

Information on Biodiversity Funding

Funding Sources for Graduate Students in Arthropod Biodiversity

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Introduction

One of the greatest obstacles to conducting research in biodiversity is finding a way to pay for it. Because of this, one of the most essential skills for students to develop is the ability to locate and secure funding for graduate and postdoctoral studies, research and travel. This document provides information on some of the available funding sources for graduate study and research in biodiversity, with special reference to terrestrial arthropods.

Even after a source of funding has been located, there is still the matter of getting it. It is surprising and discouraging to see how many students submit poorly prepared applications for funding. One of the reasons for this may be that many students never receive training in grantsmanship. To (hopefully) alleviate this oversight, this document also gives some general advice on the preparation of grant applications. Like all advice regarding money, it should be taken seriously.

Any corrections, additions or comments should be sent to BiologicalSurvey@gmail.com.

General Advice on Preparing Applications

ELIGIBILITY

The two mistakes that many students make is not applying for money that they are eligible for, and applying for money that they are not eligible for.

Some grant funds are never given out because there are not enough applications for the available funds. Do not rely on your supervisor, department or colleagues to tell you about the sources of money available out there. Get used to searching for yourself.

Read the program eligibility guidelines carefully. If a particular source of funding is specifically for studies of nutrition supplements in North Dakota beef cattle, do not assume that they will fund your study of Manitoba grasshoppers on the assumption that North Dakota beef cattle might eat some grasshoppers that blow south. That being said, some sources of funding are so broadly targeted that a wide range of studies can fit within their guidelines. Do not pass up a potential source of support just because the program title seems out of your area at first glance.

INFORMATION AND QUESTIONS

Application instructions are usually relatively clear and unambiguous. However, this is not always the case. If there are ambiguous instructions or requirements it is better to find out than to make the wrong assumption. If there is any doubt, ask (the agency, not your roommate). Most agencies have an email address or web site for questions on the application process. Use them.

PREPARING THE APPLICATION

Follow instructions exactly. The first two words often do not present any problems; many

students have trouble with the word *exactly*. *Must be typed* does not mean *can be printed very neatly using a black pen*. *In ONE page* does not mean *In as few pages as possible*. Using 8 point type to fit into the ONE page will not win you friends either. Details are important in the money game. We may not agree with the rules but it is more productive to follow them. Many applications will be downgraded or rejected if the forms are not filled out correctly; generally the bigger the agency, the tougher the rules.

Give your project or proposal a title. This is not always asked for on applications, but it is important to identify your work and put it in context. Think of your title as a one line abstract that will sell your proposal.

Be clear about what you are asking for. You want money for a specific purpose but the committee will not read between the lines and anticipate why you need it. You have to state your needs clearly to lead the reviewers to the final message. It also helps to show them that you have thought this out yourself. Too many students want the money but are not that clear on why.

Justify everything. Everything you ask for should be clearly justified and placed in the context of the proposal. Every research question should be supported by references to previous work or potential outcomes. Never leave an opening for a critical reviewer to ask *why?* (or worse - *so what?*)

Think about the level of language required in the project description. Funding sources range from national and international scientific agencies to private industry to community groups. This means that your application might be read and reviewed by an established scientist, a middle manager or a volunteer with no scientific background. Different audiences require different terminology and different levels of explanation from technical to layperson's terms. The best way to proceed is to talk to people who have been successful in securing funding from agencies at similar levels and look at their successful proposals.

Cite references. Supporting your statements is just as important in a grant proposal as in a thesis or manuscript. Place your work into the context of previous research and show how your work will advance the field.

Provide a realistic budget. Do not over- or under-estimate expenses. Assume that reviewers either know, or can easily find out, how much it costs to fly to Los Angeles, to stay in a Boston hotel, or feed yourself in the woods. In equipment and material budgets, ask for only what is really needed. You may need chemicals and pipettes, but it's a good bet that your supervisor's lab already has a compound microscope or DNA sequencer. Get quotations, do not just come up with a ballpark figure for how much something should cost (many students are really bad at ballpark figures). Indicate other available sources of funding if the application asks for them (see following section on honesty). Do not assume that you will get more money if you seem desperate; some sources of funding are meant only as supplements to existing support. You need to be realistic to get partial funding.

Be honest. It is amazing how quickly information can move through the scientific community. Honesty is especially important when indicating other sources of funding (see above) or your current financial status, but it also applies to your ability to do the work, the proposed time frame, the importance to your thesis, etc. In general, assume that the people reading your application have been playing this game a lot longer than you have and that they have seen all the tricks.

Letters of reference are important. An excellent letter of reference can give you a definite edge in a competition, while a lukewarm one can take you out of the running. Although it can be a delicate issue, make sure that the people writing your letters are going to help your cause. Generic letters are next to useless; a letter should be specific to the application, and specific to your qualifications. Any specific questions asked of reviewers on the application should be addressed directly.

Proofreading is vital. There is absolutely no excuse for typographical or grammatical errors in a

grant application. Never rely on a computer spell checker (For example, a spell checker will not make a distinction between *form from* and *farm*, or between *flies* and *files*). Some reviewers will reject applications with errors, the assumption being that if you can't get this part right, how can you do research?

Finish your proposal and application early enough to have it reviewed. It is much better (and potentially less costly) to have your supervisor or colleagues find the errors and inconsistencies than the grants committee. Take criticism objectively and use it to improve your application.

Make sure that the application package is complete. It is surprising how many applicants omit required sections of applications. Transcripts, budget estimates, letters of reference, etc. are all essential parts of the package if they are requested. Many applications are rejected immediately if they are incomplete. Read the instructions carefully and include everything that is listed. Allow enough time to get transcripts and letters of reference.

BUDGETING YOUR TIME

Some applications take a lot of time and effort. Make your investment appropriate to the size of the grant. Do not spend weeks crafting an application for a \$100 grant; your time is more valuable than that. By the same token, spend enough time and effort on the larger programs.

The worst thing that you can do is fill in the package at the last minute. Applications completed in a hurry are sometimes incomplete, usually incorporate errors, and are almost always not as clear as they could be. Reviewers can spot the hastily prepared applications. Always take the time to do the job right, and never underestimate the time it will take to fill out an application. This is especially true of online applications or complex forms.

Deadlines are real. Do not assume that the committee will be sympathetic to your exam schedule or your computer virus problems. Late applications often go directly from mailbox to recycling bin. If you are pushing a deadline, find out whether originals or FAX copies are acceptable. Sometimes, original signatures are required.

Searching for Sources of Funding

There are far more sources of money out there than most students realize, and many strategies for finding them. This section includes some general advice on locating these sources, and information on two very comprehensive search engines that most university students have access to.

ONLINE SEARCHES AND AWARDS DATABASES

One of the best ways to find sources of funding is to use one of the online sources that are available. Most universities subscribe to at least one of these sources and users, including students, can create customized search profiles that are specific to their interests. Remember that search engines are never as flexible or forgiving as the human mind, so when you are searching for funding sources try different combinations of keywords in successive searches. A slight change in many of these databases will usually return very different information.

Most university research grants offices or graduate studies offices have award guides or lists of available funding sources. These should be easy to locate on the university's web site. Most universities will also have a direct link to other funding search engines like those described below.

Community Of Science Funding Opportunities. This section of the Community of Science site (<http://www.cos.com>) is a searchable online database of

funding sources in many scientific fields. Sources of funding open to established researchers, postdoctoral researchers, graduate students, undergraduates and many other groups or individuals are listed and your status as a student can be included in the search parameters. Custom profiles and specific searches can be done relatively easily. This is an excellent place to start.

Contact: <http://fundingopps2.cos.com/>

SPIN 2000 Database. This is part of the Infoed site. It is very similar to the Community of Science site and has many of the same search features and funding sources. However, the two databases will often return different information on the same searches so trying both is advisable if you have access to both.

Contact: http://www.infoed.org/new_spin/spin.asp

Specific Sources of Funding

This section gives details on some specific funding sources. The list is divided into four categories: Scholarships and Fellowships; Funding for Museum Visits; Funding for Research, Fieldwork and Travel; and Other Potential Funding Sources. The list is obviously not exhaustive. It is meant as an overview of some of the available sources of support, as well as some strategies for finding other sources. Many other societies, institutions, government agencies and non-governmental organizations have similar programs. The databases listed above will help you find some of those other sources.

SCHOLARSHIPS AND FELLOWSHIPS

Funding sources in this section provide scholarships and fellowships for graduate students. Most of these sources are for living expenses, etc. rather than research support. Each university will have its own internal list of scholarships, fellowships and awards and students should search these lists thoroughly. Some internal university awards are not awarded in some years because nobody bothers to apply. Do not perpetuate this trend. Universities will also generally have information and contact addresses on external sources available to students. This section summarizes some of the major sources of funding available to all students, as well as some sources specific to entomology or biodiversity.

Natural Sciences And Engineering Research Council Of Canada (NSERC)

Postgraduate Awards - Scholarships for support of M.Sc. or Ph.D. studies in all fields of science and engineering. Awarded on the basis of academic merit and research potential.

<http://www.nserc-crsng.gc.ca/>

NSERC Supplements Program - NSERC offers annual supplements through institutional and university partners to encourage superior students to pursue graduate studies in selected disciplines. The Canadian Forest Service Supplements or Systematics Research Graduate Supplements may be of interest to entomology students. <http://www.nserc-crsng.gc.ca/>

Provincial Scholarship Programs - Some provinces have graduate scholarship programs similar to the federal NSERC program. Programs like FCAR in Quebec and OGS in Ontario provide funding to graduate students from those provinces.

Contact: Graduate Awards office at your university.

Entomological Society Of Canada Postgraduate Awards - Two awards of \$2000 given annually to Canadian students in the first year of postgraduate studies in entomology.

<http://www.esc-sec.ca/postgrad.html>

Entomological Society Of Canada Biological Survey Of Canada Scholarship - One

award of \$1000 given in alternate years to a Canadian post-graduate student carrying out a project on insect or terrestrial arthropod faunistics in a Canadian habitat.

<http://www.esc-sec.ca/bscschol.html>

Entomological Society Of Canada Keith Kevan Scholarship - One award given in alternate years to a Canadian graduate student pursuing studies in insect systematics.

<http://www.esc-sec.ca/kevan.html>

Entomological Society Of Alberta Undergraduate Award In Entomology - An annual award of \$500 given by the ESA to an undergraduate student from a post-secondary institution in Alberta in recognition of academic achievements in entomology.

<http://www.biology.ualberta.ca/courses.hp/esa/student.htm>

Brooks Scholarship - One award of \$500 offered annually by the Entomological Society of Saskatchewan to a graduate student in entomology in the province of Saskatchewan.

<http://www.usask.ca/biology/ess/ESS.html>

Entomological Foundation Undergraduate Scholarship - A number of annual scholarships sponsored by BioQuip Products (US\$2000) and The Entomological Foundation (US\$1500) given to undergraduate students from the USA, Canada or Mexico with a demonstrated interest in entomology.

http://www.entfdn.org/awards_scholar_fellow.php

Snodgrass Memorial Research Award - Sponsored by the Entomological Foundation. Given annually to a graduate student who has completed a thesis in the fields of arthropod morphology, systematics, taxonomy or evolution at a recognized university.

<http://www.entsoc.org/awards/student/snodgrass.htm>

Wildlife Habitat Canada Graduate Scholarship Awards - Scholarship support for M.Sc. and Ph.D. level students conducting graduate research in the conservation of wildlife habitat. Students are strongly advised to contact Wildlife Habitat Canada prior to applying to ensure that their proposed projects are eligible for the program.

<http://www.whc.org>

Macnaughton Conservation Scholarship - World Wildlife Fund Canada. Graduate scholarship for a M.Sc. or Ph.D. student whose research deals directly with the conservation of plants or animals at risk in Canada, or a wild habitat recognized by the WWF as a priority for protection.

<http://www.wwf.ca>

FUNDING FOR MUSEUM VISITS

Several museums have funding programs to support visits by students or other researchers to their collections. Students wishing to visit a particular institution to conduct research may have access to these programs. A few examples of museum programs are listed below; students planning to visit other museums should enquire about similar programs at those institutions. Many institutions will help to defray travel costs in return for authoritative curation of part of their collections.

The Canacoll Foundation - An independent, non-profit organization that provides grants for research on the Canadian National Collection of Insects, Arachnids and Nematodes.

<http://www.canacoll.org/>

American Museum Of Natural History Collection Study Grants - Financial assistance up to US\$500 to assist predoctoral and recent postdoctoral scientists to study the collections of the AMNH.

<http://research.amnh.org/grants/grantsprog.html>

Jessup Awards (Academy Of Natural Sciences Of Philadelphia) - Financial assistance to cover travel and living costs for predoctoral or recent postdoctoral graduates who wish to conduct studies in the collections of the ANSP.

Contact: Curator or research scientists in area of interest at ANSP.

Smithsonian Institution - Several sources of funding are available to graduate students, predoctoral and postdoctoral researchers wishing to conduct research in the collections of the Smithsonian Institution and National Museum of Natural History.

Contact: <http://www.si.edu/ofg/start.htm>

FUNDING FOR RESEARCH, FIELDWORK AND TRAVEL

Sources in this section cover a broader range of activities, including laboratory and field research, conference travel, etc. The requirements, eligibility, size and focus of these programs vary widely. Check the individual programs for further details.

NSERC Undergraduate Student Research Awards - These awards are available to undergraduate students who wish to gain research experience in a university or industry laboratory. They provide up to 4 months of summer research experience.

<http://www.nserc-crsng.gc.ca/>

Entomological Society Of Canada Graduate Research-Travel Grants - Two awards of up to \$2000 annually given to allow students to undertake research or course work relevant to their thesis that could not be carried out at their own institution.

<http://www.esc-sec.ca/travel.html>

Entomological Society Of British Columbia Graduate Student Scholarships -

Two awards annually of \$500 to allow graduate student members of the ESBC to attend conferences other than the ESBC Annual Meeting to present research papers or posters.

<http://www.sfu.ca/biology/esbc/>

Entomological Society Of Alberta Student Travel Grants - Grants to defray the costs of attending the Entomological Society of Alberta annual meeting for student members of the ESA.

<http://www.biology.ualberta.ca/courses.hp/esa/student.htm>

Entomological Society Of Ontario Student Travel Grants - Grants to allow graduate students to attend the Entomological Society of Ontario annual meeting.

<http://www.entsocont.com/>

The Nature Discovery Fund - Grants of \$500-\$3000 in support of efforts to discover and name Canada's insect biodiversity. Grants are available for fieldwork to collect specimens in poorly known regions or habitats, or for completion and publication of existing projects. This program is administered by the Canadian Museum of

Nature. http://www.nature.ca/research/ndfund/ndfund_e.cfm

Theodore Roosevelt Memorial Grants - Administered by the American Museum of Natural History. Support to individuals for research on North American fauna in any phase of wildlife conservation or natural history related to the activities of the AMNH.

<http://researchfunding.duke.edu/detail.asp?OppID=3160>

AINA Grants In Aid - Arctic Institute of North America. Support up to \$500 for young researchers, including graduate students, to defray the costs of research in the north.

http://www.arctic.ucalgary.ca/index.php?page=scholarships_awards_grants

Jennifer Robinson Memorial Scholarship - Arctic Institute of North America. \$5000 scholarship given annually to a graduate student in northern biology. May be used to defray the costs of research.

http://www.arctic.ucalgary.ca/index.php?page=scholarships_awards_grants

Lorraine Allison Scholarship - Arctic Institute of North America. \$2000 scholarship given annually to a graduate student conducting research related to northern issues (including northern biology). http://www.arctic.ucalgary.ca/index.php?page=scholarships_awards_grants

Northern Scientific Training Program - Administered by the Northern Studies Committee

at selected Canadian Universities on behalf of the Department of Indian Affairs and Northern Development. Support up to \$3000 for graduate students or senior undergraduates to defray the costs of research in the north.

<http://www.ainc-inac.gc.ca/nth/st/nstp/index-eng.asp>

Fondation de la faune du Québec - Funding to researchers and groups (including graduate students) for projects on conservation, biodiversity and related areas in Quebec.

<http://www.fondationdelafaune.qc.ca/>

National Geographic Society - Research grants are given to established researchers for projects related to the general interests of the Society. Although graduate students are eligible to apply as principal investigators, the success rate is very low. Postdoctoral researchers are eligible to apply. <http://www.nationalgeographic.com/research/grant/rg1.html>

Dipterology Fund Student Research Travel Grants - Up to four grants of \$1000 each year for support of field work, museum visits or conference travel by students of North American Dipterology. Preference is given to studies in whole-organism biology including systematics, faunistics and ecology.

Contact: Dr. T. A. Wheeler, Chair of Grants Committee, <terry.wheeler@mcgill.ca>

OTHER POTENTIAL FUNDING SOURCES

Most established researchers have realized that it is necessary to explore non-traditional sources of funding to support research projects. Graduate students have had some success with this route as well. A few non-traditional sources of funding are listed here. Contacts with these groups may require dealing with local representatives, regional offices, etc. It is sometimes necessary to do some legwork to find the right person to talk to. This is usually frustrating, but can be very financially rewarding.

The Nature Conservancy - Best known for efforts to purchase and preserve threatened habitats, The Nature Conservancy also funds research, including graduate student projects on biodiversity in priority habitats. Local offices of The Nature Conservancy Canada are a logical place to start to explore funding possibilities. Students in areas of Canada adjoining the USA may have some success contacting The Nature Conservancy south of the border. At least one graduate project in Canada has been partly funded by The Nature Conservancy in Michigan.

<http://www.natureconservancy.ca>

Conservation Groups - National, provincial and regional conservation and naturalists groups often have pools of money available for research, especially in threatened habitats or species. Some of these groups have a history of supporting biodiversity and conservation research. Some leg work would be required in finding these connections but they might be fruitful.

Contact: Search websites and newsletters of conservation and naturalists group to see recent and ongoing activities in support of research. Contact organizers or directors.

Industry, Growers Groups, Producers Groups - Many members of the private sector are becoming more research-friendly. There are several examples of industry money funding biodiversity research across the country in recent years. Forestry, mining, ranching, crop production interests all can be convinced, with the proper presentation of the potential benefits to supporting research relevant to their activities, whether in rehabilitation, increasing sustainability, impact assessment, etc.

Contact: Find someone who has been active in pursuing industry funding. Find out what they did. Do more legwork

