

**THE INFECTED THAT DEHYDRATION DURING DIAPOUSE OF EMERGENCE
MORALITY & ADAPTABILITY OF MONO BI & TRIVALENT VARIETY OF
TASAR SILKWORM**

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Abstract

Normal moths of sexes emergence and showed normal behavior i.e. flight copulation survival & then was no visible structural deformity. The bi & Tri cocoons were more susceptible to dehydration injury reflected by mortality. They could neither fly nor copulate. It is there for optimal moisture requirement is more critical factor for pupal development in bi & Tri varieties than the monovalent ones, which has better adaptability for water conservation & utilization during development.

Key words :-Tasar silkworm monovoltine, bivoltine, trivalentine, dehydration, diapause adaptability.

I. Introduction :-

The tsar silkworm mostly confined to tropical belts of India where physical factors like temp, humidity, wind, velocity, photoperiod etc. Fluctuate widely during different seasons. It passes through a period of diapause. (Humidity requirement during diapause has not been extensively studied in tropical sericigenous insects). The dehydration of an important cause of abnormal development and the one set or breakdown of diapause in insects. A mylitta was felt necessary to study & compare the effects of dehydration in diapausing pupal in the three valtine varieties particularly their emergence mortality adaptblity.

II. Metrical & Methods –

A mylitta with live papue were obtained from the government raw material center chaibasa Jharkhand . All three (mono Bi & Trivalent of cocoon) varieties were segregated into batches. One batch of each variety was kept in normal laboratory condition (warm from 25 ± 1 C & $75 \pm 5\%$ RH during December to 27 ± 1 C & $85 \pm 5\%$ RH during May/June with usedphotoperiod) treated as control. The next experiment batches were subjected to dehydration stress by keeping them in different condition adjusted amount of fused calcium chloride to maintain an RH of 20%. The RH of the desiccators containing fused calcium chloride were measured using a hygrometer (Springfield, USA). Initially the weight of both control & experimental cocoons were taken. For the study 25 cocoons for control & 20 cocoons as experimental in mono, 17 cocoons for control & 25 for experimental in bivolt & for trival 30 cocoons for control & 15 cocoons for experimental parpus.

III. Result :-

The result indicate that rate of dehydration or moisture lass under normal & Experimental condition as mentioned by the change in weight of cocoons. The weight change profile under normal & experimental condition in mono voltine variety was from 16.98 to 16.06 g & from 16.46 to 14.40 g respectively. The Bivoltine the weight changes from 12.32 to 11.64 g in normal condition & 13.70 to 11.20 g in experimental condition & in trivoltine from 10.78 to 9.98 g in normal condition & from 10.02 to 2.50 g in experimental conditions (table - 1).

The rate of mortality under dehydration stress was maximum in trivoltine (100%) where as bivoltine about 10% & in normal time mortality had not occurred at all.

However the moth which emerged of under experiment conditions from the cocoons of trivoltine variety were small deformed with rudimentary wings & could neither fly nor copulate whereas the percentage of survival growth pattern & emergence behavior of the moths from mono voltine variety were normal. In bivoltine emergence was intermediate the mortality was higher & the moths emerged were abnormal in their wing size, wing expansion, flight ability & copulation.

Table 1. – Change in weight of monovoltine, brvoltine, trivoltine cocoons of *A.mylytta* during development under normal conditions & dehylrtn stress

Pre. Age. pupac In month.	Normal condition (control)		Of Dehydration stress			
	Mono Voltine ± S.E.M. (g)	Bivoltine ± S.E.M. (g)	Trivoltine ± S.E.M. (g)	Monovoltine ± S.E.M. (g)	Bivoltine ± S.E.M. (g)	Trivoltine ± S.E.M. (g)
6	16.987±0.358	12.738±0.704	11.718±0.473	16.470±0.474	13.706±0.572	10.486±0.914
5	16.947±0.358	12.484±0.654	10.981±0.440	16.226±0.475	13.170±0.570	9.154±0.940
4	16.795±0.358	12.345±0.661	10.891±0.437	15.971±0.478	12.776±0.572	8.454±0.950
3	16.644±0.360	12.241±0.662	10.824±0.432	15.629±0.482	12.450±0.570	7.430±0.982
2	16.532±0.358	12.101±0.660	10.690±0.426	15.289±0.480	12.136±0.569	5.950±0.979
1	16.230±0.357	11.903±0.654	10.432±0.420	15.661±0.476	11.668±0.567	3.712±0.605
0	16.075±0.350	11.830±0.660	10.261±0.442	15.408±0.480	11.420±0.607	2.389±0.248

I. Discussion :-

The mono veltines seem to be the most resistant variety to dehydration stress which has

been compensated by prolonging its development period by undergoing much longer diapause. The bi & trivoltine being relatively faster in their development and annual repetitive life cycle metabolically seems to be more dependant on optimum moisture for their development.

The result also indicates that the optimum moisture availability is critical for the development of the tri Voltine variety. The humidity loss critical value may hamper the development, growth & emergence of bi & trivoltine variety of *A. mylitta*. The water loss tolerances vary considerably between arthropods (ARLIAN & VESELICA, 1979) many arthropods regulate their body water content between relatively narrow critical limits (COOPER, 1985; SELL & HOULIHAN, 1985).

The larval development of *Galleria mellonella* has been reported to be higher in 80% RH than dry one (CHOUVIN & CHOUVIN, 1985). ROTHERAY (1986) normal emergence of *U. vardu* from its gall. Fall of humidity below a critical level (as low as 18% RH) affects the pupae of *A. mylitta* in their differentiation development & emergence behavior.

Analysis of variance shows that the variations between control & experimental groups was significant ($P < 0.001$).

Hence all other factor, humidity during development may be highly influential one an emergence.

References

- ARLIAN.L.G. & M.M.VESELICA (1979) water balance in insects and Mites. Comp. Biochem. Physiol. 64() A.191 -200.
- CHOUVIN, G & J CHOUVIN (1985) The influence of relative humidity on larval development and energy content of *Galleria mellonella*(2) (Lepidoptera : Pyralidae). J.stored prod. Res. 21(2). 79- 82.
- COOPER.P.D.(1985) seasonal change in water budgets in two free - ranging tenebrionid beetles, *Eleodes aronata* and *Cryptoglossa Verrucosa* Physiol. Zool., 58, 458 – 472.
- ROTHERAY G.E.(1986) Effect of moisture an emergence of *Urophora cardui* (L). (Diptera : tephritidae) from its gall on *cirsium arvense* (L.). Entomologist's Gazette, 37, 41 – 44.
- SFLL, D & D.F. HOULBIAN (1985)water balance and rectal absorption in the grasshopper oedipoda. Physical. Ext. 10, 89 – 103.