

XII. THE PALAWAN BOTANICAL EXPEDITION 1984

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Palawan, the most forested and least botanically known island in the Philippines was explored by an international expedition from March 1 to May 31, 1984. The sponsors were the Swedish Match Hilleshög Philippines Inc. and the Ministry of Natural Resources of the Philippines.

Palawan separates the South China and Sulu Seas and forms a land bridge between Sabah and Mindoro in the Philippines. It is ca. 440 by 4.5—42 km, laying approximately between 8° and 12° North. There is a mountainous backbone, broken in two places, throughout its length with the three highest peaks at 2085 m (Mt. Mantalingajan), 1798 m (Mt. Victoria) and 1593 m (Cleopatra's Needle).

Geological information is varied with the northern third being poorly known. This has been formed from a microcontinental block of the South China Basin which moved to its present position from being adjacent to the China mainland in the Paleogene (B. Taylor, On the tectonic evolution of marginal basins in northern Melanesia and the South China sea, 1982, Ph. D. thesis, Columbia Univ.).

The central and southern parts have been subjected to more detailed investigations due to the presence of large areas of ultrabasic rocks.

Extensive karst limestone formations occur in the South near Quezon, in the centre at Mount St. Paul's and in the North on the islands of Bacuit Bay. Small outcrops occur elsewhere. Lake Manguao, the island's only lake, overlies limestone, but is bounded to the South by an old lava flow.

Fast-flowing streams typify the waterways of the island's mountainous central ridge. On reaching the coastal plains, where these exist, most rivers meander and develop wide estuaries with extensive mangrove/*Nypa* palm communities.

As would be expected from an island spanning four degrees of latitude a distinct climate change occurs from North to South. Factual data are very fragmentary, but it appears that seasonality increases with increasing latitude. The dry season lasts from about January to April, with a mean monthly value of 14 mm at Puerto Princesa for February. May to December is the wet season with July and October / November as the wettest months. The West coast is wetter than the Eastern one. An average annual rainfall of 1526 mm has been recorded for Puerto Princesa and values 2—3 times greater than this can be expected in the mountains. Local topography is likely to strongly influence local rainfall patterns.

There is very little annual variation in air temperature with the average monthly mean day temperature varying from 26.6—27.8° C. The daily maximum and minimum temperatures range 4° C on either side of the mean.

The expedition was led by Dr. A.C. PODZORSKI (Hilleshög Forestry AB), with Dr. C.E. RIDSDALE (L) and Ms. M.S. KADOLSKY (Hannover University, B.R.D.). Dr. D.A. MADULLID (PNH) joined for three weeks in March and Mr. E. REYNOÑO (PNH) for two weeks in May. Dr. J. DRANSFIELD (K) was present for all of May. Very good tree climbers were found.

A preliminary aerial survey of Palawan from Thumb Peak northward together with new ground information modified our itinerary as follows: Puerto Princesa (March 3 — 8), Irawan R. valley, Mt. Beaufort (9 — 31), Lake Manguao area

(April 3 — 12), Langen Island (13 — 18), Pagdanan Range (19 — 25), St. Paul's Underground River National Park, Mt. Bloomfield (May 2 — 10), Km 28 North of P. Princesa (11 — 12), Mt. Beaufort (15), Mt. Victoria (16 — 20), Brooke's Point and Barrio Pulot (21), Quezon (22 — 23), Irawan R. valley (26 — 27).

1920 numbers, each with 10 duplicates were collected from the primary rain-forest during the trip. Trees, lianas, palms, rattans and some epiphytes are represented in the collections. 861 bark plus sapwood samples were included with most of the tree and liana specimens. 18 marine and freshwater diatom samples representing over 250 taxa. 289 living plants were flown over to the botanical gardens of K and L, 245 arriving alive.

An estimated 15% of all collections are newly reported for either Palawan or the Philippines and new species in Heritiera, Heterospathe, Knema, Madhuca, Planchonella have been recorded so far. The many new palm records will be dealt with elsewhere. New to the Philippines are Chelonistele sulphurea, Elaeocarpus aff. brunescens, E. calomela, E. obtusus. The number of Syzygium has been more than doubled, Bulbophyllum-taxa over trebled and many new collections were made of Ficus and Myristicaceae.

AREA REPORTS

Irawan Valley and the surrounding mountains

A base camp was established at c. 100 m alt. on the Southwestern fork of the Irawan River. Many forest types were found in this area, gravel beds in the river beds stabilized by Erythroxylon. sp. and a Homonioia riparia. Small patches of relict deciduous forest were found c. 2 km from Barrio Irawan. Common trees were Hymenodictyon, Pterocarpus sp., Pterocymbium tinctorium, Pterospermum indicus and Sterculia cf. comosa. The valley bottom contained well-developed riverine forest with a large, straight-boled Alstonia angustiloba, A. macrophylla, A. scholaris, Buchanania arborescens, Canarium asperum, C. hirsutum, Carallia borneensis, C. brachiata, Dracontomelum, Koordersiodendron and Sterculia comosa. The slopes to the North had a narrow zone of Dipterocarpus gracilis and Kokoona excelsa (a tree with bark that can be ignited). Downslope from this were Schizostachyum sp. thickets and upslope the ridge was pole forest with a climbing Dinochloa sp.

To the Northwest of the base camp the forest was rich in Diospyros sp. and Dipterocarpus gracilis up to about 200 m alt. To the Southwest the forest was very mixed with a large number of rattans. A Gymnostoma sp. (Casuarina) became common above 200 m alt.

An unusual climatic feature of this area was that at night the cloud layer descended to about 400 m and the valley became very cold. It is perhaps significant that Agathis cf. celebica had c. 400 m as its lower altitudinal limit. The Northwest face of Mt. Beaufort appeared to be much wetter than the Eastern face and this was reflected in a richer epiphyte flora.

An unnamed peak with an altitude of 930 m to the Northnorthwest of Mt. Beaufort was scaled. The forest there appeared to be altogether drier on the Western slopes and ridges than on the equivalent positions of Mt. Beaufort. Calamus foxworthii, Nepenthes sp., Quercus merrillii and Tristania sp. were among the species collected.

Another forest type was encountered on the ridge running between Thumb Peak

(Mt. Pulgor) and Mt. Beaufort. In character it was a low canopy, c. 5 m high, upper montane rainforest with many microphyllous trees (e.g. Calophyllum pulogen-sis, Canarium euryphyllum, Eugenia sp., Quercus merrillii, Scaevola micrantha, and Ternstroemia sp. Although there was little moss present a heavy epiphyte cover indicated generally wet conditions.

LAKE MANGUAO (DANAO) AREA

Small patches of an even-canopied forest were studied along the branchroad to the lake. Canopy height was 20—25 m. Many large trees of Intsia palembanica (first record for the Philippines) and Pterocarpus indicus were seen. The forest was unique among those visited in that the palm Orania sp. was a regular component of the canopy. This forest type extended southward for several kilometers.

At the Southeastern end of the lake a well-developed high forest was found with many trees of 1—2 m diameter and clear boles from 15 m up. One strangling Ficus was found with 4 m diameter. Exceptionally fine specimens of Intsia palembanica and Dracontomelon draco were seen in drier areas.

An area to the South of Lake Manguao, c. 6 km North of Calauag was found to be very poor in species. The forest was growing on a pumice rock with isolated soil pockets. A forest North of Embarcadero appeared to be similar to that along the access road to Lake Manua. No canopy-reaching palms were seen.

LANGEN (MALAPAKAN) ISLAND

Well-developed high forest relatively poor in species covered the central portion of this island. Many trees including large Palaquium dubardii grew directly on karst limestone blocks. There appeared to be similarities between this forest type and that near Lake Manguao. The summit of the Northwestern major karst block was scaled and a low canopy forest was encountered between the pinnacles, dominated by Sterculia sp. Pleiomele cf. multiflora and Veitchia merrillii were characteristic of the exposed pinnacles and cliff-faces. A diverse mangrove community with Aegiceras and Rhizophora apiculata could be seen in the largest bay.

PAGDANAN RANGE

Collections were made in the Dipterocarp forest in the area of Ibangley Brookside Hill and the hills inland from San Vicente. Dipterocarpus grandiflorus, D. gracilis and D. hasseltii dominated the forest ridges. Alstonia sp., Palaquium spp., Parinari aff. canaroides and several emergent Syzygium spp. were also seen. Diplectris was recorded for the first time on Palawan and is represented by D. divaricata and D. stipularis. Heavy logging was taking its toll in these areas.

ST. PAUL'S SUBTERRANEAN RIVER NATIONAL PARK

Collections were made in the areas of Cabayugan and Lion's Cave. A well-developed forest with Atuna racemosa was found in both areas and at least one palm new to Palawan was discovered. In secondary forest near the camp Camellia

megacarpa was rediscovered. Pometia pinnata was the dominant emergent. A pendant Cycas growing on the cliff-faces may represent a new species. The area between the Ranger Station and the Underground River, although it contained some exceptional sealevel and karst forest remained almost uncollected due to a change in our program.

A very distinct forest type with Archidendron cf. pauciflorum, Planchonella obovata and Terminalia sp. was discovered in the vicinity of the chromite mine on Mt. Bloomfield, comparable to the forest on ultrabasic at Mt. Victoria. Canopy height was at 3—5 m and many trees had thick, small leaves.

MT. VICTORIA

Permission was given by Trident Mines Inc. to use their old camp site at 560 m. The forest at this altitude was strongly influenced by the ultrabasic soils. At higher altitudes on an exposed ridge a forest rich in Nepenthes philippinensis was encountered. The rather bizarre forest yielded many rare and endemic (some as yet undescribed) species, such as Cinnamomum rupestre, Guettardella spp., Licania palawanensis, Swintonia foxworthyi, Timonius ferrugineus, Tristania spp. and Walsura monophylla.

BROOKE'S POINT AND QUEZON

Local officers of B.F.D. showed us well-developed high forest with distinct Bornean elements, e.g. Koompassia excelsa and Terminalia copelandii. Unfortunately there was little time to collect in these areas. There is no information on the species present. A completely different forest type exists on Mt. Mantalingajan, but once again there is little information about it. It is obvious that these unique areas on Palawan deserve a full investigation in the near future.

Palawan has been shown to be of outstanding value for conservation and expedition members are working together with Hunting Surveys Ltd., the Ministry of Natural Resources, Manila, and UNESCO to develop effective conservation plans for the island.

All the material has at the time of writing (March 1985) been pre-identified by the staff of L and Dr. Dransfield. Labels are being printed and the numbers are being sorted out for distribution to A, B, K, KEP, L, PNH, SAN. Collection lists and analyses have already been distributed to the Directors and Keepers of these institutes.

The Staff of the Swedish Match Hilleshög Philippine Inc., the Ministry of Natural Resources, Manila, and the Bureau of Forest Development, Puerto Princesa, Quezon and Taytay, gave much of their time to help us with various problems. Our greatest thanks go to the people of Palawan for their kindness and help with our quest.