

## RESOURCES FOR INVENTORYING PLANTS IN THE SOUTHEAST ASIAN TROPICS: PLANS FOR THE FUTURE.

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We aimed to cover two issues in this workshop; the third arose during the course of the discussion:

1. The need for an increased rate of collecting in the Southeast Asian tropical area ('Malesia' for short) if taxonomic decisions in the 'Flora Malesiana' and other taxonomic projects are to be soundly based and, more generally, if there are to be materials adequate for the future needs of taxonomy.
2. The likelihood that any attempt to increase collecting, or even simply to continue collecting at the present rate, without paying adequate attention to the distribution, mounting, and preservation of the specimens will be an ineffective use of scarce resources.
3. We have to consider how we justify the need for more collecting and the importance of the general maintenance of collections, and also how we can develop the general motivation and education of herbarium staff.

In connection with the first issue, there was no discussion of specific areas to be targeted for collection, or of conservation; both matters were covered in other sessions. Most of the discussion covered problems that are common to institutions throughout the world; institutions in more temperate climates suffer from dermestid infestations, infestations which, if unchecked, can render much of a collection worthless. But the problems can quickly be compounded in the tropics, where a combination of climate, inadequate buildings and cabinets, and lack of funding to meet running costs may cause a remarkably speedy destruction of valuable collections.

The following points are a distillation of the comments made during the workshop:

1. There is a generally acknowledged need for more collections. The rate of collecting in Malesia as compared with that in the Neotropics is low; collecting rate in many parts of Malesia has declined over the last ten years. Institutions involved in the writing of floras cannot divert some of their already scarce staff time to collecting; institutions both inside and outside Malesia have insufficient support staff which means that scientific staff are diverted from their proper duties, which include collecting; most institutions have relatively modest funds earmarked for collecting. We have to identify sources of new funds if there is to be an appreciable increase in collecting.

2. Collecting by itself, and even the formal taxonomic work based on the collections, is seen as being inadequate justification for requesting increased funding. For instance, forestry used to be the justification for collecting and taxonomic research in Malesia, and now the needs of agriculturists and horticulturists can be united under the umbrella of germplasm resources to provide the needed justification. Good projects in conservation and applied research generally will be able to tap into new sources of money. Collecting should be built in as an integral part of these projects
3. Collecting can be most usefully carried out by people who stay in one place and who become intimately familiar with an area; large expeditions are not necessarily an efficient way to use scarce resources. Few people collect in logging areas; however, these can be very productive for the collector. Even if such sites are slated for eventual forest conversion, the record of variability that the collections represent will be invaluable for future studies. We have to maximise the resources available in terms of numbers of areas visited and intensity with which the flora of any area is sampled.
4. If we are building a global resource, we cannot expect institutions which properly have more local interests always to be able to cater to these global needs. Collecting additional specimens places burdens on institutions worldwide, but not least on the host institution. Well-curated herbaria are vital for the more applied needs of the biological community.
5. The ideal institutional structure for the preservation of collections is a matter of some concern. In Indonesia there is one major active taxonomic center and not too much else; scaled down activities at smaller herbaria is desirable. In Malaysia there has been an increase in the number of herbaria, although there is no national herbarium. However, the maintenance of collections even at large herbaria presents a problem, witness the rather recent problems experienced in Lae. Smaller herbaria and collections can become moribund much more easily without the general botanical community being aware of their problems. To the extent that unique collections are lost, irreparable damage results.
6. Money for only slightly out-of-the-ordinary herbarium operations is often lacking, and this problem in a few cases extends to their daily operations. The cost of both sending and receiving loans may pose a particular problem for smaller institutions; some larger institutions are sending loans via diplomatic channels because of the costs involved. Adding an amount to cover overheads for the Malesian collaborating institution when writing grant proposals is one way of helping with these vital basic operations.

7. There was a widespread feeling that junior staff were not getting proper training and that work in the neotropics was seen as being more glamorous and so luring the better students away. Curatorial staff need to be adequately motivated and involved in the excitement of research; this greatly helps to build up a strong institution. Training for research taxonomists includes field experience, and this aspect of their training would be addressed by increased resources for collecting. Academic training of taxonomists has been covered by a variety of courses at the diploma, Master's and Ph.D. levels, as well as the courses such as that recently run by Leiden at Bogor. Training for non-research curatorial staff has also been addressed by a variety of programs, including that recently begun by Kew. Such programs should be strengthened, although international funding may be necessary. Furthermore, taxonomic education should not be seen as ending with an advanced degree, but should be a continuing process fostered by travel and exchange of staff. Fellowships that pay accommodation and local expenses are a relatively inexpensive way of enabling taxonomists to travel more widely and so broaden their taxonomic backgrounds.
8. There is a tension between collecting and monographing or floristic work. This is evident both at the institutional level where collecting can be seen as a diversion of the efforts of those properly writing a flora, and at the personal level, where collecting can be seen to be unproductive if advancement is measured in terms of publications. Collecting by specialists is in some groups essential and very often yields material of great interest, but such collecting perforce focuses on only part of the vegetation.
9. Collaborative networks are well established in Malesian botany, and there is a general eagerness to collaborate because of the perceived benefit to all concerned. However, what is quite often lacking is the means, both financial and manpower, to collaborate, or to deal with the results of the collaboration (e.g., specimens). It is essential to build up all collaborating institutions in terms both of material and personnel resources. Widespread dissemination both of expertise and plant materials is the surest way to ensure the health of Malesian botany.

The following five recommendations that represented consensus expressed during the meeting of the whole workshop were endorsed by the plenary session:

1. *The rate of botanical collecting in Malesia needs to be increased* if future taxonomic decisions made in the 'Flora Malesiana' are to be soundly based on a representative sample of existing biological variation, and the growth of plant systematics into the twentieth century is to be ensured.

2. *Shortage of manpower, material and/or space are seriously affecting many herbaria worldwide.* Collecting programs which do not address the problems of documentation, mounting, distribution and preservation of specimens are not likely to function efficiently.
3. *Education, field training and motivation of participating staff should be an integral part of future collecting programs.*
4. *There is a need for close communication and collaboration between systematic institutions and applied biologists* if data resulting from collection programs are to be effectively utilised.
5. *The establishment of new collecting programs should not result in the slowing down of existing monographic work, or delay the completion of the 'Flora Malesiana'.* Additional resources will be required.