

## Antifeedant Properties of Tree Born Oil Seeds (TBO'S) Against Teak Defoliator, *Hyblaea puera* Cramer\*

Plant products are the indigenous products with medicinal, insecticidal and antifeedant activities. Among the plants, Tree Borne Oil seeds (TBO'S) in medicine are well recognized. The Tree Born Oil seeds Viz., *Azadirachta indica* A.Juss, *Jatropha curcas* Linn and *Pongamia pinnata* Linn are acting as source of medicine. The parts of these tree species were utilized to know their insecticidal properties in this study. In the literature, only very few reports could be found that deal with the efficacy of plant products as an antifeedant against forest pests. Mathur (1960) opined that about 46 plant species are useful in the control of teak skeletoniser, *paligha machaeralis* Walker. Meshram (1995) reported insecticidal property of natural plant extracts against the larvae of teak skeletoniser. However, no report is available on the antifeedant property of plant products against *Hyblaea puera*. Cramer. *Hyblaea puera* is a prime defoliator of teak (*Tectona grandis* L.) where it causes total defoliation during outbreak. It causes loss of 44.1 per cent of the wood volume increment (Nair *et al.*, 1996). Hence, the present investigation was carried out to know the antifeedant properties of tree born oil seeds against *H. puera* for its management.

Extracts of tree born oil seeds were prepared and evaluated against third instar larvae of *H. puera* for their antifeedant property. Larvae were collected from the foliage of teak and reared in the laboratory by providing fresh leaves of teak as feed. Food supply was stopped a day prior to the starting of the experiment so as to starve the larvae. To find out the efficacy of extracts, tender leaves of teak were collected from the field and then washed with tap water before treatment. The extracts having concentration of 0.5, 1.0, 1.5 and 2.5 per cent were sprayed uniformly on the teak leaves by hand atomizer and then air dried.

Single third instar larvae was released on to each treated leaf having 150 cm<sup>2</sup> leaf area which is approximately equal to maximum leaf area fed by the third instar larvae in its life period. The treated leaves were maintained in a rectangular insect rearing plastic box measuring 30 x 10 cm and fastened with rubber band. After 24 h of release, the leaf area consumed by the larvae was recorded by using the leaf area meter.

The results based on the leaf area consumption by the third instar larvae of *H. puera* showed that the mean leaf area consumption varied from 6.5 to 96.6 cm<sup>2</sup>. (Table-1). Among the extracts evaluated *Azadirachta indica* seed extract was most effective in minimizing the leaf consumption (6.5 cm<sup>2</sup>) and was significantly different from rest of the treatments. Seed extract of *Jatropha curcas* recorded 15.5 cm<sup>2</sup> leaf area consumption and on par with leaf extract of *Melia azadirachta* (15.9 cm<sup>2</sup>), *A. indica* (16.1 cm<sup>2</sup>) and *P. pinnata* (20.4 cm<sup>2</sup>). Further, it found significantly different from leaf extracts of *J. curcas*. However, all the treatments were statistically superior over untreated check as it recorded 96.6 cm<sup>2</sup> leaf area consumption (Table1).

Different economic parts of extracts evaluated showed significant difference in minimizing the leaf area consumption. Seed and leaf extracts of *A. indica* recorded 6.5 and 16.1 cm<sup>2</sup> leaf area consumption, respectively and differed significantly with each other. Significant difference in leaf area consumption was recorded when seed (15.5 cm<sup>2</sup>) and leaf extracts (25.9 cm<sup>2</sup>) of *J. curcas* evaluated. The leaf area consumption was inversely proportional to the concentrations of the extracts. Treatment with 2.5 per cent *A.indica* seed extract resulted in lowest leaf consumption (3.5 cm<sup>2</sup>) followed by 1.5, 1.0 and 0.5 per cent concentrations which recorded 6.3, 7.5 and 8.6 cm<sup>2</sup> leaf area consumed, respectively.

Table 1. Efficacy of extracts of tree born oil seeds on feeding ability of third instar larva of teak defoliator, *Hyblaea puera* Cramer

Plant species	Parts used	Mean leaf area consumed (cm <sup>2</sup> )				Mean
		0.5	1.0	1.50	2.50	
<i>Azadirachta indica</i> A. Juss	Seed	8.6	7.5	6.3	3.5	6.5
<i>Azadirachta indica</i> A. Juss	Leaf	25.6	21.6	9.2	8.1	16.1
<i>Melia azadirachta</i> Linn.	Leaf	19.0	17.7	12.3	14.6	15.9
<i>Jatropha curcas</i> Linn	Seed	33.5	18.8	5.5	4.2	15.5
<i>Jatropha curcas</i> Linn	Leaf	48.8	35.6	12.1	6.9	25.9
<i>Pongamia pinnata</i> (Linn)	Leaf	42.0	20.2	12.6	6.65	20.4
Untreated check	-	98.0	121.0	82.3	85.00	96.6
SEm±						1.76
CD at 0.01%						6.79
CV (%)						14.40

The results of the present investigation are of immense importance in the insect pest control, considering their harmless and pollution free implications on the environment and further avoiding the operational and residual hazards that involve in the use of organic and inorganic insecticides.

In the literature, only very few reports could be found that deal with the efficacy of plant extracts as antifeedant. Antifeedant property of natural plant products was reported only on teak skeletoniser, *P. machaeralis*. The present

investigation is a new study on the antifeedant property of Tree Born Oil seed (TBO's) as an antifeedant against *H. puera*. The results supported by Mathur (1960) and Chatterjee and Sebaestin (1965). Meshram (1995) reported the antifeedant property of different medicinal and natural plant products against teak leaf skeletonizer (*P. machaeralis*), in which, it was concluded that *A. indica* was most effective and potent antifeedant followed by seed extract of *J. curcas* and the results are comparable with the present investigation.

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## References

- CHATTERJEE, P.N. AND SEBASTIN, V.D., 1965, The feeding habits of larvae of *Hepalia machaeralis* Will, the teak leaf skeletonizer on the leaves of *Lantana camera* Linn. and suggestion for evolving a new insecticides. *Indian Forester*, **9** : 200-202.
- MATHUR, R.N., 1960, Pests of teak and their control. *Indian Forester*, **10** : 43-65.
- MESHARAM, P.B., 1995, Evaluation of some medicinal and natural plant extracts against teak skeletonizer *Eutectona machaeralis* Walker. *Indian Journal of Forestry*, **12** : 528-532.
- NAIR, K.S.S., SUDHEENDRAKUMAR, V.V., VERMA, R.V., CHACKO, K.C. AND JAYARAMAN, K., 1996, Effect of defoliation by *Hyblaea puera* and *Eutectona machaeralis* (Lepidoptera) on volume increment of teak. *Proceedings of IUFRO Symposium on Impact of Diseases and Insect Pests on Tropical Forests*, pp. 257-273.