WHERE TO COLLECT?; EXPERIENCES FROM MAPPING THE MONOCOTYLEDONS OF WESTERN AUSTRALIA

by

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Recently I completed collecting and collating data on the Monocotyledons for a revision of the Descriptive Catalogue of Western Australian Plants (involving ca 1 300 species) from the collections held at PERTH, Kings Park and the University of Western Australia. Maps of these taxa were prepared both at the Botanical Districts and 1 : 250 000 map grid scale (Beard, 1980 and Hnatiuk and Maslin, 1980).

Some analysis of this information at the 1 : 250,000 grid scale was undertaken in a series of mimeographed reports, and by Keighery (1984). An interesting outcome of these maps is that they indicate both regions and species (or higher groupings) which are poorly collected, and may deserve further study especially increased survey. This is undertaken by simply comparing actual and expected occurrences of species/genera in each grid square from the base maps.

Western Australia for purposes of simplicity is divided up into its three major phytogeographical regions: South-West; Desert and Kimberley. Nomenclature and numbering of the grid squares can be found in Hnatiuk and Maslin (1981).

South West

The families Poaceae, Juncaginaceae, Cyperaceae, Centrolepidaceae, Restionaceae, Liliaceae, Haemodoraceae and Orchidaceae all displayed a consistant trend to low collections from the Augusta sheet (280), and to a lesser extent the adjacent Collie (274), Busselton (273), Pemberton (281) and Pinjarra (264) sheets. The Restionaceae, Orchidaceae and Centrolepidaceae were poorly collected on the Bremer Bay sheet (283) and the Xyridaceae on the Collie sheet.

The trend towards low collecting effort in the higher rainfall forest zone seems to be consistent, and this region deserves increased study because of numerous development pressures being placed upon it.

Desert

Difficult to analyse because collecting has been largely confined to major access tracks (e.g. the highest specific diversity of Proteaceae in the often quoted map by Nathanial Speck clearly follows the Great Eastern Highway.) Some regional collections have been undertaken by the Western Australian Herbarium and the Department of Fisheries and Wildlife, in the southern Kimberley and Great Sandy Desert. A series of collecting trips by the first institution has given the Rudall River region the highest diversity of any grid square of this desert region (Ptilotus 12 species, Cyperaceae 10 species). Occasionally this collecting diversity has been interpreted as being of significant biogeographical interest, instead of a baseline for all grid squares of the northern desert regions.

The poorest regions in terms of surveys and numbers of collections per grid square are the south-eastern Pilbara and Ashburton, the northern-central desert (grids 140, 141, 142, 151, 152, 153, 162, 163, 173 and 174) and south-eastern desert (232, 233, 221, 222, 242, 243).

Kimberley

Currently the only reasonably well known areas are around the major towns: Broome, Derby and Kununurra and on the Western Kimberley (the Mitchell Plateau). The whole area needs collectors stationed in the area to collect during the wet, and biological survey is needed in the south-eastern Kimberley which is very poorly known, and contains few nature reserves.

One general comment that can be made on both the desert and the Kimberley is an apparent collecting bias towards upland regions at the expense of alluvial or depositional surfaces. It may true that upland regions are species rich compared to other surfaces in these regions but increased effort may provide some surprises.

These data, analysed albeit in a very crude fashion provide some real data on areas which are undercollected. I doubt if most botanists would list the higher rainfall zones as a priority region, but the collections show this is the case. Perhaps the Dicotyledons will display different trends.

General Colelcting

One could reasonably assume from the foregoing that collecting should be undertaken everywhere, for despite some repitition much useful geographic data can be obtained. However, it is truly appalling how little extra information is contained upon labels apart from locality (or such useful information as leaves hairy, inflorence a spike etc). This information is basically soil data, abundance, flowering information, associated plants and habitat.

Soil type can be found on only a few collections: e.g.

Philydrella pygmaea on 6 of 19 collections
*Erodium aureum on 3 of 13 collections
Waitzia panniculata on 9 of 16 collections

However, this lack is historical, as prior to 1950 about 90% of collections did not give soil type, while after 1970- over 90% do. The problem now is accurate recording of soil type, few botanists have any idea of what soil types are what from their collections.

Still, rarely recorded is the abundance of the plant, the degree to which it is flowering, (nor is flower colour accurately recorded).

In the future much of this subsidary inforamtion will come from sources not linked directly to Herbarium specimens (e.g.: sight records such as the Banksia Atlas). However, because of the large size of Western Australia, the taxonomic complexity of the flora herbarium material will continue to provide the largest source of available data on the ecology of the flora for many years to come.

As a consumer of this information can I make a plea that more effort be made to standardize the quality of information on collections. Perhaps A.B.R.S. or A.S.B.S. could convene some workshops on collecting priorities based on hard data not supposition, and help provide useable field data sheets for labels, soil types and flower colours.

References

Beard, J.S. (1980). "A new Phytogeographic map of Western Australia: W.A. Herbarium Research Notes 3 : 37-58.

Hnatiuk, R.J. and Maslin, B.R. (1980) "The distribution of Acacia (Leguminosae : Mimosoideae). Part I. Individual species distribution". W.A. Herbarium Research Notes 4 : 1-103.

Keighery, G.J. (1984) "Phytogeography of Western Australia's Monocotyledons" Kings Park Research Notes 8 : 39-67.

Figure 1 : Numerical Sequence of 1:250,000 grid cells for the state of Western Australia.