ergic blockade, is likely but unwarranted. The finding that racemic propranolol is less potent as local anaesthetic than either (+) or (−) form suggests that such an assumption may not be universally applicable.

1 We wish to thank Hana Boucek for skilful technical assistance. Propranolol and (+)-propranolol were obtained through the courtesy of Ayerst Laboratories Ltd, in Montreal. This research was supported by the Medical Research Council of Canada, grant MA-4754.

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Effect of NPV of the armyworm *Mythimna (Pseudaletia) separata* on the silkworm *Bombyx mori*

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Summary. Nuclear polyhedrosis virus (NPV) material of the armyworm *Mythimna (Pseudaletia) separata* was administered in the form of PIBs and free virus rods to the larvae of silkworm *Bombyx mori*. Routes used for administration were topical, intrahaemocoelic and oral. The larvae were treated with following concentrations: 10×10^5 PIBs/L, 10×10^6 PIBs/L, 10×10^7 PIBs/L, 10×10^8 PIBs/L. In all the 3 experiments, the larvae showed neither any signs and symptoms, nor mortality due to polyhedrosis. Thus it appears that the NPV of *M. (P.) separata* is safe for the silkworm *B. mori*.

Totally 187 cross-transmissions of NPV among the insect species were attempted and 60 were successful[2]. Though NPV of 7 insect species were tested on the silkworm *Bombyx mori*, it was found to be innocuous[2].

The armyworm *Mythimna (Pseudaletia) separata* - a notorious agricultural pest - can be controlled by its own NPV in the laboratory and as well in the field[3]. However, the use of NPV on a large scale requires safety tests on beneficial insects like *Bombyx mori*. Since the effects of NPV of the armyworm *M. (P.) separata* on *B. mori* has not been investigated, the present experiments were conducted.

Materials and methods. Silkworm larvae reared on mulberry leaves were treated with the following concentrations higher than those required to infect the armyworm: 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 1) and topical (experiment 2) treatments, at each concentration, 50 3rd instar larvae were used in 4 replications, during intrahemocoelic injection (experiment 3) treatment 40 5th instar larvae were replicated 5 times. In all the 3 experiments, controls generally received distilled water. However, in the 3rd experiment another set of control received viral suspension treated with alkaline solution ($NaCl+Na_2Co_3$) to free the viral rods from PIBs. Daily observations were made to determine the larval death due to NPV and other causes, and percent pupation and adult emergence.

Results and discussion. Results obtained from the 3 experiments could be summarized as follows. The treated larvae showed neither any signs and symptoms, nor mortality due to polyhedrosis. Survival rate of pupae and adults was 92.5-100%. Further, the treated larvae did not significantly differ from the controls in their intermoult period and larval duration. Hence it appears that NPV of the armyworm is non-infective to *B. mori*. In p.o. treatment (experiment 1) we also attempted to note the fate of the PIBs in the 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 4 h from the time of treatment, they were not detected either in the gut or faecal matter after 8 h and 24 h. The findings, therefore, suggest that, though the protein coat of PIBs is dissolved in the gut, the virus is noninfective to the silkworm *B. mori*. Such non-infectivity may be due to antiviral gut-juice which inactivates the viral material[4]. Since, in our work, even the free viral rods injected into the hemocoel failed to infect the silkworm, apparently factors other than gut-juice must be responsible for their innocuosness. In topical application, (experiment 2) when the exuviae of treated larvae were examined after the 3rd moult, PIBs were still found on their surface. This finding suggests that the polyhedral bodies have not penetrated the body wall of the silkworm.

Don Canerday[5], investigating the effect of high dosage level of cabbage looper NPV on some related Plusinae viz. *Pseudaoplusia includens, Rachiplusia ou* and *Angraplua biloba*, found that it was innocuous to these species when fed orally. Aruga et al.[6] when fed NPV of *Brathra brassicae* and *Hyphantria cunea* to *B. mori*, failed to produce any infectivity. Similarly Smith and Xeros[7] could not succeed in cross-transmitting the NPV of *Malacosoma alpica, M. disstria, M. americanum* and *M. pluviale* to *B. mori*. Our findings resembled these though we worked with different NPV, and we suggest that the NPV of the armyworm *M. (P.) separata* is safe for the silkworm *B. mori*.

1 Acknowledgments. We are grateful to the Karnatak University, Dharwad, for awarding UGC Junior Fellowship to S.G.D. and for financial assistance made available to S.B.M. We thank Professor M. Appaswamy Rao, Department of Zoology, for providing the necessary facilities. Our thanks are also due to Mr B. Chavannawar for supplying mulberry leaves and to the Government Silk Farm, Hindalaga, Belgaum, for providing silkworm eggs.

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