

Table 1. Protein content of midgut

Insect stages	$\mu\text{g}/\text{mg}$ fresh tissue	$\mu\text{g}/\text{gut}$
24 h larva	8.96 ± 0.17	229.57 ± 12.87
48 h larva	12.57 ± 0.12	295.00 ± 12.71
72 h larva	13.33 ± 0.14	340.27 ± 31.82
120 h larva (pre-pupa)	53.68 ± 3.02	521.8 ± 22.63
Pupa (0 day)	41.11 ± 1.69	411.09 ± 16.86
Pharate adult	17.27 ± 0.15	73.88 ± 4.34
Adult	8.06 ± 0.22	46.29 ± 10.00

Five samples each were used in the estimations and the results are the mean of the five determinations with standard deviations.

stages are given in Table 1. The concentration of proteins in the midgut epithelium increased from 24 h to 120 h larva. But it declined sharply at the time of transformation of pupa to adult. Changes observed in the protein content of midgut tissue during the period of development of 6th instar larva of *S. mauritia* indicate that midgut tissue acts as a storage organ for proteins during its late larval and early pupal stages.

The midgut forms the major part of the gut which is a prominent organ in the larva of lepidopterous insects. It undergoes considerable reduction in size during larval-pupal transformation. In silkworm, when the larva stops eating before cocoon spinning, silk synthesis is maintained at the cost of other tissues, mainly the gut and the integument⁵. Protein from the gut of *Neodiprion sertifer* provides necessary materials for the development of its adult tissues⁶. In *Malacosoma* and *Rothschildia*, fat body is not the only site for protein uptake. The transfer of blood proteins into midgut, heart muscle, accessory gland, ovary and testis occurs at various stages⁷.

In *S. mauritia* the level of proteins in the midgut wall gradually shoots up during larval period when the larva is feeding actively. It has therefore been suggested that the protein synthesized during the larval period is stored in the midgut tissue in the prepupal stage. The fall in the level of proteins in the gut of late pupa and adults of *S. mauritia* points to the utilization of these stored proteins during metamorphosis.

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Concentration of proteins in the midgut epithelium of sixth instar larvae, pupae and adult of *Spodoptera mauritia* Boisduval (Lepidoptera: Noctuidae)

Shikha Nair and U. V. K. Mohamed

Department of Zoology, University of Calicut, Calicut 673 635, India

The protein content increased in the sixth instar larvae from 24 h to 120 h (prepupa), this was the highest level observed which later declined to a minimum in the adult. The midgut tissue as a storage site for proteins has been reported.

PROTEINS stored in tissues like haemolymph and fat body are subsequently utilized for adult growth and development^{1,2}. Midgut is the synthetic site for haemolymph proteins in insects³. Changes in protein level of gut tissue during development have been studied as this has not been attempted so far.

The sixth instar larvae were separated immediately after moulting from the colony reared in the laboratory. The midgut was dissected out in an ice-cold ringer and the gut contents were removed. Protein in the tissue homogenate was precipitated with 80% aqueous ethanol. The precipitate was then successively extracted with ethanol-chloroform, ethanol ether and ether at room temperature and with 0.5 N perchloric acid at 90°C for 15 min. The final residue left on hot acid extraction was dissolved in 0.5 N sodium hydroxide and estimated for protein⁴.

The results of estimation for proteins in the different