Australian Systematic Botany Society

Hansjörg Eichler Scientific Research Fund

Example Grant Application

Based on the successful application made by Claire Marks, University of Melbourne, in 2005. whose kind permission is hereby acknowledged. Personal, budgetary and other details have been changed.

1. Surname: Gates — Member of the Australian Systematic Botany Society?
First names: William — Yes

2. Postal address: School of Botany, University of Alice Springs, PO Box 301, Alice Springs, NT 0871
Email: w.gates@yahoo.com.au
Phone: (08) 1234 5678 — Fax: (08) 2345 6789

3. Occupation and academic qualifications:

3.a Present occupation — PhD student

3.b Qualifications held and year completed — BSc (Honours 1) completed June 2005 (begun 2000 – 18 month break from studies Jan 2003 – Jun 2004 to care for sick mother)

3.c If a student

Degree being studied — Doctor of Philosophy in systematic botany

Year first enrolled — 2006

Proposed completion — 2009

4. Relevant research experience and publications:
Summer employment as field assistant to Dr. F. Glumes, CSIRO grasslands ecologist, during 2004-5. Duties included labeling and pressing specimens and writing up label information.
Honours project on an analysis of variation in the *Solanum orbiculatum* species complex. Awarded 93% on the thesis and 89% on the entire honours year (First Class). A poster on the results of this work was presented at the ASBS conference in Brisbane, November 2005. A paper on the results is in final draft form and will shortly be submitted to Australian Systematic Botany.

5. Supervisor / collaborator (if any):
Primary supervisor: Dr. I. Sprint, School of Botany, University of Alice Springs i.sprint@uas.edu.au (08) 1234 9876
Co-supervisor: Dr. S.L.O. Walker, CSIRO Arid Zone Research Station, Alice Springs

6. Title of project: An assessment of relationships within *Nicotiana* sect. *Suaveolentes* using morphological data.

7. Aims. *Nicotiana* is a worldwide genus of some 86 species, of which 26 are native to Australia. All Australian species belong in Sect. *Suaveolentes*, which has been shown to be monophyletic by the molecular analyses of Aoki & Ito (2000) and Clarkson et al. (2004). This project aims to assemble a non-molecular data base with which to assess relationships within the section, as well as to investigate the biogeography and evolutionary history of the group.
Outline. Burbidge (1960) carried out the first detailed study of Australian native *Nicotiana*, describing 21 species, and commenting that identifications were complicated by marked variations associated with different habitats. Burbidge's specimens still make up a significant proportion of the collections in Australian herbaria. Since then, five additional species have been described and several more populations requiring further study have been identified (D Symon, pers. com.). The molecular analyses conducted on the genus have not included all described Australian species, and have not provided any resolution of relationships within sect. *Suaveolentes*. Many described species are very poorly represented in collections, especially those occurring in arid central Australia. Hence, an augmentation of the collections of these poorly known species, and especially of those already identified as requiring further study to confirm species boundaries, is an essential part of this project.
Methods. 1) Field collections will be made to increase the range of specimens available to assess species concepts and provide a full range of morphological data.
2) Seeds will be collected and grown to investigate seedling characters. This is already underway where seeds are available.
3) Scanning electron microscopy will be used to investigate leaf and stem indumentums, and seed surfaces.
4) Records of chromosome counts will extended by examination of as many populations as possible, since the early work of Goodspeed (1954) showed considerable polyploidy within the section.
5) Further morphological characters will be scored from herbarium specimens and the data used to analyse variation within and between species.
Project timetable. Planning and literature review was completed during June-September 2006.
Seedling growth trials started in August 2006 and will continue as further seeds become available.
The field trip into northern NT will be conducted at the end of the wet season, May-June 2007
The field trip into SA will be done during spring, Sept.-Nov 2007. Shorter collecting trips will be made in conjunction with other students and/or CSIRO botanists in order to reduce field costs.
Data collection should be completed by the end of 2008.
Analyses will start during the second half of 2008 and early 2009.
Write-up will be completed by August 2009.
Funding is requested to permit the full extent of field collecting planned for South Australia.

8. Proposed budget: Hire of 4WD vehicle @ 60c/km for 2000 km = $1,200.00

Estimated fuel consumption 400 lt (50% @ $1.2; 50% @ $1.5)	=	$540.00
Camping permits @ $15/night for 10 nights	=	$150.00
Food/meals allowance @ $35/day for 11 days	=	$385.00
Total expenses	=	$2275.00

Justification: Available funding from university and personal sources will allow field work planned in NT to be carried out. The field trip into SA would permit many more populations to be collected, including several spp. known to require further study: *N*. sp. 'Corunna' west of Port Augusta; *N*. sp. aff. *rostulata* near Tarcoola; *N*. *rostulata* subsp. *rostulata*, *N. occidentalis* subsp. *obliqua*, *N. goodspeedii*, *N. simulans* and *N. velutina*, all with populations close to the Stuart Highway. Collections of these additional taxa would greatly improve the value of the database obtained and make the study of *Nicotiana* much more valuable. Many of the less well collected taxa that will be sampled have not been included in prior studies, and it is planned to obtain silica gel dried leaf samples so that DNA sequence data for these taxa can be added to the existing databases (work to be done by Dr M. Chase, Kew).

9. Amount requested from Hansjörg Eichler Scientific Research Fund ($2000 maximum): Funds requested = $2000. The balance of the cost of the trip will be met from university sources.

10. Names, addresses and telephone numbers of two referees:

(1) Dr. I. Sprint, Dept of Botany, University of Alice Springs, PO Box 301, Alice Springs, NT 0871, (08) 8950 3333

(2) Prof. I.N. Field, Dept of Botany, University of Alice Springs, PO Box 301, Alice Springs, NT 0871 (08) 8950 3456

11. Other research grants currently held and / or applied for:
Science Faculty Field Support Fund – I have applied for $1000 funding to cover some field costs for collections in NT.

12. Institutional support for project: The University of Alice Springs

Signature of institution delegate: Date: 2nd March 2007

I hereby apply for a Hansjörg Eichler Scientific Research Fund Grant and agree to the following conditions:

i) To apply to the project described above any grant monies that are awarded;
ii) To acknowledge said grant in any relevant publication;
iii) To provide a report on the use of the funds to the ASBS within twelve months of the grant being awarded.

Signature of applicant: Date: 5th March 2007

If applicant is a student - the applicant will be carrying out the above research project under my supervision.

Signature of supervisor: Date: 5th March 2007

References:

Aoki S & Ito M (2000) Molecular phylogeny of *Nicotiana* (Solanaceae) based on the nucleotide sequence of *matK* gene. *Pl. Biol.* 2: 316-324.

Burbidge, NT (1960) The Australian species of *Nicotiana* L. (Solanaceae*). Aust. J. Bot.* 8: 342-378.

Clarkson JJ et al. (2004) phylogenetic relationships in *Nicotiana* (Solanaceae) inferred from multiple plastid DNA regions. *Mol. Phylog. Evol.* 33: 75-90.

Goodspeed TH (1954) The genus *Nicotiana*: origins, relationships and evolution of its species in the light of their distribution, morphology and cytogenetics. *Chron. Bot.* 16

Comments: This hypothetical example satisfies the criteria upon which Eichler grants are judged. All aspects of the proposal are fully justified, including an 18 month hiatus during the applicant's undergraduate studies. Detail of the main project is brief and sufficient to put the need for field work in proper context. There is no need for an extensive background and literature review.

While the basic project could still be completed without an Eichler grant (reviewers would ask why the project was started without sufficient funding), a significant extension of the fieldwork component is identified (and properly budgeted) as the element for which funds are requested, and argument is presented that this will greatly improve the scope of the work being done on the genus.

A brief timetable of the main project is given only to show how the collecting trips fit into the full project – ie., that they are sufficiently early. The timing of the trips is obviously organised in an appropriate season for active growth to be in progress, so that a good range of stages should be available. They are of sufficient duration to permit location and collection of a number of taxa. The list of taxa in the region covered by the southern trip demonstrates it to be fully justified without the need for further discussion.

This example reflects one type of research activity suitable for Eichler funding. In other cases funds might be sought to apply additional research techniques within an existing project, which could be justified in terms of the benefit to the student of the increased training provided, as well as the likelihood of new lines of evidence improving the research outcomes. For reports on previous grants consult back issues of the Australian Systematic Botany Society Newsletter.