

WHICH IS THE TRUE *ORCHIS*?



Orchis militaris



Neotinea ustulata (syn. *Orchis ustulata*)



Anacamptis morio (syn. *Orchis morio*)

AS PART OF the ongoing *Genera Orchidacearum* project, the molecular phylogenetics of the orchid subtribe Orchidinae were the subject of a joint study between RBG Kew (Drs Alec Pridgeon, Tony Cox and Mark Chase) and RBG Edinburgh (Dr Richard Bateman). Sequence analysis of the nuclear ribosomal DNA spacers of 80 taxa in Orchidinae and seven taxa in the related subtribe Habenariinae revealed many surprising results. Perhaps the most exciting is that the type genus *Orchis*, as currently circumscribed, is polyphyletic. The 33 species fall into three distinct, well supported clades: the *Orchis militaris* clade with 18 species (including the genus *Aceras*) all having a diploid chromosome number of 42, the *O. ustulata* clade with five species (including the genus *Neotinea*) all with a diploid number of 42 plus one B-chromosome, and the *O. morio* clade with 13 species (including the genus *Anacamptis*) having a diploid number of 32 or 36. These results are supported by pub-

lished hybridization, phytochemical, and allozyme data. Nomenclatural changes, now published, transfer species in the *O. morio* clade to *Anacamptis* and those in the *O. ustulata* clade to *Neotinea*, the next available name in both cases.

These DNA sequences reflect karyotypes rather than the morphological features that were used to define the genus *Orchis*. Floral characters such as sepal and petal fusion and spur morphology are pollinator-driven and represent parallelisms and convergences that blur interpretation of ancestry. Similar studies at Kew and elsewhere on other orchid taxa are now revealing just how misleading certain morphological characters have been in delimiting orchid genera. The ultimate product will be the most complete and truly phylogenetic treatment of the orchid family, *Genera Orchidacearum*.

Contact: Dr Alec Pridgeon (0181-332 5360)



Orchid Rediscovered

On the June Friends of Kew tour to northern Sichuan, China, led by Dr Phillip Cribb, a rare slipper orchid, *Cyripedium palang-shanense*, was rediscovered. Caroline Lloyd found the orchid, last collected in 1930, growing with three other slipper orchid species in the wild mountains of Min Shan, one of the last homes of the giant panda.

Contact: Dr Phillip Cribb (0181-332 5245)



Director's Message Systematics

The focus of this issue is on systematics, the core of our scientific work at Kew and the discipline that is the fundamental basis for all work with plants or any other organisms. Systematics describes, names, classifies and produces the means whereby plants can be identified. Without this the plant user would be lost and the scientist unable to repeat an experiment with certainty that he or she had the same plant. We are engaged in the great variety of systematics projects that are reported on here, and in many others which space does not permit to include, because systematics is fundamental to our mission to increase knowledge and understanding of the plant kingdom.

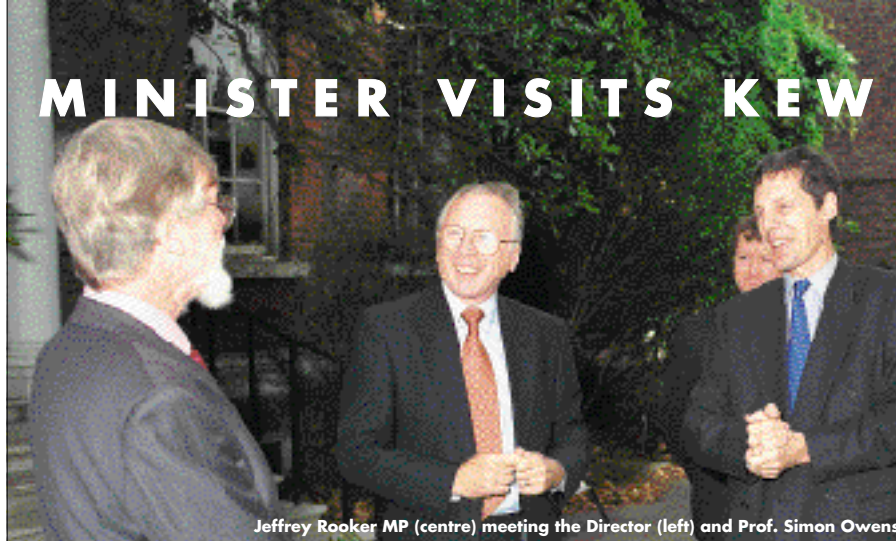
I am impressed by the vitality of our work in systematics as I attend various conferences such as the 1996 and 1997 annual meetings of the American Institute of Biological Sciences where papers by Kew authors abounded. The recent systematics meetings held in Glasgow and Oxford in August were also well supported by Kew systematists and in the later meeting, sponsored by the Systematics Association, 27 per cent of the total papers presented had a Kew author on them, and they were significant and interesting papers on systematics and evolution. This is an indication of a lively programme of productive scientists who are getting their work out to their scientific colleagues.

Our systematics programme is strong because it combines the traditional herbarium and library based studies with the more experimental such as pollen, anatomy, chromosome and genome work, phytochemistry and more recently cladistics and molecular systematics. Examples of several of these approaches are reported on here. Furthermore our systematics research is backed up by our rich collections, a seven million specimen herbarium, over 35,000 taxa in the living collections and an outstanding library.

In *Kew 2020* we have set ourselves challenging goals to complete our current flora commitments expeditiously, to expand our programme of monographic research through the study of critical groups of plants, to broaden our current programme into a wider international collaboration to produce a new classification of higher plants, and to computerise the herbarium collection. Above all, the goal of *Kew 2020* to continue first class research in systematic botany sets our pathway for the future. The recent establishment of an Information Services Department will help facilitate these ambitious goals.

Prof. Sir Ghilleain Prance, Director

MINISTER VISITS KEW



Jeffrey Rooker MP (centre) meeting the Director (left) and Prof. Simon Owens

THE MINISTER OF STATE for Agriculture, Fisheries and Food, Jeffrey Rooker MP, visited Kew on 15 September 1997. His responsibilities at MAFF, Kew's sponsoring Ministry, include plant science policy. Accompanied by the Director and the Chairman of the Kew Trustees, Mr Robin Herbert CBE, the Minister

met many staff working on Kew's science programmes in the Herbarium and the Jodrell Laboratory. He also saw science facilities recently funded by MAFF, including the newly upgraded Melon Yard glasshouse complex and ongoing work to extend wing D of the Herbarium.

Awards

DAVID PEGLER and HUGH PRITCHARD have both been awarded the title of Visiting Professor from Jilin Agricultural University, PR China. David has also been made a Centenary Fellow of the British Mycological Society and elected as a Member of the Norwegian Academy of Science and Letters.

Three Kew-based PhD students recently defended their theses successfully. In collaborative projects with King's College London, Fiona Hay (Kew-funded) researched the

development of seed longevity in wild plants and Harry Gee (Sir Jeremiah Colman Gift Trust-funded) worked on molecular markers for desiccation tolerance in seeds. Lastly, Ginny Saunders (BBSRC-CASE student, Hull University) examined the influence of dsRNA elements in orchid mycorrhizal fungi on symbiosis. A former Kew Diploma student, Tim Upson, who undertook some of his doctoral research into *Lavandula* taxonomy at Kew, has also obtained a PhD at Reading University.

GENOME SIZE

Workshop

EIGHTEEN scientists (from Argentina, Austria, Czech Republic, India, Italy, Mexico, New Zealand, UK and USA) attended the New Discovery Workshop on 'Angiosperm Genome Size' (9-10 September 1997). They discussed best practice, identified gaps and set goals for new research to improve taxonomic and geographic representation of this important biodiversity character for the global flora. The group strongly endorsed the new Angiosperm DNA C-values database (available on the internet at www.rbgekew.org.uk/cval/database1.html), recommending that Kew continues to update this valuable information service.

and Discussion Meeting

On 11-12 September, 86 participants from 15 countries attended a discussion meeting on the same topic also hosted by RBG Kew. Sessions with 22 oral and 40 poster papers addressed aspects of genome size, including its systematic and ecological significance, intraspecific variation, and mechanisms of change.

Contact: Prof. Mike Bennett (0181-332 5311)



Mike Bennett (right) with delegates at the Genome Size meeting

CASTLE HOWARD CONNECTION

ON 23 JUNE 1997, RBG Kew became formally involved with the establishment of the Castle Howard Arboretum Trust, relating to the management of the woody collections at Castle Howard (CH), North Yorkshire. The estate includes two extensive outdoor plantings of trees and shrubs established during the 1970s by the famous plantsman, the late Jim Russell. These are valuable, botanically well-documented collections that include numerous taxa lacking in the holdings at Kew and Wakehurst Place, as well as propagations of historic material such as rhododendrons collected by Kew's second director, Sir Joseph Hooker. The north of England climate is cooler and moister and provides better conditions for some plants than the drier site at Kew. The CH collections also afford the opportunity to study and conserve a wider range of genotypes, since they include a larger number of genetically-different individuals of a given species. Kew is represented on both Trustees and Management Committees and will offer advice on horticultural maintenance, collections records and mapping, as well as identification services. These activities are in part being supported by funds raised by the Kew Foundation in recognition of the importance of the CH collections for botanical horticulture.

Contact: Nigel Taylor (0181-332 5511)

DNA Bank Manager



MARTYN POWELL began work as Kew's DNA Bank manager on 26 August 1997. His role will be to extract and prepare DNA from all plant species within the living collections at Kew, whilst also maintaining the DNA Bank database and processing herbarium vouchers for all samples.

Contact: Martyn Powell (0181-332 5355)

MILLENNIUM SEED BANK UPDATE



Michiel van Slageren collecting seed in Lebanon

THIS year has seen significant progress in the Millennium Seed Bank project, both at home and abroad. A major step has been to purchase land adjacent to the existing Seed Bank at Wakehurst Place on which the new building will be constructed. Building work is due to begin this autumn.

In April, Steve Alton was appointed as the UK Coordinator for the project, organising the collecting programme and the training of volunteers from collaborating organisations. The response to the project from UK conservation organisations has been excellent and this support has ensured that we are on course to have seeds of half the UK's native plants conserved in the existing seed bank by the end of 1997. In addition, two post-doctoral researchers have been recruited to study seeds of UK aquatic plants and species with 'microscopic' seeds, mainly orchids. These groups of plants contain species whose seeds are difficult to store long-term in a conventional seed bank.

Seed from meadows in the Loder Valley Nature Reserve at Wakehurst Place has also been collected this summer using a mechanical seed harvester. The seed will be used in trials to examine whether this local source of meadowland species can be used to revegetate the grassland element of the Millennium Seed Bank landscape.

The full-scale overseas collecting programme is due to begin in the year 2000 and preparations for this continue. So far this year, Dr Michiel van Slageren has undertaken collaborative collecting expeditions in Yemen, Morocco, Lebanon and Tunisia. The latter was part of a Darwin Initiative project on medicinal plants in Tunisia, coordinated by the British Council. Fundraising has also been progressing very well; following the Millennium Commission's award of £30 million, companies, trusts and individuals have contributed a further £13.4 million towards the project.

Contact: Dr Gillian Wechsberg (01444 894091)

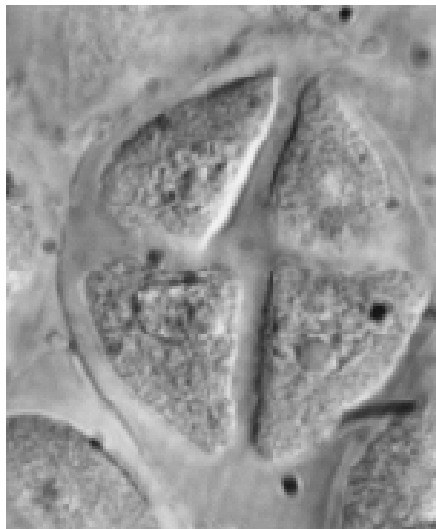
SYSTEMATICS CONFERENCES

The breadth of systematics research undertaken at Kew was evident from the number of papers presented at major meetings this summer that had Kew involvement: 24 papers at 'Systematics' in Oxford (many by postgraduate students), 15 at the AIBS meetings in Montreal, and four at the SEB meetings in Boulder. Many papers related to the combination of different data matrices. For example, at 'Advances in Plant Molecular Systematics' in Glasgow, Dr Mark Chase gave an invited paper written with Dr Renee Grayer and others on the combination of molecular and phytochemical data. Mark also organised a symposium on large data sets at the Oxford meeting (where Kew's Director gave the opening address) and was a co-author, with Dr Alec Pridgeon, on a paper on Orchidinae presented at Glasgow by Dr Richard Bateman (RBG Edinburgh)

Contact: Dr. Mark Chase (0181-332 5364)

Also this summer, Dr Dick Brummitt attended a meeting of the committee for the Species Plantarum Project, of which he is convener, at the California Academy of Sciences. The project aims to produce a World Flora giving all basic taxonomic data down to species and infraspecific levels. The committee accepted the offer by the Australian Biological Resources Study, which publishes *Flora of Australia*, to edit and publish the proposed *Species Plantarum* in a similar format. Two smallish sample family treatments (Irvingiaceae and Morinaceae) were presented for publication and both hard copy and electronic versions are envisaged. The project is obviously very ambitious and long-term, but unless a start is made, a complete synthesis of taxonomic information on the higher plants of the world will never be achieved.

Contact: Dr Dick Brummitt (0181-332 5247)



Paradeisa liliastrum: tetragonal tetrad.
Differential interference contrast.

Systematics

Systematics research at Kew covers many taxonomic levels and character types.

CYPRIPEDIUM

BRTAIN'S sole surviving slipper orchid is probably its most famous plant. The propagation and re-introduction of *Cypripedium calceolus* by Kew was the inspiration for Dr Phillip Cribb's account, *The Genus Cypripedium*, which has just been published as the latest *Botanical Magazine* monograph. The monograph provides an identification key and detailed account of all 47 species. Each is illustrated with a fine line drawing by Eleanor Catherine and, where possible, by a photograph of the plant in its natural habitat, mostly taken by the author during expeditions to the Americas and China. Details of cultivation are also provided by Holger Perner, a well-known German slipper orchid grower. Introductory chapters cover the history of the genus, its morphology and anatomy, cytology, biology, ecology, conservation, evolution, and classification. One chapter chronicles the decline of the British plant and current attempts to save it.

Kew is fortunate in having several species of *Cypripedium* in its living collections and this has permitted Dr Tony Cox and co-workers to compare a DNA analysis of the genus with taxonomies based on morphological characters. Extant taxa seem to be characterised by high degrees of morphological and DNA divergence. This may be due to either long periods of isolation or extinction of intermediate forms. While more detailed studies are still needed, it appears that Eurasian yellow or red-flowered species and North American yellow-flowered species form two natural

Morphology & Molecules



Cypripedium tibeticum.

groups. The multi-flowered species (*C. irapeanum* and *C. californicum*) appear to represent the earliest diverging lines and in many respects share similarities with their sister genus *Selenipedium*.

Contact: Dr Phillip Cribb (0181-332 5245)

Pollen Development in Asparagoid Lilies

RECENTLY published research on the lily group (Lilianaee) by Drs Paula Rudall, Carol Furness, Mike Fay and Mark Chase has revealed close correlation between certain pollen characters and the generic relationships indicated by *rbcl* sequence data analysis. This underpins current concepts of the relationships of these plants and in turn provides new insights into the evolution of pollen aperture types.

Meiosis leading to pollen development (microsporogenesis) involves either almost simultaneous nuclear divisions, without intermediate cell wall formation, to produce tetrahedral tetrads, or successive nuclear divisions, with wall formation after each, to produce tetrago-

nal tetrads. Although most monocotyledons have successive microsporogenesis, simultaneous microsporogenesis is characteristic of early-branching taxa of Asparagales (including Iridaceae and Asphodelaceae), with a reversal back to the successive type in a large group of later-branching taxa (including Alliaceae and Hyacinthaceae). Most Asparagales have monosulcate pollen, but one group (Phormiaceae plus some allied taxa, such as the European genus *Simethis* and the Australian genus *Johnsonia*) have a forked sulcus (trichotomosulcate pollen), always associated with simultaneous microsporogenesis.

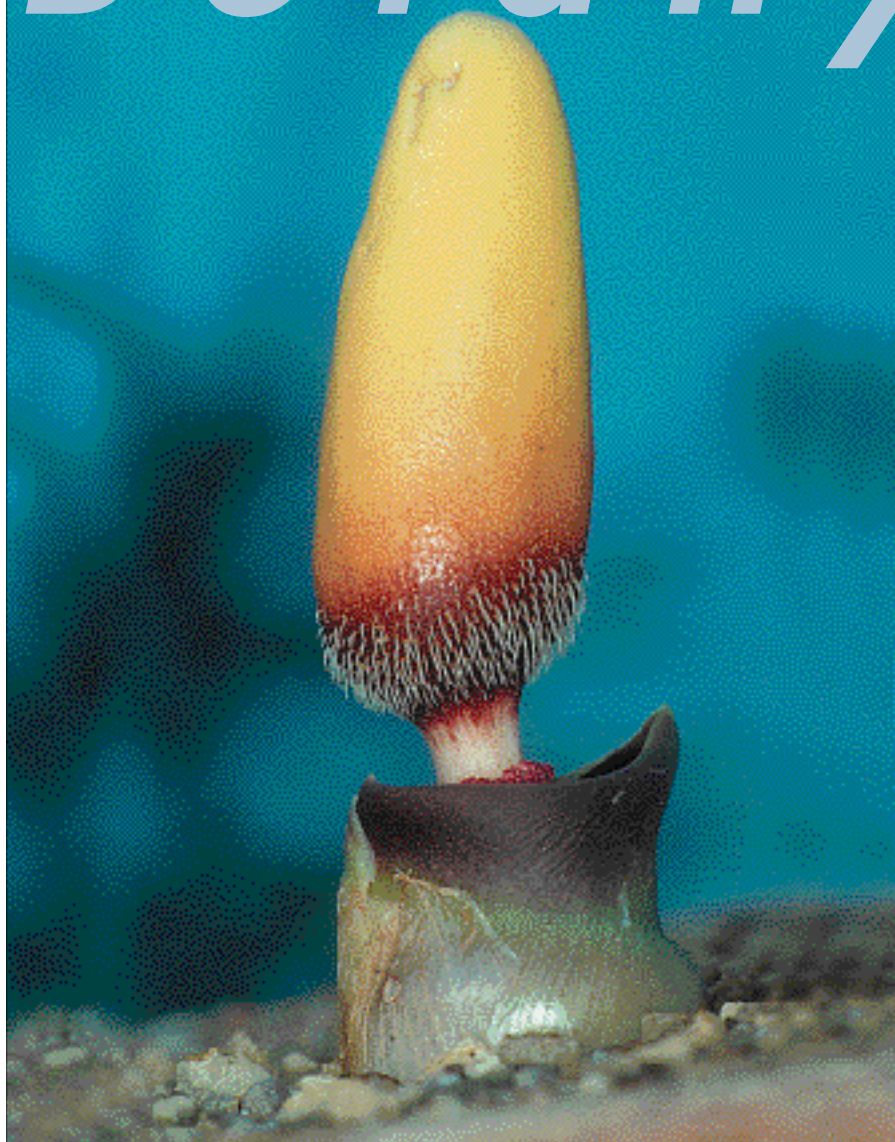
Contact: Dr Paula Rudall (0181-322 5331)

atic Botany

THE publication in September of *The Genera of Araceae* is the culmination of an idea first broached in 1980 during the first international workshop on Araceae systematics held at the Marie Selby Botanical Garden, Florida. Dr Simon Mayo began a manuscript with Dr Michael Madison (organiser of the conference) but the project really developed in 1987 when he, Peter Boyce and Josef Bogner (Munich Botanic Garden) resolved to tackle the task anew, under the encouragement of Prof. Gren Lucas (then Keeper of the Kew Herbarium). Eleanor Catherine, the artist, completed the team later, but many other colleagues from 36 institutions around the world have also contributed in various ways, such as providing material for drawing, supplying critical unpublished data or reviewing chapters.

The final form of the 370 page work was essentially inspired by Uhl & Dransfield's *Genera Palmarum*. A general part gives condensed treatments of the major character fields and includes chapters on anatomy by Prof. J.C. French and chemistry by Prof. R. Hegnauer as well as other subjects of interest such as phylogeny, fossils, uses and conservation. In the taxonomic part, each of the 105 recognised genera is described and illustrated with one or more original line drawings. A range map is provided for each genus and 96 genera are shown as colour photos; the latter are selected to show especially the shapes and colours of the inflorescences and infructescences. *Genera of Araceae* is also available as a CD.

Contact: Dr Simon Mayo (0181-332 5213)



Biarum ditschianum, a recently discovered and very distinctive species from limestone crevices and chimneys in southern Turkey, flowering in Kew's Alpine Unit.

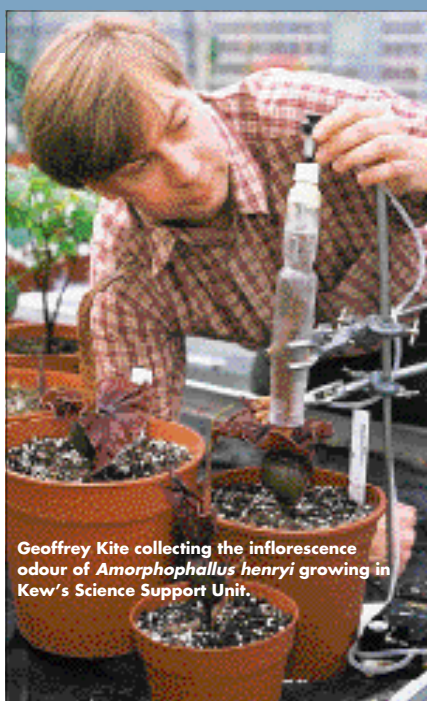
THE GENERA OF ARACEAE

Economic Araceae

5

AN 'ALICE' database of economic uses of Araceae has been compiled by Kerry Taylor (placement student, University of the West of England) and Peter Boyce. Over 800 aroid species have economic or ethnobotanical importance but the information has never been brought together. Data were assembled from scanning the literature, Index Kewensis, Kew's herbarium collection of ca 30,000 sheets, the Internet and letters or emails from colleagues around the world, particularly members of the International Aroid Society. A checklist of economic and ethnobotanically important Araceae will be published and the information made available on the Internet.

Contact: Peter Boyce (0181-332 5207)



Geoffrey Kite collecting the inflorescence odour of *Amorphophallus henryi* growing in Kew's Science Support Unit.

Araceae Chemistry

TWO aspects of Kew's work on Araceae chemistry have been published recently. Firstly, a survey of the family for alkaloidal sugar mimics revealed they were largely restricted to Aglaonemateae and Nephthytideae, supporting molecular data indicating a relationship between these tribes. Secondly, analysis of the inflorescence odours of several *Amorphophallus* species (including *A. titanum* which flowered last year at Kew), in collaboration with the independent expert Wilbert Hetterscheid, revealed foul-smelling dimethylsulphides in groups of related species. The odours of other species were quite different; for example, the cheese-smelling *A. elatus* produced almost pure iso-caproic acid.

Contact: Dr Geoffrey Kite (0181-332 5368)

Kew's Botanical Liaison Officers

Kew hosts three Botanical Liaison Officer (BLO) positions which are filled by botanists from South Africa, Australia and India. BLOs work at Kew for a period of time and act as the formal contact between the botanical community in their home country and staff at Kew. A Malaysian BLO position is occasionally filled depending on funding from the Tree Flora of Sabah and Sawarak project.



Saskia Harris comes from the National Herbarium in Pretoria. She has been the part-time South African BLO since August 1996 (regrettably, funding for the full-time post was abandoned in 1995). Her research interests include 'weedy' ruderals, phytogeography and a continuing interest in Lobeliaceae and Asclepiadaceae. The Kew Herbarium and Library hold rich taxonomic resources relating to South Africa and Saskia responds to requests for information from the South African research community and facilitates visits. She also assists staff at Kew in matters South African.



Dr Ken Hill is a Senior Botanist at the Royal Botanic Gardens in Sydney and became the Australian BLO in September 1997. His long interest is the genus *Eucalyptus*, initially in collaboration with the late Lawrie Johnson. This resulted in the splitting of *Eucalyptus* and the description of the new segregate genus *Corymbia* in 1996. More recently he has become interested in cycads and conifers through the *Flora of Australia* project and intends to work on these groups at Kew, using the Living Collections and furthering molecular studies on cycads started in Australia.



Dr Sri Krishna Murti belongs to the Botanical Survey of India and was previously posted in Dehradun, Uttar Pradesh, before coming to Kew in 1995. He is currently revising the genera *Elatostema*, *Pilea*, and *Poa* for the *Flora of India*, having already revised Elaeocarpaceae for the Flora. Previously he has co-authored or contributed to Floras of the Bilaspur District (Central India), Jammu & Kashmir (Western Himalaya) and Cold Desert (Ladak and Lahul Spiti). His liaison work at Kew involves the exchange of information, literature and material, and the identification of Indian plants.

FLORAS & CHECKLISTS

Borneo Floras

BORNEO has some of the world's most spectacular fungi and one of the richest orchid floras. Both these groups are covered in three recent books by Kew staff. *The Larger Fungi of Borneo*, by Prof. David Pegler (published by Natural History Publications, NHP, Kota Kinabalu), is the first book written for the interested public to illustrate, with full-colour photographs, some of the larger fungi from the lowland rainforests of SE Asia. The third volume of *Orchids of Borneo*, by Jeffrey Wood (published by the Sabah Society and Bentham-Moxon Trust, Kew), includes accounts of many showy orchids such as *Paphiopedilum*, *Phalaenopsis*, *Dendrobium* and *Dendrochilum*. The text is accompanied by fine line drawings and colour photographs. Lastly, the *Slipper Orchids of Borneo*, by Dr Phillip Cribb (published by NHP), covers the island's rich collection of *Paphiopedilum* species, over half of which are endemic and some desperately rare. Tropical slipper orchids have the highest profile of any tropical orchids. Fortunately some of the finest species are now protected in national parks but the continuing destruction of the forests give cause for concern about their future survival.

Contact: Ted Brown (0181-332 5219)



Phallus indusiatus (pink form), one of the larger fungi from the Borneo rainforest.

Irian Jaya Checklist

A CHECKLIST of the flowering plants of N.E. Kepala Burung, Irian Jaya, Indonesia, has recently been completed by Mark Coode, Sally Hinchcliffe and Jill Marsden. This is one result of a project funded by the John D. and Catherine T. Macarthur Foundation carried out in collaboration with the Indonesian Academy of Sciences (LIPI) and the Universitas Cenderawasih at Manokwari in Irian Jaya. Kew had hoped to conduct much more fieldwork in the area as part of the project but, unfortunately, Irian Jaya has been out of bounds for overseas scientific teams since the serious kidnap crisis of January 1996. As part of the project, one of our colleagues from Indonesia, Rudi Maturbongs, a lecturer in botany at the university in Manokwari, will be arriving in early October to spend 6 months training in the Herbarium and carrying out a research project on a complex of commercially important rattan species.

Contact: Dr John Dransfield (0181-332 5225)

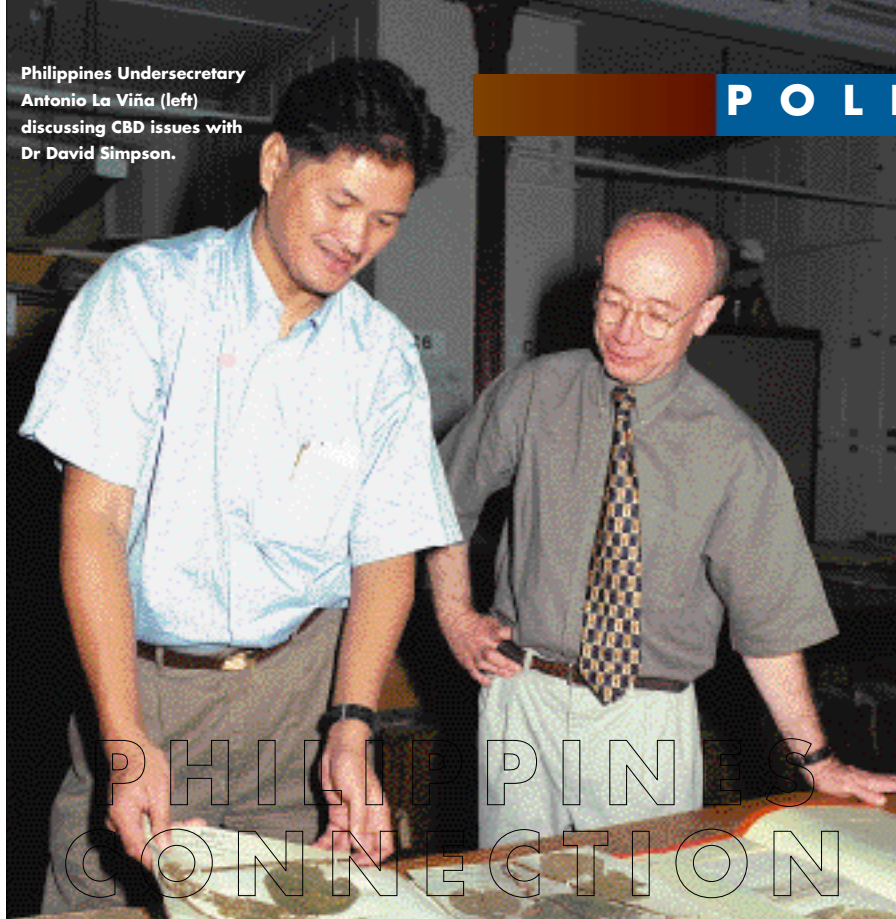
- Volume 6 of *Flora of Ethiopia* including Orchids (by Dr Phillip Cribb and Sarah Thomas) and Zingiberaceae (by Dr Mike Lock) has been published.

Madagascar Euphorbs

DR PETRA HOFFMANN (former EU research fellow at Kew, currently at Rijksherbarium Leiden) will take up a two-year grant funded by the German Science Foundation 'Deutsche Forschungsgemeinschaft' to study the phylogeny of Euphorbiaceae-Phyllanthoideae. She will be based at Kew, but also spend a period of time in the Paris Herbarium and six months of fieldwork in Madagascar.



Philippines Undersecretary
Antonio La Viña (left)
discussing CBD issues with
Dr David Simpson.



Convention on Biological Diversity (CBD)

RBG KEW was an NGO observer at the third session of the Subsidiary Body for Scientific, Technical & Technological Advice (SBSTTA3) to the CBD, Montreal (1-5 Sept. 1997). Kew's delegation consisted of the Director, Kerry ten Kate and Laura Touche (recently appointed as a CBD researcher). SBSTTA3 focused on issues relating to biological diversity of inland water ecosystems, marine and coastal biological diversity, forest biological diversity and agricultural biological diversity, as well as agenda items concerning the operation of the CBD clearinghouse mechanism, the modus operandi of the SBSTTA and the development of appropriate biological diversity indicators for monitoring and assessment. By participating in SBSTTA, Kew keeps abreast of developments that will affect its choice of policy relating to the access to genetic resources and benefit-sharing provisions of the CBD and progresses other ongoing CBD projects.

Contact: Kerry ten Kate (0181-332 5741)

UNDERSECRETARY Antonio La Viña (Philippines Ministry of Environment & Natural Resources) advised on the formulation of Kew's policy on access to genetic resources and benefit sharing during his visit on 29-30 July 1997. Mr La Viña has been central in formulating measures to regulate all scientific and commercial access to Philippine genetic resources, and he represents his country at the CBD, the Framework Convention on Climate Change and similar intergovernmental negotiations.

On his visit, Mr La Viña met Dr Lolita Bulalacao and Mercelita Bangis from the National Museum of the Philippines (NMP). Lolita had worked with Prof. Simon Owens, Dr Keith Ferguson and Dr John Dransfield to make possible a Memorandum of Understanding (MOU)

between Kew and NMP signed earlier this year. This establishes co-operation between the Kew Herbarium and the NMP Botany Division in training, and exchange of staff, botanical specimens and publications. Currently, Mercelita is making a checklist of Philippine Compositae, with Dr Nicholas Hind as advisor, after successfully completing the Kew Diploma course in Herbarium Techniques and Management. Lolita has returned to Kew to continue researching the second volume of a *Pollen Flora for the Philippines*. The first volume, started at Kew last year, is now being edited by Drs Keith Ferguson and Madeline Harley.

Contact: Dr Keith Ferguson (0181-332 5248)

A MOU between Kew, the Jersey Wildlife Preservation Trust and Fauna & Flora International was signed in July to reflect mutual interests in implementing practical conservation and training projects.

Climate Change

IN the 7th Kew Environmental Lecture (15 September 1997), the Hon. Timothy Wirth (US Under Secretary of State for Global Affairs) outlined the US Presidency's proposals to reduce global warming. These included setting realistic targets for developed countries to reduce greenhouse gas emissions, agreeing to binding emissions limits for developing countries, and establishing a system of 'emissions trading' to cut the costs of these measures. He said President Clinton recognised that the US, as the world's leading emitter, must set a strong example and has promised to take binding commitments to the conference on climate change at Kyoto in December. However, Mr Wirth thought that emissions targets proposed at Kyoto must be sensible and achievable to reach agreement.

Conservation Genetics

AT Kew, genetic fingerprinting studies are playing an integral role in the decision making process in conservation projects. The most commonly used technique, AFLPs (amplified fragment length polymorphisms) described in 1995, requires only small amounts of tissue and has been used on Kew's automated sequencer to characterise levels of variation in *Orchis simia*, *Cypripedium calceolus* and *Limonium* spp. from Britain, *Populus euphratica* from Spain and *Phyllea arborea* from Tristan da Cunha.

Contact: Dr Mike Fay (0181-332 5374)

Kew Wildlife

A Kew Wildlife Recording Group has been formalised to support the strategy, outlined in Kew's Corporate Strategic Plan, to 'maintain and enhance the existing diversity of native species and populations (plants, fungi and animals) in the estates of Kew and Wakehurst Place'. The group will build a database and publish wildlife records, including recent and historical data, covering all groups of organisms and will make the records available to those responsible for Gardens' management.

Contact: Laura Hastings (0181-332 5770)



The world's largest recorded fungus fruitbody, belonging to *Rigidiporus ulmarius*, grows at Kew. In August 1997 it had a circumference of 490 cm and weighed approximately 316 kg.



DESPITE the problems caused by death watch beetles (*Xestobium rufovillosum*) to many cathedrals, including Salisbury and Winchester, and historical houses such as Kew Palace, methods of control are costly and ineffective. This is partly because of the paucity of information about the beetle's life cycle and behaviour. Kew, in partnership with Birkbeck College, has been part of an EU-funded project (co-ordinated by English Heritage and Ridout Associates) to look at methods of beetle control. For the last three years Steve Belmain has been collecting beetles from the rafters of old buildings and studying their behaviour.

One basic discovery was that the beetles could fly and are attracted to light, enabling the use of ultra-violet or sticky traps to monitor populations and possibly control them. Collaborative studies with University College Dublin showed that, contrary to previous belief, infestation of wood by the fungus *Donkioporia expansa* was not critical for beetle development; however, beetles may develop faster in fungal infested wood. Steve found that beetles could discriminate among different types of wood, showing a preference for old decaying oak, and parallel studies by TNO in the Netherlands revealed that wood chemistry changes with age and these changes could be influenced by fungal infestation. The next phase of the project is to make traps more attractive to beetles by incorporating volatiles from old oak wood or by-products from fungal-wood interactions.

Contact: Dr Monique Simmonds (0181-332 5328)



Kew Palace (above) was a good source of death watch beetles (left) for studies on their behaviour, undertaken by Steve Belmain (pictured below searching for beetles in the attic).



FIRST FLOWERING

Iris odaesanensis (left), a very rare member of the Series Chinenses endemic to the Odaesan mountain range of S. Korea, flowered in the Cumberland woodland garden this May. The species was described in 1974 and this is the first known record of it flowering in cultivation.

Contact: Tony Hall

Jodrellia fistulosa (right), sent by Prof. Himansu Baijnath (Univ. Durban-Westville) who described the genus in 1978 whilst studying at Kew for his PhD, flowered in the Science Support Unit in late September. The plant, named after T.J. Phillips-Jodrell who funded the original Jodrell Laboratory, is now the subject of cytological and molecular research.

Contact: Clive Foster (0181-332 5523)



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