

THE DIPTEROCARPS : OUR ENDANGERED NEIGHBOURS

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The day was already warm as we sought the cooling shade of the trees in the Huay Kaew Arboretum, Chiangmai, Thailand. Just inside the gate was a sign which read: "An arboretum is a place in which a collection of trees and shrubs is cultivated for recreative, scientific and education purposes. Everyone can do something. One of the abilities you almost certainly have is to plant and care for a tree. Can we do better with less?" As we wandered through the well-tended grounds, we noted with interest the many labelled specimens of tropical trees; some were shedding their leaves as it was then the dry season.

One family well represented there was that of *Dipterocarpaceae*. Three species seen were *Dipterocarpus alatus*, *Hopea odorata* and *Shorea roxburgii*.

Dipterocarpaceae is a large family of 15 genera and about 580 species and is divided into two sub-families. The first, of only two genera, occurs in Africa while the other is based in Asia (see Figure 1). Structurally different anthers and the presence of resin canals in the Asian species separate these two sub-families.

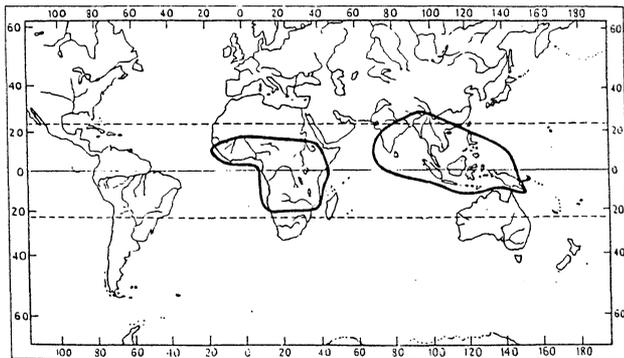


Figure 1 Range of Dipterocarpaceae, all Indo-Malayan except Monotes and Marquesia in Tropical Africa. (Hutchinson)

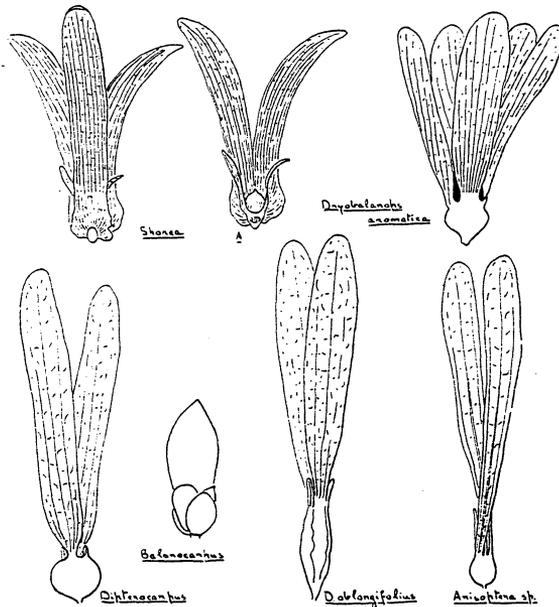
Dipterocarps are very large, seldom small, trees of lowland rain forests. Emergent species with their pale-coloured, buttressed trunks, thrust rounded heads well clear of the forest canopy. The alternate leaves are simple, entire or sinuate-crenate and have a driptip. Stipules, where present, are usually deciduous.

The flowers, borne in axillary racemes, are regular, bisexual and insect-pollinated. Whether large or small, many are scented, ranging in colour from yellow to pink or occasionally white.

A most distinctive feature of the family is the fruit which is a single-seeded acorn-like nut. This is enclosed by the calyx. Some or all of the sepals enlarge into wings giving the whole the appearance of a shuttlecock. The number of sepals that

develop into wings gives a clue to the genera. Because the wings are twisted the fruit spins as it falls long distances from the parent tree. The seeds begin to sprout as soon as they reach the ground. In fact, germination may have already begun.

The sprouting seeds cannot stand desiccation. Months after seedfall the forest floor is covered with fallen shuttlecocks, "often with grotesque yellow, pink or purple lobed and fleshy seed leaves" (Corner). The younger parts, at least, of most dipterocarps have a covering of stellate hairs or peltate scales.



Text-Fig. 53. Fruits of the *Meranti*-family (Dipterocarpaceae), $\times 4$:
A. with one wing (sepal) removed. (Corner)

Figure 2

Three important genera already mentioned, *Dipterocarpus*, *Shorea* and *Hopea* are massive trees. In the past they contributed to much of the world's supply of hardwood timber. Many yield clean trunks of 20 to 30 metres with girths of 2 to 4 metres. Sadly, most of these forest giants are gone and the dipterocarps are now in need of conservation.

Dipterocarpus. At least up until recently, some species were in great demand for plywood. Processed either locally or in Japan, the finished product was exported to the United States. The resin, common to all Asian species, called "dammar" in Burma and "Minyak keruing" in Malaysia, was extracted and used for special varnishes. Local people use it to treat ulcers, to make poultices and as an aperitive for cattle and horses. To extract the resin, a basin-sized hole is cut into the trunk and a fire lit inside to induce the flow of resin. (We saw this method used in Northern Thailand to extract resin from a species of *Pinus*.) *D. aromatica* of Malaysia yields camphor.

Hopea. There are about 100 species of *Hopea*, many of which are also important timber trees. Resin from *Hopea* is used for the treatment of sores and wounds, particularly of the mouth.

Shorea. *Shorea* is considered by some to be second only in value as timber to teak, *Tectona grandis*. This is especially so of *S. robusta*, the Sal tree of India. From *S. macrophylla* an edible fat is (or was) extracted and used as a substitute for cocoa butter in the manufacture of chocolate.

All three genera, along with others of the family, are widely used medicinally throughout Asia. We can only speculate at the number of useful drugs and medicines awaiting discovery by research workers. Many dipterocarps are important street trees in some parts of Malaysia and South East Asia.

As we left the Arboretum we pondered on the fate of these magnificent trees of the tropical rainforests. Is it already too late to save them from virtual extinction? Will future generations find them only in arboreta such as this? About four years ago an enlightened Thai Government imposed a moratorium on the harvesting of teak. However, on our recent arrival in Thailand, we read of the thriving, illicit trade in teak over the borders with Burma and probably Cambodia.

The exploitation of tropical forests continues. The value placed on their products by consumer societies is too hard for some to resist.

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GINKGOS IN NEW ZEALAND

Ginkgo-like fossils, in several distinct genera, are well-known from New Zealand Mesozoic rocks. Recently Dr Ian Daniel has worked at the University of Canterbury Plant Science Department on a very fine fossil flora from Cretaceous rocks in the Middle Clarence Valley, Inland Kaikoura Range. The flora includes *Ginkgo*, as well as araucarians and other gymnosperm groups and angiosperms. A Cretaceous Park without dinosaurs?

(Colin Burrows)