

The Life Cycle of the Pest *Hyblaea Puera* That Eats Teak Leaves in Loa Janan Sub-District, Kutai Kartanegara

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Abstract:- The aim of the research was to find out the life cycle of the teak leaf-eating pest *Hyblaea puera* in Loa Janan Sub-District, Kutai Kartanegara. This research was carried out by the authors for approximately three months from June to Agustus 2023. The method used was to directly observe the life cycle of the teak leaf-eating pest *Hyblaea puera*. Observation showed that months were 10-13 days old, eggs were 2-3 days old, larvae were 9-11 days old and pupae were 4-5 days old.

Keywords:- Teak Leaf, *Hyblaea Puera*, Moth, Egg, Larvae, Pupa, Loa Janan.

I. INTRODUCTION

Given the widespread planting of teak in Kalimantan in general and in East Kalimantan in particular and according to Hitipeuw (1999), currently in the Kalimantan area teak is being developed which can be cultivated in monoculture or intercropping. Tini and Amri (2002) stated that although teak has the advantage of being a pest-resistant timber species, it does not mean that it is not at risk of pest attack. This is because there is almost no teak growing land, either in the form of gardens or forests that are completely free from pest populations, so research is needed that leads to more effective pest eradication.

Such research is necessary because these pests are always present and have the potential to become very harmful epidemics. If the attack occurs on the leaves, while the leaves are the place for photosynthesis, then the damage to the leaves will reduce the increment of the teak. This was reported by Kirtibutr (1983) in Husaeni (1988), that defoliation of teak leaves aged 24 years with moderate attack intensity (defoliation of leaves as much as 50%) can result in a reduction in stem diameter increment of 37.5%, while in teak stands aged 33 years with heavy attack intensity (defoliation 75-100%) the reduction in increment reached 81.8%.

To eradicate a type of pest, it is necessary to know the type, life cycle, frequency and intensity of attack of the pest found. This is so that eradication can be more effective. Effective when the method used can significantly reduce the pest population. Likewise, by knowing the life cycle of a pest species, it will be able to know the most destructive stage

among the stages formed. In leaf-feeding insects, it is usually the larval stage that is most damaging than other stages, because it has a type of mouth that is used to eat leaves. After turning into an adult (imago), the body shape changes a lot and it is not easy to recognise how the larva looks like, which can be a moth, butterfly or beetle. Once the life cycle is known, the adult form can also be recognised, so that eradication can be targeted not only at the larvae, but also at the adults, although these adults do not feed on leaves, but have the potential to breed and produce new larvae that may be more numerous and therefore more damaging.

The aim of the research was to find out the life cycle of the teak leaf-eating pest *Hyblaea puera* in Loa Janan Sub-District, Kutai Kartanegara

The results of this study are expected to be useful for private and government agencies and the public about the life cycle of teak leaf-eating pests *Hyblaea puera*. In addition, the results of this study can be used as information and reference material for further research.

II. METHOD

A. Place and Time of Research

The research was conducted in June - August 2023 (from the preparation stage to the implementation of the research). The location was at Mr Suherman's land Km 21 Loa Janan and continued at the Conservation Laboratory of Politani Negeri Samarinda

B. Materials and Tools

The tools used include:

- Tweezers to take larvae, pupae and moths.
- Jars with a diameter of 15 cm and a height of 15 cm to accommodate moths.
- Petri dish 10 cm in diameter and 1 cm high for collecting eggs.
- Machete to clear the area.
- A 10 Watt white fluorescent lamp and other electrical equipment for moth attraction.
- Gauze used as mosquito nets or teak plant cages for insect life cycle observation.
- Insect nets to catch moths.

- Camera for documentation
- Flashlight to assist observation at night.
- Loupe to help view eggs and larvae.
- Sticky needle to attach the insects to be identified.
- Microscope to view eggs and count the number of eggs.
- Small knife for cutting leaves.
- Brush to collect moth eggs.

The materials used in this study are:

- Teak plants aged 12 months
- Eggs, larvae, pupae and moths.

- 70% alcohol to kill and preserve insects.

C. Research Methods

➤ Field Orientation

Before conducting the research, a field orientation was conducted to determine the presence of *Hyblaea puera* pest attacks in teak plantation areas. Orientation was conducted in early June 2023 and then the research location was determined (Figure 1).

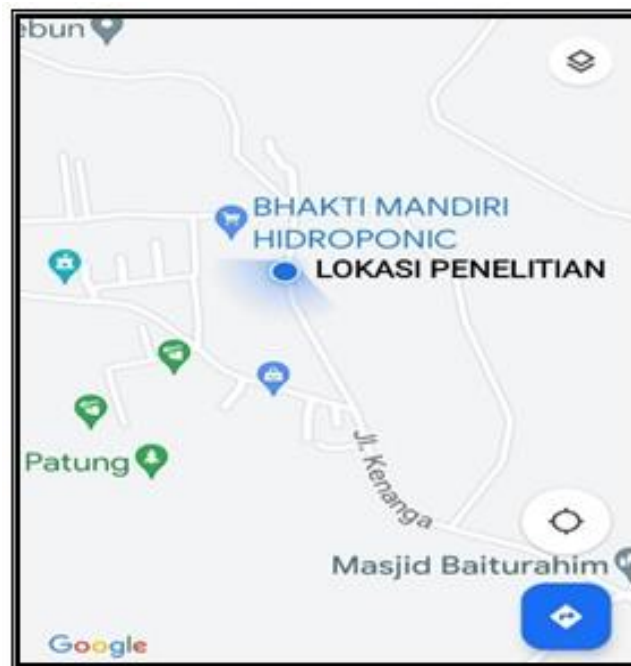


Fig 1. Research Location

➤ Life Cycle Observations

To determine the life cycle of *Hyblaea puera*, it was caught by hand and released on teak plants that had been caged with gauze. Plant confinement was carried out on all parts of the plant to the ground with the intention of preventing insects from leaving and providing a place for insects that lay eggs or pupae on the ground.

The number of plants used was 9 plants that were 12 months old. One plant was inserted as many larvae as possible, with the aim of making it easier to get 4 pairs of male and female imago. The 4 pairs of male and female imago were introduced to plants 2, 3, 4 and 5 to determine the stage and number of eggs of each pair, while in plants 6, 7, 8 and 9 larvae of 3 each were introduced from plants 2, 3, 4 and 5 to determine the larval stage and pupal stage. The life cycle of each treatment was observed every day, i.e. when to lay eggs and how many eggs. Eggs were collected with a brush and collected in a petri dish. Eggs were counted and photographed using a microscope. Other observations were where the eggs

were laid, when they hatched, what came out of the hatched eggs (larvae or nymphs), how old the larvae or nymphs were, how old the pupae and imago (adults) were. In addition, the morphology of each stage is recorded such as size, colour, shape, limbs and activity.

III. RESULTS AND DISCUSSION

The classification of *Hyblaea puera* is as follows:

Kingdom: Animal
 Phylum: Arthropoda
 Child phylum: Mandibulata
 Class: Insecta
 Sub class: Endopterygota
 Ordo: Lepidoptera
 Sub ordo: Ditrysia
 Family: Hyblaeidae
 Genus: *Hyblaea*
 Species: *Hyblaea puera*

A. Moth

The *Hyblaea puera* moth has a slender body shape with two pairs of wings, body length 18 mm, wing span 31 mm, front wing colour pattern grey, rear wing dark brown with orange spots.

Husaeni (1988) suggests that *Hyblaea puera* moths are small, with a wingspan of about 30-40 mm, various front wing colours, namely grey, brown and red equipped with dark bands and dark brown hind wings with orange curved bands. According to Suharti and Intari (1974), *H. puera* moths are generally brownish in colour, the forewings have darker coloured spots, the hind wings are brownish black with orange spots and two black stains at the tip, the abdomen is brownish with orange segmental bands. The moth is nocturnal and its stage life is 10-13 days.

B. Eggs

Hyblaea puera eggs are greenish-white in colour, laid one by one on the undersurface of the leaf, one by one on the lower surface of young leaves and close to the leaf bones, the egg stage is 2-3 days old, the same as found by Suharti and Intari (1974). One female can lay 536-608 eggs. According to Suratmo (1982), Husaeni (1988), female moths lay as many as 500-600 eggs and even up to 1000 eggs.

C. Larvae

The newly hatched eggs are called larvae and are greenish-yellow in colour, with a black head. In further development it turns reddish grey, equipped with short hairs, the larval body is 26 mm long and 4 mm wide. The larval stage is 9-11 days old, active at night and feeds mainly on leaves, while veins and leaf bones are not eaten.

Newly hatched larvae are greenish yellow, black head, adult larvae are reddish grey, equipped with short hairs, larval body length is 25-35 mm, larval stage is 10-15 days old and active at night (Anonymous, 1992).

Suharti and Intari (1974) suggested that at first the young larvae eat the soft parts of the leaves by leaving the veins and leaf bones, the larval stage is the only destructive stage of the existing stages. After hatching, the larvae forage by dispersing.

D. Pupa

The pupa stage is 4-5 days old, dark brown to blackish in colour, encased in folded leaves, 16 mm long and 5 mm wide.

The pupae found are almost the same as those found by Husaeni (1988), namely pupae aged 5-13 days, dark brown to blackish in colour, body length of about 20 mm, located on the folded leaves and according to Anonymous (1992), the pupal stage is 5-7 days old on the folded leaves.

IV. CONCLUSION SUGGESTION

The life cycle of *Hyblaea puera* is as follows:

- Egg stage 2-3 days, larva 9-11 days, pupa 4-5 days and imago (moth) 10-13 days.
- The number of eggs produced by female *Hyblaea puera* is between 536-608 eggs.
- *Hyblaea puera* adults are active at night from 19.00 to 21.00.
- *Hyblaea puera* feeds on the flesh of young leaves, leaving the bones and veins of the leaves.

V. ADVICE

Observations are needed in different climatic conditions / seasons to determine the life cycle of *Hyblaea puera*.

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