

## NOTE

### **DYSOXYLUM FRIMENSIS NG, AN INCREDIBLE NEW SPECIES**

Ng FSP

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*Dysoxylum frimensis* is described here as a new species, almost 50 years after it was discovered. It is known from a single tree 25 m tall, growing on side of the entrance road of the Forest Research Institute Malaysia, which is the centre for taxonomic botany in Malaysia. Botanist drive past this tree every day so we could not believe it could be an unknown species. We waited for another specimen to turn up, but no other specimen has turned up. The tree is self-fertile. We have germinated the seeds, planted the progeny, and found it to be very suitable for ornamental urban planting. The evidence points to its being an indigenous species.

Keywords: Forest Research Institute Malaysia, *Dysoxylum arborescens*.

## INTRODUCTION

The Forest Research Institute Malaysia (FRIM) property was deforested and mined for tin 100 years ago. The condition of the property was described by one of FRIM's pioneers, Watson (1935) as follows:

*“The areas available for planting consisted of abandoned mining land that had first been of forest, then mined by Chinese open-cast and gravel pump methods, resulting in portions of it being covered with the overburden and refuse removed from the mines, then grazed by cattle, cultivated by Chinese vegetable gardeners, and abandoned and grazed again until whatever merit the surface soil may have had was leached well out of it. The worst places of all were covered with lalang (Imperata cylindrica) encouraged by frequent burning...”*

The founder of the Institute, Dr FW Foxworthy, explained his choice of this utterly devastated land for reforestation experiments and for the establishment of the Forest Research Institute as follows, in his annual report of 1927:

*“The object of planting experiments at this stage is primarily to find out which of the many hundred possible species are worth planting up on a large scale. Bearing in mind the fact that the area was deliberately chosen with a view to providing a severe test and that the conditions are, therefore, abnormal and infinitely more severe than any that would be likely to arise in the trees' natural habitat, it is clear that failures must be the rule rather than the exception, and that there can be no question of regular plantations until the trees have proved their hardiness.”*

Foxworthy intended to launch a bold and massive exploration of scientifically unexplored territory and was prepared to accept that ‘failure would be the rule rather than the exception’. No other scientific reforestation project had ever been launched in this manner.

In the establishment of FRIM, thousands of seedlings, of 160 species, were planted on the devastated grounds. As the planted forests grew, seeds of other species got dispersed into the area independently by wind and wildlife. *Dysoxylum frimensis* would have been among those that got into the property independently from nearby forests. The possibility of this plant having been introduced from abroad can be ruled out. From FRIM records, the only introduced seeds came from the Forest Departments of Sarawak, Sabah or Brunei and such introductions were limited to known timber species of dipterocarps and belian (*Eusideroxylon zwageri*). The Institute had no exchanges with Thailand, Indonesia and other territories that were not part of the British Empire.

The tree was observed in flower in May 1972, April 1981 and April 2014. At the time of flowering, all existing leaves were shed and new shoots appeared, bearing new leaves and inflorescences. This period of change was abrupt, lasting only two weeks.

The tree was kept under close observation in March-April 2021. New shoots appeared, bearing new leaves but without inflorescences. The leaf

exchange period was stretched out to about one month during which time new leaves coexisted with old leaves. Hence, the leaf exchange period can be hard or soft. Hard is when the exchange is abrupt and accompanied by flowering. Soft is when the exchange is more gradual and there is no flowering. The fruits are fleshy capsules that ripen in two months. The fruits drop straight down when ripe, with the seeds still attached. The seeds are fleshy and would probably die if not immediately planted under moist shaded conditions. We have never found seedlings germinating under the tree. However, the seeds will germinate in 18–50 days if planted immediately and watered daily. We collected seeds and raised seedlings in 1972 and 2014.

This plant was probably brought in as a seed by an animal, perhaps a bat, from a nearby forest. The nearest forest is Bukit Lagong Forest Reserve, located immediately north of FRIM.

## DESCRIPTION

### *Dysoxylum frimensis* Ng sp. nov.

Type: Peninsular Malaysia, Selangor, Kepong; 17 May 1972, FSP Ng, FRI 6348 (holotype KEP).

*Dysoxylum* sp. in Ng (1990, 1991 & 2008). A medium-sized tree with small buttresses; bark smooth to slightly scaly or flaky. Leaves exstipulate imparipinnate, spirally arranged, up to 25 cm long, bearing 4 to 6 pairs of opposite or sub-opposite leaflets and a terminal leaflet. Leaflets  $4.0 \times 1.8$ – $7.0 \times 2.5$  cm, elliptic-obovate, slightly unequal-sided; with petiolules 1–3 mm long; apex acuminate; base slightly attenuate. Inflorescences in the form of small racemose panicles 1.5–6.0 cm long. Flowers bisexual, radially symmetrical, with pedicels c. 5 mm long; sepals 4–5, green; petals as many as sepals  $7 \times 2$  mm, pale green, obovate; stamens 8 or 10, united to form a tube 5–10 mm long; stigma capitate; nectaries large, surrounding the ovary; ovary with 4–5 locules. Fruit a globose, fleshy capsule, c. 2 cm across, splitting into 4–5 parts, each part containing 1–2 seeds that are covered in orange-red sarcostesta.

Seedlings: germination hypogeal, with peltate fleshy cotyledons; the epicotyl bearing several spiral scales, followed by spirally-arranged pinnate leaves; leaflets opposite or sub-opposite increasing from 2 to 4 pairs at the young seedling stage, up to 14 pairs at the sapling

**Table 1** Differences between *Dysoxylum arborescens* and *D. frimensis*

Feature	<i>D. arborescens</i>	<i>D. frimensis</i>
Leaflets: number of pairs per leaf on mature trees	2–4 pairs	4–6 pairs
Size of largest leaflets on a leaf (excluding the terminal leaflet)	$7.0 \times 2.5$ – $20 \times 8.5$ cm	$4 \times 1.5$ – $7.0 \times 2.5$
Length of leaflet stalk (petiolule) (excluding the terminal leaflet)	c. 0.5 cm	0.1–0.3 cm
Inflorescence length	2–25 cm	1.5–6 cm
Diameter of dried fruit	Up to 3.5 cm	Up to 2 cm
Seedling leaves	Epicotyl bearing simple leaves that increase in size progressively to about the tenth leaf, then abruptly changing to pinnate leaves with 2 pairs of leaflets	Epicotyl bearing scale leaves, followed by pinnate leaves with 2 pairs of leaflets, then successively more pairs up to 14 pairs at the sapling stage
Leafing/flowering behaviour	Evergreen trees, flowering on the leafy crown	Leaf-exchange trees, flowering during the brief exchange period when all leaves are shed and new leaves appear together with inflorescences
Distribution	Throughout Malesia and extending to the Andamans and Nicobar Islands, Taiwan, Queensland, Solomon Islands and Vanuatu	Known by one roadside tree in FRIM, and its progeny planted in various places

and pole stages, then stabilising at 4–6 pairs at maturity.

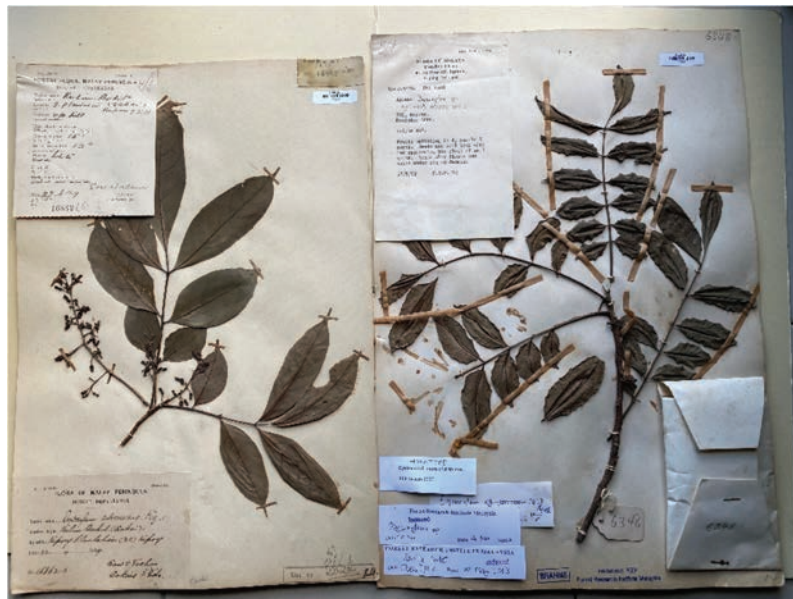
Other specimens (from the same tree): P Vethivelu 17 April 1981, FRI 29654A & B; KC Ang 20 October 1989, FRI 35055; LG Saw, 8 April 2014 FRI 48446. Seedlings (raised from the same tree) by FSP Ng: FRI 9727a, FRI 20782A, B, C, and FRI 20826). Now planted on the grounds of the Herbarium Building in Jalan Jelutong of FRIM and in the Agricultural Park of Universiti Tunku Abdul Rahman in Kampar, Perak.

The closest species to *D. frimensis* is *D. arborescens*. The latter has a wide distribution

from the Nicobar and Andaman Islands, throughout Malesia, to Taiwan, Queensland, Solomon Islands and Vanuatu. In Peninsular Malaysia *D. arborescens* has been found in all states except Perlis and Penang. The main differences between the two species are as tabulated in Table 1 and Figures 1–5 depict them.

**DISCUSSION**

*Dysoxylum frimensis* is a species that would be easy to miss in a plant-collecting expedition. Its flowering period is only two weeks and the



**Figure 1** Mature foliage of *Dysoxylum arborescens* Kep 16862 (left) and *D. frimensis* FRI 6348 (right), both from the FRIM grounds



**Figure 2** Mature canopy of *Dysoxylum frimensis*



**Figure 3** The type tree of *Dysoxylum frimensis*, on the side of the entrance road of FRIM.

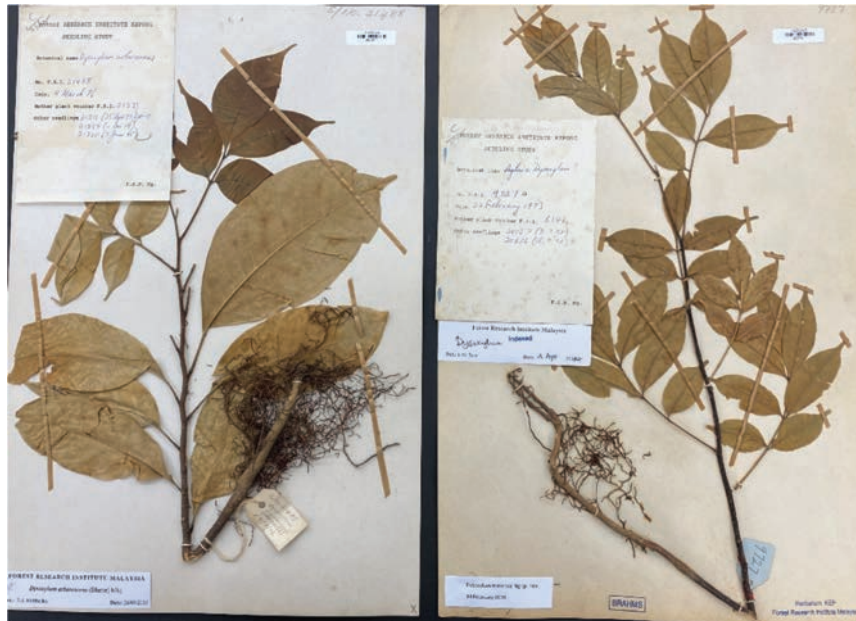


Figure 4 Seedlings of *Dysoxylum arborescens* (left) and *D. frimensis* (right)



Figure 5 Fruit of *D. frimensis* split by itself, and four seeds; the two upper seeds showing broad attachment scars; the two lower ones showing sarcotesta covering the seed except the central bulging part

time from flowering to fruit ripening is only two months. The flowers and fruits are produced sparingly and do not attract attention. The window of opportunity for such a tree to be spotted in the canopy of lowland tropical rainforest, among hundreds of other species of trees, would be extremely small. The most likely source of the seed of this tree would be Bukit Lagong Forest Reserve adjacent to FRIM.

## REFERENCES

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