The genus *Premna* (Lamiaceae) and the presence of 'pyro-herbs' in the Flora Malesiana area

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ABSTRACT. The genus *Premna* consists of 14 species in the Flora Malesiana area. The most common species in the region are all widespread. However, a series of morphologically closely-related, rare and generally geographically more restricted species are present in the region. These species can be characterised by three distinct morphological characters: 1) small decussate scales at the base of the young twigs, 2) a calyx that always has four isomorphic lobes, 3) a fruit that is clavoid in shape and almost single-seeded. The ecology and morphology of *Premna herbacea* Roxb. is unique in the genus and is the first recognised 'pyro-herb' in the Flora Malesiana area.

Keywords. Lamiaceae, Malesia, *Premna*, pyro-herbs

Introduction

The genus *Premna* was first described by Linnaeus in 1771 and occurs in the old world tropics from Africa to China and south to Australia and the Pacific (Harley et al. 2004). Following most other genera in the Lamiaceae, *Premna* is rich in species and morphological variation on the Southeast Asian mainland and on the islands of the Sunda shelf. It is widespread in the Pacific, but the number of species decreases sharply south and east from New Guinea. Eighty percent of all *Premna* specimens in K belong to only four species (*P. serratifolia, P. odorata, P. trichostoma* and *P.tomentosa*) and these are all widespread. There are two groups of species in this genus. The first group (*P. serratifolia*-group, see Table 1) has most of these common species: (*P. serratifolia, P. odorata* and *P. tomentosa*), while species in the second group tend to be rare and generally geographically more restricted (*P. trichostoma* group, see Table The difference between the groups is mainly based on three distinct morphological characters. The *P. trichostoma*-group has a series of small decussate triangular scales at the base of the young twigs, while on older branches these scales usually have fallen off, leaving a series of closely packed bract scars; a calyx that always has four isomorphic lobes, its shape remaining largely intact when the flower develops and when the fruits are formed; and a fruit that is clavoid in shape, almost single seeded (four seeds present, but only one fully developing). While the *P. serratifolia*-group

Table 1. Species of *Premna* in the Flora Malesiana area and their distribution in each morphological group.

Taxon	Distribution
***P. serratifolia*-group**	
P. odorata Blanco	India and China to Australia
P. pubescens Blume	Java, Sumatra, the Lesser Sunda Islands and the Philippines
P. serratifolia L.	East Africa to Tahiti
P. sterculiifolia King & Gamble	Peninsular Malaysia
P. tomentosa Willd	India and China to Australia, except Borneo
***P. trichostoma* group**	
P. clavata de Kok	Sabah
P. decurrens H.J.Lam	Sumatra
P. herbacea Roxb.	Southeast Asia to Australia
P. interrupta Wall. Ex Schauer	India and China to Malaysia
P. oblongata Miq.	Sunda Islands and Sulawesi
P. pallescens Ridl.	Borneo
P. parasitica Blume	Java and Bali
P. regularis H.J.Lam	Philippines and New Guinea
P. trichostoma Miq.	Myanmar and Vietnam to New Guinea

does not have these bracts at the base of the young shoots, the number of calyx lobes varies from 0 to 5 and are almost always heteromorphic, and the fruits have four mature seeds per fruit.

The ecology and the morphology of *P. herbacea* is of interest. The herbaceous habit of this species is an illusion, as only the herb like twigs are visible above ground (and are usually the only parts collected), but a short woody stem exists below or near to the ground. *Premna herbacea* is in gross-morphological and ecological terms very similar to the well known 'pyro-herbs', which occur in vegetation types adapted to frequent fires. Given the many notes on herbarium labels stating that this species occurs in vegetation which is frequently burned, the same factor may have been the driving force behind the evolution of *P. herbacea*.

Pyro-herbs

Pyro-herbs are woody plants that survive frequent fires by reducing their woody parts to underground structures and then only sprout herb-like branches each year in the wet season. They are very common in parts of Tropical Africa and South America and are rare in Asia. They are reported to be absent from Australia and South East Asia (White 1976). Since White's overview article on pyro-herbs (or the suffrutescent habit), their presence has been indentified in north Australia. At least three species belonging to the Labiatae are now recognised to be pyro-herbs (*Clerodendrum tatei* (F.Muell.) Munir

and *Clerodendrum linifolia* (Ewart & B.Rees) de Kok and *Premna herbacea* Roxb. Given that the two essential elements of recognising a plant as a pyro-herb is the woody underground parts (seldom present in herbaria) and a fire-regulated ecology (seldom mentioned on herbarium labels), pyro-herbs are difficult to recognise without extensive fieldwork. The case of *C. linifolia* shows clearly the difficulty of recognising these kinds of plants from herbarium material only. The species was first described as a monotypical genus *Huxleya* in the then also most entirely woody family Verbenaceae. The main reason that it was described as a new genus was because the type specimen consisted of only the herbaceous above-ground branches. This misconception lasted until more detailed morphological, ecological, chemical and molecular research revealed the true phylogenetic relationship of the genus and its survival strategy in a habitat that burns almost annually (de Kok et al. 2000, Steane et al. 2004). Similar ecological observations have now been made for the Australian populations of *P. herbacea* (Munir 1984; de Kok, in press).

Absence or presences of pyro-herbs in Southeast Asia

There is not much literature about pyro-herbs in Southeast Asia. In his papers on the ecology of the Indramajoe plains in West Java, van Steenis (1936) mentioned some possible examples (see Table 2). On the other hand, White (1976) reports them to be absent from South East Asia, and Henty (1982) mentions some possible examples from Papua New Guinea from what he calls 'the short lowland grasslands' which are maintained by frequent fires.

Conclusions:

1) The 14 species of *Premna* in the Flora Malesiana area can be divided into two distinct groups: the *P. trichostoma* and *P. serratifolia* groups, based on morphological characters.

2) *Premna herbacea* Roxb is the first recognised 'pyro-herb' in the genus in the Flora Malesiana area.

Table 2. Possible 'pyro-herbs' occurring in Southeast Asia.

Taxa	Sources
Butea monosperma (Lam.) Taub	Van Steenis 1936
Crotalaria alata Buch.-Ham. ex D.Don	Henty 1982
Crotalaria ferruginea Scheele	Henty 1982
Crotalaria montana B.Heyne ex Roth	Henty 1982
Dillenia sp.	Van Steenis 1936
Fordia fruticosa Craib	Van Steenis 1936
Grewia sp.	Van Steenis 1936
Morinda sp.	Van Steenis 1936
Phyllanthus emblica L.	Van Steenis 1936
Premna herbacea Roxb.	de Kok, in press
Ziziphus sp.	Van Steenis 1936

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