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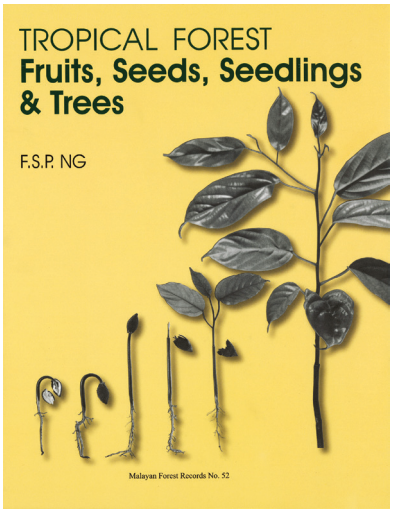
BOOK REVIEW

Tropical Forest Fruits, Seeds, Seedlings and Trees. Malayan Forest Records No. 52. FSP Ng. 2014. Forest Research Institute Malaysia, Kepong. 429 pp. RM250/USD150.



This handsome (and heavy) volume is the result of a 30-year study, the kind of project no longer really possible (or appreciated) in the short-term-oriented academic world of today, yet so fundamental in terms of practicalities. We learn that it was modelled on RS Troup's *Silviculture of Indian Trees* (1921) and was intended to be a reference manual for foresters, particularly with a view to their using it in efforts to restore logged forest. It is derived from an initial synthesis published in two volumes (1990, 1991) as *Manual of Forest Fruits, Seeds and Seedlings*.

After brief introductory chapters and a one-page bibliography, the bulk of the volume comprises the descriptions (pp 32–249), arranged alphabetically by family (and the genera alphabetically within those), and then seedling illustrations (pp 250–426), similarly arranged, the book ending with an index to generic names.

From a practical standpoint, the book will immediately be compared with EF de Vogel's *Seedlings of Dicotyledons* (1980), though Dr Ng's book has broader scope in dealing with seed and fruit structure through to tree-architecture, with gymnosperms as well as angiosperms. De Vogel's book was based on a three-year research project in Java, leading to a thesis, and covered 150 species (133 genera) in 51 families, while Ng deals with 607 species (representing 309 genera in 86 families). De Vogel abandoned the classical distinction between epigeal and hypogeal germination, for example, while Ng has four germination types (with some subtypes), which he formally described in 1978. De Vogel has 16 seedling types with 9 subtypes whereas Ng has descriptions of seedlings as the first stages in the trees' architectural development, of which he recognises 16 types in a key (p 15). De Vogel's book was beautifully illustrated, partly in watercolours, by Mohammed Toha, one of the gifted artists who worked on CGGJ van Steenis's magnificent *Mountain Flora of Java* (1972), whereas Ng's book has studio photographs by ISY Ho and line drawings by the author. De Vogel had a glossary; Ng has some pages of 'Essential concepts and definitions'.

Research for the book started in the 1960s when tropical rainforests were much less depleted than they are today. Seeds were collected, documented and germinated. The development of seedlings was followed daily, photographed and described; when large enough, young plants were established in the arboretum and grounds of FRIM at Kepong. Such simple techniques give answers to questions on germination times besides potential dormancy and viability periods, which information was published separately by FRIM in 1991.

Documented and discussed are the early stages of tree-architecture, until this becomes obscured as the tree matures, forming its massive trunk through self-pruning, and its apex arrives in the canopy to produce a crown with 'co-dominant non-pruning shoots' in what Ng calls a 'post-architectural stage'.

Each family entry has a brief introduction with distribution, number of genera and species and basic description, each genus within with its vernacular name, descriptions of seeds, fruits, and germination, with at least one example illustrated in line for each family, sometimes accompanied by colour photographs, together making up 225 figures. The bulk of the plates, whole pages of black-and-white and colour photographs of seedlings that follow, number 187. These are the meat of the book and will be those of greatest practical use and interest, a good example being the copious information on *Syzygium* spp. (p 185) for example.

Some of the introductory matter is perhaps a little less felicitous. The account of the 'post-architectural stage' of tree development and discussion of 'crown-shyness', on which the author has written before, are useful but, bearing in mind his unorthodox, iconoclastic discussion of fruit-types, where he rightly criticises the foisting of temperate-plant-based thinking on the tropics, his discussion of 'leaves' follows too much the very same essentialist Goethe canon rather than the recent more objective work showing a leaf–stem continuum. Other statements may surprise readers too, such as when the flower is best seen as an immature fruit rather than something 'shed at the end of its predetermined life unless fertilised'. And as far as leaves go, do those of grass really have 'determinate growth'?

The author makes much of changes wrought in angiosperm classification by recent, largely molecular work (though this often supports the seed work published in the 1970s by EJH Corner, one of the few critics of then prevalent Cronquist-Takhtajan-Thorne 'consensus') and follows to a large extent modern family circumscriptions. However, he keeps Myrsinaceae separate from Primulaceae, Polyosmaceae from Escalloniaceae, and Pteleocarpaceae from Boraginaceae, while his Gentianaceae contains all Loganiaceae, and he declines to split up Euphorbiaceae (even keeping Pandaceae within) when, unless split, Euphorbiaceae has to embrace Rafflesiaceae! While (laudably) maintaining the traditional names Leguminosae and Guttiferae, he has given in to Lamiaceae (= Labiatae).

In another international context, it is perhaps unfortunate that the book's title does not include the word 'Malaysian' or similar and it is also regrettable that *Flora Malesiana* treatments have not always been followed, e.g. *Heynea* (Meliaceae) not being recognised as distinct from *Trichilia* for example, both suggesting a somewhat inward-looking approach. Similarly, *Carmona* (Boraginaceae) is now known to be 'nested' in *Ehretia,* while the correct name for *Symingtonia* (Hamamelidaceae) is *Exbucklandia*, both of which (and several other) slips would have been avoided if reference had been made to modern plant-dictionaries. There are some spelling errors of which 'septae' is perhaps the most egregious—but all of these things are minor cavils and the author and publisher are to be congratulated on bringing Dr Ng's major accomplishment to scientific notice.

The ability to be able to identify fruits and seeds, seedlings and trees is in decline as older staff members retire and die. Based on long-term study and experience, such an ability is not fashionable in an academic world aping that of the north, despite the fact that such botanical riches are unique assets of tropical nations when compared with the depauperate nature of temperate floras.

Forest nurseries were formerly maintained in Peninsular Malaysia, but these too have largely lapsed there, forests being left to regenerate themselves, though in Sabah the tradition is fortunately strongly maintained. Although commercial nurseries in Peninsular Malaysia raise indigenous trees for urban greening, the range of species grown is a tiny proportion of the native tree flora. Many of these native tree species are endangered or even extinct, but those still hanging on could be saved by cultivation as has happened in many other parts of the world. It is to be hoped that this milestone book will act as a wake-up call before it is too late. Malaysia's botanical heritage is in danger: without training and application of Dr Ng's findings in practical conservation efforts, Malaysia's international reputation is in jeopardy.

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