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PRELIMINARY STUDIES ON THE RELATIVE EFFICACY OF DIFFERENT INSECTICIDES FOR THE CONTROL OF CASTOR SHOOT-AND-CAPSULE BORER, *DICHOCROCIS PUNCTIFERALIS* GUEN. (PYRALIDAE:LEPIDOPTERA) ON CASTOR

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ABSTRACT

A laboratory trial to study the relative effectiveness of different nsecticides for the control of castor shoot-and-capsule borer *Dichocrocis punctiferalis* Guen. was conducted. Partially dried castor capsules, after having been dipped in various insecticidal concentrations, were offered to the insect for feeding. The results revealed that ethyl-parathion 0.025 per cent, dichlorvos 0.025 per cent, DDT 0.1 per cent fenitrothion 0.05 per cent and endrin 0.05 per cent were effective for the control of this pest.

Castor shoot-and-capsule borer, *Dichocrocis punctiferalis* Guen., was a very serious pest on castor *(Ricinus communis* L.) around Hissar, in 1970 crop season. Besides being a serious pest of castor (David *et al.*, 1964) this insect has already been reported to attack several plant species of economic importance, such as custard-apple *Annona reticulata* L.) (Veitch, 1931); papaya *(Carica papaya* L.) (Smith, 1937); persimmon *(Diospyros spp.)* (Ono, 1937); maize *(Zea mays* L.) (Chung, 1959); sorghum *(Sorghum vulgare* Pers.), cotton *(Gossypium spp.)*, guava *(Psidium guajava* L.) mulberry *(Morus alba* L.), pomegranate *(Punica granatum* L.), mango *(Mangifera indica* L.), peach *(Prunus persica* L.), pear *(Pyrus communis* L.), loquat *(Eriobotrya japonica* Lindl.) tamarind *(Tamarindus indica* L.), cardomom *(Elettaria cardamomum* maton), jack fruit *(Artocarpus heterophyllus* Lamk.), avocado *(Persea americana* Mill.), arrow-root *(Tacca leontopetaloides* L.), soapnut *(Sapindus emarginatus* Vahl.), ginger *(Zingiber officinale* Rosc.), turmeric *(Curcuma spp.)* and sun flower *(Helianthus annus* L.) (David *et al.*, 1964).

Channabasvana (1954) recommended BHC 10 per cent dust against this pest, whereas, (David *et al.*, 1964) suggested that the damage of capsules could be reduced by spraying malathion 0.1 per cent, parathion 0.05 per cent or DDT 0.1 per cent. No further work on the control of this pest by using modern insecticides seems to have been done

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anywhere. Therefore, some of the available insecticides were tested against this pest under laboratory conditions and the results are reported in this communication.

MATERIAL AND METHODS

The larvae (almost of the same size) collected from the field were starved for 24 hours in the laboratory. For each treatment a total of 15 larvae were used. These were divided into three batches of 5 each forming three replications. Different concentrations of insecticides were prepared by diluting their commercial formulations with water. A modified testing technique (treating the food material) of Del Rivero and Planes (1966) was used. Thirty capsules of equal size were given a knife cut each (to facilitate feeding by the larvae) and dipped in each concentration of the insecticides for ten seconds. After their partial drying, a batch of 5 larvae was released per ten treated capsules, in a separate glass jar (500 ml. capacity). In case of control, the capsules were similarly dipped in tap water. The jars containing the treated capsules and larvae were covered with muslin cloth and were kept in an incubator at 26±1°C during the post treatment period. The mortality of the larvae was recorded after 24, 48 and 72 hours of the treatment.

RESULTS AND DISCUSSION

The data presented in Table 1 indicate that all the insecticidal treatments proved superior to control. However 100 per cent mortality of insect was obtained with DDT (0.1%), ethyl-parathion (0.05%), and dichlorvos (0.05%) after 24 hours, with endrin (0.05), dichlorvos (0.025%) after 48 hours and with fenitrothion (0.05%) and ethyl-parathion (0.025%), after 72 hours as compared to respective mortalities of 0.00, 6.66 and 13.33 per cent in the control. From the above results it may be concluded that ethyl-parathion (0.025%), dichlor-

TABLE 1

Relative efficacy of different insecticides for the control of *D. punctiferalis.*

S No.	Treatment	Commercial formulations used	Percentage mortality of the larvae		
			24 hours after treatment	48 hours after treatment	72 hours after treatment
1.	Control	—	0.0 (0.0)*	6.7 (8.89)*	13.3 (17.71)*
2.	Malathion 0.1%	Malathion 50 EC	73.0 (59.21)	86.7 (72.28)	93.3 (81.21)
3.	Endrin 0.05%	Endrin 20 EC	66.7 (53.99)	100.0 (90.00)	100.0 (90.00)
4.	Fenitrothion 0.05%	Sumithion 50 EC	80.0 (63.43)	93 3 (81.21)	100.0 (90.00)
5.	DDT 0.05%	DDT 25 EC	60.0 (50.77)	80.0 (63.43)	86.7 (72.29)
6.	DDT 0.10%	—do—	100.0 (90.00)	100.0 (90.00)	100.0 (90.00)
7.	Ethyl-parathion 0.025%	Paramar 50 EC	86.7 (72.28)	93.3 (81.21)	100.0 (90.00)
8.	Ethyl-parathion 0.05%	—do—	100.0 (90.00)	100.0 (90.00)	100 0 (90.00)
9.	Dichlorvos 0.025%	Nuvan 100 EC	93.3 (81.21)	100.0 (90.00)	100.0 (90.00)
10.	Dichlorvos 0.05%	—do—	100.0 (90.00)	100.0 (90.00)	100.0 (90.00)
	STATISTICAL CONSTANTS				
		F. test	Sig.	Sig.	Sig.
		C.D. at 5%	11.73	14.58	9.01

*Figures in the paranthesis are transformed on the basis of arcs in $\sqrt{\text{percentage}}$.

vos (0.025%), DDT (0.1%), fenitrothion (0.05%) and endrin (0.05%) are good insecticides. Thus any of these may be used for the control of this pest but ethyl-parathion and endrin being more toxic to human beings, may be avoided.

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