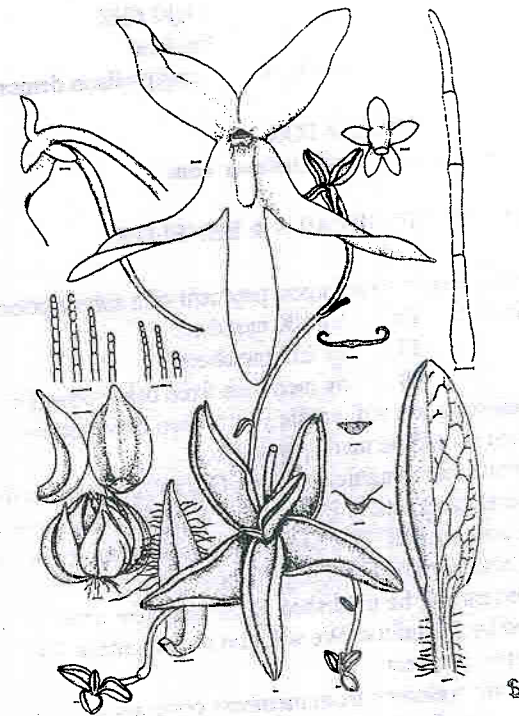


Pinguicula hirtiflora by J. Stenicka

INTERNATIONAL PINGUICULA
STUDY GROUP NEWSLETTER
Volume 9 Autumn 1998



PINGUICULA Stolonifera.

SPECIES NOVA A H. LUHRS DESCRIPTUS ET SPECIMINA A S. LAMPARD ILLUSTRATA

Habitus in ambiente montibus NOVAE HISPANIAE
ad hoc solum prope SIERRA DE JUAREZ inventa.

INTERNATIONAL PINGUICULA STUDY GROUP

EDITOR:

Stan Lampard
196, Hole Lane,
Northfield,
Birmingham.
B31 2DB
England

email: sel@kes.bham.sch.uk

MEMBERSHIP SECRETARY

Phil Wilson
14, Rope Walk,
Martock,
Somerset.
TA12 6HZ
England
: cp@pwilson.demon.co.uk

EMAIL CO-ORDINATOR

Loyd Wix: Loyd.Wix@Unilever.com

MEMBERSHIP DETAILS & BENEFITS:

Membership is based upon payment of a subscription in advance of:

£6	by UK members
£7	by EU members
£8	by members from other countries

This subscription will entitle you to two Newsletters.

Cheques should be made payable to:

"International Pinguicula Study Group" and sent to the membership secretary. For details of rates in other currencies please contact Phil. Phil has stock of back issues, enquire. Please also notify Phil of any change in address.

Newsletters will be published when sufficient articles have been received by the editor. We will aim to produce at least one Newsletter per year.

Articles are welcome from members covering all aspects of interest, including cultivation, taxonomy, ecology and conservation of *Pinguiculas*.

Seed lists will only be published when sufficient seed has been donated.

Suggestions for other services or activities are welcome.

Ce livre appartient à la bibliothèque
Dionée

Association Française des Amateurs
de Plantes Carnivores

2003

CONTENTS

Page	Title	Author
2.	Editorial	S.E.Lampard
3.	<i>Pinguicula longifolia ssp. longifolia</i>	H. Luhrs
5.	Some comments on recently described new species from the Iberian Peninsula.	L. Wix
7	Back from the Roots	L. Wix
9	Temperate <i>Pinguicula</i> Seed Germination	L. Wix
12	The <i>Pinguicula</i> of Cuba	P. Temple
22	<i>Pinguicula</i> spec. 'Sierra Tamaulipas'	O. Gluch

Illustrations & photographs:

Front cover: Line drawing of *P. stolonifera* by S.E. Lampard

Rear cover: Line drawing of *P. hirtiflora* by J. Stenicka
first published in Adela Revue

Centre Photos: *P. longifolia ssp longifolia* & Cuban Butterworts in habitat by H. Luhrs

p.24 & 25 *P. spec. 'Sierra Tamaulipas'* by O. Gluch

EDITORIAL

It is now well over a year since the last issue of the IPSG Newsletter. As editor, I must apologise for allowing other priorities to contribute on my part to the delay in the appearance of this issue. In common with others in similar positions, I sometimes have to ask myself why I do this job. There can be only one answer, because I enjoy it!

I have channelled my enthusiasm for *Pinguiculas* into the cultivation of plants and the study of literature as well as by participating in field trips. Each of these activities have greatly enhanced my knowledge and understanding of the plants and have enabled me to experience them in full splendour, both in cultivation & in their natural habitat. Most importantly, these activities have been greatly enhanced by being shared with other people, whom I now consider to be good friends.

IPSG is a logical extension of the desire amongst us all to communicate these experiences. It is not always so easy to put pen to paper and I must thank regular contributors, especially Hans Luhrs and Loyd Wix, for always helping to fill these pages. However, had not Oliver Gluch presented a re-examination of *P. sp. 'Sierra Tamaulipas'* this edition would not be with you now. Needless to say, it never rains but it pours. Paul Temple's article arrived shortly after. It spans two expeditions to Cuba and would fill a whole issue on it's own, so I have decided to split his contribution into two episodes. You will have "Cuba revisited" to look forward to in issue 10, plus some field notes on South American Butterworts by David Roberts, and hopefully others? The formation of IPSG as a specialist group has certainly proved for me to be an effective stimulus to find out more about all aspects of *Pinguiculas*. I hope that you have all enjoyed belonging too, even though the end result in the form of this Newsletter appears so sporadically. I hope that you decide to stay with us and take this opportunity to remind you to pay your subscription for the next two issues. STAN LAMPARD

Pinguicula longifolia ssp. *longifolia* RAM. ex DC.,
an endemic of the Central Pyrenees

Hans Luhrs
Krayenhoffstr. 51,
1018 RJ Amsterdam, Holland

Pinguicula longifolia ssp. *longifolia* occupies merely a small mountainous area in the heart of the Spanish and French Pyrenees, a much smaller geographic range compared to both the other sub species namely *caussensis* & *reichenbachiana*. Here, at an elevation of 700-1200 m. (2200 m.?, Quézel 1956), this species will only thrive in gorges on vertical cliffs of limestone and eroded tufa that are constantly wet, or at least damp throughout the year, by water seeping through the rock surface as well as high humidity during the night.

During a fieldtrip in late June last year, *P. longifolia* ssp. *longifolia* was found in large numbers at several localities in or near the Ordesa Nat. Park in the Spanish Pyrenees. Of the largest colonies I have seen, those be found in the Añisclo Cañon (700-800 m. alt.) are most spectacular. The countless individuals often appear as green mats on the vertical or slightly overhanging walls, with their leaves hanging down in such a way not to compare with any other *Pinguicula* except for *P. vallisneriifolia*. The large rosettes, very often divided in huge clumps, consist of 5-9 leaves, these being 160-200 mm. (sometimes up to 280 mm.) long and 14-22 mm. wide. Although Casper (1966) stated that even in August flowering plants have been found, only few faded flowers were seen but there were many seedpods. An interesting feature that had been observed was the fact that a lot of the dried flowerstalks bearing seedpods were folded backwards against the rock, presumably in order to release the seed straight on to the rock surface rather than being blown away by the wind. This would also explain the way new plants appear, spreading themselves not just below but also above the parent plants. The plants

grow in holes, cracks, and occasionally between grass in soft tufa at the base of a cliff. They sometimes grow together with the beautiful *Ramonda pyrenaica* and *Saxifraga* species.

Plants found in the Bujaruelo Cañon (1160 m. alt.) are generally somewhat smaller in size (aver. size 120-160 mm. long), and colonies are not as large as those found in the Añisclo Cañon. One colony inhabits a small cave and four plants were found still in flower, while on an earlier visit (late April '95) all colonies here were in full bloom.

On two locations in this canyon hybrids with *P. grandiflora* were found growing in open swampy places with water running through. They grow in very small groups or scattered around on low waterlogged ridges and grassy hummocks together with the tall *Dactylorhiza elata*, whereas *P. longifolia* ssp. *longifolia* inhabits the cliffs alongside. Although the hybrids outnumber *P. grandiflora*, only few were clearly of interspecific cross and many others have been backcrossed mainly with *P. grandiflora*. Some of them were vigorous and look like the latter in the shape of rosette, but with leaves up to 150 mm. long, and 45 mm. wide. The flowers generally are of *P. grandiflora* size with a somewhat paler colour, but lack the dark veining in the throat. Instead they have a light coloured brown-reddish mark in the centre of the throat.

Exploration of the published localities of *P. longifolia* ssp. *longifolia* between Gédre and Gavarnie, and towards the Spanish border in the French Pyrenees (Casper 1966) was without result. Instead, long and narrow-leaved *P. grandiflora* were found amongst normal sized plants on two locations at the base of a steep slope near Gavarnie. No flowers were seen so we could not confirm suspicions that these too were hybrids. Since the only suitable gorge where *P. longifolia* ssp. *longifolia* may, or perhaps did occur, lies between the two villages, there might be a

possibility. A similar case occurs in the Spanish Pyrenees near Torla, *P. longifolia* ssp. *longifolia* was not found anywhere in the vicinity. In two directions from Gavarnie towards the Spanish border, at altitudes of 1400 m. and higher, only *P. grandiflora* had been found (some of them with extreme dark brown-reddish leaves). Due to the absence of suitable gorges at this altitude, which seem to be the only niche in which *P. longifolia* ssp. *longifolia* thrives, I wonder if the latter still exist in the French Pyrenees or indeed ever did.

I hope to hear from any of the I.P.S.G. members who have had the opportunity in finding *P. longifolia* ssp. *longifolia* at or near the mentioned localities in the French Pyrenees.

Literature cited:

Casper, S.J. 1966. Monogr. Gatt. *Pinguicula* L. Bibl. Bot. 127/128: 153-155.

Some Comments On Recently Described New Species from the Iberian Peninsula.

Loyd Wix

E-mail: Loyd.Wix@Unilever.com

The main purpose of this article is to correct an error which appeared in an editorial note in IPSG Newsletter No. 8 as well as attempting to clear up some of the current confusion surrounding the taxonomy of some of the Spanish *Pinguicula* mentioned in recent IPSG articles (Refs. 1, 2).

Zamora et al (Ref. 3) published two new species of *Pinguicula* in 1996. The species named *P. mundi* is the plant from the Sierra del Calar del Mundo also referred to as *P. Rio Mundo*. This plant is now widely accepted as a valid new species and appears to be confined to the River Mundo area where it is locally abundant. However the proposed *P. submediterranea* is a more

controversial species with matters further confused by the editorial association of the Hoz de Beteta *Pinguicula* with this Taxon.

The plants considered by Zamora et al to be *P. submediterranea* were originally described by Canigueral in 1957 as *P. grandiflora* var *deretosensis* from Puertos de Beceite. Unfortunately for Zamora and Co, Schlauer was also reviewing the plants from Pto. Beceite and Pto. Tortosa. Schlauer came to the conclusion that the plants had nothing to do with *P. grandiflora* and instead elevated them to the status of *P. longifolia* ssp. *deretosensis*. Zamoras study included the Pto. Beceite and Tortosa plants together with further populations in Granada (Sierra Tejeda) and Jaen (Sierra de Carzorra and Sierra Segura) not investigated by Schlauer. Neither Schlauer nor Zamora and Co considered the Hoz de Beteta plants in their studies.

Zamora et als *P. submediterranea* is thus controversial and not totally accepted as Schlauers 1994 preceded their 1996 paper. In addition although Zamora et al applied many techniques to compare their proposed new species to the other Iberian *Pinguicula* (*P. grandiflora longifolia* ssp *longifolia*, *nevadensis* and *vallisneriifolia*), the authors did not broaden their study to include other European species particularly *P. longifolia* ssp *caussensis* and *P. l. ssp reichenbachiana*. One potential weakness in the study was the comparison to *P. l. ssp longifolia*, as this species may intergrade with *P. grandiflora*. Thus differences noticed between *P. submediterranea* and *P. longifolia* ssp *longifolia* could be attributable to the influence of *P. grandiflora* in the latter.

Thus the Hoz de Beteta plants were not considered by either Zamora et al or Schlauer. However these plants are similar to Zamora and Co's *P. submediterranea* / Schlauer's *P. l. ssp deretosensis* so the editorial may ultimately have been 'right for the wrong reasons'.

Clearly the publications of the mid 90's have left matters unresolved and perhaps rather than focusing on part of the taxo-

nomic puzzle, at some stage someone will have to take on the task of reviewing the genus across Europe.

References.

1. S.Lavayssiere The Discovery of Spanish Butterworts (part 1). IPSG Newsletter No.5
2. S.Lavayssiere The Discovery of Spanish Butterworts (part 2). IPSG Newsletter No.8
3. Zamora R., Jamilena M., Rejon M R., Blanca G. Two New Species of the Carnivorous Genus *Pinguicula* (Lentibulariaceae) from Mediterranean Habits. Pl. Syst. Evol. 200: 41-60 (1996).
4. Schlauer J. Auf der Suche nach den Fettkrautern (*Pinguicula* L., Lentibulariaceae) der Abruzzen - nebst einigen Anmerkungen zur systematik von *Pinguicula* im Mittelmeerraum. Palmengarten, 1994. Vol 58: p. 60-67.

Back From The Roots

Loyd Wix
E-mail: Loyd.Wix@Unilever.com

Although many plants may be propagated by means of root cuttings, *Pinguicula* with their modest and delicate root systems would seem unlikely candidates. However experience with three quite different species has shown that under some circumstances some *Pinguicula* may regenerate from their root stock.

During the winter of '95/'96 amongst others I 'lost' specimens of *P. alpina* and *P. crystallina* ssp. *hirtiflora*. The hibernacula of the *P. alpina* started to rot and rather than removing the whole pot, I removed the infected bud. Due to the perennial root system of this species I needed to sever the diseased hibernacula from the still health roots which remained in the pot. With the *P. crystallina* ssp *hirtiflora* the plant stopped growing and gradually one by one the leaves became infected with botrytis until the growth point also succumbed.

By spring the now empty pots still remained in their respective places until I at some time or another eventually got round to clearing them up. I first noticed the *P. crystallina* pot which displayed some thing interesting on the surface of the compost. On closer inspection a few small green almost spherical bodies were observed, not being too sure what these were I held onto the pot. Over time these 'bodies' developed further until they finally open out to reveal Pinguicula looking leaves, several plants were formed in this way. The green 'bodies' were certainly not seedlings, they were far too large and gave the impression of being a bud presumably developed from the top of the surviving root. I noticed the *P. alpina* somewhat later than the *P. crystallina ssp hirtiflora*. In the pot where the hibernacula used to be were several small plantlets. By the time I noticed them they were already well developed so I cannot be certain that they also started as the small green buds I had noticed with the *P. crystallina*. The plants were far too large and well developed to be seedling plants and their proximity to the old root stock of the previous years hibernacula lead me to conclude that these too had regenerated from the roots.

The third observation of this phenomena was made during the winter of '96/'97 with the North American species *P. primuliflora*. One particular specimen amongst several planted in the same pot became infected with a pathogen transmitted from old leaves that had accumulated under the rosette. Despite removing all dead growth in the pot and cutting away all infected material, the disease continued to reappear on the plant. Eventually fearing the disease would soon spread to the remaining plants in the pot, I took the drastic action of cutting out the entire rosette (or what remained of it) in the pot. This left behind the stumps of several fleshy roots. This did finally eradicate the disease from the pot and the roots remained healthy after the severed tips had dried off. With time small green buds developed from the sides of these roots a little below the severed tips which eventually became small plants. This time there was no doubt at all these plants definitely had grown back from the roots.

So from these observations it is possible to regenerate some Pinguicula from the root stock, though is perhaps only feasible with those species which do form a substantial root system. This is per-

haps too drastic and risky to exploit as a method of propagation though may warrant some further investigation to determine the potential. Perhaps the most important aspect of these observations is that under some circumstances it is worth while retaining the pots of 'lost' plants for at least a few months should anything decide to come back from the roots.

Temperate Pinguicula seed germination.

Loyd Wix

E-mail: Loyd.Wix@Unilver.com

For several years now I have been keen on the cultivation of temperate (particularly European) Pinguicula. In that time I have had my fair share of attempts to grow these plants from seed. Over the years I have used the time honored method as described by Slack (ref. 1.) and this has become part of my mid winter routine of planting the Pinguicula seed and then exposing the seeds to the frosts of late December and January.

This method has produced spectacular results on occasions though is some what haphazard with quite variable results over the years in terms of germination rates even from my own seed. In this time one particular species has eluded me and not through a lack of determination. I have repeatedly sown *P. alpina* seed every year since 1990 and have never obtained germination. At the beginning I was somewhat suspicious of the quality of the seed available from commercial supplies though since having tried seed collected by fellow IPSGers and other enthusiasts living close to the locations where the plants live. One factor which may not have helped is that *P. alpina* often lives under somewhat alkaline conditions in central Europe - I have often used an acidic peat/sand mixture in the past. Non-the-less this species had almost convinced me that it was impossible to grow from seed. Never one to give up easily and having succeeded with other 'impossible' to germinate plants such as *Byblis gigantea* and some of the Northern Australian *Utricularia* - I needed to adopt a different approach and be presented with the opportunity to break me out of my mid winter routine. The opportunity presented its self when a friend from the Czech

Republic sent me seed of an unusual coloured *P. vulgaris* (violet centered flower/white outer) together with some other *P. vulgaris* seed and 3 different locations/forms of *P. alpina*. With no frosts to stratify the seeds I needed an alternative approach. In the past I have resorted to putting pots containing the seed into the deep freezer - all this did was to force the plasticiser out of the plastic to make the pots brittle and the surface sticky - plus none of the seeds germinated anyway. I then remembered an article by Miloslav Studnicka (ref.2.) about the long term storage of temperate *Pinguicula* seed based upon his observations on *P. bohemica*. Studnicka found that seed submerged in water for a few days would germinate without a period of stratification. This observation was explained by the dispersion of abscissic acid (ABA) from the seed by suspension in water. With the removal of this dormancy promoting chemical, treated seed could be stored in water for several years and still maintain viability though the seeds needed to be kept in darkness to prevent germination. O.K. Studnicka was interested in long term storage of otherwise short lived *Pinguicula* seed, though his observations also showed me how to avoid a stratification period and also to achieve germination at the same time without even sowing the seeds on compost!

I filled a number of 150ml lidded containers with cooled boiled water and sprinkled seed on the surface. The containers were then placed exposed to light but not in an environment where the contents were liable to over heat. Using this 'bean sprout' method I aimed to remove the dormancy promoting ABA from the seeds but wanted to include light to promote germination. After 3 weeks germination was notice in most of the containers including all 3 *P. alpina* containers. Using mature aged compost filled pots, the seedlings were planted using a small plastic pipette to suck up each seedling in turn from the water container and transferring it together with a small quantity of water to the compost filled pot. Cocktail sticks were also useful implements to separate the seedlings from one another.

I held onto the pots and ungerminated seed for several months. Over this time further seedlings appeared so even under these conditions staggered germination occurred. One interesting observation is that

a high proportion of these later germinating seedlings appeared to lack chlorophyll so following germination the seedlings were a pale straw colour which failed to develop further and eventually died. Nether the less some green seedlings were still occasionally appearing even during the Winter months.

Due to these successes with this method I will break my mid Winter routine as I will only plant a proportion of my stored temperate *Pinguicula* seed according to Slacks method. Given the current mild weather in the UK it seems I will be lucky to get any frosts anyway. The remainder will be sown upon water in the spring which should hopefully allow me to better manage the seedlings than having trays hanging around with the usual uncertainties of ever achieving germination. After all if I only obtain 1 seedling from a batch of seed, a 150ml water pot is more ergonomic than a 12 inch seed tray. So as simple as that - after several years I had achieved *P. alpina* germination! What I found most interesting is that 2 lots of seed were harvested in 1995 making the seed 2 years old by the time it was planted - prior to this experience (listening to conventional wisdom on the short viability period of these seeds) I would have considered the germination of such seed to be a forlorn hope. In conclusion this method offers a simple but effective method for the propagation of temperate *Pinguicula*. It may also be worth while attempting this method on other difficult to germinate seed where the presence of germination inhibiting substances such as ABA may be the reason for poor or low germination using conventional methods.

References.

1. Adrian Slack. Insect eating plants and how to grow them. Alpha-books 1986
2. Miloslav Studnicka. Solution to the Problem of Short Vitality in Seeds of European Butterworts. CPN Vol 22, No's 1 & 2 March and June 1993.

The Pinguicula of Cuba
by
Paul Temple
on behalf of
Paul Temple, Cristina Panfret Valdez & Hans Luhrs

5 species of *Pinguicula* are listed for Cuba. All are endemic, found nowhere else. These are: *Pinguicula filifolia*, *P. albida*, *P. jackii*, *P. benedicta* and *P. lignicola*. This article addresses all five species found in Cuba describing habitat, species found and cultivation experience. A précis of this article was presented to the International Carnivorous Plant Society Convention in Germany, 1998, covering all of the *Pinguicula* species of Cuba.

INTRODUCTION

The Caribbean is a warm sea surrounded by America, Mexico and South America and with a string of islands along its Eastern and Northern edges. Within these islands, to the North, lie Cuba and Hispaniola. Hispaniola consists of two countries, Haiti in the West and the much larger Dominican Republic in the East. Cuba and the Dominican Republic are the only islands in the Caribbean known to have *Pinguicula*. As the holder of the UK's National Collection of *Pinguicula*, I targeted this area for several visits in the hope of encountering the various *Pinguicula* species found there. The visits eventually included two to Cuba and five to the Dominican Republic. On the second of the visits to Cuba, I was accompanied by Hans Luhrs. This article describes the experiences of hunting for the *Pinguicula* of Cuba and the Dominican Republic.

Cuba is the largest and oldest Caribbean Island. It is a very fertile country containing three separate mountain ranges in the North West, Central and Eastern Regions. Considering that Cuba is an island, these ranges are very high, reaching approximately 3000 metres (the tallest in the Caribbean). Therefore there is a wide range of habitats and climates within Cuba giving rise to the opportunity for diversification amongst the flora. This has resulted in Cuba successfully hosting several *Pinguicula* species, making the island an



Pinguicula longifolia ssp. *longifolia* on a limestone cliff, Sierra Marqués.



Pinguicula lignicola, Sierra Moa.



Pinguicula benedicta.



Pinguicula filifolia, Pinar del Rio.



Pinguicula albida, Pinar del Rio.



Pinguicula benedicta, Sierra Moa. (Photos: H. Luhrs)

irresistible target for a visit. So in 1994 I began making arrangements, which included creating links with the Botanic Gardens of Havana. Fortunately this was assisted by my connections with the National Society for the Conservation of Plants and Gardens, the NCCPG (who manage the UK's National Collections), who already had some small contact with the Cuban botanists. Mail takes about 6 weeks to travel from Cuba to England but communications, although slow at best, eventually succeeded.

ARRIVING IN CUBA

Arriving in Cuba in 1975, I was hosted by the Botanic Gardens under the directorship of Angela Leiva. Angela Leiva graciously assigned Jorge Gutierrez, a senior botanist in the Gardens, to lead the subsequent expeditions. The first few days were spent planning, allowing time for me to meet Cristina Panfret, Cuba's carnivorous plant (CP) expert, who was also based in the Havana Botanic Gardens.

Cuba contains much rugged country with some parts largely inaccessible other than by foot, especially in rainy weather. Therefore, in the time available, it was decided to limit field trips to the nearer West and Central parts of Cuba, leaving the more distant East for another visit. After much planning, the team departed for Pinar del Rio (both a town and a region), in the extreme West. Fortunately, Angela Leiva had permitted Cristina to join Jorge and myself, and the expedition was also blessed with an expert driver who knew the Cuban roads well, this being Pedrito.

WESTERN CUBA

In the tropical heat of Cuba, the long drive down the motorway from Havana to Pinar del Rio was helped enormously (and shortened) by the almost complete absence of any traffic, a bizarre experience for a European used to the delights of stationary traffic on a British motorway or American freeway! This expedition occurred just after the USSR abandoned communism and the result was that Cuba was left isolated, with no source of subsidised fuel and an American directed embargo that forced Cuba to practice severe rationing of fuel and everything else! Few cars could get fuel enough to travel far so

this brought home how privileged a guest I was.

The mountains of the North West were a beautiful backdrop and nearer to the motorway one could see endemic palm trees with their characteristic bulge in the trunk, as if they were pregnant. Arriving in Pinar del Rio, the group went straight to the University to find beds and also searched the Herbarium records with the head of botany there, Armando Urquiola. The evening meal was spartan by European standards and this was to be the start of a monotonous regime of food based largely on rice. Gravy, meat or vegetables were all heavily rationed; however, as a visitor, I was treated to the best of what was available and together everyone enjoyed what there was. Cubans had learnt to be stoical without losing their energy for and enjoyment of life.

The next day, our team left for the countryside, to a large area named Las Ovas. This area is very flat, at sea level and contains a large number of fresh water lakes and ponds. Pedrito and Jorge proved essential as navigators - it would have been easy to spend days here searching but finding nothing and possibly getting lost in the process. But instead, at first we found a large patch of sandy soil, covering several square kilometres, an area already known to Jorge and Cristina. This site was characterised by the presence of a small palm, rarely growing to about 8 or 10 feet but more often found as small or intermediate sizes. At first glance the area looked almost impenetrable but closer inspection showed that walking was possible and clearings without many palms could occasionally be found. This was obviously good territory for CPs, as small red spots were tell tale signs of *Drosera*, resplendent in their full colours as a result of their full exposure to tropical sun. Looking still closer, I eventually found the unmistakable leaves of *Utricularia*. The excitement rose but despite half a day of searching no more CPs could be located. This was strange as the site was known to be one for *Pinguicula* but no explanation for their total absence was identified at the time, so everyone moved on to another area near to a large artificial lake. This later proved to home to an aquatic (but not uncommon) *Utricularia* species but attention was mainly focused away from the lake at nearby fields. These fields were variously untouched, ploughed or grazed by cows - things did not look good.

The cows stood amid a field previously known to be home to *Pinguicula*. None were found, presumably as a result of grazing or farming in general. A second field was fully ploughed and no longer contained *Pinguicula*. In both cases this was sad as *Pinguicula* sites are rare and the land is generally too poor to support much livestock or crop growing. But several hundred metres away was a third area, very open and apparently untouched (recently) by plough or cow. So the team walked over and began to look. An enormous wave of excitement took over as *Pinguicula filifolia* was seen for the first time!

P. filifolia is the best known of the Cuban (or Caribbean) *Pinguicula* species and the only one that has been previously reported as introduced into cultivation, albeit briefly. *P. filifolia* grows in the West of Cuba in the Pinar del Rio region. This is a fascinating geography where the sea level savannah is pitted widely with hundreds of small fresh water lakes, some of which can be quite deep. This terrain is what one might expect to see if you were looking for an ancient peat bed, I was struck by the similarity between it and the Green Swamp in Carolina (USA), the home of Venus's Fly trap. As in Green Swamp, Pinar Del Rio was a flat savannah, with damp acid soil, sandy but with plenty of organic material. In addition, the trees and shrubs grew in such a way as to create clearings where sunlight was very strong, separated by living fences of trees and shrubs within which light was more subdued. The main difference was that in Green Swamp there were Fir Trees whereas Cuba had palms. Looking at photos to compare the Green swamp and Las Ovas, the similarity is obscure or even impossible to see. But I've been to both and despite reconsideration, I still can't shake my perceptions of similarity between the two places.

The clearings contain mainly short perennial sedges and grasses with fewer other small annuals and perennials, including *Drosera* species and *Utricularia*. Once the first *Pinguicula filifolia* was found, many more were apparent to us. Most were hidden by the grass and sedge and a species of *Selaginella* was often found climbing over everything. The *P. filifolia* appeared to be competing with the grasses, just! However, it seemed likely that they would eventually become smothered. There was evidence of a small amount of grazing and

this would have created or maintained very open areas. As this is what *P. filifolia* seems to require, it would appear that in the wild, *P. filifolia* is a coloniser of open (exposed) ground or survives where ground remains clear as a result of light grazing. The plant itself is grass like, upright to about 8 inches with long, erect leaves. Flowers are held high above the leaves on a thin stalk that may be as long or slightly longer than the rest of the plant. In the Pinar del Rio district, flowers are either blue, white or varying shades of faded blue. The fate of this plant at this site was clearly going to be determined by whether or not the local farmer ploughed the unprotected land. As we walked within the area, the grasses and sedges cleared to reveal very open areas of almost bare soil. This was an area where sedge and grass remains enriched the otherwise brilliant white silicate with humus. This soil was almost certainly reflecting sunlight and there was no protection at all from the overhead sun, so temperatures reached 35°C or higher. It seemed realistic to assume that high temperatures and very high light levels were required by this species. We collected herbarium specimens as well as seed. I later distributed this seed to Germany, France and Japan where growers had promised to use in-vitro techniques in the hope we could distribute plants more widely later. Seeds from this location were successfully germinated and these plants (and possibly their progeny) are in cultivation. (I am also aware of a separate collection, not by myself, of this species which still survives in cultivation in middle Europe and possibly in Germany and Holland). Satisfied with my first site of a Cuban Pinguicula, we returned to the University. Discussions with Cristina revealed another interesting and I believe previously undocumented fact. There are other known colonies of the plants on the Isle of Pines. However, in addition to the normal and well documented white or blue flowers, there is a yellow flowered variety! Plants also occur with yellow and blue flowers. This occurrence of a yellow flowered butterwort makes *P. filifolia* particularly attractive as few other species bear yellow flowers. A visit to the specific colonies showing yellow coloration is planned for the future but, as yet, I have not had time to visit this area. However, I was treated to evidence that the yellow flowers exist.

My colleagues, Cristina, Jorge and Pedrito, had by now become friends. Cristina and Jorge had, of course, seized the opportunity of a field trip to gather hundreds of herbarium specimens and they spent most of the night preparing them in the herbarium. I watched, occasionally assisted but also had time to listen and enjoy the sounds of Salsa music emanating from the student dormitories.

One more morning in Pinar del Rio saw us searching yet another slightly more easterly area for our second species, *P. albidula*. Unlike *P. filifolia*, I had not heard of this species being in cultivation, so this was a very exciting search. Thus the disappointment at not finding a trace of the plant was high! Our guide, Prof. Urquiola, had even seen the plants at the sight we were searching so we were confused by their complete absence. We knew little about the habits of this species so nothing more could be done this visit. It was great to see the habitat but another visit would have to be planned to find the plant.

A SLIGHT DETOUR BY WAY OF THE CORDILLERA DE GUANIGUANICO

We returned to Havana, but not directly. Those North Western mountains (or the Cordillera de Guaniguanico) beckoned, and after all, they were on the way weren't they! So a small detour took us back via the mountains, near to the town of Viñales. Thus I had a chance to visit one of a tiny number of wild sites still populated with *Microcycas*. This is an endemic cycad, highly endangered due to farming. However, as a connoisseur of the bizarre I had to actually see a plant whose name meant "tiny cycad" but which in fact is the largest cycad in the whole of this ancient genus! So much for taxonomists and sensible naming practices! A nearby area of forest, smothered in Vanilla orchid, provided a wonderful opportunity for yet another detour to view native bromeliads, orchids, *Rhipsalis* and yet another patch of *Microcycas*. I returned to Havana a very happy man.

A few more days of planning followed. This gave me time to view the Botanic Gardens. It has an impressive palm collection (though the sister garden in Cienfuegos has a much larger palm collection worth a visit by any palm enthusiast), many local fruits and other

areas of interest, including a Japanese garden. But to me, the most important discoveries were that of the vegetarian restaurant and yet another new friend. Angela Leiva (Director of the Gardens), had thought up the idea of a restaurant within the garden that served only food that could be grown within the garden. Under the splendid management of Tito Nunaz, Ristorante El Bambu was a famous success with tourists and Cubans visiting to savour both the look and taste of the food. It was obvious to all that ate there that the restaurant staff basked in the well deserved glory of a job where taste, appearance and service were all impeccable. It makes me wonder even now why other Botanic Gardens have restaurants that serve nothing as inspiring or as relevant as food from their own gardens. This was and is a Cuban innovation that others will hopefully follow. Quite aside from the food, I also had time to meet other members of the Botanic Gardens and in a short time made new friends, especially another botanist, Ileana. This was especially delightful as, in all cases, the friendships were made despite my total inability to speak any Spanish. I depended on Cuban hospitality which was warmly given in all cases.

After several days, we set forth for Central Cuba, to an area known as Trinidad. There are mountains that are amongst the tallest in the Caribbean and these are the documented home for *P. jackii*. Very few people indeed have ever seen this plant and fewer still have collected herbarium collections. The plant has never been introduced into cultivation though a very few live specimens were reputedly taken and grown briefly a long time ago, with no success. Our team took a day to reach the area and then started to search early the next day. This first day was spent climbing a massive mountain, in the tropical heat, laden with camera equipment. As the sweat literally ran from me like a river, I kept reminding myself that this was my hobby, that I chose to do it, that I enjoyed it. It was only after climbing an almost sheer section of dark dry fir forest, that I realised that the small fist sized holes almost everywhere were almost certainly tarantula lairs. Lovely! What a perfect stroll. But light beckoned and we found a house. The inhabitants were poor farmers who owned almost nothing, and I do mean nothing. But despite this, they shared what they had with us, especially black sweet

coffee, which was delicious. We shared our food with them too (including "Peperami" sausages which were proving to be very useful and popular, especially the peppery ones!).

Our temporary hosts were told where we were going. They in turn told us we were in the wrong place! They thought they could direct us to where we should be but after some discussion they decided it was easier to take us. So forgetting their own priorities, they led us on another long walk. We eventually arrived at a sheer calcareous rock face that had water below it and oozing from the surface.

Jorge recognised the spot as a place he had seen what he believed was *P. jackii*. We searched frantically, but to no avail. The ground at the bottom was damaged by pig farming and the cliff itself was very overgrown and consequently in very deep shade. If this had been a *P. jackii* site (as seems likely), it was no longer one. We left the area, exhausted.

The next day, we set off again, spirits rejuvenated and hoping for some luck. We took the route to the top of the mountains and aimed for the highest pass partly on purpose and partly following contours that looked like they might be good places to look. The map showed a high but passable mountain road but obviously didn't take account of the pot holes that had developed since map makers last visited. Pedrito was in his element, mastering horrific situations where often there was more hole than road. We broke through. A peak approached. My Cuban colleagues were resplendent with notebooks, altimeter and binoculars. I was decorated Christmas tree like with three cameras, two flash guns, exposure meters, GPS (satellite positioning). Flaunting all this high tech communications and observation equipment, we rounded the last bend to come face to face with a road block manned by the Cuban army to protect their primary radar base! Now, those of you who watch popular American films about Cuba will no doubt imagine, as I is embarrassing encounter might have led to a rather awkward situation. But the opposite was true. After a minute of discussion the commanding officer was called. He came to chat and then apologised to us! "After all" he said, "if we had only given him two weeks warning he would have arranged papers permitting me to enter and search the premises for plants". Saddened by his inability to help me at such

short notice, he allowed my friends Cristina and Jorge to search for plants while I waited. My friends found nothing and we parted on friendly terms with the army. This was helpful as they protect the entire mountain region, which is now a primary conservation area. So on we drove finding little back roads, twisting corners, little out of the way places, until suddenly we came across another cliff, two in fact, above 800 metres so a possible site for *P. jackii*. Nothing dramatic but definitely calcareous. We stopped and carefully looked. It took only about 3 minutes, which seemed like hours, and then first Jorge, then Cristina and myself, saw tiny Pinguicula. A further search showed there to be a small colony approximating 20 or less plants. These were possibly juveniles or otherwise the flowering season was over long ago so neither flowers nor seeds could be found. There were two separate groups of plants, one low near the ground and another several metres sideways and near to the top of the cliff. The high plants were impossible to reach; I tried by climbing the back of the cliff and reaching down but I could not begin to reach the high Pinguiculas. I had originally agreed with the Botanic Gardens that I would not collect plants. We had mutually agreed from the start that the rare Cuban plants should not be put at risk by collection other than if a small amount of seed could be found. With no seed available at this site, my brain set to thinking how I could hope to obtain this Pinguicula. I think I invented a new collection method! The plants were on a cliff face. Objects all follow the laws of gravity and fall downwards (on planets!). So I collected rock dust from below the plants.

This ended the botanical part of my first visit to Cuba. I had photos, seeds, rock dust and memories, but most of all I had new friends. I couldn't wait to visit them again and this friendship gained as much importance as the plants. As I moved to a plush hotel for my final night in Cuba I was contemplating the following week in Venezuela. All of a sudden a note was thrust in my hands requesting that yet another Cuban botanist visit me at my hotel as he needed my help. So I met a fern specialist, Carlos, who would soon be lucky enough to visit England. The Cubans I met are very warm people, very open and very honourable. So just as with the others, after just a few minutes Carlos became a friend that I added to my list of

Cubanos I really wanted to see again, soon. And so still not in Venezuela and with plans to visit Finland, the plans to revisit Cuba began to take shape.

SERENDIPITY

Arriving back in England, apart from distributing the *P. filifolia* seed, I still had the rock dust from the Centraldid, that th Cordille Mountains. This included several very small pieces of rock only a few centimetres in size and some really fine dust, all taken with the permission of the authorities and under their scrutiny. I found a clay pot and filled it with crushed Tufa rock. On this I "planted" my precious rock fragments and then I scattered the rock dust over the top of the rock and Tufa. The pot was then placed in a tray of rain water and the whole placed in a terrarium to maintain humidity. Every day I looked at this pot, twice a day in fact. Nothing, nothing, then more nothing. Until, one day, I thought I saw a green speck. So being short sighted, I removed my glasses to get a better look close up. Sure enough, something was growing. But was it a fern, a moss, a liverwort or what? As the first emerging leaves took on the size of a pin head, I swore each day that I could see a few tiny hairs bearing sticky de drops. Was I simply wishing or was this really a Pinguicula? Another week (I'd waited about 6 weeks already) and I was sure. I did indeed have a Pinguicula and it had to be from the Trinidad Mountains. A single precious plant that still lives to this day. But what was it? Well, it should be *P. jackii* but only flowers will prove that, and in less than natural conditions flowering is a difficult thing to predict or cause. So regrettably confirmation will have to wait a while longer (though not too long I hope). But I have learnt that this plant is, as one expects at high altitude in the Caribbean, fairly tolerant of cool temperatures but intolerant of low humidity. Temperatures in my terrarium have dropped to below 5°C (but above freezing) with no signs of slowed growth or leaf damage. However, several experiences have demonstrated that low humidity will inevitably kill this plant. The plant clearly enjoys it's growing medium of soft calcareous rock and crushed tufa should prove to be a reasonably available medium for growers to obtain when this plant is eventually distributed.to be continued next issue.....

Pinguicula spec 'Sierra Tamaulipas'
a new species?

Oliver Gluch
Germany

For some years there has been a butterwort circulating amongst cultivators under the location name of 'Sierra Tamaulipas'. This plant was originally collected over 10 years ago by Alfred Lau at a 'ranch' in the mountains of Tamaulipas, no more exact location data is known.

(according to Luhrs 1998).

I first obtained a plant of this name out of curiosity to see what species it would be. This Winter, after one year it began to form beautiful flowers that made me think it must be a new species.

I remember seeing it before in the large collection of Butterworts at the Botanic Garden in Gottingen, Germany, where the curator Mr. Lautner considers it to be a variety of *P. agnata*.

Ron Mudd (1993) mentions in his article on *P. agnata* forms that spec. 'Sierra Tamaulipas' does not fit the description of Casper's *P. agnata* (Casper, 1963) having a quite distinctive flower. No further information was given, so I decided to write about my experiences and give a description.

Because of the similarities to *P. agnata* I decided to cultivate *P. spec.* 'Sierra Tamaulipas' like *P. agnata*. In Casper's description of the type location for the latter as being "nearly sheer calcareous north-facing cliffs on dry rocky slopes" I used a substrate of calcareous loamy soil mixed with some peat to keep the soil more open. In summer I kept the soil very wet, reducing watering through autumn until in winter I kept the soil almost dry, watering only once a month. It was placed along with all my Mexican Pings 30cm beneath a 36W warm-white and cool-white bulb.

I have noticed differences with *P. agnata* concerning the summer leaves, in disagreement with Mudd I feel that the two can be easily distinguished as those of *P. agnata* do not form an upturned margin, whilst those of spec. 'Sierra Tamaulipas' have obvious upturned margins. The summer rosette consists of 10 to 15 pale green oblong-

ovate leaves, up to 4cm long and 3cm wide, spatulate at the base, with two thirds of the upper surface covered in glandular hairs. (fig 1, D-E)

The plant forms winter rosettes to 4cm diameter with up to 20 thick succulent leaves, the upper surfaces of which are densely clothed in white non carnivorous hairs. (fig 1, A-C)

Four flowers appeared from the winter rosette with 9cm long scapes. The scapes were about 4mm in diameter and brown-violet at the base and covered with white non-secretory hairs about 1mm long, as well as sessile glands.

The differences between the two plants become very obvious when the corolla is regarded. The corolla of spec. 'Sierra Tamaulipas' measures up to 3.2cm, much wider than *P. agnata*. The basal portion of the corolla lobes are white, the upper two thirds pale pink. The two lobes of the upper lip do not overlap, whilst the three lobes of the lower lip do so slightly. The upper surface of the corolla is densely clothed with white, non-carnivorous hairs, about 1mm long. I have not observed such a dense covering of hair in *P. agnata*. There are no lilac spots at the base of the lobes which are typical of the flowers of *P. agnata*.

The throat is hairy and a pale green-yellow colour. The corolla tube is green, about 1.3cm long and 0.3cm wide. The spur is about 6mm long and 1mm wide and forms an angle of 90 degrees to the corolla tube.

The similarities with *P. agnata* cannot be denied & spec 'Sierra Tamaulipas' clearly belongs with it in subgen Isoloba, section Agnata, as described in Casper's monograph. (CASPER 1966) The only point which does not fit to his description is the fact that spec. 'Sierra Tamaulipas' is not tropical-homophyllous but does produce winter leaves and so is heterophyllous, a characteristic also of *P. agnata* plants in cultivation.