

### III. EXPEDITIONS AND OTHER FIELDWORK

*(continued from Volume 10, page 315)*

#### Malaysia

A collecting trip to Linggiu, Johor, was made between 18 and 27 July, 1991. A total of 33 botanical scientists and staff from FRIM, the Malaysian Agricultural Research and Development Institute (MARDI), the Agricultural University of Malaysia (UPM), the University of Science Malaysia (USM), the National University of Malaysia (UKM), the Singapore Botanic Gardens (SING), and Forest Department of Sarawak (SAR) participated. Over 1000 specimens of forest trees, shrubs, and herbs were collected either as herbarium specimens, or as living collections. Collecting was done mainly in areas for the proposed reservoir and dam at Linggiu.

A field trip was made by a group of Japanese pteridologists between 29 July and 8 August, 1991. A report, entirely in Japanese, appeared in the J. Nippon Fernist Club 2 (1992) 1818–1823, with illustrations. Apparently the western part was visited, starting in Singapore and ending in Penang. A list of species seen (collected?) in Kuala Lumpur, Fraser's Hill, and the Cameron Highlands is given.

#### Sumatra

A team of three Japanese and two Indonesian biologists – Mr. H. MORIYA (Kagawa University), M. MUSUDA (Tsukuba University), T. TOMA (Ehime University), SUHARDJONO (BO), and A.J. ARIEF (Museum Zoologicum Bogor) – spent 3 weeks (13 December,

1990 – 6 January, 1991) in Kuala Enok, Batang Tumu, Selat Panjang, and Sungai Guntung (Riau Prov.) to study the biological processes and regulatory mechanisms of the mangrove ecosystem. The expedition brought back several voucher specimens.

For a period of 2 months, starting on 25 January, 1991, Dr. E.A. WIDJAJA and Ms. F.I. WINDADRI (BO) did a bamboo germplasm collection in all provinces, except Aceh. Some 150 living collections, 2700 herbarium specimens of mostly bamboos and some orchids and gingers as well as 185 numbers of mosses and lichens were brought back to BO.

A survey in North Sumatra has been done by Dr. R.E. NASUTION between 4 and 17 July, 1991, to gather data and material of endangered plants of the area. A similar survey was conducted in West Sumatra (Batang Palupuh, Gunung Sago, Lembah Anai) by Dr. IRAWATI, Ms. HERTINA, Messrs. M. AMIR and E. RACHMAN (BO) between 17 and 30 July, 1991.

A team of 30 botanists and zoologists from Puslitbang Biologi Indonesia did an inventory on the potential value of biological resources found in Bencoolen between 17 May and 17 August, 1991. A 100 species of living orchids, 34 of living fruit trees, and 30 of living rattans were collected and planted to enrich the collections of the newly established Bundayati Bengkulu (Bencoolen Provincial Biological Resources Garden).

In August 1991 Drs. E.A. WIDJAJA and H. SOEDJITO (BO) assisted the development project of the local government of Bencoolen by planning the establishment of bamboo-based agroforestry in the area. Six species of wild bamboo were selected, collected, and planted for further propagation in Muara Aman.

Bamboo exploration in Bencoolen was executed by Dr. E.A. WIDJAJA (BO) from 22 December, 1991, to 9 January, 1992, assisted by Ms. A.P. YANI, a junior lecturer of the University of Bencoolen. A total of 484 bamboo herbarium specimens representing 18 species and 183 living bamboos were collected. The latter were planted in the nursery of the Bundayati Bengkulu.

From October, 1991, to January, 1992. Messrs. U.W. MAHYAR, A. RUSKANDI, and SAEFUDIN (BO) undertook orchid and fruit tree exploration and other biological resources studies in Bencoolen. A total of 342 living orchids, 50 herbarium specimens and 10 spirit collections of orchids and one *Calamus ciliaris* were collected. The living specimens were planted in Bundayati Bengkulu.

An ethnobotanical study of the Kubu in Seberida (Riau) has been made by Ms. F. SYARIEF (BO) between 12 and 16 November, 1991.

## Java

Ms. N.W. UTAMI and Mr. T. UJI (BO) collected rare plants in Merubetiri and Purwodadi (East Java) and Rembang (Central Java). They managed to collect *Musa acuminata* var. *nakaii* and var. *rutilipes*, *Rafflesia zollingeriana*, *Limnocitrus littoralis*, *Caesalpinia bundoc*, *Plectocomia longistigma*, and *Gigantochloa manggong*.

**Borneo (s.l.)***Kalimantan*

Dr. J.S. BURLEY (A) accompanied by Mr. T. PARTOMIHARDJO (BO) visited the Bukit Baka Nature Reserve between 4 and 9 February, 1991, to collect bulk samples of medicinal plants for further analysis in the U.S.A.

Messrs. I. MARYANTO, H. MURNI, R. POLOKASAN, PURWANINGSIH, A. SUGIHARTO, M. SIREGAR, A.C.H. WIDJAJA, and R. YUSUF (BO) were in the watershed area of Central Mahakam (Kecamatan Kota Bangun, Kalimantan Timur, and surrounding areas) between 20 May and 18 June, 1991, to undertake an ecological survey of the effect of river water levels.

Messrs. R. POLOKASAN and M. SIREGAR (BO) spent the months of October to December, 1991, in the Kutai District to undertake a vegetation ground survey in relation to mapping prepared by the National Mapping Agency (Bakosurtanal).

*Brunei*

Mr. D.A. SIMPSON (K) collected between October and November, 1991, in the following places: 15/10: Belait Distr., along Sungai Belait from Sungai Mau (2000–2023); 16–19/10: Belait Distr., Bukit Teraja, rest house to summit, summit, and back (2024–2167); 22/10: Tutong Distr., Bukit Basong and Pasir Puteh (2168–2192); 23–29/10: Temburong Distr., Bukit Gelagas: vicinity of landing pad; ridge to sub-summit; summit ridge; ridge W of landing pad to small river; along Sungai Arur; valley N of landing pad, over ridge, down side valley; vicinity of camp site (2193–2510); 31/10: Tutong Distr., various localities, rice fields (2511–2514); 3–5/11: Tutong Distr., Sungai Medit, Medit swamp, dipterocarp forest behind swamp; upstream from camp; downstream and to Sungai Tutong (2515–2635).

Brunei Forestry Department/Royal Botanic Gardens, Kew Project: a report on the field period, 5 March to 2 April, 1991 [see also FMB 10/4 (1991) 315]. — During March, 1991, general collecting of vascular plants was undertaken by Mr. R.J. JOHNS and Mr. M.J.S. SANDS (K) in 24 localities within Brunei Darussalam. A total of 1,163 collections were made, with up to 5(–8) duplicates per number. Collections were separately numbered in the collector's private series: Johns 6500–7126 and Sands 5201–5738. JOHNS, reflecting his specialist interests, collected 481 Pteridophytes, of which several were new records for Brunei. Among others, he found 91 *Hymenophyllaceae*, 37 *Selaginellaceae*, and 32 *Aspleniums*. He also obtained 58 monocots, including 9 *Mapanias* and 8 *Araceae*, and 79 dicots. SANDS collected 51 Pteridophytes and 87 monocots, including 28 orchids, 13 gingers, and 10 palms; 394 collections were of dicots, including 79 *Rubiaceae*, 40 *Begonias*, more than 20 *Cyrtandras*, and 8 *Elatostemas*.

Before 1959 only 3 species of *Begonia* were known from Brunei Darussalam represented by just 4 specimens, but by February 1991, based on material collected more recently, SANDS had tentatively recognized 7. The 40 collections made during the March 1991 period increased the total number to a possible 15, all but one of them believed to be new species!

Localities and collections: 7/3: Area of white sands (Pasir Puteh), Tutong/Telisai (Johns 6500–6509-A, Sands 5201–5214); 8–15/3: G. Retak, Temburong/Amo, ridge between helicopter pad and sub-summit (1300–1450 m), and Temburong headwaters (750–1150 m) (Johns 6509-B–6769, Sands 5215–5408); 17/3: Pasir Puteh, Tutong/Telisai

(Johns 6770–6796, Sands 5409–5433); Bandar Ridge near Subok Road to E. of Bandar Seri Begawan (BSB), Brunei Muara/Kota Batu (Johns 6797, 6798); 18/3: Mandaram Valley to E. of Labi Road, and near waterfall, Belait/Labi (Johns 6799–6827, Sands 5434–5454); 19–20/3: Summit ridge of Bt. Teraja and valley to the North; near Labi Road, Belait/Labi (Johns 7035–7046, Sands 5621–5639); 22–25/3: Catchment of Sibut River headwaters W. of the UBD/RGS Station, Kuala Belalong, Bt. Belalong, Temburong and upper Belalong Rivers, Temburong/Amo (Johns 6903–7034, Sands 5507–5620); 25/3: Hill behind Bangar Government Rest House, Temburong/Bangar (Johns 7035–7046, Sands 5621–5639); 26/3: Peradayan FR, Temburong/Labu (Johns 7047–7064, Sands 5409–5433); Tasek Lemar, E. of BSB, Brunei-Muara/Bandar Seri Begawan: Johns 7065–7073 (Sands 5653–5665, 5738); 27/3: Sungei Mentiri and Pool, Brunei-Muara/Mentiri (Johns 7074–7080, Sands 5666–5672); Terjun Menyusop, Brunei-Muara/Kilanas (Sands 5673–5682); 28/3: Teraja Waterfall, Belait/Labi (Sands 5683–5699); Swamp forest near Tutong, Tutong/Pekan Tutong (Johns 7081–7085); 30/3: Ladan Hills FR, Tutong/Lamunin (Johns 7086–7121, Sands 5700–5735); Near Highway between Seria and Kuala Belait, Belait/Seria (Sands 5736, 5737).

Excellent support and cooperation within Brunei ensured that the visit was a success and special thanks are extended to the Director of Forestry, Dr. MORN BIN OTHMAN, the Deputy Director, Dr. HAJI HAFNEH BIN MOHD SALLEH, and the staff of the Forestry Department, particularly the herbarium staff who accompanied JOHNS and SANDS in the field. Also deserving grateful acknowledgment for their generous support are No. 1 Squadron of the Royal Brunei Airforce, Professor DAVID EDWARDS of the University of Brunei Darussalam (UBD) and his staff, and CATRIONA PREBBLE and the staff of the UBD/Royal Geographic Society Research Project Field Station at Kuala Belalong, Temburong. — M.J.S. SANDS.

Drs. J. DRANSFIELD, S. DRANSFIELD, G. T. PRANCE, and B. ROGERS (photographer) undertook field work in the period 8 February to 14 March, 1992. The latter two between 17 and 29 February. The aim was general collecting within the catchment of the Sungei Belalong and elsewhere in the sultanate as part of the Kew/Brunei Forest Department Collaborative Project. Brief surveys of the places visited are given here.

J. DRANSFIELD: 11/2. Bukit Teraja (7015–7030); 12–15/2: Kuala Belalong (7031–7093); 18/2: Wasai Kandal, Kelinas (7094–7106); 20–26/2: Bukit Belalong (7107–7231); 1/3: Layong-Gadong Pipeline (7232–7235); 2/3: Andalau FR, Compartment 19 (7236–7253); 3/3: Jalan Melayan, Labi (7254–7281); 4/3: Badas peat swamp (7282–7285); 10/3: Labi (7286–7294); Wasai Rempayoh, Labi (7295–7326).

S. DRANSFIELD: 13–15/2: Kuala Belalong (1200–1206); 20–25/2: Bukit Belalong (1207–1271); 10/3: Labi to Teraja (1272–1276); 12/3: Wasai Rempayoh, Labi (1277–1285).

G. T. PRANCE: 20–26/2: Bukit Belalong (30534–30624, 30684–30714).

### *Sabah*

In 1991 plant collecting expeditions were held at the following places:

Binsulok FR (Membakut Distr.)	15 – 30 January
Mandahan FR (Papar)	19 – 27 February
Mill 75, Beaufort Rd (Beaufort)	9 – 17 March
Pulau Tiga (Kuala Penyu)	14 – 24 May
Meligan Virgin Jungle Reserve (Sipitang)	8 – 20 July

Siunggau FR (Beaufort)	18 – 25 July
Telupid area (Telupid)	1 – 15 August
The Tungku, Silam, Taliwas (Lahad Datu), Bukit Gemok (Tawau) areas	5 – 11 August
Kuala Mengelong FR (Sipitang)	21 – 28 August
Lumaku FR & Ulu Kalang (Tenom)	9 – 23 September
Sepilok FR (Sandakan)	4 – 9 October
Kudat (Kudat), Ranau (Ranau)	7 – 21 October
Kepayan FR (Kuala Penyu)	16 – 22 October
Sayap (Kota Belud), Mandamai FR, Paitan FR (Pitas)	17 – 31 October

Dr. D.E. JONES (KLU) collected *Rutaceae* in the Garinono FR (Sandakan) between 23–28 October, 1991.

### Celebes

Ms. WIRDATETI (BO) collected medicinal plants in the Dumoga Bone National Park between 2 and 28 August, 1991, together with pharmacologists from the Hortus Medicus Tawangmanguensis.

In August, 1991, the bryologist, Dr. A. EDDY, the pteridologist, Ms. J. CAMUS (both from BM), and the ethnobotanist, W. MILLIKEN (then at E, now in K) joined the Indonesian 'Ekspedisi Linnaeus Sulawesi I' in the Dumoga Bone National Park. They stayed at the eastern end of the Park for a month, after which CAMUS and MILLIKEN made an expedition lasting one and a half month to the summit of G. Sinombayuga, the highest peak. MILLIKEN collected about 300 numbers, with up to 4 duplicates, mainly of trees found between 100–2000 m alt. The first set is in BO, the second in E. Others will go to L, K, and to specialists.

Between 20 February and 31 March, 1992, Ms. RUGAYAH and Dr. E.A. WIDJAJA (BO) visited many areas in Kalimantan, N. Celebes, and N. Moluccas in the scope of bamboo germplasm research. They collected 500 bamboo herbarium specimens representing 26 species, 100 living bamboos and 998 herbarium specimens of other plants.

### Philippines

Mr. N.B. GAPAS, Researcher I, has joined a survey and collecting trip sponsored by the National Committee on Marine Sciences under UNESCO, to the island of Pagasa, Kalayaan group of Islands, Western Palawan on two occasions: May 1988 and April 1989. Only the native species were collected and 35 species of 21 families have so far been listed. A more comprehensive report will be published soon by the Committee. Vouchers are in PNH.

The Philippine Plant Inventory (PPI) collecting teams have been very active and, as of January 1992, have completed their first year of field collecting with a total of 3829 numbers (approximately more than 37,000 duplicates) obtained from various localities throughout the archipelago. Trips to the following islands were made in 1991 since PPI's official commencement with the expedition to Palawan: Batanes, Butuan (Agusan Del Sur), Catanduanes, Dinagat, Luzon (Camarines, Albay, and Palanan provinces, Bicol National Park

and Mts Mayon and Isarog, Sierra Madre), Mindanao (Mts Apo and Kitanglad, Agusan province), Mindoro (Mt Halcon), Negros (Cuernos de Negros Mts), and Polillo.

As for 1992, all three field teams completed trips in January/February, the areas visited being Bataan and Zambales (E. REYNOSO & Team A), Samar (E. BARBON & Team B) and Panay (Mt Madia'as), (F.J. GAERLAN & Team C). These trips yielded just under 1000 numbers, about 7,600 duplicates, and further photographic documentation. Flowering had only sparsely commenced, though in Samar there was a good deal of fruiting. The second round of expeditions was undertaken in March with two localities in Mindanao (Zamboanga and Mt Matutum) scheduled for collection, and Mt Canlaon in Negros. These trips also proved quite successful, with similar numbers of collections.

Similarly with the successful Palawan expedition, the trip to Mindoro yielded a satisfactory collection of 439 numbers. On the Mt Halcon Range a coniferous forest at 1500–1600 m altitude remains largely intact (only trails used by local Mangyan people were signs of human intervention). At this altitude, the team gained the perfect view of the flanks of Mt Halcon itself and obtained collections and photographs on a beautifully clear day, which also provided such interesting collections as *Gentiana luzoniensis* and *Viola* species. Some other notable specimens were *Arthrophyllum*, *Atalantia*, *Daphniphyllum*, *Discocalyx*, a considerable array of *Ficus* species, *Freycinetia*, *Osmoxylon*, *Rapanea*, *Rhododendron* species, and several unknown or uncertain taxa. Lake Naujan was also visited but it was found to be almost entirely surrounded by coconut plantations. San Teodoro has a few remnant of forest left but is rapidly being denuded.

The trips to Batanes and to Mt Apo in Mindanao afforded far fewer collections. The shortage of numbers collected in Batanes is because of the very degraded vegetation and originally rather poor flora. For the Mindanao collection, the security situation limited the access area, and the less than perfect season provided little fertile material. During a recent trip to the summit of Mt Apo, however, a field team made collections mostly from *Ericaceae*, including eight endemic species of *Rhododendron*, such as *R. apoanum*, *R. javanicum*, and *R. mindanaense* (all collected in flower).

Several important new collections of *Pandanaceae* have been made. A new collection of *Saranga philippinensis* Merr., an important endemic species and one of the two in the genus, was collected in Dinagat in fruit. A *Pandanus* from Bicol, Camarines, appears to be undescribed or, possibly, the second known collection of an earlier poorly known species. Another *Pandanus* from Palanan (Isabel) is also undescribed.

A site assessment in the Bicol National Park revealed that of the original area set aside, probably less than 20% is still intact forest (this is the northeastern quarter). Within the area remaining, there is still some good dipterocarp forest. Several collections from the area include *Artocarpus* sp., *Euphorbiaceae*, *Pandanus copelandii* (staminate), and *P. esculentus*.

Special trips were made to Mt Pulog, Mt Apo, and Mt Matalingahan (Palawan) with visitor Dr. G. ARGENT; April–May saw further trips including an expedition to Sibuyan.

Dr. V. AMOROSO (Central Mindanao University) and Dr. R.M. DEL ROSARIO (PNH) headed a team of biology majors from the said University during a botanical exploration and collecting trip (26–29 February, 1992) at Mt Katanglad, Bukidnon, in the northern part of Mindanao. Mt Katanglad, an extinct volcano (2379 m) dominates the center of the Bukidnon Plateau. Among the most notable and interesting plants found in the higher portion were *Dawsonia* and *Tmesipteris*.

Dr. G. ARGENT (E) conducted some fieldwork at Mt Apo (Mindanao), Mt Matalingahan (Palawan), and Mt Pulang (Luzon), from February to March 1992, especially examining *Rhododendron*. He worked together with PPI field collectors, assembling 202 numbers. Dr. MADULID and PPI Team leader F.J.M. GAERLAN accompanied Dr. ARGENT to Mt Apo, reaching the summit between March 13–20. Among other collections made the notable *Ericaceae* included *Rhododendron apoanum*, *R. javanicum*, and *R. mindanaense*. From Mt Pulog, *R. taxifolium* was obtained.

Dr. D. SOEJARTO of U.S. National Cancer Institute (NCI) visited the PNH to assist the NCI voucher specimens and briefly surveyed the permanent plot in Palawan. A reconnaissance was also conducted in Samar and collections were done in Batangas in February and March 1992.

### New Guinea (s.l.)

#### Irian Jaya

Ms. J.J. AFRIASTINI and Dr. E.A. WIDJAJA (BO) spent 3 months from 26 May, 1991, in Danau Anggi and Wasior of the Manokwari District to collect medicinal plants to be screened for their anti-cancer and anti-aids properties in cooperation with and sponsored by the United States National Cancer Institute (NCI), the University of Illinois, and the Harvard Herbarium (A). Two junior staff members of the local University Cendrawasih joined in this field work.

On 12–22 June, 1991, Dr. IRAWATI (BO) was in Biak, Jayapura, and Wamena to collect orchids. She managed to bring back 80 specimens of living plants as well as 4 other local ornamentals to enrich the holdings of the Bogor Botanical Garden.

Messrs. SUHARDJONO, WARDAYA, and Dr. H. WIRIADINATA (BO) undertook a general plant exploration in the Jayawijaya mountain area between 14 January and 12 February, 1992. They brought back 269 living collections, 27 numbers of seed samples, and 408 herbarium specimens.

#### Papua New Guinea

Mr. O. GIDEON (LAE) and Dr. M.H.P. JEBB (Christensen Research Institute) spent a few days in 1991 at Finschhafen collecting *Tapeinochilus* and *Barringtonia*, respectively. A new species of the latter, a 15 m tall, monopodial tree with 2 m long leaves was found 50 m from the airstrip!

Dr. D.G. FRODIN (Philadelphia, U.S.A.) and G. MORREN (Dept. Human Ecology, Rutgers University) have started fieldwork in the Telefomin District to assess patterns associated with natural and human impacts on a comparative basis and to test the use of a geographical positioning device. Besides, botanical collections are made, whenever possible also provided with vernacular names. Collecting has started South of Vanimo, and further collecting is intended to be done in the Mianmin valleys, between the Donner and Thurnwald Ranges, and at Fiak and Hotmin in the upper May River valley, just inside the E. Sepik Province.

## Solomon Islands

The number of overseas researchers coming into the country is increasing. These included undergraduate and postgraduate students and others from Australia, Germany, Japan, New Zealand, Great Britain, and the United States. Just to mention a few:

Ms. B.A. LEWIS (K) carried out an expedition in the Western Province on Rendova and Kolombangara Islands between September and November 1991 to study the *Orchidaceae* and to deliver the newly published book 'Orchids of the Solomon Islands and Bougainville' by B.A. LEWIS and P.J. CRIBB (K). She was a Fellow of the Winston Churchill Memorial Trust and her collections have been deposited at BSIP and K.

Mr. R.M. CASSELLS (MPN) made an evaluation of subsistence use of tropical rain forest on the island of Choiseul for his Master's thesis in Development Studies. He collected 50 specimens with uses and names in Vasiqasiqa between June and August 1991. Duplicates are at BSIP.