

IPSG NEWSLETTER-1

THE AIMS OF THE INTERNATIONAL PINGICULA STUDY GROUP

- 1 To meet with other collectors of the species and primary hybrids
- 2 To exchange information between members and to provide a forum for exchange of information.
- 3 To exchange seeds internationally to improve member's access to species and to ensure that they are perpetuated in cultivation. International exchange of plant material other than seeds is more difficult as phytosanitary regulations have to be abided by.
- 4 To encourage the use of botanically correct names or otherwise the use "nomina nuda" until the plant has been adopted as a species.
- 5 To encourage accurate record keeping including such details as : precise location data, altitude, climate, soil etc., original collector's name if known.
- 6 To re-introduce to cultivation "lost" Pingiculas.
- 7 To encourage the production of new hybrids.
- 8 To encourage and help the preservation of habitats, in all countries, where the species grow wild.

THE NEWSLETTER

This newsletter will act as the main link between members. It would be desirable if ALL members made a contribution annually either to the LETTERS page, or better still by writing an article. If you need advice on writing for the newsletter then please get in touch. Remember, the newsletter cannot survive without a wide and varied input.

While membership is small it is unlikely that more than two newsletters will be produced each year. Unless this situation changes, a payment of £1 (or \$ equivalent) upon receipt of each newsletter is all that is required to cover costs at this stage. Cheques should be made payable to : R. MUDD and sent with SEED BANK CORRESPONDENCE to RON at HIS ADDRESS, whilst articles, news and views etc should be sent to myself

I look forward to hearing from you all STAN.

Revue appartenant à :
Dionée
Association Française des Amateurs
de Plantes Carnivores

INTERNATIONAL PINGICULA STUDY GROUP

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CONTENTS:

- page :
2. - Editorial, Stan
 3. - Propagation: leaf cuttings, Chris Heath
 5. - "For your diary"
 6. - P. longicollis : cultivation, Kevin Hughes
 10. - Pingicula location data, Stan Lampard
 15. - P. agnata ?, Ron Mudd
 22. - Letters
- Inside back cover - Seed Bank, Plant Exchange
- Frontispiece:
A drawing of P. cyclosecta. (Casper 1963) by Stan Lampard based upon a slide taken by Dr. A. Lau of plants growing on a limestone cliff underhang.

This species has been the subject of great controversy in cultivation. The majority, if not all plants being grown under this name are in fact : P. heliarsae, a more recently described species (Spela & Fuchs 1982) with which it shows superficial similarities in flower. The distinctions between these species and a third P. esserianna will be made clear in a full article in the next newsletter.

EDITORIAL.

Welcome to the:

"INTERNATIONAL PINGUICULA STUDY GROUP",

I hope you enjoy reading our first Newsletter. Its aim is simple: to unite all people interested in the genus *Pinguicula* by providing a forum for the exchange of news, views and plants.

The Butterworts now number over 60 species yet few public or private Carnivorous Plant Collections can boast growing more than a tenth of these. This cannot be through lack of appeal since Butterworts are amongst the most beautiful subjects, especially when in flower. The reasons are more likely to be connected with uncertainty regarding cultivation and confusion over nomenclature.

Recommended cultivation methods have been too general. It is now becoming clear that representatives of this large group are found occupying a wide diversity of niches. Some grow on sphagnum hummocks in peat bogs, whilst others are adapted to living epiphytically upon trees in moist sub tropical forests, though strangest of all are those that survive clinging to rocks or half buried in eroding gypsum hillsides in the company of xerophytes such as cacti! Clearly successful cultivation will demand great sensitivity toward the particular requirements of individual species.

Inadequate nomenclature is a great handicap to study. However, there are presently several research groups actively studying live specimens in cultivation and in the field rather than solely relying upon dried herbarium material. As a consequence, since 1980, 18 new species have been described from Mexico alone, and undoubtedly, there will be more to follow! It is exciting that an increasing number of these are now finding their way into cultivation and may soon be widely available.

It is the aim of the IPSPG to 'take Cinderella to the ball' in the 1990's. Will you join us?

Stan Lampard.

PROPAGATION : leaf cuttings of Mexican *Pinguicula* sp.

by Chris Heath

Leaf cuttings represent probably the easiest, and fastest, method of increasing this group of plants, resulting in mature plants often within a single growing season. As a method, it is made possible by groups of cells within each leaf, called meristems, capable of reproducing a whole new plant. These cells are normally kept dormant by hormones produced in the main body of the plant, but once a leaf becomes detached, and these hormones are no longer an influence, the cells become active and produce the new plants.

Leaves from the winter rosette (if the species is of this type) represent the best source for cuttings as discussed here, although summer leaves should be treated in the same way. Leaves of the winter rosette are usually more numerous, easier to handle, and cause less disturbance to the plant by their removal. Ideally, plants should be lifted just before the summer leaves develop, or when new roots are seen to be forming. The previous seasons dry leaves can then be removed along with those that have lost turgidity, by downward pull, (this is also a convenient time to remove any dead roots with tweezers). The leaves to be used are then easily accessible, and up to 75% of the rosette can be removed, those remaining are usually soon obscured by the subsequent development of the summer rosette. Some damage to the root system is unavoidable, but is of no consequence as those remaining have a smaller rosette to maintain. The removed

Below I outline my own method of propagating by this means.

Maximum humidity is important for the development of the cuttings, so containers should be enclosed. Plastic bottles which have been cut down and converted into propagators are ideal, as are tubs without drainage holes, if given a central support and sealed within a polythene bag. Condensation droplets should not be allowed to fall onto the cuttings.

Prepare a mixture of 2 parts perlite, 2 parts vermiculite, and one part coarse sand. Allow 1/3 of this to absorb water for five minutes, and then add the remaining 2/3 and mix well. The medium should be damp and not wet, which can cause rotting. The damp mixture encourages the rapid development of the root system of the leaf cutting.

Fill the container to a depth of approx. 4 cm. and place the cuttings flat on the surface of the mixture, making shallow channels where necessary if leaf shape demands. Do not cover or bury any part of the petiole as this is usually where plantlets develop.

Place the prepared container in good light, without any direct sunshine which can cause overheating. No heating is required above 10°C.

Small buds can usually be seen to be forming in 7 - 10 days. It is not normally necessary to add any further water until the cuttings are well developed, normally in six to eight weeks, although observation of the medium will indicate if more water is required. The plantlets are transplanted when a root system is seen to be developed.

It should be pointed out that, in my experience, leaves treated

with rooting hormones show no advantage over those without. Fungicides are not normally necessary, though leaves that turn opaque/brown should be removed. With a little practice, and careful observation, it is reasonable to expect a 90 - 95 % success rate.

FOR YOUR DIARY

Each newsletter will contain this 'FOR YOUR DIARY' list of events and dates. As this newsletter is intended to be international, and not just a U.K. publication which is sent abroad, it is hoped that anyone with news of meetings, shows or exhibits that involve 'pings' will let us know, wherever in the world they are occurring.

May 31 & August 23 - Stan Lampards open days

March 27 1993

- "A Pinguicula convention", Birmingham
England. (venue to be arranged). This
will be an international gathering
of ping enthusiasts and will include
a talk by prominent field researcher
Alfred Lau.

Pinguicula longifolia Ram.

An introduction to its cultivation based on personal experience in Hampshire, England.

by Kevin Hughes

Introduction -

The long leaved Butterwort occurs in three distinct ranges in S.W. Europe, each of which contains an isolated subspecies.

P. longifolia ssp. longifolia inhabits the central Pyrenees, P. longifolia ssp. caussensis the mountains of southern central France, and P. longifolia ssp. reichenbachiana the Maritime Alps and Apennines.

Typical habitats are in deep limestone gorges where colonies clad the cliffs on the tufa deposits left by reliable seepages or fall of water. Most colonies are out of direct sunshine and healthy plants can even be found growing in deep shade, underneath overhangs, where the plants cling to the walls, ceiling and stalactites. P. longifolia ssp. caussensis is the smallest subspecies producing, on average, shorter leaves and smaller flowers (corolla : P. caussensis 22-35 mm., P. longifolia 30-46 mm.). The leaves of P. caussensis are also broader relative to length, giving it a superficial resemblance to cliff dwelling plants of P. leptoceras. The flowers of all of the subspecies exhibit a variation of colour from purple to light blue and typically have white throats.

Cultivation -

This presents very few problems. This species,

with the exception of P. grandiflora and P. lusitanica, has proved the most adaptable, of the European species, to the maritime climate of South West England.

Growth in a mild winter (the last four here) can commence as early as mid - February and this can be a problem. Once growth begins even a mild frost can kill, although the species, when dormant, can withstand temperatures of at least -12°C. Therefore it can not be treated as hardy and needs the protection of a glasshouse. In mine the nighttime air temperature is allowed to fall to -1°C, while the plants are dormant, but no lower than 0°C once growth commences.

The largest hibernaculae break dormancy first and the plant may then remain active for the next ten months. These larger plants are also the first to bloom, starting in late March and producing up to four flowers per plant. Flowering has finished here by late April.

If regularly exposed to temperatures in excess of 10°C the plants respond with early dormancy and this means no flowers next year! Thus it is important to find a cool location in the garden for the summer months, a north aspect being the obvious solution. Alternatively, artificial means of cooling the plants could be sought, although I find this not necessary. Should plants go into early dormancy they require treatment which is no different from those remaining in growth i.e. you do not need to put them in the fridge.

My experience suggests that this species resents being stood in trays of still water. Instead, the potted plants are better stood on damp peat or sand contained within

a propagator to maintain high air humidity. This high humidity is vital if healthy leaf growth is desired. If conditions are right the compost will soon be carpeted with moss. This seems to benefit the growing plants but, if left unchecked, weakens them in the long term. Any liverworts or fern prothallii should be removed as they appear. If very vigorous, the mosses will need removing during the growing season, and the pot will need top dressing with fresh compost.

With the commencement of growth I start a once monthly foliar feed with an orchid fertilizer diluted to 3/4 strength. Other than this the plants take nutrients from their compost and the numerous small invertebrates they capture.

Plants are repotted every two years and the top 2 cm. of compost replaced on an annual basis. This species does not keel over and die if transplanted whilst in growth, although I wait until the Autumn dormancy before repotting. The wild habitat suggests a preference for alkaline soils but a compost of neutral or slightly acidic reaction suits them just as well in cultivation. I have now switched from sphagnum and sedge peat to 'Coco-peat' as the basis of my potting medium and have experienced no reduction in success. The main problem with the 'Coco-peat' is its tendency to succour mildew on the surface when kept wet; this is less of a problem under the cultivation techniques outlined above. For preference I use a compost of 3:2:1:1 of 'Coco-peat', perlite, loam/I.I.No.1 and coarse sand. To each litre of mix I add 1 tablespoon of crushed Dolomite lime.

Seed is best sown fresh for good germination. No modification of the compost is necessary but moss needs to be kept in check as the minute seedlings struggle to compete with it.

P.longifolia makes very few gemmae, none on most smaller specimens, so it is slow to bulk up vegetatively. I find that gemmae are best separated during the Autumn repot and then treated as normal.

Aphids are the main pest, although slugs and snails can wreak havoc. Aphids are easily removed with a fine paint brush and are most damaging when infesting the hibernaculae. If not removed quickly, deformed growth may be the result the following spring.

The above is a general description of my methods for growing this species and should be treated as a rough guide only - every garden (and gardener) is unique!

REFERENCES :

- Flora Europaea
- Caspers Monograph
- Flowers of S.W.Europe
- a field guide, Polunin & Smythies.

THE LOCATIONS FOR SPECIES BELONGING TO THE GENUS PINGUICULA

PINGUICULA locations

Introduction.

Since the publication of Casper's monograph in 1966, a large number of new species have been described, the majority coming from Mexico. The following list of species names and their locations has been compiled from the work of the following authors:

- Casper, S.J. Kondo, K. 1963 A new sp. of *Pinguicula* from Mexico. *Brittonia* 15.
- Casper, S.J. 1966 Monographie der Gattung *Pinguicula*. *Biblioth. Bot.* 127/8:1-209.
- Casper, S.J. 1974. A New *Pinguicula* sp. from Mexico. *Feddes Repertorium* 85.
- Speta, F., Fuchs, F. 1982. New *Pinguiculas* from Mexico. *Stapfia* 10.
- Studnicka, M. 1985. *Pinguicula rotundiflora* a new species from Mexico. *Folia Geobotanica et Phytotaxonomica*, Praha, 20.
- Zamudio, S., Rzedowski, J. 1986 Three new species of *Pinguicula* from Mexico. *Phytologia* 60.
- Zamudio, S. 1988. Three new species of *Pinguicula* from central and northern Mexico. *Acta Botanica Mexicana* 3.
- Speta, F., Fuchs, F. 1989. Three new *Pinguicula* species of the section *Orcheosanthus* from Mexico. *Phyton* 29.
- Zamudio, S., Rzedowski, J. 1991. Two new species of *Pinguicula* from the state of Oaxaca, Mexico. *Acta Botanica Mexicana* 14.
- Schlauer, J. *Pinguicula reticulata* species nova from Mexico
- Debbert, P. 1991 A new *Drosera* and a new *Pinguicula* Mitt. *Bot. Staatsamml. München* 30.
- Zamudio, S., Lux, A. 1991. Two new species of *Pinguicula* from Nuevo Leon, Mexico.

Additional papers would be most welcomed in order that this compilation can be kept up to date.

S.E. LAMPARD.

NAME	COUNTRY	STATE	LOCATION
acuminata	MEXICO	HIDALGO	El Chico National Park
argentea	MEXICO	HIDALGO	Zimapan district, road from Z to Mina Loma del Toro
albida	CUBA		Pinar del Rio, Laguna Santa Maria, Sarans de Pineda, Celibata, Vol Guanes
alpida	SIBERIA		
alpina	EUROPE		Widespread throughout much of this range
antarctica	CHILE		prov Chile, prov de May, Isla Clarence, Fuego
balcanica	ARGENTINA		Tierra del Fuego, Rio Douglas, Estados
barbata	MEXICO	CHIAPAS	10km E de El Porvenir, Huixtla-Sillapene de la Grandeza
benedicta	CUBA		Campo la Barpa to San Benito, Pinar de Yarela, Tacobay, Rio Yare Yarela
botanica			
caerulea	USA		N.S. Carolina, Georgia, Florida
caerulea white			
calycata	ECUADOR		Andean ridge
castellana	COLOMBIA		Central Cordillera
chilensis	CHILE		Cerro Volcan Llama Osorno, Pasopuyenus
ciadophila	ARGENTINA		Cerro Negro, Rio Negro N.P.
crossifolia	CUBA		Santodomingo, Cordillera central, Loma la Vieja
crossifolia	MEXICO	HIDALGO	El Chico Nat. Park, Las Ventanas Cerro de las Ventanas
crenatioloba	MEXICO	JALISCO	Guadalupe, Rio Planco
	OAXACA		Cordillera, Tepic, Concepcion
	GUERRERO		Acahuizotla, 36km S Chilpancingo
	MEXICO		Tenascaletpec, Rincon del Carmen
crystallina	CYPRUS		Troodos Gebirge, Parnitha, Prodromo, Karyos, Polamos
collinaensis	MEXICO	GUERRERO	Galena, Tenepes, Mina, Piles
	MICHIGAN		Coslemon, Barroloso
coriacea	COSICA		Isl. de Corle, Isl. Grasso & central mountains
cyclopecta	MEXICO	NUOVA LEON	Sierra Madre Oriental, 3m NE Dulces
	ITALY		IPA, Nombres, Istione cliffs El Carroci

PINGUICULA locations

SPECIES	COUNTRY/STATE	LOCATION
<i>Gillieria</i>	MEXICO S.L.P.	Guadalupe
<i>Lophalia</i>	VENEZUELA	Paramo de los Leones, Paramo de Loma N de Santander, Paramo de Santibon
<i>marginale</i>	MEXICO COahuila	N de Santander, Tatzayana, Orilla del Rio Sobre Pemas
<i>asseriata</i>	MEXICO PUEBLA	Cascada Olmeca entre Tezuitlan y Tlapachoyan
<i>littoralis</i>	MEXICO TAMPAULIPA	Sierra Solimanica (99.3.23.5)
<i>fluo-mulonis</i>	CUBA	Pinar del Rio Candelaria, San Luis, Rio de los Indios, Santa Barbara
<i>gracilis</i>	MEXICO YUCA CRUZ	Paso del Macho (19.0.96.41)
<i>grandiflora</i>	MEXICO NUEVO LEON	Pionerrey, N Cerrado las Milras
<i>pallida</i>	FRANCE	
<i>v. rosea</i>	FRANCE	
"pink leaf"		
<i>cysticola</i>	MEXICO S.L.P.	Minas de San Rafael, Buenavista, nc. Cerrillos
<i>hemiphylica</i>	MEXICO OAXACA	58km N Ixtlan, Valle Nacional
<i>hierophylla</i>	MEXICO OAXACA	Ixtlan, Jovesta, Sierra de San Felipe,
		PICHOACAH San Jose Coalcoman
		GUERRERO E. Chilpancingo to Chilpan, Pino Taro Puerto Agua Terca
<i>littoralis</i>	ITALY	
<i>littoralis</i>	IRECE	
<i>littoralis</i>	MEXICO GALIANA	Piedra Ancho, mossy boulders under oak & pine
<i>maculata</i>	MEXICO INDIENOS	Rayones y Galeana
<i>involuta</i>	PERU BOLIVIA	Peruvia Mito, Elvencos, Savilempa, Torrenuasi
<i>ionantha</i>	USA	Underl. Morogunges
<i>lactil</i>	CUBA	Florida, Franklin, Liberty Gulf, Bay
<i>laurensis</i>	MEXICO	Santa Clara, Trinidad Missan Blas, Las Legunas
		Juamave

PINGUICULA locations

NAME	COUNTRY	STATE	LOCATION
komodo	MEXICO	TAMAULIPA	21 km from Tampico del to Ciudad Victoria
laeana	MEXICO	OAXACA	Sierra Nixte, N.E. Mills Rd, Zempatlénel
laploceras	EUROPE		Central Alps
lignicola	CUBA		Camp san Benito, Finas de Ybarra, Lago bay
lilacine	MEXICO	MEXICO	Hispania, Jalapa, Poaxilapa, Mirad
		VERA CRUZ	Zacupán, Barranca de Venampe
		TAMAULIPA	San Juan
		NOUEVO LEON	Dulces Hombres
		OAXACA	Cor dillerá
		CHIHUAHUA	San Ignacio- San Javier
		ETC.	
longiolia	FRANCE		Central Pyrenees
	SPAIN		
l.v. caussensis			
l.v. relictus	FRANCE		Alps
lustanica	EUROPE		West coast from Scotland through to N Africa
lutea	USA		Louisiana, Mississippi, Alabama, Caroline, Georgia, Florida
macroceras	USA		West coast of N America
	JAPAN		
macrophylla	MEXICO	S.L.P.	Pico el Auyón, Puerto de la Huera
		CHIDAGO	Real del Monte
morariensis	MEXICO	WIDE-SPREAD	
m.v. alba			
m.v. caudata			
m.v. caudata berlin			
m.v. caudata hemburg			
m.v. mexicana			
m.v. minor elia			
m.v. rosei			

NAME	COUNTRY	STATE	LOCATION
nevadensis	SPAIN		Sierra Nevada, Sierra de Alfacar
oblongiloba	MEXICO	OAXACA	Toluca
		OAXACA	Toniquila
		CHICOMULCO	Coahuatlan, Coahuila
		DURANGO	Coyoles
		JALISCO	Guadalupe
orchiloides	MEXICO	GUERRERO	Minatitlan, Puerto
		OAXACA	Quetlepec, Yotok, Oaxaca to Tuxtutepec
peruviana	MEXICO	JALISCO	road, road Cerro Machin
			Guadalupe, Sierra de San Esteban
planticola	USA		Idaho, Lemscallepec
			Mississippi, Florida
polosensis	MEXICO	S.L.P.	Belme, San Luis Potosi in Riquit, Rio Verde
primitiva	USA		Florida, Mississippi, Alabama, Georgia
pumila	USA		Texas, Louisiana, Alabama, N Carolina, Georgia, Florida, Bahamas
ramosa	JAPAN		Nikko, Tochigi, Mt. Nantai, Mt. Hyoko, Koshin, Koshinso
rayonesensis	MEXICO		Los Rayones y Galeana
reclinata	MEXICO	OAXACA	Juxtlahuaca, Sierra Madre del Sur, Presa Morelos/Rio Balises
reclinata	MEXICO	S.L.P.	Tula
reclinata	MEXICO	HUEVOLEON	Ascension
reclinata	MEXICO	OAXACA	Pinas de Asbestos
sharpii	MEXICO	CHIAPAS	Pueblo Nuevo, Yerba Buena
sharpii	MEXICO	S.L.P.	Villa Juarez, Pinas de Guascama
			2km SE de Buenavista
ultracurvaoides	MEXICO	OAXACA	Cerro Azul N de Huilepec
valisneriifolia	SPAIN		Almeria Sierra de Abrocena, Granada Sierra Nevada
variegata	SIBERIA		
villana	ARCTIC		Alaska, Canada, Finland, Norway, Sweden, Russia
vulgaris	NETHERS		
zecheri	MEXICO	GUERRERO	Puerto de Gallo, Huay Acapulco

P. agnata ? by Ron Mudd

P. agnata was originally described by Casper in 1963. He described the plants from material collected by Moore and Wood in 1948, from the state of Hidalgo in Mexico. The original plants, he said, were found on the lower portion of nearly sheer calcareous north facing cliffs, on dry rocky slopes, at an estimated altitude of 5000'.

A summary of Caspers original description states that P. agnata is perennial and consists of a rosette of between 8 - 12 spatulate to obovate - oblong pale green leaves, each leaf being 35 - 5 mm. long and 10 - 15 mm. wide, and without an upturned margin. The flower stalks are 50-120 mm. long, hairy, and each carry 1 large flower, 18-22 mm. long (including spur). The Isoloba type flower is white to pale blue. The corolla tube is 8-10 mm. long, 3-5 mm. wide and without a palate. The spur is 3-4 mm. long and forms an obtuse angle with the corolla tube. There is no mention of a winter rosette.

In his work on carnivorous plants (1986), Slack describes P. agnata as having strap shaped leaves with rounded ends, which are unusually thick and succulent, and forming rosettes to 13 cm. in diameter. The flowers are described as medium sized, wide throate and of mauve-blue to pale violet in colour with two deep flecks at the base of each. The throat is described as greenish. It is mentioned that no winter rosette is formed.

The aim of this piece is two-fold,
A) to describe the different plants which are at present being

grown as P. agnata, and to mention two obviously allied plants

B) to describe my observations of variation which can be induced in one of these types by growing in different cultivation materials.

A) Different plants.

At present it is apparent that, in Europe, two plants, which are obviously different, are being commonly grown as P. agnata. The first, (which I shall call "Blue", and to which the work in section B) applies), fits the descriptions of Casper and Slack very well, apart from the fact that it readily forms an obvious 'winter' rosette (fig 1). The second is a smaller plant (5 - 6 cm. max. diameter in summer rosette), which is very similar in both rosette forms (fig 2), which I shall call "Pale". The flowers of this plant are similar in shape and size to "Blue". The flowers of this plant are paler in colour, indeed the blue areas often appear pale brown/cream. The throat usually appears pale lemon as opposed to the originally described green. However the two flecks, mentioned by Slack, are apparent but very pale. The summer rosette is very much more ground hugging than in the "Blue" plant where the leaves often point upwards from the surface at many angles. The leaves are much shorter and much more rounded in "Pale", slightly darker in colouring, but are equally as succulent. This plant is akin to the plant shown by Kondo (Carnivorous plants of the world, 1903) as P. agnata, and from my own experiences is the one more commonly grown as this plant on the Continent, whereas the "Blue" plant is the more common in Great Britain, (possibly due to Slacks involvement).

The "Blue" plant is often cultivated as P. tilliclona, a mistake



Fig.1 The winter rosette of P. agnata "Blue".

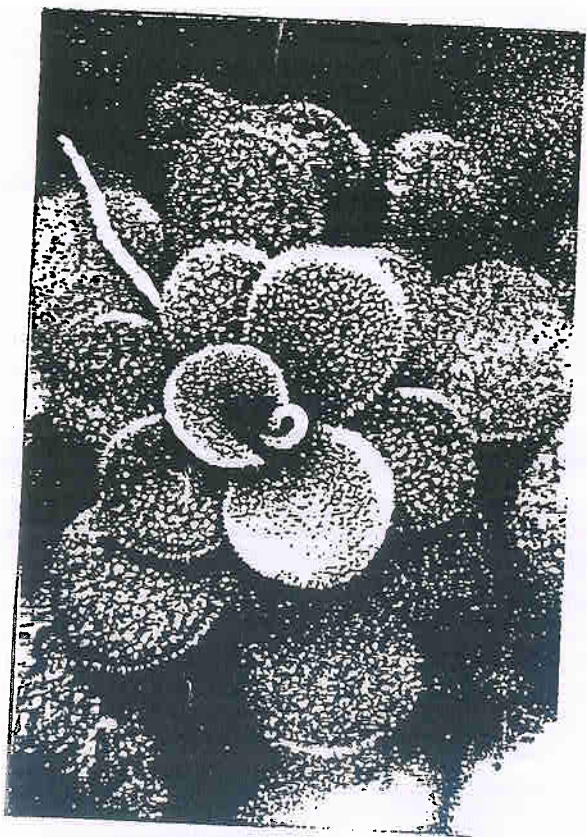


Fig.2 The winter rosette of P. agnata "Pale". The summer leaves can be seen emerging at the centre.

... different to this plant, (corolla tube with palate!), and Casper stresses the obvious close relationship between P. illacina and the Southern U.S.A. species, a comment that cannot be applied to these plants. I believe that these "Blue" plants are P. agnata as they conform to the original description.

The "Pale" plants are sufficiently different in size, leaf shape, growth patterns and other smaller areas, to be, in my opinion, considered as different species. This, however, rests with the taxonomists and may be resolved one day. This plant is now being imported into Britain, from Holland, in large numbers and is being sold in garden centres as P. agnata.

The differences described above are from my observations of plants grown in identical material (2:3 perlite:vermiculite) in identical growing conditions. The size of leaf and rosette, flower colour, time of 'dormancy', and length of flowering period can all be affected by the growing medium, as I will endeavour to show later.

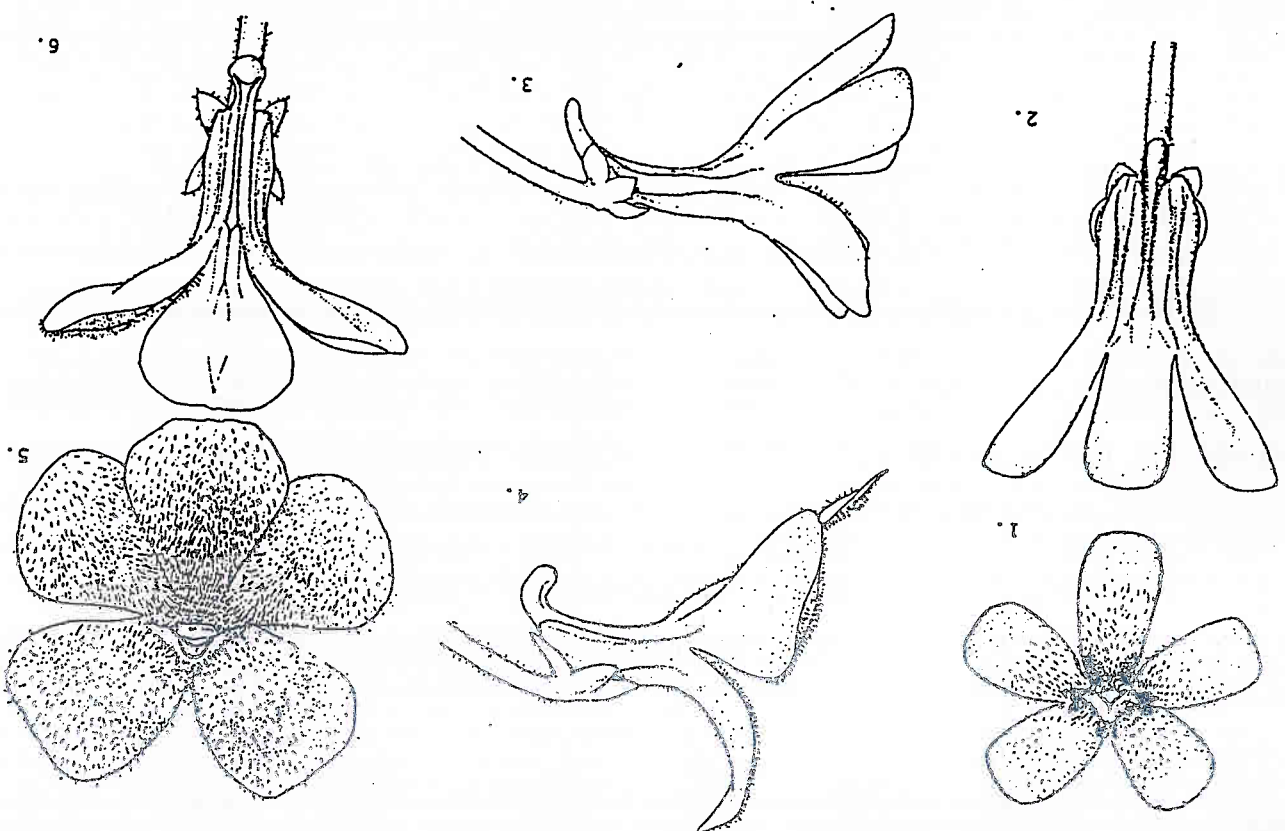
Although not widely in cultivation at the moment, two other plants which appear to be related to P. agnata, and could be confused with this species in leaf shape and rosette form are P. 'Sierra de Tamaulipas' and P. 'Ayautla'. In the first the leaves are again succulent, strap shaped and pale green. However, once this plant flowers it can no longer be confused with P. agnata. In fig. 3 (for which I am indebted to Mr. S. Lampard) the structural differences between the two flowers can quite clearly be seen, and when the fact that P. 'Sierra de Tamaulipas' is white to pale pink is known, the difference is confirmed.

The second plant, P. 'Ayautla', again possesses pale green

P. agnata no.s 1., 2. & 3.

Fig. 3

P. 'Sierra de Tamaulipas' no.s 4., 5. & 6.



with slides (1) is known, any confusion is dismissed.

Although these two plants have not been officially described as species to date, I believe that this is to be done in the near future.

B) Different 'composts'

During 1989 (after many losses of the more delicate pings due to rotting in previous years), I decided to investigate the use of different growing media, in an attempt to overcome this problem. From my growing knowledge of pings, I suspected that a very open, free draining medium, with large pockets of saturated air, would most closely represent the natural growing medium. However as I did not understand which other factors would influence growth and the rot problem, I decided to investigate a wide range of composts. These are listed below:

1. 100% sphagnum moss peat,
2. 50:50 peat:sand,
3. 100% sand,
4. Rockwool/foam (Wellbanks orchid medium),
5. Sponge (bathroom type),
6. 3:2 vermiculite:perlite,
7. 50:50 peat:perlite,
8. Brand potting compost.

The plants used were all from leaf cuttings from the same parent plant. The rootless winter rosettes were laid upon the surface of the composts in January. In February roots were seen to be emerging from the rosettes, and watering (from below) was commenced. All of the pots containing the plants were kept in the

commenced well and the first flowers appeared in March. When all plants were flowering it became apparent that some were considerably paler than others, and as this became more apparent, the more flowers that opened, it was obvious that something was affecting flower colour. As everything else was constant, and enough plants had been grown in each medium to rule out mutation, I concluded that it must be the growing medium. This was reinforced as three distinct groups were noticed:

1. palest - composts 1,2,7,8,
2. pale - composts 3,4,
3. vivid - composts 5,6.

As the year progressed it also became apparent that similar groups could be formed with respect to the size of the size achieved by the plants, the more open composts producing the larger plants. At the end of the growing season, when watering had been ceased for 4 weeks, i.e. at end of October, the plants were removed from the growing media. It was apparent at this stage that the roots of the plant in composts 1,2,3,4,7&8 had been continually rotting during the growing season, and that although they had been replaced, to varying degrees, were in no way as healthy as the roots of the plants from the no. 5 and no. 6 media. The roots of the plants in the perlite:vermiculite mix had even retained the very fine root hairs which are apparent on the last 5-6 mm. of the mature roots.

Although none of the plants had rotted, those in medium 6 were evidently the most healthy plants and so this system has since been adopted with the result that no plants have since been lost, even in the more delicate 'pings'.

Conclusion -

Although the above can only be a brief summary of my trials, my observations of these plants throughout the year convinced me that the appearance of P. agnata can be influenced to such an extent by the growing medium, that the same plant must appear quite differently in different collections. However, although depth of colour and size of rosette may be affected, the shape of the flower and leaf is not, and as I now grow "Blue" and "Pale" in the same medium, this does not account for the differences between these plants.

LETTERS

from Chris Heath, London, England :

"It has been suggested that seed from plants that reproduce so easily by vegetative means, and from those that have been cloned continually, lose viability or are sterile. Where seed stubbornly refuses to germinate, you may consider carrying out the following test on a small portion of your seed. This sample will be killed, and due to the size of the seed, a microscope is required.

Soak the sample of seed in 2,3,5 - Triphenyltetrazolium chloride, which will kill the seed, but stains live tissue red. If when cut open, the embryo or endosperm of the seed shows a red colour, then viability is established. If 70 - 80 % of the sample shows red then this would show good overall viability"