and the adults were separated as soon as they emerged. The adults were kept in 4" petridishes containing moist cotton and a filter paper above it. Pieces of sweet potato tuber were served as food. Daily dissections of the CA and the ovaries were conducted in Insect Ringer's solution and the volume of CA was calculated according to the procedure of Tobe & Pratt[7].

In sweet potato weevil, the CA are connected to the Corpora cardiaca (CC) and the nerve, the nervus corporis allatus cannot be seen due to the fusion of the two glands CC and CA. the CA is oval in shape (figure 1).

In freshly moulted adults, the CA are small in size and measure about 0.039 nl. At this stage the CA are inactive, translucent and cannot secrete juvenile hormone (JH). The CA are activated usually after feeding and mating. From second day onwards, after the adult emergence, the size of the gland increases and on 5th day it decreases and measures 0.076 nl and on the 6th day it reaches its maxium size and on 7th day it decreases again. Thus, the volume of CA increases from 0.039 nl (0-day) to 0.085 nl on the 6th day and on the 7th day it decreases to 0.043 nl. This corresponds with the first gonadotropic cycle. From the 8th day onwards its size increases again indicating the onset of the second gonadotropic cycle (figure 2).

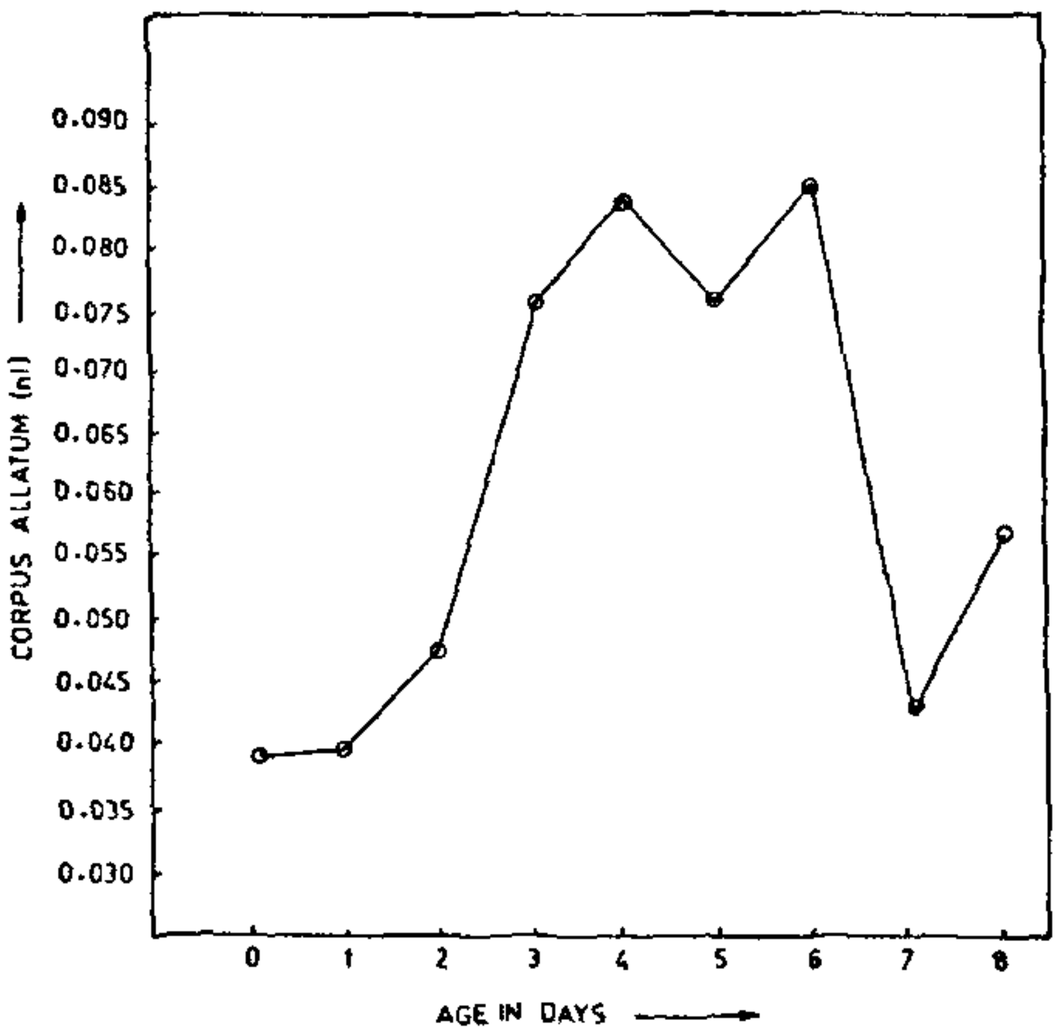

Figure 2. Graph showing the volumetric changes of corpus allatum in a female insect till first gonadotropic cycle.

In the sweet potato weevil, the CA increased in its volume during the previtellogenic and early vitellogenic stages. This suggested that JH was actively synthesized and released into the haemolymph to stimulate vitellogenesis. A short fall in the volume of CA on 5th day may be due to the release of the hormone into the haemolymph for the initiation of vitellogenesis in the other ovarioles. This corressponds to the cyclical development of the oocytes in each ovariole. In the late stages of egg maturation it decreased to about the size observed just after the adult emergence. During the egg maturation, the CA shows a remarkable increase in its size in practically all insects[8-10]. This is in agreement with the results observed in the sweet potato weevil also.

Authors wish to thank Prof. P. Narayan Rao of the University for facilities and encouragement. GMR acknowledges financial assistance by UGC, New Delhi.

21 December 1981.

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BACILLUS CEREUS FRANKLAND AND FRANKLAND AS A PATHOGEN ON RICE LEAF ROLLER, *CNAPHALOCROCIS MEDINALIS*, GUENEE (PYRAUSTIDAE: LEPIDOPTERA)

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CNAPHALOCROCIS medinalis, Guenee, commonly known as the rice leaf roller, is one of the serious pests of rice in India. A granulosis virus was reported on this pest from Fiji[1] and from Kerala[2]. In November 1980, a large number of dead and dying larvae of *C. medinalis*, showing symptoms of bacterosis were observed on rice plants in paddy fields of Kerala. A rod-shaped bacterium was isolated in pure culture from these specimens. Preliminary test using third instar larvae of *C. medinalis* obtained from healthy laboratory culture indicated that they would be experimentally infected by feeding them on leaves which had been dipped into

a heavy suspension of spores prepared from a 2-day old culture of the bacterium.

The comparative susceptibility of different larval instars of *C. medinalis* to infection by the bacterium was assessed. The larvae used in these studies were reared in the laboratory on rice plants. A purified suspension of the two-day old bacterium in water formed the inoculam. Teepol (0.1%) was used as the wetting agent. Twenty larvae of each instar were inoculated with a concentrated spore suspension (1.36 $\times 10^{10}$ spores/ml) of the bacterium by smearing it on the leaf tip. Another set of each instar fed similarly with sterile distilled water and Teepol alone served as control. The larvae which had consumed the treated area of the leaf were reared separately by providing uncontaminated foliage.

Shortly before death, the external colour turned light brown which deepened readily to a dark shade and shortly after death it turned black compared to the normal greenish stress colour of healthy larvae. During death the larvae were soft, flaccid and almost black. The internal tissues had broken down to a viscid consistency. The body wall was very fragile and got ruptured easily liberating the viscous fluid. In every case, the fluid yielded an almost pure culture of the bacterium. The dead or dying last instar larvae usually came out of the folds and some times found hanging head downwards with the prolegs attached to the substrates. But most of the first, second and third instar larvae died on the surface of leaves. The dead larvae gave off a putrifying odour. A similar septicemia in the southern army worm, *Prodenia eridania* Cram. and in the American Cockroach, *Periplanata americane* Linn. caused by this bacillus[3] was earlier reported.

TABLE 1

Pathogenicity of Bacillus cereus to various larval instars of Cnaphalocrosis medinalis

Instar of larvae inoculated	No. of larvae inoculated	No. of larvae control*	Time taken for death (in days) Range	Mean	No. of larvae dead dead due to Bacterosis	Other causes	Percent mortality due to bacteria
First	20	20	1–2	1.35	20	Nil	100
Second	20	20	1–2	1.55	20	Nil	100
Third	20	20	1–3	2.16	20	Nil	100
Fourth	20	20	1–5	2.70	20	Nil	100
Fifth	20	20	1–7	2.93	17	Nil	85

*There was no mortality in the control.

Data on the time taken for death and per cent mortality of different larval instars of *C. medinalis* inoculated with the bacteria are represented in table 1. The time taken for the death was prolonged from 1.3 days in the first instar to 2.9 days in the fifth instar larvae. The bactorial infection caused 100% mortality of first, second, third and fourth instar larvae. The per cent mortality of fifth instar larvae was 85. Normal adults emerged from the surviving pupae.

The infected larvae exhibited symptoms typical of bacteriosis. The first detectable signs of bacterial infection were evident 24 hr after ingestion of the bacterial spores, expressed by sluggishness in movement and reduced feeding. The normal excreta of berry-like pellets changed to a semifluid one and then to a watery discharge and on drying sometimes fasten the larvae to the foliage and sides of the container.

The authors thank Dr. J. F. Bradbury of Commonwealth Mycologial Institute, Kew, Surrey, England for identification of this pathogen.

10 December 1981.

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