

Integrating Research Grants: An effective tool for integrating the taxonomic work force

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EDIT Work Package 2 introduced the Integrating Research Grant (IRG) in 2008 to promote the integration of research in the fields of systematic and descriptive biology - two disciplines that work on sorting out the evolutionary relationships among species and on naming and describing them. These areas have for a long time found it very hard to receive funding, especially in competition with new advancing disciplines within molecular and applied biology.

EDIT has therefore been very happy to be able to fund skillful and dedicated scientists in pursuit of describing and classifying the overwhelming biodiversity of this planet and the IRG has by now awarded funding to several high-quality taxonomic and systematic projects. A good example is one lead by Jeremy Miller of the Netherlands Centre for Biodiversity Naturalis (Leiden) and Nikolaj Scharff of the Natural History Museum of Denmark (Copenhagen). They have gathered a group of arachnologists which include both the renowned capacities Charles Griswold of the California Academy of Sciences in San Francisco and Milan Řezáč of the Crop research institute (Prague) as well as the young scientist Mohammad Marhabaie of Akron University in the United States. This group was awarded an IRG in May 2010 for their project to do a systematic revision of the spider family Eresidae, commonly known as the velvet spiders.

The content of the project

The project is very comprehensive and includes microscopy, especially the Scanning Electron Microscope (SEM), which allows for examination of microstructures by enlarging to ten thousand times or even more in some cases, phylogenetic analyses, molecular work to match males with females of some species, scientific drawing and documentation by photo-microscopy and collection of specimens in Tanzania. In addition to making the results available through traditional scientific publication, the group will also contribute cybertaxonomic content to established



Fig. 1. Photo-micrograph showing frontal view of *Paradonea spendens*, one the many intriguing spiders included in the velvet spider project.

websites such as Encyclopedia of Life (EOL), (an online encyclopedia with species descriptions), Morphbank, (a website where images of anatomical structures and forms can be deposited), and the Global Biodiversity Infrastructure Facility (GBIF) (an internet portal for scientific biodiversity data).

Why choose velvet spiders?

Jeremy Miller originally came up with the idea to establish a project on the eresid spiders. He had been working together with Charles Griswold and Milan Řezáč on another project on an enigmatic subfamily of spiders that used to be included in the family of velvet spiders. However, it turned out that these spiders did not belong to the velvet spiders and Miller and colleagues promoted them to family rank, giving them the scientific name Penestomidae.

But as typically happens in science, answering one question and gaining new knowledge seems to raise new questions and in this case the investigation into the familial relationship of the velvet spiders created a need for clarifying the circumscription of this family. Another phenomenon that makes these spiders particularly interesting to scientists is that they seem to have evolved sociality several times independently. It may be surprising, but sociality is not a common phenomenon in nature, even though some of the species displaying sociality (ants, for example) are very easily seen as they typically occur in great numbers. In a group such as spiders, which is well known for being solitary to a degree where the females eat males, the evolution of sociality therefore becomes very intriguing.



Fig. 2. SEM picture showing a spigots of a species belonging to the African genus *Gandanameno*. Spiders extrude their silk through these small spigots.

Integration

Jeremy and Nikolaj have never collaborated on a paper before this project, but as a professional relationship has now been established the prospects for future collaboration are very high. Mohammad Marhabaie has benefitted from the opportunity to work with and being trained by established specialists and is now about to begin his Ph. D. program at the University of Akron in Ohio, U.S.A. Furthermore, he is even forming a society of Iranian arachnology together with fellow arachnologist Majid Moradmand. So, in addition to the scientific output, this projects is also establishing new connections among the scientists involved and are thereby implementing one of the key objectives of EDIT and the IRG, namely to integrate the taxonomic work force.

Links to other projects mentioned in the article

Morphbank <http://www.morphbank.net>
 Encyclopedia of Life (EOL) <http://www.eol.org/>
 Global Biodiversity Information facility (GBIF) <http://data.gbif./welcome.htm>

FACT BOX

EDIT Work Package 2 established the Integrating Research Grant (IRG) as a funding tool to support international collaborative research projects in systematic and revisionary biology. This funding tool was implemented in 2008, and grants were also awarded in 2009 and 2010.

Applications for IRG were evaluated by a panel of reserachers, who scored each one according to the following criteria

- Degree to which the project advanced EDIT's goals
- Quality of the proposed research project
- Research qualifications of the applicants
- Justification of the items applied for
- Degree of justified use of EDIT products

In 2008, nine out of thirteen applications were successful. The total amount awarded was 10.000 EUR.

In 2009, six out of thirteen applications were successful. The total amount awarded was 100.000 EUR.

In 2010, six out of twenty applications were successful. The total amount awarded was 100.000 EUR.