

The Virtual Australian Herbarium

a cooperative flora information system being developed by Australian herbaria

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The Virtual Australian Herbarium

The vision of an Australian flora information system called the *Virtual Australian Herbarium* was the centrepiece of HISCOM's first presentation to the heads of Australian herbaria (CHAH) in 1995. It was presented to the Australian systematic community in the *Software in Systematics* symposium, run by HISCOM, at the joint Australian systematics societies conference in Adelaide in 1997.

The *Virtual Australian Herbarium* (Fig. 1) will comprise primarily an interactive web front end linked to a shared scientific names database (the *Australian Plant Names Index*) with remote internet links to distributed specimen and other taxon- or specimen-associated datasets (e.g. vouchered spatial collection locality data) in the Australian herbaria.

Users are potentially of four types: herbaria and plant systematists; other scientific workers; land managers and environmental decision makers in government and non-government agencies; and the general public.

Data maintenance will be shared by regional and taxonomic specialists (of special importance in maintaining the currency of names in the *Australian Plant Names Index* and their links to older names) and the Australian herbaria. A potential benefit will be the reduction of substantial replication in the process of updating scientific names in State censuses and other datasets.



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Herbaria in data storage and information dissemination and the establishment of HISCOM as a coordinating body

Herbaria are the centres of knowledge and expertise in Australian plant, algal and fungal biodiversity. Their

unique and substantial collections numbering about 6.5 million in all Australian herbaria are essential to this knowledge.

Species names and circumscriptions change as the knowledge of all groups of Australian plants continues to advance. It is imperative therefore that biological data be attached to specimens (vouchers) to ensure accurate upgrading of names. Data not associated with such vouchers are prone to major decay in reliability.

Herbaria have long been associated with data storage and information dissemination. Traditionally data are contained on the herbarium specimen labels, while information is disseminated in the form of scientific accounts (revisions, monographs) and made more widely accessible in state, regional and national floras and handbooks.

Since the mid 1970s Australian herbaria have been involved cooperatively in digitisation of their data through initiatives at state and commonwealth level and by individual scientists. Underpinning this has been the development of a common specimen data interchange standard (HISPID).

The establishment in 1995 of the Herbarium Information Systems Committee (HISCOM) by the Council of Heads of Australian Herbaria (CHAH) was initiated to accelerate cooperative development of flora data storage, maintenance and dissemination in Australian government herbaria.



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Current status of digitisation of data in Australian herbaria

Australian herbaria are well advanced in digitising two major traditional core areas of data under their custodianship: taxonomic and herbarium specimen data. All government herbaria are committed to producing electronic censuses of the plants. Data associated with almost half of Australia's collections have been captured, with a data interchange programme already established (HISPID). Progress with compilation of other taxon or specimen-associated data is varied.

[Table1 Electronic data in Herbaria](#) gives more detail of electronic data relating to vascular plants available to a *Virtual Australian Herbarium*. Data capture relating to the nonvascular plants (mosses, lichens, etc.), algae and fungi has also progressed significantly, but not to the same extent.



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The Future

The Herbarium Information Systems Committee is preparing a cooperative strategic plan for the development of the *Virtual Australian Herbarium*, including timeframes.

Goals within reach, owing to the considerable achievements in cooperative data capture and management in Australian herbaria, will enable the prototype of this Australian Flora Information System to be developed. These are:

- The development of a web front end
- The production of a shared *Australian Plant Names Index*, compiled or vetted remotely by approved plant group specialists with updating via the internet
- simultaneous access to distributed specimen data in Australian herbaria, with pooling of query results, for example for the production of distribution maps of species, geocode validation and spatial analysis
- access to some distributed specimen-associated or taxon-related data sets being assembled by herbaria and specialists in taxonomic groups, for example the Australian type specimen image database, initially being tested by the Australian Botanical Liaison Officer at the Royal Botanic Gardens, Kew.

The development of a strategic framework will have a major role in realising the full capability of a *Virtual Australian Herbarium*.



HISPID3 data interchange standard for specimen data

Since 1994 Australian herbaria have been exchanging herbarium specimen data electronically to a standard developed over the previous 5 years.

The *HISPID3** format and the international plant record data standard for botanic gardens (*ITF2*[†]) have been made as compatible as possible. Both use a "flat file" structure for transferring data.

The standard is of considerable relevance to the building of databases.

The current version *HISPID3* is available from the HISCOM Website.

URL: www.rbg Syd.gov.au/HISCOM

**HISPID: Herbarium Information Standards and Protocols for Interchange of Data (version 3)*

†ITF2: International Transfer Format for Botanic Gardens Plant Records (version 2)



Achievements of HISCOM the Australian Herbarium Information Systems Committee

Provision of a forum for Australian herbaria for the exchange of ideas

Setting cooperative directions for handling data and information

Development of a specimen data interchange standard *HISPID3*, already fully operating between several herbaria

Promotion of sharing of expertise

The free exchange of common and shared datasets

Promotion of the advantages of a cooperative approach to management of herbarium data and information



The need for herbarium specimens as vouchers for scientific plant names

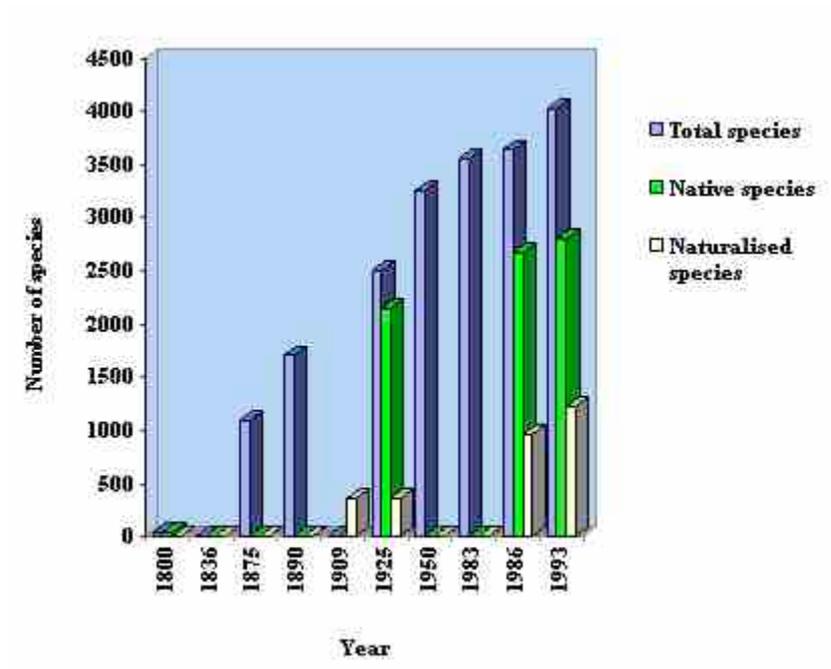
Herbarium specimens are indispensable for maintaining confidence in data linked to scientific names owing to the changing circumscription of species as knowledge of our flora advances.



The changing knowledge of plants

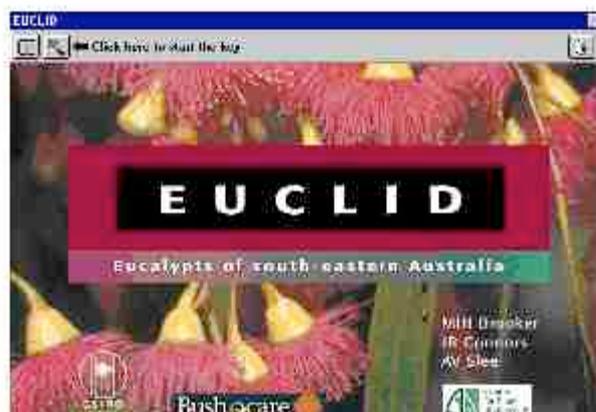
Scientific names of plants continue to change as knowledge of Australian vascular plant species continues to increase, even in the better known regions.

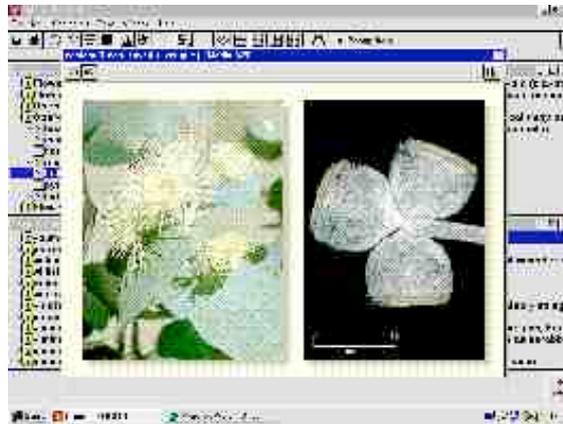
This example is from South Australia, data taken from published Australian and state floras, handbooks and lists



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Electronic flora information and identification tools





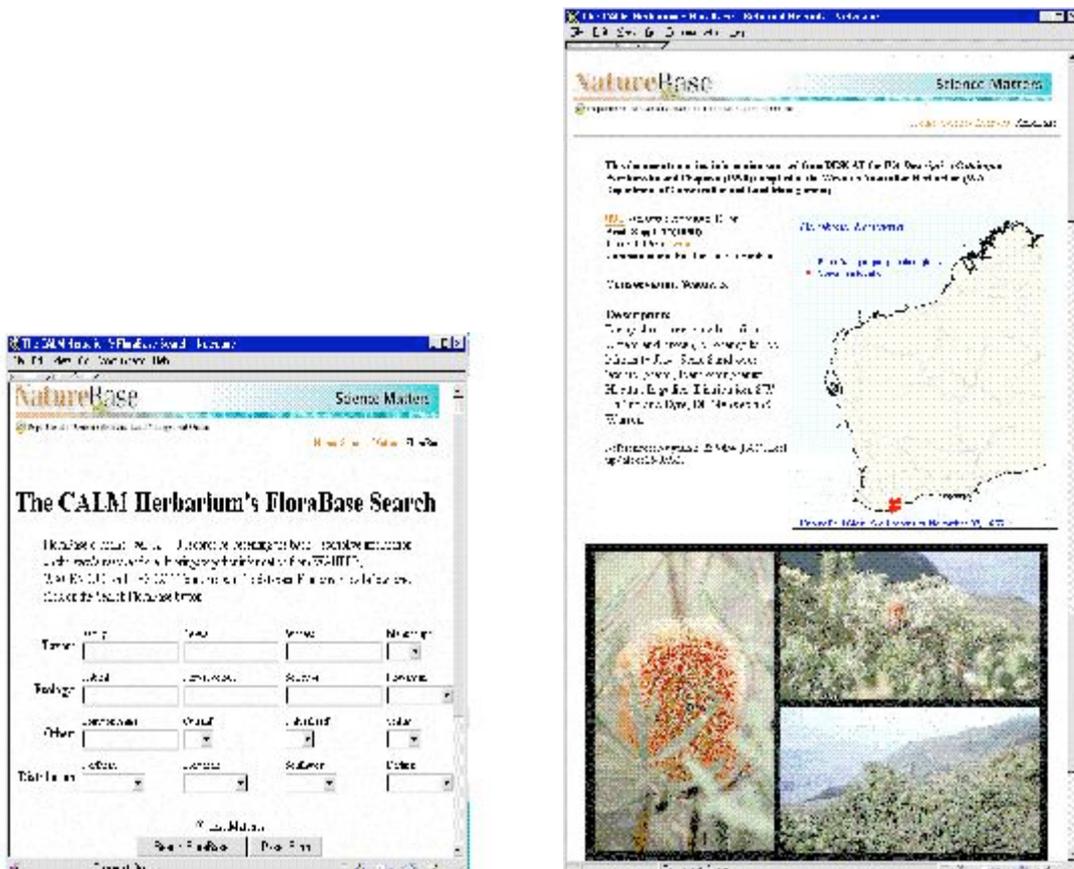
Electronic handbooks to plant groups such as these will become accessible over the Web via a *Virtual Australian Herbarium*



Western Australia's *FloraBase* : an operational Australian State flora information system

FloraBase, being developed by the Western Australian Herbarium (PERTH), gives a feel for some of the features planned for the *Virtual Australian Herbarium*.

It comprises an integrated web site drawing specimen, census and descriptive data together with maps and images.



The site is due to be launched permanently on the Web shortly.

Of other other Websites involving herbaria, *PlantNet* being developed by the National Herbarium of New South Wales (NSW) is well-advanced.



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