

Host Plant-*Antheraea Mylitta* Interactions and Its Effect on Reproductive and Commercial Parameters



S.S. Rath*, G.S. Singh, S.S. Singh, M.K. Singh and N.B. Vijayaprakash

Central Tasar Research and Training Institute

Piska Nagri

Ranchi-835303 (Jharkhand); India

Abstract : Impact of food plant on reproductive and commercial parameters in *Antheraea mylitta*, a polyphagous insect of economic importance was studied upon feeding the insect larvae on the same host plants for six continuous generations. *A. mylitta* larvae were fed upon *Terminalia tomentosa*, *Terminalia arjuna* and *Zizyphus jujuba* and restricted them to the same host plant for six generations to document the quantitative improvement in reproductive and commercial parameters. The parameters showed significant improvement in all the host plants studied over their respective controls. Fecundity among the reproductive parameters was highly improved than others (85.9% in *T. tomentosa*; 58% in *T. arjuna* and 49.7% in *Z. jujuba*). Likewise in commercial parameters, the shell weight in male showed the highest improvement (by 52.9%, 45.8% and 42.1% in *T. tomentosa*; *T. arjuna* and *Z. jujuba*, respectively). On the other hand, the shell ratio percentage in female recorded the lowest improvement. The values for all characters were recorded a decline in *T. arjuna* and *Z. jujuba* fed ones over *T. tomentosa*, except that of shell ratio percentage in female has registered an increase in *Z. jujuba* fed. The study thus revealed the comparative superiority of *T. tomentosa* over *T. arjuna* and *Z. jujuba*.

Key words : Host plant, *Terminalia tomentosa*, *Terminalia arjuna* and *Zizyphus jujuba*, *Antheraea mylitta*.

Introduction

Antheraea mylitta is wild and polyphagous. It thrives better upon *Shorea robusta*, *Terminalia tomentosa*, *Terminalia arjuna* and *Zizyphus jujuba* where its reproductive and commercial parameters are expressed suitably. But the extent of racial adaptation of this insect in nature upon these host plants is not known fully. Larval feeding in non-feeding adult insects is an active and dynamic process, and the amount, rate and quality of food eaten has an immense effect on growth, development and reproductive potential (Slansky and Scriber, 1985; Rath, 2005). Insects attain their functional optima through intake and growth target (Raubenheimer and Simpson, 1999) and any change in intake and growth targets will lead to physiological disturbance affecting at its performance level. Both reproductive and commercial parameters vary greatly in *A. mylitta* owing to differences in host plants (Rath, 2000; Rath *et al.*, 2000, 2006). Though a good number of works were attended in the past to study the quantitative aspect of the nutrition (Ojha *et al.*, 2000; Rath *et al.*, 2000, 2004; Sinha *et al.*, 2000) attention were lacking to evaluate the long time interaction of a definite host plant and *A. mylitta* to study its effect on the improvement in the reproductive and commercial parameters in this polyphagous insect, which is the aim of the present investigation.

Materials and Methods

Antheraea mylitta Drury (Lepidoptera: Saturniidae) of eco-race Daba Bivoltine was used as the experimental animal owing to its high exploitation potential and locally available host plants like *Terminalia tomentosa*, *Terminalia arjuna* and *Zizyphus jujuba* were selected for the study. The newly hatched out silkworm larvae (fresh and healthy) were brushed upon different host plants. The larval population was maintained at 5000 in each host plants and proper care was taken to avoid any starvation loss and its affect on various parameters (Rath, 2000; Rath *et al.*, 2004). The rearing was conducted during July-August, and the cocoons harvested were processed separately (host plant-wise) for preparation eggs, which were reared during September-November upon the same host plant as done previously. Thus three different lots were maintained, one for each host plant. The parameters (both reproductive and commercial) recorded after the first two generation was treated as control. The process of egg preparation and rearing were repeated so as to complete six generations in the same host plant with out any interchange in host plants in between. At the end of sixth generation different reproductive parameters (female pupa and moth weight, fecundity, number of eggs laid per unit female moth weight and hatching %) and commercial parameters

* **Corresponding author :** S.S. Rath, Central Tasar Research and Training Institute, Piska Nagri, Ranchi-835303 (Jharkhand); India; E-mail: ssrathlee@rediffmail.com

Table 1. Change in reproductive and commercial parameters of *Antheraea mylitta* upon restricting to monophagous condition.

Food plant	Condition	Reproductive parameters					Commercial parameters					
		Av. Female pupa wt. (g)	Av. Female moth wt. (g)	Av. Fecundity (nos.)	No. of eggs laid/g wt. female moth	Hatching %	Cocoon weight (g)		Shell weight (g)		Shell ratio (%)	
							Male	Female	Male	Female	Male	Female
Tt	Control	11.5	5.1	175.86	34.63	86.4	9.81	13.45	1.49	1.95	15.01	14.55
	P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Exptl.	14.68 (27.67%)	7.16 (40.35%)	326.86 (85.86%)	45.31 (30.81%)	93.23 (7.34%)	12.10 (23.31%)	17.29 (28.53%)	2.27 (52.92%)	2.61 (33.57%)	18.79 (25.20%)	15.14 (4.11%)
Ta	Control	10.96	4.96	162.29	32.72	78.99	9.52	12.64	1.36	1.68	14.26	13.27
	P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NS
	Exptl.	13.42 (22.44%)	6.44 (29.73%)	256.43 (58.01%)	39.76 (21.5%)	91.56 (15.91%)	11.39 (19.55%)	15.68 (24.06%)	1.98 (45.8%)	2.26 (34.09%)	17.41 (22.09%)	14.38 (8.33%)
Zj	Control	7.84	4.34	128.71	29.63	68.3	7.79	9.41	1.13	1.57	14.44	16.65
	P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NS
	Exptl.	9.22 (17.64%)	5.25 (20.91%)	192.71 (49.72%)	36.7 (23.82%)	79 (15.67%)	9.44 (21.17%)	11.09 (17.86%)	1.6 (42.10%)	1.86 (18.96%)	16.95 (17.42%)	16.81 (1.00%)
CD at 5%	Control	0.389	0.515	15.772	2.066	5.626	0.379	0.357	0.079	0.163	1.105	1.399
	Exptl.	0.775	0.464	36.72	3.177	3.342	0.389	0.829	0.142	0.207	1.263	1.23

Tt- *T. tomentosa*, Ta- *T. arjuna*, Zj- *Z. jujuba*. Values in parentheses indicates percentage increase over respective controls.

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