

Gaultonia

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Contents.

Page

More Magnificent Mammillarias by Peter Bint	3
Zone Symposium	5
Spiders and Spines by Joylene Sutherland	6
Postcard from Sucre by Brian Bates	7
Plant Auction-the collection of the late Mr Alan Craig	7
Evolution of the Genus Mammillaria by Ivor Crook	8
In search of <i>Geohintonia mexicana</i> & <i>Aztekium hintonii</i> .	12
By Geoff Bailey	

Cover Photograph.

View of the greenhouse of the late Alan Craig showing part of his collection to be auctioned next month. For further details see page 7.

MORE MAGNIFICENT MAMMILLARIAS

By Peter Bint

For this month's offering I want to delve in the series *Lasiacanthae*. I am taking a related trio of plants, two well known, the other maybe dubious. The plants in question are *M. lasiacantha*, *M. magallanii* and *M. roseocentra*.

Mammillaria lasiacantha was first described in 1856 by Engelmann in a journal, *Proceedings of the American Academy of the Arts and Sciences*. Further information was published in *Cactaceae of the Boundary Survey*, by Engelmann in 1859 with illustrations. This was a survey of the Mexican/USA boundary. The variety *denudata* was acknowledged in *Kakteen* in 1929 and in 1972 came some updating of information in the *Mammillaria Society Journal* and in *Cacti of the South-West* by Weniger.

Mammillaria lasiacantha is the plant that both the series *Lasiacanthae* and the group *Lasiacantha* are named after. It is indeed a beautiful plant and one I delight in growing. It is an attractive, small member of the series, which makes small clusters of globular to ovoid button mushroom sized stems in habitat. In my greenhouse the stems tend to be slightly larger. These stems are covered by tightly massed white spines which completely hide the green body. These are all radial spines numbering from 40 to 80 per areole. They are to be found in several layers and measure from 3 to 5mm in length. Under a magnifying glass they can be seen as pubescent (covered in minute hairs) to smooth, as in the variety *denudata*. The flowers are white with a prominent red stripe down the centre of the petal, making a handsome sight when it is in flower in early to mid Spring. The fruit is small and scarlet, the seeds black.

It is reported to grow in the USA in west Texas, around Leon Spring and Camanche Spring on low limestone hills among herbage. It is also reported from South Eastern New Mexico. Glass and Foster have also found it at Marathon in Texas and from as far south as Zacatecas and in the States of Chihuahua, Coahuila and Durango giving the plant a considerable range.

As with all plants in this group extra care is required in the cultivation of this gem. First patience is required as it is indeed a slow growing plant and remains compact all its life. A good loamy soil with generous applications of perlite and limestone chippings 1:1:1 will give a good growing medium allowing it to be watered regularly through the growing season. Seedlings develop painfully

slowly through the first two seasons. Very often the plants seen in collections are single headed but I am lucky to have multi headed specimens of many, many years standing. At one time most of the specimens in cultivation would have been wild-collected specimens but this is no longer the case, though it is not the most common plant to be seen in collections.

Mammillaria magallanii is obviously from the same series and group and is hard, at first sight, to differentiate from the previous plant above. It is a diminutive plant with cream coloured spines and cream-pink flowers. As with the previous plant it is a slow grower and a specimen at 5cm tall will be six years or more in age. A plant could be at least ten years old before it will start to cluster. When it does so offsets will appear randomly from different levels on the stem.

It forms globular stems, elongating with age, the axils being slightly woolly. The many radial spines which number 70 to 75 are only 2 to 5mm in length, creamy-white and slightly brown at the tips, and fine and needle like. Usually there are no central spines, but, should they occur, there is only one varying from 1 to 6mm in length. Very rarely that spine is hooked but I have never come across any plant with this phenomenon. The flowers are small, recurved at the tip and fail to open very wide. The cream petals are usually marked with a tan coloured mid-stripe. Fruits are red, about 1.5cm long and the seeds are black.

It is reported from Coahuila, to the north-east and west of Parras. Cultivation details are identical to *M. lasiacantha*.

It can be distinguished from *M. lasiacantha* by the spine colouration and by the way the spines stand out from the body. In flower the difference is even more noticeable.

Mammillaria magallanii was first described by Schmoll in **Craig's Mammillaria Handbook** in 1945 with an update in the **Mammillaria Society Journal** in 1972.

Mammillaria roseocentra was first described by Boedeker and Ritter in 1933 in **Ein Mammillarien Vergleichs Schlüssel** and followed by further writings in the **Mammillaria Society Journal** in 1973.

The identity of this specific name is uncertain. David Hunt of Kew, in his assessment of the Genus *Mammillaria*, referred it to *M. magallanii*, but only with reservations. The original description called for 25 radial spines, far less than *M. magallanii*. I have four seed grown plants of this name, now about six years old. Certainly there are many less spines but they are white as opposed to the

creamy nature of *M. magallanii*. The flowers are small and have a tan coloured mid-stripe. At present they are less than 5cm in height, much broader than high, bearing a good sized tap root and have been flowering for the last three years. Obviously things can change, but, at present, they show more inclination to be a low growing, flat plant. As there is no cited locality in habitat, it is, for the time being, unlikely to be positively identified.

Notwithstanding this information, I recommend it as a plant well worth growing, always assuming either plant or seed are available anywhere. Again cultivation is the same as the two previous plants.

Another name that may be met for a plant obviously belonging in this grouping is *Mammillaria neobertrandiana*. This was erected by **Backeberg** in **Cactus**, the **French Society Journal** in **1933**, as well as in **Die Cactaceae, 1961-1963** (volumes 5/6), this time with illustrations. It was also discussed in the **Mammillaria Society Journal** in **1973**. It is referred to synonymy with *M. magallanii*, an argument I would not dispute after studying my specimen.

I hope this article will stimulate you to search out these plants if you do not already own them, particularly if you are short of space and want to grow anything which will not stretch the available growing space. I also hope it will stimulate you to write a few words about your favourite Mammillarias. It does not have to be something learned, just enthusiastic!!!!

Zone Symposium
Saturday 29th September 2001 at 10am

Graham Charles, Sheila Collenette, Anton Hofer

Sir James Black Conference Centre
Astra Zeneca Pharmaceuticals
Alderley Park
Macclesfield

Ticket £14 incl Lunch
Details and tickets from Geoff Bailey

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By Joylene Sutherland

Over the years many different species of 'wildlife' have made their home in the cactus garden. Most have been transient, however many different spiders seem to like the different types of habitat this garden provides.

Down at ground level, the Wolf Spiders (*Lycosa godeffroyi*) make their burrows close to a cactus, usually near a rock or some grass. The preferred genus of cactus for them is the Ferocactus. Maybe its something to do with the deep ribs or large spines. One Wolf Spider used to come to the top of her burrow to have a look at me when I was down on my hands and knees trying to peer into the burrow! They look rather fierce with their large bodies and hairy legs, but I think it would have to be rather annoyed to bite a person.

Huntsman Spiders (*Isopoda vasta*) like to hide in the upright leaves of *Agave* sp. One had woven her egg sac in between the leaves of one *Agave* this Spring. The *Agave* put on a growth spurt and broke open the webbing and the egg was exposed. She just shifted it further down, and some time later there were hundreds of tiny Huntsmen hatched and seeking safer territory.

The most interesting spiders are the Spiny Spiders (*Gasteracantha minax*). These spiders build a complicated web structure, with the normal wheel shaped web, as well as lots of scaffolding type webbing built in horizontal shapes. They seem to like company as many will live together, each with their own web, but all joined together. The web tie lines being slung from cactus to cactus spine. The most amazing sight was dozens of them living communally in a *Dasylirion* in Rudolf's garden. Their bodies are hard and shiny looking, like enamel and make quite a picture. Their underside is yellow and black with white spots, also with spiny bits along their backs.

Living alongside of the Spiny Spiders in it's own web is the Long-Jawed Spider (*Tetragnatha nitens*). This spider's favoured habitat is in grasses near water. They seem to have adapted to the cactus garden just fine. Their web is built right next to the Spiny Spiders and one has laid an egg along the spine of a *Trichocereus*, instead of a grass stem, which is more typical of the species. These spiders have a long body the same shape as, but slightly thicker than a match stick, and their front legs are extra long.

Postcard from Sucre By Brian Bates.

Greetings from Sucre,

On my most recent trip, I, or rather Ralf Hillmann, found Pterocactus at several sites in northern Argentina. The top growth of these was in most cases so small that they are definitely "winter deciduous". In December they are quite difficult to see, and at some sites, I didn't see a single plant without Ralf pointing them out, and I'm not too bad at spotting plants in the wild. In one locality, they were growing in sand below bushes. The sand was in the form of mounds under the shrubs and quite deep, without rocks or stones, i.e. pure, deep sand. At another site, the site of Eriosyce (Pyrrhocactus) vertongenii, they grew in pure scree. Most of the other sites were in stony ground. The top growth, in December, consists of tiny little, worm like growths of from 5 mm dia x 15 mm long to growths up to 7 cm long. We only saw 2 or 3 plants in flower.

Best wishes

Brian Bates
Sucre
Bolivia

Cactus Plant Auction

4th and 5th August 2001 from 9am

at , Kirklevington, Yarm

Disposal of the collection of the late Mr Alan Craig

Enquiries, and applications for bidding cards to:-

Mr Brendan Burke,

Evolution of the Genus *Mammillaria*.

Br Ivor Crook.

Cactus evolution is a new and difficult subject. By the very nature of the plants, which grow in dry areas and lack structures as resistant to decay as bone, fossilisation almost never occurs. There also appears to be a complete lack of impression fossils of primitive desert plants in the fossil record. Scientists have therefore pieced together cactus evolution by indirect means. The present distribution of cactus plants and their features, known models of earth's climate and the formation of desert areas in the Americas and geological evidence from plate tectonics, the movement of areas of the earth's crust, have all helped to mould our current knowledge and understanding of cactus evolution. It's little wonder then that the science of cactus evolution is less than 50 years old.

In 1958, the English translation of Franz Buxbaum's book *Cactus Culture* was first published. Buxbaum, a botanist working at the University of Graz, examined the external appearances, floral and fruit structures of cactus plants and postulated three main sub-families based on his findings (figure 1). The most primitive features were to be found in the 18 species of the *Pereskioideae*. Here, cactus evolution was only just beginning and to the amateur the plants probably bear more resemblance to a rose than a cactus, non the less they remain true cacti. They are shrubby, tree-like or vine forming plants starting to show some signs of adaptation to survival during a prolonged dry season. The sub-family *Opuntioideae* show further evolution in the development of the true opuntiod areole and the presence of glochids. Many species betray their leafy ancestral past during the development of new pads when small leaves begin to develop at the areoles but fall off, often long before the pad reaches maturity. The final sub-family, *Cactoideae* is the most highly developed group and contains all the familiar ball and cereoid cacti and the spineless epiphytic and jungle cacti.

Apart from this early work on sub-families, Buxbaum also postulated the Caribbean islands as the epicentre of cactus evolution. This was based solely on the present day distribution of the most primitive plants of the genus *Pereskia*. With the benefit of more information than was available to Buxbaum, scientists now think this hypothesis is probably incorrect. More recent work has shown that the sub-families are all monophyletic, that is they all have a common ancestry. This would suggest a potentially long evolution to the present day

Figure 1. The cactus family tree showing the position of major families and the genus Mammillaria.

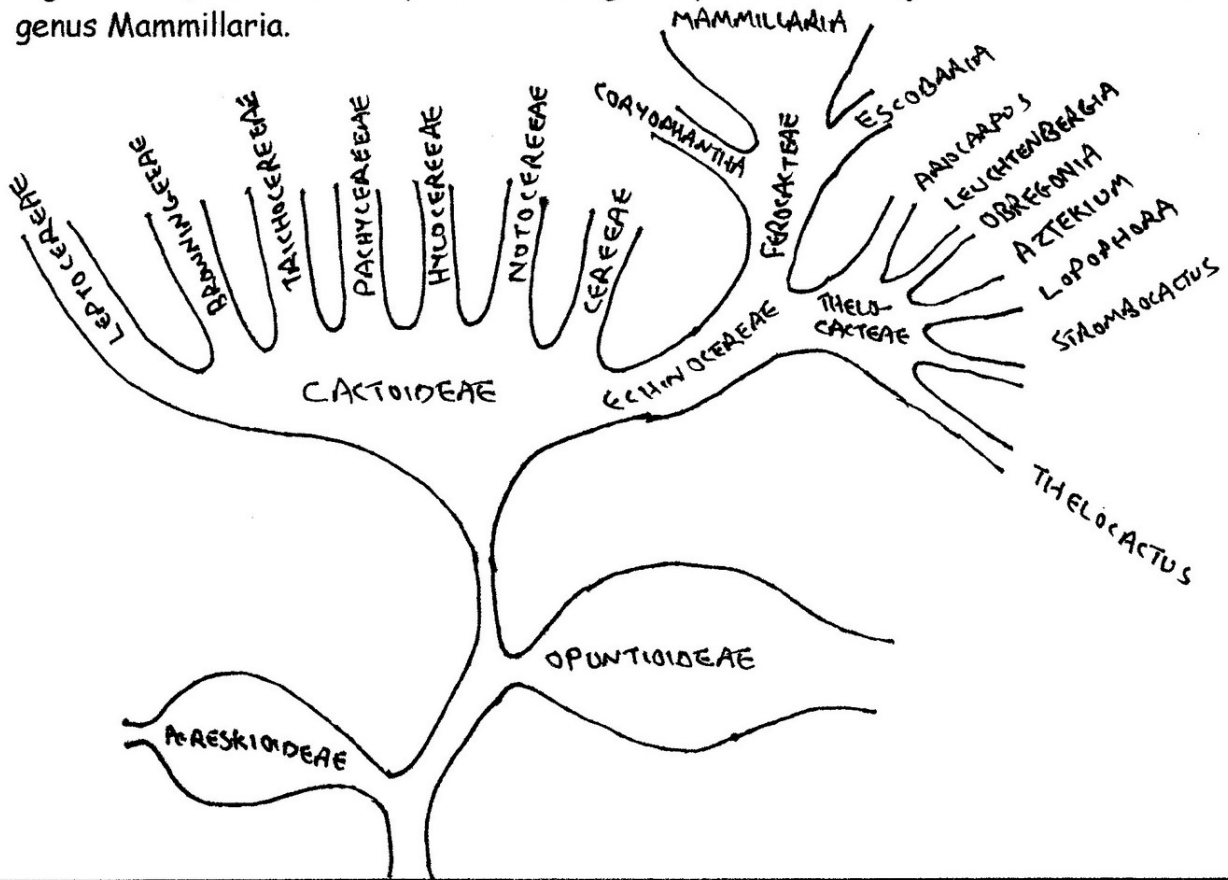
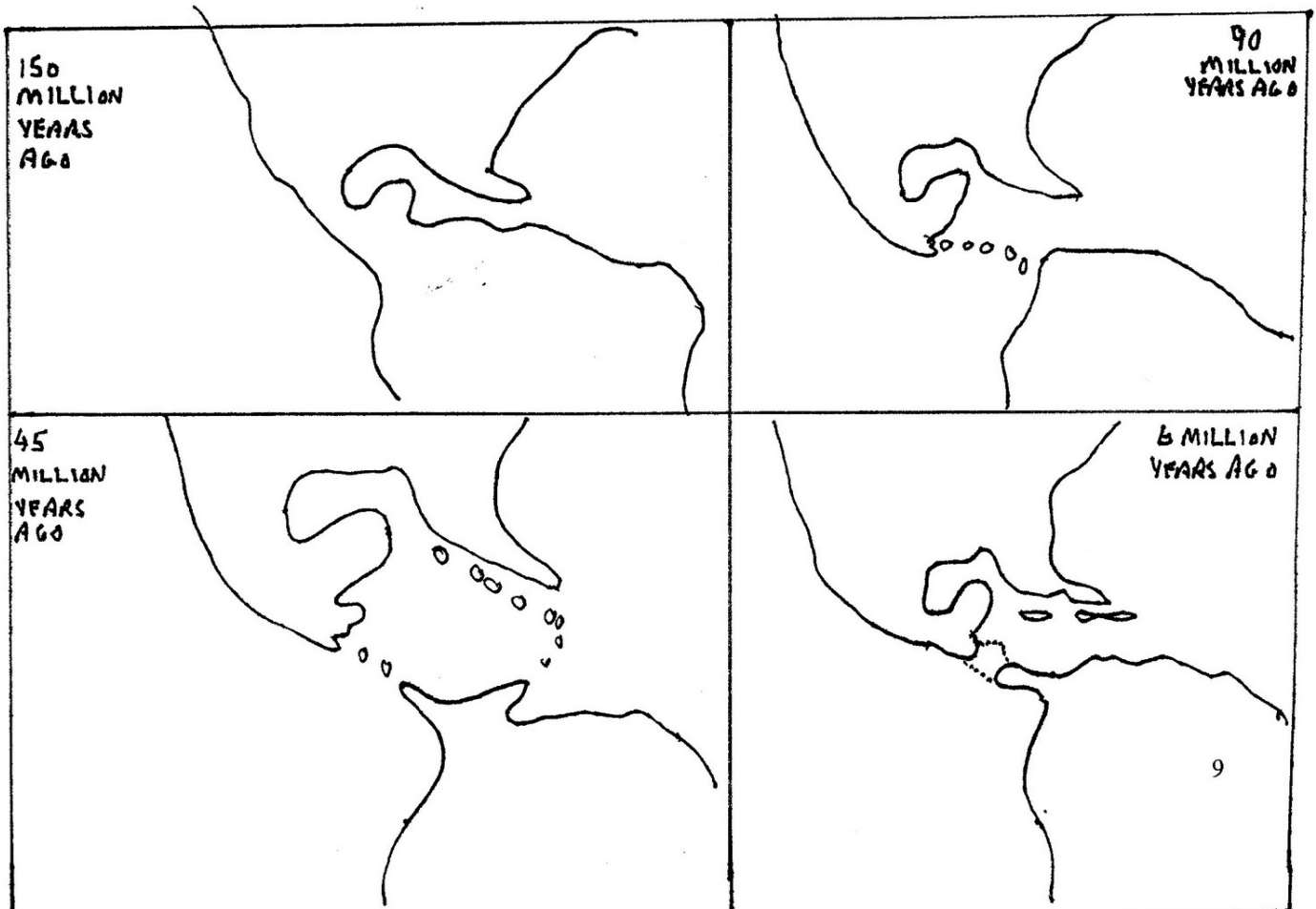


Figure 2. Continental drift in recent geological time showing the changing position of Central America and the Caribbean Islands.



state of affairs. Ninety million years ago the West Indies were not in the same place they occupy today. The continental masses of North and South America were much closer together with the present day Caribbean islands forming a land bridge between the Americas. Over time, these islands have drifted east as North and South America have drifted apart. Present day Central America has only formed over the last 6 million years (figure 2). Another factor botanists use to suggest the epicentre of evolution is the density of species. This theory states the highest density of species represents the evolutionary epicentre and species density decreases as you get further from the epicentre. These theories have been used to suggest the epicentre of cactus evolution to be north/north western South America.

From this epicentre, cacti have evolved and spread into a variety of habitats across the Western Hemisphere. The Opuntioideae in particular have colonised both North, South and Central America from east to west coasts, as far north as Canada approaching the Arctic Circle and as far south as Patagonia.

The sub-family Cactoideae is split further into 8 or 9 tribes depending on which author you happen to be reading. These tribes show parallel evolution as they spread north and south. One of the earliest attempts at cactus classification during the last century, Britton and Rose, assumed ball cacti in North America were closely related to ball cacti in South America and that the same held true for the cerei. It is now thought that globular and cereoid cacti evolved separately from a central location then spread both north and south. As both encountered similar climatic conditions and habitats it is no surprise that the end points are so similar. This is called parallel evolution. One of the tribes to spread north was the Echinocereae. It shows early divergence into two lines of development. The Thelocactinae contain several genera, most with small numbers of species including *Leuchtenbergia*, *Strombocactus*, *Ariocarpus*, *Aztekium* and *Lophophora*. Most of these plants in this evolutionary branch look very different to most other cacti in Mexico and North America and are often referred to as 'nature's experiments'. They are thought to be the most modern and fastest evolving line of cacti. The Ferocactinae by contrast, went on to evolve further into *Escobaria* and *Mammillaria*. This line has a small number of genera, each with a large number of species. Today the genus *Mammillaria* is probably the largest genus of the *Cactaceae* containing 181 species and 127 subspecies and spread over most of Mexico, parts of the southern states of North America and into the Caribbean islands and even back down to the northern tip of South America (figure 3).

Figure 3. The distribution of the genus *Mammillaria*.



The evolution of this line to *Mammillaria* has involved two significant changes distinguishing the genus from other genera of cacti. The areoles producing the spines and sometimes wool form tubercles or outgrowths on the stem characteristic of the genus rather than the situation of areoles on ribs as in other cacti. Secondly, the flower too has migrated and develops from the axillary meristem, the area between the tubercles rather than the areolar area itself as in most other cacti. These changes are quite easy to spot in the greenhouse when the plants are in flower.

The genus *Mammillaria* is therefore one of the most highly developed within the Cactaceae, not only from an anatomical point of view, but also by its ability to diversify into such a large number of species over such a wide area of land.

References.

- Cactus Culture - Based on Biology. Franz Buxbaum 1958.
- The Cactus Primer. Arthur Gibson and Park Nobel 1990.
- Evolution of the Cactaceae. (From cacti_etc Internet discussion group)
Rob Wallace 1996.
- Mammillaria*. Cactus File Handbook 6, John Pilbeam 1999.

In search of *Geohintonia mexicana* & *Aztekium hintonii*. By Geoff Bailey.

A few issues ago I wrote about visiting Rayones to see *Ariocarpus scaphirostris* and *Aztekium ritterii* and the return journey in an easterly direction to Galeana. Not far from Galeana is another easterly narrow mountain road to the tiny village of Palmitos. In the steep sided gorges of gypsum rock off this road is the habitat of *Aztekium hintonii* and *Geohintonia mexicana*.

David Rushforth, John Miller and myself visited this location in November 1999 and we had a little trouble with finding the precise location, which was not helped by the natives, who after a protracted discussion, and our assurances that we were not there to dig but only look and photograph, confirmed the plants were there and offered to take us for a fee eventually negotiated to 400 pesos - about 40 US\$, which is what they really wanted - the dollars rather than the pesos that is. It transpired that 'taking us there' involved a walk of all of about 300 metres, but then we knew from others who had visited previously, that this was really protection money for our car!

Whilst we were there we were offered plants of both of these species, which had been previously been dug and hidden behind a rock, especially, we concluded later, in anticipation of our visit. We took our photographs of the plants, which are extremely plentiful at this location, but the weather was very overcast and the gorge dark so the photographic conditions were not at their best. We were also anxious to return back along the narrow mountain road, which is the only way into and out of Palmitos, and which has a potentially slippery clay-like surface, before it rained and before dark. On route back to Galeana we were met and stopped by an official looking Mexican in a four-wheel drive vehicle. He wanted to know if we had some of the plants and looked in the car. After some time we convinced him we had no plants and were Brits and not Czechs as he kept insisting we were. All I can say is that it is a damn good job we did not accept the plants offered by the villagers in Palmitos!

It is clear now that the "escort you to the plants - car protection scheme 'fee'" and the plant sales for later recycling are the local scams and part of the local economy. The villagers at the entrance to the narrow mountain road obviously tick-tack to the Palmitos villagers who tick-tack to the local 'conservation official' and between them they have a 'nice little earner' going with the occasional gringo and other white visitors. I bet they have mobile phones by now!

We returned to Palmitos on 24th October 2000, this time as a much larger party of John and I, Andreas Lauras from Athens, Wolter ten Hoeve from Holland and Mick and Bradley Rivers from Kent in a much larger vehicle. This time we knew exactly where the plants were and had precise GPS data from the previous year. The weather conditions were perfect and we escaped detection by the locals. This meant that we got here for free, got some excellent photographs and were not intercepted on the way back. The first photograph is of the steep, sharp gypsum cliffs on which these plants grow, the second is of *Geohintonia mexicana* and the third of *Aztekium hintonii* in flower all taken on this day in October 2000. What a difference a year makes!!!



Photo 1. The habitat of *Geohintonia mexicana* and *Aztekium hintonii* at Palmitos.



Photo 2. *Geohintonia mexicana* in habitat



Photo 3. *Aztekium hintonii* in flower in habitat on 24.10.2000