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 dertosensis* 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 to do with *P.grandiflora* and instead elevated them to the status of *P.longifolia ssp. dertosensis.* Zamoras study included the Pto. Beceite and Tortosa plants together with further populations in Granada (Sierra Tejeda) and Jaen (Sierra de Carzorla 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 Betata 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 dertosensis* 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.

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Back From The Roots

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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 spp. 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 severe 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 rootI 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 perhaps 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.

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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 giganteа 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