PHASE VARIATION IN JUTE HAIRY CATERPILLAR: DIACRISIA OBLIQUA WALK. (LEPIDOPTERA, ARCTIIDAE)

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Introduction

The jute hairy caterpillar, *Diacrisia obliqua* Walker is a major pest of jute in East Pakistan. It appears on the crop when the plants are about two to three feet tall and causes damage till the harvest. The caterpillars feed on the leaves and skeletonize them (Fig. 1). In case of heavy attack, the plants are totally defoliated and sometimes the top tender shoots are also eaten up. Consequently the growth of the plant is retarded. The loss of height ultimately reduces the yield and quality of the fibre.

D. obliqua is polyphagous and usually migrates to other crops *viz.*, cabbage, cauliflower, brinjal, beet, ground nut, mustard, tobacco and soyabean during off jute season. Its life cycle is completed within 30 to 40 days. As many as four generations have been recorded during the jute season from the end of March to middle of September of which two, the second and third, are responsible for serious outbreaks.

Phase variation

The jute hairy caterpillar is characterised by phase variation both in the larval and adult stages. The second and third stage caterpillars of the gregarious phase have black lateral bands. They are greenish brown having dark venter. The adult moth of this phase has a large number of black spots at the anterior half of the forewing which are arranged in the form of an inverted 'V' (Fig. 2). There are four dark spots on the hindwing of which three are larger in size and located at the apical region. The other spot is smaller and located at the anterior margin. The gregarious phase predominated during the population outbreaks of the pest when greatest harm is done to the crop.

The caterpillars of the solitary phase do not possess black lateral bands. The first and fourth instar larvae become brownish yellow in colour with greyish venter. The adult moth belonging to this phase has only one dark spot on each forewing. There is only one prominent dark spot at the anterior margin of the hindwing. The spots of the apical region are not conspicuous. This phase predominates during the beginning and toward the end of jute season.

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The transient phase is intermediate between the two. In this phase the last two larval instars have black intersegmental spots on the dorso-lateral sides of the body. The adults have inconspicuous spots on the forewings which are arranged as in the gregarious phase.



Fig. 1. Jute leaves heavily infested with hairy caterpillars. The lower leaf is completely skeletonised.



Fig. 2. Adult moths on a jute leaf.

Discussion

Uvarov (1921) observed that under natural conditions, variation in colour morphometrics and behaviour of many locust species are related to the density of population. In the present study it has been found that overcrowding is responsible for gregarious phase. It has further been observed that a slow but

continuous rainfall and cloudy conditions are favourable for the population outbreaks.

Solitary phase larvae could be produced in the laboratory by rearing each individual in separate glass tubes from the time of hatching to the adult stage, when kept out of visual and tactile contacts with others. Ellis (1961) has suggested that secretions of the prothoracic gland play a part in governing the colour changes in locusts. The colour changes are controlled, at least in part, by hormones, and the hormonal balance of solitaries differs from that of gregarious individuals. No work has yet been done in this species on the possible role of hormone-balance in relation to phase variation.

Summary

The jute hairy caterpillar is a serious pest of jute in East Pakistan. It causes considerable damage to the crop for about two and a half months when the plants are over two feet tall. Its life cycle is completed within 30 to 40 days. There are four generations during the jute season of which two generations are responsible for serious outbreaks.

Phase variation was determined in both the larval and adult stages. The gregarious phase predominates during the population outbreaks of the pest while the solitary phase predominates at the beginning and towards the end of jute season. The transient phase is intermediate between the two. Overcrowding seems to be responsible for gregarious phase.

References

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