

# FIELD TRIAL EXPERIMENT OF ARTIFICIAL DIET ON TASAR SILKWORM, *Antheraea mylitta* D.

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## ABSTRACT

An indoor and outdoor experiment were conducted at Shyamsunderpur, Mayurbhanj, Odisha to test the efficacy of the artificial diet, Tasar Amrit on the young aged *Antheraea mylitta* silkworm larvae. The results of the experiment reveal that survival and effective rate of rearing (ERR) was higher when larvae were brushed on TASAR AMRIT (75 and 42.45%) in contrast to complete outdoor rearing (44 and 33.56 %). Uniform moulting was also observed in the larvae fed with Tasar Amrit.

## INTRODUCTION

Tasar silk is produced by a sericigenous insect known as *Antheraea mylitta* D. The insect is polyphagous in nature and feeds on Arjun (*Terminalia tomentosa*), Asan (*Terminalia tomentosa*) and Sal (*Shorea robusta*). The silkworms are reared completely in outdoor condition over these host plants. Outdoor rearing cause heavy mortality to the young stage worms (I to II instar larvae) due to pest, predators and disease attack which the small worms could not cope with and major population (35-40%) die. Further the availability of the ideal foliage for the early stage larvae are also very difficult in the nature as a result the small worms are compelled to chew matured foliage which are not easily digestible by them ultimately they die. Wild silk moth artificial diets (TSFs) were earlier developed for *Antheraea yamamai* and *Antheraea pernyi* (Fukuda, 1987; Higuchi, 1990). Later, Akai *et al.*, 1991 have been able to rear tasar silkworm *Antheraea mylitta* on artificial diet of oligidic nature in laboratory

condition. Semi-synthetic diet has also been developed for tasar silkworm by Kanika *et al.*, (2008) but it was too costly and not within the reach of the farmers.

## MATERIALS & METHODS

Keeping in-view the problem, Central Tasar Research & training Institute, Ranchi has evolved an artificial diet, named Tasar Amrit, for the early stages larvae. The recently formulated diet consist the following: Shade dried leaf powder of Asan/Arjun/Sal, Rajma powder., Soyabean meal, Spirulina algae powder, Ascorbic acid, Sorbic Acid, Methyl Paraben, Cholesterol, Chlorophenacol, Vitamin B complex mixture, Agar-agar type and water..

The diet has been prepared and tested at different field laboratories at CTR&TI, Ranchi , the that Data reveals that young age survival and effective rate of rearing (ERR) was higher when larvae were brushed on TASAR AMRIT (88.82 and 46.95%) in contrast to indoor rearing on fresh leaf (83.45 and 42.81%) and complete outdoor rearing (68.76 and 36.56 %).

Based on these findings the diet has been supplied to Research Extension Center, Bangriposi, Odhisa for conducting field trial of the Tasar Amrit. The field trial was conducted during III Crop 2011 in November at Tasar Rearing Cooperative society, Shyamsunderpur.

The field trial was initiated with 100 disease free layings of Daba ecorace of *Antheraea mylitta*. The laying were allowed to hatch at a room temperature i.e. 28° C side by side the preparation of rearing of the newly hatched larvae were also done.

A bamboo rack of 6 feet x 6 feet with 6 selves was prepared. 12 Rearing trays of 3 feet x 2 feet with nylon net base were also prepared. The diet supplied by CTR&TI, Ranchi was kept under refrigerator at 4-5° C. The rearing trays were disinfected with diluted alcohol solution. On the upper side of the inner core of rearing tray a brown tape of 2 inch was pasted and grease was applied on the tape in order to restrict the outgoing young silkworms.



Fig 1. Bamboo rack with selves



**Fig 2. Disinfection of rearing tray**

Soon after hatching the young silkworms were given feeding of thin strips of tasar amrit. In one tray 30 hatched larvae were brushed on the diet. The diets were given twice a day. Indigenous methods were applied to maintain the humidity in order to protect the diet from desiccation. The rearing was conducted in a proper hygienic condition with timely removal of litters and unfed diet residuals. The rearing was conducted till 12 days in which the young stage larvae passed two moults. After second moult the larvae were brushed outside on the Arjuna plants. Side by side a control lot of 100 dfls were also maintained in which the hatched silkworms were brushed directly outside on the Arjuna plantation.





**Fig 3. Artificial diet - Tasar Amrit**



**Fig 4. Hatched silkworm larvae are fed on Tasar Amrit**

## RESULTS

Rearing on TASAR AMRIT resulted comparatively higher chawki (up to II moult) survival (75 %), uniform larval growth (82% )moult out within 3 hours in higher larval weight (0.458g) comparison to outdoor rearing survival 44%, 28% moult out in 3-4 hour and larval weight 0.381g respectively, in comparison to fresh leaf fed larvae in outdoor conditions.

Data reveals that young age survival and effective rate of rearing (ERR) was higher when larvae were brushed on TASAR AMRIT (75 and 42.45%) in contrast to complete outdoor rearing (44 and 33.56 %).

### **Advantages of Rearing on Tasar Amrit**

1. Rearing on TASAR AMRIT requires minimum handling of larvae in comparison to minimum three times/day leaf change in Indoor conditions (existing indoor rearing technology), hence labor cost gets reduced.
- 2, Self life of tasar silkworm feed is 25-30 days at  $26\pm 2$  °C (room temperature) and one year at  $4\pm 2$ °C.
3. By using our innovative product, young age rearing of tasar silkworm can be conducted at farmers living premises by farmers; it does not require any sophisticated instruments hence the technology is farmer's friendly and easy to handle.
4. TASAR AMRIT cost is Rs. 650/- for 100 dfls. Additional minimum income of a farmer is Rs. 2000-2500/- by spending Rs. 650/- on TASAR AMRIT for young age rearing in comparison to presently exiting nylon net technology.

It is apparent that young age rearing on TASAR AMRIT gave better results and improvement in cocoon characteristics than the completely outdoor rearing on fresh leaf up to 2<sup>nd</sup> instar. It is also help full to avoid unfavourable condition during I crop rearing (June-July) and maintenance of stock of precious eco-races to increased production of tasar cocoons.

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