

FIRST REPORT OF INFESTATION OF THE AGAR DEFOLIATOR *HEORTIA VITESSOIDES* (MOORE) ON THE AGAR WOOD TREE *AQUILARIA MALACCENSIS* BENTH. IN SOUTH INDIA

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ABSTRACT

Massive infestation of the agar defoliator *Heortia vitessoides* (Moore) (Lepidoptera, Pyraloidea, Crambidae) was observed in Thiruvananthapuram and Kollam districts in Kerala on agar wood tree *Aquilaria malaccensis* Benth. (Thymelaeaceae), during February – December, 2022. Of the 119 trees observed in Thiruvananthapuram and Kollam districts, 115 were infested and six of them died due to the pest attack.

Key words: *Aquilaria malaccensis*, *Heortia vitessoides*, Thymelaeaceae, Crambidae, pest, south India, Kerala, damage, death of tree, defoliator, agar wood

Agar wood tree *Aquilaria malaccensis* Benth. (Thymelaeaceae), native to north east India, is known for the essential oil, extracted from the resinous hard wood formed in response to complex biotic, abiotic and physical stress (Naziz et al., 2019). The resinous hard wood of agar is the most expensive wood in the world as the price of agar wood oil is as much as US \$ 50,000 to 80,000 per litre (Pearson, 2007). Assam in north east India is one of the globally important centres of agar wood cultivation and extraction of oil (Naziz et al., 2019). As the climate and soil in Kerala are more or less similar to those of Assam, the tree grows well in the state and there are many small and marginal farmers who have taken up the cultivation of agar wood expecting exorbitant returns. There is a network of such farmers spread across the state. Information on the insect pests of agar wood is limited. Samsuddin et al. (2019) reviewed the insect pests of agar wood plantations. The agar wood defoliator *Heortia vitessoides* (Moore, 1885) (Lepidoptera, Pyraloidea, Crambidae) is the most important pest of the tree (Figs. 1 - 5). The pest causes total defoliation of the trees. Consecutive cycles of defoliation, flushing and defoliation may cause death of the trees. Biology of *H. vitessoides* was studied by Singh et al. (2000) and Rahman (2018). Moore erected a new monotypic genus *Tyspana* for a new species, *T. vitessoides* from Sri Lanka (Moore, 1885). Hampson (1896) treated *Tyspana* as a synonym of *Heortia* Lederer, 1863. *Heortia vitessoides* is distributed in south-east Asia, including Bangladesh, Fiji, Hong Kong, India, Sri Lanka, Taiwan, Thailand and northern Queensland in Australia. In India, *H. vitessoides* has been reported in Arunachal Pradesh,

Assam, Meghalaya, Nagaland, Sikkim, Tamil Nadu and Tripura. In south India, its presence has already been reported in Ponmudi in Thiruvananthapuram District and Asambu Reserve Forest in the neighbouring Kanyakumari District (Veino, 2022). Its host plants include *Aquilaria crassna* Pierre ex Lecomte, *Lagetta lagetto* Nash, *Phaleria lanceolata* Gilg (Robinson et



Fig. 1-5. *Heortia vitessoides*. 1. adult, 2. egg masses, 3. larvae and leaf damage, 4. larva, 5. damaged twig

Table 1. Extent of infestation of agar defoliator on agar wood tree in Thiruvananthapuram and Kollam districts, Kerala

| Locality | GPS coordinates | No. of trees observed | No. of trees infested | No. of trees dead |
|--------------------------------|---------------------------------|-----------------------|-----------------------|-------------------|
| Bonaccord, Thiruvananthapuram | Lat. 8.677699, Lng. 77.157892 | 1 | 1 | 0 |
| Channapetta, Kollam | Lat.8.8856372, Lng. 76.9655662 | 20 | 20 | 0 |
| Chavara, Kollam | Lat. 8.9958117, Lng. 76.5451889 | 75 | 75 | 3 |
| Edava, Kollam | Lat. 8.7725190, Lng. 76.6848140 | 11 | 11 | 3 |
| Pulimath, Thiruvananthapuram | Lat. 8.737004, Lng. 76.874366 | 10 | 6 | 0 |
| Thonnakkal, Thiruvananthapuram | Lat. 8.633435, Lng. 76.859460 | 2 | 2 | 0 |

al., 2010), *Aquilaria malaccensis* (Singh et al., 2000) (all Thymelaeaceae) and *Rhus* L. sp. (Anacardiaceae) (Herbison-Evans & Crossley, 2010). Law et al. (2022) presented a chromosomal-level assembly for *H. vitessoides*, consisting of a 517 megabase (Mb) genome assembly. Qian et al. (2023) showed that *Metarhizium anisopliae* (Metschn.) Sorokin, can effectively kill the gregarious larvae of *H. vitessoides* through direct contact and horizontal transmission.

MATERIALS AND METHODS

Massive infestation of the agar defoliator was observed in Thiruvananthapuram and Kollam districts in Kerala on agar wood tree during February – December, 2022. Field visits were carried out to assess the nature and extent of damage. A voucher specimen of *H. vitessoides* (Accession number: NIM/NBAIR/LEP/HEOR/30522) is deposited in the ICAR-National Bureau of Agricultural Insect Resources, Bengaluru.

RESULTS AND DISCUSSION

Infestation was recorded at Bonaccord, Pulimath and Thonnakkal in Thiruvananthapuram district, and Channapetta, Chavara and Edava in Kollam district (Table 1; Fig. 1-5). All the trees examined were affected, except four out of 10 in Pulimath. In Chavara, of the nearly 75 trees, three died due to the infestation, while in Edava three trees out of 11 were lost. Eggs were observed in masses (Fig. 2) on the abaxial surface of tender leaves. The larvae (Figs. 3, 4) webbed the leaves together and fed on the leaves (Fig. 5). In most cases, defoliation was complete and the tender branches dried up. This is the first report of infestation of *H. vitessoides* on *A. malaccensis* in south India. As the cultivation of

agar wood tree is gaining popularity in Kerala, there is an urgent need to develop sustainable management measures, including cultural, biological and chemical methods.

ACKNOWLEDGEMENTS

Anoop P. Balan, BAM College, Pathanamthitta confirmed the identity of *A. malaccensis*.

FINANCIAL SUPPORT

No funding was received for this work.

AUTHOR CONTRIBUTION STATEMENT

PKD conceptualized the study, identified the pest, carried out field work and prepared the first draft of the manuscript. TS carried out field work, survey and revision of the manuscript.

CONFLICT OF INTEREST

No conflict of interest.

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(Manuscript Received: January, 2023; Revised: June, 2023;

Accepted: June, 2023; Online Published: July, 2023)

Online First in www.entosocindia.org and indianentomology.org Ref. No. e23074