



Combating medicinal plant extinction and indigenous culture loss – an Australian model



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Introduction

Traditional medicinal plant knowledge developed in Australia over 40,000 years, is diminishing due to the loss of biodiversity, acculturation and the demise of its custodians. This knowledge is scattered among different indigenous communities, universities, museums, repositories and research organisations across Australia, in heterogeneous format. For sustainable use and conservation, this distributed knowledge needs to be documented, digitised and integrated. To achieve this goal, we have adopted a collaborative model partnering Aboriginal communities (Figure 1), leading to the development of the Customary Medicinal Knowledgebase (CMKb; <http://biolinfo.org/cmkb>) [1] shown in Figure 2.

About our collaborative model

- Adheres to the Participatory Action Research (PAR) method of UNESCO [2].
- Aboriginal communities were involved during the development of CMKb.
- The communities determine the nature of data collection, data management and presentation.
- Information documented and digitised with the full consent of Local Aboriginal Authorising Body (LAAB).
- Shared information still owned by the Aboriginal communities.
- All scientific data shared with communities.
- Indigenous intellectual property rights are acknowledged, protected and ensured.

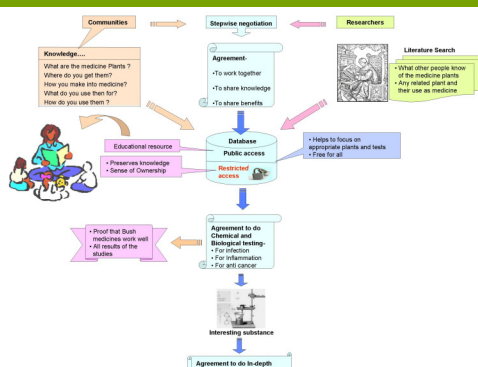


Figure 1. Collaborative model

Data in CMKb

- Primary information from our group on more than 20 plants used as bush medicine by Aboriginal communities.
- Secondary information on more than 500 traditionally used medicinal plants (Figure 5).
- Indigenous names archived.

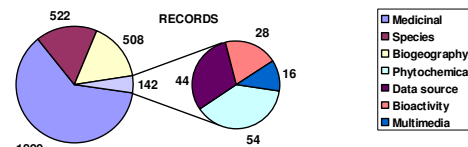


Figure 5. CMKb data statistics

Salient features of CMKb

- Collates and integrates primary and secondary information related to medicinal plants used by the Aboriginal communities (Figure 3).
- Sensitive first-hand information is password protected. Access to only authorised users.
- Collated secondary data freely available to public.
- Complies with Darwin Core and Dublin Core schemas [3] (Figure 3).
- Ability to integrate with global and regional biodiversity informatics initiatives.
- Cross linked to relevant public domain databases such as NCBI Taxonomy [4], PubChem [5], Integrated Taxonomic Information System (ITIS) [6], Integrated Botanical Information System (IBIS) [7] and Google images [8] (Figure 3).
- Ability to store multimedia information.

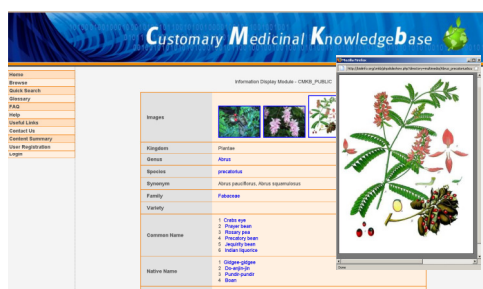


Figure 2. Species information page with image

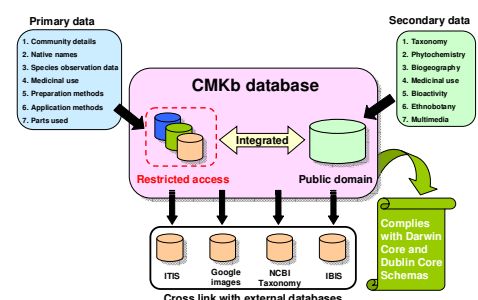


Figure 3. Data integration in CMKb

Data collection

- First-hand information documented and digitised by conducting interviews (Figure 4).
- Voucher specimens deposited in Macquarie University herbarium.
- Novel plant specimens identified correctly with assistance from the Royal Botanic Gardens, Sydney.
- Secondary information collated from scientific literature for Australian plants exhibiting medicinal properties.



Figure 4. Aboriginal elders being interviewed

Significance

- Addresses the first National Research Priority of "An Environmentally Sustainable Australia" by conserving traditional indigenous knowledge, culture and biodiversity.
- Encourages Aboriginal communities to participate in all aspects of research, providing a sense of community ownership.
- CMKb can be used as an educational resource by the communities as well as for scientific research.
- This partnership can serve as a global model for indigenous medicinal plant knowledge conservation.

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- Royal Botanic Gardens, Sydney, Australia.

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- Google images. (<http://images.google.com.au/>)