

SUMMARY

Trichoplusia ni of order lepidoptera is a defoliator of *Brassica oleracea* var capitata in Uttar Pradesh. Adults are nocturnal and show clear sexual dimorphism. The male being slightly larger in size and higher in body weight than the female. The fore wings are mottled gray brown where as hind wings are light brown at the base with the distal portion dark brown. The fore wings beared silver white spot. The sex ratio (male: female= 1.68:1). The total life span of the male moth is higher than the female one with an average of 7.62 ± 0.22 . A mated female, with a fecundity of 300 to 400 eggs in 3 to 5 days, lays eggs in patches in a very characteristic pattern in between the leaves. The eggs are rounded, white yellowish in colour and with shining appearance. The eggs hatched after 3 to 5 days of incubation period. A small dusty white larva comes out after hatching which is completed within 1.30 to 2 hours.

The life of larval period in *Trichoplusia ni* completed in 6 instars in 20.31 ± 0.52 days. The 6 larval

stages determine by applying of Dyar's law. The newly hatched larvae congregated near the egg mass and started feeding on empty egg shell.

After that they start feeding over the leaves of *Brassica oleracea* var capitata. Among the caterpillars, the maximum mortality was recorded in 1st instar stage and the minimum mortality in the IVth instar stage. The VIth instar caterpillar congregated in between the leaves of host plant, found a cocoon and entered in the pupal stage through prepupa. The size of VIth instar larvae considerably decreases before pupation.

In the present study different parameters pertaining to food utilization of caterpillar of *Trichoplusia ni* i.e. body weight, tissue growth, consumption, egestion and assimilation. They show successive increase from Ist to last instars at all the three gradient i.e. live weight, dry weight and energy basis on an average basis. However the male and female instars show variations in different stages of development.

The male caterpillars with higher values of body

weight from Ist to VIth instars, at all the three gradients moved to be better herbivore than the female in the food chain.

In its tissue growth the male caterpillar is observed superior over the female at succeeding instars except the IVth on live weight basis, at Ist, IInd and Vth instar on dry weight basis and at Ist, Vth and VIth instars on energy basis. In the remaining instar stage, the female superseded the male.

In throughout larval period it has been observed that a male larva has higher tissue growth value on live weight and energy basis, but significantly, the female recorded better tissue growth than male on dry weight basis.

Corresponding to the body weight, the consumption by the caterpillars increase successively from Ist to Vth instar and also, the male retained superiority over the female at all the three gradients, indicating the higher rate of metabolism in the former than the later.

Analytical data shows that a unit mg of consumed cabbage provide 2.80 calories of body weight.

The maximum consumption of food in the last two instars (143.272 ± 22.448 , 329.591 ± 27.994) shows i.e. lot of food energy used for histogenesis and future development in the pupal stage.

The egestion of male caterpillar remain more than the female from second to VIh instars while the female in Ist and VIth instar excreted more than the male.

Most of the food consumed by the caterpillar is assimilated into the body. Though male assimilated more during Ist, IIIrd and VIth instars on live weight basis. On dry weight and energy basis it assimilated more in Ist, Vth and VIth instars over the female.

Moreover, in its complete larval span, the male caterpillar achieved higher assimilatory values over the female on live as well as dry weight basis while on the energy basis, the female have little higher assimilatory values over the male.

A large amount of assimilated food is utilized during metabolic processes to support the growth & maintenance of the body of larva.

Unlike food utilization, the parameters pertaining to the ecological growth efficiencies of the caterpillars of *Trichoplusia ni* i.e. efficiency of conversion of ingested food (ECI) efficiency of conversion of digested food (ECO), approximate digestibility (AD), growth rate (GR), and consumption index (CI) have not shown increasing trend.

The ECI & ECD successively increase from Ist to IIIrd instars while ECI & ECD fluctuated in the IVth instars with a sudden decline in both sexes at all the three gradient of live weight, dry weight & energy basis. .

The larva of *Trichoplusia ni* observed with almost constant growth rate (GR) during Ist, IInd & IIIrd instar, which fluctuates in the IVth to VIth instar and decline to the minimum in its last instar on an average live weight basis. The minimum of GR in the last instar is, perhaps, due to the process of histogenesis and histolysis occurring side by side in the larva and entering in pupa.

More over the values obtained for growth rate lie well within the prescribed range of 0.518 ± 0.060 /mg/day for foliage chain of lepidopterous larvae.

The food energy budget of *Trichoplusia ni* shows that out of the total energy consumed by an individual caterpillar 50.69% is assimilated into its body stored in the form of calory.

The caloric values obtained for various developmental stages faeces and host plant leaves for *Trichoplusia ni* fed over cabbage have been in the descending order of larva>pupa>adult>cabbage>faeces.

The energy flow very much correlated to a general trend that the coloric values are always more in caterpillar than the food or egesta. The more calories in the larval stage is probably due to a greater amount of fat in the larva.

In a simple food chain the energy flow from one trophic level of producers, to the other trophic level of primary consumer or herbivores different larval stages of *Trichoplusia ni* is illustrated in Plate (10-12).

The total consumption throughout the larval period is observed 1530.65 cal/mg on an average. Male larvae consume more of caloric (1587.14) than the female (1476.20 cal) of the total energy consumed that is 1587.14 is assimilated by a caterpillar larvae on an average. However, with shorter larval life (19.66days) the female larvae assimilated more calories (51.21) than the male (48.79%).