

DAVIS EXPEDITION FUND

REPORT ON EXPEDITION/PROJECT

Expedition/Project Title: Molecular Systematics and Evo-Devo of *Senecio* Sect. *Senecio* in Southern Africa.....

Travel Dates: September 2005.....

Location: Cape Provinces of South Africa.....

Group Members: Mr J.J. Milton and Professor R.J. Abbott.....

Aims: To collect as many annual species of *Senecio* as possible for phylogenetic analysis and further investigation

OUTCOME (not less than 300 words):-

The field trip to the Cape regions of South Africa during September 2005 was very successful. It was decided that it would be more productive to visit the Cape regions again, rather than visiting Kwa-Zulu Natal, which contains only a few annual species of *Senecio*.

Initially in Cape Town, Richard Abbott and I drove east as far as East London, and then began to head back west again, stopping to collect *Senecios* wherever possible. Several days were also spent around Cape Town itself, searching around the Cape Peninsula, and slightly further afield to the north and east. A trip was also made to the Cederberg area around Clanwilliam. By this point, Richard had returned to the UK, so for this journey I was accompanied by Christopher Cupido of the Kirstenbosch Research Centre.

In total, 67 collections were made, consisting of herbarium voucher material, and silica dried leaf material for subsequent DNA extraction, sequencing of fragments and phylogenetic analysis. Seed was also collected wherever possible. In cases where whole populations were found in fruit, population level seed collections were made. Where large numbers of seed could not be found, as much seed as was available was collected. Since returning from South Africa, DNA extractions have been made for the majority of the collections. Analyses of *ITS* and *trnL-F* sequences have also begun using PAUP and Mr Bayes. Seed has been planted out and many of the collections are currently growing here in the glasshouse. These live specimens will be used for a morphometric analysis to complement the phylogenetic analysis. Allozyme analysis of these specimens is also being carried out by an honours student and I intend to begin investigating the breeding systems of the collections. Hybridisation will be attempted between the similar weedy annual species of *Senecio*. Chromosome counts are also being made and ploidy levels investigated. A RAPD analysis currently being carried out on two closely related species, *Senecio flavus* and *Senecio engleranus* may also be extended to include some of the closely related weedy annuals which we collected in South Africa.