and in various ways. The "pseudo Marakames" (fake ceremonial guides) remove large quantities (sacks) of Peyote to sell on private ranches along with a "Huichol experience" and charges large amounts of money for this act. The fact alone that new tribes are invited to consume Peyote created a subsequent aura around this custom and caused it to spread beyond reasonable limits. The ritual of Peyote medicinal use (the Native American Church) contributed to the decimation of plant populations in the U.S.; later on they lobbied to the government for support of DEA raids, which, without permission by the SEMARNAT and the Mexican Government, entered into Mexican territory to collect and transport to the United States and Canada thousands of heads of peyote that are requested by the Native American Church in both countries.

It has been observed that many Huichole have changed the way in which they used to collect Peyote heads and as a result of having fewer plants available they tend to cut progressively deeper in order to obtain a larger amount of plants and thus replenish the absence of Peyote heads; this practice reduces the regeneration potential of the species since it removes most of the storage tissue.

Hunger, the urgency of meeting basic needs, loss of identity and westernized Mexican trends and all the propaganda that it entails, are pushing the native people to consider or try certain habits that would be dishonorable to their culture and their ancestors, such as alcoholism and drug addiction, and mainly the loss of traditions, values and customs.



**Fig. 20, 21 *Lophophora williamsii* - a caespitose form from the Huizache valley, this are natural clusters formed without any human intervention of any kind. *L. williamsii* and *P. aselliformis* - Peyote and Peotillo.**

The consumption of peyote for recreational purposes had its origin during the early 60's when the hippie movement began to dabble in the use of new psychoactive substances. Although shortly before the real lootings occurred, the 60's were made famous by the generalized use of drugs, well sought by literary and musical icons of the time, such as Aldous Huxley known for his book "The Doors of Perception, 1953," author and journalist Hunter S. Thompson, and musicians such as The Beatles and The Doors, who all caused a great interest in the Peyote ritual. Since then, waves of domestic and foreign visitors are flooding the region annually, roaming where Peyote is known to exist. Unfortunately, this place is the valley west of the Sierra de Catorce, which is sacred to the Huichol who call this place Wirikuta.

The current situation and the future of Peyote is not well established, especially if we are held by the wrong ideas and mysticism reasoned mainly around the "neo-hippies", who want too to feel, by chewing Peyote, "in tune with nature". Being illegal in two ways according to NOM -059 -SEMARNAT- 2010 and the Health Act supported by the Federal Criminal Code, the forfeited Peyote species usually ends in police custody and its way out is usually completed by incinerating the specimens. Rare these are delivered to botanical gardens, universities, research centers and hospitals; rarely because of the highly complicated steps necessary to make arrangements for research to benefit from controlled species. And because all these plants remain in custody, it becomes impossible to have a benefit of it in any way from them, nor germinate their seeds, nor collect their pollen, and neither hybridizing the

different species; however, it is not stipulated what to do with the seeds obtained. These plants cannot be returned to their original habitat because it is generally not known where the Peyote heads were collected from, and if so there is a risk to be removed again. In the same way, the seeds obtained cannot be returned due to unknown genetic purity and source of the germplasm.



Fig. 22, 23 As can be seen in the village shop, harvested Peyote is not the only produce sold here, but it is sold with the skins and other animal by-products and even live animals. Peyote seized by PROFEPA<sup>[6]</sup> in the state of San Luis Potosi. For more than 20 years this plant is under care of the National Institute for Forestry, Agriculture and Livestock.

## Conclusions

The lack of popular knowledge about ecology and sustainability concepts represents a limiting condition for the prosperity not only of this species, but of all natural resources, both biotic and a-biotic. To promote cultural values and respect for Peyote, it is needed to create botanical gardens in situ, to establish interpretive trails where tourists can appreciate the flora and fauna of the desert and learn from a holistic perspective, and favor a potential and direct economic benefit for the residents. There should be increased security systems in areas where these species are known to be found, affecting individuals for consumption or marketing. Production and marketing of this species must be allowed for specialist nurseries to provide the regular market with ornamental plants, and foster the appreciation of the species by noting, among other things, the long time it takes for these plants to reach an acceptable size for consumption.

The production of mescaline and other alkaloids produced by cultivated plants should be studied, this in order to know the difference in the production of mescaline, which we speculate as connoisseurs to have fewer amounts of active compounds due to the proportionally rapid growth in cultivation, as opposed to field specimens. In this way we ensure that the consumption of commercially grown Peyote, using conventional nursery methods for mass-produced cacti becomes somehow impossible, because of the poor cost-benefit ratio obtained in these circumstances.

Replanting programs of these species seem quite remote; it is first needed to create forestry nurseries and seed plots at each site that is intended to be replanted. However, even so strict sanitary controls become absolutely necessary, in order to prevent the release of pests, diseases and parasites, such as cactus beetles (*Moneilema* sp.), and various species of nematodes that would be far more damaging than the over-collection itself. To avoid such risks is preferable to exclude the populated areas or where livestock exists, to allow the natural seed bank to support repopulation, as well as permitting the reproduction of adult specimens that have remained and can thrive as they naturally do.

Livestock cannot be maintained in this type of ecosystem rather than through a rotational grazing system known as the Savory system (Alan Savory, 1983), because the ecosystem is not able to support livestock beyond that. On the contrary, old buffalos that migrate in immense herd from north to south, grazing on these plains are leaving for the rest of the year the ecosystem to recover.

The change in land use is a key factor since it permanently stops the possibility of natural restoration of the ecosystem, so we have that Peyote's greatest threats are in ascending order: the induction of cattle pastures, conventional farming and modern agriculture greenhouses, also population growth and development that entails, such as roads, dams and levees, etc., and mining and exploitation materials such as sand quarries, lime kilns and quarries. Employment and social welfare should be encouraged to prevent people from being edged to find and traffic these species in order to survive.

It should be avoided the creation of propagandistic media, such as films, magazines, alluding to abuse of Peyote as it only encourage misinformation and makes use of this sacred entheogen<sup>8</sup> plant merely a fashion that is not only adopted by nationals, but also by many foreigners trapped by fame and mystique of Peyote. Even now there are many who live in towns like Real de Catorce, Estación Catorce, Wadley, etc., or where there word came out of abundance of Peyote.



**Fig. 24 Caespitose forms generated after correct harvesting practices and given time for regrowth, pictures taken on the historic-cultural route for the Huichol people.**

The effects of intensive harvesting of the plant has been noted in several studies (E. F. Anderson, 1969, 1980, 1995; Schultes, R.E. y A. Hoffman. 1982; Fred Dortort, 2007; Glafiro J. Alanís Flores, Carlos G. Velazco Macías, 2008; Martin Terry, 2008; Daniela Montero Anaya, Oscar R. García Rubio, 2010; M. Abul Kalam, 2013) and abuse is indicated in all corners of its distribution area. It is necessary and crucial for the continuity of the species to prohibit transportation of Peyote heads toward the U.S. by the Native American Church, consumption must be secured for the native Mexican tribes (Huichol, Tarahumara, Cora, etc.) in order to perpetuate their cultural and traditional customs, and only allow those who practice it for religious purposes. Unless the legal production of Peyote in nurseries for medicinal, recreational or ornamental purposes is not allowed, the irrational uses of this natural resource should remain penalized.

The municipality of Catorce in San Luis Potosi has become the focus of attention to the point that many people believe that there is nothing else but Peyote in this municipality. This perception is so common and frequent that by purely mentioning of Real de Catorce, Wirikuta, Wadley or some other towns or regions of the municipality, it is immediately linked in one's mind to the harvesting of Peyote. This reputation is actually well earned because of the hill called El Quemado, located in the area and that represents the most important ceremonial center for the Huichol

culture, which, as mentioned above, uses Peyote in religious ceremonies because in their worldview Peyote represents the heart of one of their major deities, the Deer.

The Wirikuta sacred territory and the cultural-historical route for the Wirraritari<sup>3</sup> people (Huichol people) should be elevated as federal protection area. It also should be considered expanding the protection area in order to protect more endemic species which are found in areas immediately outside the polygon of the Natural Protection Area, as the case with:

- *Ariocarpus bravoanus* subsp. *hintonii* (Stuppy & N.P.Taylor) E.F.Anderson & W.A.Fitz Maur.
- *Ariocarpus kotschoubeyanus* (Lem.) K. Schum.
- *Coryphantha poselgeriana* (D.Dietr.) Britton & Rose
- *Lophophora alberto-vojtechii* Bohata, Mysák & Snicer
- *Mammillaria coahuilensis* (Boed.) Moran
- *Pelecypora strobiliformis* Frić & Schelle

In this way you can increase the biological importance of the reservation as all these plants mentioned are in the NOM-059-SEMARNAT 2010 or are newly discovered and therefore endemic.

The possibilities for legalization of Peyote are very remote; it will be difficult to legalize its production while

indiscriminate consumption exists. While use and possession are not legalized yet, it becomes necessary at the same time to intensify the surveillance of Peyote in their respective localities; however, this requires first of all extensive research in populations, to understand their degree of vulnerability when facing change in land use, looting or other human activities that are adverse. It requires creating security and surveillance systems in localities that have been designated, after evaluating the populations of Peyote, as the most affected. In parallel it becomes authoritative to teach children from schools, especially in areas where these "important plants" grow, to preserve the environment for future generations.



**Fig. 25\*\*\* A colony formed after correct harvesting practices and given time for regrowth, Charco Cercado, 9 km from Huizache.**

Contrary to what Nierika 2011 and C. Gamboa, 2013 refers, it is firstly required to educate the public so that it can accept in the first place its position as a Mexican citizen, and secondly that there are different races and cultures, and although according to art. 2 of the Constitution of the United States of México, the Mexican nation

is one and indivisible, it does not mean that they have to unify multicultural beliefs and customs that make México the most mega-diverse country, as it not only has a wide biodiversity, if not also a great diversity of cultures, which also must be warranted, protected and respected.

Any new piece of legislation must regulate the collection and trade or "barter" by the indigenous tribes and consider the existence of the already known false "Marakame" that perform private ceremonies near México City. It should

stop the peyoteros who, with American permission, collect Peyote, which drive into México and make available their collections and distribution networks to the headquarters of the Native American Church in the U.S. and Canada. Since they have Peyote in Texas they do not have to cross over and affect biodiversity and put in risk populations of Peyote of another country only because their excessive consumption has decimated the populations of this plant in Texas. These actions seek to pressure the government of the United States of America to allow private Peyote cultivation that would permit to members of the Native American Church and to perform their practices without jeopardizing the populations of their so called sacred plant.

In order to slow down the population growth and the impact that this entails, to reduce the pressure from population growth and land use change that this is supposed to encourage, agricultural practices in the highlands should be planned differently, by promoting less invasive traditional agricultural practices in the rural areas and conduct modern intensive agricultural practices only in regions around the major population centers.



Fig. 26\*\*\* Another colony formed after correct harvesting practices and given time for regrowth, Charco Cercado, 9 km from Huizache.

A compilation of the seizures recorded in newspapers or preliminary investigations over the last few years, Bibliography, Author's Notes and Editor's Notes can be accessed and consulted at [Annexes & Notes](#).

**Legislation:** Following this link you will find brief summary of the articles that refer to federal provisions in regards to production, transportation, traffic, trades, and even provide for any free or prescribed of the narcotics referred to in Articles 237, 245, sections I, II, and III and 248 of the General Law of Health in México.

\* Photos published by courtesy of Epifanio Candelaria Rodríguez

\*\* Photos published by courtesy of Jorge Xolapa Plancarte

\*\*\* Photos published by courtesy of Leo Rodríguez

O traducere prescurtată a articolului **Uzul și abuzul de Peyote** poate fi accesată la [Abridged Romanian translation](#).

# Our Special Guests



## Andreas Laras



Born and raised in Athens, Greece during the daunting times of the military dictatorship but the best years of rock, I started high school with some great records under arm: Machine Head, LA Woman, Aqualung, Led Zeppelin IV. I studied Biology and got my Ph.D. in Molecular Biology from Brown University in 1991 on the gene regulation of Human Immunodeficiency Virus (HIV). Since 1993 I have been working on Hepatitis B Virus (HBV) gene regulation and drug resistance at the University of Athens.

I have been collecting cacti since I was a teenager, however systematically only since my return home in 1991 when I began to raise them from seed. The breakthrough in my passionate relationship with *Ariocarpus* came with my first

field trip to the Big Bend National Park area in Texas, in 1999 with the encouragement and direction of Steven Brack, to whom I will be forever indebted. What ensued you already know.

Other than studying *Ariocarpus* in habitat and cultivation, in the back of my head there is this idea of assembling an *Ariocarpus* genetic reserve. I am not sure if this would ever be of practical use (in terms of re-introduction) but the sad fact is that several of my documented populations already face dire prospects or no longer exist.

Current projects include processing field data, writing articles, an *Ariocarpus* book that is likely to take me a few years and learning new skills with the making of an *Ariocarpus* web site, hopefully a rudimentary version will be up at [www.ariocarpus.gr](http://www.ariocarpus.gr) as you are reading this.

### Demystifying the "Aramberri enigma" – an interview with [Dr. Andreas Laras](#)

**Xerophilia:** Hi, Dr. Laras, our readers will be pleased to know how did you actually start your lifelong passion for C&S? And in what extent have you been influenced in your C&S hobby by your profession?

**Dr. Andreas Laras:** Hello Dag, first of all thank you for giving me the opportunity to communicate with your readers and hopefully, to share with them something of interest. A good deal of our passion with these plants has to do with communication and sharing and in its short lifetime *Xerophilia* has contributed a great deal to this exchange.

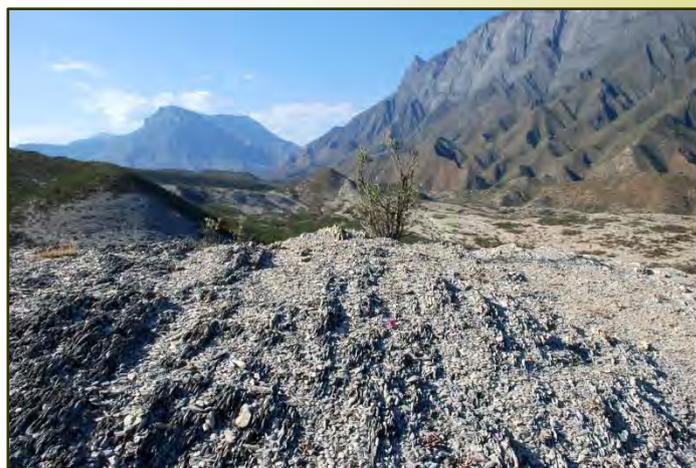


Fig. 1 The mystifying Rayones Valley, NL (left). Fig. 2 The distinctive habitat of *Ariocarpus scapharostrus* (right).

Ever since I was a young child I had a fascination with nature and all of its miraculous creations. I used to snorkel for hours, collect seashells, rocks, fossils, insects, you name it! Eventually I got to plants... and cacti and succulents quickly captured my attention and sparked my imagination. My very first succulent was a *Haworthia fasciata*, others quickly followed and soon I had assembled everything spiny or succulent that I could find in Greece at that time, the early '70s,

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

which was not a lot but enough to get me hooked forever. My other passion was my chemistry set and microscope, I wanted to grow up to be a mad bioscientist and a jungle explorer. I suppose, I am lucky enough to have realized a version of both aspirations, jungles replaced by deserts and madness evaded, though others might attest otherwise.

Being a molecular biologist has certainly influenced my approach to the hobby in many ways; some straightforward, a solid understanding of biology and genetics is certainly helpful to growing and breeding plants or even understanding molecular phylogenetics. Others complex, a methodical scientific approach to collecting plants, acquiring knowledge, gathering data, paying disproportionate attention to microscopic detail, understanding form and function and so on...

I do not believe that anyone without scientific training would be nutty enough to go measuring stems, tubercles, areoles and flowers of every *Ariocarpus* that grows in Mexico and Texas! Actually, self-sarcasm and objectivist mythology aside this Baconian enumeration and tabulation of data from *Ariocarpus* populations in habitat has recorded a great deal of interesting data that would have otherwise gone unnoticed. If you do field work, grab a measure and a pencil, you will be surprised how much evades the eye and the camera. So, for a brief answer, my profession is in many ways inextricably intertwined with my "hobby".

**Xerophilla:** You travelled extensively and saw plant in their natural habitat; of all places which one has overwhelmed you most? ...and of all plants which was the ONE that left you breathless when you first saw it?

**Dr. Andreas Laras:** This is a tough one, selecting the "one" place and the "one" plant. Mexico and the Big Bend area in southern Texas are places of exceptional beauty. So, what is more memorable? Descending over the Sierra Madre Oriental down the snaking road to the valley of Rayones to discover *A. scapharostrus* and *Aztekium ritteri*? Watching the mountain ranges encircling Aramberri from a hill top painted with the palate of flowering *A. confusus*?



Fig. 3 "to discover *Ariocarpus scapharostrus*" (left). Fig. 4 "a huge pristine ostentatious *A. retusus* in full flower" (right).



Or having the desolate sense of being the only person alive on earth in the wild and austere splendor of central Coahuila? And the "one" plant, of course it has to be an *Ariocarpus*, but which one? An inconspicuous tiny *A. kotschoubeyanus* sunk in a cracking mud puzzle, a huge pristine ostentatious *A. retusus* in full flower, a perfectly sculptured *A. fissuratus* v. *lloydii* with metallic epidermis or a rare creeping *Ariocarpus* crest?

Fig. 5 *Ariocarpus kotschoubeyanus* lost in a magic puzzle of cracking mud, Tanquecillos, NL.

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

But, I have to give you an answer, so it is going to be one of personal narrative rather than a measure of the natural beauty of a place or plant. And that is easy to pick: my first encounter with *Ariocarpus* in habitat, Big Bend National Park in 1999. The sight of rock-like rough *A. fissuratus* growing imbedded in pure bright white limestone and the desolate beauty of white crested hills sheltering *Ariocarpus* among Mesozoic shell fossils at the southernmost tip of the park will be with me forever. It was the spark for the *Ariocarpus* field study spree that has led me to everything else.



Fig. 6 The southern territories of Big Bend National Park, Tx, USA. Fig. 7 *A. fissuratus* among limestone fossils in BBNP, Tx.

**Xerophilia:** You are well known as an *Ariocarpus* aficionado. What can you tell us about your experience about this genus in habitat? What are the health conditions and what are the dangers threatening these populations?

**Dr. Andreas Laras:** Since 1999 I have made 13 field trips to Mexico and Texas, some short, some long, and studied over 300 *Ariocarpus* populations. What has struck me the most is the enormous morphologic variability of *Ariocarpus* populations one encounters in habitat. With the exception of *A. bravoanus* ssp. *hintonii* which is immutably constant, all other species show noteworthy variability, in some cases, confined in just a few hundred square meters (*A. bravoanus* ssp. *bravoanus*) or within the boundaries of a single valley (*A. confusus* or *A. scapharostrus*) and in others stretching over a distance of hundreds of kilometers (*A. fissuratus* or *A. retusus*). In some cases it is difficult to find two populations with the exact same characters/characteristics.



Fig. 8, 9 "perfectly sculptured *Ariocarpus fissuratus* v. *lloydii* with metallic epidermis"  
Epidermal structure variability of *Ariocarpus fissuratus* v. *lloydii* in a single locality, southern COA.

The other astonishing observation is the immaculate condition of *Ariocarpus* plants in undisturbed natural populations. It is something hard to relate or believe unless one sees it (habitat photos of course speak of only part of the story), perfectly grown spotless specimens embedded in rock or mud, basking in the sun or sheltered under a shrub, well-watered from the summer rains or even thirsty after severe drought, looking better than any *Ariocarpus* plant that you have ever seen on a show bench. They are perfectly adapted to admittedly harsh and unfavorable environments, champions of evolution.

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

Unfortunately, to the joy and wonder of discovering a new healthy undisturbed population in pristine condition there is sometimes an opposite emotion, the anger and despair of witnessing its deterioration and destruction. In too many instances I have witnessed the slow decline or unnecessary devastation of natural populations. The dangers are many and we all know them. I will start with human idiocy and greed for profit; *Ariocarpus* populations are still being destroyed by merchant poachers and I am not talking about some rare novelty but about plants like *A. fissuratus* and *A. hintonii* both of which are readily available in all sizes and for all budgets in cultivation. I have also documented the removal of single or few plants from several sites probably by individual collectors but I am here referring to large scale removal obliterating entire populations.



Fig. 10 A spotless specimen of *A. bravoanus* ssp. *hintonii* at an unknown undisturbed habitat (left). Fig. 11 The single sad remaining plant, where hundreds of *A. bravoanus* ssp. *hintonii* use to grow, at a widely known locality of the taxon (right).

Although this is the most infuriating practice and probably detrimental to the survival of certain taxa (*A. bravoanus* ssp. *bravoanus* and *A. bravoanus* ssp. *hintonii*), the most prevalent danger in extent and impact is grazing livestock, goats and cattle, which by trampling and/or eating the plants slowly and persistently destroy the population. The problem is that *Ariocarpus* populations safe from other human activity, for example on a rocky hill or mountain side, are liable to destruction by grazing animals. Other dangers include expansion of agriculture, spreading of rural or urban communities, public works like road building, etc and they all differently affect different *Ariocarpus* taxa depending on their prevalence.

In closing this answer, I would like to make a plea to all collectors: Please do not buy field-stolen plants and when you see them on sale (usually on the internet) write the seller and tell them why you refuse to buy them and if you are in the mood, please, go ahead and harass them on top of it!



Fig. 12 *Ariocarpus retusus* eaten by goats at a highly threatened habitat, General Cepeda, COA (left). Fig. 13 The vast majority of previously majestic *Ariocarpus confusus* plants is now severely damaged by cattle in the westernmost locality of this species (right).

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

**Xerophilia:** What can you say about the variability and the inter-specific sexual compatibility of the species of this genus vs. the current lumping taxonomy?

**Dr. Andreas Laras:** Anyone who wants to appreciate or study the genus should at the onset understand that *Ariocarpus*, or at least certain sections of the group, are actively evolving in the present time; they are in the process of speciation as we speak. This is exciting for the collector, endless variants and forms to grow, but even more so for student of the genus. It is mesmerizing to watch evolution at work, the stunning variability which I mentioned before, the different ecotypes, intermediate forms, and populations segregating and developing distinct morphology or others merging and recombining their characters.

Given this realization however, we must reconcile ourselves with the idea that not all natural *Ariocarpus* populations can be shoehorned into the neat little boxes-categories of species, subspecies and variety, but this makes life all the more interesting. This is most obvious in the *A. retusus* group, where most collectors would like a different name to go with each different "retusus form" they are growing, but in most instances they have to compromise with a field number and locality, which in my opinion is at this point more valuable and meaningful. Understanding the relationship between all the "retusus forms" (Figs. 36, 38, 39) will require first and foremost extensive fieldwork, aided by observations in cultivation and hardcore modern science such as DNA phylogenetic studies.

Regarding interspecific (between different species) hybridization, it is no longer considered as a valid criterion for conspecificity (belonging to the same species), certainly not among plants; this is actually a relic notion originating from an animal-defined species concept. We can all infer this from experience, take *A. asterias* and *A. coahuilense* or *A. fissuratus* and *A. retusus*, each pair readily hybridizes producing fertile (often attractive) offspring but they surely do not belong to the same species. In fact, interspecific hybridization has been recognized as a significant speciation mechanism especially in angiosperms (flowering plants). So, "lumping" based on the presence of hybrid populations alone is simply incorrect.

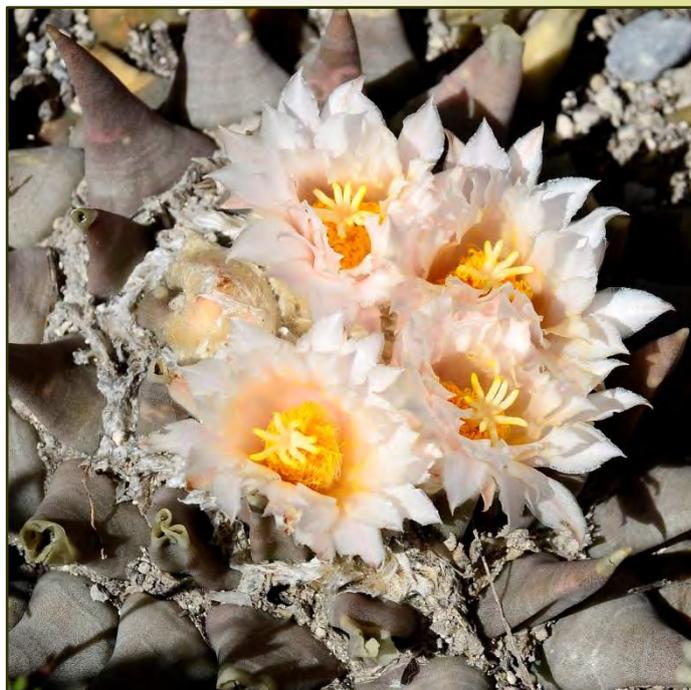
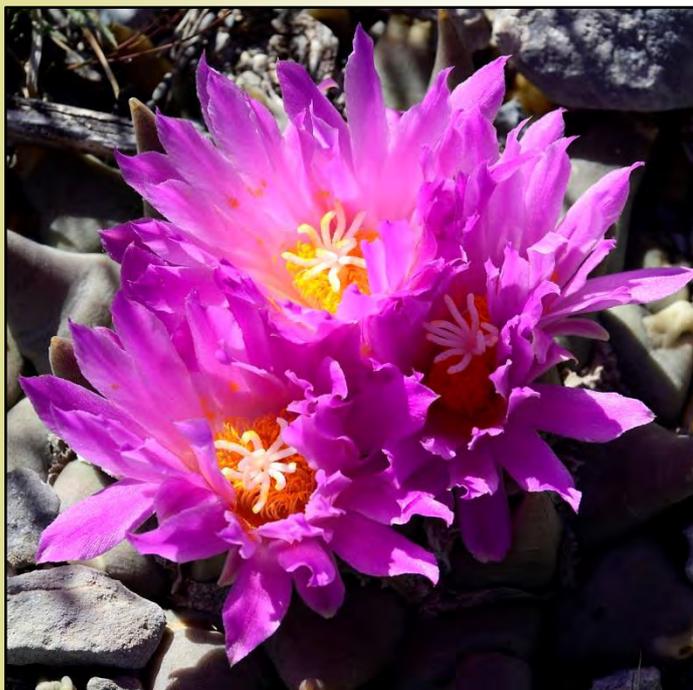
"Lumping" prevails in *Ariocarpus* not only as a consequence of its ideological dominance in the scientific field of taxonomy but for another, let us say, "objective" reason. *Ariocarpus* generally lack two of the most useful morphological features used for the classification of cacti. First, they have minimal morphologic variability of their reproductive organs (flowers) and second and perhaps most important, they do not have spines (except in their juvenile state and save *A. agavoides*). To illustrate the significance of this, how many *Mammillaria* species do you think would be erected if one re-classified the genus based on tubercle and areole morphology alone?



Fig. 14 The enigmatic Aramberri Valley, NL, home to a 15 meter pliosaurus and *Ariocarpus confusus*.

**Xerophyllia:** What do you think about "Aramberri enigma"? Does it deserve an infra-generic name or is it just a form of *A. retusus*? For you, is *Ariocarpus trigonus* - maybe an ancient parent of this "enigma" - a subspecies of *A. retusus*?

**Dr. Andreas Laras:** Perhaps we need to explain this ario-jargon a bit. The term "Aramberri enigma" is a fancy title for two questions pertaining to an *Ariocarpus* population in the valley of Aramberri, described as *A. confusus*. First question is if this population can be regarded as a distinct taxon and if yes, does it deserve specific or sub-specific recognition? Second, what is the relationship of this taxon to the *A. retusus* and *A. trigonus* populations that flank the valley to the east and to the west, respectively?



Figs. 15 - 18 Flower colour variability within a single *Ariocarpus confusus* colony.

Much confusion (and hence the specific epithet) and in a way the "enigma" itself were created by two deservedly respected authorities in the field, Anderson and Fitz Maurice, when in their revision of the genus in 1997 gave a single wrong answer to both questions. Based primarily on the extraordinary morphological variability of the Aramberri populations, they concluded that these unique plants are no more than a natural hybrid between *A. retusus* and *A. trigonus*. They even went one step further following the lumping 'pied piper' and concluded that the

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

existence of this hybrid population predicated that *A. retusus* and *A. trigonus* are one species! To me it seems tragic, not only did they fail to recognize the taxonomic importance and integrity of this taxon but because of this mistake ended up submerging *A. trigonus* under *A. retusus* as *A. retusus* ssp. *trigonus*. This subspecific nomenclature of *A. trigonus* is often used out of propriety but in reality it has not been widely embraced by most scholars of the genus. So, what are the correct answers to the enigma questions? *A. confusus* variability is indeed mesmerizing: tubercles can be short or long, wide or narrow, curved or straight, pointed or blunt, with or without keels, areoles present or absent, epidermal colour from green and grey to reddish and purple, flower colour white, cream, yellowish, light pink, rose, magenta or purple and I could go on in more details but I will spare you, I think you got the point. Clearly this striking phenotypic variability is not the result of hybridization but rather it requires a genetic wealth that sets apart this taxon from either *A. retusus* or *A. trigonus*. For this and some other reasons that would require a more lengthy and detailed presentation, the specific recognition of the Aramberri populations as *A. confusus* by Halda and Horacek in 1988 was in my opinion correct.



**Fig. 19 Tubercle morphology and epidermal colour variation of *Ariocarpus confusus* in cultivation representing a single locality (first four rows of plants, four plants each row).**

Now, regarding the relationship of this pluripotent taxon to its two neighbors, as we discussed with Geoff Bailey and John Miller during our first visit to Aramberri in 2000 and is presented on the Living Rocks of Mexico site, it is probably the other way around. To put it a little different than John, given the genetic wealth of *A. confusus*, a quite possible hypothesis is that the Aramberri taxon descended from an ancestral population which gave rise both to *A. retusus* and *A. trigonus* by migration to the west and to the east of the Sierra Madre Oriental. A common ancestry of these three taxa, if correct, simply means that they are related, not conspecific.

I have formulated a more elaborate and well documented answer to the "Aramberri enigma" but I need to do a little more research on it before I can present it. So, please be patient.

**Xerophilia:** Regarding your "Aramberri enigma" theory, it is interesting to know your opinion about some hybrid populations of *A. retusus* x *A. trigonus*. I have in my mind a natural hybrid between the both mentioned species, from an apparently established population at nearly 400 km from Aramberri, in Nuevo Leon (see our March 2014 **Xerophilia** issue). Can those hybrids become in time other 'enigma'? And if your answer is yes, in how many generations this new specificity can be recognized and accepted?

**Dr. Andreas Laras:** I think this question was partly answered above. Interspecific hybrids, such as the *A. retusus* x *A. trigonus* population you mentioned, can indeed be the seed for the genesis of a new taxon, although there are many conditions that must be met for this to occur. Two important and illustrative conditions are geographic and/or genetic isolation, if the hybrids are within a bee's flight from either of the parental populations the hybrids can be diluted (regressed) back to either species, unless there are geographic and/or genetic barriers. Of course, even if circumstances conspire for speciation, this hybrid will never become *A. confusus* but rather something else, another 'enigma' for us to tackle in the distant future.

The time frame for speciation is something of a mystery and certainly the subject of much debate among evolutionary biologists. There is certainly not a single time mode, some speciation is cataclysmic, some gradual. Plant hybrids sometimes can quickly generate genetic distinctness by polyploidy (having more than the basic two chromosome sets) however, the delineation and establishment of a new species is a long multistep and multifactoral process that requires countless generations and for *Ariocarpus* that certainly means a very long time.

**Xerophilla:** Now, about the *A. kotschoubeyanus* ssp. *elephantidens*, is it or isn't it a subspecies of *A. kotschoubeyanus* for you? And if we have already found a population of this plant more than 200 km north, in an ecological environment almost typical for *A. kotschoubeyanus* ssp. *kotschoubeyanus*, can we assume that the segregation reason based on areal rupture is still valid...?

**Dr. Andreas Laras:** *A. kotschoubeyanus* ssp. *elephantidens* is both morphologically distinct and geographically isolated from other *A. kotschoubeyanus* populations and hence it constitutes a discrete biological-taxonomic entity. I think the subspecific ranking is correct, at least for the time being. A specific (or varietal, not to be biased) status



could be considered in the future but only in the light of some hard genetic data.

If hypothetically this newly discovered population is *A. kotschoubeyanus* ssp. *elephantidens* (I personally believe that despite the reported morphological similarity, it is likely to be genetically distinct from the Queretaro populations) and it manages to maintain its morphological characters and distinctness despite its geographic proximity to other *A. kotschoubeyanus* populations, it would actually strengthen the argument for a taxonomic distinction, not the reverse.

Fig. 20 The "gigantic" *A. kotschoubeyanus* ssp. *elephantidens* growing in Queretaro.

**Xerophilla:** Which is your *Ariocarpus* preferred complex of species and why?

**Dr. Andreas Laras:** Aesthetically I rank the *A. fissuratus* complex number one, be it the roughest *A. fissuratus* or the smoothest v. *lloydii*, I find them captivating, irresistible and magical. The fact is that *A. fissuratus*



is the most rock-like "living rock" among "living rocks". Its rough sculptured tubercles adorned with fissures, grooves, pimples and wrinkles form a hard compact depressed hemispherical structure that not only looks like a rock but it also feels like one! I am also partial to *A. fissuratus* since it was the very first ario (excuse the term of affection) to hold in my hands and grow and the first one to see in habitat.

Research wise, I believe that the *A. retusus* complex with its myriad of taxa, forms and ecotypes offers more challenges and "enigmas" than one could tackle in a few lifetimes. Horticulturally, I would still opt for the alien rocky weirdness of the *A. fissuratus* complex, although *A. confusus* with all its morphological and floral permutations is very enticing.

Fig. 21 Part of my cherished *Ariocarpus fissuratus* collection, the four (and later five) left rows are 9 to 14 year-old seedlings from several Texas localities.

**Xerophilia:** And now, for all the ones who are waiting this: how can you describe your experience in growing *Ariocarpus* species? What kind of special tips can you give us about?

**Dr. Andreas Laras:** For this we probably need a full article, if not a book! I have been quite verbose already so I will try to be more to the point. Let me start by saying that I strongly believe that the beginning and the end in growing *Ariocarpus* must be the seed. This is why I wrote the "*Growing Ariocarpus from Seed*" article so long ago, to help and encourage growers to take this alluring journey. If you do not mind, to save some space and time we can refer your readers to it (The Cactus and Succulent Journal (U.S.), Vol. 71, 1999, p210-215 or at <http://www.living-rocks.com/laras.htm>)<sup>1</sup> where I expound on the reasons, benefits and how to grow "living rocks" from seed. Some are discouraged by the timeframe of this enterprise, thinking that our lifespan is insufficient, too short, but our endearment with these plants has to do with slowing down, taking time, observing, enjoying. In return they do slow down time for us; I hope that you all have noticed.



Fig. 22 Caught weary in a long moment of intimacy, pollinating from morning until sundown.

Fig. 23 Freshly repotted *A. bravoanus* ssp. *hintonii* at the age of 10; it is a good idea to plant part of the caudex above ground, plants will quickly retract by themselves to the desired depth (see previous dirt level).



Fig. 24 Even the most modest of all, *Ariocarpus agavoides*, will make a dazzling specimen given care and time, a clustering plant at the age of twenty. Fig. 25 *Ariocarpus scapharostrus*; given a deep pot, a generous layer of top dressing and appropriate conditions, most *Ariocarpus* will assume their natural pose (compare to the habitat photo earlier).

Arios believe it or not are easy plants to grow. Excepting the first few years of their life when most activity is underground, as most resources are directed downwards for the formation of their sustaining tap root, growth is constant, steady and measurable. In fact after a certain age it becomes hard to keep up with repotting the largest growing species like *A. trigonus* and *A. retusus*.

For some practical advice, I have found that most problems growers face start at the root, using the wrong substrate. *Ariocarpus* grows primarily on soils of limestone origin and in cultivation they detest acidic material such as peat moss but thrive on mixtures based on mineral soils. My basic ario-recipe is nothing fancy and I will gladly share it with your readers: 2 parts mineral based surface soil (mine is rather clayish) - 1 part leaf compost (not peat!) - 1 part

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

crushed marble bits 3-4mm (or dolomite) - 1 part pumice 6mm-12mm - 1 part perlite. Several modifications can be made to the above mix depending on the availability of raw material in your home country but remember to keep it mineral-based and heterogeneous in size (for good drainage and aeration). With this recipe as a starting point or a safety net, please do experiment, good horticulture starts with experimentation, you and your collection are unique. No one else has the exact conditions that you do: climate, microclimate, shelter, soils, water, light, temperatures, techniques and personal idiosyncrasies and so your substrate must also be unique.

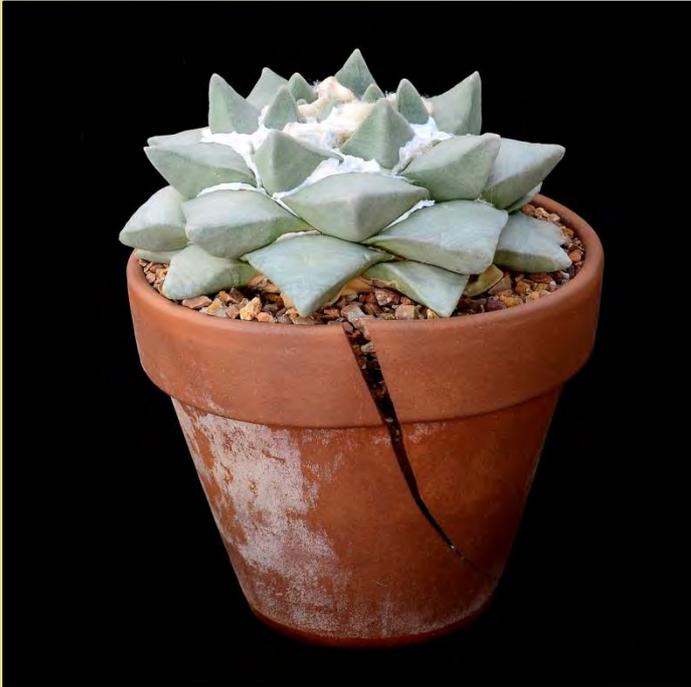


Fig. 26, 27 *Ariocarpus retusus* and *Ariocarpus bravoanus* ssp. *bravoanus* protesting my repotting practices; if forgotten in a clay pot, most *Ariocarpus* will throw a temper tantrum and break their domicile.

Another common problem is too little water, often responsible for the "living-fossil" as opposed to the "living-rock" look of cultivated plants. Arios should be watered deeply and as much as other cactus plants, the rule being "do not water unless completely dry from the previous watering". As your arios thrive and grow big they will require larger and larger pots to accommodate their huge root system. If you are too generous with the watering hose or your climate is wet, it is best to add a little extra pumice in the mix and use clay pots, this is also a good precaution against unexpected cold-wet spells at either end of the growing season. Do not be afraid to use large and deep pots given of course the appropriate substrate and some initial watering restraint. I regularly overpot my arios; I simply do not have time for the "next size up" approach. Finally for the fine arioculturist, as for the fine artist, a vision of the final creation is primary. Am I growing a deeply sculptured rock-hard *A. fissuratus* or a tight compact *A. kotschoubeyanus* sunk just beneath the soil surface? Or am I aspiring to create a smooth plump wide tuberclad *A. retusus* or a gigantic shiny cypress-green *A. trigonus*?

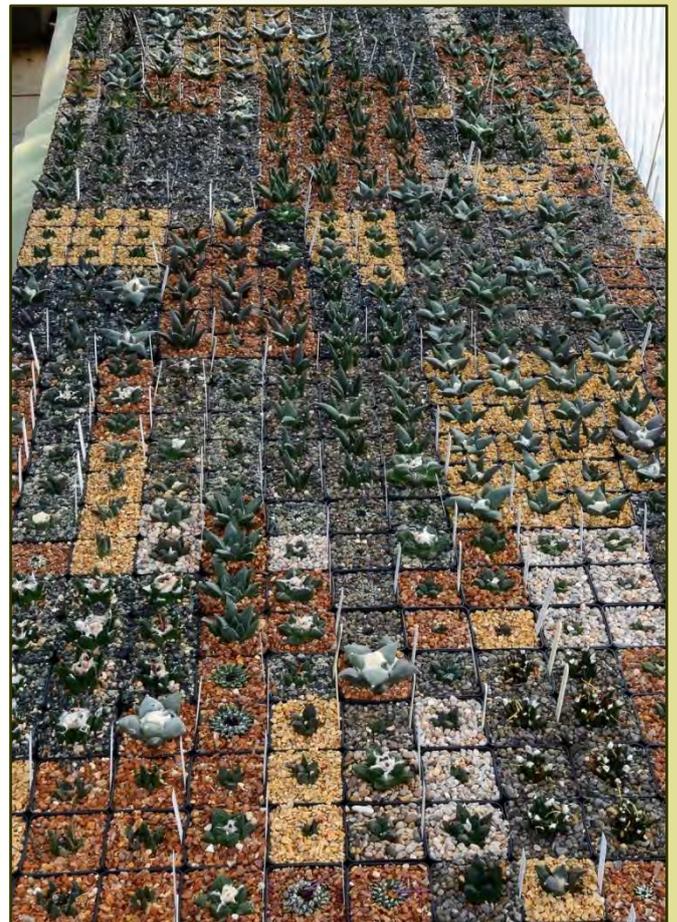


Fig. 28 Labour of love, mostly ages four to six.

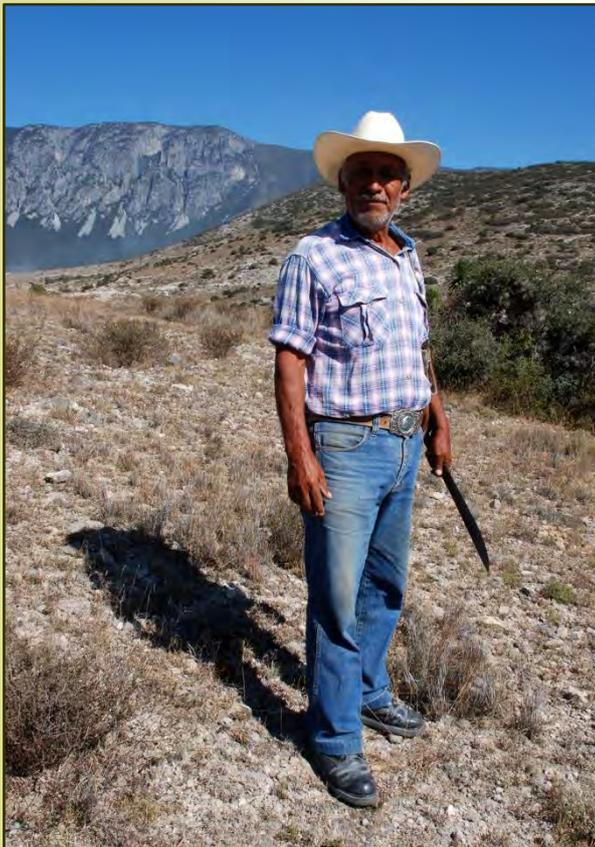
## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

**Xerophilia:** Excepting the *Ariocarpus* species, what others genera of Mexican plants do you like and collect in your greenhouse? And, from this point of view, what represents Mexico for you?

**Dr. Andreas Laras:** Mexico is just full of living jewels, how could one not grow *Astrophytum*, *Aztekium*, *Encephalocarpus*, *Geohintonia*, *Lophophora*, *Obregonia* or *Pelecyphora*? I grow all of these and others species of *Ferocactus*, *Mammillaria*, *Stenocactus*, *Thelocactus*, *Turbinicarpus*, etc. I surely grow more than I can handle, but I find it difficult to scale down. I have grown just about everything in the past, but for a long time now I have stopped growing species that do not improve their look as they grow old. To make this clearer, many plants like *Mammillaria* or *Turbinicarpus* species reach their beauty apogee at a certain (often young) age and then deteriorate aesthetically, losing form, symmetry and compactness. To some extent it has to do with the natural habit of the species, no one designed *Turbinicarpus* to be 6cm wide and 12cm tall!

Mexico is a lot of things, not just *Ariocarpus* or other cactus rarities. For some reason I feel quite at home there, I see a lot of similarities with Greece not only in its nature, like the climate or the dramatic landscape changes over short stretches of space-time, but also in its people, the open hearted mind-set that one finds with the people of the Mediterranean.

The people of Mexico are just as magnificent and giving as is the nature of their country. Of course, travelling alone and speaking Spanish, certainly helps to break inhibitions and language barriers. I have been asked to share a plentiful meal or just tortillas and bean soup alike, to drink tequila or mezcal, been invited to a birthday party of someone I just met, to a Los Tigres del Norte concert or to "revolve" around the zocalo blasting loud Mexican rap from the car stereo. I had sophisticated political conversations with goat shepherds and taco makers, been given information, help, water or shelter and it is usually the poorest dignified folk that are most eager to share the little they have.



Figs. 29 – 31 "I have made 13 field trips to Mexico and Texas"

Fig. 29 Proud and bright, and a keen conservationist on many matters, a goat shepherd from Galeana (left).

Fig. 30 My generous host rolling tortillas and the overview of Boquillas del Carmen, at sunset; the closing of the informal border crossing after 9.11 brought this community that relied on BBNP tourism on the verge of extinction (top right).

Fig. 31 Morning coffee, out of the sleeping bag but still all bundled up; daytime temperatures are similar to Greece but nighttime temps in the Chihuahuan desert can dive near freezing, even in October (bottom right).

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

I would not be honest though if I did not mention that Mexico is also an escape from my reality, which no matter how pleasant or happy we construct it to be, it is in a way imprisoning, limiting. I often feel that there are so many different versions of our life that we could be living and I cannot easily come to terms with having to choose and be confined in just one of them.

**Xerophilla:** Which was the most important or emotional C&S event you witnessed during your long career? A first plant grown from seed blooming? A new discovery...? The day you saw in habitat a long time wanted species?

**Dr. Andreas Laras:** Really Dag, I am not very good with these exclusive "most" or "best of" questions. Of course, "firsts" like the first love, the first kiss and so on... occupy a special place in one's memory dump and hopefully heart; first germination, first flowering, first seeds. I still have vivid memories, images and scents, from my first seed sowing out of a generic "Cactus" seed pack almost 40 years ago.

Unquestionably, first sightings in the field, probably due to a generally heightened level of mental alertness, remain deeply engrained in our mind. I already related my impressions from my first arioc encounter with *A. fissuratus* in BBNP and I would also add those with *A. kotchoubeyanus* and *A. scapharostrus*. I think in all three cases the unique eccentric morphology of the plants combined with the strangeness of their highly specialized habitats construct a visual image that is impossible to forget. To be fair, notwithstanding my arioc-bias, I must include here Aztekiums, *Geohintonia*, *Strombocactus* and their remarkable outlandish habitats or even the tiny pin-sized *Turbinicarpus* growing in rock cracks.



Fig. 32 *Ariocarpus fissuratus* of typical morphology half buried in drifting sand at Boquillas del Carmen, COA (left).

Fig. 33 *A. trigonus* is the largest growing *Ariocarpus*, an immaculate monster at a Jaumave Valley locality (top right).

Fig. 34 Adorable as ever, *Astrophytum asterias* in habitat at the Tamaulipas Gulf Coast plains (bottom right).

A new discovery, as you correctly pointed out, surely is thrilling; whether a new taxon, ecotype or simply a new *Ariocarpus* population, it sends shivers down your spine. And here is where the crux is: our hobby (dict. an activity pursued in spare time for pleasure or relaxation) or better our mania (dict. an excessively intense enthusiasm,

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

interest, or desire; a craze), as an old-timer likes to correct me, is a constant source of these “emotional” moments or events as you phrased it. In the field there is always something new, something unexpected, something exhilarating, so much to discover! Mexico is hiding many more succulent treasures; consider that most explorers have not ventured more than a few kilometers away from any dirt road.

In horticulture as well, there is always something fresh and exciting cooking in the greenhouse: the new seedlings sprouting, the older ones starting to show their adult morphology, later flowering (what color?), harvesting new seed, breeding to preserve a natural population or to create an unnatural cross, painstakingly adding another eugenics generation, one more F to your cultivars or better taken by surprise by the emergence of an unexpectedly hopeful monster among the brood, and if you sow as much seed as I do there is always something new lurking! Hobbyists or maniacs, we are a lucky bunch, made happy by tending nature’s most elementary and yet mysterious act, nurturing the acorn to become an oak tree. I still get the same accelerating flash of warmth and joy every time I germinate a green pot-full of *A. fissuratus* tiny spheres.



Fig. 35 A dense colony of healthy *Ariocarpus trigonus* in spectacular flower, Jaumave Valley, TAM.

**Xerophilia:** And in the end, could you present to our readers what - in your opinion - enthusiasts must do to increase this passion in neophytes? For example, Greece has – from what we know – a very suitable climate for outdoors cultivation of cacti, succulents and other xerophytes. Do you think promoting succulent gardens in Greece, is a solution?

**Dr. Andreas Laras:** True, the climate in Greece, at least in the southern and sea-side parts of the country, is very suitable for the outdoors cultivation of cacti and many succulents. There are two basic problems: winter rains which preclude the cultivation of moisture sensitive cactus species and the “Siberian” weather fronts, as the news media call them, that descent from the north once every 3 or 4 years bringing subzero temperatures to the entire country, even down to Crete, that can destroy most tropical succulents like Euphorbias. Nonetheless, there is an enormous gamut of suitable plants, mostly cacti and many succulents that can thrive outdoors.

The fact is that most Greeks love these plants, there is hardly any balcony, small yard or garden in Greece without cacti or succulents and several species have become naturalized. Yet unfortunately, we do not have any C&S gardens in Greece. In general, horticulture of ornamentals was never much developed in our country. Greece was a poor

## Demystifying the "Aramberri enigma" – an interview with Dr. Andreas Laras

country and like most of the Balkan nations has a long disturbing history of wars, occupations, dictatorships, foreign interventions... and it does not seem to ever end, does it? So horticulture was destined for sustenance not for beauty. The Hellenic Cactus and Succulent Society founded, if I remember correctly, 13 years ago and numbering about 100 members has established a reference collection in a small greenhouse and there are a couple of other efforts in this direction but nothing of the magnitude and complexity you and I are thinking.

Certainly the creation of large well designed C&S gardens would expose more people to the enormous variety and alluring beauty of C&S and attract more of them to the hobby. However, to address your question, what enthusiasts must do to inspire neophytes? The answer is simple: they must share; they must share their passion and enthusiasm, they must share plants and seeds, they must share their homes or greenhouses, but above all they must share their knowledge and experience. There is a vast amount of hard earned knowledge within each one of us and it is our responsibility to pass it on to others. There is nothing that would boost the enthusiasm of new collectors more, than their ability to grow a perfect golden specimen of *Echinocactus grusonii*, not to mention a rocky *Ariocarpus fissuratus*!



Fig. 36 An *Ariocarpus retusus* form growing at 2,260 meters above sea level in Tamaulipas (top left).

Fig. 37 A rare and happy encounter with an *Ariocarpus retusus* crest in Nuevo Leon (top right).

Fig. 38 The southernmost form of the *Ariocarpus retusus* complex, known as *Ariocarpus retusus* ssp. *scapharostroides*, SLP; note the fully exposed tiny seedlings at 11 o'clock (photographed in November) (bottom left).

Fig. 39 Another attractive *Ariocarpus retusus* form, from Zacatecas (bottom right).

**Xerophilla:** Thank you again, Dr. Laras for this kind contribution to our knowledge free sharing effort.

**Dr. Andreas Laras:** The pleasure was mine Dag and if any of your readers want to ask me more about cultivation problems or techniques, I do not feel I said enough about the subject, I will be happy to communicate and help.

<sup>1</sup> Varianta română este disponibilă în [Anexa 1](#).

Interviul în limba română este disponibil în [Anexa 2](#).

# Contributions

## On the *Turbinicarpus* of Tamaulipas, part 1

by [Leccinum J. García Morales](#)

Herbarium of the Museo de Historia Natural de Tamaulipas, TAMUX  
Ciudad Victoria, Tamaulipas, México

My interest in cacti started some near 20 years ago in 1994, when still a young boy; at that time frequent travels from Tamaulipas to Coahuila increased the number of specimens in my incipient collection. Soon after, in 1996, the Asociación Cactológica Tamaulipeca of Ciudad Victoria, Tamaulipas – The Tamaulipas Cactus Association – was started, leaded back then by Mrs. Virginia Togno, a politician and great enthusiast of the cacti of Tamaulipas. Then immediately we (together with my father as I was still a minor aged boy) joined this new formed group. After that, everything was much easier; we first recorded all the specimens from our privates collections with the then recently created SEMARNAP authorities (now SEMARNAT), as we all got at least part of our plants from the field. We have to admit that this put us immediately on the spot in the face of the authorities, as we all kept some large field collected plants from almost all over Northern México, specialists and amateurs inside the group as well. However, that also allowed us to report our findings in the field to people from this government agency - the Environmental Agency of México. Collecting permits began to be grated for the purpose of exploring and serving as basis for the Cactus Collection of Tamaulipas, but there were not so easy to get at that time. The entire process lasted more than 6 months and in the end you got an authorization valid for the current year, so you have to re-apply year in, year out, and therefore little time was left for collecting and exploration indeed. We also needed some time for sending reports on the new collected specimens by each authorized member. Important results were accomplished especially with the discovery of new cactus species by some of the members of the group (e.g. *Turbinicarpus nieblae*), described by us few years later.



**Fig. 1, 2 The habitat of *T. saueri* ssp. *saueri*, Jaumave Valley, March 2013, note the alteration on the place due to the drought and fire. A couple of plants of *T. saueri* ssp. *saueri* in habitat, March 2013, not affected by fire or drought.**

New records and new cactus populations of was a constant happening on each field trip, we got of course some references about the richness of the Tamaulipas cactus populations, but after some years of explorations that number was overpassed, even with the discovery of then not yet described species, some of them being later described by other authors from neighbouring states.

The taxonomy of Cactaceae in the 1990's was quite different from what we know now, I must say that it changed drastically each year because the use of the improved genetic tools helping to better understand their relationships, but still not completely understood. I must admit that, as a young boy at junior school, I got special skills for

understand the taxonomy of several of the species, but not for all. However, I combined the passion for cactus cultivation with interest for the cactus taxonomy and, of course, got the right books at the time. This allowed me to make assumptions and even descriptions of several species, some still not yet published.



**Fig. 3, 4** An offsetting plant of *T. saueri* ssp. *saueri*, almost never seen in field or cultivated plants, probably a response to a previous damage. A beautiful plant of *Turbinicarpus saueri* ssp. *saueri* with flowers in habitat, May 2013.

The case of *Turbinicarpus* is a must tell history, as the moments I found some species in field go back more than 15 years ago. At the end of the 1990's and beginning of the 2000's a frenzy for the discovery of new "Turbis" was started; several new taxa from North-eastern México and Central México were found and described, mostly by Czech, German and Italian amateurs, with some North Americans wanting to do the same. At the same time, Mexican environmental politics were toughened and several European, Japanese and North American citizens were caught with field collected plants; some were fined, some jailed and some expelled forever from México, but this did not stop the discovery (and the illegal collecting) of new plants every year.



**Fig. 5, 6** Habitat near the place of *Turbinicarpus viereckii* ssp. *viereckii*, South Jaumave Valley, March 2013. A big clump of *Turbinicarpus viereckii* ssp. *viereckii* in habitat, April 2002.

The first part of this article will consider the species of *Turbinicarpus* subgenus *Gymnocactus* existing now in Tamaulipas, México; they are usually are the bigger species of the genus. The second part is dedicated to the rest of species found in Tamaulipas, the smaller of the genus.



**Fig. 7, 8** A small clustering plant of *Turbinicarpus viereckii* ssp. *viereckii* in habitat, April 2002.  
A field flowering specimen of *T. viereckii* ssp. *viereckii*, March 2003.

We, as an organized group, made trips every time possible. I financed this with my “Sunday’s tips”, since I saved as much as possible to pay for the gasoline and drive in the field as far as we could. My first *Turbinicarpus* collection happened on October 29th 1995, when my friend Kurt Bergmann, his son and I travelled into the Eastern part of the Jaumave Valley. We were looking for a “mythical” species that supposedly grew within the valley, we certainly had some references of the place, but at that time the GPS devices were only for rich people. In that day we travelled to many places in the valley and we were pretty sure we will not going to find the plant in a single afternoon. We searched on a long hill for some hours, but when the sun just almost disappeared, Kurt and his son walked quickly the steep down hill, as the car was almost one kilometer away. As usually, I stayed last and took another route down hill, full of spiny *Hechtia* sp. and *Agave lechuguilla*. It was almost dark when, close to a river bed, I saw a few “white puffs of curly spines” of the *Turbinicarpus saueri* ssp. *saueri* between rocks in a small spot... “Here they are” I yelled loudly... surprising the rest... they arrived few minutes later late as they had to get back up here, and they were ahead some 200 meters.



**Fig. 9, 10** The habitat of *T. viereckii* ssp. *neglectus*, besides the Río Guayalejo, along with *Neobuxbaumia euphorbioides* and *Pilosocereus leucocephalus*, were the plants grow on those big vertical cliff rocky walls. A group of single headed plants of *T. viereckii* ssp. *neglectus* at its type locality, growing on the fissures of big rock walls. Photo: Manfred Stober

That was my first encounter with such an interesting group of plants in habitat. We collected only few specimens, as we did not see more than a dozen in the field; later in July 1997, the SEMARNAP authorities came with us to lead them to the location of this endangered species and they took the GPS data. In 2008 the place suffered of severe forest fires and burned part of the populations of the species; more, the severe drought that occurred at the valley damaged and killed also several specimens, so the few known populations must be considerate as endangered now.



**Fig. 11, 12 A view on the habitat of *Turbinicarpus viereckii* ssp. *reconditus*, at the North of the Jaumave Valley. A flowering specimen of *T. viereckii* ssp. *reconditus* in habitat. Photos: Daniel Labhart**

After finding my first *Turbinicarpus saueri*, almost one year later, we went to explore again the extreme south of the Jaumave Valley. We were looking this time for *Turbinicarpus viereckii*, known at that time only from the scarcely populated type locality in the southern edge of the valley. However, we managed to discover the largest single population in an isolated place, on August the 10th 1996, while exploring a remote creek west from the type locality. The plants grew in clusters, mostly on near vertical walls of the mountain, surrounded by *Mammillaria klissingiana* clumps, *Agave lechuguilla* and *Hechtia* plants, among other succulents. The walk to that particular place is always tough; most of the plants we touch during the entire walk have spines or thorns that scratch your jeans, shirt and skin, making it painfully difficult to reach the place; this was perhaps a reminder that we must respect these plants in habitat.



**Fig. 13, 14 Habitat of *Turbinicarpus nieblae*, near San Carlos, Tamaulipas. *Turbinicarpus nieblae* growing among grasses in the type locality location.**

By the time, we recognized that the plants from near the Nogales River were kind of different - all single headed - and with darker spines, growing isolated from the main population. We thought that a description of the plant was necessary, but we got notice that it was in process of being described already by some Europeans, and it was later described indeed as *Turbinicarpus viereckii* ssp. *neglectus* by Donati and Zanovello in 2005, finally, after many years of waiting. This species is in severe danger of extinction, as only a couple of dozen of plants are known to occur in field now, but that is perhaps because of the inaccessibility of the location due to the vertical cliffs and rock walls

beside a river canyon; probably more plants will be found on those walls if thoroughly explored. *Turbinicarpus viereckii* ssp. *neglectus* shares here the habitat with the northernmost known populations of *Neobuxbaumia euphorbioides* and *Pachyphytum werdermanni*.



**Fig. 15, 16** A flowering specimen of *Turbinicarpus nieblae* prior to its preservation as the type series  
A field specimen of *T. nieblae* showing their main characters, particularly the small account of spines.

Although not many more novelties from the area were expected to be discovered, another new subspecies of the *Turbinicarpus viereckii* complex was found in the extreme north of the Valley of Jaumave by Daniel Labhart, who described *Turbinicarpus viereckii* ssp. *reconditus* in 2012, a very interesting plant indeed, which deserves more studies.



**Fig. 17, 18** The type locality of *T. saueri* ssp. *gonzalezii*, in the border of Tamaulipas and Nuevo León States, near the town of San Carlos. *T. saueri* ssp. *gonzalezii* with flowers in habitat, February 2010. Photo: Manuel Salazar González.

In June 2000 I got a couple of plants collected by Mr. Sergio Niebla near San Carlos, Tamaulipas, he maintained very insistently they are *Mammillaria*, but as soon I saw them I recognized they are members of the genus *Turbinicarpus*. At that time the taxonomy of the group just had changed and *Gymnocactus* was incorporated into *Turbinicarpus* as a subgenus. In January 2001 I had the chance to explore a local ranch, far from the first location of this new *Turbinicarpus*, guided by a school colleague from Victoria, Edilia Martínez, who was preparing her thesis work on cacti from the area. She collected a single specimen from an uncommon place - the side of the road leading to a local ranch, but she did not know what this species was, cactus species keys did not helped at all... So, I was invited to have a look. We started our walk at about mid-day and some meters away from the main road she pointed to where the plant was, amazingly on the very side of the dirt road, surrounded by a very high Matorral Espinoso Tamaulipeco type vegetation – the endemic Tamaulipan thorn scrub – a very uncommon place for any species of *Turbinicarpus* indeed, or for any other cactus species. The road was long, extending some kilometres inside the ranch so I

suggested walking a bit more, probably there should be a place nearby from where the plant came... and so it was! After a mile we crossed a small creek and close nearby there was a small hill with low vegetation - "that's the place" I said to her; meanwhile she did not believe me and had a laugh. In that place we saw *Ariocarpus trigonus*, which was a good indicator, and also other species growing close to the road. I focused then on a rocky gentle slope of the hill side and looked for plant and surprisingly there it was! Dozens of specimens of the new *Turbincarpus*! I collected still very excited some plants to begin the studies and preservation plans for the new species.



**Fig. 19, 20** The habitat of *T. saueri* ssp. *ysabelae*, near the town of Tula, Tamaulipas. March, 2013, note the completely damaged place due to cutting of the shrubs by locals. *T. saueri* ssp. *ysabelae* with flowers in habitat, February 2003.

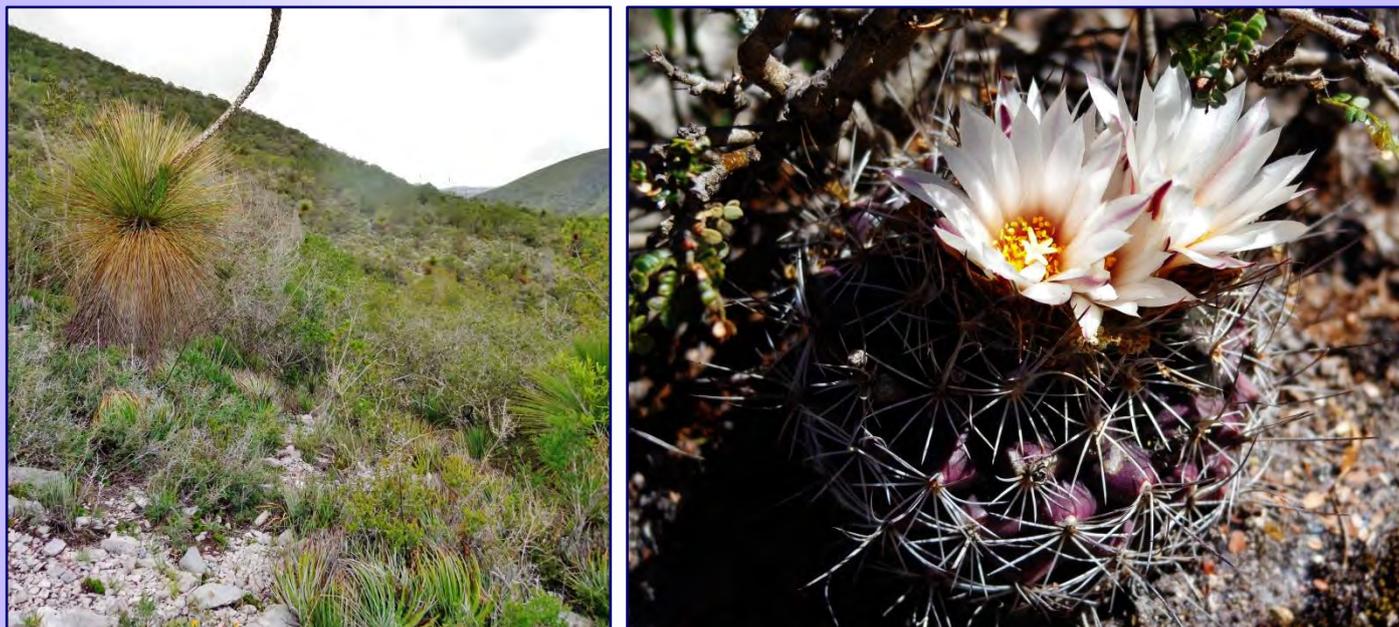
By mid 2004 we learned about some Czechs, who were going to describe a new *Turbincarpus* from the area too. We urgently started work on it and finally, at the end 2004, we officially described it as *Turbincarpus nieblae*. We did not find a relation of this new species with other members of the *T. saueri* complex then, but certainly we did find with the closely related species known at the time: *T. laui* and *T. swoboda*, the first from San Luis Potosí State and the later from Nuevo León State, however, all growing far away from the habitat of this new plant. Few weeks later, at the beginning of 2005, another closely related taxon was described by the Czechs, collected from several kilometers north of the known populations of *T. nieblae*, but near the political limits of Nuevo León State, a plant having different evident characters: *T. saueri* ssp. *gonzalezii*, now known from several other locations in Nuevo León State.



**Fig. 21, 22** The habitat of *T. saueri* ssp. *nelissae*, near the town of Bustamante, Tamaulipas, growing among open places in a *Juniperus* and *Quercus* forest. A mature plant of *T. saueri* ssp. *nelissae* with flowers in habitat, March 2013.

At the same time when we were describing *T. nieblae* another member of this interesting unknown complex of related species was described from the North-Central Nuevo León State as *T. saueri* ssp. *septentrionalis*, the northernmost population of this small group of species. We still think all these plants are different, *T. nieblae* being the subspecies

with the lowest number of spines count and probably the largest flowers for this group of taxa that grow outside the Chihuahuan Desert Eco-region. However, it is just amazing that three new taxa of close related *Turbinicarpus* were described almost at same time from different places that supposedly shouldn't contain any "turbis" indeed.



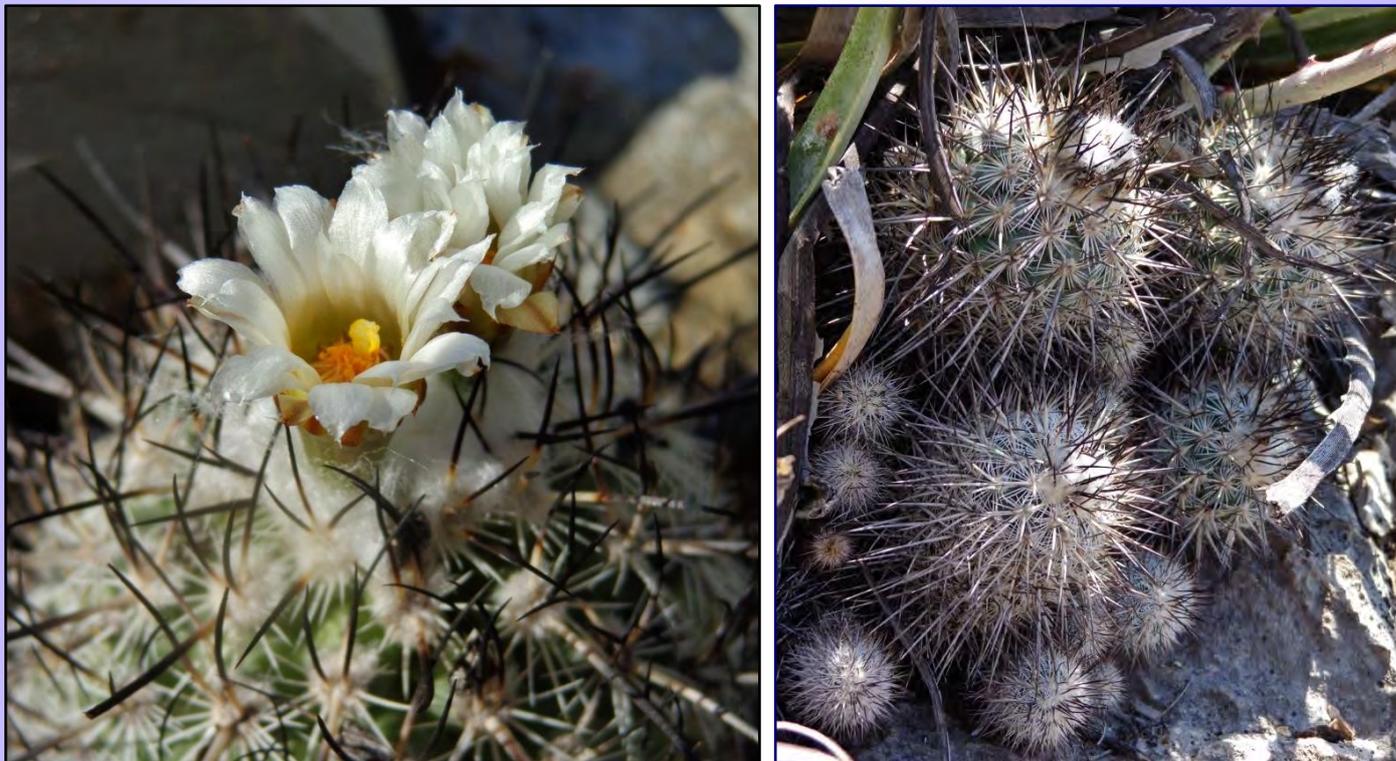
**Fig. 23, 24** Habitat of *T. saueri* ssp. *verduzcoi*, near Bustamante, Tamaulipas, October 2013, along with *Dasyllirion quadrangulatum*, *Hechtia hernandez-sandovali* and *Pinus nelsonii*. A flowering plant of *T. saueri* ssp. *verduzcoi* in habitat, March 2013, showing the purplish colored epidermis after the exposure to cold and direct sunlight in winter season.

Returning now to the south of Tamaulipas: the *Turbinicarpus saueri* complex is also known by other 3 taxa, all endemic of 3 small areas. We were very fortunate to visit the population of *T. saueri* ssp. *ysabelae*, from near Tula, in 2001. A bit later also the recently described *T. saueri* ssp. *nelissae*, from near Bustamante, and recently the habitat of *T. saueri* ssp. *verduzcoi* also close to the Bustamante town. These latter plants probably just belong to a forma or variety of *T. saueri* ssp. *nelissae*, that grow in a much dryer and open places, but time will define them as being different when such adaptations force them to become more and more dissimilar; both grow near the 2000 meters altitude mark. *T. saueri* ssp. *ysabelae* is by now very distinctive in the group, so that several authors also place the species as an independent one; it grows in a dry open rosette-scrubland. On the contrary, *Turbinicarpus saueri* ssp. *nelissae* and *T. saueri* ssp. *verduzcoi* grow in transitional areas of oak forest and scrubland, these being the close relatives of *T. saueri* ssp. *saueri* that grows in the Jaumave Valley. We must keep in mind that the taxonomy of these plants is merely artificial for most of the species, being described as they were found, and do not reflect any natural or phylogenetic arrangement of the group.



**Fig. 25, 26** The habitat of *Turbinicarpus viereckii* ssp. *major* in Tamaulipas, growing in colonies among *Hechtia* plants, April 2013. An uncommon crested form of *Turbinicarpus viereckii* ssp. *major* in habitat, showing a well-developed fasciation of the plant and flower remains, April 2013.

I will conclude that from the entire *Turbinicarpus saueri* complex taxa, six of seven of them grow in Tamaulipas and all are endangered due to human activities, cattle grazing, and particularly by illegal collecting of specimens, documented each time we visit the places. The climate change is also a trouble, as many specimens seen in some locations, like at *T. saueri* ssp. *saueri* have died because the extreme drought periods that occurred in the Jaumave Valley. At the same time forest fires were documented at this and other *Turbinicarpus* locations, but most of those are natural phenomena we can't avoid.



**Fig. 27, 28,, A flowering specimen of *T. viereckii* ssp. *major*, showing their typical strong central spines and whitish flowers, July 2013. A clump of several generations of *T. viereckii* ssp. *major* growing under the protection of *Hechtia* plants, April 2013.**

Another very interesting species found at extreme Southwest Tamaulipas is *Turbinicarpus viereckii* ssp. *major*, of which some authors think it should be better treated as an independent species from the *Turbinicarpus viereckii* complex endemic of the Jaumave Valley and close related also with the endemic *Turbinicarpus gielsdorffianus* from North San Luis Potosí State. However, in my opinion I find more suitable to be included in the *T. viereckii* complex, even if some characters do not match completely with the group. We have found at two different locations in Tamaulipas, west Tula; one is near the border with San Luis Potosí State, the second in near the border with Nuevo León State. Contrary to the rest of *Turbinicarpus* species, except perhaps *T. beguinii*, this taxon does not suffer of the extreme environmental pressure as their cousins, and usually is found in considerably amounts in its habitat, at least in Tamaulipas. It was suggested to me that the northern populations and the southern populations belong to two different species or varieties; we could not confirm this, because several locations from San Luis Potosí are quite scarce in individuals.



**Fig. 29 The green Valley of Bustamante, Tamaulipas, after a very abnormal rainy season, October 2013.**

## Despre turbincarpușii din Tamaulipas, partea 1-a

de [Leccinum J. García Morales](#)

(traducere prescurtată)

Interesul meu pentru cactuși a început acum 20 de ani, în 1994, când, în urma călătoriilor frecvente în Tamaulipas și Coahuila, mi-am sporit colecția incipientă de cactuși. Curând, în 1996, a luat ființă Asociația colecționarilor de cactuși din Tamaulipas, condusă pe atunci de d-na Virginia Togno, politiciană locală și mare iubitoare de cactuși. Fiind încă minor, a trebuit să mă înscriu împreună cu tatăl meu. A trebuit însă să ne înregistrăm speciile colectate din natură cu nou înființata agenție SEMARNAP (în prezent SEMARNAT). Acest lucru a contribuit însă la o mai bună cunoaștere a noilor descoperiri din teren de către funcționarii Agenției de Mediu mexicane. Se puteau obține permise anuale pentru colectare și cercetare și pentru formarea colecției statului Tamaulipas, procesul era greoi iar fiecare membru autorizat trebuia să trimită rapoarte despre speciile colectate. Dar, cum la fiecare ieșire în teren erau descoperite noi și noi populații, s-a putut forma în timp o opinie în privința bogăției de specii de pe teritoriul statului Tamaulipas, inclusiv specii care nu au fost descrise încă sau specii care au fost descrise ulterior în baza unor colecții efectuate pe teritoriul altor state.

Taxonomia cactaceelor era destul de diferită în anii 1990 de cea din prezent. A trebuit să îmbin deci pasiunea pentru cactuși cu interesul pentru taxonomia lor, ajutat și de consultarea unor cărți adecvate. Acest lucru mi-a permis să fac diverse presupuneri și chiar să descriu mai multe specii, unele încă nepublicate. Primele exemplare de *Turbincarpus* le-am întâlnit în teren acum mai bine de 15 ani, în perioada în care se stărnise o frenezie pentru descoperirea de specii noi, unele fiind descrise mai ales de amatori cehi, dar și germani sau italieni, câțiva americani fiind și ei foarte dornici de astfel de performanțe. În aceeași perioadă, politica de protecție a mediului a fost înăspriată, astfel că mai mulți europeni, japonezi sau nord-americani care au fost prinși cu material colectat din natură au fost amendați sau expulzați definitiv din Mexic. În prima parte voi trata plantele mai mari ale subgenului *Gymnocactus*, iar restul plantelor în partea a 2-a.

Prima colectare a unui *Turbincarpus* a avut loc pe 25 octombrie 1995, când, împreună cu Kurt Bergmann și fiul său, am călătorit în partea estică a văii Jaumave. Am căutat îndelung pe versantul unui deal fără să găsim nimic, până când soarele a început să apună. Kurt și fiul său au început să coboare în vale, spre mașina aflată la aproape 1 km distanță, eu luând o rută diferită, printre *Hechtia* sp. și *Agave lechuguilla*. Aproape de albia unui râu am văzut *Turbincarpus saueri* ssp. *saueri* printre pietre. Am colectat numai câteva specimene, întrucât nu am văzut mai mult de o duzină de exemplare mature. Ulterior, în iulie 1997, am revenit însoțit de agenți SEMARNAP care au luat coordonatele GPS. În 2008 acel loc a fost afectat de incendii forestiere, care au distrus parte din exemplare. Seceta puternică care a urmat a mai omorât cu siguranță și alte exemplare, astfel că această populație este periclitată. Pe 10 august 1996, pe când exploram sudul văii Jaumave, am descoperit o mică populație de *Turbincarpus viereckii*, la vest de localitatea tipului. Plantele creșteau pe pereți aproape verticali, alături de *Mammillaria klissingiana*, *Agave lechuguilla*, *Hechtia* sp. și alte plante suculente.

În acea perioadă remarcasem deja că plantele din apropierea râului Nogales erau oarecum diferite, toate solitare, cu spinii mai închiși la culoare, crescând izolate de populația principală. Am considerat că este necesară o descriere a acestei plante. Am aflat însă că câțiva europeni lucrau la așa ceva, fiind publicată într-adevar în 2005 de Donati și Zanovello sub numele de *Turbincarpus viereckii* ssp. *neglectus*. Acest taxon este în pragul extincției, numai două duzini de plante fiind cunoscute în prezent în teren. Posibil însă ca multe plante să existe în zone neexplorate – pereții verticali ai unui canion. *T. viereckii* ssp. *neglectus* împarte habitatul cu cele mai nordice populații ale *Neobuxbaumia euphorbioides* și *Pachyphytum werdermanni*. Daniel Labhart a mai descris în 2012

*Turbinicarpus viereckii* ssp. *reconditus*, un alt membru al complexului *T. viereckii*, din nordul extrem al văii Jaumave.

În iunie 2000 am primit două plante colectate de Sergio Niebla de lângă San Carlos, Tamaulipas, despre care credea că sunt *Mammillaria*, dar eu am recunoscut imediat că aparțin genului *Turbinicarpus*. În ianuarie 2001 am avut ocazia să explorez împreună cu Edilia Martínez flora locală, la mare distanță însă de locația acestui nou *Turbinicarpus*. Ea colectase – de pe marginea unui drum – o specie necunoscută, așa că m-a invitat să arunc și eu o privire. Mi-a arătat unde se găsea planta – la numai câțiva metri de marginea drumului, înconjurată de tufișuri spinoase xerice specifice în Tamaulipas. I-am sugerat să ne deplasăm în continuare pe drumul din pământ și după o milă am traversat un mic pârâu după care am dat peste un deal scund, acoperit de vegetație scundă. Aici am observat *Ariocarpus trigonus* și alte câteva specii crescând până la marginea drumului. Mi-am concentrat căutarea pe o pantă pietroasă și iată... duzini de specimene ale noului *Turbinicarpus*! Am colectat, încă foarte entuziasmat, câteva exemplare pentru studiu și planul de conservare al speciei.

Pe la mijlocul anului 2004 am aflat că exploratori cehi urmăreau să descrie un nou *Turbinicarpus* descoperit în aceeași zonă, așa încât ne-am grăbit să publicăm oficial *Turbinicarpus nieblae* spre sfârșitul aceluiași an. Nu am putut găsi nici o relație directă între această specie nouă și membri ai complexului *T. saueri*, dar am observat în schimb similitudini cu *T. laui* și *T. swoboda*, habitatul ambelor aflându-se însă la mare distanță. Cehii au descris însă la începutul anului 2005 un alt taxon colectat doar câțiva km mai la nord, înrudit dar prezentând și caractere diferite evidente: *T. saueri* ssp. *gonzalezii*, cunoscut acum din mai multe locații din statul Nuevo León. Tot atunci a fost descris și *T. saueri* ssp. *septentrionalis*, cea mai nordică populație a acestui grup de specii. Suntem convinși că toate aceste plante sunt diferite, *T. nieblae* având cel mai mic număr de spini și în același timp floarea cea mai mare. Este însă remarcabil că toți cei trei taxoni au fost descriși aproape simultan și provin dintr-o zonă despre care se credea că nu conțin turbinicarpusi.

În sudul statului Tamaulipas complexul *Turbinicarpus saueri* este cunoscut și prin alți trei taxoni endemici zonei. Ulterior am vizitat populația de *T. saueri* ssp. *ysabelae* de lângă Tula în 2001, iar puțin mai târziu și recent descrisul *T. saueri* ssp. *nelissae*, de lângă Bustamante. Ultimul a fost *T. saueri* ssp. *verduzcoi*, tot de lângă Bustamante. Plantele din urmă aparțin foarte probabil unei forme sau varietăți ale *T. saueri* ssp. *nelissae*, dar cresc în spații mai deschise și mai uscate, la aproximativ 2000 metri altitudine. *T. saueri* ssp. *ysabelae* se distinge de asemenea în cadrul grupului și crește în locuri uscate, printre plante care formează rozete. *Turbinicarpus saueri* ssp. *nelissae* și *T. saueri* ssp. *verduzcoi* populează în schimb zone de tranziție între tufișurile xerice și pădurile de stejar, aceștia fiind rudele cele mai apropiate ale *T. saueri* ssp. *saueri* din valea Jaumave. Trebuie să ținem cont de faptul că taxonomia acestor plante este doar artificială pentru majoritatea speciilor, fiindcă au fost descrise separat, pe măsură ce au fost descoperite și nu reflectă în nici un fel structura naturală sau filogenetică în cadrul grupului.

În final trebuie precizat că toți taxonii grupului *T. saueri* 6 sau 7 se întâlnesc în Tamaulipas și sunt periclitați de activități umane, pășunat, în mod special de colectarea ilegală de specimene – fapt documentat de noi la fiecare vizită în teren. Seceta și focurile naturale produc de asemenea pagube, dar acestea sunt fenomene naturale care nu pot fi evitate.

O altă specie interesantă din sud-vestul extrem al statului Tamaulipas este *Turbinicarpus viereckii* ssp. *major*, pe care unii autori consideră că ar trebui tratată separat de complexul *T. viereckii* întrucât este apropiată de *Turbinicarpus gielsdorffianus* din nordul statului San Luis Potosí. În opinia mea, această plantă trebuie inclusă în complexul *T. viereckii* chiar dacă unele caractere nu se încadrează perfect în grup. Am descoperit două locații diferite, la vest de Tula. Spre deosebire de restul speciilor de *Turbinicarpus*, poate numai cu excepția *T. beguinii*, acest taxon nu suferă ca urmare a presiunii extreme a mediului și este întâlnită în număr mare, cel puțin în Tamaulipas. S-a sugerat de asemenea că populațiile nordice și respectiv sudice aparțin unei varietăți diferite, dar nu am putut confirma acest aspect datorită numărului prea redus de exemplare cuprinse în cele câteva populații din San Luis Potosí.

## Aymeric de Barmon



Aymeric de Barmon has been interested in cacti since childhood. He lives in France and focuses on studies of plant biology in cultivation, especially in regards to seed production process, which is rarely documented. Within this activity he likes photographing and making weekly reports on plant's life in cultivation. Self-fertility/sterility, dioecy (\*) and other observations are checked and refined each season. In 2006 he setup ADBLPS to sell seeds produced mostly in his greenhouse. Mother plants are all grown from seeds with a few exceptions and challenging taxa for seeds production are much cared after. He is very grateful to all friends who are constantly helping him all the way long.

## The Genus *Austrocactus*

by Aymeric de Barmon, Pont-sur-Yonne, France

*Austrocactus* plants come from a very remote part of South America. This has prevented close investigations on those plants until recently. In this context current taxonomy for this group is still quite confusing. This short article will report cultivation notes made during the last decade in Western Europe.

Basically there are three groups of plants within this genus:

1. Andean plants making clumps of decumbent stems and golden flowers
2. Lowland plants with cream/orange flowers
3. The plant near Santiago de Chile (*A. spiniflorus*)

Plants from the first group have several names (*A. hibernus*, *A. philippi*, *A. gracilis*).



**Fig. 1, 2 *Austrocactus hibernus*. Plants comfortable with snow in December, direct sun is not mandatory in winter. *Austrocactus hibernus*. Flower in May, despite having a style all flowers of this plant are unable to develop fruits/seeds.**

They are very frost hardy and do not appreciate dry winters. Strangely they are fully turgid when grown outside without rain protection in winter and this does not decrease their hardiness. Sun is not essential at that time. These conditions seem necessary for the plants to

be healthy and able to flower in spring. Dry winters induce weak growing and smaller spines, after a few years the plants eventually die. In spring/summer those cacti revert to standard requirements and an excess of water can produce rot. Best period for cutting is fall due to the large water intake during cold weather.

## Aymeric de Barmon – The Genus *Austrocactus*

Ritter mentions dioecy for his *A. hibernus* (reference 4, p909). This is consistent with personal observations. All plants that I've observed have identical flowers but some clones never set fruits despite cross-pollination. Seeds germination is usually good without any special treatment.

Second group is quite variable with some large solitary plants and smaller clumping forms (*A. patagonicus*, *A. bertini*, *A. intertextus*, *A. ferrarii*, *A. coxii*...)



**Fig. 3, 4 *Austrocactus coxii*. Flower bud in April.  
*Austrocactus coxii*. Deshiscent fruit in June.**



**Fig. 5, 6 *Austrocactus coxii*. Plant kept very dry during winter, at this stage recovering in spring is problematic.  
*Austrocactus patagonicus* Buen Pasto. Flower in May, sprawling form of a plant from group 2.**

Dry winter is less an issue than for the former group but frost hardiness is identical. Dioecy is also present but with transitional steps, some plants being self-fertile other self-sterile and individuals amongst them rarely set fruits and, when this occurs, fruits are small with few seeds. When the weather is not too hot spare flowers can develop in summer.

Seeds germination is often poor without additional help (manual or chemical scarification, cold effect...).

In both groups stems quickly develop into zygomorphic shapes. The upper part of the stems bear the largest spines and flowers buds only appears there. Closest relatives seem to be *Eriocyce/Pyrrhocactus*.



Fig. 7, 8 *Austrocactus patagonicus* Peninsula Valdez 50 m. One month old seedlings. *Austrocactus patagonicus*. Rotted plant one week after flowers withering in bad weather.



Fig. 9, 10 *Austrocactus spiniflorus* Las Aranas 1600 m. Very large flower in June (9 cm pot) and very large fleshy fruit.

Last group – consisting only of *A. spiniflorus* – does not fit very comfortably in *Austrocactus*. Placed here, it might make this genus polyphyletic.



Fig. 11, 12 *Austrocactus spiniflorus* Las Aranas 1600 m. Fruit section, indehiscence and pulp to be noticed. *Austrocactus spiniflorus*. Tuberous roots, unlike groups 1 & 2.

Amongst the features not shared with the other *Austrocactus* species are:

- Stoloniferous habit
- Non zygomorph stems
- Fleshy fruits that can persist more than one year on the plants
- Much less frost hardy than the two other groups (-10 °C is a lethal temperature)
- No dioecy observed so far.

*Corryocactus* would a better genus to accommodate this group.

### References :

1. KuaS 62 (1) 2011, Auf der suche nach *Austrocactus intertextus*, Elisabeth Sarnes & Norbert Sarnes
2. KuaS 63 (12) 2012, *Austrocactus ferrarii* (Cactaceae) der nördische Vertreter der Gattung *Austrocactus*, Elisabeth Sarnes, Norbert Sarnes & Roberto Kiesling.
3. Englera 16, Egli-Schick-Leuenberger, 1995, p 180/271
4. Kakteen in Sudamerika, Band 3, Ritter, 1981, p 907
5. The New Cactus Lexicon, DH Books, 2006

(\*) The term **dioecy** (comes from Greek, meaning "two households"; in adjectival form: **dioecious**), refers to organisms having distinct male and female morphological features or organs. Dioecy refers primarily to plants, as for animals the coined term is gonochory.

## Genul *Austrocactus*

by Aymeric de Barmon, Pont-sur-Yonne, France

### (Abstract)

Articolul prezintă succint cele trei grupe ale genului *Austrocactus*, un gen puțin cunoscut și cu o taxonomie confuză:

1. Plantele andine cu tulpini târătoare și flori aurii;
2. Plantele de șes cu flori crem sau portocalii;
3. O plantă din vecinătatea Santiago de Chile (*A. spiniflorus*).

Plantele din primul grup (*A. hibernus*, *A. philippi*, *A. gracilis*) sunt rezistente la ger și acceptă ierni umede; iernate pe uscat produc o creștere debilă în sezonul următor și nu înfloresc. Pe timpul primăverii/verii plantele revin la cerințele obișnuite de cultivare a cactușilor – putând fi ucise de excesul de apă. Sunt plante dioice (\*).

Grupul al 2-lea este mai eterogen, cuprinzând atât plante solitare cât și plante mai mici care lăstăresc (*A. patagonicus*, *A. bertini*, *A. intertextus*, *A. ferrarii*, *A. coxii*...). Iernarea umedă nu mai este esențială, dar sunt la fel de rezistente la ger. Și acest grup conține plante dioice, dar există o anumită gradare – unele specii sunt auto-sterile, altele sunt auto-fertile.

În ambele grupuri tulpinile se dezvoltă rapid, luând forme zigomorfe. Par înrudite mai îndeaproape cu *Eriosyce*/*Pyrrhocactus*.

Ultimul grup este format dintr-o singură specie - *A. spiniflorus*, care nu se încadrează perfect în gen datorită unor caracteristici distincte: este stolonifer, nu formează tulpini zigomorfe, are fructe cărnoase care persistă mai mult de un an, este mai puțin rezistent la ger (-10 °C este fatal), iar din observațiile la zi nu pare a fi dioic.

*Corryocactus* ar fi o alegere mai bună pentru încadrarea acestei specii.

(\*)**dioic** - (*despre plante unisexuate*). Care are florile masculine și femele pe tulpini diferite ale aceleiași specii.

# Ecology - Biology - Conservation

## A very sad story

by [Dr. Andreas Laras](#)

A rare occurrence at the brilliant gypsum habitat of *Geohintonia mexicana* and *Aztekium hintonii*. Despite their massive numbers such a happy coexistence, perfect for a joined portrait, is not at all common, so I was ecstatic to stumble upon it.



However, an unexpected drama unfolded overnight and the next morning found the *Geohintonia* completely devoured and the *Aztekium* half-eaten by grazing animals, donkeys or more likely goats, both beasts lurking at the site.



I felt very sad and most ambivalent. On one hand, I felt lucky or even destined to have immortalized the moment before it was for ever lost. On the other, I could not help but think that my intrusion had disturbed some cosmic balance or had triggered some Heisenbergian sequence of events that led to the plants' demise. Or even that the observing animals mistook my photographic interest for culinary suggestion.

Introspective speculation aside, this incidence is an illustrative example for the serious and escalating danger imposed by grazing livestock on wild plant populations, including those that are considered safe from other human activities.

# Contributions

## Six desert bulbous plants from South Africa

by [Judd Kirkel Welwitch](#), Johannesburg, South Africa

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Photography - copyright 2013: Judd Kirkel Welwitch

### Introduction

This article aims to introduce the reader to some of the desert bulbs that are found in South Africa's arid north regions. These six species are distributed in the Northern Cape area of The Cape Province of South Africa and the Western regions of the Richtersveld zone. This area is notorious for its succulent flora, but that's not all as there are many other groups of wildflowers represented here. Bulbous plants create another big grouping of flora in this amazing area resembling a desert.

The following six bulb species will be under discussion:

*Lachenalia buchbergensis* (fam. Hyacinthaceae)

*Strumaria bidentata* (fam. Amaryllidaceae)

*Gladiolus saccatus* (fam. Iridaceae)

*Babiana namaquensis* (fam. Iridaceae)

*Brunsvigia pulchra* (fam. Amaryllidaceae)

*Colchicum circinatum* subsp. *circinatum* (fam. Colchicaceae)

### *Lachenalia buchbergensis* (Dinter)



Lachenalias belong in the family called Hyacinthaceae. The Genus *Lachenalia* was named after a Professor of Botany in Basel, Switzerland, Werner De La Chenal (1736-1800). Bulbs in this group are subterranean and have linear to lanceolate leaves. The inflorescence is usually a spike or raceme with the main axis sometimes swollen. Flowers are usually sessile or stalked, tubular or campanulate and have different colours. Colours vary from purples, browns, yellows to greens. There are various species available on the horticultural market for use in gardens and displays. They are relatively easy to grow and get to flowering stage in a short period of time. They are popular amongst collectors. *Buchbergensis* is named after the Buchberg Mountains in South Western Namibia where this plant is also known to occur. It is a dwarf geophyte which gets about 10 cm high. The leaf is blotched and has a zebra like appearance. The flowers are sessile with outer tepals olive to blue green, with a greenish to brown thickening near the tip, inner tepals



protruding with a bright green to purple coloured tip. This plant is known to be in flower at peak in July time. The distribution is known to be in the southern Namib deserts and Northern Cape region. This specimen was photographed in the Western Richtersveld Gariep zone.

### **Strumaria bidentata (Schinz)**



This extraordinary bulb will leave you breathless. Against the desert sands it stands out with its white flowers and typical maroon stamens. It is hard to believe that this small flower is in the Amaryllidaceae family. The flowers appear by themselves before the leaves emerge. It gives a strange look as they are just flowers on stalks emerging out of the desert sands. Plants get about 12cm high and have a dense umbel inflorescence up to 3 cm across. The white flowers contrast well with the reddish maroon anthers making this bulb easy to identify. The most interesting fact is that after the flower is pollinated the inflorescence bends over to the side and dispels the seeds after reaching maturity. This is very strange as other amaryllis family bulbs actually detach and loose the whole fruiting head and the tumbleweed structure rolls free over the landscape thus expelling the seeds. The fruiting head on this *Strumaria* species stays on the plant.



After the flowers have passed their best, the 2 leaves will emerge which are narrow and tongue like. This plants distribution is in the open, dry sand dune areas of the North Western Richtersveld zone.

**Babiana namaquensis (Baker)**



This bulb, included in the Iridaceae family of plants, is a low growing deciduous perennial geophyte with typical narrow, oblong curling leaves. Its flower is often eaten by insects and is short lived. The flowers are sweet and highly scented. Flowering time is June and July. The geology it is associated with is dolomite and schist and it is often seen wedged in cracks of these rocks. Collected from areas around Port Nolloth and Buchberg in South-western Namibia region, but mainly occurs around Alexander Bay region.

*Gladiolus saccatus* (Klatt) Goldblatt & M.P. de Vos



This is known locally as the 'spoon' Gladiolus, as the red flowers resemble spoons. This is a more widespread species than the others and occurs from Richtersveld down into Namaqualand and further south into parts of the Cedarberg Mountains. You are most likely to encounter this species if traveling in these areas from June – August. The peak flowering time is July. Plants can get 25 -80 cm high and can have 8-12 spoon flowers at a time. The flower spikes are angled at a strong incline of about 45 degrees and the flowers are arranged vertical off this angled spike. Located on dry shale slopes, I found plants on a south westerly aspect of the hill.



**Brunsvigia pulchra (W.F.Barker) D.Mull- Doblies & U.Mull-Doblies**

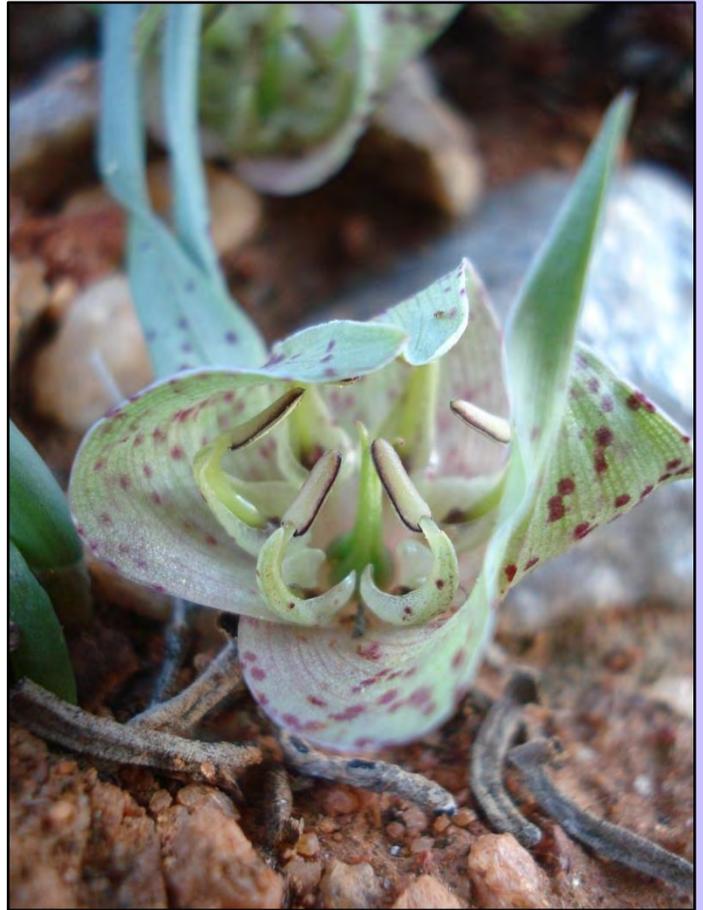


*Pulchra* means beautiful of its kind and this is truly a spectacular sight. This perennial geophyte grows up to 30 cm tall and at an altitude of around 1000 meters above sea level. The distribution is in central Namaqualand to Northern Namaqualand, this is a very rare and seldom seen species. Flowers are quite large and short lived and dry up very fast in the heat. In the photographs the flowers are at their peak, the flowers rarely open up more than this, making it a very strange *Brunsvigia*. Most plants in this genus open up to form a sphere or a ball shape of flower arrangement. Flowering time is early in March – April. The leaves are not present during flowering and emerge only after the flower has gone. They are typical flat medium sized green leaves which grow level on the ground.

**Colchicum circinatum (Baker) J.C.Manning & Vinn. subsp. Circinatum**



Leaves of this species die off completely in summer, so best to view these species is from March to August. The common name is: “men in a boat”. They belong to the Colchicaceae family and under their synonym name they were known as *Androcymbium* species. This one is very striking in that it occurs with very curly leaves and is heavily spotted.



This makes it a very attractive species. They are relatively easy to grow as the corms store a lot of nutrient and water, taking it through the dry, hot periods. Most of the time they grow under the shade of bushes and it's very possible that these flowers could be pollinated by rodents who visit at night.

#### Acknowledgements and Thanks

To **Anthony** and **Gina Rausch**: A huge thank you to my friends for an enjoyable trip through Namaqualand and the Richtersveld zone in 2012.

#### References and further Readings

Graham Williamson, 2000. Richtersveld - the enchanted wilderness. Umdaus Press, Hatfield, S.A.

Abraham E. van Wyk & Gideon F. Smith, 2001. Regions of floristic endemism in Southern Africa - A review with emphasis on succulents. Umdaus Press, Hatfield, S.A.

## Şase plante bulboase de deşert din Africa de Sud

de [Judd Kirkel Welwitch](#), Johannesburg, Africa de Sud  
(traducere prescurtată)

Scopul acestui articol este de a prezenta cititorilor noştri câteva plante bulboase deşertice care se găsesc în regiunile aride ale Africii de Sud, în Northern Cape şi în regiunile vestice ale Richtersveld, renumite pentru flora succulentă.

Sunt prezentate succint următoarele plante:

*Lachenalia buchbergensis* (fam. Hyacinthaceae)

*Strumaria bidentata* (fam. Amaryllidaceae)

*Gladiolus saccatus* (fam. Iridaceae)

*Babiana namaquensis* (fam. Iridaceae)

*Brunsvigia pulchra* (fam. Amaryllidaceae)

*Colchicum circinatum* ssp. *circinatum* (fam. Colchicaceae)

### **Lachenalia buchbergensis (Dinter)**

Aparține fam. Hyacinthaceae, genul *Lachenalia* fiind numit în onoarea prof. Werner De La Chenal (1736-1800). Bulbii acestui gen sunt subterani iar frunzele sunt lineare până la lanceolate. Inflorescența este o racemă cu flori tubulare sau campanulate, în diferite nuanțe de purpuriu, brun, galben sau verde. Unele specii se găsesc în comerțul de plante, sunt ușor de cultivat și înfloresc de la vârste fragede. Sunt geofite mici, care ajung la 10 cm înălțime. Numele *buchbergensis* provine de la Buchberg Mountains în sud-vestul Namibiei. Perioada de maximă înflorire este iulie. Specimenul prezentat aici a fost fotografiat la Gariep, din vestul zonei Richtersveld.

### **Strumaria bidentata (Schinz)**

Bulbul, din fam. Amaryllidaceae, produce o remarcabilă floare albă cu anthere brun-roșcate. Florile apar înaintea frunzelor. După polenizare inflorescența se înclină într-o parte pentru a ajuta la eliberarea semințelor, atipic pentru familie. În mod obișnuit fructul se detașează complet și se rostogolește expulzând semințele. Abia după înflorire apar și frunzele, sub formă de limbă. Crește în dune de nisip expuse în nord-vestul zonei Richtersveld.

### **Babiana namaquensis (Baker)**

Este un geofit peren tipic, cu frunze înguste ondulate și flori parfumate. Înfloresc în iunie-iulie. Crește pe dolomite și sisturi, în fisuri ale rocii. Centrul de distribuție este în jurul zonei Alexander Bay.

### **Gladiolus saccatus (Klatt) Goldblatt & M.P. de Vos**

Este o specie mai larg răspândită, din Richtersveld spre Namaqualand și spre sud până la munții Cedarberg. Ușor de observat dacă se întâmplă să călătorești în zonă în perioada iunie-august, având înflorirea maximă în iulie. Plantele pot ajunge la 20-80 cm înălțime, florile lor roșii având forma unei linguri. Se întâlnește pe pante uscate formate din roci sedimentare, deseori cu expunere sud-vestică.

### **Brunsvigia pulchra (W.F.Barker) D.Mull- Doblies & U.Mull-Doblies**

*Pulchra* înseamnă frumos, iar imaginea acestei plante este într-adevăr spectaculoasă. Geofit peren, de până la 30 cm înălțime, crește la altitudini în jurul a 1000 m. Aria de distribuție se întinde din centrul până în nordul Namaqualand, dar este o specie rar întâlnită. Florile sunt mari dar cu viață scurtă, ele uscându-se rapid în caniculă. Se deschid rareori mai mult decât se poate vedea în fotografii, ceea ce este neobișnuit în genul *Brunsvigia*. Înfloresc în martie-aprilie. Frunzele cresc numai după trecerea florilor și stau mai mult sau mai puțin lipite de sol.

### **Colchicum circinatum (Baker) J.C.Manning & Vinn. subsp. circinatum**

Frunzele dispar complet pe timpul verii, așa încât cea mai bună perioadă a anului în care se poate observa această specie este martie-aprilie. Are frunze ondulate, puternic pătate. Este relativ ușor de cultivat întrucât cormii acumulează cantități mari de nutrienți și de apă, ajutând supraviețuirea pe timpul perioadelor calde și secetoase. De cele mai multe ori crește la adăpostul (umbra) tufișurilor și este foarte posibil ca florile să fie polenizate de rozătoare care le vizitează peste noapte.

# Xero - Files

## *Lophophora williamsii* (Lem. ex Salm-Dyck) J.M. Coult.

### Descriptive profile of the species

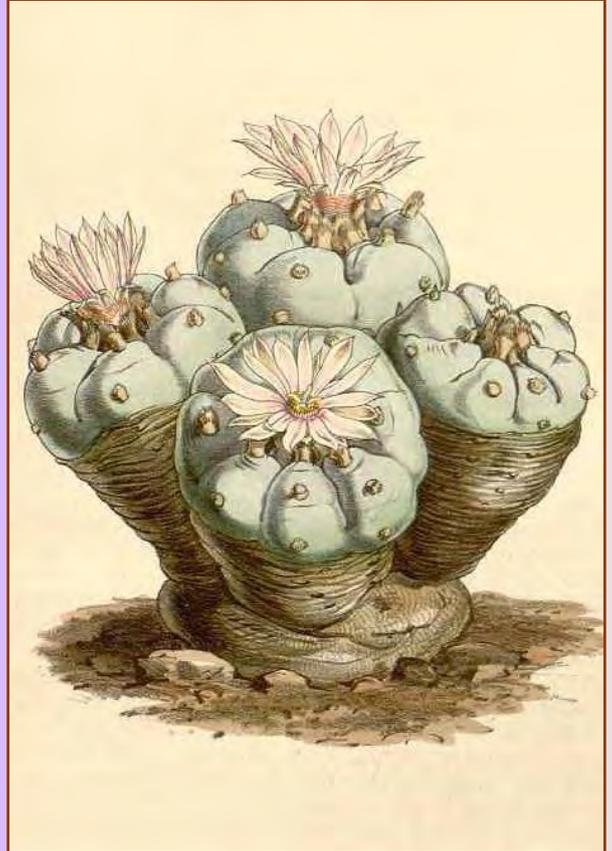
[\(Original Spanish file\)](#)

by [Pedro Nájera Quezada](#), Jovana Jaime Hernández, Claudia López Martínez, Sandi Karina Neri Cardona

#### Description

**Characteristics:** The Peyote cactus is a flowering plant of the family Cactaceae, which is a group of fleshy, spiny plants found primarily in the dry regions of the New World. Some of the characteristics which one normally sees in cacti are not readily evident in peyote, except for the obvious one of succulence. Spines, for example, are present only in very young seedlings. However, the cactus areole—the area on the stem that usually produces flowers and spines—is well pronounced in Peyote and is identified by a tuft of hairs or trichomes. Flowers arise from within the center of the plant and, like other cacti, the perianth of Peyote flowers is not sharply divided into sepals and petals; instead there is a transition from small, scale-like, outer perianth parts to large, colored, petal-like, inner ones. Another characteristic which shows that Peyote belongs in the cactus family is the absence of visible leaves in either juvenile or mature plants. Leaves are greatly reduced and only microscopic in size; even the seed leaves or cotyledons are almost invisible in young seedlings because they are rounded, united, and quite small. Also, the vascular system of Peyote is like that of other succulent cacti in which the secondary xylem is very simple and has only helical wall thickening. (Edward F. Anderson, 1980)

**Fig. 1** The first drawing of *Lophophora williamsii*, described as *Echinocactus willamsii*, in Curtis Botanical Magazine 1847, vol. 73, plate 4296



**Habit:** Solitary or forming small clumps to 1m wide.

**Roots:** Long, spindle shaped.

**Stem:** Globose to flattened globose, somewhat firm to the touch, blue-green or occasionally reddish green, 2-6 cm high, 4-11 cm in diameter.

**Tubercles:** Usually present, low and rounded or humplike, often arranged in distinct vertical ribs, 4-14, usually well defined, extremely variable, sometimes only forming podaria.

**Areole:** Usually linearly arranged along the ribs or at the tips of the tubercles, each bearing a tuft of soft, yellowish or whitish hairs.

**Spines:** Absent.

**Flowers:** Usually pink or pinkish white, sometimes red, 1-2.2 cm in diameter.

**Fruits:** Club shaped to elongated, pinkish red, fleshy, becoming brownish white and dry at maturity, naked, indehiscent, 1.5-2 cm long.

**Seeds:** Black, pear shaped, tuberculate, 1-1.5 mm long, 1 mm broad, with a large hilum area. (Edward F. Anderson, 2001)

*Lophophora williamsii* is a species so widely distributed that it manifests different phenotypic shapes near its entirely distribution area, from almost completely rounded or flattened shapes, to individuals with prominent ribs, as well as caespitose forms covering an area of more than 1 m<sup>2</sup>. In the same way, the pilose tufts of the areolas are presented in various forms, in some individuals are virtually absent, while in other localities they flaunt their generic epithet, "*Lophophora*: The tufts bearer".

Flowers also vary in tones ranging from pink-red, deep pink to almost white, it should be emphasized that the variations of the plants are stable in each location, so it is theorized that genetic and phenotypic lines are the results of the differential gradient of environmental factors.

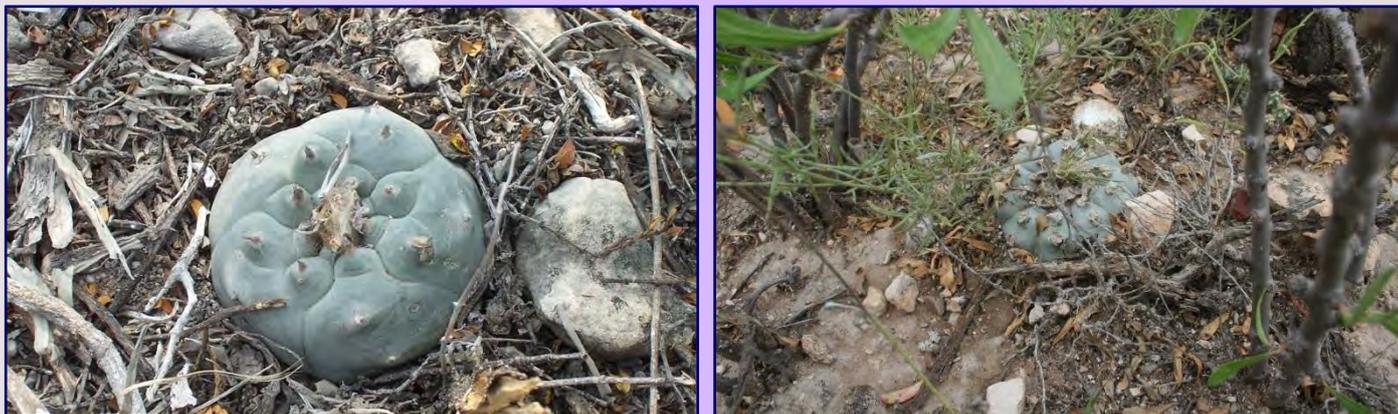


Fig. 2, 3 *Lophophora williamsii*, Huizache phenotype, is the form that Anderson choose as Neotype - solitary plant in habitat. A solitary plant in typical microphilous habitat desert scrub composed of *Larrea* and *Yucca*.



Fig. 4, 5 Roots of cultivated plant. The flattened body of a plant from Marie Gerard's collection, France. Photos M. Crisbășanu



Figs. 6 - 8 The small black seeds are tuberculate and have a large hilum area. The seedlings with customary spines. *Lophophora williamsii* VZD 505 Matamoros. The whitish tufts are spectacular in cultivated plants. Photos V. Posea



Figs. 9 - 11 The flower that can be from pinkish to white with darker shades of pink (photo V. Posea) Closeup with buds and opening fruits (photo D. Panco). An unharvested individual peyote on the historic-cultural route for the Huichol people.



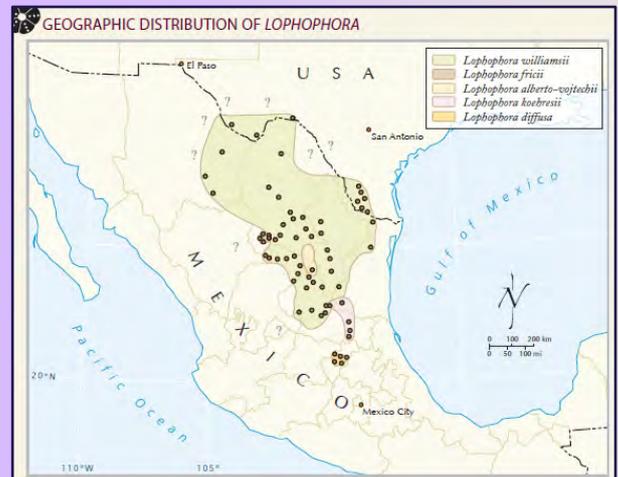
Fig. 12, 13 *Lophophora williamsii*, a caespitose form (photo D.Panco). *Lophophora williamsii* is a spineless cactus.

### Biogeography and distribution

The genus *Lophophora* is one of the most widely distributed genera of cacti in Mexico, its species occur only in the Chihuahuan Desert and on a narrow calcareous arid area extending to Queretaro.

*L. williamsii* specimens can be found to over 2500masl (meters above sea level) in SLP, and less than 150 masl in Texas. Its most northern range of distribution is from southern Fort Davis TX. (30 ° 30'N, 103 ° 55'W) and southern Starr County Tx. (26 ° 30'N, 98 ° 45'W) in the United States, and reducing their conical distribution so that terminates north of the capital of San Luis Potosi, locations where there are the southernmost localities of peyote (*L. williamsii*), south of the municipality of Villa de Arista (22 ° 28'N, 100 ° 49'W), in México.

Fig. 14 The distribution map by Martin Terry, 2008.



*L. williamsii* records exist in municipalities north of Guanajuato and Aguascalientes as well as a very small region south-west of the state of SLP, but it is speculated that these populations are not natural but ancient indigenous cultures that were responsible for its spread since all these areas (five so far) are located near ancient pre-Columbian settlements. Its high resilience to extreme arid climates and cold, has allowed the species to occupy a variety of desert habitats: microphyllous desert scrub, rosetophyllous desert scrub and even rarely in submontane scrub. In most microphyllous localities it grows under the protection of shrubs such as *Larrea*, *Prosopis*, *Condalia*, *Flourensia*, *Senna*, and *Lycium*; the *L. williamsii* of these locations are those that are more likely prone to poly-cephaly due primarily to harvest mescal buttons (heads of Peyote), as well as the tendency of the plant to rapidly regenerate the aerial parts.



Fig. 15 Peyote can also be found on high places, such as rocky hills.

In denuded localities, where almost the entire population is exposed or merely protected by leafless shrubs such as *Acanthotalmus*, *Jatropha* and *Koeberlinia*. These locations are the least common and present exclusively monocephalic individuals, even after harvest of the mescal buttons.

In the montane locations there are two vegetation types: the rosetophilous desert scrub which consists primarily of *Agave lechuguilla*, *A. striata*, *A. stricta*, *Hechtia*, *Dasylyrion* and *Nolina*; and the submontane scrub, which is developed under the protection of species such as *Cowania*, *Eysenhardtia*, *Gochnatia* and *Karwinskia*, in these localities are currently the healthiest populations, mainly due to the wildness of the mountains and the pungency of vegetation feature that helps to deter looters.

Also, you can find Peyote growing in cracks of cliffs or rock walls, in several regions such as in Texas, Nuevo Leon and San Luis Potosi and more rarely in halophyte-lake areas, where, during part of the year, the plants bodies are covered with clay.



Fig. 16, 17 Typical habitat of *Lophophora williamsii*, microphilous desert scrub composed of *Larrea* and *Yucca*.

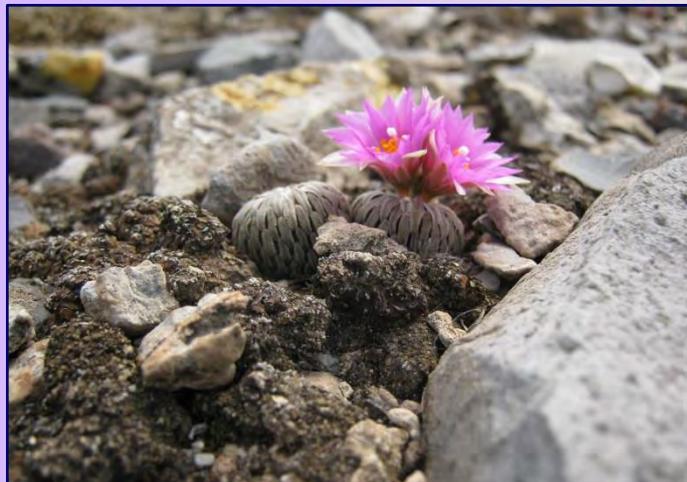
*Lophophora* probably arose from a now-extinct ancestor that occurred in semi-desert conditions in central or southern Mexico. Morphological and chemical diversity may have then appeared in various populations as they slowly migrated northward into drier regions which were being created by the slow uplift of mountains. Perhaps *L. diffusa* represents one of the earlier forms that became isolated in Queretaro, whereas *L. williamsii* spread more extensively to the northward, producing new combinations of genes that eventually led to a distinct but highly variable species having somewhat different pollen, vegetative characters, and alkaloids from the peyote populations to the south. (Edward F. Anderson, 1980)



Fig. 18, 19 Peyotes hidden between small rocks on the open ground. *Lophophora williamsii* still thrives where only few other species manage to survive, in one of the localities where it grows on the open and practically without vegetation, presenting a coverage of 10 to 15%.

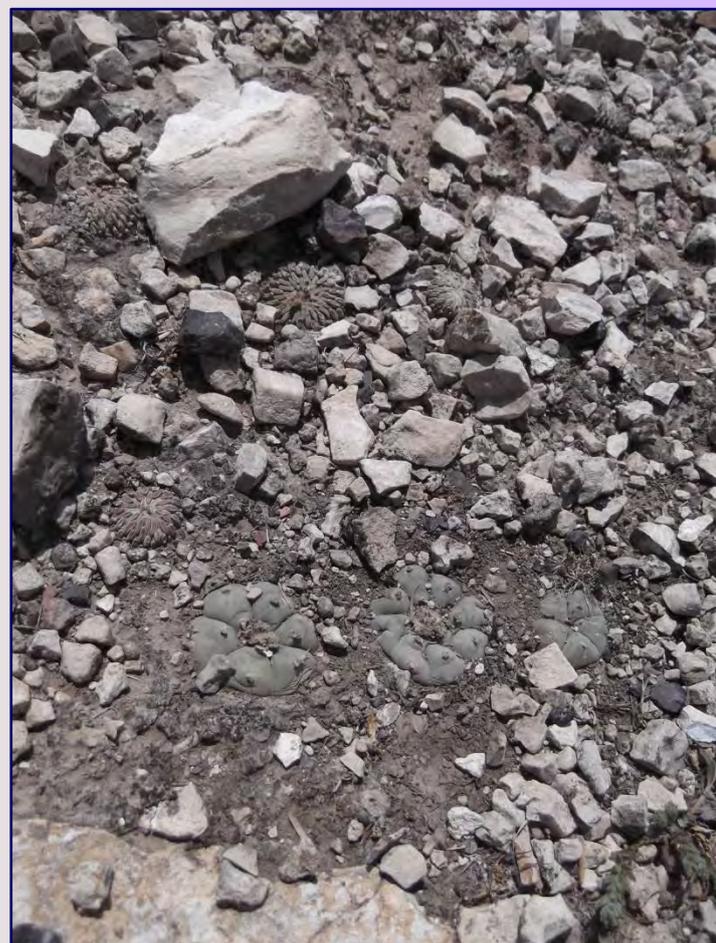
It is difficult to determine when the first specimen was discovered as Peyote used to be a plant formerly consumed by the natives for centuries before the Spanish conquest.

It is not known whether or not the Chichimeca were the first Indians to discover the psychoactive properties of Peyote. Some students believe that the Tarahumara Indians, living where Peyote abounded, were the first to discover its use and that it spread from them to the Cora, the Huichol, and other tribes. Since the plant grows in many scattered localities in Mexico, it seems probable that its intoxicating properties were independently discovered by a number of tribes. (Hofman, A. and R. E. Schultes 1979/1992)



**Fig. 20, 21** Peyote and Peotillo (*Lophophora williamsii* and *Pelecypora aselliformis*) coexisting on the most extremophilous localities for *Lophophora williamsii*. *Pelecypora aselliformis*, La Tinaja SGS1 –the type loc, the second subpop - known as Peotillo or Falso Peyote is often confused with *Lophophora williamsii* despite their broad differences.

Peyote was first described by western man in 1560 but it was not until the nineteenth century that any plants reached the Old World for scientific study. Apparently the French botanist Charles Lemaire was the first person to



publish a botanical name for Peyote, but unfortunately the name that Lemaire used for the plant, *Echinocactus williamsii*, appeared in the year 1845 without description and only in a horticultural catalogue. Therefore, it was necessary for Prince Salm-Dyck, another European botanist, to provide the necessary description to botanically validate Lemaire's binomial. No illustration accompanied either the Lemaire name or the description by Salm-Dyck and it was not until 1847 that the first picture of Peyote appeared in Curtis' Botanical Magazine.

### Threats

Over the past few decades Peyote has become scarce in many parts of its historical geographic range. The largest part of the reduction in Peyote population size is clearly habitat destruction associated with urban sprawl and adverse agricultural practices, notably root-plowing, which uproots and kills Peyote along with the native brush, effectively exterminating the Peyote along with the associated plants of its natural habitat, so that the damage to Peyote in a root-plowed tract is absolute and permanent. Another major cause of the decline of Peyote is overharvesting of the plant for ceremonial use by the Native American Church.

**Fig. 22** Peyote – *Lophophora williamsii* and Peotillo - *Pelecypora aselliformis*.

Overharvesting of Peyote has several different adverse effects on the wild populations:

(1) It reduces the harvestable population size, and selectively removes the largest crowns first, as these are most valued in the peyote market. (Terry et al. 2013)

(2) That reduces the quantitative reproductive output of the population, as a direct consequence of the removal of the largest crowns that produce most of the seed in an unharvested population. In terms of population genetics, while such selective harvesting of the largest plants may not have a marked short-term effect on population size (assuming good harvesting practices, benign weather, and consequently a low mortality rate in harvested individuals), it has the immediate effect of reducing the effective population size. (Terry et al. 2013)



Fig. 23, 24 *Lophophora williamsii* - blooming Peyotes, at Guanamé, Venado and on Catorce's Valley "Wirikuta". At times the plant's body is completely buried in the soil.

(3) Concomitantly, there is a qualitative genetic loss in the selective loss of seed production from the oldest individuals, which are ipso facto best adapted to local conditions. That loss may be temporary, if the harvested plants survive to produce regrowth buttons that are allowed to mature after a few years, or it may be permanent, if mortality occurs in the old plants due to repeated harvesting of regrowth buttons (Terry et al. 2012).

(4) The phenomenon of post-harvest regrowth of new crowns arising from areoles of the subterranean stem (Terry & Mauseth 2006) temporarily increases the number of crowns in the population, but severely decreases both the average size and the total combined weights of crowns in the population (Terry et al. 2011).



Fig. 25, 26 Two "special" plants from collection of Basarab Popa (photos V. Posea).

(5) The decreased size of Peyote buttons available to the Native American Church means that an individual in a Native American Church Peyote ceremony must consume more buttons to equal the weight of the smaller number of buttons that would be consumed if mature crowns were available. This leads to a vicious circle of more frequent harvesting to supply the demand for greater numbers of buttons, which leads to the early harvesting of yet smaller buttons—but now fewer, as the overharvested plants exhibit signs of decreased energy reserves for the production of more new crowns following repeated harvesting at two-year intervals (Terry et al. 2012).

(6) Looking at the quality of peyote for ceremonial use in purely pharmacological terms, there would appear to be yet another disadvantage to regrowth buttons for ceremonial use, apart from their small size, and that is the possibility that the dry-weight concentration of mescaline in the small regrowth buttons is substantially lower than in mature peyote crowns, which now constitute a minor percentage of the total offering in the regulated peyote market. (Terry et al. 2013)



Fig. 27, 28 A juvenile Peyote, with a speculated age of 10 years, protected from the harsh sun by a small rock, at El Tule, Garabatillo, Moctezuma and an old plant.

## Conclusions

The conservation of a species, as already mentioned is a purely anthropocentric concept, in which the man intended to replace the ecosystem to sustain the species, rather than seek to protect the ecosystem as such.

Often considered a threatened species as exclusive and independent individuals, when species, all are the result of biotic relationships, adaptations, genetic continuity and survival eco-systemic conditions, and is what makes a plant or animal having that way because they are directly proportional outcome of genotype, phenotype and its environment. When trying to protect a species in captivity these factors and capacity change, as captive population, to survive the ecosystem becomes increasingly smaller over generations because it facilitates genetic dilution of adaptations to survive its environment.

To get a better view of the problem had to conduct a thorough investigation solely to understand the problems and possibilities that encompass the world of Peyote and those who use it. You will find this in an article that is also published here and which we have called „About the Use and Abuse of Peyote”.

All habitat pictures by Pedro Nájera Quezada and Jovana Jaime Hernández, except where stated otherwise.

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## Felipe Escudero Ganem



Felipe Escudero Ganem was born in Acapulco, Mexico. He studied at the Universidad Autónoma del Estado de Morelos, becoming horticulturist engineer. He specialized in plant tissue cultivation at the Centro de Plantas of Biotechnology of the University of Villa Clara, Santa Clara, Cuba. He did Master in Plants Biotechnology at the Universidad Internacional de Andaluía of Rabida, España; strictly personal reasons have delayed his dissertation. He is currently a researcher in plant biotechnology at the Facultad de Ciencias of the Universidad Autónoma Agropecuarias del Estado de Morelos, Cuernavaca, México.

## Notes on *in vitro* propagation of *Aztekium ritteri* and other species of Mexican cacti

by Felipe Escudero Ganem, Cuernavaca, México.

### Introduction

This article aims only to spread the knowledge regarding the benefits obtained from using *in vitro*<sup>(\*)</sup> propagation techniques, a very useful tool to reproduce plant species in danger of extinction. Technical details on the work carried out are not mentioned since it is too much information for a general knowledge article. These works described below were performed in the laboratory of plant tissue culture, of the Research Biotechnology Center (CeIB) of the Autonomous University of the State of Morelos, México.



Fig. 1 *Aztekium ritteri*, mother plant from habitat, for seeds production and inoculation *in vitro*.

### Background

Mexico is one of the countries possessing a great biodiversity, but unfortunately this has been drastically weakened by various factors such as the change of land use allowing large tracts of land to become agricultural areas, livestock grazing areas, industrial and housing facilities, since demographic growth demands ever more resources. There are some other factors as well, such as the indiscriminate plunder of the species from the habitat, the indiscriminate illegal collection, or natural disasters like wildfires, flooding, landslides, etc. All these factors combined or separately, have placed a large number of species in serious danger of extinction. These species include cacti, plants that are native to the American continent and which are distributed especially in arid and semi-arid regions. The widespread hobby of collecting and purchasing these exotic plants represents a pressure for wild populations.



Fig. 2, 3 Two of the threatened cacti *Obregonia denegrii* and *Pelecyphora aselliformis*.



Fig. 4 *In vitro* inoculation under aseptic conditions in a laminar flow.



**Fig. 5, 6 *Aztekium ritteri* - plants of more than 12 years – left, photo provided by Deawcactus Nursery, Bangkok, Thailand and multiple shoots generated *in vitro* – right.**

In the first half of the 20th century, wild species were abundant; but due to the extensive collections that have been subjected by unscrupulous traders, who were providing mainly for the European markets, populations have decreased at an alarming rate and in such a way that the Government of the Republic of México is determined to enforce laws prohibiting their export. However, despite all of this, the harmful activity of these merchants has continued and cactus smuggling is still a common place.



**Fig. 7, 8 *Aztekium ritteri* - rooted shoots and *Pelecypora aselliformis* - multiple outbreaks generated *in vitro*.**



**Fig. 9, 10 *Pelecypora aselliformis* - shoots rooted *in vitro*; and *Obregonia denegrii* multiple outbreaks generated *in vitro*.**

Prices people were willing to pay for a certain plant reached really impressive levels; in 1994, for example, Japanese buyers offered 2,000 dollars for a *Geohintonia mexicana* or *Aztekium hintonii*. This circumstance has led to the development of a complex network of illegal trade which has decisively affected natural populations and has put many species at risk. The official Mexican norm (NOM-059-SEMARNAT-2010), which lays down the specifications for the protection of species of wild fauna and flora, included in 1994 a number of 257 species of cacti in some category of risk, of which 24 were endangered, 96 threatened, 135 rare and two subject to special protection; as a matter of fact close to one third of the Mexican's flora is threatened in a way or another.

From the long list of species of cacti that are threatened or on the verge of extinction, we can mention *Aztekium ritteri*, *Obregonia denegrii* and *Pelecypora aselliformis*, three endemic species with a very restricted distribution area within the Mexican territory and a very high commercial demand both within the legal trade and in the black

market of illegal trafficking of species. Therefore, the *in vitro* plant tissue culture method becomes a powerful tool for the propagation of threatened cacti.



Fig. 11, 12 *Obregonia denegrii* - multiple *in vitro* sprouting from tuber and shoots rooted *in vitro*.

The objective of this study was to obtain an *in vitro* production system of these plants, which then allows us to establish an effective method of mass propagation that can be used for commercial purposes or replanting/reforestation. And, as a direct result, reduce the pressure on the habitat. The *in vitro* plant tissue culture can be defined as the regeneration of whole plants under aseptic and artificial physico-chemical conditions from cells, tissues or organs of plants. The advantages of this technique are: high rates of multiplication, an efficient phytosanitary control, uniformity in production, short production cycles of obtaining sexually mature specimens, being a highly profitable option.



Figs. 13 - 15 *Obregonia denegrii* - generated *in vitro* shoots directly grafted on pattern of *Myrtillocactus geometrizans*, *Aztekium ritteri* produced *in vitro* within 16 months of grafted from the flask and *Pelecyphora aselliformis* produced *in vitro* within 14 months of grafted from the flask.

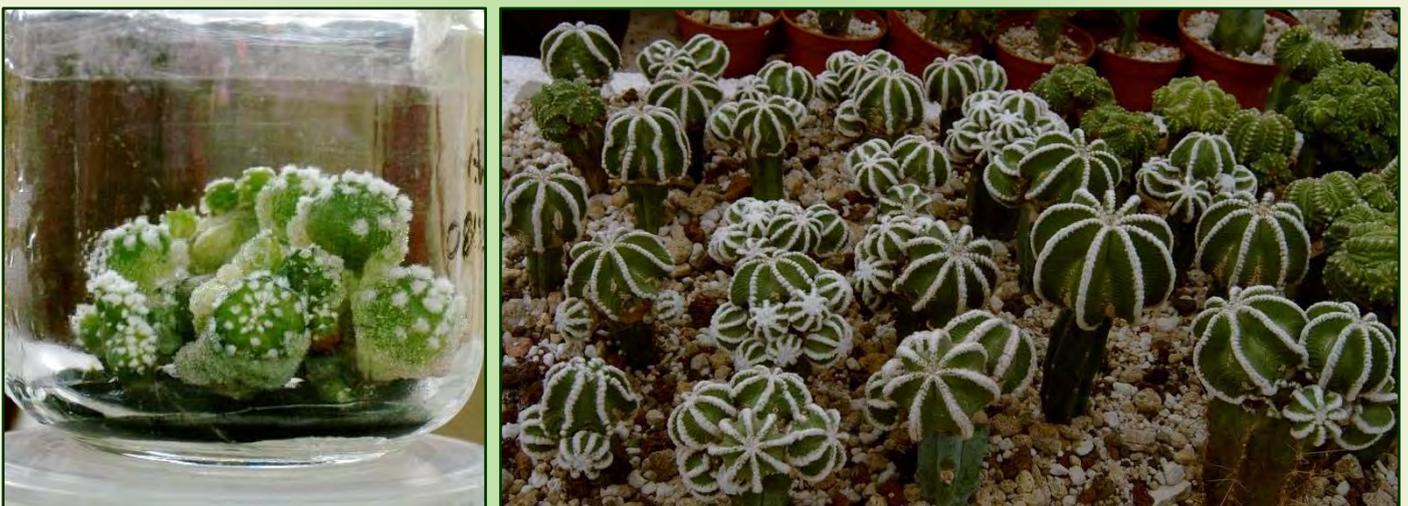
Interlaced vegetable cultivation *in vitro* leverages a quality of plant cells known as Totipotency, which means that plant cells contain the genetic information needed to develop in an organism full if provided the physicochemical conditions, (i.e., water, light, temperature, growth regulators, vitamins, nutrients). This methodology has been applied successfully to the commercial production in forestry, fruit, vegetables, medicinal, ornamental plants and endangered species or in danger of extinction.



**Figs. 16 - 18 *Aztekium ritteri* produced *in vitro* ten years after being grafted from the bottle, *Epithelantha micromeris* and *Ariocarpus agavoides* produced *in vitro*.**

Some cactus species, such as *Aztekium ritteri*, *Strombocatus disciformis* among many others, have an extremely slow development. A seedling of *Aztekium ritteri*, grown from seed, takes up to 9 years or even more to reach sexual maturity. In nature this time triples; in addition, seedlings in habitat have low rates of survival, which, in the best of cases, it is less than 5%.

For the present work, there were used one year old seedlings previously obtained from seed collected from adult plants and cultured *in vitro*. Culture medium was based on minerals (macro and micro nutrients), to which vitamins, amino acids, carbohydrates and regulators of plant growth (hormones) were added (Murashige & Skoog, 1962). The manipulation of the concentrations and combinations thereof in the culture medium enables us to direct the response of plant tissues towards the results that we hope to get. That means that we can direct to plant cells to regenerate only in roots, organs such as stems and leaves or whole organisms (seedlings), even embryos similar to those containing sexual seeds.



**Fig. 19, 20 Callus of *Aztekium hintonii* regenerating multiple shots on *in vitro* culture; Grafted *Aztekium hintonii* after 16 months from the flask.**

For *Aztekium* and *Pelecyphora* were used entire one year old plants, of approximately 1 to 1.5 cm in diameter, as well as plants sectioned lengthwise in half. For *Obregonia* we also used both, whole one year old plants of approximately 2 cm in diameter, and plants that have been sectioned lengthwise in half; in addition, tubers extracted from dissected seedling were used. Each combination of different plant growth regulators concentrations was prepared within Gerber type jars and inoculated with various explants (\*\*\*) of the aforementioned.

**Results**

Excellent results in terms of production and number of outbreaks, as well as in terms of the size of these three species were obtained in a period of 90 days. *Aztekium ritteri* and *Pelecyphora aselliformis* produced multiple shoots, while *Obregonia denegrii*, in addition to multiple outbreaks, also presented embryonic formation (somatic embryos) (\*\*\*) . Among the most interesting results that we were able to obtain, within a period of three months of culture, was the number of shoots per explant.



**Figs. 21 - 23 *Turbiniacarpus*, *Strombocactus disciformis* and *Aztekium ritteri***

For *Aztekium ritteri* the number of shoots obtained was from 5 up to 120, in *Pelecyphora aselliformis* up to 15 outbreaks, while with *Obregonia denegrii* the number of shoots was up to 13 per explant, but the number of somatic embryos exceeded 50.



**Figs. 24 - 26 The grows and sexual maturation of extremely slow plants is accelerated by *in vitro* culture. Here some grafted plants age from the flask: *Geohinthonia mexicana*, 18 months; *Pelecyphora aselliformis*, 14 months; *Strombocactus disciformis* 18 months.**

In studies carried out with other species were also obtained impressive results, the largest response being with *Strombocactus disciformis*, with more than 500 shoots per explant. While the outbreaks, isolated and rooted *in vitro*, were established and adapted perfectly to the external conditions of cultivation under greenhouse, its growth from the moment out of the flask was reduced to normal rates. The best results, and the most surprising, were when the seedlings obtained *in vitro* were directly grafted on *Myrtillocactus geometrizans*.



**Figs. 27 - 29 RARE FORMS OBTAINED IN VITRO: crested forms of *Mammillaria pectinifera*, *Strombocactus disciformis*, *Pelecyphora aselliformis*, *Aztekium ritteri* and *Obregonia denegrii*.**

It is worth mentioning that *Aztekium ritteri* started flowering at eleven months when grafted on *Myrtillocactus geometrizans*, that means from seed germination to a flowering plant were spent only 21 months, compared with 9-15 years it takes to grow up to sexual maturity in normal culture conditions; the work was a resounding success.

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**With special thanks to Miguel Angel Gonzalez Botello for his suggestions and corrections.**

(\*) *In vitro* propagation (or micropropagation) is the practice of rapidly multiplying stock plant material to produce a large number of progeny plants, using modern plant tissue culture methods. (Wikipedia)

(\*\*) In biology, explant culture is a technique used for the isolation of cells from a piece or pieces of tissue. Tissue harvested in this manner is called an explant. (Wikipedia)

(\*\*\*) Somatic embryogenesis is a process where a plant or embryo is derived from a single somatic cell or group of somatic cells. Somatic embryos are formed from plant cells that are not normally involved in the development of embryos, i.e. ordinary plant tissue. (Wikipedia)

## Note despre propagarea *in vitro* a *Aztekium ritteri* și a altor specii de cactuși mexicani

de Felipe Escudero Ganem, Cuernavaca, Mexic

(abstract)

Articolul își propune să facă cunoscute avantajele propagării plantelor *in vitro* și prezintă rezultatele lucrărilor efectuate în cadrul Centrului de Cercetare Biotehnologică al Universității Autonome a Statului Morelos, Mexic.

Mexic este o țară cu o biodiversitate deosebită, din nefericire afectată de o serie de factori: extinderea exploatărilor agro-zootehnice, dezvoltarea urbană și industrială, ca urmare a dinamicii demografice și a necesarului de resurse suplimentare. Există însă și factori de altă natură: distrugerea și jefuirea habitatelor, precum și efectele calamităților naturale (incendii, inundații, alunecări de teren, etc). În prima jumătate a sec. XX, Mexicul, cunoscut pentru o extraordinară abundență de specii endemice a devenit prada unor negustori lipsiți de scrupule, specimene fără număr, fiind comercializate în principal pe piețele europene și asiatice unde s-au vândut la prețuri uneori exorbitante. Astfel, în 1994 colecționarii japonezi au ajuns să ofere 2.000 de dolari pentru un specimen de *Geohintonia mexicana* sau de *Aztekium hintonii*. În acest context s-au format rețele complexe de trafic ilegal. Guvernul Mexican a fost determinat să introducă legi pentru protecția speciilor periclitare (în jur de o treime din numărul total de specii native). Printre speciile endemice cele mai periclitare se numără *Aztekium ritteri*, *Obregonia denegrii* și *Pelecypora aselliformis*.

Obiectivul acestui studiu a fost obținerea prin metoda propagării *in vitro* a unui sistem de producere în masă a acestor plante. Cultivarea *in vitro* a țesuturilor poate fi definită ca regenerarea unor plante complete, din celule, țesuturi sau organe, în condiții fizico-chimice artificiale, aseptice. Este o metodă foarte utilă în producerea de plante cu ritm de creștere încet cum ar fi: *Aztekium ritteri*, *Obregonia denegrii* și *Pelecypora aselliformis*. Au fost utilizate țesuturi obținute de la plantule în vârstă de până la un an.

Rezultatele au fost excelente în ceea ce privește numărul de focare de creștere (5-120 pentru *Aztekium ritteri*, până la 15 pentru *Pelecypora aselliformis*, până la 13 pentru *Obregonia denegrii* și peste 500 pentru *Strombocactus disciformis*), în timp ce numărul embrionilor somatici a depășit 50 la o plantă. Plantulele obținute *in vitro* au fost altoite pe *Myrtillocactus geometrizans*. S-au obținut *Aztekium ritteri* florifere la 11 luni după altoire (deci un total de 21 de luni din momentul germinării) față de 9-15 ani în condiții de cultură, ceea ce este un succes deosebit.

# Aztekium valdezii dossier

## R.I.P. *Aztekium valdezii* ...?

by [Dag Panco](#), Tęgheș, Romania

As predicted in early summer, when the imminent [first description](#) of *Aztekium valdezii* was still a rumour, we face mainly a soaring spectacle of show off sale offers on the black market and sustained protests of dedicated conservation groups. Almost simultaneously with the scientific proposal of this new species, the first plants appeared on sale on [e-Bay](#), this becoming increasingly a common occurrence. It all started from a couple of well-known nurseries in the Czech Republic, launching the sale of portioned seed at an extremely hefty price, directly from their websites ([1](#), [2](#)) next to photos of habitat plants, none of them made available by the discoverer or by the authors of the description. It is worth noting on the one hand the total disregard of the European set of laws by both the seller and the local authorities, as, on the other hand, it is worth drawing attention that harvesting seeds in habitat without a license from the Mexican authorities is considered by law a [crime](#), in the same way as illegal collected plants.

After a first stage of portioned seed sale – first 5, later on 10 seeds – and some plants that have been sporadically traded, both in Europe and in Japan via Thailand, ([1](#), [2](#)), we recently encountered a new import wave of *Aztekium valdezii* seeds and plants, on which we draw a desperate warning. Starting with November there is a new seed offer, this time more discreet, sent on e-mail to people likely to be interested in such offers. This offer is much more aggressive, targeting wholesale buyers as well, as besides 10 seeds sachets, are offered also packets of 100 and even [500](#) seeds. We wonder how was it even possible to harvest these seeds during one of the wettest Mexican autumns in many years, because if the seeds would have been harvested in the summer, then at that time the offer would have been poles apart from what it really was. We wonder who could travel into the habitat to harvest thousands of seeds from plants completely washed out by rain ... Various rumours are circulating. One is about the existence of a single new supply source located in Mexico. Another one talks about the centralization of seeds in the Czech Republic, in the hands of one distributor placed out of the spotlight. Due to a certain lack of factual evidence, we cannot afford to go into more details here, but the fact is that questions grow overwhelmingly and then painfully dwell around – unanswered (yet).

The uneasiness comes precisely from the fact that beside seeds, there is a really huge offer of plants distributed by dealers. If you are “reliable” and have the proper “referrals” you’re good! They will certainly not tell you it’s been sold out! We also note that the price is much lower now compared to the early summer prices and, considering the new exciting species; it is neither large nor exaggerated at all! These are signs of a massive stock! We consider this inflation of irreplaceable biological material collected directly from the habitat as extremely worrying.

In this context, we can not overlook the campaign of the official discoverer of the species, Mario Valdez Maroquin, in the Monterrey [media](#) and social platforms, also complaining to the Mexican authorities (PROFEPA). Backed up by other well-known Mexican cactus experts, Mario Valdez Maroquin does not miss any opportunity to point out who the habitat looters are, sometimes even naming and directly accusing the involved nursery owners. We do not know what effect may have his approach in Mexico; however, in Europe this protest is totally ignored. This will allow the black trade to flourish, and will certainly lead to the disappearance of a species which we just learned about and of which probably we will not ever get to know anything. We also regret that none of those who have promised to start a protection management project, subject to debate and public support, did not want to contribute with first-hand information and specific documentation for this file ... But perhaps the project consists only in grandiose statements, not on paper! It now looks like those who had to design and hand over this project, are more interested in their own quite noisy local image campaign, than to save this new species almost completely destroyed. Will be this claim in an European journal even less heard in Europe and throughout the world, than a newspaper from Monterrey, Nuevo Leon, Mexico ...? Match this question with the fact that here, in Europe, the plants in question are illegally sold, not in Mexico, Nuevo Leon, where they come from.

We regret that instead of presenting our readers comprehensive data about the biology of the species, or reports on the number of plants in habitat and on how they survived the recent tropical storms and flooding, or on conservation matters, we are bound to express grief about this disturbing situation. It is entirely possible that the cover of one of our future issues to be half-mast flagged and a rhetorical interrogation "RIP *Aztekium valdezii* ...?" It could be a harsh reality against which we can only powerless bow our foreheads in resignation.

Versiunea română este disponibilă în [Anexă](#).

## Tóth Norbert



I live in Hungary, in Debrecen, which is the second largest city of the country. I collect cacti and other succulent plants since 1992, when I finished my studies. My favourite genera are *Ferocactus*, *Echinocactus*, *Stenocactus*, *Turbinicarpus*, *Mammillaria*, *Thelocactus*, *Coryphantha*, *Eriosyce*, *Copiapoa* and the small Mexican genera, but virtually I like the entire cactaceae family and also many other species from the succulent world. My recent passion is the genus *Adenium*. I am the co-author of a monograph on *Ferocactus*, written few years back in Hungarian together with my colleague Libnár Antal. In addition I contribute with articles for the Hungarian cactus journals and I'm one of the co-editors of Debreceni Pozsgástár journal. I've been to Mexico several times, travelled through this wonderful country, from the tropical southern part to the northern succulent territory. Baja California is the region, which is next to my heart. I am a member of several Cactus Societies, and Hon. Treasurer of the Hungarian Cactus and Succulent Society.

## Myths and truths about *Ortegocactus macdougallii* (\*) (\*\*)

by Tóth Norbert, Debrecen, Hungary

At the beginning of this century, while browsing the Internet, I discovered purely by chance a Thai website presenting, among other very interesting things, excellent pictures from a local cactus show. I was very impressed especially by a *Ortegocactus macdougallii* colony filling a 30 cm wide planter. This was something I have never seen before and, I have to say this, nor since. Years have passed... and when I planned in 2007 a Mexican trip, in the southern states, together with my friend Dr. Fehér Máté, it was an obvious choice to include a visit in the *Ortegocactus* habitat. However, all the research and all the specialized literature we consulted on this rather mysterious monotypic cactus, was rather in vain. Apart from the name of a locality in the state of Oaxaca, San Jose Lachiguiri, there was no specific information we could possibly find (at that time at least). We realized that we have not researched well enough, only after we returned home. Again, purely by chance, I flicked through an English cactus magazine, namely the British Cactus and Succulent Journal (2004, no.2), where, to my surprise, I found a very informative travel report by Bill Weightman on this plant's habitat. However, things went pretty well for us too. Guided by a local and we found yet in spring 2007 the species in its natural habitat. We described the entire quest for *Ortegocactus macdougallii* in Debreceni Pozsgástár 2011/4 magazine. Later on, comparing the account of the renowned explorer with our own observations we discovered several inaccuracies. But before that, a few words that ought to be known about *Ortegocactus*.

During the winter of 1951-52, Thomas Baillie Macdougall (1895-1973), a well-known explorer and plant hunter of that time, while browsing the Mexican state of Oaxaca, discovered in a very remote and almost inaccessible location near the small town of San Jose Lachiguiri, a very strange small globular cactus. He immediately realized this species was new for the science by considering its habitus and the extraordinary epidermis of this plant. To hear a second educated opinion, he sent few plants for study to the curator of the New York Botanical Gardens, E. J. Alexander.



Fig. 1 *Ortegocactus macdougallii* flower (photo Tóth Norbert).

In time, the rest of the imported specimens have acclimatized very well and started flowering and producing for the plants owner plenty of fruits and seeds. However, the Botanist E. J. Alexander was facing a problem while trying to identify the plant, or at least to circumscribe it within a certain genus. He observed obvious traits hinting towards *Coryphantha* and *Mammillaria*, but also noticeable differences. Based on the rather peculiar characteristics of this new plant, after several years of observations on the plant, he decided to establish a new genus - named after a local family, Ortega, who greatly helped MacDougal in his field research. So, the new genus was named *Ortegocactus*, while the species was named *macdougallii*, in honour of its discoverer. New discovered plant, named therefore *Ortegocactus macdougallii*, has been revealed and described first in 1961 in the Cactus and Succulent Journal of America, Vol. 33, pages 39-40. The few black and white photographs that illustrated the article of the plant have long been the only published photos of *Ortegocactus macdougallii* in habitat, until the appearance of that 2004 article mentioned above.

E. J. Alexander stated very clearly in the first description that although *Ortegocactus macdougallii* presents similar traits to the old genus *Dolichothele*, but also to *Coryphantha*, the differences in the flower structure and also in the fruit and seed were significant and enough to justify the separation from the two genera mentioned before.

Later on several botanists have come up with many different theories regarding relationship with different genera and other taxonomic matters. In making up theories excelled Leo Kladiwa, who included *Ortegocactus* in the genus *Neobesseya* and even creating a subgenus to accommodate it. Our plant was therefore recombined as *Neobesseya macdougallii*. This classification has long been accepted even by famous botanists such as Helia Bravo-Hollis and Hernando Sanchez-Mejorada, in the primary work which is the multi-volume *Las Cactaceas de Mexico* (2:395), volume 2 being published by the Universidad Nacional Autonoma de Mexico in 1978, where they shared Kladiwa's point of view. Few years later, in 1985, Alain Zimmermann came up with another interesting idea. According to A. Zimmermann, based on phylogenetic analysis, *Ortegocactus* is placed on the *Coryphantha* clade together with *Escobaria* and *Neobesseya*. Despite these theories trying to classify our plant in different genera, most of today botanists believe - given the evidence we have currently available - the existing classification of *Ortegocactus macdougallii* in a monotypic genus is correct. In conclusion of this brief taxonomic history of the plant, we must admit that it would be necessary some modern genetic studies in order to clarify without any doubt the affiliation and taxonomic position of *Ortegocactus macdougallii*.



Fig. 2, 3 *Ortegocactus macdougallii* detail of spination and dotted epidermis (photo Valentin Posea).

And now let's have a closer look at *Ortegocactus macdougallii*: generally the plant is offsetting freely and develops in time in small colonies. It has a globular body, or only a bit elongated, having only 3-4 cm across and a characteristic grey-bluish colour. The tubercles have a rhomboidal shape, are less prominent, and sometimes all are flattened, in a spiralling arrangement, while the epidermis is sporting small dots. The woolly whitish-grey areoles bear only one central spine; its colour can vary from completely black to grey, but the tips are always darker than the rest. The spines are straight and 4-5 cm long. Radial spines are 7-8, they are whitish or greyish, having a darker tip exactly like

the central spine. Radials are straight as well and are 5-10 mm long. The yellow funnel form flowers develop in the mostly woolly axiles near the meristem. The daytime flowers are 2-3 cm long and 1.8- 2.5 cm wide. The ovary is a bit woolly, covered with soft hairy yarn, without scales. The petals are yellow, while the sepals are also yellow but with a reddish tint in the middle. The filaments are orange or yellow, the anther is yellow as well, the style is green and is significantly longer than the stamens. The fruit is very small, spherical, red, and it dries up when ripe; in time the parchment-like film breaks up releasing the spherical seeds. Their colour can vary from black to brown, and have about 1 mm. Their surface is finely dotted, the hilum is unusually big. The only known habitat is Mexico, in the southern part of the Oaxaca state, near San Jose Lachiguiri and Cerro el Cantaro, at 1600-1700 m altitude.



Fig. 4, 5 *Ortegocactus macdougallii* with bud and the flower (photo Dag Panco).

*Ortegocactus* is spread across a barren, rocky, country side. The distribution in these areas is far from being uniform. The two observed populations revealed quite a big difference in the density of plants. While in the first population there, were just small numbers of individuals scattered in the area, leaving large gaps between them, in the second population the density was so great that I had to be careful not to trample on small plants. The succulent vegetation in the surrounding region occupied by *Ortegocactus macdougallii* did not present too much diversity; here and there few *Opuntia* specimens seemingly infamous haunted by weather, a species of *Agave* we failed to identify, a few *Ferocactus recurvus* ssp. *greenwoodii* and finally a dwarf species of *Echeveria* with sunburned leaves were actually the only plants representing succulent flora in the area. Beside these only few small aromatic shrubs and sunburned herbs and by all appearances barely surviving in the dry heat, could be noticed around.



Fig. 6, 7 The axilla is the secret nestling place for the small fruits (photo Dr.Jürgen Menzel); Seeds (photo Stefan Nitzschke).

I have omitted on purpose to describe the habitat conditions, but the reason will be revealed soon.

Now I would like to go back a bit to the circumstances in which I found the plant habitat. When after long and unsuccessful searches we finally managed to find our plant, in locations near Cerro Cantaro and San Jose Lachiguiri, several oddities caught my attention. I first have intrigued by the rock type these plants were growing on. The first

specimens we found in crevices of rocks of different shades of dark grey. Although I cannot consider myself not even close an expert in petrography, examining more closely these rocks, it seemed as if it would not be calcareous rocks. Of course I knew there is no specific colour in limestone rocks, which can have different colours depending on the minerals content. The grey colour may be given by high clay content or by other contaminants. For this reason I became cautious in expressing a firm opinion in regards to the composition of the rock, but this kept bothering me.



**Fig. 8, 9 Habitat of *Ortegocactus macdougallii*. Antigoritic serpentine – this is the kind of substrate the plant grows on (photos Tóth Norbert).**

So, I looked for several smaller pieces of rock to submit them for further examination by specialists, because I did not suspect that the next *Ortegocactus* location we found there were huge amounts of rubble from the same rock lying around, just enough to fill few monster trucks. In the following location, no more than 4-5 km from the first location in which we found our plant, we came across the same type of rock, and again this time mostly as rubble. I collected some samples from here as well. One thing caught my attention regarding this rock: the larger areas were covered with patchy green-brown spots, which could indicate the presence of primitive micro-organisms or exudation of inorganic salts. The story continues when I arrived home and handed the samples to my friend Dr. Csajbók József for analysis. He intermediated the rocks to be analyzed in the laboratory at the University of Debrecen, one of the top Hungarian Universities becoming increasingly popular with international students. Conclusion - antigoritic serpentine.



**Fig. 10 "... the density was so great that I had to be careful not to trample on small plants." (photo Tóth Norbert).**

From the literature we learn that antigoritic serpentine is a volcanic rock that formed at great depth by crystallization of silicates under pressure and high temperatures after volcanic activity. Although it usually contains various impurities such as Fe, Ca or others, in the samples collected from Cerro Cantaro there was no calcium carbonate, and also no organic compounds.

And here comes the big novelty - almost everyone who wrote about *Ortegocactus macdougalii* has pointed out that the plant grows on limestone, and therefore in cultivation the soil needs to be limestone rich as well. We must recognize that this statement - after having analyzed soil samples from the habitat – cannot be really confirmed. In any case, as a result of this more than unexpected found, I repotted all my *Ortegocactus macdougalii* specimens (the ones grown on own roots) in a mainly mineral soil mixture composed primarily of volcanic rock rubble, zeolite and rhyolite tuff. And.... see the miracle! My plants, who once suffered visibly in calcareous soil, seemed to revive in the first year after being repotted, only to thrive during the second year like never before! In spring all plants were covered in yellow flowers, one after another. This flowering show was simply impressive and quite unexpected I would say. At first I thought this was because of the unusually sunny period preceding autumn and winter, but the appearance and increased plant growth in the first year after being repotted confirmed that *Ortegocactus macdougalii* does not require lime in the soil mixture, of course, they neither have it in their original habitat.



**Fig. 11, 12 Seedlings (photo Balázs Zoltan).  
We can already expect to flower after exceeding a diameter of 1 cm (photo Agócs György).**

Otherwise, in the rather modest literature that deals with *Ortegocactus macdougalii* authors generally emphasize the fact that the plant's epidermis becomes affected at temperatures below 10°C by some rust spots becoming sometimes big enough to stretch as a continuous coating towards the base of the plant. Although these spots do not cause plant's death, they may become a nuisance and wrecks good sized plants from the aesthetic point of view; they will be especially for the unwitting a kind of silent witness to an alleged inadequate care of the plant. This is not necessarily true. In the above mentioned article Weightman recalls that the epidermis of most plants observed in habitat were sporting these rust spots; from here his conclusion that these spots are more likely caused by a physiological phenomenon. Since the plant's habitat is characterized by a mild and not so cold climate, even in winter the temperature only rarely drops below 8-10°C, Bill Weightman's theory can be somewhat accepted. But if low temperatures are not to blame, then what else is causing these rust spots? It might happen that this is a defence mechanism of the plant against the heat emanating from rock or gravel, as they become extremely hot in high summer, like a hot oven? To make a judgment in this matter is not an easy task at all, primarily because prolonged observation in habitat would be required, but as a starting point I noticed that most plants I met and were covered by these rust spots were growing in very exposed places. Those individuals who have received partial protection from herbaceous shrubs and possibly bigger rocks were much less affected by these spots. The *Ortegocactus* specimens exposed to huge amounts of direct sunlight very often get rust on 80% of their epidermis, while for others growing in slightly shaded places spots were sometimes almost insignificant. These facts cannot be accidental, but the final diagnosis has to be given by botanists, as they are the ones able to clarify the matter. So, I'm looking forward to their opinion in this regard.

I will present you now another interesting addition to this subject. I placed my *Ortegocactus* specimens high up on the top shelves in the solarium, in the sunniest position. In winter we usually have temperatures of 5-6°C, and of course during sunny days temperatures go up a lot. However, it happens sometimes during winter (even several times in a season) that the sun remains hidden by thick clouds for a longer period of time, even for several weeks in a row, and then the temperature in solarium does not exceed 6°C, not even in the warmest corners. Since I grow my *Ortegocacti* on mineral substrate (without any lime) I observed that, although in winter it gets so cold that sometimes teeth chattering could be heard coming from their direction, these rust spots that make life a hell for any dedicated *Ortegocactus* collector strangely stopped appearing. Could it be only a coincidence? In any case I recommend to all present and future collectors and owners of *Ortegocactus macdougallii*, to plant these outstanding globular plants in mainly mineral substrate, containing a high percentage of volcanic rock rubble, such as zeolite, rhyolite, and so on, and adding only small amount of organic compounds. Plants will be grateful if you place them in the sunniest spot in the greenhouse, and in this case you can keep them in winter even below 10°C, which is the minimal temperature that has been insistently and so far exclusively recommended in all specialized literature.



Fig. 13, 14 *Ortegocactus macdougallii* - grafted seedlings (photo Balázs Zoltan).  
A flowering plant grafted on *Harrisia* (photo Barta Laszlo).

Another hot topic was grafting the plant. For many, many years common knowledge was that *Ortegocactus macdougallii* is very difficult to keep on its own roots, but we can definitely say now that this theory is at least exaggerated. If grown in a suitable substrate (as described above) it is somewhat slower than grafted, but altogether poses no particular problem.

Propagation can be done by seeds or by rooting offsets removed from the plant. However, if we want our plants to set fruit and obtain seeds, it is necessary to obtain specimens by generative means, i.e. grown from seed, given that *Ortegocactus macdougallii* is autosterile. Seedlings from seeds grow quite slowly, but we can already expect to flower after exceeding a diameter of 1 cm. Grafting can accelerate their growth, but this method often leads to distorted growth, plants losing their characteristic appearance.

The fruit is hidden between axils and ripens relatively quickly. Often, we see it only when dry skin cracks and small seeds start falling on the substrate. We have to be unbiased mind; otherwise we might sow without our will.

In the end, an oddity. Several years ago an Italian nursery obtained a chimera of *Ortegocactus macdougallii* from a specimen which was grafted on *Opuntia compressa*. From the joint of the graft and the rootstock rose a strange plant that resembles *Ortegocactus macdougallii* as it retains the ovoid shape characteristic for the young shoots and the epidermis. However, older pads and spines resemble *Opuntia*; it was named + *Ortegapuntia* 'Percy'. The plant seems to be much easier in cultivation than the *Ortegocactus* parent, but there is quite a challenge to avoid offsets reverting to the *Opuntia* shape and colour. According to the nursery's website overwatering and overfeeding

stimulates *Opuntia* like growth. Sometimes patches of the epiderm revert to ordinary *Opuntia* epidermis. Propagating this chimera is also a big challenge as most of the time rooted offsets produce only reverted *Opuntia* pads or offsets with patched epidermis.

In any case, I can highly recommend *Ortegocactus macdougallii*, a cactus of great beauty, to all fellow cactus collectors; through proper care a special gem can be obtained in any collection.



Fig. 15, 16 *Ortegocactus macdougallii* - old plants from Dag Panco and Basarab Popa collections (photo Dag Panco).

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(\*) An earlier version of this article was published in Debreceni Pozsgástár, 2012, No. 1, pages 41-50.

(\*\*) The English version is based on a Romanian translation by Lévai Melchior and Lévai Magdolna.

(\*\*\*)The serpentine group describes a group of common rock-forming hydrous magnesium iron minerals; they may contain minor amounts of other elements including chromium, manganese, cobalt or nickel. Antigorite is an iron-bearing secondary mineral found in serpentine. (Wikipedia)

## Mituri și adevăruri despre *Ortegocactus macdougallii*

Tóth Norbert, Debrețin, Ungaria  
(traducere prescurtată)

La începutul secolului am descoperit un site thailandez care prezenta imagini de la o expoziție de cactuși și am fost foarte impresionat de o colonie de *Ortegocactus macdougallii* având 30 cm în diametru. Când, în 2007, am planificat expediția din Mexic împreună cu prietenul meu Dr. Fehér Máté am stabilit să vizităm și habitatul acestei plante. Nu am găsit decât date superficiale care includeau însă numele localității - San Jose Lachiguiri, Oaxaca. Din nefericire nu am descoperit, decât la întoarcere, articolul bine documentat al lui Bill Weightman publicat în 2004.

Planta a fost descoperită în iarna 1951-52 de Thomas Baillie Macdougall (1895-1973), un cunoscut explorator și vânător de plante al vremii și imediat a realizat că este o specie nouă. Pentru confirmare a trimis pentru studiu câteva exemplare botanistului E. J. Alexander, pe atunci curator al Grădinii Botanice din New York. Acesta a observat caracteristici similare cu *Coryphantha* și *Mammillaria* (vechiul gen *Dolichotele*), dar și deosebiri marcante în structura florii și fructelor și în aspectul semințelor. A decis în final să creeze un gen nou și a descris noua specie în 1961 ca *Ortegocactus macdougallii*. Numele genului și speciei onorau pe dl. Ortega (care l-a ajutat mult pe Macdougall în expedițiile sale) și respectiv pe descoperitorul acesteia. Până în 2004 nu au mai existat alte fotografii ale acestei plante în habitat.

Ulterior Leo Kladiwa a inclus *Ortegocactus* în genul *Neobesseya* (ca *Neobesseya macdougalii*), idee menținută și de Helia Bravo-Hollis și Hernando Sanchez-Mejorada în monumentală lucrare *Las Cactaceas de Mexico* (2:395). În 1985 Alain Zimmermann, bazându-se pe analiza filogenetică, a concluzionat că *Ortegocactus* se situează pe aceeași cladă cu *Coryphantha*, împreună cu *Escobaria* și *Neobesseya*. În prezent marea majoritate a botaniștilor susțin această poziție taxonomică și consideră genul *Ortegocactus* ca fiind monotipic.

Singurul habitat cunoscut este în sudul statului Oaxaca, în apropierea localităților San Jose Lachiguirri și Cerro el Cantaro, la altitudini de 1600-1700 m. Sunt cunoscute numai două populații distincte de *Ortegocactus*, într-un ținut stâncos și arid, având o distribuție neuniformă: în timp ce în prima există un număr redus de indivizi, cu spații mari între aceștia, în cea de a doua populație densitatea era atât de mare încât trebuia să fii atent când calc să nu strivesc plantele tinere. Vegetația succulentă nu este prea diversă în zonă: câteva specimene de *Opuntia* bântuite de vreme, o specie de *Agave* pe care nu am putut să o identific, câțiva *Ferocactus recurvus* ssp. *greenwoodii*, iar în final o specie minionă de *Echeveria* având frunzele arse de soare. În rest, câteva erbacee aromate și tufișuri care păreau că abia reușesc să supraviețuiască caniculei uscate.

În habitat a existat o ciudățenie care mi-a atras atenția în ambele locații: tipul de rocă, având diferite nuanțe de cenușiu, în crevasele cărora crește *Ortegocactus*. Creștea exclusiv pe acest tip de rocă, fie în crevase formate în blocuri compacte, fie în grohotiș. Fără a fi expert, am avut impresia că nu sunt calcare. Am căutat deci câteva spărturi din ambele locații și le-am dus pentru analiză prietenului meu Dr. Csajbók József de la Universitatea din Debrecin. Rezultatele au confirmat absența carbonatului de calciu și a componentelor organice, roca fiind serpentin antigoritice. Am citit că se formează la adâncime prin cristalizarea silicaților ca urmare a presiunii și temperaturilor înalte generate de activitatea vulcanică.

Este o constatare surprinzătoare și cu o doză de noutate. Aproape toți cei care au scris despre *Ortegocactus* au menționat că planta crește în natură pe calcare și ca urmare recomandau insistent utilizarea calcarului în cultură. Acest lucru a fost infirmat de analize. Ca urmare am transplantat toate speciile mele crescute pe rădăcină proprie folosind un substrat preponderent mineral format din spărturi de roci vulcanice, zeolit și tuf riolitic. Și... miracol! Plantele mele care păreau suferinde în substratul calcaros au început să-și revină în primul an, pentru a vegeta viguros și înflori abundent în al doilea sezon. Am confirmat prin aceasta că *Ortegocactus* nu necesită calcar în amestec, așa cum nu-l are de fapt nici în natură.

Un alt aspect des menționat este că epiderma este afectată la temperaturi sub 10°C de formarea unor pete de rugină, inofensive dar inestetice, care pot deveni uneori destul de mari, întinzându-se spre baza plantei. Nu este adevărat. Temperaturi de 8-10°C se întâlnesc ocazional și în habitat, în ciuda climei blânde. Mai mult, Bill Weightman, care a observat aceste pete și la plante din habitat, susține că acestea pot fi rezultatul unor fenomene fiziologice. Mă gândesc că pot fi un mecanism de protecție al plantei față de căldura infernală emanată de roci în verile uscate și toride. Desigur, pentru a confirma acest lucru sunt necesare observații extinse în habitat. Totuși, ca punct de pornire doresc să fac următoarea remarcă: în habitat am observat aceste pete mai ales la plante extrem de expuse - ocupând uneori până la 80% din suprafața epidermei; specimene protejate fie de tufisuri, fie de stânci mai mari erau mult mai puțin afectate, la cele mai umbrite petele fiind nesemnificative. Acestea sunt simple constatări, botaniștii fiind cei care vor trebui să lămurească acest aspect.

În solarul meu iarna am de obicei 5-6°C și desigur mult mai mult în zilele însorite. Deseori iarna pot trece însă și 2-3 săptămâni fără soare și atunci temperatura rareori trece de 6° C. Totuși, de când am trecut ortegocactușii pe mineral, aceste pete de rugină au încetat să mai apară. Pentru mulți ani s-a considerat că *Ortegocactus* este dificil de crescut pe rădăcină proprie, fiind de regulă altoit. De când am schimbat substratul pot spune însă că această teorie este exagerată. Propagarea se poate face din semințe sau prin înrădăcinarea butașilor. Pentru a obține semințe este însă nevoie de plante obținute generativ, adică din semințe, întrucât specia este auto-sterilă. Înfloresc de mică, după ce depășește 1 cm diametru. Fructul este ascuns între axile și eliberează semințele în momentul în care se usucă. Recent, o nurserie italiană a obținut accidental o himeră, pornind de la un lăstar apărut la îmbinarea altoiului cu portaltoiul (*Opuntia compressa*), numită '+*Ortegopuntia* 'Percy'.

# Our Special Guests

## Graham Charles



Graham Charles started growing cacti and succulents at the age of 12, and soon after joined National Cactus and Succulent Society. In 1972 he qualified as a competition judge and started building his extensive collection of documented plants. His interest rests mainly with South American cacti. He has a very enthusiastic but practical approach on conservation, reducing the demand of habitat collected plants by growing seedlings from documented seed collections. He made over 20 visits to South America in order to study and document cacti in their natural environment.

For his contribution to the hobby, the CSSA made Graham a Fellow of their Society in 2005. He has given hundreds of talks at BCSS meetings and conventions in Europe, America and New Zealand. Graham authored several books (*Copiapoa*, 1998; *Gymnocalycium* in habitat and culture, 2009) or co-authored several other books. He was a member of the

editorial team of the New Cactus Lexicon, contributing many photographs to the picture volume. Graham founded the Cactus Explorers Club and launched the first free on-line journal for cactus and succulent enthusiasts, 'The Cactus Explorer', in 2011. He currently is editor of *Bradleya*, the yearbook of BCSS.

## The Changing Face of Succulent Publications

by Graham Charles, Ketton, Stamford, England

Succulent journals have been published for more than a century. They have been the principal way to disseminate information about the plants and their cultivation. Until recently, traditional printing has been the only way of producing journals, whether they were aimed at professional botanists or amateurs.

The arrival of new technologies presents the publishers with more possibilities. Conventional printing is expensive for small quantities, but now digital printing has improved in quality and offers a cheaper alternative for printing a few hundred copies, a choice favoured by many small specialist Societies.

It is difficult to remember what life was like without the internet. It has had a major effect on many aspects of our lives and publishing is no exception. The 'Portable Document Format' (PDF) was invented more than 20 years ago as a universal format for illustrated document files on computers. The PDF reader is distributed free and allows anyone to view files saved in this format whilst preserving the exact appearance of the original.

So, as the internet became available to most of the population, PDF offered a new way to deliver journals, particularly as the internet speed improved, so allowing the download of large files in a reasonable time. This publishing method was given a further boost when the ICBN (International Code of Botanical Nomenclature) changed the rules concerning the publication of new names and allowed it to be done on-line.

Distributing a journal on-line has a number of advantages for the publisher. Firstly, it is cheap, since there are no printing costs, nor an increasing bill for postage. It is also quick to produce, offering authors rapid publication, and quick to deliver. If any issue becomes larger than expected, there is no problem, unlike with conventional printing.

For readers whose first language is not English, PDF files give them the chance to run the text through an on-line translation program which can help them to understand the content.

But what do the readers think? Do people like reading on-line journals? Are they more likely to read an on-line journal? When I talk to people who download the 'Cactus Explorer', the free on-line journal I created in 2011, they

## Graham Charles - The Changing Face of Succulent Publications

often tell me that they print it out to read and keep. I lay out the pages with double-sided A4 printing in mind, a format which most similar journals have also adopted. If it was intended for on-screen reading, a journal could be any size and would probably be better with just a single column of text.

Speaking personally, I still prefer a printed book or journal. They are more convenient to refer to or read. You can read them in bed or in the garden on a sunny day. Perhaps I am old fashioned, but there is something about a book which suggests authority and reliability, and they feel good!

The arrival of so many free on-line journals coincides with diminishing numbers of people subscribing to succulent Societies. Such numbers have been in decline for many years, so I don't believe the two are directly linked. Rather, I think that now the internet is so often the first place to look for information, on-line journals are more likely to be seen by new converts to the hobby, and this may lead to them joining a Society.

In conclusion, I think there is a place for both and indeed, as the editor of *Bradleya* as well as the *Cactus Explorer*, I produce both. I enjoy the contact with people around the world who share my interest in cacti and succulents. It is really all about communication, so we need to use all the media available to inform and entertain fellow enthusiasts.



(Pictures taken in Graham Charles' greenhouses - courtesy of **Trevor Wray**).

# Connoisseur's Notes

## *Mammillaria albiflora* (Werdermann) Backeberg 1937

by [Ricardo Daniel Raya Sánchez](#), Celaya, Guanajuato, México

*Mammillaria albiflora* is a small cactus species that grows only about 5 cm high and 3 cm wide, rarely offshooting. It has multiple areoles, about 60-80, topped with white radial spines of just a few millimeters and without any central spine, covering almost 100% of the plant's body. This provides a unique shape and its main particular feature within the genus. The plant also has a large turnip-shaped root that can be up to 8 cm long and 3 cm wide, which stores water for the dry season. The plants are flowering from April to June, they have daytime flowers, and white colored occasionally with light pink stripes and reach 4 cm in diameter, which is quite a huge flower for such a small body, sometimes the flowers becomes larger than the plant itself.



Fig. 1 *Mammillaria albiflora* in habitat

FEATURE	MAMMILLARIA HERRERAE	MAMMILLARIA ALBIFLORA
spines	100 or more, unequal, interlaced, white or gray, 1-5 mm long, with no central spine, covering almost 100% of the plant	60-80, unequal, with no central spine, interlaced, white or gray, 1-5 mm long, covering almost 100% of the plant
size	8 cm high and 5 cm wide	5 cm high and 3 cm wide
flower color	magenta	white, occasionally with a small pale pink stripe
flowersize	3-5 cm of diameter	4-6 cm of diameter, funnel-shaped
root	fibrous, shallow up to 5 cm long	napiforme up to 8 cm long and 3 cm wide
seed	within the plant body, blackish brown,	few millimeters black color, protruding mammilas on a white coat



Fig. 2 The habitat. Locality type 1.

*Mammillaria albiflora* was initially included as a variety in *Mammillaria herrerae*, as *Mammillaria herrerae* var. *albiflora* Werdermann 1931, main reason being the superficial similarity of the two and then was separated as a new species after considering several differences; compared to the *Mammillaria herrerae* type the most notable variances are: smaller body and flower size, totally different flower color, fruiting and root type (napiform in *M. albiflora*).



Fig. 3, 4 *Mammillaria albiflora* in habitat – locality 1.

*Mammillaria albiflora* is endemic to the state of Guanajuato in central Mexico, growing on small hills with lots of limestone rocks, at about 1200 meters altitude. It prefers denuded areas with great sunlight exposure; you can see it growing there together with companion plants such as *Mammillaria pseudocrucigera*, *Mammillaria magnimamma*, *Coryphanta erecta*, *Mammillaria perbella*, *Ferocactus latispinus*, *Ferocactus histrix*, *Jatropha dioica*, *Agave applanata*, *Acacia schaffnerii*, etc.

My first encounter with *Mammillaria albiflora* was after several years of research and more than 7 expeditions to the area. At that time I did not have accurate information in regards to their location, neither the right tools for its search, or further information on their growth habits, distribution and general data. Information was very scarce, virtually no useful information contained in books, magazines or websites. Only few details were briefly mentioned about it, which made my search in the field like seeking a needle in a haystack. So I decided to seek the small *Mammillaria* by quadrants, each of them covering different places I was visiting and so I walked much of the territory, which actually was very pleasing because I could find other rare and beautiful species, and, after several trips, I finally was successful in finding this wonderful plant.



Fig. 5, 6 *Mammillaria albiflora* in habitat – locality 1.



**Fig. 7 The habitat. Locality type 2.**

I first discovered this cactus in habitat in its type locality, where the population of *Mammillaria albiflora* is currently very scarce, due to illegal collection and land use change, in that particular location I had found only 6 plants during 4 hours of search and after covering quite a large area.



**Figs. 8 - 11 *Mammillaria albiflora* in habitat – locality 2.**

I read about this location that it was purchased by the CANTE A.C. now CHARCO DEL INGENIO and that it would be a privately owned area where the plants would be secure. Now, cattle corrals are overgrazing carelessly the entire

habitat of *Mammillaria albiflora* and therefore there is no certainty that this plant could do well and populations recover in a foreseeable future.



Fig. 12 The habitat. Locality type 3.

After my first visit a good friend told me about the existence of other *M. albiflora* populations which are far from the type locality, little known to the people and in which human impact has not diminished populations. Knowing this, I planned another expedition.



Fig. 13, 14 *Mammillaria albiflora* in habitat – locality 3.

In these new localities I could see lots of plants of different sizes which indicate that the populations are healthy and thriving, and despite the presence of small herds of sheep and cows, there is no serious and imminent problem for plants from this direction. However, there is a threat of considerably greater concern: the planned construction of a golf course and a number of housing developments, designed to build lodges and relaxation facilities for the upper class. All of these are planned to be built on a large area (470.61 hectares) in the Pozos community and (unfortunately) in the *Mammillaria albiflora* habitat.

The project comprises a first step to be developed in an area of 253.82 hectares, which includes the construction of a golf course, subdivisions for lots of housing, roads and services. This project is part of a comprehensive development plan in Pozos community in an area of 1015.82 hectares, to be completed over 30 years; this project is aimed to stimulate a long-term improvement of touristic, residential and agroecological ventures, using historical attractions and scenery mining haciendas in the zone.



Fig. 15, 16 *Mammillaria herrerae* vs. *Mammillaria albiflora*. Photos Miguel Angel Chavaria.

Even if there was conducted an environmental impact study, this is not realistic and does not provide the correct and complete information on the biodiversity of the area. This document is open to the general public for their information, so you can access on the Internet with report number 11GU2010UD081 SEMARNAT (link for download the pdf <http://sinat.semarnat.gob.mx/dgiraDocs/documentos/gto/estudios/2010/11GU2010UD081.pdf>); it does not include species that are considered under some protection such as *Glandulicactus uncinatus* ssp. *crassihamatus* CITES appendix 2 NOM-059-SEMARNAT-2010 THREATENED *Echinocactus horizonthalonius* CITES appendix 2 among others, perhaps this is due economic interests that are at stake, as these projects involve millions of dollars that benefit powerful people who have no respect for nature and only seek wealth.



Fig. 17, 18 Together with *Mammillaria albiflora* in habitat, *Acacia schaffnerii* and *Coryphanta erecta*.

With the disappearance of its habitat the future of *Mammillaria albiflora* is at risk if there are not taken adequate protection measures for the short time future; perhaps the only way to see them in future will be in private collections, photographs, and not in their natural environment.

Will we get in such a desperate situation to require international aid to protect this species...? We don't know yet for sure, but very probably yes!

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[Helia Bravo Hollis](#), [Léia Scheinvar](#) - El interesante mundo de las cactáceas, ed. 1 (1995) and ed. 2 (1999); John Pilbeam – *Mammillaria*, Cirio Publishing Services, Southampton (1999).



Fig. 19, 20 Together with *Mammillaria albiflora* in habitat, *Echinocactus horzonthalonius* and *Mammillaria perbella*.

### ***Mammillaria albiflora* (Werdermann) Backeberg 1937**

de [Ricardo Daniel Raya Sánchez](#), Celaya, Guanajuato, Mexic

(traducere prescurtată)

*Mammillaria albiflora* este un cactus de mici dimensiuni, cu areole dense din care cresc spini radiali scurți și deși, acoperind întreg corpul plantei. Planta are o rădăcină napiformă ce poate atinge 8 cm lungime și 3 cm grosime. Înflorește în aprilie-iunie, floarea diurnă, de 4 cm, mai mare decât corpul plantei, fiind albă, ocazional cu dungi longitudinale roz deschis pe petale. Inițial, această specie a fost inclusă ca varietate în *Mammillaria herrerae* (*Mammillaria herrerae* var. *albiflora* Werdermann 1931), ulterior ridicată la nivel de specie distinctă ca urmare a unor diferențe notabile (vezi tabel). Este o endemică a statului Guanajuato din Mexicul central, unde crește la aproximativ 1.200 m altitudine pe dealuri conținând calcare, în locuri puțin vegetate, expuse, alături de alte specii de cactuși și alte plante suculente.

Am întâlnit pentru prima dată această plantă după mai mulți ani de cercetări și 7 expediții în zonă. Informațiile erau precare, așa încât am împărțit zona în sectoare pe care le parcurgeam în diferite expediții și astfel am descoperit această plantă minunată. S-a întâmplat să fie localitatea tipului, unde populația existentă este foarte redusă numeric – am găsit numai 6 plante după căutări care au durat 4 ore. Am citit că terenul acesta a fost cumpărat de o companie privată și am crezut că plantele vor fi în siguranță. Numai că terenul este pășunat excesiv, neexistând deci certitudinea refacerii acestei populații.

Ulterior am aflat de la un prieten bun de existența altor populații de *M. albiflora*, aflate la mare distanță față de localitatea tipului. Aici am văzut numeroase plante de diverse dimensiuni, indicând faptul că populațiile sunt sănătoase. Totuși, există un motiv de îngrijorare mult mai serios: există planuri de dezvoltare a zonei ocupate de comunitatea Pozos, urmând ca pe 470,61 hectare să se construiască un teren de golf, locuințe, cabane și alte amenajări turistice pentru înalta societate, din nefericire inclusiv în habitatul *M. albiflora*. Aceasta este numai o secțiune a unui proiect mai amplu care urmează să se deruleze pe parcursul a 30 de ani pe o suprafață de 1.015,82 hectare.

Chiar dacă a fost efectuat un studiu de impact asupra mediului, acesta nu este realist și nu cuprinde informații corecte privind biodiversitatea zonei. Nici nu menționează specii considerate protejate cum ar fi *Glandulicactus uncinatus* ssp. *crassihamatus* sau *Echinocactus horzonthalonius*. Există interese economice ale unor oameni puternici, care urmăresc numai bunăstarea materială și care nu sunt interesați de natură. Prin dispariția acestui habitat, viitorul *Mammillariei albiflora* este sumbru dacă nu vor fi luate urgent măsuri adecvate de protejare; nu știm încă cu siguranță, dar este foarte probabil ca în viitor să putem admira această plantă doar în colecții private sau fotografii, dar nicidecum în habitatul natural. Putem ajunge într-o situație atât de disperată încât să cerem ajutor internațional pentru a proteja această specie? Nu știm încă cu siguranță, dar este foarte probabil.

## Gabriel Millán Garduño



About me: Mexican, born in 1982. Dilettante Cactophile, budding communications expert. Lover of literature, philosophy, history and a stubborn defender of good Spanish language. Coordinator of contents for the Project *Salvacactus* of Mexico, a Facebook page dedicated to the promotion of activities related to the conservation of Mexican cacti, through the dissemination of knowledge for the conservation and habitat enforcement and to promote collecting responsible and lower extraction, illegal sale and purchase.

## The *Salvacactus de México* Project

by Gabriel Millán Garduño, Cuernavaca, Morelos, México

By mid-2011, with the intention to start a social advertising campaign promoting succulent plants, a small project that should have been maintained and expanded with limited financial and human resources, I came up with the idea of creating a website focusing on Mexican cacti. Considering the large number of users we were expecting and the abilities in creating virtual communities, Facebook was considered to be the best platform for the site.

In early 2012 the project was reinforced and named *Salvacactus de México*. The entire project started in a quite intuitive manner, being closer to media, marketing and advertising considerations, rather than taking shape as botanical or ecological evidence. This approach of the entire Mexican cacti phenomenon is perfectly reflected by the primary target of our website, which is to raise awareness and spread messages against the collection of cactus specimens, cuttings and seeds from their natural habitats, assuming that the illegal harvesting is the greatest threat to this plant family.

Once the first releases online, using advertising techniques and constantly applying the "trial and error" method, *Salvacactus* was gaining more and more followers, albeit at a slow pace. While our interest and eagerness to learn more about the Mexican cacti grew, the first members of *Salvacactus* (Gabriel Millán Garduño, Adriana Villafuerte and Iván Figueroa) noticed that the project cannot revolve only around illegal cactus collections, as it would leave aside the biggest threat for the cacti: the land use change and the subsequent loss of habitat, which is the main threat, for cacti and for other biological families alike. The transformation of its objectives at that time didn't occur only for its members, but together with our curiosity and interest, it attracted the interest and interaction of several other followers of *Salvacactus*, transforming the page due to their own input and feedback, and some of them were experts in the field.



Fig. 1 The first postal of the campaign "Échale la mano a las cactáceas" (give a hand to the cactaceae). This image is focusing on preventing cactus collection from its habitat.

And so, as time passed, the *Salvacactus* network grew, and more and more members and repeat visitors shared their pictures or thoughts with us. In November 2012 the team was joined by Cesar Hernandez, a young agro-ecology student, native of San Luis Potosi. Enthusiastic and altruistic, he began sharing with *Salvacactus* page his excellent photographs of the cacti from his region, but also from other states of

the country. Cesar Hernandez's participation marked a milestone in the history of the project and as a direct result of the visual wealth and impact of his images *Salvacactus* gained much more visibility and a larger number of followers. The quality of the images, his experience in identifying cacti and above all, the willingness to cooperate was reflected in the page, which not only increased in followers, but achieved a much higher engagement from its audience.



**Fig. 2, 3 Second and the third postal of the campaign "Échale la mano a las cactáceas". The first image is focusing on preventing littering and the cactus habitat preservation and the second is focusing on promoting trade of cacti legally produced in greenhouses.**

In 2013 we considered the *Salvacactus* logo, aiming towards a greater brand identity and trying to craft it as a visual reference. The logo was extracted from the Codex Boturini (also known as "Tira de la peregrinación") (\*), which describes the journey of the Mexica tribe from Aztlan to the Valley of Mexico. One of the pages shows two globose cacti on which human sacrifices were performed, probably *Echinocactus grusonii* or *E. plathyacanthus*. With a logo from such an old document, *Salvacactus* consolidated and defined more incisively its scope: Mexican cacti.



Currently, *Salvacactus* can be defined as a cyber-activist page. As a result it produces, develops, disseminates, and promotes shared content from both own and external sources, in order to give visibility to Mexican cacti, to raise awareness and spread knowledge of their habitat, characteristics, distribution, biology and threats, as well as the biological and evolutionary richness surrounding this plant family. This project seeks to create a new level of awareness, to drive beyond a web-page showing pictures of cacti and a space for dialogue, debate and peer learning. *Salvacactus* does not try to "teach", but it opens the space and creates channels for information to flow, everything from expert commentary to rural anecdote.

**Fig. 4 Fourth postal of the campaign "Échale la mano a las cactáceas", this was conducted to underline the importance of cactus knowledge for their conservation.**

*Salvacactus'* vision is not to be only a website. Our future vision is to build a civil society organization, to conduct environmental education campaigns, media campaigns in order to alert the population on the importance of cacti,

on the effect of human interventions in arid and semi-arid eco-systems, and lobbying to change rules, regulations and legislation for the preservation of Mexican cacti.

For the time being *Salvacactus* is being directed by: Gabriel Millán Garduño, media and communication student, who coordinates the content, public relations and also assures the Facebook users interface; **Cesar Hernandez**, agro-ecologist engineer, who shares his wonderful photographs of wild cactus life; **Antonio Arias**, ecological restoration master, who serves as an external counsel on ecologic issues; and most recently **Eva Almanza**, agro-ecologist engineer, who also shared her images for publication and began her involvement as web-page administrator.

**Fig. 5 Fifth postal of the campaign "Échale la mano a las cactáceas".**

**This insist on the importance of not extracting cacti from the wild and appreciate their beauty in habitat.**

Although this is the only "staff", *Salvacactus* has received and receives substantial contributions from many people, some well-known, some not, who joined the *Salvacactus'* ideals by giving visibility to the Mexican cacti and deliver a strong message in support of their conservation, from the virtual barricades, some even indirectly, due to their continuous involvement in this project.



**Fig. 6, 7 The poster promotes the idea that mining is one of the most threatening activities for biodiversity and The Image promoting thr World Environment Day.**

Among the many people who have worked together with the "*Salvacactus Project*" we can mention: **Adriana Villafuerte**, who is preparing a series of fantastic artwork on cacti, to show that art and conservation can work together, **Silvia Rivera**, who was formerly involved with the **Charco del Ingenio** Botanic Garden and who "boarded" *Salvacactus'* train, supporting the project and establishing a beneficial and direct relationship for both portals; **Dag Panco**, a Romanian hobbyist and Senior Editor of this journal, who invited us to publish this essay, and who always enthusiastically shared his interest on conservation; **Pedro Najera**, another Potosinian agro-ecologist engineer,

passionate and having a huge determination to defend the Mexican natural resources; **Felipe Escudero**, whose experience, expertise and patience are invaluable and who shared his knowledge without hesitation and supports the conservation; **Miguel González**, master in management of arid wild ranges, who is a fierce critic of publications and thanks to whom precision is a long sought goal, and many others, some temporary, some permanent, directly and indirectly, are part of the **Salvacactus** movement, a movement that seeks nothing but help for the conservation work of Mexican cacti.

Fig. 8 Image promoting the International Day of Biological Diversity.

**Salvacactus** is always looking for people to become part of its staff, so if you are interested please contact us either by writing us at [salvacactus.mexico@gmail.com](mailto:salvacactus.mexico@gmail.com), by sending us a private message on our website [www.fb.com/salvacactus](http://www.fb.com/salvacactus), or by contacting Gabriel Millán Garduño at [migg8210@gmail.com](mailto:migg8210@gmail.com).



(\*)The Boturini Codex was painted by an unknown Aztec author sometime between 1530 and 1541, roughly a decade after the Spanish conquest of Mexico. Pictorial in nature, it tells the story of the legendary Aztec journey from Aztlán to the Valley of Mexico. Rather than employing separate pages, the author used one long sheet of amatl, or fig bark, accordion-folded into 21½ pages. (Wikipedia)

## Proiectul *Salvacactus de México*

de Gabriel Millán Garduño, Cuernavaca, Morelos , Mexic

(abstract)

Proiectul a fost inițiat la mijlocul anului 2011, cu scopul de a atrage atenția asupra cactușilor mexicani și a colectării lor ilegale, Facebook fiind considerată o platformă optimă. În 2012 a fost denumit **Salvacactus de México**. Membrii inițiali (Gabriel Millán Garduño, **Adriana Villafuerte** și **Iván Figueroa**) au realizat în curând că prevenirea colectării ilegale a cactușilor din habitat nu este decât o latură a problemei, modificarea utilizării fondului funciar și pierderea habitatelor fiind probleme chiar mai acute. În timp s-au alăturat numeroși susținători, expertiza unora dintre ei fiind esențială. În luna noiembrie a anului 2012 **Cesar Hernandez**, un tânăr student la ecologie agrară, s-a alăturat acestui proiect, acesta fiind un moment decisiv în viața proiectului, prin calitatea materialelor, fotografiilor și contribuțiilor sale, de mare impact, care au atras mulți alți susținători. În 2013 a fost desemnată o siglă a proiectului, extrasă dintr-o lucrare istorică cunoscută și sub numele de Codex Boturini, definind mult mai bine scopul acestei asociații.

În prezent, **Salvacactus** poate fi definit ca o pagină activist virtuală. În esență ea produce, dezvoltă, difuzează și promovează informații, atât din surse proprii cât și din surse externe, pentru a sensibiliza populația și a răspândi cunoștințele în ceea ce privește habitatul, caracteristicile acestuia, distribuția, biologia speciilor de cactuși mexicani, precum și amenințările la care sunt expuse. Scopul este de a construi o organizație a societății civile, care să conducă campanii mediatice, de educare, lobby pentru modificări legislative în scopul conservării cactușilor mexicani. Printre persoanele care au conlucrat sau care au sprijinit proiectul putem enumera pe: **Adriana Villafuerte**, **Silvia Rivera**, **Dag Panco**, **Pedro Najera**, **Felipe Escudero**, **Miguel González** și alții. **Salvacactus** este în permanentă căutare de susținători și colaboratori. Doritorii ne pot scrie la [salvacactus.mexico@gmail.com](mailto:salvacactus.mexico@gmail.com), sau mesaj privat pe site-ul nostru [www.fb.com/salvacactus](http://www.fb.com/salvacactus), sau contactându-l pe **Gabriel Millán Garduño** la [migg8210@gmail.com](mailto:migg8210@gmail.com).

# Xero - Arts

## Carl Spitzweg (1808 – 1885), the succulent plants lover

by [Eduart Zimer](#), Auckland, New Zealand



**Fig.1 Carl Spitzweg - self portrait, ca. 1835**

Carl Spitzweg is known as one of the most important representative painters of the Biedermeier era, producing art for the everyday man, and immortalizing with great humour and indulgence everyday life of the German small-town middle class. He wasn't even set to become an artist. He attempted his secondary education in a humanistic gymnasium, but managed to complete only two of the four years and left school in 1824 in order to start apprenticeship at the Royal Bavarian Court Pharmacy in Munich. He appeared to have found his way in life and started in 1830 studies towards a degree in pharmacy, botany and chemistry at the University of Munich, where he graduated in 1832 with honours. Subsequently he was admitted as a practical pharmacist and worked as such in several pharmacies, including the Erding town pharmacy. However, in 1833, after an illness of some sort, Carl Spitzweg broke from his pharmaceutical career and opted to become a painter. His decision has been probably made easier as he received at about the same time a substantial inheritance.

However, this wasn't fully unexpected as he had a predilection for drawing since being a teenager (his first known drawing is dated 1823). In 1835 he became a member of the Munich Art Society, quitting, however, two years later as he felt his work was largely misunderstood. At the same time he sold his first painting. For many years to come he travelled extensively in several European countries and throughout Germany, and although he was an autodidact and never attended an art academy himself, Carl Spitzweg was inducted as an honorary member of the Bavarian Academy of Visual Arts in 1868, and eventually became a landmark of German culture. Since 1844, he teamed up with the *Fliegenden Blätter* (a humorous publication of the time), which he illustrated with numerous humorous drawings. A characteristic feature for many of his paintings.



As a cactus and succulent enthusiast I always have a stray eye for these plants and it struck me (purely by chance) how often appear various succulents, cacti and agave in particular in his paintings. I have not been able to find out if he had contacts with exotic plants fanciers but of course, he probably knew cacti and succulents from pharmacy showcases (this is typical European) and is likely to have been attracted by their exotic forms.

**Fig. 2, 3 Carl Spitzweg - The Pensioner, ca. 1856 (widely known as The Cactus Lover) and detail of the same.**

However, I think there's more to it. German painters and artists used to travel, among other places, in Italy, an almost necessary step in becoming an artist. And there, in parallel with learning the secrets of the trade, they must

## Eduart Zimer – Carl Spitzweg (1805-1885), the succulent plants lover

have been exposed to the Italian gardens, so rich in succulents due to the mild Mediterranean climate. A good example of what he could have seen there is one work of another German painter Friedrich von Nerly – subsequently established in Italy – the 1834 painting *The Roman Balcony*, depicting a potted *Agave*. Although I couldn't document if Carl Spitzweg met von Nerly, there is a drawing of a yellow flowered *Aloe* (erroneously called *Agave*) in his 1840 sketchbook of the first Italian journey. This could have been the starting point, if not the Dalmatian travel in 1839.



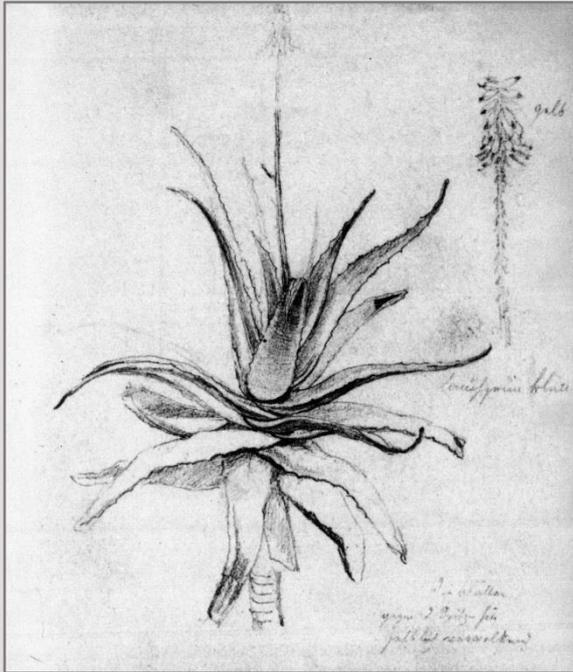
**Figs. 4 – 6 Carl Spitzweg - *The Cactus Lover*, 1850 (known as *The Cactus Enthusiast*), Carl Spitzweg - *The Naturalist in the Tropics*, ca. 1835 and Friedrich Nerly - *Roman-Balcony*, 1834.**

Carl Spitzweg must have been interested in exotic plants prior to his first Italian travel since one of his first paintings, *The Naturalist at the Tropics* (ca. 1835), presents a naturalist looking at a quite colourful and exotic plants arrangement, however, inappropriately matched for a pristine natural habitat (*Opuntia* & *Aloe*). However, it was only after his second Italian travel (1850, Venice) that succulent plants became an almost constant presence in his paintings – as feature element, or in the background.

Probably the most famous cacti paintings are *The Pensioner* (mostly referred as *The Cactus Lover*, ca. 1856) and *The Cactus Lover* (mostly referred as *The Cactus Enthusiast*, 1850). Very interesting is the Italian atmosphere that permeates from the first picture; more, both capture very accurately the passion and propensity for study, proper to

## Eduard Zimer – Carl Spitzweg (1805-1885), the succulent plants lover

all respectable cactus collectors. There also is a variant of *The Pensioner* (Carl Spitzweg used to produce several versions of one work) painted in a very different style, called *The Pastor as Cactus Lover*. Carl Spitzweg painted also a somewhat diluted version of *The Cactus Lover* few years later, in 1880 (The Writer) only this time the cacti were replaced by a large *Agave*.



Especially the original *The Pensioner* is highly interesting for today's cactus collectors because of the hindsight into an amateur collection. There is a very interesting plant mix (and not a specialized collection as such) consisting of a nice *Opuntia* in a large wooden planter, few *Agaves*, a leafy epiphyte cactus by the looks of it, a cereiform one (maybe *Echinocereus*) and couple of globular cacti (maybe *Notocacti*)... but not the very popular *Bauernkaktus* with its triumphant trumpet flowers (that would have been a nice one). Note the thermometer on the wall and the bird houses. A very nice painting indeed... which emanates kind of Mediterranean warmth and tranquillity, even if the central figure looks reasonable German... or maybe Dutch?

**Fig. 7 Carl Spitzweg – *Agave*, 1840. A drawing from his 1840 Italian travel sketchbook actually depicting an *Aloe*!**

Among Carl Spitzweg's favourite characters are hermits, monks and philosophers, mostly enjoying tranquillity surrounded by dense vegetation or potted plants. One of the most interesting paintings of this series is *The Suspicious Smoke* (ca. 1860), depicting a hermit concentrated on observing a suspicious fire in the distance. Three plants have an almost central position in this work and can't be overlooked: an *Agave*, an *Opuntia* and another plant that looks like an epiphytic cactus to me. There are several other paintings featuring *Agave* plants: *Old Hermit Sleeping*, *Hermit Reading*, *Music Making Hermit in Front of His Rocky Hermitage* (ca. 1856-58), *With the Philosopher in the Garden* (ca. 1850-55), etc.



**Fig. 8, 9 Carl Spitzweg – *Suspicious Smoke*, ca. 1860 and *In the Garden, with the Philosopher*, ca. 1850-1855**

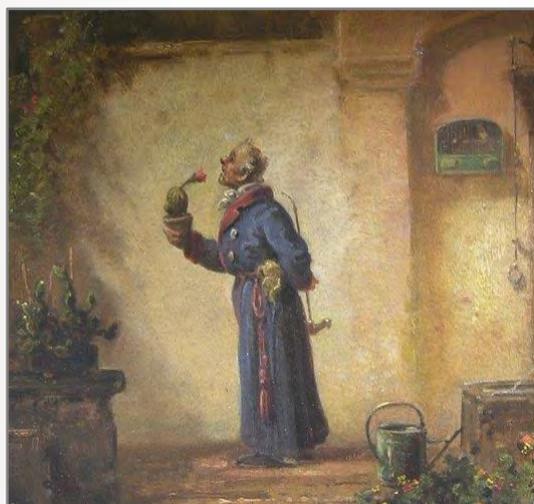
*Visit at the Countryside (School Day Friends)*, 1855, is one of my favourites, with a large *Agave* dominating this humoresque reunion of two old friends. As mentioned above, Carl Spitzweg used to paint several versions until reaching perfection – this is the case with *The Eternal Bridegroom* (1853-60), *The Farewell* (ca. 1855), *The Portrait Painter* (1852-55), *The Garden Friend* (1860), and several *Serenades* (some Spanish, some not) – all featuring, more or less discrete, potted *Agave* plants.

Last but not least, a very interesting early painting called *The Newspaper Reader in the Garden* (1847). This is quite tricky. Definitely, our reader is not interested in his newspaper at all! By all appearances he is checking out the young and slender maid. There are certain things that never change. But wait, don't jump into conclusions... maybe he's actually just mindful she doesn't overturn inadvertently the potted *Agave*. Well, at least that's my guess.



Fig. 10, 11 Carl Spitzweg – Hermit reading and The Scribe, 1880

Apart from the preference for cacti and succulents, Carl Spitzweg was one of a kind, and one of the most representative Biedermeier era artists. He even had a most fervent follower, namely Willy Moralt (1884-1947) who was only one year old when Carl Spitzweg passed away. Despite the age gap and the fact that he produced his own original works, Willy Moralt is mostly known for being a copyist and imitator of Carl Spitzweg, whose painting style he had internalized to such extent that his paintings (if not signed) could be partially confused with Spitzweg's originals. He created several replicas entitled *The Cactus Lover*.



Figs. 12 - 14 Willy Moralt – The Cactus Lover



Fig. 15 Carl Spitzweg – A Visit at the Countryside (School Day Friends), 1855

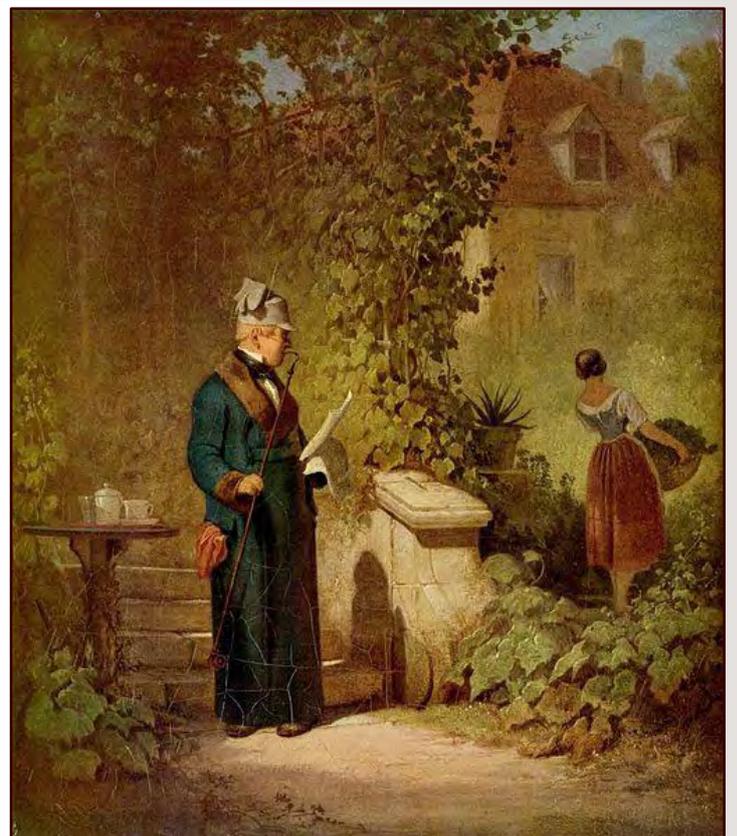


Fig. 16, 17 Carl Spitzweg – The Garden Friend, ca. 1860 and The Newspaper Reader in the Garden, 1847



Fig. 18 Carl Spitzweg – The Portrait Painter, ca. 1852-1855

Even today there are artists re-creating Carl Spitzweg's work (like Otto Rohr's 1889 *The Farewell* replica), not to speak of an apparently very lucrative souvenir and memorabilia industry. In 2008 the Bundespost issued a stamp commemorating 200 years since Carl Spitzweg's birth. Looking at *The Pensionist* (Fig. 2 -3) it becomes so obvious that the world has little changed since, only that new cactus species have been discovered in the meantime.



Figs. 19 - 21 A portrait photo of Carl Spitzweg, ca. 1860,  
The 200th anniversary of Carl Spitzweg in 2008 – the silver coin and the post stamp.

# Connoisseur's Notes

## Stefan Nitzschke



Photo by Milan Zachar

My name is Stefan Nitzschke. I was born in Köln (Cologne) in 1967. My passion for cacti evolved from the common hobby involving plants from around the late 1970s. At the beginning I used to collect all species of cacti that were available, however, after some time I started a specialized collection, focusing initially on *Turbinicarpus*, then accommodating the other Mexican species in my collection as a result of an increasing available space. My hobby culminated with several study trips to Mexico and with the first description of *Turbinicarpus horripilus* ssp. *wrobelianus* Nitzschke et Anaya Montes. Over the years, many contacts were made with like-minded people all over the world including also the meantime deceased *Turbinicarpus* and Mexico specialists such as Hans Joachim Bonatz, Gerhard Frank / Vienna, Werner Reppenhagen and Alfred B. Lau. Currently, I am maintaining an extensive *Turbinicarpus* collection in a 40m<sup>2</sup> greenhouse and am very interested in the exchange of *Turbinicarpus cristates*.

## Notes on *Mammillaria herrerae* Werdermann in habitat and culture

by Stefan Nitzschke, Cologne, Germany

I had my first encounter with this gem of the Genus *Mammillaria* at the very beginnings of my travels through Mexico, back in 1990. After traveling for 29 km on a dirt road we finally reached the small village of Vista Hermosa. Unfortunately we didn't find at that time the plant in its natural habitat, but we saw it collected by locals among other cacti such as *Echinocactus grusonii*.



Fig. 1, 2 Junction of the MEX 120 towards Vista Hermosa and the village of Vista Hermosa, with collected *Echinocactus grusonii* in the front yards.

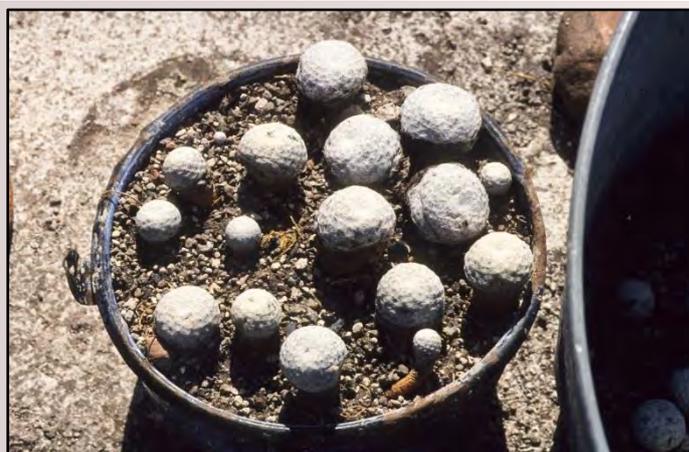
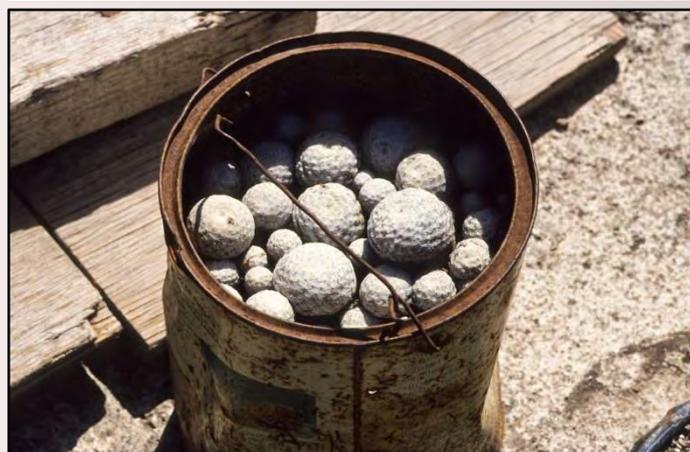


Fig. 3, 4 *Mammillaria herrerae* for sale.

In Vista Hermosa, still an existing locality for *Mammillaria herrerae* at that time, several plants were offered for sale to us. However, we declined and, as a result, for expressing our concern in regards to nature protection and after teaching them the existing Mexican laws, we ended up collecting only scorn and mockery. We left the village and continued our travel in the direction Zimapan, crossing the Rio Moctezuma and photographing few locals during laundry day. The residents of the village of Vista Hermosa were relocated few years later in a higher-lying village Bella Vista del Rio, because of the construction of the dam.



Fig. 5, 6 "Retail area" with *Echinocactus grusonii* and a flowering *Echinocactus grusonii*.



Fig. 7, 8 Laundry day in Rio Moctezuma and drying the laundry.



Fig. 9, 10 *Mammillaria herrerae* at the site.

On later trips I saw the plants on long hikes in this region several times and in different locations along the Sierra del Doctor till next to the present-day reservoir near the village of Bella Vista del Rio. So far, I could never find them in mass occurrences, but every time only sporadically in small populations along the way. *Mammillaria herrerae* grows in raw humus-filled pockets and crevices of limestone slabs. The location and the nature of the substrate allowed their roots to dry rapidly. They are associated with other cacti such as *Turbiniacarpus pseudomacrochele* ssp. *krainzianus* var. *lausseri*, *Astrophytum ornatum* ssp. *mirbellii* and *Thelocactus hastifer*. All sites that are known to me are located in the state of Queretaro. The plants use to stay predominantly solitary, which is common for both habitat and culture plants, however, very old plants tend to offset even without any damage to the growing point, and form multi-headed groups.



Fig. 11, 12 *Astrophytum ornatum* ssp. *mirbellii* and *Thelocactus hastifer* at the site.

I'm cultivating my seed-grown plants on their own roots, in the greenhouse, in a well-drained soil mixture consisting of 1/3 pumice, 1/3 tuff and 1/3 high quality commercial potting mixture (Composana). During the growing season my plants receive no additional fertilizer and are watered only after the potting mix becomes completely dry, that is 3-6 times in a season. I'm not watering from above, but from the tray. In my experience this is the appropriate watering method for this plant for two very good reasons: 1) the sensitive roots may rot when exposed to moisture for too long, and 2) protects the stunning white spination (which may become brownish or chalky otherwise). This species is flowering for me in June/July, which is in the middle of the growing season. Every now and then, with a bit of luck, you can obtain even cristate plants. Growers who manage to keep alive even somewhat more sensitive cactus species, should not miss this outstanding jewel.

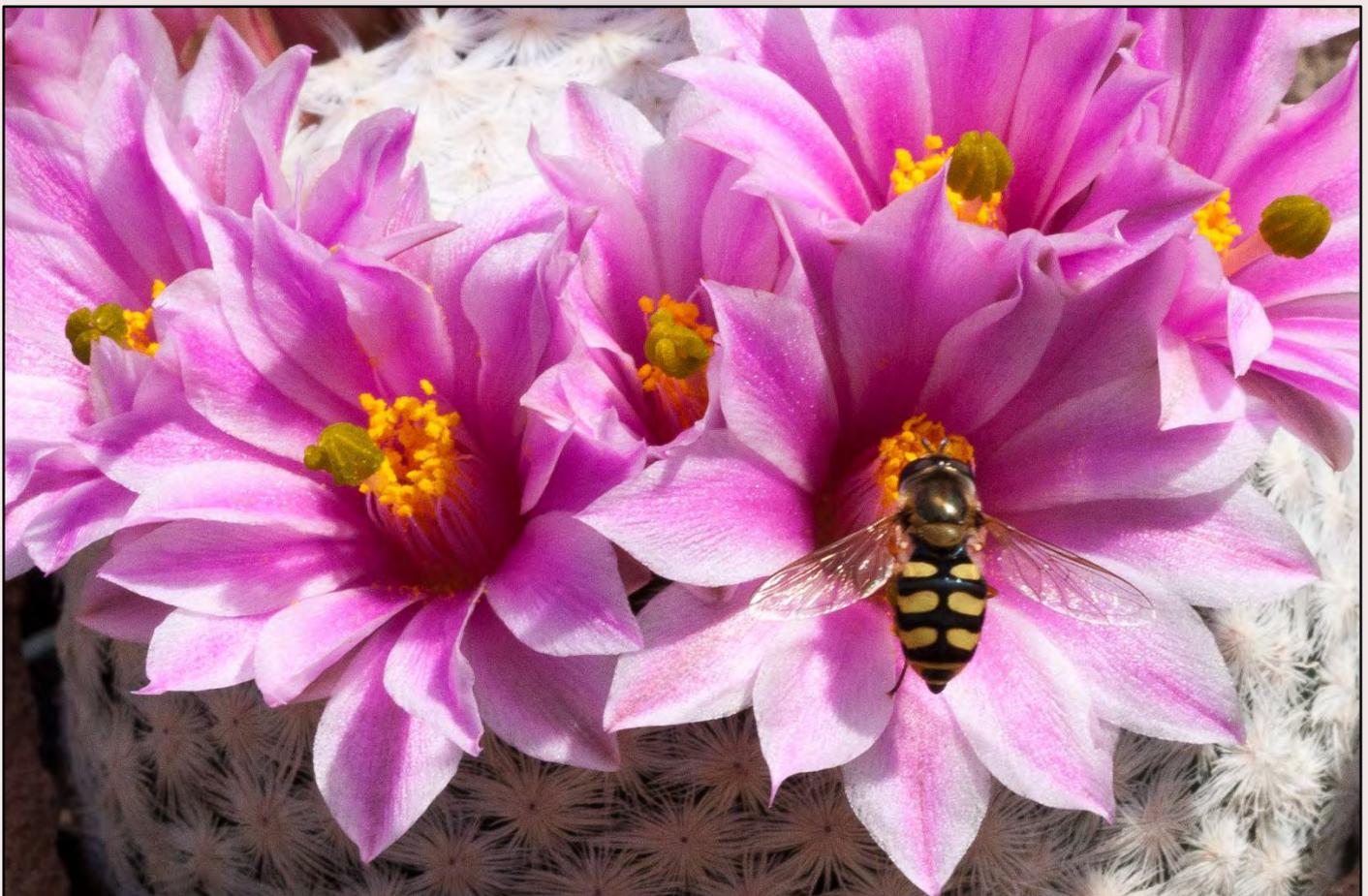


Fig. 13 Flowering *Mammillaria herrerae* with pollinator in culture.



Fig. 14 Flowering *Mammillaria herrerae* with pollinator in culture.

## Note despre *Mammillaria herrerae* Werdermann în habitat și în cultură

de Stefan Nitzschke, Köln, Germania

(abstract)

Autorul evocă prima întâlnire cu *Mammillaria herrerae* în Mexic, în 1990, în mica localitate Vista Hermosa. Nu a întâlnit planta în habitat, dar a găsit-o oferită spre vânzare de localnici alături de *Echinocactus grusonii*. Încercând să explice ilegalitatea acestor oferte și expunând opinia sa despre protejarea naturii și conservare, nu a atras decât ironiile vânzătorilor. Câțiva ani mai târziu Vista Hermosa a fost strămutat iar habitatul plantei a fost inundat datorită construirii unui baraj. În călătoriile ulterioare autorul a întâlnit *Mammillaria herrerae* în diverse locații de pe cuprinsul statului Queretaro, începând cu Sierra del Doctor și până la lacul de acumulare nou format, în dreptul noii localități Bella Vista del Rio. Crește de regulă în mici acumulări de sol din crevase formate în stânci calcaroase, unde rădăcinile se pot usca rapid. Ca plante însoțitoare au fost semnalate: *Turbincarpus pseudomacrolele* ssp. *krainzianus* var. *lausseri*, *Astrophytum ornatum* ssp. *mirbellii* și *Thelocactus hastifer*. Autorul își cultivă plantele crescute din semințe pe rădăcini proprii, într-un amestec bine drenant, constituit din 1/3 ponce, 1/3 tuf vulcanic și 1/3 compost comercial (Composana), fără fertilizanți. Udări rare (3-6) în sezonul de creștere, din tăviță. Înfloarește în iunie-iulie. Ocazional pot apare și forme cristate. Colecționari capabili să țină în viață specii mai dificile nu trebuie să ocolească această bijuterie remarcabilă.

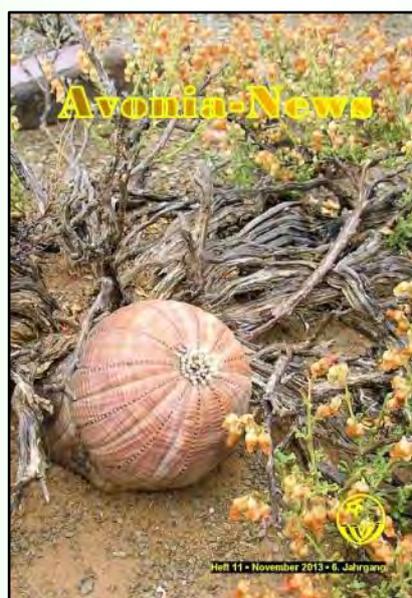
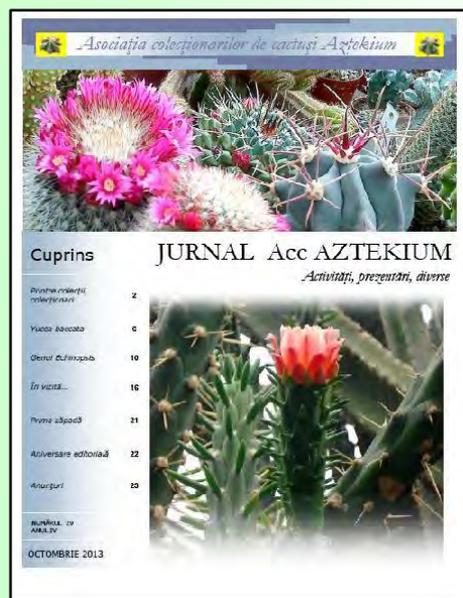
# Bits and Pieces

## Online magazines

First of all we would like to introduce a newcomer among the free online journals: [Acta Succulenta](#), having its first issue released in early October. This outstanding quarterly journal appears in three different editions: English, French and Italian, and is devoted to succulent and xerophyte plants and their environments, with an extra focus on European and Mediterranean succulent flora, in a superb layout. The Editor is Davide Donati, while publisher is [Collegium Europaeum pro Plantis Succulentis](#) (CEPS). The 94 pages of the first issue contains a selection of very interesting articles written by



Fritz Hochstätter (first description of *Nolina pollyjeanniae*, from Oklahoma), Davide Donati, Elvia Speranza, Moreno Centa, Gérard Dumont, Antoine Mazzacurati and Fabrizio Barbieri. Once again, this is a splendid publication of an exceptionally high editorial quality. Well, this was the latest online addition, now let's introduce one of the longest running online journals: [Boletín electrónico de la SLCCS](#) (Sociedad Latinoamericana y del Caribe de Cactáceas y otras Succulentas) – with the first issue published in 2004 and which appears (in Spanish) three times per year. Its latest issue we have downloaded (Vol. 10, No. 1, Jan. – Apr. 2013) includes papers and articles on cacti and other succulents from Latin-American countries. Among the authors we noticed a few familiar names: Marlon Machado, Nigel Taylor, Salvador



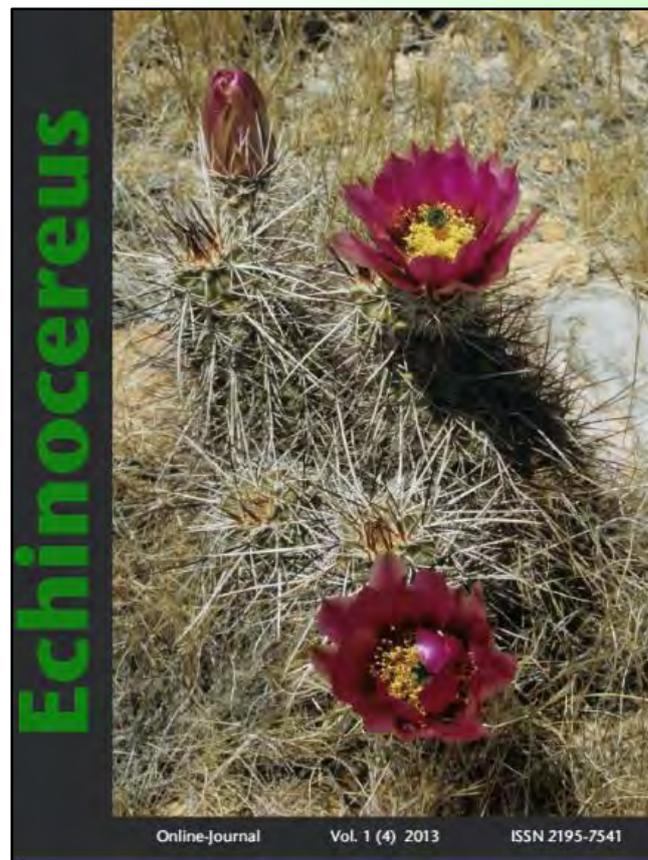
Arias, Eduardo Estrada Castillón, and others.

Monthly journals: The [Acc Aztekium Journal](#) continues its monthly appearances (in Romanian), with the same interesting and varied summary. From the last few issues we wish to mention the noteworthy plant portraits written by Liviu Jidoveanu (e.g. on *Yucca bacatta* and *Agave pumila* 'Nana') and the overwhelming pictorials of important society members racing each other to visit collections and botanical gardens abroad. [Avonia-News](#) is offering us another couple of interesting issues

packed with highly interesting reports on succulent flora, written by German and International authors: *Khadia beswickii* (by Gerog Fritz), *Euphorbia valida* (Dr. Volker Dornig), *Aichryson tortuosum* (by Ray Stephenson), and – last but not least – a massive and highly interesting article on *Euphorbia obesa* & *Euphorbia meloformis* (by Gerhard Marx).

## Online magazines

[Sansevieria Online](#) (the latest specialist journal addition published by Dr. Heinz-Günter Budweg and Peter A. Mansfeld) just came out with its first issue in German language. According to the notice on page 2, “our goals are to study the genus *Sansevieria*, to publish articles, to do a continuous research on these plants (classification, morphologie,



evolution), as well as to protect the genus *Sansevieria* by reproduction from seeds and distribution of seedlings.” Contributors are some of the well-known specialists of this genus: Peter A. Mansfeld, Nicholas Edward Brown, Christof Nikolaus Schröder, Jutta Rosigkeit. [Succulentopi@](#), the journal edited by our francophone colleagues, includes in its latest issue (No. 7), a number of interesting articles focused specifically on the presentation and description of cacti and succulent plants. Recent titles: *Conophytum*, *Lithops* & Co. series – *Cerochlamys*, *Conophytum*, and *Corpuscularia*; a reprint from *Cactus Explorer* 8 - *Echinopsis oxygona* by Graham Charles (an exceptional article on a plant that gathers little esteem otherwise), From the pollen to the ovule or the difficult path of the pollen tube (by Michel Derouet), and many others (In French). [Echinocereus Online-Journal](#) – fourth issue (German with English abstracts), presents three high end papers on *Echinocereus koehresianus* and *E. ortegae* (by Werner Rischer & Dieter Felix), *Echinocereus bonkeriae* (by Herbert Bauer) and *Echinocereus rectispinus* (by Michael Lange). A total of 54 pages of *echinocereoid* delight for the *Gymnocalycium* aficionados. [Schütziana](#), [The Cactician](#), [Crassulacea](#) and [The Cactus Explorer](#) – we did not see new releases by the time we had to close off our current edition.



Semnalăm cititorilor noștri apariția unor noi numere ale jurnalelor electronice gratuite : [Acta Succulenta](#), [Boletín electrónico de la SLCCS](#), [Acc Aztekium Journal](#), [Avonia-News](#), [Sansevieria Online](#), [Succulentopi@](#) și [Echinocereus Online-Journal](#).



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## What else do we have prepared for our future issues?

Well, first of all we would like to announce our third special issue planned to be online in January 2014: *Epiphytic myrmecophytes of southern Asia and the southwest Pacific*, by **Derrick J. Rowe**, New Zealand. Derrick has already published his own DVD book back in 2010, entitled "*Ant-plants: Arboreal Wonders of Nature*", and co-authored



together with Attila Kapitany "*Australian ant-plants: amazing relationships with insects*" in 2012. Not to mention several articles on the subject, which have appeared in prestigious printed and online magazines and journals worldwide over the last few years. This present paper

will cover the basic biology of these pretty much unknown plants, and will explore few hot spots where these weird and often spectacular plants grow: Fiji, Australia and various regions of Papua New Guinea (New Britain Island, Bougainville Island, the Central Province, and the Highlands). Prepare yourself for an informative feast and a pictorial delight. This will be an English only issue.

And now, few other titles from our next regular issue (*Xerophilia* 8, March 2014): **Leccinum J. García Morales - On the Turbinicarpus of Tamaulipas, part 2**; **Attila Kapitany - A new Australian intergeneric hybrid: xDisphyllum 'Sunburn'**; **Gabriel Millán Garduño - Despite their spines: Mexican cacti under threat**; **Miklós Ficzere - Cacti and succulents at -23<sup>o</sup> C.**



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We would like to thank to all who contributed with articles, pictures and translations to this new issue! These are the ones who allowed us this time to share the knowledge: **Agócs György**, Hungary; **Andreas Laras**, Greece; **Aymeric de Barmon**, France; **Balázs Zoltan**, Hungary; **Barta Laszlo**, Hungary; **Claudia López Martínez**, México; **Felipe Escudero Ganem**, México; **Gabriel Millán Garduño**, México; **Graham Charles**, England; **Jovana Jaime Hernández**, México; **Judd Kinkel Welwitch**, South Africa; **Jürgen Menzel**, USA; **Leccinum J. García Morales**, México; **Manfred Stober**, Germany; **Manuel Salazar González**, México; **Lévai Melchior** and **Lévai Magdolna**, Romania; **Mihai Crisbășanu**, France; **Pedro Nájera Quezada**, México; **Ricardo Daniel Raya Sanchez**, México; **Sandi Karina Neri Cardona**, México; **Stefan Nitzschke**, Germany; **Tóth Norbert**, Hungary.



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