at 0·003 M concentration of the insecticides. Thus the above contractions seemed invariably altered both with DS and IDS. Similar inhibitory patterns were observed in the HCT and HRT with DS and IDS when the muscle was presoaked in the organochloride insecticide (DDT)[11]. The extent of decrement in HCT was found to be more than in HRT on both DS and IDS, when the muscle was presoaked in Ringer solution with malathion. Similar inhibitory modulation on contractile kinetics were observed when the muscles were presoaked in normal and aestivated body fluids of *Pila*[13].

The greater inhibition of contractile kinetics of muscle in IDS as compared to DS, suggests greater involvement of this insecticide at neuromuscular junction. Present finding adds credence to the previous reports suggesting the irreversible inhibition of acetylcholinesterase and thereby changing the amounts of neurotransmitter, acetylcholine, with malathion[14,15]. In general it may be presumed that this organophosphorus insecticide alters the contractile potential of the muscle involving the neuromuscular junction, rather than the individual cellular response systems.

Department of Zoology,
Sri Venkateswara
University, Tirupati,
Andhra Pradesh, 517 502,
April 3, 1979.

W. RAJENDRA.
D. SUHASINI.
C. SREERAMULU CHETTY.
K. INDIRA.
K. S. SWAMI.

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EFFECT OF NUCLEAR POLYHEDROSIS VIRUS OF THE ARMYWORM *MYTHIMNA (PSEUDALETIA) SEPARATA* ON THE TASAR SILKWORM *ANTHERAEA MYLITTA*

NUCLEAR Polyhedrosis Virus (NPV) of the armyworm *Mythimna (Pseudaletia) separata* is successfully used to control its host which is a serious agricultural pest[1]. However, large scale use of NPV needs safety tests on beneficial insect like tasar silkworm *Antheraea mylitta.* Since the effect of NPV of the armyworm *M. (P.) separata* has not been investigated the present experiments were conducted.

Tasar silkworm larvae reared on *Terminalia tomentosa* were treated with following concentrations of virus higher than those required to infect the army worm: 10×10^5 Polyhedral Inclusion Bodies/Larva, 10×10^6 PIBs/L, 10×10^7 PIBs/L and 10×10^8 PIBs/L. While in oral (Experiment I) and topical (Experiment II) treatments, 50 fifth instar larvae were used in 4 replications, during intrahemocoelic injection (Experiment III) treatment 40 fifth instar larvae were replicated 5 times. In all the three experiments, controls generally received distilled water. However, in the III experiment another set of control received alkaline solution ($NaCl + Na_2CO_3$) to free the viral rods from PIBs.

Observations were made daily to determine the larval death due to NPV and other causes, and also on per cent pupation.

Results obtained from the three experiments could be summarised as follows. The treated larvae showed neither any signs and symptoms, nor mortality due to polyhedrosis. Pupation rate was 60–84%. Further, the treated larvae did not significantly differ from the controls in their cacoon formation. Hence, it appears that NPV of the armyworm is non-infective to *A. mylitta.* In experiment I (P.O. treatment) we also attempted to note the fate of the PIBs in the tasar silkworm bodies by examining periodically the gut and faecal matter. Though PIBs could be found in the gut lumen but not in the faecal matter of the treated larvae, after $3\frac{1}{2}$ h from the time of treatment, they were not detected either in the gut or in faecal matter after 24 h. The findings, therefore, suggest that though the protein coat of PIBs is dissolved in the gut, the virus is non-infective to the tasar silkworm *A. mylitta.* In topical application (Experiment II) when the larval body was gently scraped and observed for the PIBs, we could find PIBs after 15 days of treatment This finding

indicates that the polyhedral bodies have not penetrated the body wall of the tasar silkworm.

Totally 187 cross transmissions of NPV among the insect species were attempted and 60 were successful indicating that the insect viruses are generally species specific[2].

Aruga *et al*[3] when fed NPV of *Barthra brassicae* and *Hyphantria cunea* to *Bombyx mori* failed to produce any infectivity. Similarly Smith and Xerose[4] could not succeed in cross-transmitting the NPV of *Malacosoma alpica*, *M. disstria*, *M americanum* and *M. plauiale* to *B. mori.* Don Canerday[5] investigating the effect of high dosage level of cabbage looper NPV on some related plusinae, *viz.*, *Pseudoplusia includens*, *Rachiplusia ou* and *Angraplua biloba* found that it was innocuous to these species when fed orally. Our findings too were similar to these, though we worked with different NPV and insect, and suggest that the NPV of the armyworm *M.* (*P.*) *separata* is safe to the tasar silkworm *A. mylitta.* Quite recently our NPV has been demonstrated to be innocuous to another beneficial insect *B. mori*[6].

We are thankful to the Karnatak University, Dharwad, for awarding U.G.C. Junior Fellowship to the first author and for financial assistance made available to the second author. We thank Dr. M. Appaswamy Rao, Professor and Head, Department of Zoology, for providing the necessary facilities. Our thanks are also due to Dr. M. N. Narsimhana, Director, Central Tasar Research Station, Ranchi, for providing the tasar silkworm larvae and other facilities to carry out the experiments.

Division of Entomology, S. G. Dhaduti.
Department of Zoology, S. B. Mathad.
Karnatak University,
Dharwad 580 003,
June 7, 1979.

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REVIEWS AND ANNOUNCEMENTS

Indian Cenozoic Stratigraphy. By V. J. Gupta. [Hindustan Publishing Corporation (India), Delhi 110 007], 1976. Pp. iii + 344. Price not mentioned.

As the title suggests, the book deals with the Cenozoic Stratigraphy of India and *not* that of the Indian subcontinent. Students of Indian stratigraphy are never used to understand the stratigraphy, especially the Cenozoic stratigraphy, without covering the Pakistan region which is known for many type sections of Cenozoic stratigraphy of the Indian subcontinent. Therefore, the book lacks some 'regional' component. With its eleven chapters the book covers all the distinct and different geological provinces which fall into two zoogeographical provinces, Tethyan and Indo-Pacific. Each chapter is devoted to a particular region excepting the first chapter which is devoted to "Introduction". This chapter is almost an abstract of the book and includes 3 tables of which the one deals with the 'standard' classification of the Cenozoic. The expression, "CAINOZOICS", both in its spelling and construction, could have been avoided to maintain consistency in vocabulary. Similarly 'Quaternar', could have been substituted by 'Quaternary'. The other table is concerned with the correlation of stratigraphic units of the Indian Cenozoic occurring in different regions. It is, indeed, a very valuable correlation chart but the title of the chart, by having 'Tertiary' in it, is an anachronism as it covers Pleistocene also. The third table dealing with a part of Tertiary also has the same defect in its title.

The next 3 chapters, almost amounting to half the book, are rightly devoted to the Himalayan region. A complete survey of the literature on granitic bodies of the region, published upto 1975, is a very valuable bibliographic source for those interested in hard rock material. It is interesting to note that a tourmaline granite in the area is dated to be 4100–4250 million years (p. 16) old. A comprehensive bibliography is provided for the region. The case is similar for the other regions covered by the remaining chapters, the references covering upto the year 1975. Chapters 8–9 amount to 65 pages and cover Saurashtra region. The region of Laccadives is, however, not included in the survey. Palaeontological, palynological, palaeobotanical and micropalaeontologial data discovered in recent years is extensively and mechanically documented to provide wealth of information.

The reviewer feels that the bibliographic material in the book could have been conveniently arranged in one lot at the end of the book to serve as a store-house of references which the book essentially is. Had it