

IBPGR

I B P G R

REPORT

"In-house" review on the collection  
of the wild species relatives of  
major crop plants"

Rome 8 - 11 December 1986



**International Board for Plant Genetic Resources**

## Contents

	<u>Pages</u>
1. Report	1
2. Recommendations	9
3. Appendices	
1. Agenda of meeting	
2. Identification of wild relatives in the field. Dr. G. Ladizinsky.	
3. The use of ecological data in the collection of wild species. Dr. G. Ladizinsky	
4. Eco-geographic surveys. Mr. Brent Ingram	
5. <u>In-vitro</u> collecting methods. Dr. L. Withers	
6. Practical problems in collecting wild plant species. Dr. G. Ayad.	
7. List of conclusions and recommendations on both policy and management issues collectively prepared by the in house review.	
8. List of participants	

IBPGR IN-HOUSE REVIEW ON THE PROBLEMS OF COLLECTING WILD SPECIES

"ECOGEOGRAPHIC SURVEYS"

BRENT INGRAM

Collecting wild species

Introduction

The term "Ecogeographic Survey" is an overly shortened and jumbled expression for something far more specific.

"Ecogeographic Survey" = surveys of geographically and ecologically related genetic variation.

Geographic refers to the spatial dimensions of selection factors, particularly those detectable at the broader scales (across continents and regions, and including such parameters as climate, geomorphology, soil and land use.

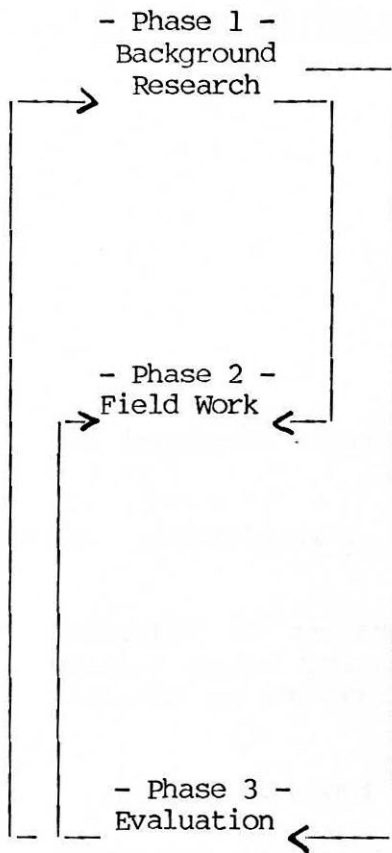
Ecological refers to a number of different types of factors.

- microhabitat variation within the broader spatial parameters (factors which often can not be mapped and can not be detected without field work)
- ecological variation over time: successional and disturbance factors
- specific biological relationships: pollinators, mutualisms, pests, disease

Related is a rather key word in this definition. An ecogeographical survey is concerned with active selection factors. However, these do not create alleles, genotypes, genomes and species but only maintain and destroy them.

Genetic variation refers to 3 levels: the intra-specific, the inter-specific and occasionally the inter-genetic. Much of the work of the IBPGR is concerned with genetic variation within a small number of species. However, where taxonomy and systematics are unclear, the search for priority genetic material can extend to many other species and to other genera. In addition, some genepools are particularly expansive, such as for sugar cane, and include a number of genera.

### Components of Surveys



- select species
- taxonomic clarification
- compilation of occurrence data

#### Select areas

- compilation of data and maps for each parameter (from published material)
- creation of a check list and identification of gaps in information to be filled through contact with specialists.

- visits to documented populations (if they still survive)
- visits to various "ecogeographic" zones in supposed species distribution
- verification of the supposed species distribution for particular areas and possible expansion of field work to include additional areas
- for each population visited, detailed sampling of possible, micro-habitat variation.

- compilation of passport and "ecogeographic" data into a computerized data base with a mapping facility
- ex situ "growing out" of material
- correlation of genotypic variation with particular sets of factors
- making the data base workable and accessible to breeders for the choice of samples for use in specific breeding programmes.

In extended programmes, the results of the initial evaluation phase might suggest the need for additional field work and more intensive study of certain parameters.

### Development of Surveys

There is, of course, more than one way to undertake a survey. surveys involving different sets of species, ecogeographic factors and projected needs for conservation and utilization of germplasm will probably be very different to one another. The following is a flow chart of the kinds of decisions which need to be made and the factors which influence them.

Choice of species and areas



Level of detail



Methods for field work



monitoring, conservation utilization



Evaluation

The choice of the species will depend on the systematics which are accepted, information on the utility of breeders such as chromosome numbers, projected technical innovations in breeding which might expand the pool of and useful species, rates of genetic erosion as related to loss of populations, habitats and species, and the quality of the data on all of the above factors which is currently available. Area to be discussed in talk.

No matter how comprehensive it is desirable to be, practical decisions must be made in terms of: the duration of a study, the thoroughness of visiting populations and eco-geographic zones, the thoroughness of sampling micro-habitat related variation the extent and precision of the data collected, the extent and sophistication of the computerized data compilation and the extent of the intended access to data.

The factors which govern the choice of field methods:

- the (known) biology of select species
- the nature of each distribution and Methods for pattern of occurrences
- the nature of the area which is to be surveyed (e.g. broad clines vs.) "centres of environmental heterogeneity"
- space factors and time limitations
- land use factors and the nature of genetic erosion.
  
- monitoring: How much on-going work with the wild populations will be necessary? A mission should be prepared to be able to return in the near future to collect more material to conduct biological research (e.g. for adaptation or disease).
  
- will in vitro or in situ conservation be necessary?
- utilization: will additional "fresh" samples be desirable?
- will sampling of more specific, micro-habitat variation be necessary.
  
- Which ecogeographic factors could be practically evaluated for correlations (if any)?
- which more specific factors might be of interest in the future?

Case Studies for Discussion

1. Sahel Region, W. Africa - Pennisetum spp. in the primary gene pool of pearl millet  
Vigna subterranea - Bambarra groundnut
2. Sumatra, A.E. Asia wild relatives of citrus
3. Ferguson Island, Papua, "multi-gene pool" in situ  
New Guinea conservation.