

HISTOPATHOLOGY OF A GRANULOSIS VIRUS OF *PERICALLIA RICINI* F.  
(ARCTIIDAE; LEPIDOPTERA)

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The black headed hairy caterpillar, *Pericallia ricini* F. is a polyphagous pest which feeds on castor, cotton, banana, cucurbits, sunflower and field beans. Jacob *et al.* (1972) reported the occurrence of a granulosis virus disease in this insect. Observations made on the histopathological changes in the virus infected larvae are reported in the present paper.

### Materials and Methods

The larvae used in this study were reared in the laboratory on castor (*Ricinus communis* L.) leaves. A purified suspension of the granules in distilled water was used as the infective material. Third instar larvae were infected by the spot feeding technique (Jacob, 1972). Five microlitres of capsule suspension was applied to each spot and the larvae which had consumed the entire potted areas within four hours were taken for the test and others were discarded. Control larvae were fed similarly on spots of 0.1 per cent teepo) in distilled water. At 24 hours intervals upto 192 hours of the treatment, three larvae each from the inoculated and control groups were selected at random and used for the histopathological preparations. The larvae were killed in hot alcoholic Bouin's solution and allowed to soak for approximately 10 minutes after which the smaller specimens were cut into two and larger ones into three and transferred to cold alcoholic Bouin's fixative for 24 hours (Drake and Mc Ewen, 1959). The fixed specimens were soaked in several changes of 70 per cent ethano! until the yellow colour disappeared, dehydrated in an ethyl acohol-butyl alcohol series and embedded in paraffin according to standard procedures. Longitudinal sections were cut at six microns and stained by an azan staining technique developed by Hamm (1966).

### Results and Discussion

Pathological changes were noticed mainly in the adipose tissue and to a limited extent in hypodermis with scattered infection of tracheal matrix cells. At 24 hours after treatment, signs of infections were noticed in some adipose tissue cells. They showed a slight enlargement of the nuclei and the presence of a network of strands (Fig. 1). The proportion of hypertrophied cells and nuclei in the fat tissue of inoculated larvae increased considerably by 72 hrs. The vacuoles were reduced in number and size. But no inclusion bodies were visible at this stage. All cells within a given tissue were not affected simultaneously. At this satge, hypodermal cells in certain regions also showed hypertrophied nuclei (Fig. 2). Sections made at 96 hrs after inoculation showed the presence of capsules in some cells of the fat

body (Fig. 3), hypodermis (Fig 4), and tracheal epithelium (Fig. 5). The infection progressed further and at 192 hours after treatment, the whole adipose tissue was in advanced stage of infection. In many areas, it had lost its cellular integrity, Hypodermal cells in some regions were also heavily infected and showed signs of disintegration,

Granuiosis in *P. ricini* is a polyorganotropic disease as defined by Martignoni (1954), in which the fat body, hypodermis and tracheal matrix cells exhibit pathologies and are infected by the virus. In general, as pointed out by Huger (1963), fat body is usually the first organ to show pathology in granuiosis. This is also the situation in *P. ricini*. A distinct proliferation of cells of the fat body was reported from *Pseudaletia unipuncta* (Haworth) (Tanada, 1959) and *Trichoplusia ni* (Hubner, Humm and Pschake, 1963). According to Huger (1963), in granuiosis infected larvae, initially the fat body cells begin to proliferate leading to more voluminous fat lobes. This does not occur always as is evidenced in the granuiosis of *P. ricini*. Hughes and Thompson (1951) also made similar observations in a granuiosis of *Sabulodes caberata* Guenee.

### Summary

Histopathology of a granuiosis of the larvae of *Pericallia ricini* F., is described. Adipose tissues were the major sites of virus infection. Moderate infection was observed in hypodermis and tracheal matrix cells. Capsules were first observed in many fat body cells and in a few cells of the tracheal matrix and hypodermis in 96 hours after infection. By 192 hours after treatment, infection had spread to the entire adipose tissues.

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### സംഗ്രഹം

പെരികേലിയ റിസിനി യെ ഗ്രാനൂലോസ്സിസ് എന്ന വൈറസ് രോഗം ബാധിക്കുമ്പോൾ അവയുടെ കലകൾക്കും കോശങ്ങൾക്കും ഉണ്ടാകുന്ന മാറ്റങ്ങളെപ്പറ്റി വിശദമായ ഒരു പഠനം നടത്തി. ഈ വൈറസ് പ്രധാനമായും വാസകല (adipose tissue) യിലും ചുരുങ്ങിയ തോതിൽ അധഃശ്ലർമ്മത്തിലും (Hypodermis) ശ്വാസനാളിപ്പുഴ (tracheal matrix) ആവരണ കോശങ്ങളിലുമാണ് വർദ്ധിക്കുന്നത്. വൈറസുകളുടെ ഗ്രാനൂലോസ്സിസ് നാലുദിവസത്തിനകം പ്രത്യക്ഷപ്പെടുന്നു.

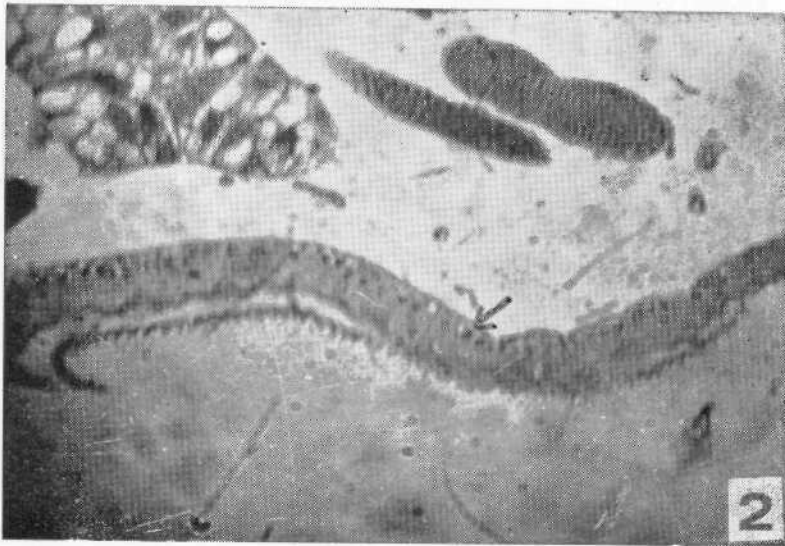
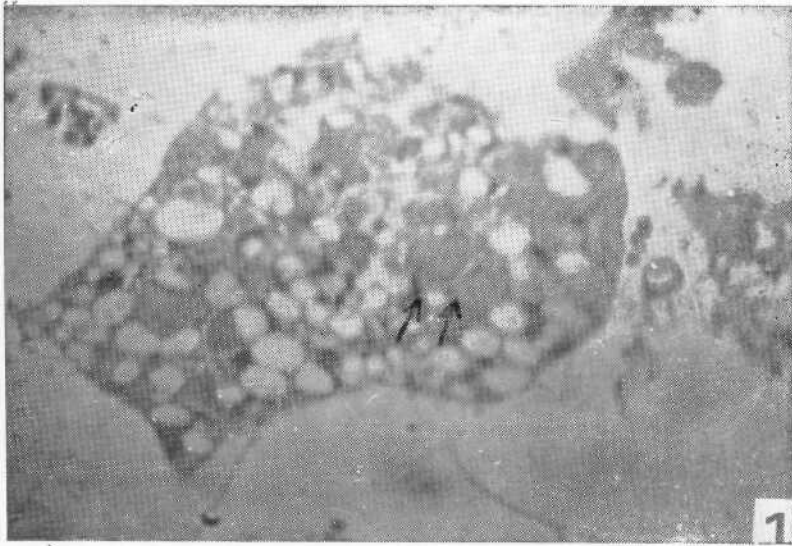


Fig. 1 Section through the fat body of the larva of *P. ricini* 24 hours after ingestion of granulosis virus. Note the enlarged nucleus (arrow)

Fig. 2 Section through the hypodermis of the larva of *P. ricini* 72 hours after ingestion of granulosis virus. Note the hypertrophied collars and nuclei (arrow)

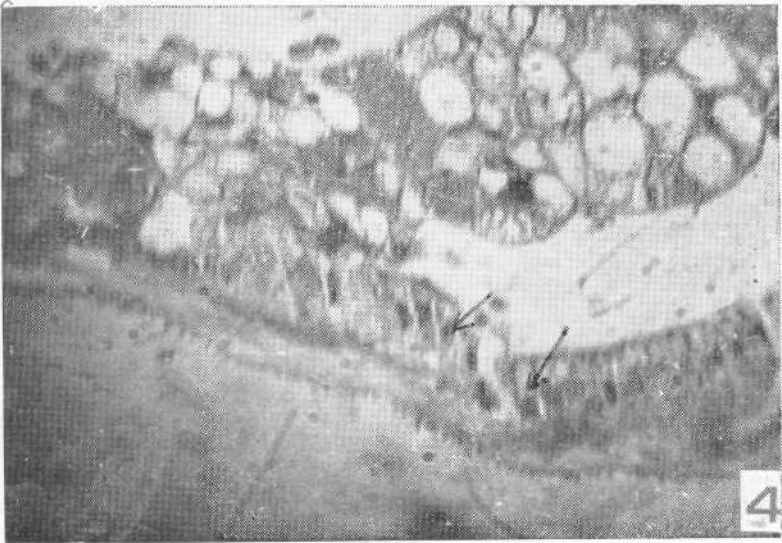
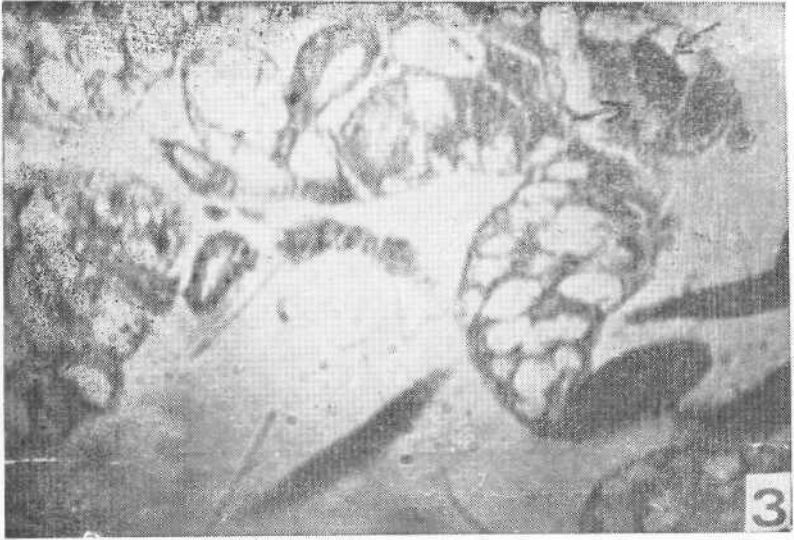


Fig. 3 Section made at 96 hours after inoculation showing the presence of capsules in some cells of the fat body (arrow)

Fig. 4 Section through the hypodermis of the larva of *P. ricini* 95 hours after the ingestion of granulosis virus. Note the hypertrophied cells containing the capsules (arrow)

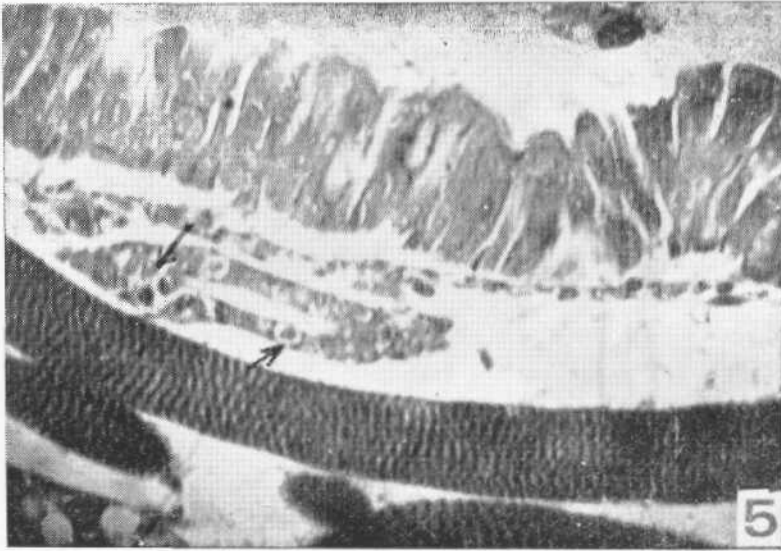


Fig 5 Section of the larva of *P. ricini* 96 hours after the ingestion of granulosis virus. Note the infection at tracheal epithelium (arrow)

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