



# samara

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

[www.kew.org/msbp/samara](http://www.kew.org/msbp/samara)

## Seed collecting successes in Namibia

In Namibia so far this year three seed collecting trips have been undertaken.

In March an area to the south-west and south of the Etosha National Park was visited due to reported good rainfall there. In general it was too early for most seed, but we nevertheless managed to collect 11 samples that were not yet represented in the MSB, including Namibian endemics such as *Phlyctidocarpa flava* and *Geigeria odontoptera*. We also collected herbarium specimens of others as references to return to at a later stage.

The main collecting trip was planned for the extreme north-west of the country, the Kaokoveld Centre of Endemism. Over three weeks in April/May we drove approximately 3000 km and didn't cover half of what we initially planned before time ran out. Rainfall in the area was rather patchy and together with a noticeable increase in the human and livestock populations in certain areas, it was not all that easy to locate our target species based on records that were sometimes 50 years old. Most of the older herbarium collections that we used as starting points, were made at places that were now totally overgrazed and where there was no hope of finding these species again. We made the most valuable collections in the more inaccessible, mountainous areas. We collected close to 200 herbarium voucher specimens and 75 seed samples. Of these 54 species, are new to the MSB and 56 are endemic or near-endemic (occurring just into Angola to the north) to Namibia. Again, we were a little bit too early to find mature seed on many of the plants and some had not set any seed at all. In a



Above: *Euphorbia eduardoi*, (near-endemic) in the Zebra Mountains.

Left: *Euphorbia leistneri*



population of the threatened *Euphorbia leistneri* we could locate only two immature seed capsules on one of about 75 plants. For others, like the 7-8 m tall *Euphorbia eduardoi*, getting hold of the seed was near-impossible and we lost most in the cracks of rocks amongst which these giants prefer to grow. Special species that we collected on this mission were

*Rogeria petrophila* (near-endemic, first collection since the type in 1957, growing in minute cracks in vertical granite rock faces), *Phaulopsis semiconica* (near-endemic, first collection since type in 1969), *Indigofera anabibensis* (endemic, only the second collection since type in 1963), and *Hibiscus merxmulleri* (first collection since type in 1974). We also collected specimens of at least three plants that we were unable to identify and are not represented in the collection of the National Herbarium (WIND).

In June the National Plant Genetic Research Centre (NPGRC) returned to the extreme south-east of the country where farmers reported the first good rains in five years. The aim was mainly to do red-list assessments of the many



*Rogeria petrophila*, which grows only in minute cracks of vertical rock.

Story continues on page 2

## News from Namibia *continued from page 1*

interesting and unique succulents in the area, but also to try and collect seed. About 20 red-list assessments were done, but the seed was mostly still immature and only three samples –*Dinteranthus* (2 species) and *Antimima eendomensis* were collected. The landowners are, however, very interested in



*Tu mera oculata* var. *paucipilosa*, an endemic; other species of this genus occur only in South America.

assisting the Namibian programme and have promised to collect seed of other species as they mature.

Further news from Namibia is the appointment of Herta Kolberg as permanent co-ordinator/seed collector for the project from 1 July 2005, based at NPGRC in Windhoek. The aim is to increase outputs and the number of collections from Namibia, also through collaboration with other programmes, projects and persons.



Above: *Phaulopsis semiconica*

Far left: Namibian seed collecting landscape

Left: A herd of Elephants seen during a collecting trip



## South Australian threatened species affected by Bushfires

In January 2005, the Eyre Peninsula in South Australia was affected by one of the most severe bushfires that has been experienced in recent times. The Eyre Peninsula is considered one of South Australia's biodiversity hotspots, with 2,261 native plant species (40 being endemic) known to exist within the region. A substantial area of approximately 82,000 hectares was burnt. Pre-fire, high levels of native vegetation loss associated with agricultural practises has reduced the landmass covered by native vegetation in the region to less than 15%. The patches of native vegetation that were

present before the fire were generally small in size, resulting in a high level of habitat fragmentation. Post-fire surveys have shown that the fire has impacted at least eleven nationally threatened native plant species.

A targeted collection strategy by the South Australian Seed Conservation Centre has ensured that seed from eight of the affected species including *Acacia pinguifolia* (Leguminosae), *Haloragis eyreana* (Haloragaceae), and *Ptilotus beckerianus* (Amaranthaceae) have been collected and entered into long-term *ex situ* conservation storage. These activities were undertaken as part of the SACRED Seeds project, a collaborative partnership between the South Australian Department for Environment and Heritage and the MSBP. Whilst it is anticipated that some of the affected species may respond favourably to fire, the *ex situ* collections held in duplication in Adelaide and the MSB will ensure that a source of viable seed is available should it be needed for restoration activities.

For more information, please contact:

**Phil Ainsley**

[ainsley.phillip@saugov.sa.gov.au](mailto:ainsley.phillip@saugov.sa.gov.au)



Far left: Tod River Reservoir, Eyre Peninsula post-fire.

Left: *Ptilotus beckerianus* (Amaranthaceae), one of the nationally threatened species affected by the January bushfires.

# NSW Seed Bank in recovery effort for endangered Regent Honeyeater



Richard Johnstone at the site of the revegetation programme.

The Regent Honeyeater (*Xanthomyza phrygia*) is the most endangered species of honeyeater in Australia, with estimates of a total population of somewhere between 1000-1500 individuals.

Breeding is now thought to be confined to three main areas: around Barraba in inland northern NSW, around Chiltern in north eastern Victoria, with the most important location being the Capertee Valley, about 3 hours drive north west of Sydney. The valley is a spectacular example of Sydney sandstone geology, surrounded by sheer cliffs and wilderness areas. It is bordered to the south by Gardens of Stone National Park, and to the east by the vast Wollemi National Park.

Since 1993 a revegetation programme has been undertaken in the cleared agricultural sections of the Capertee Valley, with a range of locally collected plant species favoured by the honeyeaters being used in the plantings. About 120 volunteers undertake two plantings per year, in April/May and in August, with approximately 8000 plants being planted each year.

The most important plant species for the Regent Honeyeaters are Mugga Ironbark (*Eucalyptus sideroxylon*), Yellow Box (*E. melliodora*), White Box (*E. albens*) and River Oak (*Casuarina cunninghamiana*). These provide nectar flows at various times of the year, with the nectar on the River Oak being provided by the mistletoe *Amyema cabbagei*.

As well as the larger trees, smaller species such as some of the many Acacias in the valley are also being planted, as these are fast growing and soil nitrogen fixers.

Through the MSBP partnership – Seedquest NSW, the NSW Seedbank has been able to provide 250 species of NSW native plant seed per year to the MSB, with the Capertee Valley a major focus of our collecting effort. So far 20 important Regent Honeyeater food and habitat species have been collected from the Capertee Valley, which are now

duplicated at both the MSB and NSW Seedbank. The NSW Seedbank collection has provided seed for revegetation as part the national Regent Honeyeater Recovery Program. Despite the severe drought affecting virtually the whole of NSW, many of the eucalypts are developing fruit this winter, and these are expected to be added to the NSW Seed Bank collecting program during the coming year.

For more information, please contact:

**Richard Johnstone**

Richard.Johnstone@rbgsyd.nsw.gov.au

## Australian seed workshop – “Seedbanking as a conservation tool”

A National practitioner-based seed workshop “Seedbanking as a conservation tool” was held at the NSW Seedbank - Mount Annan Botanic Garden 4-7 April 2005. The workshop was designed with a strong focus on building capacity in technical staff from new MSBP partners in the Northern Territory, Tasmania and Greening Australia (Western Australia), as well as organisations such as Australian National Botanic Garden and non-government groups. Day one began with presenters from different organisations showcasing the applications of seedbanking in conservation of wild species. Topics covered included threatened species and *Phytophthora* spp., seedbanking for endangered fauna habitat reconstruction and regional seedbanking support for Landcare. Other key areas covered over the week were seedbank design, collection fundamentals, seed viability, as well as data management and provenance issues.

Kate Gold and James Wood from the SCD,

RBG Kew imparted much knowledge in their presentations and added valuable comments throughout the week. Other interstate presenters also added value to the workshop through their wealth of experience. Feedback from participants was very positive with comments like “...stimulating and good balance of theory, talk and hands-on” and “lots of opportunity for participation and interaction”. The presentations prepared for this workshop have been made available on compact disc to workshop participants and others to promote further training in the area of conservation seedbanking throughout Australasia.

For more information, contact:

**Peter Cuneo**

Peter.Cuneo@rbgsyd.nsw.gov.au



Seedbanking Officer Richard Johnstone conducting a field assessment of Windmill Grass (*Chloris ventricosa*) as part of the recent seedbanking workshop.

# A selection of international programme activities

## Mexico

Ismael Calzada has continued to make notable botanical collections, including several new records for the Flora of the Tehuacán-Cuicatlán Valley and three species new to the RBG Kew herbarium. Expansion of the collecting programme northwards continues through the work of Ulises Guzmán, sponsored by CONABIO. This work will be strengthened through the preparation of pilot target collecting guides by Dr Oswaldo Tellez, who worked with Dr Tiziana Ulián and the Kew GIS Unit during a visit to the UK in April. It is planned to incorporate BIOCLIM predictive distributions into the established Kew collecting guide methodology.

Left: *Fouquieria ochoteranae*, an ornamental species, endemic to the Balsas river basin in Mexico



## Chile

INIA hosted several visits from RBG Kew staff in early 2005. Richard Wilford from Kew's Hardy Display Unit provided training to the newly appointed horticultural research assistant, Ana Sandoval, at INIA's base bank. Sharon Laws (RBG Kew development team) and Tiziana Ulián (MSB) accompanied Pedro Leon to meet several Chilean mining corporations that may provide access and logistical support for seed collecting in the future. Through engagement with the mining sector, it is hoped that funding will be obtained for completion of the Red Lists for Chilean desert Regions 2 and 3, in which many companies have ongoing operations. Tiziana and Sharon also joined Richard and Ana to tour horticultural operations at the Chagual and Viña del Mar Botanic Gardens, in order to swiftly raise INIA's capacity to propagate threatened endemic species.

## Burkina Faso and Mali

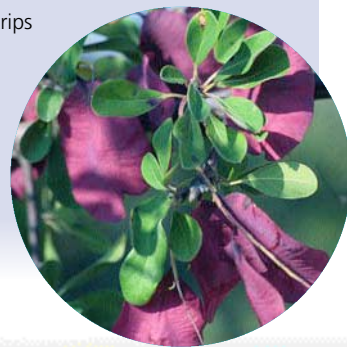
Since the last report in December 2003, partners in Burkina Faso and Mali have been engaged in seed collecting efforts during most of the year. On several occasions the fieldwork has been carried out jointly by both partners in Mali, but most of the time the teams have operated separately. As a result, several hundred collections have now been conserved. Until the establishment during 2005 of seed banking capacity at the station at CRRRA, Sikasso, Mali, part of the *Institut d'Économie Rurale* (IER), their collections were held at the Centre National de Semences Forestières (CNSF) in Ouagadougou, Burkina Faso, and at the MSB. Among the more significant results in Mali was the collection of an endemic tree, *Pteleopsis habensis* in 2004.

In January 2005 MSBP staff Michiel van Slageren and Moctar Sacandé visited the projects in Burkina Faso and Mali. As well as joining some collecting efforts in the field, the main aim was to advise with follow-up procedures for when collections arrive at the respective institutes. In 2004 the MSB provided incubator-dryers for both CNSF and IER; both machines are now operational and the first batches of seeds have been dried successfully. As a follow-up, CNSF will re-dry most of its collections as it was found earlier in 2004 that these are currently at damagingly high moisture conditions in their cold store. In Mali, operations for a banked collection are only just beginning and we have the opportunity to "get it right" from the start. Both centres are now also equipped with a relative humidity measurement instrument to monitor the drying process in the incubators. Thus with all links in the chain now in place at both sites, the

## Botswana

The Botswana programme continues to go from strength to strength. A combined MSBP/Forestry Department team recently carried out a vegetation survey of part of the diamond mining concession owned by Debswana at Orapa. The objectives of the survey were to produce a vegetation map of the area, compile a checklist of the plant species there, and make recommendations for their conservation. Two recent seed collecting trips in April and June yielded a total of 73 collections, including three Red Data List species and three endemics.

Right: *Terminalia prunioides*, a dominant tree in Orapa Game Park, Botswana.



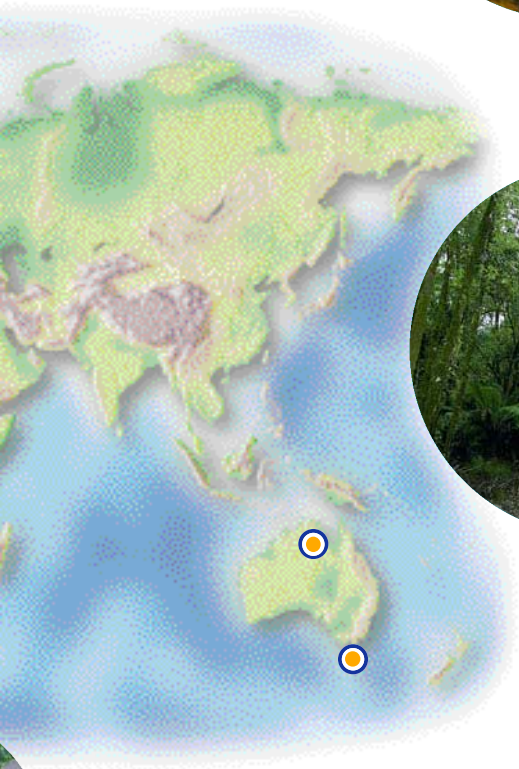
MSBP has been instrumental in establishing and further supporting seed conservation capacity in both countries. A solid 46 collections were also made during nine days (two in Mali, seven in Burkina Faso) of the January 2005 visit, with most of the species identified and having some economic value; most were also predicted as being new for both the MSB and the seed banks in the countries of origin.

A second strand of capacity building is also taking shape. After completing her MSc degree, CNSF's Christiane Sylvie Yameogo nee Gamene is now proceeding with a PhD in collaboration with the University of Gembloux in Belgium. Sibidou Sina, also from CNSF, arrived at the MSB, in July to complete his PhD studies, carried out together with the universities of Wageningen, the Netherlands, and Montpellier in France. A PhD project is being developed for Sidi Sanogo of CRRRA in Mali, in collaboration with the University of Angers in France. This will hopefully start later in 2005.

## Malawi

The MSBP team in Malawi mounted their third expedition to Mount Mulanje in May. Mount Mulanje, the highest massif in south-central Africa (3000 metres), is home to around 70 endemic species. 35 collections were made on the expedition, six of which were endemics. The team also found the rare endemic *Polygala adamsonii*, which had not been collected since 1971. Unfortunately it was not in seed, but its position has been marked and we will return to collect it.

***Helichrysum buechananii*, collected on Mount Mulanje, May 2005.**



Far left: **Collecting *Ipomoea dichroa* in the Dogon country in Mali**

Above left: **Near the waterfalls of Farako, Mali, displaying *Gardenia imperialis*.**

Above left: ***Harungana madagascariensis* south of Sikasso, Mali.**

Above right: **Michiel van Slageren and Burkinabe team collecting *Terminalia mollis***

## Australia

### Tasmania and Northern Territory, Australia

Another state (Tasmania) and a territory (the Northern Territory) of Australia have become partners in the expanding MSBP international seed conservation network. Both new partners signed Access & Benefit Sharing Agreements in November 2004 and have already been involved in MSBP Australia-wide meetings. Over the next six years both will make a significant contribution to the MSBP through the collection and duplication of 800 (Tasmania) and 550 new species (Northern Territory).

**Tasmania** will be unlike most of the MSBP collaborations in the sense that it is predominantly temperate-humid instead of warm and dry (their "drylands" receiving the average annual rainfall of most parts of the UK). However there is a unique flora of some 2500 species of which 35% are endemics. Collecting has already started in April 2005 in spite of the optimum part of the season having passed already. Of the 48 species received thus far as duplicates, a preliminary 43 have been marked as new for the MSB collections, reflecting both the unique Tasmanian flora and a focus on endemic species thereof. Other priorities are threatened species, species typical of threatened ecosystems and of key ecological communities, species of economic and ethnographic importance, and species that are considered primitive and of evolutionary significance (Tasmania having many of the so-called "Gondwanaland" species that are of prime interest to evolutionary biologists).

In addition the project will support the establishment of the Tasmanian Seed Conservation Centre, housed in a remodelled part of a building on the grounds of the Royal Tasmanian Botanic Gardens. Later in the project attention will be given to joint seed research, involvement in species recovery plans and population enhancement studies.

Above: **Portrait of *Gaultheria hispida***

Left: **Vegetation along track up Mt. Field, central Tasmania**

Below: **Collected seeds of four species on Mt. Field: *Trochocarpa thymifolia* (bluish berries, top left), *Coprosma nitida* (orange berries, top right), *Leptecophylla juniperina* (red berries, bottom left), and *Gaultheria hispida* (white, bottom right)**

The **Northern Territories (NT)** will represent quite a different project from Tasmania. Although the flora is larger (around 4200 taxa) and with more endemics (635), it may prove much more difficult to collect a substantial part of this. The so-called "Red Centre" is prone to long periods of drought and has far less infrastructure while being substantially larger in surface area than Tasmania. Although based in the south at the Alice Springs Desert Park (ASDP) the MSBP will cover the whole of the Territories and include the more humid, tropical so-called "Top End" as well. Working in the Top End will involve the herbarium at Palmerston, near the capital Darwin. Moreover, 87% of the endemic species (obviously the top priority for species collecting) in NT occur in the northern half. Other species priorities are threatened (476 spp.) and data deficient (680 spp.) ones, species restricted to habitats under threat of weed invasion, and species of economic and cultural importance to Aboriginal Australians. The project aims to deliver another 550 species new to the MSB collections over the course of its 6-year duration.

In addition the project will support an upgrading of *ex situ* facilities at ASDP and support a seed curator / biologist to supervise the *ex situ* conservation and to engage in several seed studies at ASDP and collaborate with the NT State Herbarium and universities in NT and elsewhere in Australia. We also expect a substantial involvement of Aboriginal people in aspects of the project.

# Strengthening seed cryo-biology research



Far left: The team at University of Kwa-Zulu Natal  
Left: A 'garden project' in Durban where villagers grow their own 'muti' plants that have direct benefits to their health.

in Sydney. Work will be conducted with Cathy Offord and John Siemon on the simultaneous cryopreservation of orchid seeds with their fungal symbionts. This work which is funded by the Hermon Slade Foundation will enable the long-term storage of seeds of rare New South Wales orchids with the appropriate fungal species to enable subsequent seed germination. This work builds on earlier research conducted on UK species (*CryoLetters* **21**, 125-135).

Two competitively-funded research applications have been secured recently by Dr Chris Wood (MSB), and science partners in South Africa strengthening science links with both South Africa and Australia. The first of these two projects is a Darwin Initiative programme with Prof. Pat Berjak based at the University of Kwa-Zulu Natal, Durban. The project aims to establish a Cryo-Conservation Centre of Excellence for Sub-Saharan Africa (CESSA). The centre will conserve socio-economically important recalcitrant seed species from the continent as well as provide education and training on ultra-low temperature storage techniques. CCESSA will also link to another Darwin Initiative, DEFRA funded, programme Garden Africa which is based at the University of Zululand. Garden Africa is concerned with the storage and cultivation of plant species that are particularly helpful in preventing / delaying the onset of HIV/AIDS. The seeds of many of these species are recalcitrant and are being investigated in the CCESSA programme.

The second project is with MSBP partner Mount Annan Botanic Gardens

For more information, please contact:

**Chris Wood**

c.wood@kew.org

**Pat Berjak**

berjak@biology.und.ac.za

**Cathy Offord**

cathy.offord@rbgsyd.nsw.gov.au



## St. Helena

As part of a project funded by the UK Foreign & Commonwealth Office (See Samara 7), Steve Alton (Donations Officer, MSB) recently travelled to the island of St. Helena in the South Atlantic. St. Helena, an Overseas Territory of the UK, lies some 1800km off the coast of southern Africa and has an area of just 121.7 km<sup>2</sup>. Its remote location – it has no airport and can only be reached by a 4 day boat journey – has led to a high level of endemism in its native flora; approximately 80% of its native plant species are found nowhere else.

Several of the rarest endemics were already held by the MSB and, as a result of Steve's work with the Agriculture & Natural Resources Department of the St. Helena Government, six more have been collected and safely conserved. These include the Black Cabbage *Melanodendron integrifolium* and the St. Helena Ebony *Trochetiopsis ebenus*.

The trip was filmed by the BBC for the second series of 'A Year at Kew.'

Of the other three UK Overseas Territories in



the project, all the bankable higher plants native to Ascension Island have now been collected and material continues to arrive at the MSB from the Falklands and British Virgin Islands.

Rare St. Helena endemics the Black Cabbage (*Melanodendron integrifolium*) and the St. Helena Ebony (*Trochetiopsis ebenus*).

For more information, please contact:

**Steve Alton**

s.alton@kew.org

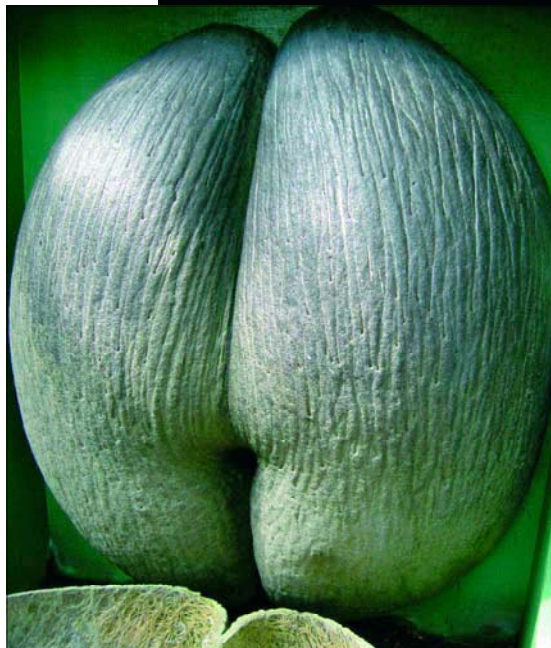
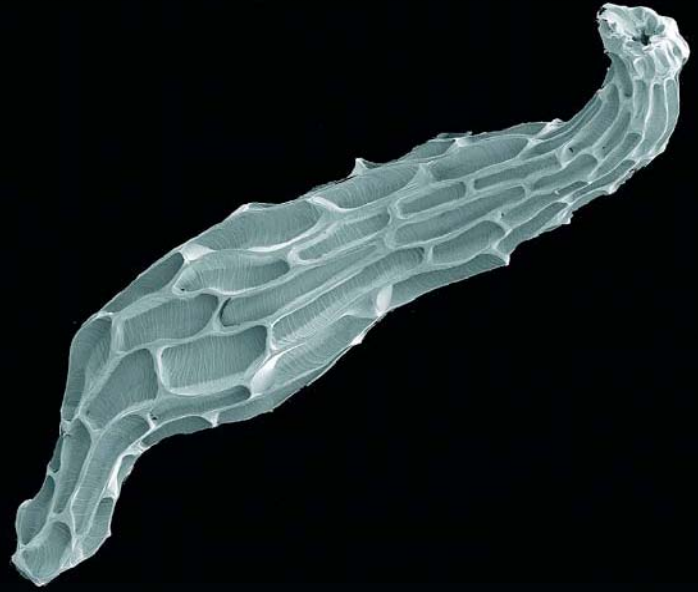
# A brief history of seed size

Seed size correlates with establishment environment and a number of plant traits, e.g. plant size, dispersal, size, dispersal syndrome, life-span, ability to form a persistent seed bank. Its surrogate seed mass is usually quite simple to measure, and it became clear to Roger Smith (see article p.8), long before the MSBP really took off, that it would be useful to compile the seed mass measurements for large numbers of species, available from both the published literature and elsewhere. Such a data-set could be used in later comparative analyses, aimed at establishing predictors of a variety of seed behaviour thereby contributing to decision support for seed conservation operations. Thus it was that when the MSB came to develop the Seed Information Database (SID), we inherited the fruits of countless hours of Roger's time spent gleaning these data, much of it in airports around the world, as he travelled to countries that would form the partnerships vital to the MSBP. SID now has over 22,000 seed mass records, covering around 14,000 species.

Meanwhile, a much improved phylogenetic classification of seed plants has become available. This has led to exciting opportunities for global syntheses of wider interest, especially phylogenetic analyses of the evolution of traits such as seed mass. Seed mass in present day species varies by 11.5 orders of magnitude, from orchids to the Seychelles coconut (*Lodoicea maldivica*). While immediate and direct applications of such analyses to seed conservation are not always easy to see, it is nevertheless likely that a deeper appreciation of seed evolution will eventually feed back into better predictions or decision support for applications like seed conservation.

SID's large collection of seed mass data was a major contribution to a recent collaboration led by Angela Moles of MacQuarie University, Sydney. While she was working in David Ackerly's laboratory at Stanford, she arrayed seed mass data for almost 13,000 species on the best current

Photo: Rob Kessler & Wolfgang Stuppy; © Board of Trustees RBG Kew - All rights reserved



Above: Scanning electron microscopy image of *Eulophia alta* (Orchidaceae) seed

Left: *Lodoicea maldivica* (Palmae), Seychelles coconut or coco-de-mer seed

PHOTO: CHRISTINA HARRISON

phylogenetic estimates for seed plants, to develop hypotheses about how seed size has changed, from the emergence of the angiosperms to the present day. Wide divergences in seed size were more often associated with divergences in growth form (usually trees *versus* herbaceous) than with divergences in either dispersal syndrome or latitude. For example, the divergence in seed mass between Arecaceae (palms) and the rest of Commelinoids (mostly herbaceous) was among the largest observed; and the contribution made by that particular divergence to the total variation among

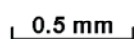
extant species was second only to that between Gymnosperms and Angiosperms. So, growth form and seed size appear to have evolved in a coordinated manner, consistent with both cross-species studies and evolutionary theory.

Moles, A.T., Ackerly, D.D., Webb, C.O., Tweddle, J.C., Dickie J.B., Westoby, M. (2005) A brief history of seed size. *Science* 307: 576-580.

For more information, please contact:

**John Dickie**

[j.dickie@kew.org](mailto:j.dickie@kew.org)



*Argemone grandiflora* (Papaveraceae) seed PHOTO: ELLY VAES

# NEWS

## China Programme Officer

Jie Cai joined the Seed Conservation Department at Wakehurst Place in July 2005.

Jie, a Chinese national, has several years experience of carrying out research on plant systematics and evolution and taxonomy. He holds a 3-years research Masters degree on botany from the Graduate School and Kunming Institute of Botany, the Chinese Academy of Sciences working on flower evolution of *Pedicularis* (Orobanchaceae) from China.

Jie will work closely with project partners, mostly a newly developed seed bank in China—the Southwest China Wild Species Bank Project, and the MSB Collecting Section to increase the plant conservation and sustainable use impact in China.

For more information, please contact:

**Jie Cai**  
j.cai@kew.org

## Name for South Australian Program

In 2004, a statewide competition was held to determine a name for the conservation partnership between South Australia and the MSBP. A wide range of volunteer and non-government groups associated with plant conservation within South Australia were asked to submit potential names. The name selected for the partnership was SACRED Seeds, an acronym for the South Australian Collection of Rare and Endangered Seeds. A farmer from the mid-north of South Australia suggested the name. For his efforts, Mr Rod Hunt will accompany collecting staff from the South Australian Seed Conservation Centre on a collection trip later this year.

## Errata

*Ex situ* conservation of a newly discovered species of Dioscoreaceae in Mpumalanga Province, South Africa (Issue 8, page 7)

Paragraph 2, line 7-8 should read "In addition, the species is dioecious" NOT monoecious. We apologize for this error.

# Roger Smith – signing off



Roger Smith head of RBG Kew's Seed Conservation Department, at RBG Kew, and MSBP has just retired, after 31 years at RBG Kew, and leaves us with some departing thoughts. He will be succeeded by Paul Smith, formerly International Co-ordinator for Southern Africa and Madagascar.

When I accepted to write a valedictory piece on the first four years of the International Phase of the MSBP it appeared a simple task. So far, each draft has ended up in the bin, rejected as either smugly self-congratulatory or a lifeless litany of numbers. Nowhere had I captured the passion of all MSBP's people, that no seed bearing species of plant should go extinct for the want of an insurance collection in a seed bank. So let me celebrate your boldness in joining what is a heavily outnumbered band of obsessive activists, determined to put some mind and muscle behind the fine words and grand sentiments of the CBD in 'the spirit of Rio'. There can be no doubt



that seed banking is an imperfect solution to species loss. It can only insure against loss of species and their genes, never against ecosystem damage. However, the increasingly unsustainable footprint of the human population, exacerbated by the ever more extravagant lifestyles of those in the North, on the world's ecosystems suggests imperfect solutions, maybe are as good as it gets in this race against the extinction clock. Should it not be so and all species continue to survive in what remains in the wild, then we will be part of the 'win – win', where insurance was taken, but happily not needed. The outcome then, a living library for scholarship.

Personally, it has provided me with such fun since 1995 that I have not noticed how quickly my time has flown. Now, to my surprise, it has. Yet, inside I know this is the right time to bring in some 'fresh legs' to carry the project forward to great success in 2009 and beyond.

With your support, I know Paul Smith will meet that challenge. I will remain your number one cheerleader, despite my problems with pom-poms.

**Roger Smith**  
June 2005

Top: **Roger addressing MSB staff**  
Left: **Roger at his retirement presentation**

## Millennium Seed Bank Collection Figures to 19 July 2005

	total in MSB	since Phase III started
Collections	23,742	12,275 (1,576 UK)
Species	11,870	7,330 (586)



## 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.**

Contact the editor **Anne Griffin**,  
Librarian & Information Officer  
Royal Botanic Gardens, Kew  
Wakehurst Place, Ardingly, West Sussex, RH17 6TN, UK.

tel: +44 1444 894178 fax: +44 1444 894110 email: a.griffin@kew.org



samara