



Ethnobotanical Leaflets



A Call for an Economic Botany/Ethnobotany Cluster at NSF

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For several years there have been attempts by a number of Presidents and past Presidents of the Society for Economic Botany to have NSF (National Science Foundation) put more resources into economic botany and ethnobotany. Though some improvements have been made in the form of more consideration for a few projects from individual funding clusters, there are a number of obstacles that continue to cause worthwhile projects in these disciplines to fall between the cracks. This editorial urges NSF staff to support efforts to produce a cluster within Biology to support work in these disciplines and urges established economic botanists and ethnobotanists to actively support this goal at this time.

NSF is and should remain, an institution which funds new ideas in science with an emphasis on basic over applied research. It is in part for this reason that medical research is left in the hands of the NIH (National Institutes for Health) and agricultural research is the primary concern of the USDA (United States Department of Agriculture). There is a perception that economic botany should be covered by USDA and ethnobotany is concerned exclusively with pharmaceutical plant research, and therefore is entirely within the jurisdiction of NIH. But in actuality, both disciplines are often far broader than the missions of any one of these agencies. As a result there is little available for most of the basic research needed within economic or ethnobotany beyond large scale agriculture.

In truth economic botany includes agriculture in its broadest sense. Much work is required on wild relatives of crop and other useful plants, including those which are of use in small scale efforts to maintain communities and protect ecosystems. Much work is needed on interactions between wild and human landscapes in order to better understand both. This understanding is the first step to designing effective protection of both economic and natural systems. Though the fusion of such information into a protection plan or community development project may well belong in a forestry management or community development program, the underlying research is often too basic and time consuming to be practically covered at that scale.

Currently, USDA policy focuses narrowly on large scale agricultural crops and is following NSF's lead in emphasizing molecular studies over other methods of investigation. This in spite of public relations efforts in the past year which have celebrated USDA's past efforts in plant exploration. Much lip service

is given to environmental and social impact, but not actual dollar consideration at either agency. NIH is too narrowly focused on human medicine exclusively to meet these requirements either.

The genomic plant work at both NSF and USDA is primarily focused on *Arabidopsis* and a few model systems for the purpose of solving questions in molecular and cellular biology. Systematics work is primarily aimed at world-wide monographs of a narrow group of taxa. All of these are important areas in basic research, but often when ethnobotanists attempt to find funding to do field and lab work on more obscure but useful species with an eye to impact on regional or specific human communities and adjacent wild ecosystems, the cracks are too wide.

Funding has increased for ecosystem protection involving human systems from private agencies, but not for the underlying basic research on taxonomic problems, population biology questions and other information needed to make the right decisions to enable success of these efforts. There is money for germplasm work at both USDA and NSF, but both are currently emphasizing a few species of major crop plants such as corn, wheat and rice, and recommendations for work into the next decade seem to continue in this vein, as evidenced by the contents of the PCAST report (see [Fall 1999 issue of Ethnobotanical Leaflets](#)).

Individual projects which might be best served by ethnobotanists with a strong background in culture and biology and their interactions, are frequently either unfunded or end up under the auspices of researchers with little prior experience or concern for the human component and impact on the natural systems which they study, except in the most negative sense. This is particularly disturbing when it is the positive potential of the human component, both impact on and by humans, which is used to raise public and legislative interest in funding such projects in the first place.

This funding hole is not only a problem for individual researchers. It is a problem for the maintenance of economic and ethnobotany within the academic fold. A handful of ecologists and systematists have obtained some funding for themselves and less frequently for their students within the auspices of existing clusters within biology at NSF. For the most part this does not translate to much field experience for the students, who frequently end up sequencing in the laboratory while only the advisor spends any significant time in the field. This often occurs even when students obtain their own funds. A look at all of the NSF funding for systematic plant biology of any kind at NSF's website for the past two years shows that in every case, obtaining molecular characters was claimed to be the mainstay of the project, even where morphological and field work are included. That's fine when molecular characters are most likely to lead to the answers being sought, but some of the plants needing attention from ethnobotanists are so unclear in terms of what constitutes a species, that choosing species for a representative molecular sampling is premature. Current technology is too ponderous to efficiently process reliable molecular sample sizes where species are not clearly delineated and within sufficient time to complete work for a particular grant. Where species are poorly delineated morphologically, reliable results cannot be obtained within such a timetable or often even within the timetable allotted for an advanced degree. This difficulty in clearly establishing the lines for most species within a group is often the direct result of human manipulation of the plant and the effect of escaped cultivars interacting

with wild types. Thus it is not an infrequent problem for the ethnobotanist.

Also, often for ethnobotanical projects it is the establishment of an accurate field and herbarium key that is of greater importance than establishing molecular characters or clades. Surely when this is the case it should be alright to say so and still have funds made available. Instead a situation is arising where many students and even some advisors think of molecular biology as the first step to obtaining any funding for any project in systematic plant biology in spite of the fact that every one knows that good research should be based on questions, and not technique driven. Much of conventional sequencing involves time-consuming mastering of specific techniques in specific technical systems, even for specific instruments, which can easily take the entire time allotted for research when developing a graduate student at the Ph. D. level, let alone at the M.A. level. This leaves insufficient time for students to develop the field and herbarium skills needed to wisely interpret molecular data. On top of that many of these techniques will soon be obsolete with the advent of new technology.

NSF's PEET (Program for Enhancing Expertise in Taxonomy) initiative, designed to correct the lack of funding for training taxonomists, still emphasizes molecular data over morphological, and a world-wide monograph approach, not usually practical for the needs of ethnobotanists. Also there are more likely to be opportunities to master molecular techniques through post doc, workshop, and visiting scholar opportunities after graduate school, but few opportunities after graduate school to experience the kind of mentoring needed to master field and herbarium skills in taxonomy. This has been further exasperated by the lack of qualified taxonomists which gave birth to the PEET project in the first place. It will be years before past neglect of systematics and taxonomy can be fully repaired within universities.

It is ironic that the "business-decision" mentality within academia which has done so much harm to traditional field and herbarium work, now fails to recognize the windfall of students coming to biology precisely because they want to learn about ethnobotany and economic botany. Every professor who participates in meetings of the Society for Economic Botany whom has spoken with this author on this topic, tells of being inundated with requests from students wanting to study these disciplines and of having to turn away promising students for lack of time, space and funds.

Yet few biology or plant science programs are replacing ethnobotanists when they retire, let alone considering creating positions for persons with these interests, in spite of pressure to get enrollments up in these programs.

This author believes that this is due to a perception, often accurate, that there is not a steady funding source for these disciplines and that the funding that is out there is often mired in controversy. The current consortium of a small number of programs that exists off a mixture of funds from both private and public sources is viewed with suspicion due to the heavy emphasis on dollars from the pharmaceutical industry, even where NIH money is also involved. Pharmaceutical money is of use, but cannot escape the pharmaceutical industry's own necessary agenda, which is to make money to replenish research dollars, and a corporate outlook of ownership and control of any useful information to emerge from the studies. This has contributed greatly to suspicion between indigenous communities, foreign

governments and researchers and has stifled a number of projects. If a stable, politically neutral funding source for basic research could be found for economic and ethnobotany, surely biology departments would welcome those best suited to compete for these dollars.

Biologists claim to care about the environment. They cannot save the planet without an informed and willing public which recognizes their own interest in maintaining healthy wild ecosystems and which is willingly committed to finding a functioning balance between use and protection of wild resources. Economic and ethnobotany is being sought by graduate and undergraduates students of all disciplines as the area in which they want to learn more about this during their experience in higher education. The general public is increasingly voicing support for greater dissemination of accurate information on useful plants, a major stepping stone to developing in that public an understanding of the importance of protecting wild resources broadly.

NSF has just been granted its largest budget ever as part of an effort to step up funding in research generally in response to the new, technologically driven economy and in recognition of the need for research to find environmentally sound ways to keep the economy growing. Thus there has not been a better time to find the money to correct these problems.

In the opinion of this writer, the hiring of more people qualified to teach and do research in these disciplines will not occur within the current academic atmosphere in universities until there is a stable funding source for academic research in these disciplines. This writer urges the powers that be at the National Science Foundation to recognize this problem and take action to correct it, and those interested in ethnobotany and economic botany to willingly work toward the goal of stable funding sources for present and future generations of scientists in these disciplines. Usually the first step to developing any new cluster at NSF is for the agency to make funds available for meetings and discussion in the area of interest. Hopefully the Society for Economic Botany will move to take the steps necessary to request those meetings and NSF will be receptive to facilitating the process. A cluster for ethnobotany and economic botany could be operating at NSF within five years if the will to have it could be found both within and outside the agency.

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