

## **A new record of granulovirus on sugarcane top borer, *Scirpophaga excerptalis* Walker (Lepidoptera: Pyralidae)**

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**ABSTRACT:** A granulovirus was found to infect sugarcane top borer, *Scirpophaga excerptalis* Walker for the first time. In a preliminary study, the virus infection in field population was found to vary from 1.6 to 14.4 ( $\bar{x}=5.8$ ) per cent. In the laboratory test, the virus caused mortality of final instar larvae up to 55.2 per cent in 4 to 8 days after infection.

**KEY WORDS:** Baculovirus, granulovirus, natural infection, pathogenicity, sugarcane top borer

The top borer, *Scirpophaga excerptalis* Walker (Lepidoptera: Pyralidae) is unique among the moth borers of sugarcane in that it is prevalent in all the sugarcane regions and attacks all stages of the crop (Mukunthan, 1986). In a field survey made around Coimbatore for natural enemies, some of the larvae were found dead. Examination of haemolymph and tissue smears of dead larvae, under dark field microscope, revealed the presence of a granulovirus, which was further confirmed by electron microscopic examination. Survey was conducted to find out the level of virus infection in field populations of top borer, in and around Sugarcane Breeding Institute, Coimbatore. Cane bits containing

the larvae were vertically planted on moist sand bed. The bed was kept moist to prevent shrinkage of the cane bits until the study was completed. The larvae in the cane bits were examined periodically for mortality or pupation. Tissue smears of dead larvae and pupae were examined for the presence of virus particles and the level of virus infection was determined. The infection level varied from 1.6 per cent during March, 1999 to 14.4 per cent in December, 1998 with a mean of 5.8 per cent (Table 1). Some larvae were found to be infected by granulovirus and at the same time parasitised by any one of the parasitoids viz., *Isotima javensis* Rohwer, *Rhaconotus scirpophagae* Wilkinson and

*Stenobracon nicevillei* Bingham. Parasitisation of the top borer larva is not observed when it feeds above the meristem but mortality due to diseases has been observed (Mukunthan, 1989). Since parasitisation of the final instar larva is possible only when it starts tunneling the internode below the meristem, the viral infection would have either preceded

exit hole was used as a reference point to cut a flap of rind to expose the larva feeding in the tunnel. The mouthparts of the larvae and the tunnels were contaminated with a few drops of viral suspension using a hypodermic syringe. The flap of rind was held to its original position using an elastic band and planted in moist sand bed for further observation. Mortality of larvae

Table 1. Natural infection of granulovirus in sugarcane top borer around Coimbatore

Month	Larvae collected	Infection (%)	Parasitisation in infected larvae and pupae (%)
November, 98	119	9.2	4.2
December, 98	138	14.4	14.4
January, 99	60	8.3	5.0
February, 99	404	2.9	2.0
March, 99	122	1.6	0.8
May, 99	40	7.5	-
June, 99	251	5.1	2.0
Mean ( $\bar{x}$ )	-	5.8	1.9

parasitisation or could have occurred due to transmission by parasitoids themselves. Young and Yearn (1990) have demonstrated transmission of virus by parasitoids under field conditions. The extent of parasitisation in virus infected larvae varied from 0.8 to 14.4 per cent with a mean of 1.9 per cent.

Preliminary pathogenicity tests were conducted by feeding crude suspension of virus to the field collected final instar larvae. The final instar larva before pupation makes an exit hole on the rind of the cane. This

occurred between 4 and 8 days after feeding. Mortality up to 55.2 per cent was observed due to virosis. Infected larvae developed creamy yellow discolouration on the ventral surface and at the advanced stage of the disease, the integument disintegrated releasing milky white body contents.

Perusal of the literature indicates this as the first observation of a granulovirus on top borer. In India, granuloviruses have been reported on shoot borer, *Chilo infuscatellus* Snellen (Easwaramoorthy and

David, 1979) and internode borer, *Chilo sacchariphagus indicus* (Kapur) (Mehta and David, 1980) of sugarcane.

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