

**"THE MORPHOLOGY OF CATERPILLAR OF PAPILODEMOLEUS LINN.
(LEPIDOPTERA PAPILIONIDAE)"**

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ABSTRACT

The study of morphology of Lepidoptera has been a fact of great Charm for the insect lovers. The interest in insects started from behavioral (um-ecological approach, but the need to try understanding that the insects were doing and how they were doing it extended to morpho histology.

Key Words : *Morphology, Catter pillar, LepidopterPapilionidae.*

INTRODUCTION

The thought of getting knowledge of the digestive system in early stages of Lepidoptera has attracted a large number antomists. Simpason (1902).studied the anatomy of the alimentary canal of some Lepidopterous larvae. Ishimori (1924) explained the distribution of Malpighianvassels in the wall of the reetum of Lepidopterous Larvae. Henson (1929) worked on the midgut in the larvel stages of Vanessa urticae,Srivastavas (1959) on the mohphology of the aslimantary canal of the larva of Leucinodesorbonalis deserve attention.Mukerji (1962). studied the anotomy of the mature largva of Acherontiasyk. Krhteen (1968) cited worthy of noting investigations on the anatomy of the head and the alimentary canal of the adult Eriocraniidae.

Luis et al (2022) studied effec t of experimental host plant swifehing on the life cycle of a ferm spore freedingmicromorth of the genus stathmopodaEntomolgia. Xioaling et al (2021) discussed the evalution and genetics of Lepidopteran egg and caterpillar coloration wagner et al (2018) gave parisitism of Lepidopteran defoliators of Urban plants by Palmistichuselacisis. Blandin&Purser (2013) presented evaluation and diversitication of Neotropical butterflies. Blandin et al (2014) cited premieres observations de la chenille de Merphoachilles. Constantino and correndor (2004) studied the biology and merphology of the carry stages of MorphoMacrophthalmus and Mophopeleidesfelaman.

MATERIAL AND METHODL

The caterpillars of different instars of Papiliodemoleuslinn were collected from J.S. University, Shikohabadorchasrd and were reared in glass jars be Maintain the stock.

2.1 MORPHOLOGY

In order to study the morphology of the digestive tract the mature caterpillars were dissected quickly in double distilled water stained mounts of various structures and associated glands were also prepared. For histological studies of different structures and associated glands of the digestive tract, Bouin's fluid was used to prevent the post mortem changes at a minimum. The material was kept in the fixative for about twenty four hours. Paraffin was used for microtomic preparations. A small quantity of bee wax (1:100) was added to paraffin wax to avoid the crystallization in the microtomic sections. The addition also helped in getting the continuous ribbons during sectioning.

Before embedding the material under study was dehydrated in the usual way and cleared up twice in xylol. Then it was placed in a mixture of xylol and wax for over night of room temperature. After it, the material was replaced to the oven at a temperature of 52°C for two to three hours. Two to three changes of pure wax were given for complete removal of xylol. Blocks were also prepared in the usual way to study the different structures. Sections of 6µ thickness were cut with the help of rotating microtome and stained in Haematoxylin and Eosin. Microphotographs were also taken.

3. OBSERVATIONS

3.1 MORPHOLOGY

The digestive tract of mature larva is a simple straight tube of varying thickness extending from the pre-oral cavity to the anus. The average length of the digestive tract is about 3.5cm. It is differentiated into three main regions viz., foregut or stomodaeum, midgut or mesenteron and hindgut or proctodaeum. The stomodaeum and proctodaeum are thin walled in comparison to mesenteron. The gut is supported in the body by muscles and especially by tracheae which form an important element of the connective tissue. The mesenteron is the largest and stomodaeum is the shortest part of the gut. The entire mesenteron is thrown into folds throughout its length. The junction of the mesenteron is clearly marked at the posterior and the anterior ends of the gut which earmarked the proctodaeum and stomodaeum.

The stomodaeum is about 1.0cm in length. The mouth opens into the narrow muscular pharynx which runs into the circumoesophageal ring of the nervous system. After traversing upto the posterior extent of the brain, it slightly broadens to form the oesophagus. The length of the pharynx and oesophagus is about 0.4cm. The oesophagus is a small tubular structure which joins the small pharynx with the crop. The crop is an enlargement of the foregut and measures about 0.6cm in length and is the largest part of the foregut. It is in the form of a pearshaped sac.

The mesenteron is a straight tube of uniform thickness extending from the first abdominal segment to the seventh abdominal segment. It represents the largest part of the digestive tract measuring about 1.45 cm in length. It is marked externally by transverse folds which impart it a striated appearance. It is overlapped by means of malpighian tubules on its dorsal and lateral sides. It is lined by a

transparent, delicate paritrophic membrane.

The proctodaeum extends from the posterior end of the mesenteron to the anus. The proctodaeum measures about 1.05cm in length. It is divisible into by lorus, ileum, colon and vectum. The ileum and the mesenteron are differentiated by means of a strong muscular fold, the pylorus. The average length of the ileum is 0.4cm. The ileum leads to a colon which measures about 0.35cm in length. The colon then joins the rectum at its posterior end which is an enlarged sac and thick walled containing the rectal pads. The rectum in mature caterpillar is almost covered by thin, coiled yellow coloured, malpighian tubules. The length of the rectum is about 0.3cm. The rectum ultimately opens to the exterior by means of anus.

The two labial or salivary glands are tubular structures and are symmetrically placed on both sides of the alimentary canal. These paired structures extend upto the fourth abdominal segment. Each salivary gland measures about 3.4cm in length. Anteriorly each gland lies below the digestive tract upto the 1st abdominal segment after which it extends along the sides of the midgut and forms an 's' shaped band extending upto the end of midgut merged into tracheae and fat bodies. The posterior end finally gets attached to the junction of the midgut and hindgut by a fine thread. Anteriorly the glands open into a narrow duct on each side.

A pair of mandibular glands lie on each side of the anterior portion of the digestive tract. The glands arise from each mandible and extend upto nearly the second thoracic segment.

The Malpighian tubules in the *P. demoleus* larva is composed of 3 Malpighian tubules and an ampulla lying on each side of the digestive tract. The Malpighian tubules are long, thin and yellowish coloured blindly ending tubes arising from near the junction of the midgut and hindgut. In the distal part of the Malpighian tubules are closely associated with the vectum, resulting into a cryptonephridial arrangement of the tubules. The tubules have shown a rich tracheal supply and uric acid granules. Each Malpighian tubule is divisible into proximal, middle, distal and terminal regions.

4. DISCUSSION

MORPHOLOGY

The Malpighian system in the larva of *P. demoleus* is composed of 3 Malpighian tubules and an ampulla lying on each side of the digestive tract. They basically join to give rise to a thin walled sac, the uvater which opens into the ampulla. The similar view has been interpreted by Kumar and Srivastava (1983).

The labial glands of lepidopterous larvae are homologised with the true salivary gland of a generalised insect (Inns 1957) the free end of the labial gland is attached to the longitudinal muscles by means of a fine thread. The presence of such a thread has also been reported by Mathur (1966) in *Achaesia*.

The mandibular glands in the larva employed under study are simple, straight tubes. However, Mukeraji (1962) has reported the presence of nodulated structure in *Achevontia styl.* Generally, the digestive tract of *P. demoleus* comprises of three regions, the stomodaeum, the mesenteron and the proetodaeum. The characteristic feature of the stomodaeum is the absence of pre-ventriculus and gastric caecum. This view has also been discussed by Davey and Trechens (1903).

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