OSCOV - Orchid Conservation in Victoria

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Ongoing Orchid Conservation Projects

The following orchid conservation projects have been reported previously and are continuing. For more information about the projects and how to get involved please go to the websites at the end of this report.

Current Department of Sustainability and Environment Projects (DSE)
Charming Spider-orchid, *Caladenia amoena*
Red Cross Spider-orchid, Caladenia cruciformis
Stuart Mill Spider-orchid, Caladenia sp. aff. venusta
Midlands Spider-orchid, caladenia sp. aff. concolour

Current SWIFT projects (South West Integrated Flora and Fauna taskforce)
The Swamp Greenhood, Pterostylis tenuissima
Mellbloms Spider-orchid, Caladenia hastata
Elegant Spider-orchid, Caladenia Formosa
Gorae Leek-orchid, Prasophyllum diversiflorum

Orchid research projects

1. **Sexually deceptive pollination and multiple signal mimicry in orchids (2005-2008)**

Anne Gaskett, PhD project, Behavioural Ecology Lab, Dept. Biological Sciences, Macquarie University, NSW.

Sexually deceptive orchids, such as Australian *Cryptostylis* spp., have floral structures, colours, scents and textures thought to mimic female insects. Male insects that respond by attempting to mate with the orchids' flowers, inadvertently collect and distribute the pollinia. In sexually deceptive systems, a pollinator is usually specific to only one orchid species. *Cryptostylis* is unique because although the five Australian species look remarkably different, they are thought to share a single pollinator, a male Ichneumonid wasp species. I am using *Cryptostylis* orchids to examine the functions of multiple signals (chemical, visual, structural and tactile) in mate choice by the fooled male wasps. I am also interested in the potential costs of sexual deception for pollinators, and the evolution and maintenance of deceptive relationships. This research is supported by a Furniss Foundation/American Orchid Society Fellowship.

2. **Storage of rare and threatened NSW orchid species and their associated mycorrhizae**

John Siemons, The Botanic Gardens Trust, Sydney at Mount Annan Botanic Garden

Website: http://www.hermonslade.org.au/projects/HSF_04_8/hsf_04_8.htm

3. **Developing a reintroduction plan for the Sunshine Diuris, *Diuris fragrantissima.* (2003-2006)**

Zoe Smith, PhD project, Burnley College, The University of Melbourne, and The Royal Botanic Gardens Melbourne, VIC.

Diuris fragrantissima has declined so severely in the last 100 years that only six plants are now known to exist at a single site. A flourishing *ex situ* collection of plants has been cultivated asymbiotically for reintroduction. In order to successfully reintroduce *D. fragrantissima* to the wild, a suitable fungal partner must be located either *in situ*, *ex situ* or from closely related species. Germination trials will determine whether isolates form mycorrhizal symbionts with *D. fragrantissima.* Fungal isolates will be genetically identified by direct sequencing of the ITS region of nuclear DNA. A suitable isolate will be utilised in

reintroduction trials. The taxonomic status of *D. fragrantissima* will be investigated using direct sequencing of the nuclear ITS and chloroplast *trn*T-F and matK regions of DNA, and population genetics and gene flow among *D. fragrantissima* and its closest relatives investigated using AFLPs. Evolutionary relationships between fungal isolates and plant hosts will be investigated as well as fungal persistence *in situ.*

4. **Maximising mycorrhizal efficacy for improved cultivation and reintroduction of *Caladenia tentaculata* (2004-2007)**

Magali Wright, PhD project, Burnley College, The University of Melbourne, and The Royal Botanic Gardens Melbourne, VIC.

5. **Effect of media and fertilisers on the growth of *Pterostylis* spp. and their mycorrhiza (2004)**

Michaela Walsh, Honours Project, Burnley College, The University of Melbourne, and The Royal Botanic Gardens Melbourne, VIC.

6. **Mycorrhizal fungi in *Caladenia* species (2000-2003)**

Tien Huynh, PhD project, Burnley College, The University of Melbourne, and The Royal Botanic Gardens Melbourne, VIC.

7. Weevils feeding on orchids: The amycterine genus Tetralophus

Nick Porch, Geography and Environmental Science, Monash University, Clayton, Vic. 3800.
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The genus Tetralophus Waterhouse currently contains two similar species that are apparently restricted to south-eastern Australia T. sculpuratus (see below) and T. excurusus. Like many genera of amycterine weevils nothing was known of the hosts of this small genus. Recently ll records of the genus in the Australian National Insect Collection (ANIC) and the Museum of Victoria were examined for distribution and host data. Of several dozen records only one had any indication of collection circumstances beyond location. This record "found on flower of orchid" confirmed the suspicion that the genus is restricted to Orchidaceae.

How Can You Help? There are a number of ways. We really know relatively little about the distribution and ecology of these beetles. I'm particularly interested in records of the distribution, hosts and habits of these (and other) beetles on terrestrial orchids. It is possible that other genera of amycterine weevils feed on orchids – we don't know the hosts of most of the genera let alone the species.
1. Specimens – if you can, collect the specimen, record the date and time, the detailed location and notes on the host and what the beetle was doing. This information will help build a detailed picture of the ecology of these weevils.
2. Photographs – I know there are plenty of photographers out there. I have no images of these beetles on their hosts and these would be greatly appreciated if you can get them.
3. Anecdotes about past observations that may have been of these or other beetles would also be useful.
4. Finally, and I shudder at the suggestion knowing the way in which growers treasure their charges, it would be interesting to attempt rearing these weevils on cultivated orchids. First we would need a number of live captured adults (this may be difficult enough to make this an unlikely exercise) and a pot of suitable hosts (probably Thelymitra). I'm happy to chat about this to anyone who would even consider this exercise.

Orchid conservation websites:

www.rbg.vic.gov.au/coc/home - The Cooperative Orchid Conservation Website.
An orchid conservation website set up by the Melbourne Botanic Gardens.
www.dse.vic.gov.au/DSE Department of Sustainability and Environment. Go to this page and then type orchid into the lookup box.
www.bird.net.au South West Integrated Flora Taskforce. Go to this page and then to projects.