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Conservation Notes on *Vatica yeechongii* (Dipterocarpaceae) from Peninsular Malaysia

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Abstract

The conservation status of *Vatica yeechongii* L.G. Saw, recently discovered from Peninsular Malaysia, is described.

Introduction

Vatica yeechongii was discovered along Sungai Tekala in Sungai Tekala Recreational Forest, which is located in Sungai Lalang Forest Reserve, Selangor, Peninsular Malaysia, 3° 03.485' N, 101° 52.373' E, alt. 79 m asl (Saw, 2002). Several weeks after its discovery in the type locality, a population was found in Compartment 4, Setul Forest Reserve, along the upper stream of Setul River, Negeri Sembilan (2°46.937' N, 101°55.069' E). The population was located in the forest margin of a logged-over forest adjacent to the trunk road from Mantin to Seremban town at an altitude of c. 192 m.

Vatica yeechongii is very distinct in leaf characters and nut shape (Saw, 2002). The leaf blade is oblanceolate, 44–84 x 10–6.5 cm, thickly coriaceous, bullate above with 28–30 pairs of veins. The nut is ovoid.

Ecology

A medium-sized tree 8–15 m tall and 9–13 cm diameter, *V. yeechongii* occupies the dense understorey of lowland dipterocarp forest. In the type locality, nine trees were found on gentle earth banks of a free flowing stream near the public campsite. There were no trees further upstream. Details of its growth pattern are described in Saw (2002). Large dipterocarps such as *Shorea leprosula* Miq., *S. parvifolia* Dyer, *S. macroptera* Dyer, *S. acuminata* Dyer, *S. pauciflora* King, *S. ovalis* (Korth.) Blume, *S. bracteolata* Dyer, *S. dasyphylla* Foxw., *Dipterocarpus crinitus* Dyer and *D. cornutus* Dyer dominated the forest. Non-dipterocarps included *Intsia palembanica*

Miq. (Leguminosae), *Saraca cauliflora* Baker (Leguminosae), *Terminalia subspathulata* King (Combretaceae), *Pometia pinnata* J.R. Forst. & G. Forst. (Sapindaceae), *Canarium patentinervium* Miq. (Burseraceae), *Elateriospermum tapos* Blume (Euphorbiaceae), *Palaquium gutta* (Hook.*f.*) Baill. (Sapotaceae), *Pimelodendron griffithianum* (Müll.Arg.) Benth. (Euphorbiaceae), *Endospermum diadenum* (Miq.) Airy Shaw (Euphorbiaceae), *Dyera costulata* (Miq.) Hook.*f.* (Apocynaceae), *Artocarpus lanceifolius* Roxb. (Moraceae), *A. scortechinii* King, *Gironniera subaequalis* Planch. (Ulmaceae), *G. nervosa* Planch., *Payena lucida* A. DC. (Sapotaceae), *Streblus elongatus* (Miq.) Corner (Moraceae), *Litsea costalis* (Nees) Kosterm. (Lauraceae), *Gynotroches axillaris* Blume (Rhizophoraceae), *Cratoxylum formosum* (Jack) Dyer (Guttiferae), *Scaphium macropodum* (Miq.) Beumée ex Heyne (Sterculiaceae) and *Pternandra echinata* Jack (Melastomataceae).

At Setul, the forest margin vegetation gradually gave way to a forest having a main canopy to c. 20 m tall, dominated by *Shorea leprosula*, *S. macroptera*, *S. multiflora* (Burck) Symington, *S. acuminata*, *S. parvifolia*, *Parkia speciosa* Hassk. (Leguminosae), *Pometia pinnata*, *Campnosperma auriculatum* (Blume) Hook.*f.* (Anacardiaceae), *Artocarpus scortechinii*, *Pterocymbium tinctorium* (Blanco) Merr. (Sterculiaceae) and *Alstonia angustiloba* Miq. (Apocynaceae). The understorey lacked palms and climbing rattans and the forest floor was covered with abundant dipterocarp seedlings. Herbs such as *Tacca integrifolia* Ker Gawl. (Taccaceae) and *Costus speciosus* (J. König) Sm. (Costaceae) were present in scattered numbers. At least 70 *V. yeechongii* trees were found on steep slopes of riverbanks and on slopes away from the riverbanks. Trees here averaged 9.8 m tall (range 2–21 m), had a diameter at breast height c. 8.2 cm (range 1.6–18.8 cm) with a spreading crown. Its bark was whitish and smooth with horizontal rings. Those growing along the riverbanks had poor bole form and multiple branching was common while those further away had a better bole form.

Germination

Mature fruits were available from at least six trees in Sungai Tekala and one tree in Setul Forest Reserve from June to August 2002. Three seed batches, collected from two localities at different dates, were germinated with the seed wings removed and observed in the Forest Research Institute Malaysia, FRIM (Table 1). Germination is deemed to begin when the radicle protrudes through the seed coat. Germination of *Vatica yeechongii* is epigeal. The emergent cotyledons are bilobed, fleshy and equal. The hypocotyl elongates to c. 4.8 cm tall and the first two leaves are opposite.

Mean percentage germination was 63.011 ± 31.207 s.d., the percentage varying from 42.1 to 98.9. All three seed batches showed a typical sigmoidal germination curve. Germination percentage on the first day of germination, i.e. day 5, was 38% for seed batch 2002–0510 and 18.7% for seed batch 2002–0503. Despite this promising

Table 1. Percentage germination and survival of three seed batches of *Vatica yeechongii*

Batch No.	2002-0503 (FRI 46613)	2002-0510	2002-0542 (FRI 46668)
Locality	Sungai Tekala, Sungai Lalang Forest Reserve, Selangor	Sungai Tekala, Sungai Lalang Forest Reserve	Setul Forest Reserve, Negeri Sembilan
Collector	Chung R	Saw LG	Chan YC & Ayau K
Date planted	14 July 2002	28 July 2002	20 August 2002
No. sown	107	79	89
Max. germination (%)	42.1	48.1	98.9
Germination period (days)	5–37	5–25	2–25
No. days to achieve 40% germination	45	32	5
% seedling survival after 1 month	95.5	97.3	40

beginning, however, these two seed batches took a longer time to achieve the 40% germination mark compared to seed batch 2002–0542 (Fig. 1). Preliminary germination results suggest that seed viability is higher in the population at Setul Forest Reserve but this could be due to a variety of factors e.g., fruit maturity, seed vigour, timing of fruit collection, tree health, pest infestation on fruits, etc. In addition, population sizes could also affect gene flow; a larger population is probably more genetically diverse.

In situ Conservation

Vatica yeechongii is so far known only from these two localities. Preliminary observations on population size suggest that this species is a rare endemic. The population at Sungai Tekala lies in recreational forest. Under the National Forestry

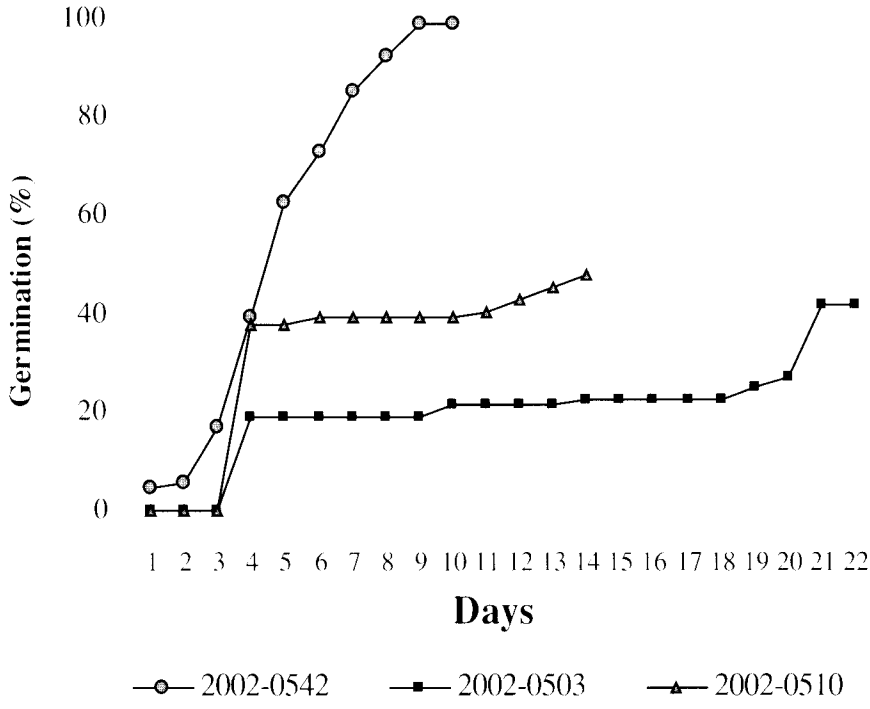

Figure 1: Cumulative germination percentage for different seed batches of *Vatica yeechongii*

Act, no harvesting of resources is permitted in such forests as they are strictly meant for recreation. Population loss will only take place if the Forest Reserve or parts of the reserve, through de-gazettement, are converted to non-forestry land use. For Sungai Tekala, such action is, however, highly unlikely as the area is in the vicinity of the water catchment for the Semenyih Dam, a principal dam providing water supply to Kuala Lumpur. In terms of man-made threats to the reduction in population size and area of occupancy, there are no immediate foreseeable pressures either from habitat loss or degradation or timber harvesting. We note that the practice of clearing undergrowth in areas designated for recreational use may affect regeneration and survival of populations. Careful observa tions on the individuals here suggest that the species has no potential commercial value, as trees do not attain significant harvestable size at maturity and has a poor bole form. The Forest Department of Central Selangor District has been alerted to the presence of the new species and steps are being taken to conserve the population.

The population at Setul faces a different scenario. Although it lies in the forest reserve, it is adjacent to the main road. It has some form of protection by virtue of it being in Forest Reserve, but the fact that it lies very close to the road could pose

future conservation conflicts when road expansion is required. It is therefore recommended that more stringent protection measures be provided for this population. In view of the above scenario, *Vatica yeechongii* should be given the 2001 IUCN category of Critically Endangered CR A2cB1. It falls within the A2 category (inferred or suspected population size reduction of ≥80% over the last 10 years or three generations, whichever is longer); 'c' (a decline in area of occupancy, extent of occurrence and/or quality of habitat) and B1 (its geographic range, in the form of the extent of occurrence and area of occupancy, is estimated to be less than 100 km^2). An attempt to estimate the population size of the species in each locality is currently being undertaken.

From the viewpoint of conservation, the discovery of a new dipterocarp species in Selangor and Negeri Sembilan is remarkable because in comparison to other states, these two states encounter higher conflict between socio-economic development and conservation. Both populations face an acute need for non-forestry related land development and hence there exist tremendous pressures leading to habitat loss and degradation. The fact that a new species was discovered in this current era of diminishing forest areas merely shows that we do not know enough about our plant diversity and that long-term field observations are necessary. This can only take place with concerted botanical research programmes having full national, financial and personnel support.

Ex situ Conservation

One month after potting, 215 seedlings from the three batches survived, each bearing at least two pairs of leaves. Distribution to other gardens and arboreta is envisaged in the near future.

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