TIMBER TECHNOLOGY BULLETIN

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Powder-Post Beetles - *Minthea* spp. (Lyctidae)

by

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Introduction

The lyctids are important beetle pests of seasoned hard-wood in Malaysia [1,2]. They are commonly known as powder-post beetles. Several species of lyctids have been recorded locally, namely, *Minthea reticulata* [3,5],*M. rugicollis* [1,6],*Lyctus discedens* (Ho unpubl.), *L. africanus* (Browne unpubl.) as well as the most dreaded species in temperate countries, *L. brunneus* [1]. Of these, *M. reticulata* (Figure 1) and *M. rugicollis* (Figure 2) are of importance in Malaysia.

The Insect

The adult beetle is small, about 2.8 mm long and rather flattened. It is reddish-brown and covered with regular rows of yellowish hairs on the forewings. Its head is clearly visible from above. The tips of the antennae bear two distinctly thickened segments. The sides of the first thoracic segment are finely toothed in *M. rugicollis* but disinctly in *M. reticulata*. The females can be differentiated from the males by the fringe of hairs on the ventral side of the fifth abdominal segment (Figure 3). The fringe of hairs is sparse in *M. reticulata* and thick in *M.rugicollis* [4].

Figure 1. *Minthea reticulata*

1. Brown,F.G. (1938). The common Malayan powder-post beetle, *Minthea rugicollis* Walk., (*Coleoptera-Lyctidae*). Malayan Forester 7:107-120.

2. Browne, F.G. (1950). Protection of timber against powder-post beetles during seasoning. Malayan Forester 13:166-168.3.

3. DhanarajanG.(1977). Degradation of wood by insects and other organisms in Malaysia. In A New Era in Malaysian Forestry (Ed.bySastry, CB., Srivastava, P.B.L. & Abdul Manap, A) 287-299.

4. Gerberg, E.J. (1957). A revision of a new world species of the powder-post beetles belonging to the family Lyctidae. Technical Bulletin No. 1157.1-55.

5. Ho, Y.F. (1993). *Minthea reticulata*, a species often mistaken for *M.rugicollis* in Malaysia. Journal Tropical Forest Science 6:82-85.

6. Menon, K.D. (1957). Susceptibility of commerial species of Malaysian timbers to powder-post beetle attack. Malayan Forester 20:19-23.

Figure 2. *Minthea rugicollis*

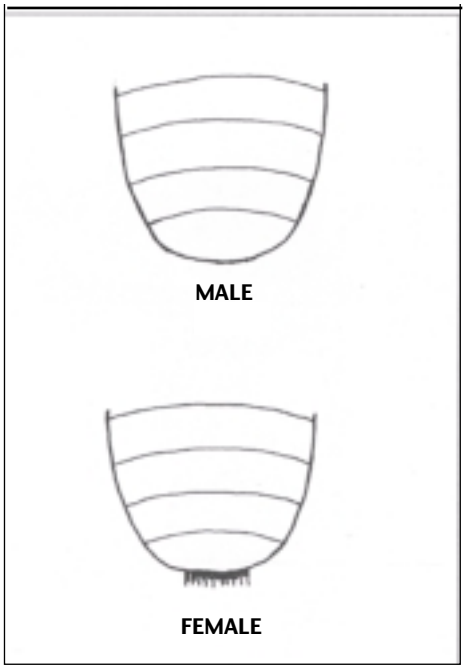

Figure 3. Ventral view of the fifth abdominal segment in male and female *Minthea rugicollis.*

which mainly follow the grain of wood. This stage takes about 2-6 months [2] , depending on factors such as starch and moisture contents of wood as well as temperature.

The mature larvae then transform into pupae at the end of the tunnel. The pupa is adult-like except for certain structures which are undeveloped. This stage lasts for about 12 days [2].

The young adults remain tunnelling and feeding in the wood for several days before emerging through small circular holes they make in the wood [1]. The newly emerged beetles show increased locomotory activity initially but they soon settle down to feed, pair and lay eggs. Pairing occurs upon emergence and stretches throughout the life span of the female. Egg-laying occurs a few days later.The beetles dislike light and tend to hide in crevices[1]. Their average life span is 77 days.

The abundance of *M. reticulata* and *M. rugicollis* at FRIM is shown in Figure 4. The data were obtained by exposing seasoned and unseasoned rubberwood every month for a year at FRIM and counting the number of beetles that emerged from them. Both species possess 3 generations per annum.

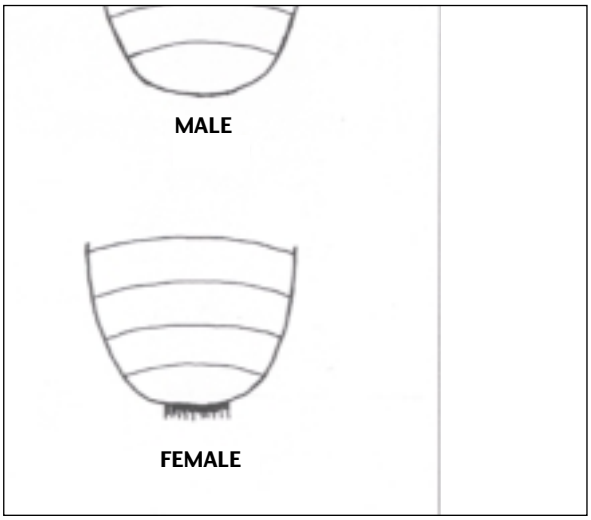

Figure 4. The monthly abundance of *M.reticulata* and *M. rugicollis* at FRIM. (The number of beetles was obtained from seasoned and unseasoned rubberwood)

Life cycle

The lyctid life cycle begins with the hatching of eggs. The egg is about 0.5 mm long, white, cylindrical and narrowed at one end[1] . The eggs are deposited in the pores of wood and take about a week to hatch[2].

The larva is small, white and C-shaped. They bore into the wood to feed. Their feeding activities result in a series of meandering tunnels of increasing diameter,

1. Brown,F.G. (1938). The common Malayan powder-post beetle, *Minthea rugicollis* Walk., (*Coleoptera-Lyctidae*). Malayan Forester 7:107-120.
2. Kirton, L.G. (1990). Common pests of seasoned timber:The common powder-post beetle. Timber Digest No. 102.
3. Menon, K.D. (1957). Susceptibility of commerial species of Malaysian timbers to powder-post beetle attack. Malayan Forester 20:19-23.

Damage to timber

The damage caused by the adult beetle is negligible.Feeding marks are visible at the surface of the wood, through not conspicuous Lyctid eggs are invisible to the naked eye and so **initial attack goes unnoticed**. The hatched larvae eat their way into the wood, constructing irregular tunnels and filling them with bore dust. **It is the larvae which are responsible for the deterioration of wood.** Often the wood shows no evidence of attack until piles of dust or circular holes appear on the wood surface. Both *M.reticulata* and *M. rugicollis* were found to attack seasoned (ca. 14.8% moisture content) and unseasoned rubberwood (ca. 41.2% moisture content) but the latter showed a clear preference for seasoned timber.

Infestation can be recognized by small circular holes of the size of an ordinary pin head (ca. 1 mm) on the wood surface (Figure 5).

Figure 5. The smaller holes are exit holes of *Minthea* while the larger ones are that of the powder-post beetle, *Heterobostrychus aequalis*

These holes are caused by the emergence of young beetles from infested wood. Larval activity is evident by the appearance of little piles of talcum-like dust (Figure 6) on or beneath the infested wood. When wood is closely stacked, disfigurement can occur due to the surface tunnels. Larval tunnels will be exposed when infested wood is split open (Figure 7). These tunnels weaken the structure of wood. The sapwood of timbers is susceptible to attack by these beetles.

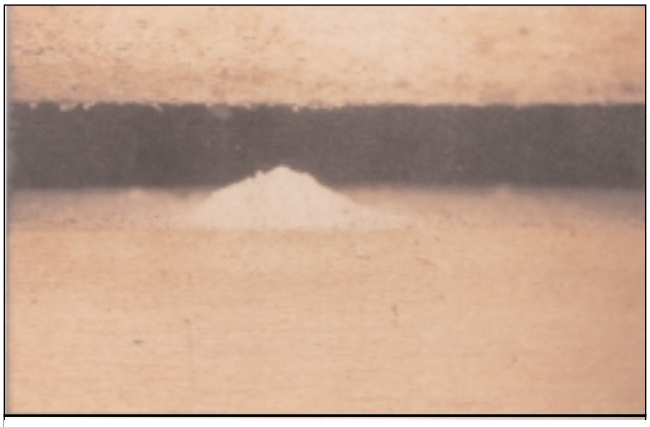

Figure 6. A heap of dust on wood

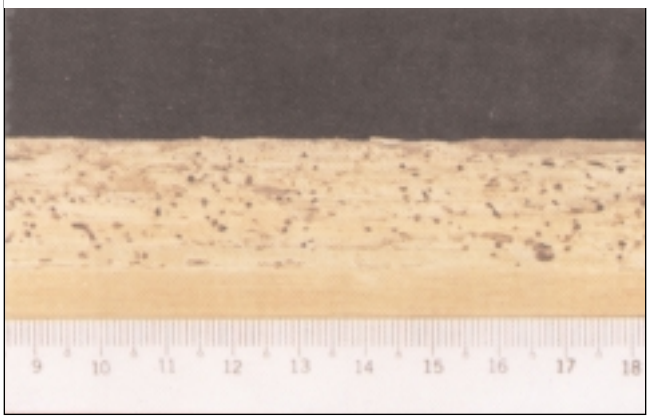

Figure 7.Tunnels excavated by *Minthea larvae*

Control

Consignments of timber suspected to be infested should be rejected or treated immediately. Heat sterilization in kilns at temperatures between 51.7^0 and 60^0C, for 3-50 hours had been proven effective against all lyctid stages in wood of thickness between 1" and 3" [1]. However, wood products with glue joints and finishings that are sensitive to high temperatures may require fumigation with methyl bromide [1]. Reinfestation can becontrolled by dipping, brushing or spraying wood products with insecticides such as borax or synthenic pyrethroids. However, this method can only kill stages which come into contact with the wood and the protective layer is removed during planing and sanding[1] Application of varnishes and paints may be helpful as it wood pores[2].

Common name	Species
Jelutong	*Dyera costulata*
Ramin	*Gonystylus* spp
Rubberwood	*Hevea brasiliensis*
Simpoh	*Dillenia* spp.

1. **LaFage, J.P. & Williams, L.H. (1979).** Lyctid Beetles - Recognition, prevention, control. Louisiana State University and Agricultural and Mechanical College No. 106.
2. **Kirton, L.G. (1990)**. Common pests of seasoned timber:The common powder-post beetle. Timber Digest No. 102.

It is impossible to determine initial infection as the eggs are laid in the wood pores. Therefore early preventive measures should include first in/first out stock rotation, use of stickers and pallets which are purely heartwood and the burning of wood scraps which can be potential breeding sites for the beetles [1]. In spite of all these, a more reliable way of protecting timbers is to pressure treat them with preservative such as borax or borax and boric acid mixture

In nature, both the adult and immature stages of *Minthea* are attacked by a clerid beetle while certain wasps parasitize the larvae and pupae. Ants and spiders are also known to feed on them [2]. The method by which natural enemies can be used to keep the beetle population low, without using insecticide, is called biological control. This area as well as the possible use of attract ants and repellents could be further investigate to find alternative insecticides for the control of powder-post beetles.

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1. LaFage, J.P. & Williams, L.H. (1979). Lyctid Beetles - Recognition, prevention, control. Louisiana State University and Agricultural and Mechanical College No. 106.

2. Brown, F.G. (1938). The common Malayan powder-post beetle, *Minthea rugicollis* Walk., (Coleoptera-Lyctidae). Malayan Forester 7:107-120.

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