



samara

The International Newsletter of the Partners of the Millennium Seed Bank Project

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MSBP Regional Workshop in Botswana

The MSBP started its international programme in Africa after the official signing of the first Access and Benefits Sharing Agreements (ABSAs) on 14th September 2000 by the environment ministers of Burkina Faso, Kenya and Madagascar on behalf of their respective governments, and Prof. Sir Peter Crane on behalf of the RBG Kew Board of Trustees. Since then, a lot has been going on in the continent, regarding the project activities.

As part of an on-going process to forge and strengthen regional collaboration between MSBP partners sharing common interests, a Regional Workshop for southern Africa was held in Gaborone, Botswana, from 30 October to 4 November 2006. Hosted by the Direction of Agricultural Research, the workshop involved 36 participants from MSBP partner institutes in Botswana, Malawi, Namibia and South Africa, plus four staff from the MSB of RBG Kew. The packed programme for the five-day meeting included presentations on seed collecting, seed handling and research outputs, hands-on, practical field training, case studies of partnerships with other institutions, including mining companies, and group and plenary discussions of the way forward for future work together in the region.

MSBP International Co-ordinators, Drs Michiel van Slageren and Moctar Sacande, presented an overview of the global MSB project. Each of the National Co-ordinators presented a review of the various MSBP activities in their respective countries. Seed collectors and researchers outlined the collecting and research activities in their institutes. Each presentation was followed by lively discussions, as partners compared situations and sought more information, about each others' procedures – in other words, learning from each other. On the whole, partners are doing well, and are reaching their targets in terms of delivering project activities.

A training component was included in the workshop programme. Areas covered included use of the MSBP collection guides; plant identification, including important features for field identification; and collection of quality seeds, herbarium specimens and field data. To put this into practice, a one-day field exercise was carried out, in which the group were challenged to find and collect *Rhus magalismontana*, a species not seen since 1949. Luckily, the challenge was met, except that the plants, which according to the Collecting Guides should have been fruiting at that time of year, were in flower rather than seed. This may be due to climate variations over more than 50 years, but is a good indication that the Guides are quite accurate. Herbarium specimens and locality information



Above: Collecting field trip
Left: Participants at the MSBP Regional Workshops



have been gathered and seeds will be collected later by the Botswana team.

The standard handling of incoming collections was presented in order to inform

partners of exactly what happens to collections once they arrive at Wakehurst Place for banking and databasing.

Looking to the future, Dr Paul Smith, head of the MSBP, talked about the contribution the MSBP can make to both reduce the loss of, and restore, wild plant diversity threatened by climate change. He led a workshop discussion on the strengths, weaknesses, threats and opportunities for the MSBP in southern Africa. Discussions were open and frank and all participants appreciated exchanging directly with the project leader. Finally, the workshop discussed opportunities to work together and came up with a list of short-, medium- and long-term goals which have been compiled into 16 recommendations and follow-up action points.

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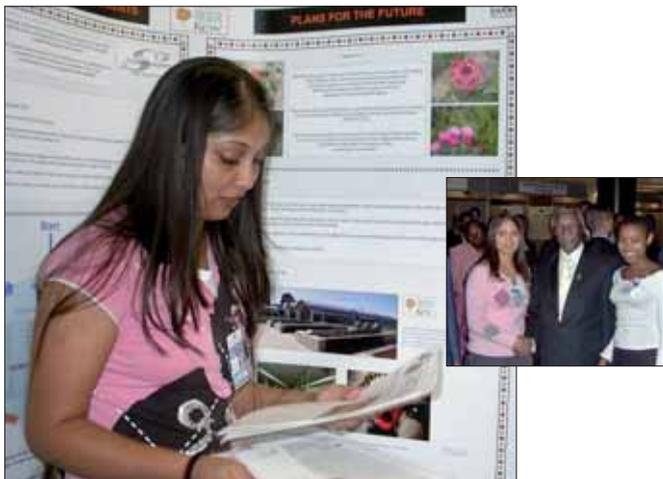
Rhus magalismontana

Science in Africa

Recent policy reports have emphasised the importance of strengthening science and technology to enable African economies to grow. In plant science, the African Union and others have identified biotechnology and biodiversity as areas for urgent development, particularly through support in the university sector. The MSBP already has strong contacts with African universities, as the examples below demonstrate, and is now seeking to consolidate its higher education role in the region.

Joint African Union – Economic Commission for Africa Science, Technology and Innovation Exhibition

The MSBP joined forces with the University of KwaZulu-Natal, South Africa at the Joint African Union – Economic Commission for Africa Science, Technology and Innovation Exhibition in Addis Ababa, Ethiopia (January 2007). The Innovation Exhibition was run concurrently with the 2007 Summit of Heads of States and Governments, the theme of which, as adopted by the African Union, was “Science, Technology and Research for Africa’s socio-economic development”.



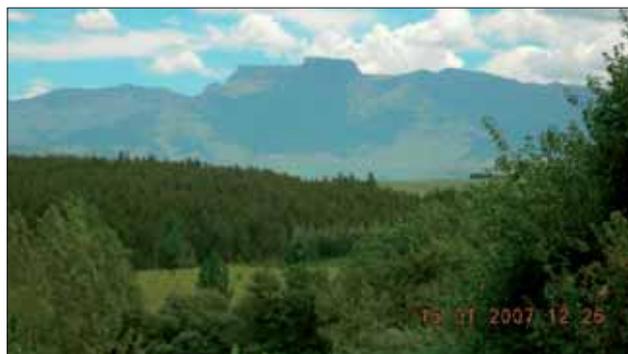
Above: **Ashika Jaimangal** holding a copy of *Samara* and standing in front of *Plants for the Future* poster
Inset photo: **Ashika Jaimangal** and **Nomali Ngobese** with the President **Thabo Mbeki**

Pre-eminent at the exhibition was the collaboration between the MSBP and the University of KwaZulu-Natal (supported by the Darwin Initiative) on the conservation of recalcitrant/non-orthodox seeds using cryopreservation. The stand was visited by President Thabo Mbeki of South Africa and Prime Minister Meles Zenawi of Ethiopia and contact was made with representatives of the Bill & Melinda Gates Foundation. The collaborative studies are led by Professors Patricia Berjak (UKZN) and Hugh W. Pritchard (SCD, RBG Kew).

Ashika Jaimangal and Nomali Ngobese
(University of KwaZulu-Natal).

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Drying out in Africa



Drakensberg Mountains, South Africa PHOTO: Y. GUTTERMAN)

Fifty eight scientists from 14 countries (Canada, China, France, Ghana, Hungary, India, Israel, Poland, Russia, South Africa, The Netherlands, Taiwan, UK and USA) gathered at a retreat in the Drakensberg Mountains, South Africa to discuss the latest developments in understanding the phenomenon of desiccation sensitivity in seeds and vegetative tissues. A total of 37 oral presentations were given and 12 posters were exhibited. Five Seed Conservation Department staff of RBG Kew gave six talks and a poster, and two MSPB-supported PhD students, Sershen Naidoo (University of KwaZulu-Natal) and Thomas Roach (SCD, RBG Kew and University of KwaZulu-Natal), also presented their work.

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Academy and United Nations



Participants at the joint Royal Society and Ghana Academy of Arts and Sciences workshop. PHOTO: FRANCIS ANKRAH

In January 2007, the MSBP, through Hugh Pritchard, participated in a Royal Society and Ghana Academy of Arts and Sciences sponsored two-day workshop to identify research priorities in Ghana. The Ghana contingent covered eight universities and three government departments. The UK delegation, covered disciplines as diverse as conservation and cosmology and consisted of senior academics from 11 institutes. Separate discussions also took place on developing a link between the MSBP and the UN University Institute for Natural Resources in Africa.

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"100-years-lost" plant re-emerges in Yunnan, China

Left: Topography and vegetation in Shilin
Right: *Paraisometrum mileense*
Below: *Paraisometrum mileense*

A wild population of *Paraisometrum mileense*, thought to be extinct in the wild, has been rediscovered in Yunnan, China.

P. mileense, a species of the Gesneriaceae family, was described in 1998 by Prof. Wen-Tsai Wang, a Gesneriaceae expert from the Institute of Botany in Beijing, part of the Chinese Academy of Sciences (CAS), during preparation of the Flora of China. Wang noticed that one Gesneriad specimen collected from southeast Yunnan was very distinctive from the others with regard to the corolla lobes and stamen arrangements. Together with his colleagues, he recognized and published this plant, in 1998, as the new genus *Paraisometrum* with a single species, *Paraisometrum mileense*, endemic to China and distributed only in southeast Yunnan. The specimen in the Musée National d'Histoire Naturelle, Paris, collected 100 years ago by a French missionary, F. Ducloux, was the only evidence of *P. mileense*.

In the summer of 2006, Dr Shui Yuming and students from the Kunming Institute of Botany, CAS, found the wild *P. mileense* in Shilin County, in southeast Yunnan, during a seed collecting trip. According to a quick survey, about 320 individuals of *P. mileense* were found in this wild population, around 30% of them in flower. It was the first time since Ducloux's 1906 expedition that *P. mileense* had been seen in the wild.

Like most of the Gesneriads, *P. mileense* is a limestone-loving plant and only inhabits nutrition-poor and vulnerable limestone habitats in Yunnan. Due to the short distance from local settlements in the region and easy access, the habitat of *P. mileense* is greatly threatened by human activity.



It is greatly encouraging for botanists and conservationists to rediscover a species thought to be extinct in the wild and only to "exist" in the herbarium. Dr. Shui emphasises that the rediscovery of *P. mileense* provides people with an opportunity to understand its evolution, conservation, and potential utilization. Shui and his team are going back to the area to continue their unfinished work and will search extensively for other populations. Seeds will be collected and kept in the Germplasm Bank of Wild Species in Kunming for long-term conservation, seed biology study and other research purposes. Small living collections will also be introduced to the Kunming Botanic Garden in order to enhance public education and awareness.

We hope that local government and the environmental authorities will provide necessary funding to protect and monitor this wild population for further studies. This distribution-limited species deserves the priority conservation and legal status to ensure its survival against becoming once more restricted to the herbarium cabinet.

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Seedbanking workshop in China

The 7th National Workshop on Biodiversity Conservation for Botanic Gardens in China was held in Kunming, China from 21 to 24 August 2006. Under the theme of "Seedbanking for botanic gardens in China" the aim of the workshop, sponsored by Botanic Garden Conservation International (BGCI), was to boost *ex-situ* conservation activities in China, especially by use of seedbanking skills.

The workshop is part of the training workshop series on biodiversity conservation and education for China's botanic gardens. It was hosted by Kunming Institute of Botany (KIB) and the Chinese Academy of Sciences. KIB, one of the MSBP's partners, and will have the largest seed bank in China, the Germplasm Bank of Wild Species (GBWS, formerly known as the Southwest China Wild Species Bank), by the end of this year.

Over 70 participants from 37 botanic gardens and research organizations worldwide attended this workshop, including invited speakers from UK, America, Australia, Israel and China. Robin Probert, head of Technology and Training at the MSBP and Jie Cai, China coordinator, were invited to facilitate the first two days of the workshop by introducing participants to comprehensive seedbanking techniques

which are widely used by the MSB and its partners.

With the imminent completion of the seed bank in GBWS, the workshop delivered much-needed capacity building on seed conservation and contributed towards the activation of a national seed conservation programme through the GBWS and the MSBP's China programme.

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Robin Probert presents at the BGCI Workshop on Seedbanking in China.

A selection of international programme activities

Malawi

The MSBP in Malawi is a collaboration between the RBG Kew and four national institutes (the Forestry Research Institute Malawi, the National Plant Genetic Resources Centre, the National Herbarium and Botanical Gardens and the National Research Council). The project is making a major contribution to meeting the objectives of the Global Strategy for Plant Conservation in Malawi, mainly targets 8 and 15.

The 2005-06 campaign was the project's best ever for seed collections, reaching a total of 257 species, mostly during joint expeditions.

The move to collect in the Nyika region, in addition to the Mulanje Mountains, and the participation of Kew's roving seed collectors, Damien Hicks and Daisy Dent, were of great impetus in this achievement.

Capacity building is an important part of the project, and Malawi has received additional laboratory equipment that will allow them to continue to develop their research activities. In early 2006, Tembo Chanyanga started his PhD programme with the University of Stellenbosch, South Africa. He is developing his research activities on the *in-* and *ex-situ* conservation of the Mulanje cedar (*Widdringtonia whyte*), under the supervision of Dr Coert Geldenhuys (Stellenbosch) and Dr Moctar Sacande (RBG Kew). Tembo presented his preliminary work at the DIRECTS workshop on African tree seed science, held in Kumasi, Ghana.

The first phase of the Malawi ABSA ends in 2007 and the National Steering Committee, chaired by the National Research Council, has started discussions on a possible next phase. Overall, the Committee appreciate that the project is making a great difference to species conservation in Malawi. A new strategy has been put in place to collect about the same number of collected species in 2007.

The project will work closely with the National Parks and Wildlife Services in Nyika, who will provide a plant biologist to support expeditions covering three new high biodiversity sites, i.e. Nkhatabay, Ntchisi and Nkhotakota forests.

Malawi collecting team, out on the Nyika Plateau, November 2005



China

China's national seed conservation network

Seed conservation activities in China have been reinforced by the establishment of a national seed collecting network.

Eleven botanic gardens and botanic research organizations from Beijing, Xinjiang, Hunan, Jiangxi and Yunnan will work together to collect seeds and share ideas on plant conservation activities. The network, sponsored by the MSB partner the Kunming Institute of Botany, host to the Germplasm Bank of Wild Species (GBWS), aims to safeguard wild species from threats, implement China's national Biodiversity Conservation Action Plan and contribute to the Global Strategy for Plant Conservation.

Five staff from GBWS visited the MSB for 6 weeks' training early in 2006 to improve their knowledge and skills in seed conservation, as well as developing their confidence in plant conservation.



Chile

In August 2006, INIA and Kew celebrated the first five years of the MSBP partnership and welcomed the INIA national director and regional governor to a ceremony at the base bank, La Vicuña, in Chile's IV region. Kew's Drs Hugh Pritchard, Matt Daws and Tiziana Ulian also held seed research discussions with INIA personnel and with the associated CEAZA program, coordinated by University of La Serena.

The MSBP Chile project continues to successfully target and conserve a range of threatened species from desert and mediterranean regions of Chile. The collecting program has now banked over 500 species, of which 57% are national endemics and an additional 15% are regional endemics. This success has been the result of the thorough preparation by project taxonomist Marcelo Rosas, and intensive field survey work carried out with MSBP seed collector, Pablo Guerrero. To successfully identify geophytes and other critical species, Marcelo



***Alstroemeria pelegrina*, on the coast near Los Vilos, IV region, collected by joint INIA-Kew team in December 2006. PHOTO: CHARLES GODFRAY.**

carries several monographs and extracts from PhD theses during the fieldwork, in addition to target collection guides prepared during the winter season. He has received strong support from Alicia Marticorena, University of Concepción herbarium, in preparing images and descriptions of target species. Several successive visits to the field are often necessary to obtain sufficient seed for banking, and herbarium specimen location data can be viewed in GIS both at the planning stage, or during the fieldwork itself on a laptop computer. Pablo Guerrero has been accepted on a post graduate course from March 2007 but will continue to advise the project in particular on GIS and conservation assessments.

The experience gained from MSB enables them to provide technical support to the new national seed conservation network and facilitate large-scale seed collecting activities across the country.

In addition to seed collecting activities, the network will also play an important role in developing collaboration in seed biology research, both abroad and in-country, and will support a comprehensive plant conservation strategy in China.



Left to right: *Psammosilene tunicoides*, important medicine plants endemic to China
Fruit of *Rosa* sp.
Shaking to collect the dogwood (*Cornus* sp.)



Laboratory and greenhouse support from Marcos Acosta and Ana Sandoval has enabled germination tests to be carried out on over 100 species, and recent test data will be provided to the MSBP for reference. With continuation of support for two further years by Rio Tinto Plc, the propagation trials for priority species are yielding important information for species such as *Dalea azurea* (Fabaceae). Species profiles will be periodically updated at the web page www.inia.cl/recursosgeneticos/bancobase/propagacion/

Renewal of the Access and Benefit Sharing Agreement between INIA and Kew to December 2009 will enable further consolidation of the network of Chilean collaborators, including the University of Concepción, the National Botanic Garden and, from 2007, the University of Talca. This will allow the partners to extend collecting to a wider range of habitats and species and to continue to meet MSBP seed conservation targets.

Italy

New collaboration in Sardinia

Sardinia is the second-largest island in the Mediterranean Sea (after Sicily), occupying an area of 24090 km² and comprising a flora of 2407 species. The isolation and the high geological diversity in this island have created a wide range of habitats with high level of endemism (347 plant species), especially on the Gennargentu, Supramonte and Sulcis-Iglesiente mountains.

At the beginning of September 2006 a Memorandum of Collaboration was signed between RBG Kew and the Centre for Conservation of Biodiversity (CCB), in the Department of Botany at the University of Cagliari (in Sardinia), aiming to contribute to the plant conservation of the island.

The collaboration will focus on seed collecting, conservation and research on seed ecophysiology, plant demography and phytosociology of Sardinian native plant species. All targeted species will be representative of the Mediterranean flora and will be prioritized according to their conservation importance and phytogeographical interest.

Dr Tiziana Ulian (RBG Kew) joined an expedition in mid September 2006 in which seeds were collected from 30 endemic species, including two of the 'Top 50' most threatened Mediterranean Island Plants: *Lamyropsis microcephala* (Asteraceae) and *Ribes sardoum* (Grossulariaceae). These species, both endemic of Sardinia, are considered critically endangered (CR), with *L. microcephala* found only in two populations in the Gennargentu massif and *R. sardoum* recorded from just one site in Supramonte.

The seed lots collected during the joint expedition are now conserved in the Bank of Sardinian Germoplasm (BG-SAR) of the CCB in Cagliari and duplicates with an adequate number of seeds will be sent and stored in the MSB.

Together with seed collecting, field surveys were carried out for nineteen of the species collected and for seven additional ones. Their phenology, ecology, population structure and phytosociological associations were analysed in order to contribute to the ongoing conservation assessment for the species carried out by the team at CCB.

At the end of November 2006, Efisio Mattana, a PhD student from CCB, visited the MSB for a period of one month. He received training in seed processing, conservation and germination, working with Janet Terry and Natasha Ali and discussed his PhD research on seed ecophysiology with Dr. Matthew Daws.

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Above top: *Lamyropsis microcephala* (Asteraceae) PHOTO: GIANLUIGI BACCHETTA

Above left: *Ribes sardoum* (Grossulariaceae) PHOTO: EFISIO MATTANA

Above right: Staff from the Centre for Conservation of Biodiversity (CCB) (from the left Giuseppe Fenu, Efisio Mattana, Bianca Alva and Prof.

Gianluigi Bacchetta) preparing for fieldwork in September 2006 in Orgosolo, central east of Sardinia PHOTO: TIZIANA ULIAN

Damasonium alisma (Starfruit) introduction on Greenham Common



On Tuesday the 28th November 2006, horticultural and seed bank staff from the RBG Kew at Wakehurst Place joined staff from Plantlife, Natural England (NE), and West Berkshire (WBCC) and Buckinghamshire County Councils (BCC) to try and secure the future of one of the UK's rarest plants.

Damasonium alisma (starfruit), a beautiful aquatic herb, is critically endangered. Indeed, it has not been recorded in the wild during 2006. It flowers from June to August and is found at muddy pond margins where the water level fluctuates naturally. The species has star-shaped fruits and blunt, heart-shaped leaves.

Greenham Common in Berkshire had a high profile during the Cold War when peace protests were directed against American cruise missiles based at this former air base. However, now the site is being gradually restored to a natural habitat and provides ideal growing conditions for starfruit. This is because the site has a number of ponds which are used regularly by cattle and their trampling of the pond margins creates ideal conditions for the species.

The above team started work by assessing the suitability of five specially selected ponds around the site. It was decided to sow starfruit seeds directly into two of the ponds and plant seedlings into two other ponds, using a

mixture of seed and seedlings at the fifth. Over 300 seeds and 60 seedling plugs were planted throughout the day. The seeds and seedlings originated from seed collections saved in the MSB at Wakehurst Place some years ago under a programme sponsored by Natural England. The seedlings were grown up at Wakehurst Place nursery especially for this work.

The hope is that this introduction will secure a population of starfruit in the wild and ensure its long-term presence within the UK's flora.

The following people were involved in the project:

Dominic Price (Plantlife), Jo Wenham (Horticulture & Estate Management (HEM), RBG Kew, Wakehurst Place), Andy Coulson-Phillips (WBCC), Sarah Mansbridge (NE), Joanna Walmisley (HEM, RBG Kew, Wakehurst Place), Frances Stanley (SCD, RBG Kew, Wakehurst Place), Andrew McVeigh (BCC) and Sarah Wright (BCC).



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A new module for seed banking in BIOTICA (version 4.3)

The BIOTICA Information System, the leading biodiversity database used by Mexican field biologists, has recently been enhanced with a new module specifically for seed banking. The module has been developed by the Bioinformatics team of CONABIO (National Commission for the Knowledge and Use of Biodiversity www.conabio.gob.mx) in Mexico, in collaboration with staff from the Seed Bank at FESI-UNAM (Faculty of Superior Studies of Iztacala of the National Autonomous University of Mexico www.iztacala.unam.mx) and the MSBP, which also provided the funding for the update.

The module allows the storage and management of information about seed accessions, i.e. seed number, seed weight, physical seed quality, seed storage behaviour, test results (X-ray, drying, viability and germination) and regeneration, as well as data collected during fieldwork. In BIOTICA, the seed banking module can be easily accessed from the *Ejemplar* (Specimen) window,

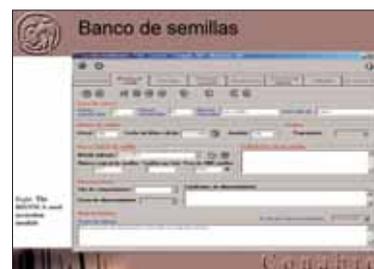
by clicking on *Muestra de semillas* (Seed accession) (see figure).

The new version was released in November 2005 and CONABIO's Bioinformatics team has run eight training courses to update users. Furthermore, a chapter explaining the functionality of the new module, and a dictionary of the terms used, has been added to the manual.

The FESI-UNAM MSB team are now using the new module for collection data and believe that it will improve management of the seed bank.

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Desiccation tolerance and sensitivity studies

Desiccation tolerance is a widely occurring phenomenon found in orthodox seeds, but is usually lost upon completion of germination in the very young seedling. Only a small number of species are known to display desiccation tolerance after completion of germination, all of which are found in a semi-arid environment. Highly unusual, it makes for an interesting topic of study, given a recent report of induction of desiccation tolerance in young seedlings of *Medicago truncatula* that are otherwise intolerant. This finding suggests that induction of desiccation tolerance in young seedlings is not unique to a select group of species, but a widespread phenomenon in the plant kingdom. In order to understand more about the induction of desiccation tolerance, Carlos Vinício Vieira, a PhD student from the Universidade Federal de Lavras (UFLA), has investigated young seedlings of *Tabebuia impetiginosa*, a tree species found in Brazil. This species is used as an ornamental and the bark is used for medicinal purposes. Upon optimization of the protocol, it was found that desiccation tolerance could be induced in the very young seedlings of *T. impetiginosa* by osmotic treatment, and is regulated by environmental and endogenous factors. Currently, molecular aspects underlying this phenomenon are under investigation. This study aims to contribute to a better understanding of desiccation tolerance and sensitivity.



A rabbit's eye view of a *Tabebuia impetiginosa* tree.

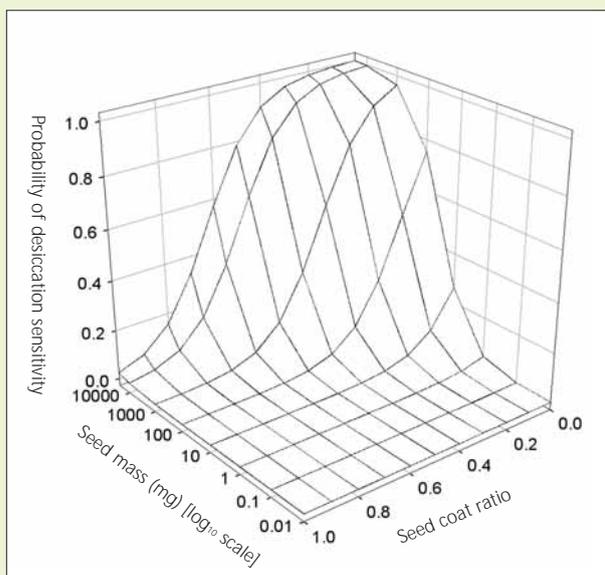
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Predicting the occurrence of desiccation sensitivity in seeds

Seed desiccation sensitivity may limit the *ex-situ* conservation of up to 47% of plant species, particularly those from wet tropical habitats. Consequently, the first challenge for seed conservation is to determine seed responses to desiccation. About 540 species with desiccation-sensitive seeds have been identified and included in our Seed Information Database (www.kew.org/data/sid/). Since it is unlikely that all such species will be identified experimentally, a second approach is to identify predictors of desiccation sensitivity. We have developed a predictive model based on seed traits of 104 species from 37 families from Central America (Open Access Publication, *Ann. Bot.* **97**: 667–674, 2006). For these species, seed mass and the proportion of the dry seed mass in the seed coat (SCR) were reliable predictors of the



response to drying - desiccation sensitive seeds were large with a low SCR (i.e. thin 'seed' coats). We have also successfully validated our model on 38 species, of known seed storage behaviour, from dryland Africa and Europe. Consequently, this model can be used as a decision making tool when handling species of unknown storage behaviour since it enables a rapid assessment of the probability of an individual species displaying seed desiccation sensitivity.

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NEWS

Exceptional longevity of South African seeds

Although the seed viability equation predicts survival for hundred to thousands of years under gene bank conditions (15% RH, -20°C), there are only a handful of credible reports of seeds actually surviving for ≥ 150 years. Recently we have conducted germination tests on seeds of 33 South African species collected in 1802/3. The seeds were found at the National Archives in London among



the papers of a Dutch merchant, Jan Teerlink, whose ship was captured by British privateers during its return from the Far East via the Cape of Good Hope, South Africa. Seeds of three species germinated: two legumes (*Liparia* sp. and *Acacia* sp.) and a Proteaceae (*Leucospermum* sp.). Our reports (Seed Science Research, in press) of seeds surviving for over 200 years (supported by carbon-dating), under sub-optimal conditions, suggests adaptation for extreme seed longevity in species of seasonally dry, Mediterranean environments.

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Errata

A year with the MSB Cape Team (Issue 11, page 3). Caption: *Widdringtonia swartzii*, this caption should have read *Leucadendron orientale*. We apologize for any confusion caused.



A message from Paul Smith

With all of the recent publicity generated by the issue of climate change, we have become increasingly aware of the value not only of the seed collections that we have made together, but also the data associated with them. In the context of future climate change impacts and other threats to plant diversity, the information that we are currently collecting every time we make a seed collection is critical. Data on location, population size and threats, represent a baseline against which future changes can be measured. If we go back to compare numbers of those same populations in 10 or 15 years time, we can start to measure the impacts of climate change and the threats we have identified.

If you are not currently recording this kind of information routinely, please can I urge you to do so. Measuring the number of individuals in a population is rarely straightforward, but recording population density is usually possible, and even terms such as 'common', 'frequent' or 'rare' are better than nothing. Similarly, we have always used the 'modifying factors' box on the standard MSB field form to record threats, but so long as they are recorded somewhere, it doesn't matter where. Finally, I would like to urge you to record Level 1 'use' information (i.e. food, medicine etc.) because we still need to persuade politicians and policy makers of the real value of wild species to people.

West Aussie making changes after learning at Wakehurst Place

Mark Ochtman manages Greening Australia WA's Environmental Services Unit which, among other things, is responsible for supplying locally sourced native seed for large scale restoration projects. He contributes collections to the MSB through a partnership he and his team have with the Botanic Gardens and Parks Authority in Western Australia.

Mark attended the Seed Conservation Techniques training course held at Wakehurst Place in September 2006 and is making practical use of what he learnt now he's back in Western Australia.

The seed bank Mark is responsible for contains seed used in revegetation projects around Western Australia and the seed is generally stored only for a short time (i.e. less than 5 years). It is basically an old bank vault built in the 1890s and maintains a fairly constant temperature of around 23°C, though the humidity is a bit of an unknown.

Having seen first hand at Wakehurst the effects of high humidity on seed longevity, steps are now being taken to manage humidity at a safe level. Although the current conditions are unlikely to cause a significant loss in seed viability during the short period of storage, Mark sees it as important to the longer-term viability of their operation. He will be consulting with staff at Wakehurst when re-designing their seed-bank layout.

Another area that has primed Mark to instigate change in his team was the germination and viability testing methods he learnt. Having had very little



Seed Conservation Techniques Course, September 2006.

experience in this area, he had not considered conducting their own testing on seeds as a viable option. Now equipped with the knowledge gained at Wakehurst, he and his team will be developing their own testing laboratory.

These are just two changes Mark is making, with numerous others being implemented across their operation.

"The knowledge I have gained, the friendships I have made, the professional contacts I have made and the memories I will always have, made the Seed Conservation Techniques Course at Wakehurst Place one of the most valued experiences I expect to have in a lifetime" said Mark in summing up his experience at Wakehurst Place.

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Millennium Seed Bank Collection Figures 13 February 2007

	total in MSB	since Phase III started
Collections	33,629	22,169 (1,608 UK)
Species	18,295	13,870 (603 UK)



WE WANT TO HEAR FROM YOU!

Samara is your newsletter, so send us news and articles about yourself and your work.

Please let us know if you want to be removed from the mailing list.

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