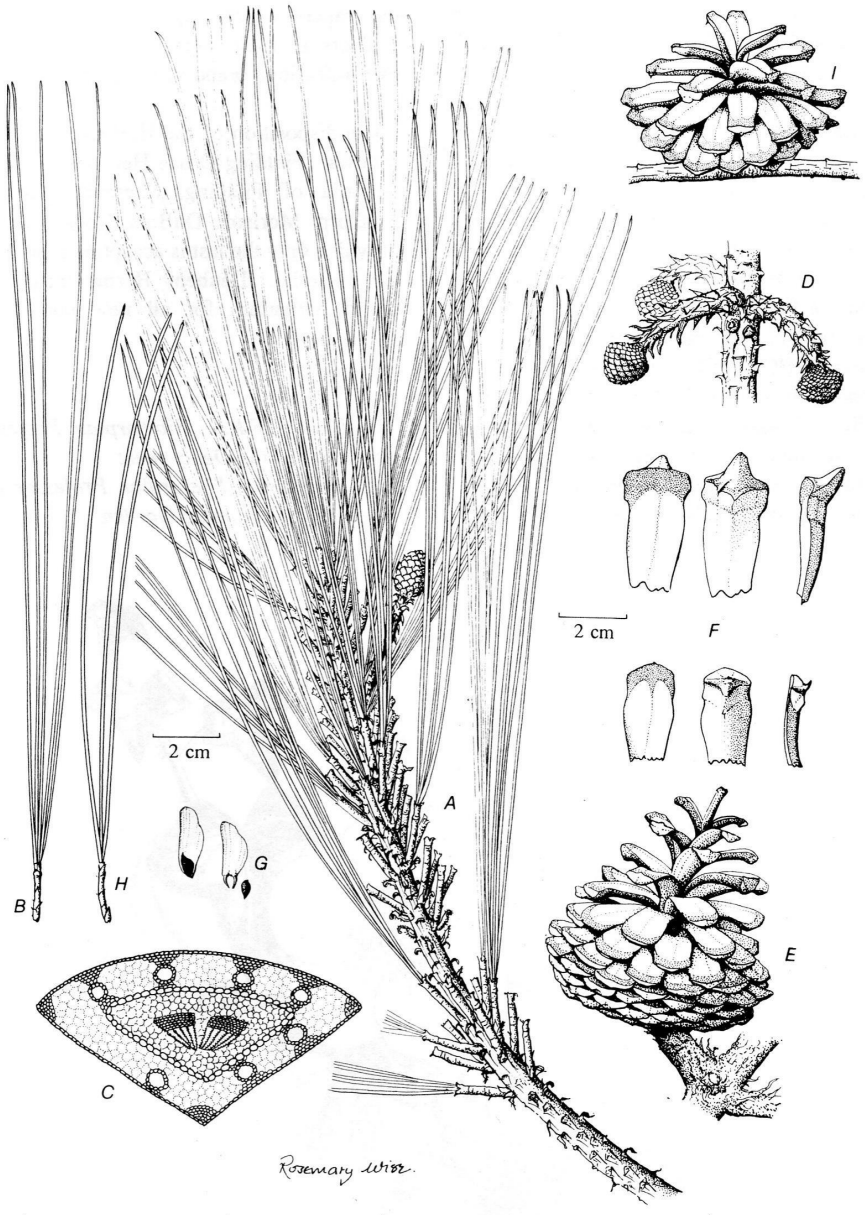
# Oxford Plant Systematics



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

OPS 1 November 1993




*Pinus oocarpa* Schiede ex Schltdl. (A-G). A. Habit; B. fascicle; C. cross section of leaf; D. young cones; E. mature cone; F. cone scales; G. seeds. *P. oocarpa* var. *trifoliata* Martinez (H-I). H. fascicle; I. mature cone.

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# Editorial

The study of plants and plant taxonomy at Oxford has a substantial history. The Fielding-Druce Herbarium, the oldest in Britain, has botanical collections dating back to the 17th Century. Examples are the *Hortus Siccus* of Jacob Bobart and early publications including Morison's *Plantarum Historiae Universalis Oxoniensis Pars Secunda* (1672) and the *Historia Muscorum* of Dillenius (1741). A wealth of new accessions and publications from more recent decades can be found. Notable examples are the comprehensive collections of woody legumes made by the Forest Genetics Group, in Latin America and Africa; and publications such as *The Vegetation Map of Africa* (1983) by Frank White and *The Plant-Book, a portable dictionary of higher plants* (1987) by David Mabberley.

We are now experiencing a resurgence of activity in the field of plant systematics with new appointments and research initiatives, herbarium reorganization and upgrading, related computing developments, and much more. Since October 1992, there have been regular meetings of a newly appointed Taxonomy Steering Committee chaired by Professor Hugh Dickinson, to discuss these and related issues and also, an informal Taxonomy Forum coordinated by David Mabberley, open to all staff and students.

As one would expect in a Plant Sciences Department, the range of research activities is wide. The broad subject area of plant systematics occupies an increasingly prominent role and it is encouraging to witness a steady integration of activities from all corners of the building with a blending of technologies old and new.

The purpose of the newsletter will be to provide a summary of current events in this Department that relate to work in systematics, with a focus on the herbaria. The past, however, will not be neglected and in future issues, there will be a series of more historical articles from the herbarium and library. We intend to produce a maximum of two issues per year.

*Denis Filer, Editor of OPS 1*

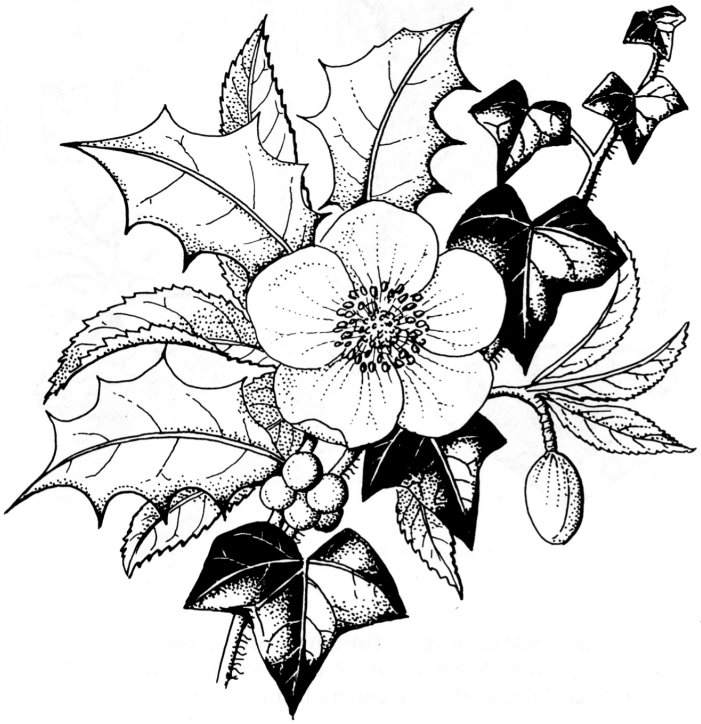
# Strengthening research in systematics at Oxford

Teaching and research in Plant Taxonomy at Oxford has recently been reviewed by a Panel chaired by the Director of the Royal Botanic Gardens, Kew. Acknowledging the increasing commitment to the plant sciences at Oxford, the panel recommended that taxonomic research be developed through an integrated programme of restructuring. The first step in this reorganisation will be the securing of funds for the comprehensive refurbishment of the herbaria and associated laboratories. Changes are already being made but throughout these improvements there will be no restriction on loans. However, inquiries should now be addressed to the Acting Curator, Dr David J. Mabberley.

One of the panel's recommendations was that the Fielding Herbarium ceases to accumulate new material and that the Forest Herbarium be the repository for new specimens. The Druce Herbarium will continue to be the repository for all British material and the Forest Herbarium will now be that for material from the rest of the world. The latter (FHO) will accordingly be known henceforth as the Daubeny Herbarium as it will no longer be merely the repository of forest plants. The name commemorates Charles Giles Bridle Daubeny, MA, MD, F.R.S., (1795-1867), Professor of Botany from 1834, having been Professor of Chemistry from 1822. He did much to restore the teaching of botany at Oxford, reviving the Botanic Garden and introducing experimental techniques into the subject. He was instrumental in the University's acquisition of the Fielding Herbarium in 1853. To quote H.N. Clokie, *An account of the herbaria of the Department of the Botany in the University of Oxford* (1964) p.47 "Professor Daubeny is one of the most outstanding of the Oxford Professors of Botany. His greatness lay chiefly in this ability to get botany taken seriously in the University, in his capacity to read and assimilate data on the latest ideas in botany, chemistry, geology and agriculture, and to work in the same directions, producing papers which might be of use to his students in their work and generating his own infectious brand of enthusiasm".

The disposition of the Herbaria is now as follows: Fielding-Druce Herbarium (OXF): herbaria of Fielding, Sherard, Dillenius, Sibthorp, Morison, DuBois, Bobart, Druce, of which only the last is accepting new (British) material. Daubeny Herbarium (FHO): world herbarium for all new non-British material.

*C.J. Leaver F.R.S., Sibthorpian Professor and Head of the Department.*
*H.G. Dickinson, Sherardian Professor and Keeper of the Botanic Garden.*



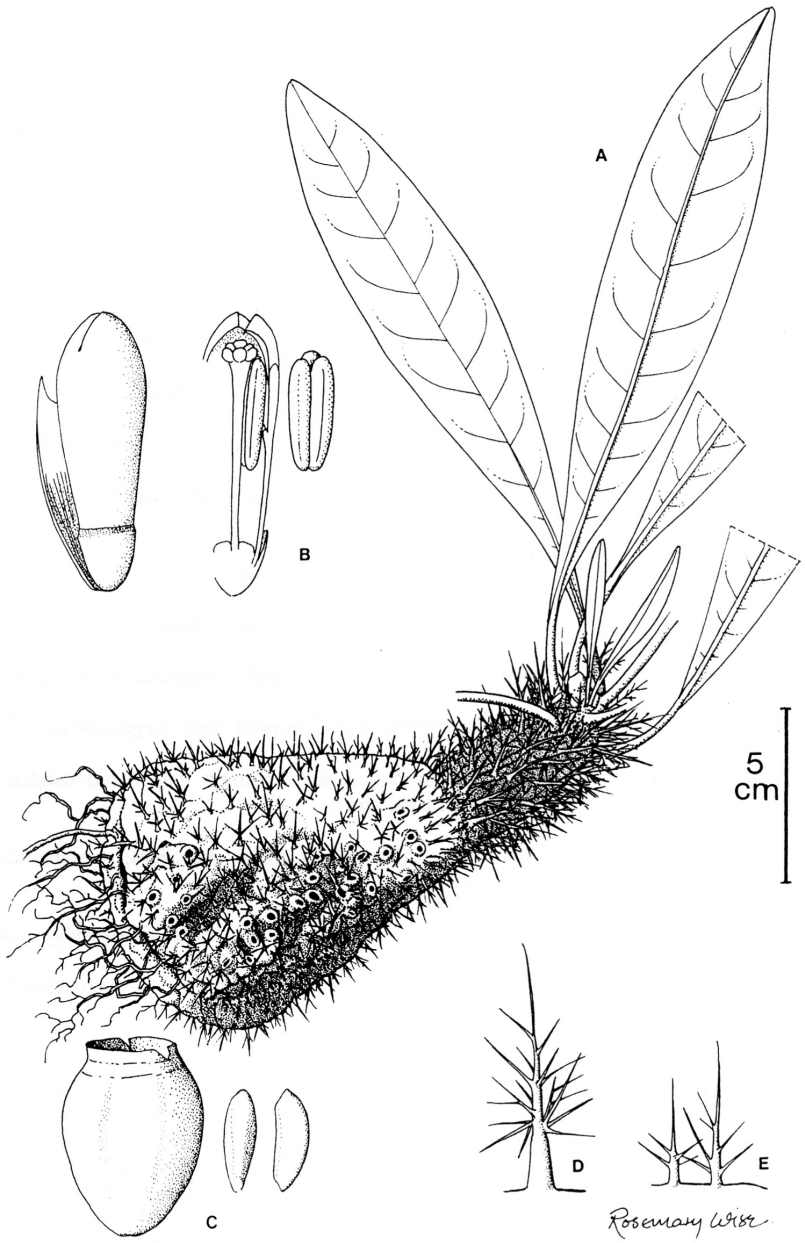
# News items

The Department of Plant Sciences is pleased to announce the conferment of the title of Distinguished Research Curator on F. White, M.A. (Oxon.), Sc.D. (Cantab.) until retirement, in recognition of his outstanding research work, notably on the taxonomy and ecology of African plants. Dr White is due to retire on 30 September 1994. This coincides with the 70th Anniversary of the founding of the Forest Herbarium (FHO), now known as the Daubeny Herbarium. To mark the occasion Dr White will be writing a paper on the history of the Daubeny (Forest) Herbarium, a summary of which will appear in a future issue of this newsletter.

David Mabberley has been appointed Acting Curator of the Oxford Herbaria.

The Royal Society has recently announced the latest round of university research fellowship awards. Congratulations are due to Robert Scotland, currently Druce Research Fellow in this Department, who has been awarded a fellowship. Robert will produce a monograph of *Strobilanthes* (Acanthaceae) utilizising both molecular and morphological data.

Work on the revision of the Rubiaceous ant-plants took a step forward with the publication of *Myrmecodia* (25 species). *Anthorrhiza camilla*, illustrated here, was named by Matthew Jebb to celebrate the recognition of the new genus *Anthorrhiza* Huxley & Jebb. During the next six months, Matthew will be completing the revision of the subtribe *Hydnophytinae*, along with work on *Nepenthes*, *Barringtonia* and *Pandanus* from New Guinea. Funds have been raised from the Linnean Society (NERC fund for taxonomic publication) for illustration of the final ant-plant genus *Hydnophytum*. The new world ant-tree *Tachigalia* (Leguminosae) is being studied by C.R. Fonseca who is jointly supervised by Camilla Huxley and Prof. W.D. Hamilton. Matthew has been appointed to revise the Araliaceae of Thailand at Dublin.




*Anthorrhiza camilla* Jebb. A. Habit; B. flower with anther detail; C. fruit and pyrene, axial and lateral views; D. stem spine. E. tuber spines.

*Lonchocarpus hughesii* (Leguminosae -Papilionoideae: Section *Willardia*) has been named by Mario Sousa, leguminologist at MEXU in honour of Colin E. Hughes, botanical and seed collector of the Oxford Forest Genetics Group. This magnificent, pink-flowered deciduous tree is native to the largely decimated dry tropical forests of Honduras, Nicaragua and Costa Rica and is now rare and threatened throughout much of its range. Its survival may be assured as it does occur in the Santa Rosa National Park, Guanacaste, Costa Rica. The first collection was made by Colin Hughes and Brian Styles in northern Nicaragua in 1982, and further collections throughout its range have been made by Colin over the last ten years. (Anales Inst. Biol. Univ Nac. Auton. Mexico Ser. Bot. 63: 147-154).

We have three new members of staff: Aljos Farjon, Stephen Harris and William Hawthorne. Aljos joined the Department on 1 October, to work on the completion of the

monograph on neotropical pines, continuing the work of Brian Styles. He was previously working at the herbarium division of the University of Utrecht, The Netherlands, on the taxonomy of conifers. He joins us for a one year period. Stephen started on 1 October, coming from St Andrews. He is coordinating activities in the new molecular systematics/population genetics laboratory. The upgrading of this laboratory is to benefit from a grant from the E.P. Abraham Research Fund. His expertise in molecular systematics will be an invaluable addition to the Department. Stephen is already familiar with the research undertaken by the Forest Genetics Group through his previous collaborative work on tropical legumes. William, who was formerly a doctoral student of David Mabberley, brings his considerable expertise in the combined fields of botany and computing. His main work focuses on the development of a new mapping and imaging package, linked to the BRAHMS project. Previously, William worked as forest botanist for 5 years at the Forestry Department in Ghana. We are sorry to have said goodbye to Jennifer Edmonds and Duncan MacQueen. Jennifer is continuing her work on the genera *Piper* and *Toona*, based in Leeds. Her new address is: Department of Pure and Applied Biology, The University of Leeds, Leeds LS2 9JT. Before departure, Duncan completed a field survey, collection and revision of the Section *Racemosae* of the mimosoid legume genus *Calliandra*. Much of his work was based in Central America and Mexico. The revision is to be published jointly with Hector Hernandez (MEXU).

## Staff

| | |
|---|---|
| Dr Philip S. Bacon | Convolvulaceae (Malesian region); invasive species. |
| Dr Richard D. Barnes | Genetic resources of Leguminosae (Africa). |
| Dr David H. Boshier | Reproductive biology; habitat fragmentation in Central American dry forests. |
| Dr Quentin C.B. Cronk | Departmental lecturer; Flora of St Helena, especially *Trochetiopsis* (Sterculiaceae); monoclonal antibodies for taxonomic analysis. |
| Mr Chris W. Fagg | Leguminosae (Africa); genetic resources, taxonomy and ethnobotany of *Acacia*. |
| Mr Aljos Farjon | Taxonomy of conifers; neotropical pines. |
| Mr Denis L. Filer | Information systems; BRAHMS (Botanical Research And Herbarium Management System). |
| Dr Stephen Harris | Molecular systematics of tropical trees; Leguminosae. |
| Dr William D. Hawthorne | African forest botany and ecology; map based databases (FROGGIE: Forest Reserves Of Ghana: Graphical Information Exhibitor). |
| Mr Colin E. Hughes | Leguminosae (Mexico, Central America); systematics, ethnobotany and genetic resources of *Leucaena* (Mimosoideae). |
| Dr Mark F. Large | Royal Society Endeavour Fellow; pollen morphology; Labiatae, Verbenaceae. |
| Dr David J. Mabberley | Acting Curator of the Herbaria; Meliaceae; Verbenaceae; Labiatae; Vitaceae; *Dysoxylum*; *Munronia*; *Clerodendrum*. |
| Miss Serena K. Marner | Herbarium manager (OXF); *Faurea* (Proteaceae); William Dampier. |
| Dr Robert W. Scotland | Royal Society University Research Fellow; Acanthaceae; *Strobilanthes*; cladistics. |
| Dr Tony Simons | Population genetics and reproductive ecology of selected tropical genera. |
| Miss Anne M. Sing | Technician supporting Green Plants Option, working in David Mabberley's lab. |
| Mrs Alison Strugnell | Herbarium manager (FHO); Flora of Mt. Mlanje, Malawi. |
| Mrs Cynthia Styles | Secretary to the herbaria. |
| Ms Christine Surman | Technician supporting Forest Genetics and Ecology Group. |
| Mrs Sean Turner | Specimen mounting. |
| Mr Timothy Walker | Departmental Research Lecturer, living collection; Superintendent, University of Oxford Botanic Garden. |
| Dr Frank White | Distinguished Research Curator; Ebenaceae, Meliaceae, Myricaceae, Ptaeroxylaceae; vegetation of Africa and its islands; historical chorology; tropical ecology including reproductive biology. |
| Mrs Rosemary Wise | Botanical artist; endemic Flora of granitic Seychelles. |

## Student progress

**Examinations**
The following have recently satisfied the examiners for the degree of D.Phil. David Boshier (A study of the reproductive biology of *Cordia alliodora* (R. and P.) Oken); David Harris (A taxonomic revision and an ethnobotanical survey of the Irvingaceae in Africa); Jeanine Felfili (Composition of Gallery forest in Central Brazil); and Phanuel Oballa (Genetic variation within *Acacia karroo* Hayne).

**Julie Hawkins** (D.Phil. first year). Systematics of *Parkinsonia* and *Cercidium* (Leguminosae). Supervised by C.E. Hughes, P.J. Kanowski, R.W. Scotland and S.A. Harris. ODA studentship. The delimitation of the genera and determination of the relationships amongst the species will use both molecular and morphological characters. The molecular characters will be used to investigate tokogenetic relations for *P. aculeata* as well addressing taxonomic problems.

**Colin Hughes** (D.Phil. first year). Systematics of *Leucaena* (Leguminosae). Supervised by D.J. Mabberley and R.M. Polhill (K). Despite the considerable economic and ethnobotanical importance of *Leucaena*, no recent taxonomic revision of the genus exists. This small genus is being studied in detail using morphology and ethnobotany to examine species relationships and interspecific hybridization to produce a monographic treatment of the genus.

**Jill Humphries** (D.Phil. final year). The Development of a Methodology - John Ray's Plant Classification. John Ray was a seventeenth century natural historian whose contribution to the development of taxonomy was considerable. Ray's work was increasingly affected by the growing awareness that essentialism could not legitimately determine character choice. To create a natural classification, an alternative method classification was required and Ray applied himself to the task. The development of Ray's classification method is the theme of the thesis.

**Toby Pennington** (D.Phil. third year). Molecular Systematics of *Andira*. Supervised by Professor C.J. Leaver, R.W. Scotland, R.M. Polhill and Professor M.D. Bennett (K). Joint SERC-CASE award with the Royal Botanic Gardens, Kew. *Andira* (Leguminosae, Papilionideae, tribe Dalbergieae) is a genus of approximately 30 species of tropical trees distributed across the neotropics, with one species in Africa. The taxonomy of *Andira* is extremely confused, and this project provides a re-evaluation of species boundaries, and an investigation of the utility of chloroplast DNA restriction site data for determining the relationships amogst these species.

**Rebecca Rowe** (D.Phil. first year). The population biology of *Trochetiopsis*, a genus endemic to St Helena. Supervised by Q.C.B. Cronk, J. Burley and S.J. Owens (K). *Trochetiopsis* (Sterculiaceae) is a genus containing 2 species: *T. erythroxylon* (St Helena redwood) and *T. melanoxylon* (St Helena ebony), both endemic to the island of St Helena. Over-exploitation of the redwood and intense herbivore pressure on the ebony have caused the decline of both species to very low numbers. Today, both species are being replanted on the island. Few studies have been made on very rare plants and there is limited knowledge on how best to conserve them. This study aims to determine the genetic variability of both species and to identify factors influencing the genetic composition of successive generations.

**Karen Sidwell** (D.Phil. first year). A revision of the genus *Brillantaisia* P. Beauv. (Acanthaceae). Supervised by R.W. Scotland and K. Volleson (K). This diverse genus of large forest herbs from tropical Africa and Madagascar has been recently estimated to have between fifteen and forty species. Molecular techniques, anatomical studies and herbarium taxonomy will be used to produce a monographic treatment of the group.

**Dorothy Steane** (D.Phil. Second year). Molecular Systematics of *"Clerodendrum* and *Cyclonema"*. Supervised by R.W. Scotland and D.J. Mabberley. Despite numerous attempts in the past two centuries, consensus has failed to emerge about the classification of *Clerodendrum, Cyclonema* and related taxa. A molecular approach using chloroplast DNA is being adopted to provide a new data set with which to examine the problem.

## Recent publications


Bosser, J., Rabevohitra, R. & Marner, S.K. (1993). *Faurea coriacea* S.K. Marner (Proteaceae) and *F. forficuliflora* Baker var. *elliptica* Humbert are the same. Bull. Jard. Bot. Nat. Belg. 62.

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Large, M.F. & Braggins, J.E. (1993). Spore morphology of *Azolla filiculoides* (Salvineaceae) in New Zealand. New Zealand Journal of Botany 31(4).

Large, M.F. & Braggins, J.E. (1993). A morphological assessment of *Adiantum hispidulum* Swartz and *A. pubescens* Schkuhr (Adiantaceae: Filicales) in New Zealand. New Zealand Journal of Botany 31(4).

Lockhart, L.A. & Edmonds, J.M. (1992). Chemotaxonomic and Genetic Variation Studies at Oxford Forestry Institute. Third Malaysian Conference on Essential Oils and Flavour Chemicals. July 1992: Langkawi, Kedah, Malaysia.

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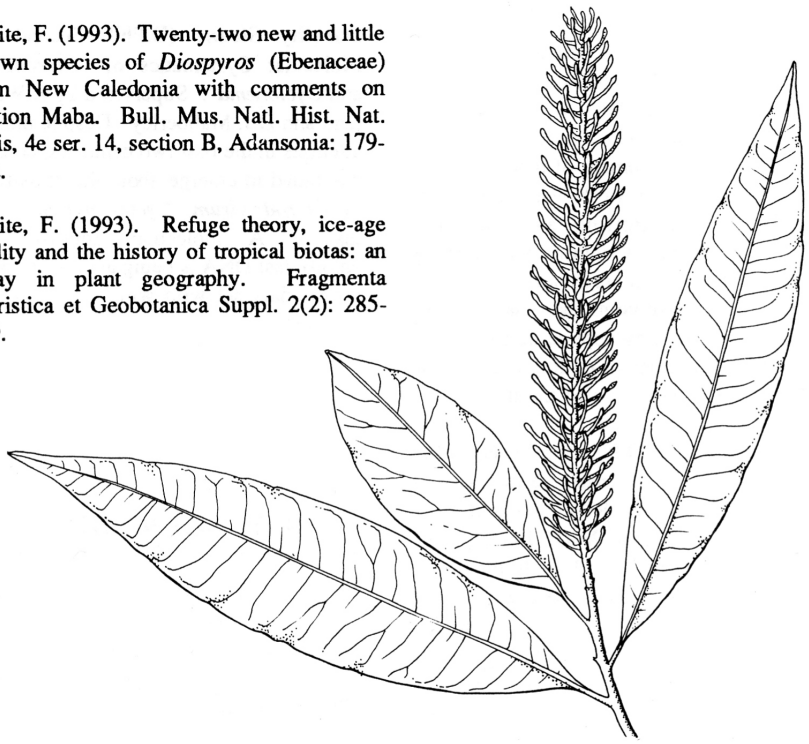
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The illustrations on this page show a flowering spike of *Faurea delevoyi* De Wild. (above) and *F. wentzeliana* Engl.



## Herbarium

Visitors are always welcome to consult the collections of the Oxford University Herbaria but we should appreciate advance notification as not all times are possible due to other commitments including teaching requirements and staff absences.

*David Mabberley*

**Visitors to the Herbaria (OXF & FHO)**
During 1992 and the period from 1 January to 30 September 1993, 163 people visited the herbaria to consult the collections or to meet staff. Included in this number were 11 students taking part in the Kew International Diploma Course in Herbarium Techniques, who also visited the Botanic Garden. Apart from local visitors and those from other Oxford University departments, we were pleased to welcome visitors from Kew, The Natural History Museum (London), the Natural Resources Institute (Chatham) and other British Universities including Cambridge, Liverpool, Reading and Stirling. Visitors from abroad came from a wide range of European countries such as The Netherlands, Denmark, Norway, France, Spain, Italy, Austria, Germany, Poland and Russia, and from further afield including those from Brazil, Mexico, Argentina, U.S.A., Canada, Namibia, South Africa, Malaysia, Papua New Guinea and Australia. There have been several longer term visits, notably those made by :

Dr Françoise Dowsett-Lemaire from France who is working with Dr F. White on the Forest Flora of Malawi.

Larissa Noresyelova from Perm University, Russia, who stayed for three weeks in November 1992 in connection with her studies on *Medicago*.

Professor H.W. Lack, Director of the Botanisches Museum, Berlin-Dahlem, came to work on the Sibthorp and Bauer collections in the Herbarium and Library relating to the Flora Graeca, a joint project with David Mabberley.

Malle Leht from the Herbarium at the Institute of Zoology and Botany, Tartu, Estonia, came for four weeks on a visit organised by the Oxford Scholarship Scheme for East European academics funded by the Soros Foundation. Malle worked on the genus *Potentilla*.

## Fielding-Druce (OXF)

**Accessions and mounting**
Before the 'closure' of the Fielding Herbarium to new accessions in 1992, now a 'Special Collection', a further 35 specimens of species endemic to the Granitic Seychelles were added. These endemics were collected by Rosemary Wise, Departmental Artist, and, added to collections from previous years, represent an almost complete set.

Since October 1992, just over 500 specimens have been mounted for the Druce Herbarium, comprising material collected by Dr H.J.M. Bowen for the Flora of Berkshire and other material collected in Oxfordshire. Mounting of the Bowen collections continues.

**Loans**
During 1992 and the period from January to September 1993, approximately 900 specimens have been sent out on loan from the OXF collections. These loans included the following genera and families: *Ichnocarpus*, Apocynaceae; *Baccharis, Hieracium, Taraxacum*, Compositae; *Carex, Cyperus*, Cyperaceae; *Geranium*, Geraniaceae; *Acacia, Inga, Robinia*, Leguminosae; Lycopodiaceae & Selaginellaceae; *Mollinedia*, Monimiaceae; *Orobanche*, Orobanchaceae; *Exochorda, Rosa, Rubus*, Rosaceae; *Cissus, Vitis*, Vitaceae. A large loan comprising miscellaneous Moroccan specimens was also sent to Reading Herbarium. Other borrowing institutions included AAU, BM, BHCB, CGE, DAO, GOET, K, LANC, LCR, MA, MSU, NFLD, P, TCD, VSC & WAG. A number of miscellaneous specimens were lent to the University Museum for display in an exhibition on products from tropical forests.

A total of 965 herbarium sheets plus 22 boxes of E.F. Warburg's bryophytes were returned to OXF from loan during the same period. Of those specimens returned since October 1992, with the exception of the Moroccan material, *c.* 4% have been types.

**Other activities**
During the same period, many enquiries were received in connection with particular specimens in the historic herbaria, especially those in the Dillenian, Sherardian and Sibthorpian collections. As the historic specimens are not sent out on general loan, this resulted in some cases in a number of photographs being sent for taxonomic purposes to individuals from botanical institutions worldwide, including those from BM (London), E (Edinburgh), FI (Firenze), ISTE, (Istanbul), K (Kew), O (Oslo), P (Paris), PRE (Pretoria), SIU (Illinois), TCD (Dublin), UAMH (Edmonton) and UPS (Uppsala).

*Serena Marner*

## Daubeny (FHO)

**Accessions**
During the period 1992 - 30 September 1993 nearly 1500 specimens have been incorporated into the collection. Groups that warrant particular mention are:

Over 200 *Crataegus* (Rosaceae) specimens which represent the collection of species and cultivars made by Harvey Dunkley as the basis for his thesis on members of this genus grown in the U.K.

The Meliaceae collection has recently been expanded, firstly, by the addition of a large number of *Aglaia* specimens collected in Sumatra by Caroline Pannell as part of her study leading to the recently published monograph on *Aglaia*. Further collections from Malaya will soon be added to an already comprehensive holding of the genus which is all determined by Dr Pannell in accordance with the species delimitation described in the monograph. Secondly, further material of the genera *Cedrela, Carapa* and *Swietenia* from Central and South America and *Dysoxylum* from New Caledonia has been incorporated. The holding of this family is one of the assets of FHO as it represents a major focus of taxonomic research interest in this Department over the last 34 years.

Specimens of *Parkia* (Leguminosae: *Mimosoideae*) collected by H.C. & M.J.G. Hopkins in Brazil along with some collected by others elsewhere and identified by Helen Hopkins (a previous D.Phil. student of this Department) are now accessed to FHO.

Also specimens of Meliaceae, Ebenaceae and Verbenaceae sent as gifts for identification as part of phytochemical surveys in Malaysia, Papua New Guinea and the Philippines have been received.

**Distribution of duplicates**
**(1992 - September 1993)**
A total of 1380 duplicates were distributed to interested herbaria. The majority consisted of rubiaceous ant-plants from the genera *Hydnophytum, Myrmecodia, Myrmephytum, Squamellaria* and *Anthorrhiza* collected by Camilla Huxley and Matthew Jebb in Papua New Guinea. The accounts of these genera are being published as a series of papers in

the journal *Blumea*. Duplicates of the fern genus, *Lecanopteris*, were also distributed. These were collected by Dr Honor Gay in Papua New Guinea during field work for her thesis entitled 'Ant association and structural rhizome modifications of the far-eastern epiphytic fern genus *Lecanopteris* (Polypodiaceae)', 1990. *Parkia* duplicates collected by Helen Hopkins as part of her taxonomic revision of this genus have also now been distributed.

**Loans**

A large amount of material is obtained on loan for the various research projects being undertaken at Oxford. For example, during the period January 1992 to September 1993, specimens of *Andira* (Leguminosae), *Parkinsonia* (Leguminosae) and Irvingiaceae have been sent for D.Phil. studies on these taxa by Toby Pennington, Julie Hawkins and David Harris respectively.

Additional material of *Faurea* (Proteaceae) has been acquired for the final stages of this generic account being written for the Flora of Tropical East Africa by Serena Marner and of Meliaceae for the final stage of the account of this family for *Flora Malesiana* by David Mabberley with contributions from Caroline Pannell (*Aglaia*), T. Clark (*Walsura & Pseudoclausena*) and Jennifer Edmonds (*Toona*).

Other projects for which loans have been sent are the Ebenaceae account for the Flora of China by Dr Frank White and revisions of *Toona* (Meliaceae) and *Piper* being carried out by Jennifer Edmonds.

Also over this period, loan material of Meliaceae, Ebenaceae, Pinaceae, Rubiaceae, Dipterocarpaceae, Myrtaceae, Simaroubaceae and Irvingiaceae has been returned.

*Alison Strugnell*

## Expeditions and visits

David Mabberley spent a three month sabbatical period (January - March 1993) in New South Wales, Australia as a Trust Visiting Research Fellow at the Royal Botanic Gardens, Sydney. He also spent six weeks at the Rijksherbarium, Leiden working on the *Flora Malesiana* project. He attended the International Botanical Congress in Yokohama, Japan in August/September. He also gave some lectures at the University of California, Irvine in September.

Duncan Macqueen visited Mexico and several Central American countries from March to May continuing his studies on *Calliandra*. Botanical collections were made of *Calliandra* and several further genera of woody legumes. The main herbaria visited were MEXU and NY. Seed collections were finalized for *Calliandra* series *Racemosa*.

Julie Hawkins spent five months in Central America and Mexico collecting seed and botanical material of *Parkinsonia* and *Cercidium*. Visits were made to MEXU, TEX and UC herbaria. Colin Hughes joined Julie for a six week period in January-February to assist and supervise her field work.

Jennifer Edmonds visited Malaysia and Sri Lanka working on *Piper*.

Denis Filer visited EA (Kenya), MEXU (Mexico) and PDA (Sri Lanka), to assist with the coordination of their respective BRAHMS projects. The most recent visit was to MEXU where data is being collated, on a priority basis, for the Flora of Oaxaca. Check lists are also being compiled for the Tehuacan valley and Tehauntepec region, both with large numbers of endemics.

Tony Simons continued the search in Meso-America for *Gliricidia* and its close relatives focusing on the diverse populations in NW Guatemala and SW Mexico. Seed and botanical specimens were collected for further investigation. In collaboration with CPATU, work commenced on the reproductive ecology of 15 Amazonian tree species.

During the last year Chris Fagg has visited countries in east and southern Africa, continuing his studies on *Acacia*. Important botanical collections were made in the remote Kaokoveld region of Namibia with the curator of the Windhoek herbarium. Chris also spent two weeks at the East African Herbarium working, with EA staff, on the curation of their *Acacia* holdings, some 5400 specimens.

Rosemary Wise visited the Seychelles for one month and completed her series of paintings of the 73 endemic plants of the Granitic islands. She is presently working on the text.

## Library

The Plant Sciences and Oxford Forestry Institute Library encompasses the three formerly separate departmental libraries of Agricultural Science, Botany and Forestry. It has a total stock of around 200,000 books and pamphlets and some 5800 serial titles and provides the main collection in its subject area for the University of Oxford. It is also an international library of deposit for forestry literature, all of which is abstracted and indexed by CAB International in its *Forestry Abstracts* and related journals and databases. Over 50 years of information is now also available on CD-ROM as TREECD. The library is open to the public and serves an international clientele with over 1000 University and external users a year.

The Library collects current material in subject areas relevant to the teaching and research staff of the department, and provides for the needs of undergraduates reading Biology, and for postgraduate students working for research degrees or the taught MSc in Forestry. The Library is richly endowed with rare early botanical works, many dating from the 17th century, including taxonomic works still in regular use.

The most significant of the Library's early works are grouped in the Sherard Collection, named after William Sherard (1659-1728), who endowed the Chair of Botany at Oxford. One of the best pre-Linnaean collections in the UK, this comprises some 750 books and 480 manuscripts, mainly on taxonomy, from the libraries of Sherard himself, J. Bobart, R. Morison, J.J. Dillenius, J. Sibthorp., G. Williams and C.G.B. Daubeny. In this century, the Library has also received valuable bequests from S.H. Vines, G.C. Druce and J. Burtt-Davy, amongst others.

A British Library funded project for conservation work on this material is currently underway.

The taxonomically relevant collections are currently being re-organized and brought together into one sequence so that they are more accessible to readers. The taxonomic journals previously arranged in 3 separate sections are now shelved together and will be interfiled once checked and duplicates have been withdrawn. All taxonomic works and Floras are now being considered with the intention of bringing them together into one sequence and arranged by the same UDC classification system (they are currently classified by 3 different classification schemes). These will then be housed either in or near the Fielding-Druce Herbarium.

*Roger Mills and Anne-Marie Townsend*

## Computing

Two new Viglans 486 computers and a 600 dpi HP laser printer have been purchased. These have been installed in offices within the Fielding-Druce and the Daubeny Herbaria - a further step towards providing improved curatorial support. Links to the new Departmental Ethernet system will shortly be forged, paving the way for easier access to electronic mail and networked database files.

A new computing project entitled *The expansion and collaborative development of the forestry and biodiversity information systems BRAHMS, FROGGIE and SISTEM+* started in April, 1993. Denis Filer and William Hawthorne are working together on this project. William is developing a new and highly versatile mapping package, designed for botanical/ecological use, building on his achievements with FROGGIE (Forest Reserves of Ghana: Graphical Information Exhibitor). A new version of BRAHMS (Botanical Research And Herbarium Management System) was completed in November 1993 and is now being distributed to registered users. Version 3.02 has benefitted from further, substantial upgrading, and has been endowed with extensive on-line help and a step-by-step tutorial guide. The new data entry module RDE (Rapid Data Entry) has now been fully integrated with the main system and has largely replaced the earlier data entry interface. RDE is faster and more flexible than the previous data entry method and can be translated into different languages by the user. RDE-X can be operated independently of the main system on a machine with less demanding specifications, ideal for the itinerant botanist with an older model of laptop. Data can now be *spliced* out of BRAHMS into RDE format, opening up a path for simple data exchange between systems.

Index Kewensis has now been acquired on Compact Disc and is available in the library where it may be consulted by visitors. The electronic version allows the entire dataset (published since 1883) to be searched in one sweep.

*Denis Filer*



## *Leucaena* Systematics: Mixtecs to Modern Man

Over the past thirty years, much of the research in systematics at Oxford has focused on tropical woody genera of widespread economic importance in industrial plantation forestry and agroforestry. This focus continues to be an important component of work of the Forest Genetics Group, where the aim is to provide sound taxonomic foundations for the utilization and future improvement of forest genetic resources in tropical countries. Research in systematics in the Forest Genetics Group, is thus very much demand-driven, often closely associated with assembly of new germplasm collections which, without exception, generate taxonomic problems and difficulties of assigning names to seedlots. Currently research is in progress on the systematics of the Legume genera *Acacia*, in Africa and *Calliandra, Gliricidia, Leucaena* and *Parkinsonia*, in Central America and Mexico.

*Leucaena* (Leguminosae - Mimosoideae) is a good example of one such genus of diverse economic importance. *Leucaena* is a small genus in the tribe Mimoseae restricted to the Neotropics and adjacent subtropical areas of North America. The centre of species diversity lies in southern Mexico with nine taxa known from the Mexican State of Oaxaca. The genus was first described by Bentham in 1842 and the most recently published monographs are those of Standley in 1922 and Britton and Rose in 1928. In both these and all subsequent studies, prominence has been given to leaflet size and shape and the related number of pinnae, characters which are now known to be unreliable indicators of the structure of the genus and which led to a proliferation of named taxa. More than fifty taxa have been ascribed to the genus; most are synonyms of 17 species with 24 taxa currently recognised. Most species are narrowly defined, uniform and discrete, often with highly restricted distributions; a few are widely distributed, variable and polymorphic forming complexes of variation.

One species, *Leucaena leucocephala*, was transported as early as the seventeenth century from Mexico to the Philippines; it is now widely cultivated as a source of leaves for livestock fodder and green manure and small wood products throughout the tropics and is naturalized and weedy in over twenty tropical countries. *L. leucocephala* is a fast growing, nitrogen-fixing tree; it is readily propagated and managed by farmers and produces high quality wood and leaf products making it an attractive tree for agroforestry and other uses. In the last few decades *Leucaena* has been the focus of intensive agronomic and genetic research and agroforestry interest has expanded beyond *L. leucocephala* to include all the other species in the genus. Three major germplasm collections have been assembled, crossability and interspecific hybridization have been investigated and research undertaken on all aspects of its production, management and use. Given the widespread use and importance of the genus and the advanced research in other areas, it is anomalous that no recent taxonomic revision exists for *Leucaena* and the systematics of the genus remains very confused. As agronomic research progresses, wide use of unpublished and doubtful names is creating intractable problems and considerable taxonomic confusion; a new taxonomic revision and thorough understanding of the systematics of *Leucaena* is an urgent priority.

Over the last five years field work to explore and collect seed and botanical material of *Leucaena* has been undertaken in collaboration with MEXU, EAP and other organisations in Mexico and Central America. With a field base at the National Forestry School at Siguatepeque, Honduras, and access to reliable transport, it has been possible to explore and collect all known taxa throughout the range of the genus from Texas, USA south to Ecuador in South America.

Many parts of Central America are still under-collected and several new taxa have been found in Honduras and Guatemala. Other taxa, such as *L. salvadorensis*, known until recently only from the type material, have been investigated and their status clarified. For species with complex patterns of morphological variation, more intensive population sampling has been undertaken for morphometric and molecular investigation. This is in progress at Oxford and in collaboration with the Universities of St Andrews and Cambridge. The botanical database, BRAHMS, has been used to assemble information on the 2,500 *Leucaena* herbarium specimens examined in the course of this study and to produce distribution maps for *Leucaena* taxa for the first time.

In contrast to the primary interest in livestock fodder and green manure by *Leucaena* growers outside Mexico and Central America, indigenous interest in *Leucaena* species has been mainly as a minor food plant and a source of house construction poles. Local residents throughout Mexico and Central America recognize, use, protect and cultivate virtually all species in the genus in different areas. Pods and unripe seeds of at least 13 taxa are harvested and

marketed for human consumption in Mexico today. Archaeological evidence shows that two species, *L. leucocephala* and *L. esculenta* have been used as food plants for at least the last two thousand years by pre-Colombian Mixtec and Zapotec peoples in south-central Mexico and have been widely transported and cultivated within Mexico. Just how extensive historically and geographically and important human interference may have been in shaping the genus is only now becoming clear. Incipient domestication has not only affected patterns of genetic variation within species, but has altered species distributions, bringing previously isolated species into artificial sympatry creating opportunities for hybridization. Spontaneous hybrids have been identified and characterized from *Leucaena* "orchards" in central Mexico. Human interference may have been instrumental in the origin of some of the known polyploids and may even account for origin of *L. leucocephala* itself. The effects of human interference, natural hybridization and the origin of the polyploids in *Leucaena* is under further investigation at Oxford and St Andrews.

The opportunity to spend long periods on field work in Mexico and Central America and the close association between research on systematics and assembly of seed collections, allows this sort of study to go beyond the limits of routine herbarium taxonomic revisions. All taxa can be seen and collected in the field; intraspecific variation and morphological complexes can be investigated by range-wide population sampling for morphometric and molecular studies; detailed ecological, ethnobotanical and phytogeographical information can be gathered; complete seed collections and other associated material can be assembled offering golden opportunities for molecular systematics. In addition to the compilation of a taxonomic revision, a complete picture of the evolution and the potential use of the genetic resources of *Leucaena* is providing the necessary understanding for wise use of *Leucaena* species throughout the tropics.

*Colin Hughes*

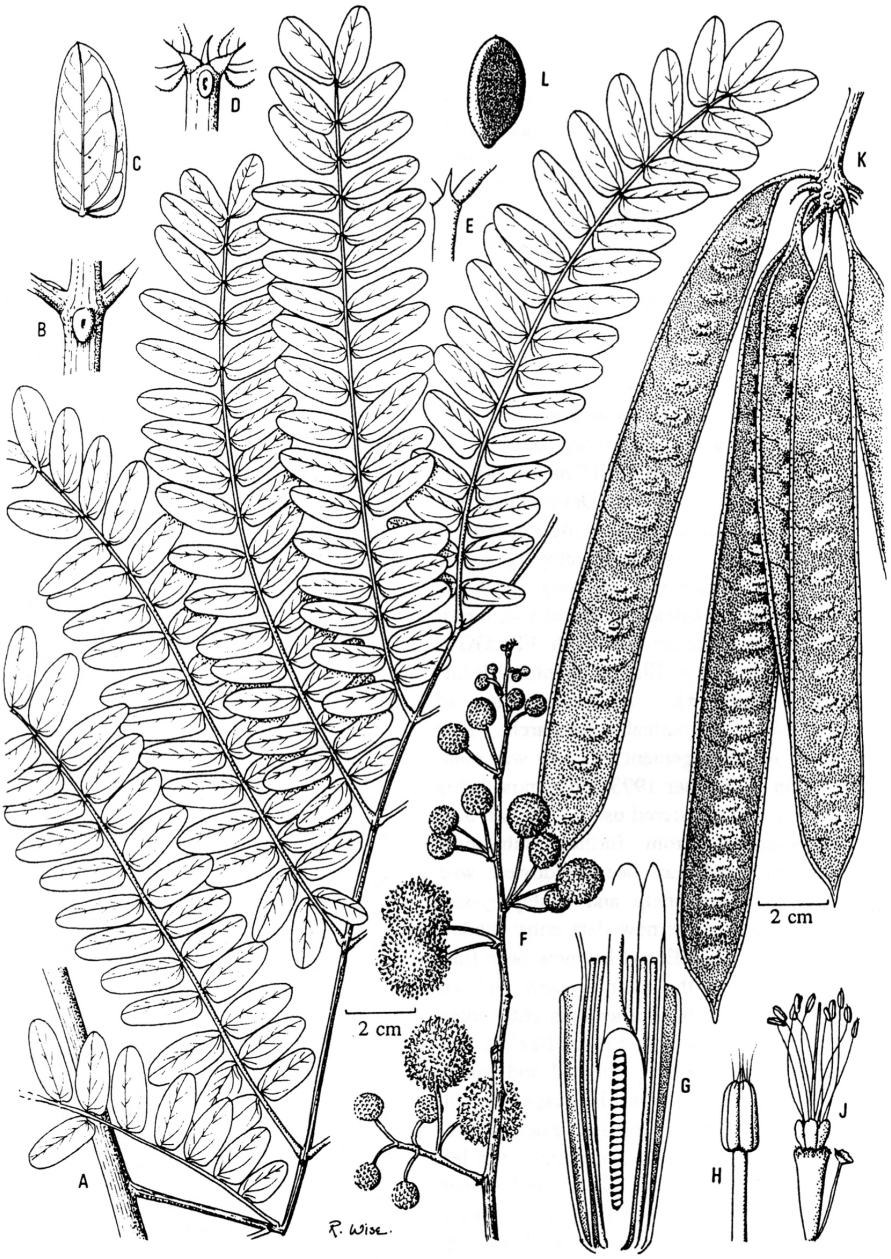



Figure 1. *Leucaena shannoii* subsp. *magnifica*. One of the taxa described form Central America as a new subspecies named in reference to its magnificent stature and tree form, in 1991. This economically important taxon is endemic to the Guatemalan Department of Chiquimula and now reduced to around 400 known individuals. Drawings by Rosemary Wise.

# Yet Another Assault on *Clerodendrum* Taxonomy

*Clerodendrum* (Verbenaceae; Viticoideae) which is a pan-tropical/subtropical genus, is predominantly distributed in Africa, Asia and Pacific Oceania, with somewhat fewer representatives in the New World. The genus, comprising 400-500 specific and subspecific taxa, displays a high degree of morphological variation. Attempts to delimit and subdivide the genus remain unsatisfactory. Several schemes (*e.g.*, Schauer 1847, Briquet 1897 and Lam 1919) use inflorescence structure to define subgroups, while Thomas (1938) recognises calyx structure as the important character for subdividing the genus. Moldenke (1985) combines the classifications of Thomas and Briquet, leading to a classification which is somewhat ambiguous, due to distinct incompatibilities of the two classifications upon which it is based. *Clerodendrum* may contain up to six subgenera distinguished on the basis of floral structure (*e.g.* Thomas 1938). Most classifications distinguish two large, species-rich groups, and up to four other smaller groups, depending on the author. The two larger groups, *Clerodendrum* (or "*Euclerodendrum*") and *Cyclonema* have been ranked at sectional (Briquet 1897), subgeneric (Thomas 1938) and at generic (Schauer 1847) levels. Along with *Cyclonema*, the ranking of Thomas' other subgenera, *Kalaharia* (raised to generic level by Moldenke), *Tridens*, *Cornacchinia* and *Volkameria* requires careful revision. In the *Flora of Tropical East Africa* (1992) Verdcourt proposes another treatment of the genus, involving significant changes to the taxonomic ranking of the six main taxa (*i.e.* Thomas' six subgenera) within the genus. In a recent review of Lamiales (Cantino *et al.* 1993) *Cyclonema* was raised to generic level and both *Clerodendrum* and *Cyclonema* were transferred from Verbenaceae to Labiatae (subfam. Teucrioideae). Verdcourt (and Thomas) deal only with the African species of *Clerodendrum*. A large number of Asian (Lam 1919) and American species, constituting a distinct set of taxa in most classifications of *Clerodendrum*, have not been studied in as much detail as the African taxa, and remain poorly understood.

The classifications discussed above use floral and vegetative morphology and employ *a priori* character weighting. Attempts have been made at applying phenetic and cladistic approaches to the problem. Stenzel *et al.* (1988) constructed a phenogram for 129 species of *Clerodendrum*, using 52 morphological characters (18 quantitative and 34 qualitative). The resulting classification recognizes *Cyclonema*, *Kalaharia* and *Konocalyx* (subgen. *Clerodendrum*) *sensu* Thomas, as a group and subgen. *Clerodendrum*, the monotypic subgenera *Volkameria* (*C. aculeatum*) and *Cornacchinia* (*C. acerbianum*) as another group. The recognition of these two groups is supported by limited evidence, from 31 species of *Clerodendrum* of iridoid distribution. Representatives of the *Cyclonema* and *Euclerodendrum* groupings contained C10 and C9 iridoid glycosides respectively. *Clerodendrum* has been less comprehensively treated in a cladistic analysis of the Labiatae by Cantino (1992). Cantino's characters include traditional morphological features and one chemical character. His resulting strict consensus cladogram indicates that *Clerodendrum* may be paraphyletic or polyphyletic. The cladogram is largely unresolved in places, but suggests that reproductive structures (flowers and fruits) of *Cyclonema* distinguish this group from all other taxa within *Clerodendrum*.

No consensus has yet emerged about the classification of *Clerodendrum* and *Cyclonema*. It is for this reason that a molecular approach is being adopted to investigate the problem with a new set of data. The study aims to use chloroplast DNA (cpDNA) variation to identify monophyletic groups within *Clerodendrum* and associated genera. Last year a small pilot study was conducted to assess the amount of variation in cpDNA at different taxonomic levels. DNAs from five species of *Clerodendrum*, two accessions of *Cyclonema myricoides*, *Teucrium flavum* and *Faradaya splendida* were analyzed using restriction digestion and Southern hybridization analysis. The digested DNAs were probed with three chloroplast probes from barley (pHvcP4, pHvcP5 and pHvcP6) and one from *Pisum* (pPB87) which includes the *rbcL* (the large subunit of ribulose bisphosphate carboxylase) and an ATPase gene. Different enzyme probe combinations revealed different levels of polymorphism. The probe pPB87 provided evidence of a distinct taxonomic disjunction between *Cyclonema* and *Euclerodendrum*. Restriction fragment length polymorphisms (RFLPs) as well as quantitative polymorphisms were detected at the species level. There is evidence that cpDNA may be conserved within a species (*viz. C. myricoides*), although further investigation is required to confirm this.


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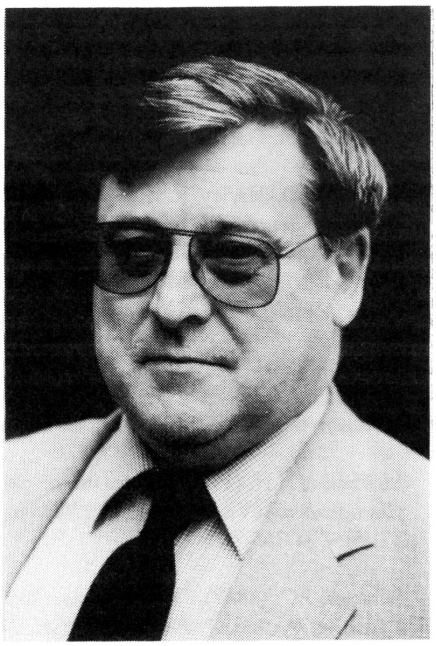
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*Dot Steane*

# Brian Thomas Styles



Brian Styles who worked in the Department for 33 years died in Oxford on 27 June 1993. At a time of unprecedented concern and debate about the importance and future of tropical forests, the loss of such a valued and experienced tropical botanist as Brian Styles will be acutely felt. By studying the taxonomy of some of the most important and widely used tropical trees - the Mahogany family, the pines of Mexico and Central America and tree legumes - Brian contributed directly to the wiser use and conservation of tropical forests.

Neither Brian's childhood in Gloucestershire, where he was born in 1934 and attended the local grammar school in Northleach, nor his student years at Oxford where he read botany at Wadham College and successfully submitted a doctoral thesis on the taxonomy of the British Knotgrasses (*Polygonum*), indicated a career in tropical forest botany. However, even in 1959, the British flora was already well described, offering limited scope for taxonomists. Brian was offered a research assistantship at Oxford to work on the preparation of botanical monographs of commercially important tropical forest species with funding from the then Colonial Development and Welfare Office. What was envisaged as a three year project was extended repeatedly and Brian stayed in Oxford for the next 33 years, becoming a senior research officer at what was then the Commonwealth Forestry Institute (now the Oxford Forestry Institute), funded by the Overseas Development Administration (and its predecessors).

Brian worked initially on the Mahoganies (*Meliaceae*) in Africa, later extending this work to Neotropical species, producing definitive monographs for the family in Africa with F. White and the New World with T.D. Pennington, and contributions to floras of Tropical East Africa, southern Africa, Flora Zambesiaca, Mozambique, Uganda and Ethiopia. Work on the Meliaceae continued throughout his career, but it was the pines of Mexico and Central America that became his main interest from 1970. Brian started his work on pines with the little-known taxa in Central America, publishing a series of scientific papers on these species, progressing the focus of his studies north to Mexico where the genus is at its most diverse, He became the leading world authority on the group and at the time of his death was nearing the completion of a definitive monograph of the pines for the Flora Neotropica Series.

Many taxonomists become progressively more productive with age; Brian's sudden and premature death at the age of 58 cheated him and us of that time and his *magnum opus*. It will be a tragic loss to taxonomy and forestry if this great work is not published. Plans have now been made for the monograph to be completed. Brian's scientific contribution and published work went far beyond the bounds of strict taxonomy to include cytology, flowering biology, ecology, conservation, weediness and plant uses. Brian was also active in the International Commission for the Nomenclature of Cultivated Plants, the Systematics Association (organising their symposium on Infraspecific Classification of Wild and Cultivated Plants in 1986) and in IUFRO, as chairman of Working Party S2.02.01 (Dendrology). In all of this, he was ably assisted by his wife Cynthia, who undertook much of his secretarial work.

Although rooted in Oxford, Brian worked extensively in both Africa and Latin America. He experienced his first taste of the tropics as a young man in Uganda in 1962. In recent years he returned to Africa, with short visits to Somalia and Namibia, but it was to Mexico and Central America that Brian went almost annually from 1970 until his last trip earlier this year. His enthusiasm for field work was always "as keen as mustard" and the investigation of the 60 or so pine species in Mexico and Central America took him to all corners of the region from Baja California to Nicaragua.

Alongside his contribution to the science of taxonomy, Brian will be particularly remembered by all those who benefited from his teaching, supervision and advice. He was extremely active in teaching at the University, particularly as a supervisor of post-graduate students. Brian was an attentive supervisor, always patient, understanding, full of good advice and generous with his time, never arrogant or haughty in his response to even the most trivial enquiries. He was genuinely interested in and concerned about people, and many of his students became life-long friends. Brian accompanied many foresters from OFI on field trips to Central America or Africa, instilling good botanical practices and often inspiring strong and long lasting interests in taxonomy. Many foresters throughout the tropics benefitted from his taxonomic advice and help and Brian's one-man taxonomic advice bureau will be sorely missed by the tropical forestry community.

Brian often described himself as a "lowly botanist" and was always flattered by the widespread respect that he received. He was greatly cheered by the recent renewed interest in and funding for taxonomy, as tropical biodiversity rose up the political and scientific agenda. As tropical forestry evolves to encompass an ever broader remit, let us hope that there will be enough lowly botanists to continue Brian's work.

*Colin Hughes*

