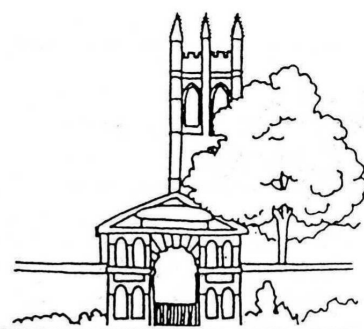


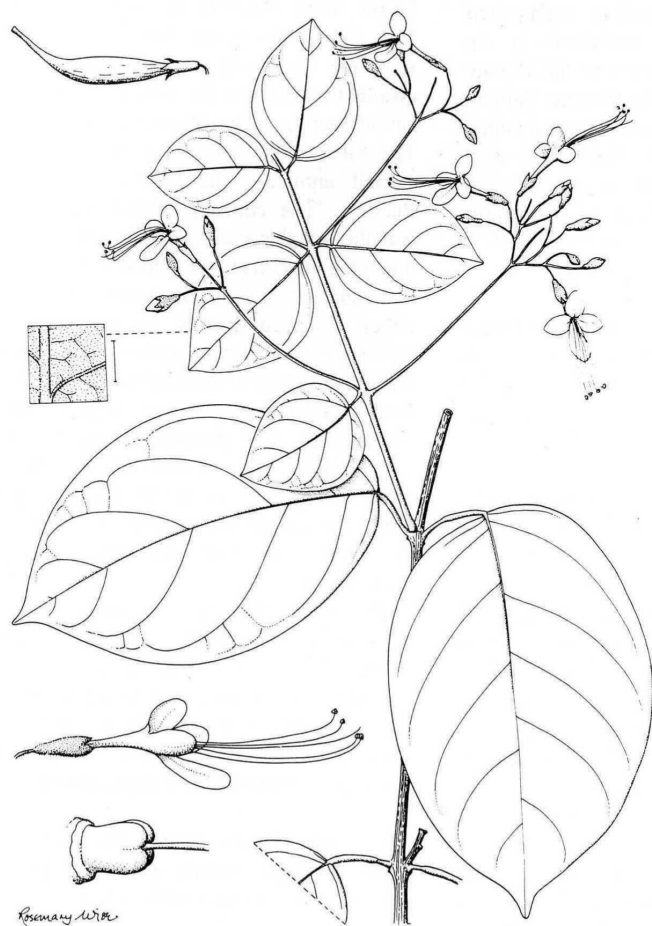
Oxford Plant Systematics



With news from Oxford University Herbaria (OXF and FHO), Department of Plant Sciences, Oxford

OPS 4

December 1996



Hosea lobbii was described by Clarke in 1885. The species makes a very attractive garden plant because the large first order bracteoles, as well as the corollas, are delicate pink in colour. *H. lobbii* is native to Sarawak and Brunei, and is reported to be very common along rivers and in swamps. The long thin fruits differ greatly from the fruits of its close relatives *Faradaya*, *Oxera* and *Clerodendrum*.

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Editorial

This year has seen a number of changes in the systematics personnel in Oxford Plant Sciences. When I arrived in Oxford in 1990 there were three taxonomists in the department [Frank White, Brian Styles and David Mabberley]. Drs White and Styles have since died and David Mabberley has this year moved his base to Australia [see news items]. We wish David well in Australia and will sorely miss his expertise on many aspects of taxonomy. Nevertheless, the department continues to support Plant Systematics at Oxford and research is flourishing. The two outstanding D.Phil. theses completed this year by Drs Colin Hughes and Julie Hawkins [see abstracts in this issue] illustrate the flavour of research being carried out. Dorothy Steane being awarded the Irene Manton prize for her thesis on *Clerodendrum* systematics shows outside appreciation of our research effort. Currently, we have four D.Phil students [see student progress], one Leverhulme funded post-doc [David Harris] and a short term ODA funded post-doc [Julie Hawkins]. Rosemary Wise continues as our botanical illustrator and has completed her book entitled: *Endemic Flowering Plants of the granitic Seychelles*. Three members of the Oxford Forestry Institute forest genetics group [Colin Hughes, Denis Filer and Chris Fagg] have re-located themselves in close vicinity to the herbaria to pursue their research and further consolidate the systematic effort in the department. We are sad to say goodbye to Séan Turner our specimen mounter who has retired after a lifetime working in the department. We wish her good health in retirement.

Next year will see the first of a new symposium initiative of the Systematics Association which will be held in Oxford [see back cover]. This symposium represents an exciting new development in British systematics and we are delighted to be hosting the event in Oxford.

This newsletter is largely the result of the able efforts of Serena Marner, who has patiently gathered the submissions and put together the final lay-out. We thank Serena for all her efforts.

Robert Scotland

News items

General news

David Mabberley was appointed Honorary Research Associate at Royal Botanic Gardens Sydney early in the year and has now resigned his University Lectureship in the Faculty of Biological Sciences to be able to spend more time in Australia where he has Permanent Resident Status, and Holland where he is Professor Extraordinary at the University of Leiden.

Caroline Pannell has been funded by the ODA to complete an account of *Aglaia* Lour. (Meliaceae) for the Tree Flora of Sabah and Sarawak project.

Séan Turner, specimen mounter in the Herbaria, retired in September. Séan joined the Department as a technician in the 1940s, when it was known as the Botany School and situated at the Botanic Garden. After bringing up her family Séan rejoined the Department in 1976. During her early years in the Department Séan worked in George Claridge Druce's house in Oxford. We shall all miss Séan and her skill at preparing often difficult specimens.

Congratulations to **Karen Sidwell** who has been appointed to a position at the Natural History Museum in London working on Flora Mesoamericana. Karen begins her new job in February 1997.

Congratulations to **Robert Scotland** who has been elected onto the Linnean Society Council.

Congratulations to **Dorothy Steane** on being awarded the Irene Manton Prize administered by the Linnean Society. Dot received a painting and cheque for £1000 for her thesis on *Clerodendrum* systematics. Dot (now back in Tasmania) has recently given birth to a baby girl. Both are doing fine.

The Linnean Society of London awarded £325 from the AG Side Fund for Research in Systematic Biology to **Karen Sidwell**. The money will cover the cost of art materials and training time from Rosemary Wise and enable Karen to produce publication quality illustrations of the 11 species of *Brillantaisia*.

Rosemary Wise has completed her book on *The Endemic Flowering Plants of the granitic Seychelles* and is about to send the

text and paintings to Princeton University Press. Publication is set for late 1997. Rosemary is now wondering what her next spare time project should be!

A poster was prepared by **Serena Marner** for the one day symposium of the Genetical Society which was held at St. Catherine's College, Oxford on 27 April on "Genetics of Garden Plants". The poster was entitled 'Mules, mongrels and man' and was based on a number of early hybrid specimens of significance from the historic collections in the Fielding-Druce Herbarium (OXF).

The Third Meeting of the Collection Managers of major herbaria in the British Isles group of the UK Systematics Forum was held in Oxford in July.

News from Oxford Botanic Garden

The 1996 Educational Out-reach display from the University Botanic Garden was awarded a medal in the Scientific and Education Section of the Chelsea Flower Show. The Silver Gilt medal was given for the exhibit entitled "The Healing Power of Plants". The concept behind the exhibit was the fact that many people in the UK do not make the connection between plants and medicine, yet 50% of mainstream drugs are either produced directly by plants or are based on plant derived products. Furthermore many new drugs originate from plant derived chemicals even if they are later synthesised in a pharmaceuticals factory. The display was sponsored by Scotia Pharmaceuticals and the Wellcome Trust, both of whom believe that plants are vital in the search for new and more efficient pharmaceuticals.

This is the fifth year in succession the Botanic Garden has been awarded a medal at the Chelsea Flower Show and it is just one part of its commitment to public education. In addition the Garden has launched a formal programme of adult education on a range of botanical and horticultural subjects.

For more details contact the Education Officer at the University of Oxford Botanic Garden, Rose Lane, Oxford OX1 4AX.

The molecular systematics laboratory

The facilities offered by the molecular systematics laboratory have continued to be used this year in a number of systematics projects, and a larger number of forest population genetics projects. The systematics projects include the work of Joanne Chamberlain on utilising isozyme markers

for infraspecific taxon delimitation in *Calliandra calothyrsus* Meissn. (Leguminosae) across its natural, neotropical range. D.Phil. students Rogier de Kok, Karen Sidwell and Mark Carine are using chloroplast DNA to study phylogenies of the genera *Oxera* Lab./*Faradaya* Muell. (Labiatae) and *Brillantaisia* P. Beauv. and *Stenosiphonium* Nees (Acanthaceae) respectively.

A European Union Framework IV grant was awarded to investigate the molecular systematics of neotropical pines.

Stephen Harris

The Frank White Memorial Symposium on The Ecology, Chorology and Taxonomy of the African and Madagascan Floras

Dr. Frank White, Distinguished Research Curator of The Oxford Herbaria, died on the 12 September 1994.

On 26 and 27 September 1996, The Frank White Memorial Symposium was held here in the department, featuring The Ecology, Chorology & Taxonomy of the African and Madagascan Floras. It was attended by over 100 visitors from many different countries and excellent papers were given on wide ranging topics, relevant to the pioneering work of Dr. White in Africa.

The full programme was as follows:

Introduction by Professor Sir Ghilleen Prance

Chorology

Prof Ib Friis, University of Copenhagen: The development of ideas for African chorology.

Dr Peter Linder, Bolus Herbarium, Cape Town: Historical interpretation of the African phytochoria.

Dr Françoise Dowsett-Lemaire & R. J. Dowsett: Parallels between F. White's phytochoria and avian zoochoria in tropical Africa.

Dr C. C. Berg, University of Bergen: Systematics and phytogeography of the African Moraceae compared with those of other tropical areas.

Life and Work of Frank White

Dr Caroline Pannell, the life and work of Frank White: Personal tributes by - Audrey Nichol, Jock Angus, Jim Chapman,

Jonathan Okafor, Judy Cassels and Elmar Robbrecht.

Aspects of Conservation

W.R. Bainbridge, Pietermaritzburg: Contribution of the Southern Maputaland Biosphere Reserve to the conservation of biological diversity resources in South Africa.

Dr David F. Cutler, Royal Botanic Garden, Kew: Dry forests, their utilization and conservation.

Animal Interactions, Variation and Taxonomy

Dr Caroline E.G. Tutin, Centre Int. Recherches Medicales de Franceville, Gabon: Gorillas and food plants at Lopé.

Dr Inga and Prof Olov Hedberg, Uppsala Universitet: Plant variation phylogeny and systematics.

Dr Quentin Cronk, Royal Botanic Garden, Edinburgh: The Ochlospecies.

Dr W. Dijkman and Prof M.J.A. Werger, University of Utrecht: Variation in ramet size and leaf morphology of the *Ilala* palm, *Hyphaene petersiana* in southern Africa.

African Vegetation

John Grimshaw, University of Oxford: Disturbance, pioneers and the Afromontane forests.

Dr Ray Lawton, Oxford: The ecology of the wetter Miombo Woodlands - a review of the Ndola plots, Zambia.

Dr Mike Lock, Royal Botanic Gardens, Kew: Fire in African vegetation.

Madagascar

Prof Dr Wilhelm Barthlott & Dr S. Porembski: Rheinische Friedrich-Wilhelms-Universität, Bonn: Diversity and phytogeographical affinities of inselberg vegetation in tropical Africa and Madagascar.

Dr David du Puy and Justin Moat, Royal Botanic Gardens, Kew. Madagascar: mapping vegetation diversity for conservation planning, using Geographical Information Systems (GIS).

Dr G.E. Schatz, Dr P.P. Lowry, Missouri Botanical Garden, and A. Weiss: A preliminary chorological study of the flora of Madagascar.

(These papers will be edited and published. For further details please contact Dr Camilla Huxley-Lambrick, Picketts Heath, Ridgeway, Boars Hill, Oxford, OX1 5EZ, UK or Tel/Fax 01865 735161).

The personal tributes were also diverse. His surviving sister, Mrs Audrey Nichol, spoke of a side of Frank known only to her, his boyhood, with reminiscences of an extremely clever yet fun-loving brother. "Jock" Angus, Bill Bainbridge and Jim Chapman recalled fond memories of field work. Other tributes reflected other facets of his character, including his love of entertaining and memorable meals he had cooked, the great ability he had as a story teller and the amazing stories that many of us remember hearing and also even as a baby sitter! (He looked after my 3 month old son on one occasion.)

It was a superb opportunity for those with an interest in the flora and fauna of Africa and Madagascar to congregate here, to have the chance of meeting old and new friends and to remember our colleague.

We thank the Linnean Society of London, The Royal Botanic Gardens, Kew, The Department of Plant Sciences and British Airways for sponsorship and Dr Camilla Huxley-Lambrick for organizing such a successful symposium.

Rosemary Wise

Student progress

Mark Carine (D.Phil., second year). Systematics of *Stenosiphonium* Nees (Acanthaceae). Supervised by Robert Scotland and Tony Cox (Kew). BBSRC studentship. *Stenosiphonium*, together with *Aechmanthera*, *Hemigraphis* and *Strobilanthes s.l.* comprise the Strobilanthinae (sensu Bremekamp). Work is currently underway to revise the taxonomy of *Stenosiphonium*, and to resolve generic delimitation within the southern Indian and Sri Lankan Strobilanthinae, using both morphological and molecular approaches.

Augustine Chikuni (D.Phil., second year). A taxonomic study of *Brachystegia* Benth. (Leguminosae). Supervised by S.A. Harris and B. Schrire (Kew). This complex genus which has been a long-time interest of the Department is restricted to Africa. Species delimitation within the genus has been the source of much confusion, especially due to

the occurrence of putative hybrids. Morphological and molecular methods will be used to try to resolve some of these problems.

Rogier de Kok (D.Phil., third year). A taxonomic study of the genera *Oxera*, *Faradaya* and *Hosea* (Labiatae). Supervised by D.J. Mabberley and A. Paton (Kew). These genera are endemic to South East Asia and the Pacific region. During the year the revisions were finished and a three month field trip to New Caledonia, Fiji and Vanuatu to work on the pollination biology of *Oxera* and *Faradaya* was carried out. A talk about my work during a South East Asia biodiversity network meeting in Dublin, was awarded the prestigious "lucky Irish Leperchaun" prize for the best talk.

Karen Sidwell (D.Phil.). The systematics of *Brillantaisia* P. Beauv. (Acanthaceae). Supervised by R.W. Scotland and K. Vollesen (Kew). A pluralistic species concept is adopted and eleven species of *Brillantaisia* recognised using morphological and anatomical data. The influence of character choice, character coding and outgroup selection on hypotheses of relationship for these species are explored in detail. Biogeographic comparison of *Brillantaisia* with two other African genera is discussed.

Abstracts of systematic theses submitted in 1996

Julie Hawkins (D.Phil, completed). Systematics of *Parkinsonia* and *Cercidium* (Leguminosae). Supervised by C.E. Hughes, R. W. Scotland and S. A. Harris. ODA studentship. The thesis was passed in October 1996, and Julie has taken up a temporary post-doctoral position in the department.

Thesis Abstract

The generic limits of *Parkinsonia* L. and *Cercidium* Tul. were investigated, and the status of a putative hybrid, *Parkinsonia aculeata* x *Cercidium praecox*, was evaluated.

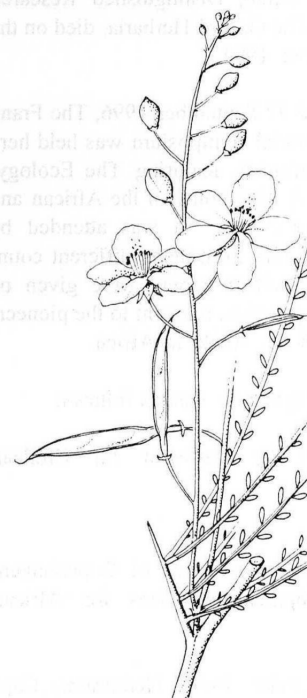
Nine ingroup terminal taxa were delimited using the phylogenetic species concept (*sensu* Nixon and Wheeler, 1992). Because of a lack of consensus as to the higher level relationships of the study group, six outgroups were widely sampled from the *Caesalpinia*, *Peltophorum* and *Poepigia*

groups. A morphological character matrix was compiled for the fifteen terminal taxa. The description and delimitation of characters and character states was not straight-forward: theoretical considerations did not clarify whether: (1) quantitatively varying characters showing discrete pattern of variation should be included in the analysis; (2) characters which describe structures which show states of presence or which are absent should be conceptualised as two characters, or a multistate character. Sixty six morphological character matrices were analyzed using parsimony. The alternative data matrices differed in: (1) the outgroups specified; (2) the treatment of quantitative variation; (3) the treatment of variation shown by structures which were present or absent. The results of the cladistic analyses of all the matrices showed that both character conceptualisation and outgroup choice dictate the outcome of the analysis of morphological relationships between *Parkinsonia* and *Cercidium*; the strict consensus trees of the individual analyses described conflicting relationships so that the strict consensus amongst all suites of cladograms was unresolved. In the absence of more higher level studies, morphological data alone may not resolve the problem of the generic delimitation of *Parkinsonia* and *Cercidium*.

Collection of molecular data was not routine. Protocols based on the polymerase chain reaction (PCR) were employed. Amplification of nine target sequences was attempted. ITS, 5S, *trnT*, *matK*, *rpo* and *atpB* sequences could not be amplified, whilst *trnL*, *trnF* and V7 sequences were amplified, but negligible sequence variation was identified using an RFLP (restriction fragment length polymorphism)-based approach. Sequence variation was identified using the RAPD (randomly amplified polymorphic DNA) technique and a RAPD data set was compiled. The RAPD data set comprised seven accessions of *Parkinsonia aculeata*, nine of *Cercidium praecox* and 11 of a putative hybrid between those two species, scored for the presence or absence of 94 products of unique size generated by 12 primers. Sequence similarity between RAPD products was investigated using Southern analysis; sequence similarity between markers of different sizes within and between accessions was demonstrated.

Ecological, distributional, molecular and morphometric data was used to clarify the status of a putative hybrid between *Parkinsonia aculeata* and *Cercidium praecox*. The putative hybrid occurs in disturbed sites, often where *P. aculeata* is established as a weed, and where *C.*

praecox and the putative hybrid were cultivated as shade, ornamental and fodder trees. All hybrid sites are located within the area of sympatry of the widespread species *P. aculeata* and the more narrowly distributed *C. praecox*. A morphometric data set comprising 24 characters scored for six accessions of *P. aculeata*, eight of *C. praecox* and 16 putative hybrids was analyzed using principal component analysis and the character count procedure. Morphometric, ecological and distributional evidence was considered to support the hypothesis of hybridity. Principal coordinate analysis of the RAPD data set, and comparison of the lengths of divergent and reticulate trees was more equivocal. Two reasons suggested for the discrepancy between morphometric and RAPD evidence are difficulties in: (1) interpreting RAPD data; (2) devising an appropriate algorithm for measuring the length of reticulate trees.



The hybrid between *Parkinsonia aculeata* and *Cercidium praecox*

Colin Hughes (D.Phil, completed). Systematics of *Leucaena* Benth. (Leguminosae: Mimosoideae). Supervised by D.J. Mabberley and R.M. Polhill (K). The thesis was passed in September 1996.

Thesis Abstract

Leucaena Benth. is a small Neotropical genus, here found to comprise twenty-two species, six infraspecific taxa and two named hybrids, placed in the tribe Mimoseae of the Mimosoideae. In this

study a new morphological data set is used to analyze sister group relationships of the genera of the informal *Leucaena* and *Dichrostachys* groups *sensu* Lewis and Elias (Adv. Leg. Syst. 2. 1981) and species relationships within *Leucaena*, using cladistic methods.

The comparative morphology of species of *Leucaena* and closely related genera is investigated and presented. This includes detailed studies of bark anatomy, nyctinastic leaf movements, morphology of extrafloral nectaries, seedlings, inflorescences, and their arrangement on flowering shoots, and pods, and their dehiscence, as well as anther and pollen morphology using Scanning Electron Microscopy. Criteria for the assessment of primary homology, including the problems of character coding in relation to inapplicable data and continuous characters, are discussed from a theoretical standpoint, and applied to define 40 characters and partition and code them as character states.

Forty-one terminal taxa representing the genera of the informal *Leucaena* and *Dichrostachys* groups and two outgroup genera, *Parkia* and *Xylia*, are scored for 31 of the 40 morphological characters and the resultant data matrix subjected to parsimony analysis. The use of successive weighting to choose amongst multiple equally parsimonious cladograms is discussed and applied, and consensus techniques used to summarize the 32 equally parsimonious cladograms which resulted. This analysis shows no support for the *Leucaena* and *Dichrostachys* groups. Instead, three resolved clades are found: a monophyletic *Leucaena*, a clade containing *Schleinitzia*, *Desmanthus* and *Neptunia* and a clade containing the remaining genera of the *Dichrostachys* group. Relationships among these three clades remain ambiguous even after application of successive weighting.

Twenty-two species are delimited within *Leucaena* using the phylogenetic species concept. The difficulties posed by hybrids for cladistic analysis and the evidence for hybridization in *Leucaena* are reviewed. Analysis of species relationships omitting the four known tetraploid species, using 29 morphological characters is carried out using different outgroups. Results of the morphological analysis are compared with those of the chloroplast DNA analysis of Harris *et al.* (Pl. Syst. & Evol. 191. 1994). There is lack of congruence between morphology and cpDNA and this is interpreted in terms of possible hybridization and as grounds for not pursuing a combined analysis using a total evidence approach.

Two putative interspecific hybrids are investigated and their identities established

beyond reasonable doubt using a combination of geographical, morphological and ethnobotanical evidence and comparison with artificial hybrids. Ethnobotanical data is presented and reviewed. It is shown that several species of *Leucaena* are undergoing a process of incipient domestication as minor food plants in Mexico. Domestication and consequent artificial sympatry is postulated as the main cause of hybridization.

A full taxonomic account of *Leucaena* is presented; all taxa are illustrated and their distributions mapped. One species, two subspecies and two hybrids are described as new.

Recent publications

Chamberlain, J.R., Hughes, C.E. & Galwey, N. (1996). Patterns of isozyme variation in the *Leucaena shannonii* (Leguminosae: Mimosoideae) alliance. *Silvae Genetica* **45**: 1-7.

Fagg, C.W. (1995) *Faidherbia albida* - inverted phenology supports dryzone agroforestry. *NFT Highlights*. NFTA 95-06 Nitrogen Fixing Tree Association Network, c/o Winrock International, Morrilton AR72110 U.S.A. 2 pp.

Grassly, N.C., Harris, S.A. and Cronk, Q.C.B. (1996). British *Apium repens* (Jacq.) Lag. (Apiaceae) status assessed using random amplified polymorphic DNA (RAPD). *Watsonia* **21**: 103-111.

Harris, D.J. (1996). A revision of the *Irvingiaceae* in Africa. *Bulletin du Jardin Botanique National de Belgique* **65**: 143-196.

Harris, S.A. (1995). Systematics and randomly amplified polymorphic DNA in the genus *Leucaena* (Leguminosae, Mimosoideae). *Plant Systematics and Evolution* **197**: 195-208.

Hughes, C.E. (1995). Protocols for plant introductions with particular reference to forestry: changing perspectives on risks to biodiversity and economic development. In: Stirton, C.H. (Ed.) *Weeds in a Changing World*. British Crop Protection Council Symposium Proceedings No. **64**: 15-32.

Hughes, C.E. and Harris, S.A. (1995). Systematics of *Leucaena*: recent findings and implications for breeding and conservation. In: Shelton, H.M., Piggan, C.M. and Brewbaker, J.L. *Leucaena* - opportunities and limitations: 54-65. ACIAR, Canberra.

Hughes, C.E. & Johnson, C.D. (1996). New host records and notes on Bruchidae (Coleoptera) from *Leucaena* (Leguminosae: Mimosoideae) from Mexico, Central and South America. *Journal of Applied Entomology* **120**: 137-141.

Mabberley, D.J. (1995). *Meliaceae* (*Aglaia* by C.M. Pannell). In: *Revised Handbook to the Flora of Ceylon* (M.D. Dassanayake, ed.) **9**: 229-300. Balkema, Rotterdam.

Mabberley, D.J. (1995). *Vitaceae*. In: *Revised Handbook to the Flora of Ceylon* (M.D. Dassanayake, ed.) **9**: 446-482. Balkema, Rotterdam.

Mabberley, D.J. (1995). Plants and Prejudice. Inaugural oration, Rijksuniversiteit Leiden. 22 pp. [see also *Het Kameleon* **60**(3): 8-9.]

Mabberley, D.J. (1996). Plant introduction and hybridisation in colonial New South Wales: the work of John Carne Bidwill, Sydney's first director. *Telopea* **6**: 541-562.

Mabberley, D.J. (1996). Sarah Bowdich, Margaret Gatty, Marie Stopes. In: S. Raphael (ed.), *Women in Natural History*: 13-14, 15-16, 24-25. [Catalogue of the Exhibition in association with the Society for the History of Natural History, 1996.] Bodleian Library, University of Oxford.

Marner, S.K. (1996). Herbaria, Department of Plant Sciences, University of Oxford on microfiche. *Supplement 2, Herbaria on Microfiche IDC*. Interdocumentation Company Leiden, The Netherlands. pp. 1-4.

Marner, S.K. (1996). Herbaria, Department of Plant Sciences, University of Oxford, on Microfiche. *Taxon* **45**: 409-410.

Marner, S.K., Styles, C.F. and Cronk, Q.C.B. (1996). Publications of F. White. *Bothalia* **26**,1: 74-76. Incorporated in: Angus, A. and Chapman, J.D. A tribute to Frank White (5th March 1927 to 12th September 1994). *Bothalia* **26**,1: 69-76.

Perez de la Rosa, J., Harris, S.A. and Farjon, A. (1995). Noncoding chloroplast DNA variation in Mexican pines. *Theoretical and Applied Genetics* **91**: 1101-1106.

Williams, D.M., Scotland, R.W., Humphries, C.J., Siebert, D.J. (1996). Confusion in philosophy. *Synthese* **108**: 127-136.

Systematics of *Stenosiphonium* Nees (*Acanthaceae*): the legacies of Hooker and Thomson

The publication, in 1855, of Joseph Hooker and Thomas Thomson's *Flora Indica* was planned as the first volume of a detailed and exhaustive account of the Indian flora. The aim was to "present a systematic account of the vegetable products of British India arranged according to natural principles [and] besides the descriptions.... all matters of importance connected with anatomical, structural, morphological and physiological points, wherever it is practicable, [were to] be treated and in other cases pointed out as subjects worthy of future attention".

The need for a flora of British India was widely recognised, and large collections of Indian plants, including The East India Company Herbarium ('The Wallich Collection'), and the herbarium of Robert Wight from southern India, were available for use in its preparation. In addition, Hooker and Thomson had gathered their own herbarium (labelled '*Herb. Ind. Or. Hook. fil. T. Thomson*'), comprising their collections from northern India, supplemented by the herbarium of southern Indian plants made by Thomas Thomson's brother, Gideon Thomson, and by the collections of several other botanists. Upon their return to Kew from India in 1851, Hooker and Thomson set about sorting and distributing their herbarium, and preparing *Flora Indica* (see Burkill, 1965 for details).

The descriptions in the first volume were very detailed, and completion of the work would clearly have been both time consuming and very costly. Indeed, it was the problem of money, and more specifically the refusal of the East India Company to sponsor *Flora Indica* that led to its abandonment after the first volume (Desmond, 1992).

However, whilst work on *Flora Indica* was halted at an early stage, Hooker and Thomson's herbarium was to prove a valuable source of material for people working on the Indian flora. Thomas Anderson, Superintendent of the Calcutta Botanic Garden from 1861-1869, was amongst those, and whilst working at Kew, he made use of the herbarium in producing his *Enumeration of the Indian species of Acanthaceae*, published in 1867. This work included an account of *Stenosiphonium*

Nees, a genus of the Acanthaceae currently under study at Oxford.

In his *Enumeration*, Anderson described two new species of *Stenosiphonium*, namely *Stenosiphonium setosum* and *Stenosiphonium parviflorum*. *S. setosum* was based on a single specimen from the Hooker-Thomson herbarium, collected by Gideon Thomson, and originally labelled '*Strobilanthes* 67'. Three specimens were cited in the account of *S. parviflorum*, including another Hooker-Thomson herbarium specimen, again collected by Gideon Thomson, but labelled '*Strobilanthes* 68'.

Hooker and Thomson had clearly thought the two plants similar, placing them closely together (as *Strobilanthes* 67 & 68) and Anderson's only criteria for distinguishing the two species were the size of flower parts, as the epithet *parviflorum* ('small flower') would suggest. The two other specimens cited in the protologue account of *S. parviflorum* (one in the Wallich Collection, and one in Cleghorn's herbarium) upon close inspection are not conspecific with the Thomson specimen. Both have small inflorescences, but are immature specimens of *S. cordifolium* (Vahl) Alston, a widely distributed and relatively common species. This was recognised by Clarke (1885) and Gamble (1935). Size of floral parts however, was clearly a significant factor in Anderson's delimitation of species in this group.

A number of specimens currently on loan to Oxford had been determined as *S. parviflorum*. However, all proved to be species of *Strobilanthes*, the large, widely distributed and morphologically variable genus with which *Stenosiphonium* has long been associated. Thus, the only material of Anderson's two new species available were duplicates of the Gideon Thomson specimens, '*Strobilanthes* 67 & 68', from Hooker and Thomson's herbarium.

Little is known about the collections of Gideon Thomson. The Hooker-Thomson herbarium labels lack detail, with the locality of both the *S. parviflorum* specimen, and that of *S. setosum* given as 'Maisor [Mysore] and Carnatic' covering a large area of southern peninsular India. We do know from *Flora Indica* that the herbarium was gathered, chiefly by means of collectors, from the plain of the Carnatic (chiefly in the neighbourhood of Madras), the Nilgiri and Curg [Coorg] mountains, and in the Courtallum Hills. However, no more precise locality details were available. Our knowledge of these plants, based on material in European and North American herbaria was extremely limited.

Of a genus thought to contain six species (Mabberley, 1987), two were known only from a single collection, made before 1855, from an unknown locality. It was therefore with great interest, but low expectations of finding material of these species that I embarked on a visit of Indian herbaria during March and April of 1996 to study their collections of *Stenosiphonium* and *Strobilanthes*. Many herbaria containing important historical as well as recent material were consulted. These included the Central National Herbarium in Calcutta (CAL), BSI Industrial Section Herbarium, Calcutta (BSIS), BSI Southern Circle Herbarium, Coimbatore (MH), Rapinat Herbarium, Tiruchirapalli (RHT), French Institute, Pondicherry (HIFP), Tropical Botanical Garden and Research Institute, Trivandrum (TBGT), Presidency College Herbarium, Madras (PCM), and the Herbarium of the University of Kerala.

Two of the herbaria, the Central National Herbarium, and the Tropical Botanic Garden and Research Institute (TBGRI) contained *Stenosiphonium* specimens collected in the early part of this century, in 1912 and 1914 by M. Rama Rao and K. Vencoba Rao respectively, for the '*Flora of Travancore*'. Rama Rao's specimen had been identified as *S. parviflorum* (it has small flowers), and Vencoba Rao's as *S. russellianum* Nees (a synonym of *S. cordifolium*). Further, researchers at TBGRI had collected living material of *Stenosiphonium* from the evergreen forests of the Western Ghats in Kerala during 1993 (Thomas *et al.*, 1995). This material, in the living collection at TBGRI, along with the two '*Flora of Travancore*' specimens shared the characters that distinguish Anderson's two species from other species of *Stenosiphonium* i.e. lanceolate bracts and the presence of two stamens and two staminodes. However, placing the specimens into either of Anderson's two species was difficult. Whilst the two Thomson specimens, very different in size, were easy to separate, the increased sample made distinguishing between the two species impossible. Detailed study of the specimens showed that Anderson's two species are conspecific.

Clearly, there is a need for adequate sampling in resolving problems of species delimitation, and problems of synonymy will result from the description of species using few specimens. This was recognised by Hooker and Thomson in their Introductory Essay to *Flora Indica*. They rather boldly estimated that "one half of the recorded species of Indian plants are spurious, and that in many natural orders

the undescribed species hardly equal in number those which require to be cancelled". 'Hair-splitting naturalists' who "separate accidental forms by trifling characters" were blamed for this, and they went on to urge botanists to "endeavour, by selecting good suites of specimens, produced under all variations of circumstances, to determine *how few* not *how many* species are comprised in the flora of [a] district".

'Good suites of specimens' however are not always available. In all of the herbaria consulted, I have found just three further specimens conspecific with '*Strobilanthes* 67 & 68' of the Hooker-Thomson herbarium. Similarly, in another species of *Stenosiphonium*, *Stenosiphonium wightii* Brem. only seven collections are recorded.

Whilst a lack of specimens probably reflects the rarity and limited distribution of these taxa, it does make species delimitation difficult, as Anderson's attempts prove.

In *Strobilanthes*, a genus closely related to *Stenosiphonium*, forty six species are recognised in the former Madras Presidency, including a large number of endemics (Gamble, 1935). In this genus we find a similar problem, with many of the endemic species known only from type material, or from limited collections, often decades old.

It is over one hundred and forty years since Hooker and Thomson set out their aims for *Flora Indica*, and identified the requirements for a rigorous investigation of taxonomic problems in the Indian Flora. Today, at least in *Stenosiphonium* and *Strobilanthes*, we are still far from meeting those requirements. Under-collection still poses a significant barrier to our understanding of these groups.

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Mark Carine



Stenosiphonium wightii Brem. (syn. *Stenosiphonium diandrum* Wight). Lithograph illustration from Robert Wight's *Icones Plantarum Indiae Orientalis* Vol. IV Part iv (1850).

Species delimitation problems in *Brachystegia* Benth. (Caesalpinioideae - Leguminosae).

Brachystegia Benth. (Caesalpinioideae - Leguminosae) has a tropical African distribution and comprises some 30 species, nine of which are restricted to the rainforests of West Africa whilst the rest are common in the widespread miombo woodlands of the Congo - Zambian domain.

The ecological and socio-economic importance of *Brachystegia* woodlands are well known. Unfortunately the miombo woodlands are threatened as a result of deforestation. Whilst government departments and non-governmental organisations have put conservation strategies in place, lack of knowledge regarding the number of *Brachystegia* species, their identification and distribution makes the implementation of effective conservation difficult.

Infrageneric groupings in *Brachystegia* have been controversial. In 1908 Harms recognised section *Neobrachystegia*, based on *Brachystegia stipulata* De Wild. and later in 1915 recognised sections *Paucijugae* and *Multijugae* based on the number of leaflet pairs. Apparently unaware of Harms sections, Burt Davy and Hutchinson in 1923 distinguished two sections, *Stipulatae* and *Caducae*, based on the form and persistence of stipules. Hoyle in 1967 rejected the earlier subdivisions and proposed two groups, A and B, based on the shape of the dormant buds in relation to the free and connate base of the stipules. However, infrageneric grouping characters may be misleading since the number of leaflet pairs is highly variable across the genus, mature and coppice shoots of the same species may show different stipules and buds may either be small or obscured by hairs and their shape may change with age. Furthermore, Hoyle's system was based on East African specimens and hence the applicability across the genus is unknown.

The genus is notorious for its taxonomic difficulties and though not experimentally proven, hybridisation is believed to contribute to the complex pattern of morphological variation observed in a number of species. The genus was first revised by Burt Davy and Hutchinson in 1923 and later by Baker in 1930, but both these revisions failed to resolve the species delimitation problems. Arthur Hoyle made a considerable effort to monograph the genus but despite thirty

years work he failed to ascertain the status of such taxa as *B. kalongoensis* De Wild., *B. glaucescens* Burt Davy & Hutch., *B. tamarindoides* Welw. ex Benth., *B. luishiensis* De Wild., *B. longifolia* Benth., *B. subfalcato-foliolata* De Wild.. However, Hoyle produced regional Flora accounts for *Tropical East Africa*, the *Belgian Congo* and *Rwanda and Angola*, but retired before completing the *Flora Zambesiaca* account where most of the complex species occur. Recent publications, suggest that *Brachystegia* taxonomy is confusing, incomplete and poorly understood. For example, in 1989, Lock in his *Check List of African Legumes*, omitted *B. oblonga* Sims., whilst in 1996, de Outer and van Veenendaal studied the wood anatomy of *B. spiciformis* Benth. var. *latifoliolata* (De Wild.) Hoyle, *B. spiciformis* Benth. var. *mpalensis* (Michel.) Hoyle and *B. spiciformis* var. *schmitzii* Hoyle. Although, Hoyle described infraspecific taxa in *B. spiciformis*, he later lumped all the infraspecific taxa into *B. spiciformis*.

The taxonomic problems and the socio-economic importance of the genus have stimulated a *Brachystegia* research programme with the aim of providing the long overdue taxonomic account for the genus, to provide a basis on which to plan conservation programmes. This research is being sponsored by the Commonwealth Scholarship Commission.

A preliminary survey of diagnostic morphological characters showed that many of these characters overlap considerably. Using conventional comparisons, 17 of the currently recognised species could easily be identified, whilst the rest showed continuous patterns of morphological variation and these were placed into four groups: *Brachystegia longifolia* group (*B. longifolia* Benth., *B. boehmii* Taub., *B. gossweileri* Burt Davy & Hutch., *B. glaberrima* Fries, *B. luishiensis* De Wild.), *B. microphylla* group (*B. microphylla* Harms, *B. glaucescens* Burt Davy & Hutch., *B. tamarindoides* Welw. ex Benth.), *B. spiciformis* group (*B. spiciformis* Benth., *B. bakeriana* Burt Davy & Hutch.) and *B. leonensis* group (*B. leonensis* Burt Davy & Hutch., *B. kennedyi* Hoyle and *B. nigerica* Hoyle & Jones). Considering that the genus has a difficult taxonomy, a taxonomic account of the whole genus will not be possible during the current D.Phil. research programme. However, the project seeks to provide an in-depth account of the very variable species and a synopsis of the easily identified species. Specifically, i) an assessment of species limits in the *B. longifolia* group, ii) characterization and identification of a

putative hybrid between *B. boehmii* and *B. glaberrima* (i.e. *B. longifolia*), iii) geographical variations in the *B. microphylla* group and iv) clinal variations in the *B. spiciformis* group will be undertaken. To fulfill these objectives extensive morphological examination will continue and additional information from wood anatomy and pollen will be sought. Furthermore, the putative hybrid between *B. boehmii* and *B. glaberrima* (*B. longifolia*) will be assessed using phenetic intermediacy, field evidence and the distribution of molecular (nuclear and chloroplast sequences) markers.

It is generally accepted that *Brachystegia* is a notoriously difficult genus, which has defeated others over the past years. However, through collaboration with other researchers the problems in *Brachystegia* can be resolved. I would therefore appreciate any information regarding *Brachystegia* other researchers are willing to share.

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Augustine Chikuni



Flowering and fruiting branchlets of *Brachystegia spiciformis*. Stipellar and leaf base details from the top: stipels with free apices; adnate stipels; unequal leaflet base.

Hosea, a monotypic and enigmatic genus of the Labiatae

The enigmatic genus *Hosea* is a very close relative of *Faradaya*. The flowers of *Hosea lobbii* resemble the flowers of *Faradaya*, but are more fragile. The large first order bracteoles have the same delicate pink colour as the corolla, which makes this species a very attractive native of Sarawak and Brunei. The long thin fruits, with their distinct pointed apexes differ greatly from the fruits of its close relatives, and it was the main reason for describing a new genus for this species.

The genus was described in 1908 by Ridley as *Hosea*, with as its only representative former *Clerodendrum* species described by Clarke (Clarke 1885; Ridley 1908). The name of the genus is in honour of George Frederick Hose (1838-1922), an English missionary who collected extensively in Malaysia. Merrill (1917) thought that *Hosea* Ridley was a later homonym of *Hosea* Dennstedt, and proposed a new name for the genus: *Hoseanthus* Merrill. The name *Hosea* has been given to a plant depicted in Rheede's *Hortus Malabaricus* (Dennstedt 1818). However, *Hosea* Dennstedt is an invalidly published name (Nicolson et al 1988), and *Hosea* Ridley is therefore not a later homonym.

The place of the genus in the *Verbenaceae* has always been problematic, this can be partly explained by the vague genera delimitation of *Clerodendrum* and its relatives. In his treatment of the *Verbenaceae* of the Malayan archipelago, Lam concluded that *Hosea* must be very closely related to *Faradaya* (Lam 1919). In Junell's (1934) detailed discussion of the structure of the gynoecium of the *Verbenaceae* and *Labiatae*, he placed *Oxera*, *Faradaya* and *Hosea* together in the *Verbenaceae*, Tribe *Viticoideae*, Subtribe *Clerodendreae*. Based on differences in the placing of the placenta, he informally distinguished a sub-group within the *Clerodendreae* consisting of *Oxera*, *Faradaya*, *Hosea* and *Holmskioldia*. Based on overall similarity of the gynoecium he placed *Hosea* between *Oxera* and *Clerodendrum*. The pollen morphology seems to confirm the place of *Hosea* near *Oxera*, *Faradaya* and *Clerodendrum* (Raj 1983 & Abu-Asab 1990).

In 1992, Cantino published a cladogram of the *Labiatae*, with some *Verbenaceae* genera which he thought were closely related. *Oxera* was placed together with *Hosea*, as part of an unresolved clade at the base of

the *Ajugeae* and most genera of the tribes *Clerodendreae* and *Caryopterideae* (Cantino 1992a & b). In the discussion Cantino expressed his doubt about the exclusion of *Faradaya* from this group (Cantino 1992b). In a reanalysis of the group with more data, *Faradaya* is placed together with *Hosea* and *Oxera* in the cladogram (Cantino, pers. com.).

The complement of the revision of *Oxera* and *Faradaya* makes it possible to reanalyse the position of *Hosea*. In the last part of my D.Phil project I hope to answer the following questions: Are *Hosea*, *Faradaya* and *Oxera* a monophyletic group, and are *Hosea* and *Faradaya* a monophyletic group.

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Rogier de Kok

Plant Sciences Library Digitisation Project

The Plant Sciences Library regularly mounts exhibitions for visiting groups, covering the whole range of its stock from the earliest, 4th century material right up to the present day. To make our material more widely available we are hoping to use scanning technology to create an electronic image archive, accessible via the Internet or on CDROM, etc. As a first stage we are seeking funds to capture some 1000 images selected from our rarest material, chosen to illustrate the history of botanical illustration, and to digitise the original drawings by Ferdinand Bauer for Sibthorp's *Flora Graeca*, our best known and greatest treasure, together with his *Mediterranean Scenes* drawn at the same time.

Specialist scanning equipment already installed in Oxford University would be used to produce the images, which should show a level of detail equivalent to that visible on the original with the use of a handheld magnifying glass. Scanned images would be stored permanently exactly 'as the camera saw them'; compressed copies (JPEG format) would be used for Internet access. Users could manipulate these using image enhancement software, which can reveal features not visible to the naked eye: erased pencil markings, for example, or features of the paper which may help to date it. One of the major inhibiting factors in the development of digital archives is of course the potential for copyright infringement; satisfactory ways of allowing use of the archive for study and research while protecting the interests of copyright owners are currently being investigated.

Considerable interest has already been evoked by the quality of some test images we have prepared from the *Flora Graeca*; the level of detail visible on a normal office PC screen is extraordinary (but not as extraordinary as the patience and skill of the artist in drawing it in the first place!), though the full quality of the image is only revealed on high quality large screen displays. The potential is clearly enormous, and we look forward to initiating this project, if funding can be secured, with great excitement.

Roger Mills, Head of Library Services

A simple method for the collection of bees in the tropics: A cautionary tale from Cameroon

When, at 10 am on the first day of a recent plant collecting trip in South West Cameroon, I came across a large population of *Brillantaisia lamium* visited by big, black, fast-flying bees, it was essential for me to catch these beasts. Despite all the equipment in the landrover, none of it was appropriate for collecting insects and instant improvisation was called for. Luckily I was travelling with an experienced team of botanists, and the quick thinking Martin Cheek snatched Nancy Garwood's white floppy hat and, intrepid as ever, strode off into the undergrowth. Within seconds a bee was trapped in the hat, killed and transferred to a plastic bag.

Over the next six weeks, further bee collections were made and my methodology evolved. Insects were most successfully captured using either the floppy hat technique or by Emanuel Epie (Freddie), a field guide, who could pick the insects in flight, straight out of the air with his hand. The time of day was noted and observations were made on pollinator behaviour including the length of time the bees rested on each flower, the distance travelled between flowers and the number of other species visited in the vicinity. The bees were all stored in the alcohol used to collect flowers (70% ETOH with 1% glycerol) in numbered 50ml screw top plastic tubes to await identification back in Oxford.

I sent my insects to Chris O'Toole at Oxford University Museum. Unfortunately, my collecting techniques caused him enormous problems of identification. Firstly the bees should not have been placed in alcohol. Many of the taxonomic characters used for bee identification are in the hairs which simply cannot be seen when the bees are wet. Secondly, the bees were often squashed on capture and thirdly, after rigor-mortis has set in, the bees cannot be manipulated and pinned out correctly. It was essential to thoroughly dry and clean the bees before any attempt at identification could be made. Mr O'Toole carried out this time consuming process, pinned out the insects and put names on them all.

Six bee species in three genera were collected visiting three species of *Brillantaisia*. A simple and effective method for collecting dry, clean bees ready to be pinned out

by an entomologist was described by Mr O'Toole. His method, described below, requires little equipment, just some forward planning and preparation. It is highly recommended for any botanist wanting to make high quality collections of pollinating bees and to maintain a working relationship with the entomologist receiving these collections for identification.

A simple method for field collection of bees

NB: It is essential that the bees remain clean, dry and unsquashed at all times for preservation of taxonomic characters.

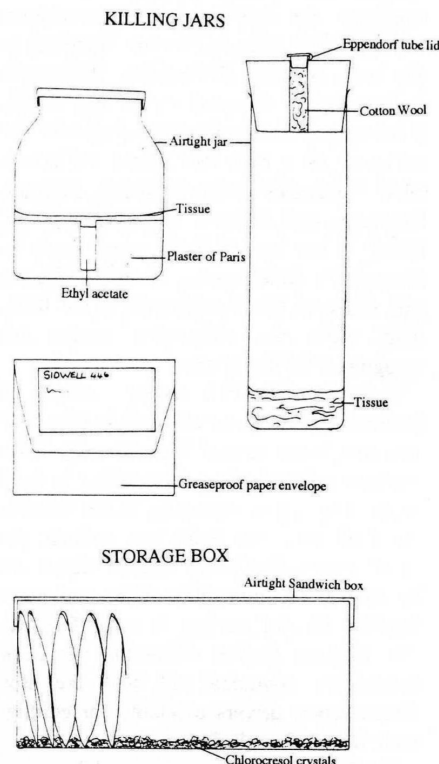
Materials

Collecting book.

Butterfly net.

Killing jars: airtight glass jars, 3cm & 7cm diameter (for example, an old honey jar and a narrow olive jar would be fine); rubber bung to fit neck of jar; Eppendorf tube; plaster of Paris; glass rod; vaseline; tissues; cotton wool; Ethyl acetate.

Storage Box: greaseproof paper envelopes; airtight plastic box c. 150 x 100 mm; chlorocresol crystals.



Method

Before the field trip prepare two jars for killing the insects and a box for storing the collections:

Large jar for bees > 20 mm

1. Fill the large jar to a depth of 20-30 mm with plaster of Paris.
2. Place a glass rod smeared with vaseline in the centre of the wet mixture and leave to harden.
3. Remove the glass rod, leaving small well in centre of plaster.

Small jar for bees < 20 mm

1. Drill a 10 mm diameter hole through the centre of the rubber bung.
2. Fill the hole with tightly packed cotton wool.
3. Cut off the lid and top 5 mm of the Eppendorf tube and push this into the top of the bung.

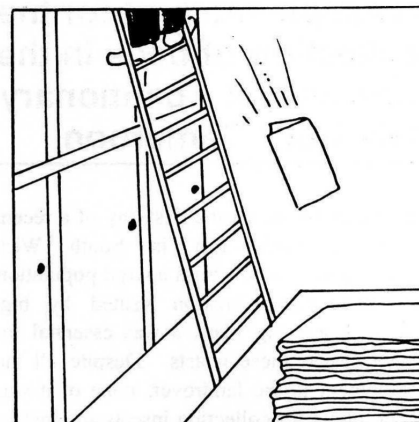
Storage Box

1. Place a layer of Chlorocresol crystals in the bottom of the airtight sandwich box.

In the field:

1. Fill the well of the large jar to almost full with ethyl acetate and cover with a layer of tissue to prevent the bee from getting wet. (The liquid will soak into the plaster).
2. Place tissue in the bottom of the small jar and soak the cotton wool with ethyl acetate
3. Catch the bees using a net.
4. Place in a jar until dead (more than one bee can be placed in the jar at any time but do not over fill the jar and damage the insects)
5. Make careful collecting notes including locality information; all details of the plants visited by the bees, particularly colour and scent; time of day; any noticeable behavioural notes e.g.: "hovering beside rather than visiting the flower", "visiting the flower for 2-3 seconds".
6. When dead, remove carefully and place in an envelope with collecting data on the outside.
7. Stack envelopes vertically in an airtight sandwich box with a layer of chlorocresol crystals in the bottom (this will keep the insect free of mould and relaxed to enable easy observation and pinning out in the lab).

Karen Sidwell



Brahms 4.4

Introduction

Brahms is an information system for managing and processing botanical, ecological and bio-geographical data, designed to optimise the value of data, catalyse research activity and to encourage and facilitate publication.

Brahms includes software tools to add, import, edit, retrieve, process, format and export data. Reports can be formatted for specific Floras and Monograph series and to provide further processing power, data can be freely exchanged with packages such as Word, Excel and Access. Development is co-ordinated from Oxford but *in situ* module development is encouraged using database packages such as Microsoft's FoxPro and Access.

The last year has been active with system modernisation and development and project funding has been diversified. The ODA Forestry Research Programme, who have largely funded development to date, are continuing to support c.50% of the project for the next two years, the remainder being raised by links to specific projects. With Brahms now operating in over 30 countries, procedures for handling project registration, licensing and the scheduling of system development are under review.

Windows/Dos - FoxPro/Access

While still a DOS based package, Brahms is geared to run under Windows. Under Windows 95, with close links to word processors, spreadsheets, the Clipboard, the mapping software MUSICA and other databases, the disadvantages of working in DOS have been minimised. The full transfer to Windows remains high on the agenda.

As literacy with database packages such as Access and FoxPro increases, a greater number of botanists are able to write their own add-on programs or macros for making lists, labels and reports. While Brahms is a

self-contained system, the use of these packages provides the user with another layer of control and additional flexibility. Sample Access programs are now available.

Version 4.4

In 4.4, the old menu interface has been completely replaced with mouse sensitive menuing throughout. The help text has been extensively revised and can now be accessed by entering ctrl+return on a high-lighted menu bar or, as before, using the shift+F1 help index.

RDE, the workhorse for data entry, combines the simplicity of a spreadsheet with powerful links and lookup functions to the main Brahms dictionaries. RDE now includes more data categories and fields. Field control has been tightened up with the inclusion of a new RDE field validation table. Fields can be translated into different languages and formats. An example from Brazil is the use of field names such as *Paisestado*, *Microregion*, *Coletor*, *Numero* and *Registro*. Once registered in the RDE field table, the alternative names are recognised by the system.

Those familiar with earlier versions of Brahms will see major changes in all output and processing menus. For example, fields are now selected using user-definable field views. Tagging or numbering fields listed in the field view file (with one column per view) means that many default views can be maintained, altogether tidier and more flexible. Record sorting is more flexible. The Brahms Report Generator has been extensively upgraded and there are now fifteen report drivers available for editing, each with a default design.

The Herbarium Transaction module, monitoring the dispatch and receipt of specimens in the herbarium, is now fully operational. Categories of transaction (e.g. loans dispatched, loans returned, staff accession) can be edited into a system dictionary.

Collections already stored in Brahms can be easily linked to a transaction and there is also an option to auto-link to a transaction when importing RDE files.

A dictionary to store specimen determination status categories has been added. Example entries in the Mt. Cameroon database (Limbe) are *Field determination*, *Determined by family specialist* and *Confirmed by family specialist*. As before, the name of the specific person naming a collection can be stored but the new dictionary means that questions such as *list all Rubiaceae with field dets only* can be asked more easily.

Another recent addition is the facility to store species character states in a linked data file. File structure can be edited without restriction and the data can be used to prepare formatted outputs using spreadsheet or word processor macros or fed to analysis packages. The simplicity of this approach was recently described by Alan Whittlemore (Taxon 45, August 1996).

Spanish and Portuguese versions of Brahms are now available - new languages can be easily added. A French version is to be prepared at Wageningen early in 1997. The language can be selected by clicking the language bar on the system configuration menu. At present, the help text is only available in English.

Getting started

One of the challenges of the Brahms project has been to simplify procedures for those wishing to start a new database project. Three key areas targeted by the project are the initial set-up procedures, the creation of standard data entry RDE templates and the supply of useful start-up data. The new primary set-up procedures have minimised post-installation trauma. The user is guided through the configuration process, ensuring they get maximum benefit from their database as quickly as possible.



Mapping with MUSICA

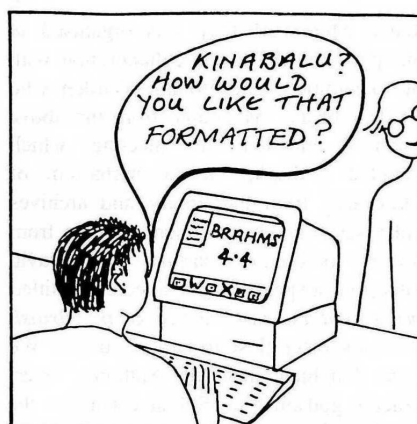
The production of quality botanical maps is a high priority for many and one of the objectives of the project has been to provide botanists with an easy-to-use alternative to expensive GIS systems. William Hawthorne's Visual Basic mapping package MUSICA does exactly this. The new Brahms map interface module allows users to build their own map library, creating and attaching data files from RDE, Brahms output files or any other xBASE file. The plotting style (colour, symbol, size, hide) for points can be set using functions and user-defined data classification schemes. Map features such as margins, grid, boxing, clip, scale-bars, compass and legend can be added. World map data is provided with MUSICA but many projects need more detailed map data. Hawthorne's MAPED program can be used to digitize and edit new maps.

GEOname

There are many useful data files that can be imported or linked to Brahms. A recent discovery made by Chris Fagg (Oxford), currently preparing an Atlas of African Acacias, is the gazetteer package GEOname. This is based on the database used for world-wide non-USA mapping and charting, replacing over 200 volumes of published US government gazetteers. Brahms includes a function to translate GEOname output into RDE format. The RDE files are usually maintained as external, indexed gazetteer country files (often large). Records can be accessed using a dedicated lookup function key when entering data - or the files can be imported, feasible for projects dealing with a restricted geographical area. (Available from: GEOname Products, GDE Systems, Inc. P.O. Box 509008, San Diego CA 92150-9008 USA. Fax: 1-619-592-5420)

Project news

During the last year, Brahms training



workshops were held in India (IFGTB), Cameroon (Limbe), Malaysia (FRIM), OFI (Darwin Initiative), Brazil-Amaozonia (CPATU), Brazil-NorthEast and Honduras. The OFI course included attendants from Brazil, Cameroon, Costa Rica, Ghana, Malaysia and Namibia. In Brazil-NorthEast, fourteen botanists were invited to a course in Joao Pessoa (Paraiba) by the Plantas do Nordeste (PNE) project, co-ordinated by Regina Barbosa. In Honduras, the course coincided with the second annual meeting of Mesoamerican curators organized by George Pilz (EAP herbarium, El Zamorano) attended by representatives from all Central American countries.

While the majority of Brahms projects are based in tropical herbaria, more projects are now starting in Europe, two of these in the Netherlands. The EU-funded ECOSYN project, based at Wageningen University, co-ordinated by F.J. Breteler and Renaat van Rompaey, is reviewing floristic diversity in West Africa while Luc Willemsse at Leiden is co-ordinating a project documenting type specimens held in the Netherlands, in collaboration with Utrecht and Wageningen.

One project focus is the Brazilian governmental centre for research in Oriental-Amaozonia (EMBRAPA-CPATU). The curator of the CPATU herbarium, Regina Celia V. Martins da Silva, is active with database projects on their type collections, the Meliaceae and Lecythidaceae, checklists for key forest study areas and common names. They are also helping to develop a standard forestry species list which hopefully will be adopted by the government research agency IBAMA. Project collaboration is also being developed with the close-by Museu Goeldi.

For more information about Brahms, write to denis.filer@plant-sciences.oxford.ac.uk.

Denis Filer

Department of Plant Sciences

Expeditions and visits

Robert Scotland visited S. India from 17-22 November 1996 to set up collaborative work on *Strobilanthes* with the Tropical Botanic Garden and Research Institute at Palode, Trivandrum.

Stephen Harris attended the Belfast meeting of the Linnean Society in August and presented a paper entitled 'Herbaria as a source of molecular data'.

C.E. Hughes and W.D. Hawthorne visited the southern Mexican State of Quintana Roo for four weeks in September/October to assist the Overseas Development Administration Quintana Roo Forest Management Project with its programme to appraise and monitor the impact of forest management, forest road construction and logging on biodiversity. A preliminary plant species checklist was annotated as a species database and a pilot botanical survey carried out. Even with the limited work done so far it is clear that the flora in the forests visited (and in Quintana Roo as a whole) is dominated to an inordinate degree by widespread opportunistic species which thrive on forest disturbance. This work will continue over the coming year. It is hoped that the final report could assist certification of forest products from the area and satisfy others in the field of natural resource conservation / impact assessment that the type of forestry activities being carried out are unlikely to be of any lasting detriment. At the same time what limits there might be to such exploitation and what measures are needed to prevent transgression of these limits are to be defined.

Chris Fagg continued herbarium studies on *Acacia*, visiting Brussels (BR) and Paris (P), and during fieldwork in Zimbabwe in February, visits were made to the little known herbaria in Bulawayo (BUL) and in the Mtetsi and Hwange National Parks.

Joint fieldwork in Zimbabwe, with the ecologist Jonathan Timberlake, identified new localities and ecological data for a fieldguide to Zimbabwean Acacias, as well as contributing to an Atlas of African Acacias which is also being prepared. Given the substantial collecting that has occurred in Zimbabwe, it was surprising to find a hybrid new to southern Africa, between *Acacia mellifera* and the gum arabic species *Acacia senegal*.

Rosemary Wise spent four weeks in Peninsula Malaysia (FRIM), Sabah (Forest

Research Centre) and Sarawak (Forest Department) in March 1996, drawing for the Tree Flora of Sabah and Sarawak and continuing to advise the other artists on techniques of botanical illustration.

See student reports.

Herbaria

Visitors

214 people visited the herbaria between the beginning of October 1995 and the end of September 1996. We were very pleased not only to welcome visitors from Britain, but from many other parts of the world, some from as far afield as Australia, Brazil and Japan, amongst many others. An additional 101 people attended the Frank White Memorial Symposium during which they had the chance of visiting the herbaria, as well as a large number of guests attending an 'Art and Exhibition' evening in the Department of Plant Sciences on 21 June 1996.

Ebenaceae collections, studied by the late Frank White, were the reason for visits by Dr. G. Gosline (K) and Dr. C. Sothers (INPA, Brazil) who worked on West African and Amazonian Ebenaceae respectively. Dr. Françoise Dowsett-Lemaire also visited in connection with preparing for publication the book she had been working on with Frank White on the Forest Flora of Malawi.

Fielding-Druce (OXF)

There have been several opportunities over the past year to promote public access to the collections in the form of displays/exhibits at various meetings and events. To this end, we have been pleased to welcome a larger number of visitors than in some more recent years. We hope this trend will continue.

Work has also progressed on the curation of the lichen collections through the direction and enthusiasm of Professor Mark Seaward, Head of Department of Environmental Science at the University of Bradford (see below).

The Druce Herbarium

Largely through the efforts of the Botanical Society of the British Isles and the Ashmolean Natural History Society of Oxfordshire, enough funds were raised to purchase and erect a new headstone for the previously unmarked grave of George Claridge Druce (1850-1932), who bequeathed his herbarium to the University. To mark this occasion, a **George Claridge**

Druce Memorial Day was organised to take place on 18 May in collaboration with the Department and Botanic Garden who acted as hosts. 54 people from the above societies attended the meeting which included a display in the herbarium of 'Druceana' from the library and archives and a selection of specimens of note from Druce's original herbarium. Dr David Allen, guest speaker, gave a lecture entitled *Druce and the biodiversity of the British flora*, a subject close to Druce's heart! We were delighted that Mr Anthony Jeyes, Druce's godson, Mrs Sylvia Chandler, the granddaughter of a cousin of Druce and Mrs Josie Smith, one of the Druce family from the village of Eynsham, Oxon, all came to join in the days' activities. A booklet commemorating the event is under preparation and will be available shortly.

Members of the Rare Plants Group of the Ashmolean Natural History Society of Oxfordshire were also active in recording data from sheets in the herbarium for various threatened plants and previously widespread arable species. A total of 54 visits were made in this connection.

During the year 70 specimens were accessed to the Druce Herbarium including several grasses collected by P.J.O Trist and a number of miscellaneous species collected in Cornwall by Daniel Barker, a graduate from the University now studying for a Ph.D. at E.

The Druce collection was also used by Elizabeth Moylan during undergraduate project work on the variation within the species *Lathyrus pratensis*.

The historic herbaria of OXF

The microfiche of the Morisonian, Dillenian and Sibthorpean Herbaria with accompanying guides were published by IDC (Inter Documentation Company) of the Netherlands. The complete set is available for consultation in Department of Plant Sciences Library.

Selected material from the historic collections, including the Fielding collection, was exhibited on a number of occasions. A display on the theme 'Empires of Nature' was prepared for members of the Society for the History of Natural History during their symposium in April. Early specimens, associated with collectors of note, from the Americas, Australia, South Africa, China, India and St. Helena were displayed. During an 'Art and Exhibition' evening in the Department, specimens given to the first Sherardian Professor by Linnaeus were exhibited amongst other material. Participants attending the Frank White Memorial

Symposium also had a chance to see a selection of specimens from the historical collections, as did a group of Oxford librarians.

Collections of particular interest to visitors this year included those of William Dampier - the first properly documented plants to be collected from Australia in 1699. The Honourable Peter Foss QC MLC, Attorney General, Minister for Justice, the Environment and the Arts for Western Australia, with two of his staff, visited UK specifically to see the Dampier material. Dr Diane Miller (RHS Wisley) was interested to see specimens of *Pelargonium* and found some of the earliest known specimens cultivated in the United Kingdom in the Sherardian collection. Specimens of *Senecio squalidus* (Oxford Ragwort) from the historic collections were studied by Dr Enrico Coen (John Innes Institute, Norwich). There was also continuing interest in the OXF holdings of specimens collected by Mark Catesby from Carolina, Florida and the Bahamas.

Loans

Loans sent out from the Fielding and Druce collections during the year from 1 October 1995 to 30 September 1996 included the following material: *Doronicum*, *Hypochoeris*, *Taraxacum*, Asteraceae; *Symphytum*, Boraginaceae; *Anthodon*, *Hippocratia*, *Salacia*, Celastraceae (Hypocrateaceae); *Scutellaria*, Labiatae; *Polygonatum*, Liliaceae; *Mollinedia*, Monimiaceae; *Ptaeroxylon*, Ptaeroxylaceae; *Gaertnera*, Rubiaceae; *Sium*, Umbelliferae; *Premna*, Verbenaceae; *Viola*, Violaceae; *Woodсия*, Woodsiaceae; *Gymnostomiella*, *Splachnobryum*, Bryophyta; plus a number of miscellaneous lichens for identification. The borrowing institutions included BHCB, BR, E, H, K, KUS, MJG, MO, NCE, USP and WSY. During the same period 424 specimens were returned to OXF from loan and 8% of these are types.

Serena Marner

The Oxford University Lichen Herbaria

As well as housing the famous Dillenian lichen herbarium (see Crombie 1880, Druce & Vines 1907 & Cloukie 1964), the Fielding-Druce Herbarium (OXF) contains several other lichen collections hitherto unresearched. In the main, this reflects the scarcity of local lichen specialists over the years able to dedicate time to organizing the various collections, which until recently

were virtually inaccessible, and to promoting their use.

Over the past year, Serena Marner and myself, ably assisted for four weeks this summer by a temporary assistant, Laura Mabblerley, have integrated many of the collections to form a functional (general) lichen herbarium. The Dillenian and the Sherardian (see Clokie 1964) lichen herbaria have been retained as separate entities, as has the Lipscombe lichen collection, formerly thought missing (Clokie 1964 p. 201), but which has now been relocated. However, the Bohler exsiccata, *Lichenes Britannici*, has not been traced as yet.

The new general lichen herbarium has been arranged according to modern taxonomy, at least to generic level, and mounted (some for the first time) specimens placed in new folders; wherever possible, acid-free materials have been used for this work. Within genera, lichens have been separated into different folders according to whether they are either (a) British and Irish or (b) foreign. A full geographic analysis has not been made, but, to date, at least 95 collectors have been identified (many not included by Clokie (1964), the following being the more important and/or prolific contributors:

Ayres, P.B.	(1813-1863)
Baker, J.G.	(1834-1920)
Baxter, W.	(1787-1871)
Borrer, W.	(1781-1862)
Boswell, H.	(1837-1897)
Brenan, J.P.M.	(1917-1985)
Brunton, W.	(1775-1806)
Burn, R.	(1887-1972)
Clements, F.E.	(1874-1945)
Coultas, H.	(?-1877)
Dalton, J.	(1764-1843)
Dixon, G.	(1812-1904)
Edgeworth, M.P.	(1812-1881)
Gardiner, W.	(1808-1852)
Gardner, G.	(1812-1849)
Hailstone, S.	(1768-1851)
Harriman, J.	(1760-1831)
Lyll, D.	(1817-1895)
Mudd, W.	(1830-1879)
Polunin, N.V.	(1909-)
Richardson, J.	(1787-1865)
Watson, W.	(1872-1960)

A more detailed appraisal of the contents of the general lichen herbarium (and of the Sherardian herbarium) and taxonomic revision of them is currently in progress.

References

Clokie, H.N. (1964). *An account of the Herbaria of the Department of Botany in*

the University of Oxford. Oxford University Press.

Crombie, J.M. (1880). On the lichens of Dillenius's 'Historia Muscorum', as illustrated by his herbarium. *Journal of the Linnean Society: Botany* 17: 553-581

Druce, G.C. & Vines, S.H. (1907). *The Dillenian Herbaria. An account of the Dillenian Collections in the Herbarium of the University of Oxford*. Oxford Clarendon Press.

Mark Seaward
University of Bradford

Daubeney (FHO)

This year progress has been made towards our aim of making the FHO collection a more accessible and useful resource as well as paving the way for further improvements and the hoped-for refurbishment. The shortage of cupboard space is obvious to everyone entering the herbarium as the overflow has to be housed in sturdy, green, filing boxes stacked on the worktops. The problem of limited space has forced us to be very selective in accepting offers of specimens for the collection from herbaria and individuals.

Accessions

During the year October 1995 - September 1996, 1169 sheets were accessed to the FHO collection. Included in this were specimens of *Strobilanthes* (Acanthaceae) collected by Robert Scotland, *Andira* (Leguminosae: Papilionoideae) collected by Toby Pennington (now at E) and *Clerodendrum* (Labiatae) collected by Dorothy Steane (now at the University of Hobart, Tasmania).

Loans

Nearly 1000 specimens in 38 loans were borrowed for current research in the department. They included specimens of *Stenosiphonium* (Acanthaceae) for Mark Carine, *Brachystegia* (Leguminosae: Caesalpinioideae) for Augustine Chikuni, *Acacia* (Leguminosae: Mimosoideae) for Chris Fagg and further *Faradaya* & *Oxera* (Labiatae) for Rogier de Kok. Over the same period, 1125 specimens were returned or transferred and 272 specimens sent on loan.

Distribution of duplicates

Over 700 specimens were sent to other herbaria as gifts. This total included: Caroline Pannell's *Aglaia* collections from

Sumatra (mainly to L, but a small amount each to FRIM & KLU); Robert Scotland's *Strobilanthes* (Acanthaceae) collected in Sri Lanka to K, L, PDA, E & AA; Central American pines to K, NY, IBUG & EAP with smaller amounts to U, B, L & W.

Items of interest: Curation

The major curation of several sections in FHO was completed this year. These were the Tropical African Euphorbiaceae (excluding *Euphorbia*); *Aglaia* from S.E. Asia; the Central American legumes; the gymnosperm collection (excluding cultivated material - see below); a large part of the Tropical African Rubiaceae; the genera *Eugenia* & *Syzygium* (Myrtaceae) from Tropical Africa. East Tropical African & cultivated *Clerodendrum* (Labiatae) and *Vitex* (Verbenaceae) from Sri Lanka. Curation of the Ebenaceae is ongoing. *Diospyros* from New Caledonia, Tropical Africa (East, South & West) and Madagascar has been completed so far.

Cultivated Specimens

Cultivated material in this collection derives from roughly three areas of study: i) exotics collected from interest, both in tropical countries and Great Britain (in the latter case usually from Arboreta or Botanic Gardens); ii) specimens from forestry field trials; iii) material collected for teaching or publications, mainly from plantations, woods and Arboreta in the U.K.

Because cultivated specimens are not of particular interest to taxonomists working on wild floras, but may be of interest to horticulturalists and foresters, we are starting to separate them from the wild collections at the end of each genus. Cultivated material is probably only of limited interest but we would like to hear of people's views on this matter.

Spirit & Carpological Collection

Both these associated collections of FHO are in need of attention. Temporary accommodation in the department has recently been completed to house the spirit collection outside the main FHO collection. Safety regulations require this and it is hoped that a permanent, purpose-built store will eventually be provided. The spirit collection therefore will be moved shortly and the job of curating it will begin.

The carpological collection, which is overflowing its original accommodation in FHO, will be stored in the space relinquished by the spirit material until more purpose-built cupboards are available.

Alison Strugnell

First Biennial International Conference

SYSTEMATICS ASSOCIATION

St Anne's College, Oxford, 19-21 August, 1997

Systematics is an exciting and rapidly developing science that is the cornerstone of modern biology. To provide a new forum where students, amateurs and professional systematists can present their research and discuss topics of interest to biologists worldwide, the Systematics Association is launching a series of biennial conferences.

This first conference will include both open sessions and focused, thematic sessions. The emphasis of the conference is on the open sessions which are to provide a format for systematists to present their work. Basically, if you are coming to the conference you should present a paper.

Preliminary topics under which the general sessions will be organised include:

- * Phylogeny reconstruction * Alpha taxonomy * molecular systematics * Systematics and Conservation * systematics and ecology * ancient and modern biodiversity *
- * microbial systematics *

The focused sessions will address three areas:

- * how to analyse large molecular data sets *
- * character conceptualisation: conjectures of primary homology *
- * dissemination of taxonomic information *

To receive registration details contact:

Dr Toby Pennington
Royal Botanic Garden Edinburgh
20a Inverleith Row
Edinburgh EH3 5LR
Fax: 0131 552 0382
e-mail: system97@rbge.org.uk