

EUSCYRTUS CONCINNUS DE HAAN
(GRYLLIDAE—ORTHOPTERA)
A NEW PEST OF RICE

TWO gryllids, *Gryllus nigratus* Burm from Indonesia and *G. testaceus* Walk from Malaysia and Philippines have been reported as feeding on rice leaves (Anon.¹). During November–December, 1977 a gryllid was observed at the Central Rice Research Institute Farm, cutting holes in paddy leaves. This was identified as *Euscyrtus concinnus* de Haan.

Though the occurrence of this pest in India has been reported without host association by Chopard², this is the first record of this pest feeding on rice foliage.

Nymphs and adults of *E. concinnus* feed on the leaves by making characteristic longitudinal holes leaving the margin intact (Plate 1). The incidence

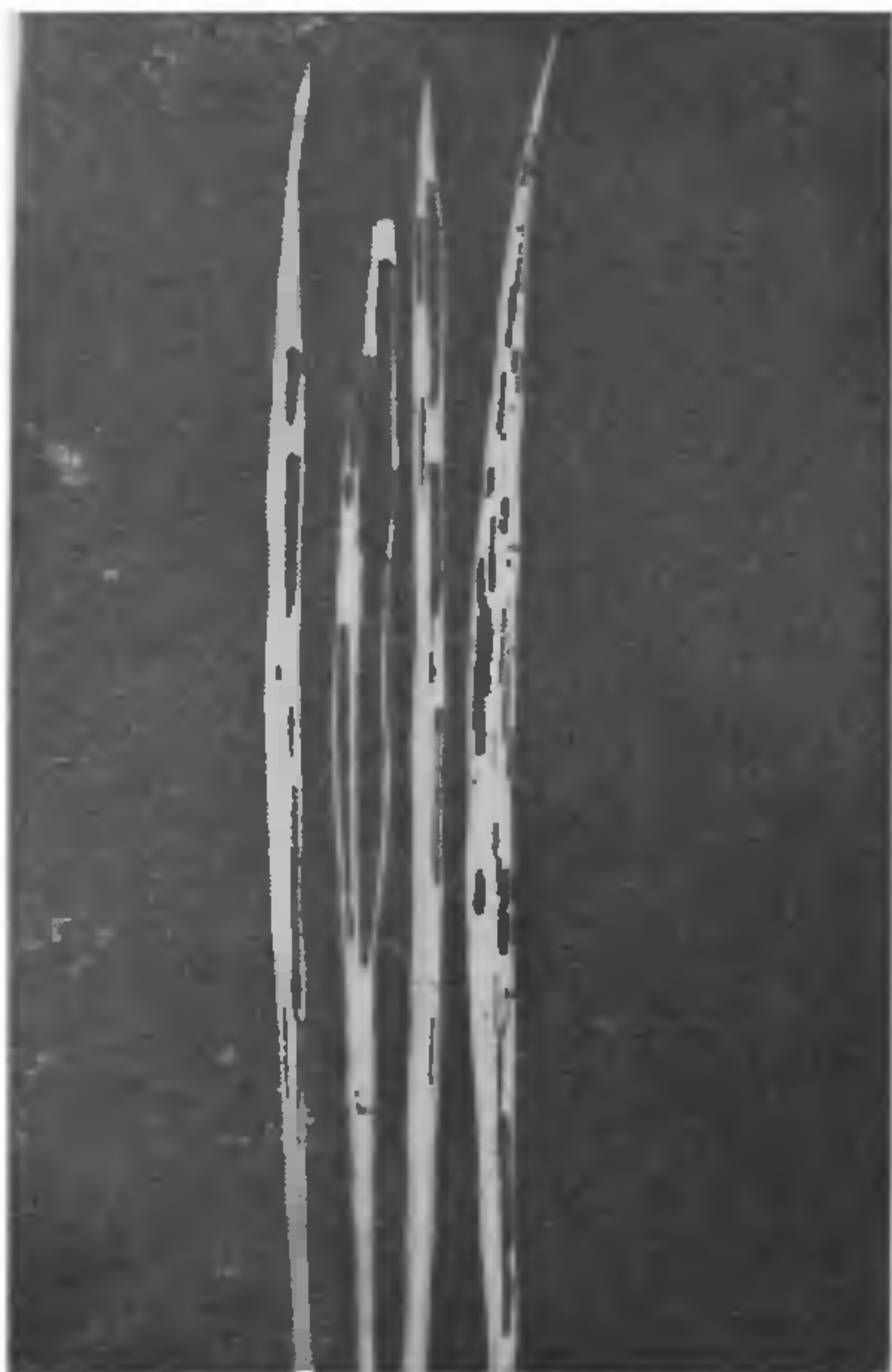


PLATE 1. Rice leaves damaged by *Euscyrtus concinnus* de Haan (K. Natarajan *et al.*).

was relatively severe in the second fortnight of November both in nursery and transplanted crop. The number of insect obtained per 5 standard sweeps during the first week of December was 20–30. However, the population dwindled subsequently, perhaps due to the onset of winter coupled with non-availability of food plants. At this time the pest

was found feeding on unidentified grasses. Again a peak incidence (30–40/5 sweeps) was observed in the last week of February, 1978.

The adults are brown with a mean body length of 1.5 to 2.0 cm. The antennae are long and the females possess long spear-shaped ovipositor (Plate 2).



PLATE 2. Adult male (left) and female (right) *Euscyrtus concinnus* de Haan (K. Natarajan *et al.*).

The authors are grateful to Dr. N. C. Pant, Director, Commonwealth Institute of Entomology, London, for identification of the pest and to the Director (Dr. H. K. Pande), Central Rice Research Institute, for providing facilities.

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EFFECT OF NUCLEOPOLYHEDROSIS VIRUS ON NITROGEN, URIC ACID AND PROTEIN CONTENTS OF GROUNDNUT RED-HAIRY CATERPILLAR, *AMSACTA ALBISTRIGA*

NUCLEOPOLYHEDROSES have been reported to cause considerable derangement in the physiology of infected insect¹. Though the occurrence, pathogenicity and field efficacy of a nucleopolyhedrosis virus (NPV) in groundnut red hairy caterpillar, *Amsacta albistriga* (W.) have been reported in India²⁻⁴, its effect on the metabolic disturbances in the insect has not been well studied. In the present study observations on the changes in total nitrogen, uric acid and total protein contents during the course of virus infection in *A. albistriga* are reported.

The polyhedral inclusion bodies (PIBs) were processed from the diseased final instar larvae of *A. albistriga* and purified by differential centrifugation. Freshly moulted fifth instar larvae were infected by leaf spot feeding technique⁵ with 10 µl virus suspension containing 8.05×10^6 PIBs/larva. Those larvae which did not consume completely the entire leaf bit within

2-4 h were discarded. The larvae which fed with the normal leaf bit not spotted with virus suspension served as control. Samples were taken at 24 hr intervals for a period of 144 hr after treatment. Total nitrogen was estimated using the whole body dry homogenates by micro-kjeldahl method⁶. Uric acid was determined following the method of Brown⁷ after precipitating the protein by the addition of tungstic acid in dry sample and expressed as percentage of dry matter. Total protein was extracted from the perchloric acid insoluble residue in the whole body homogenates of fresh material⁸ and estimated following the method of Lowry *et al.*⁹, and expressed in mg/g protein.

The results presented in Table I show that the average nitrogen content in diseased larvae (9.21%) was significantly higher than that of healthy larvae (8.67%). Similar increase in total nitrogen content has been observed in *Bombyx mori*¹⁰ and *Spodoptera litura*¹¹ larvae infected with NPV. The increased nitrogen content of the diseased larvae may be due to the preservation of large quantities of nitrogen in the form of polyhedral protein since polyhedra consist of 95% protein¹².

Though there was a slight increase in uric acid content in the case of diseased larvae, the difference was not statistically significant. Since uric acid is one of the characteristic catabolites of the insect, the slight increase at the end of the catabolism may probably be due to the reflection of the metabolic disturbances induced by a viral infection as suggested by Smirnoff and Loisella¹³. The finding that NPV-infected larvae of *A. albistriga*, having comparatively higher levels of total protein, though not statistically significant may be due to increased protein leading to the formation of millions of polyhedra. It has been observed that

TABLE I

Effect of nuclear polyhedrosis virus on nitrogen, uric acid and protein content of A. albistriga

Period after infection (hrs.)	Nitrogen (% dry weight)		Uric acid (% dry weight)		Protein (mg/g of wet weight)	
	Healthy	Diseased	Healthy	Diseased	Healthy	Diseased
24	1.22	1.24
48	8.51	8.91	1.39	1.36	45.73	46.51
72	8.91	9.31	1.34	1.38	48.74	49.33
96	9.81	10.11	1.32	1.39	54.11	56.80
120	8.11	8.71	1.22	1.47	42.59	47.64
144	8.01	9.01	1.35	1.47	41.88	48.40
Mean	8.67	9.21	1.29	1.39	46.61	49.73
C.D. (P = 0.05)	0.347		N.S.		N.S.	

N.S. Not significant.

C.D. (P = 0.05): The critical difference at 5% probability level.