ELECTROPHORETIC VARIATION IN HAEMOLYMPH PROTEINS OF THE TOBACCO CATERPILLAR, *SPODOPTERA LITURA* (F.) INFECTED WITH A NUCLEOPOLYHEDROSIS VIRUS

NUCLEOPOLYHEDROSES cause considerable derangement in the physiology of infected insects. Changes in the protein and the amino acid metabolism have been reported in several cases[1]. In the present paper, changes occurring in the electrophoretic pattern of haemolymph proteins in the case of nucleopolyhedrosis virus infected larvae of *Spodoptera litura* are presented.

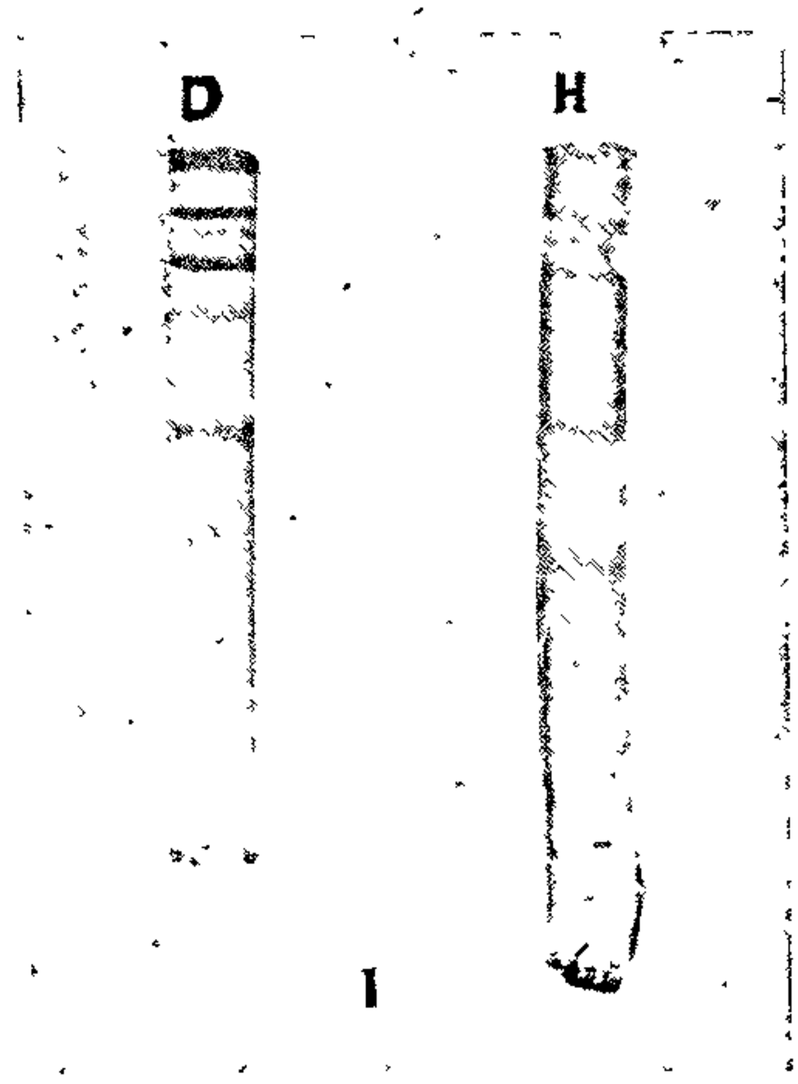

FIG. 1. Disc electrophoretic pattern of haemolymph of healthy (H) and diseased (D) larvae of *Spodoptera litura* (F.).

Freshly moulted fourth instar larvae of *S. litura* were infected by feeding them on castor leaf disc spotted with 10 μl of virus suspension containing 4×10^6 inclusion bodies. The larvae were reared individually and inactivated in chips of ice, and 10 μl of the blood was removed by clipping off, the first pair of prolegs. Whole blood from each insect was diluted with 100 μl of 40% sucrose. Ten μl of diluted blood was used for disc electrophoretic separation using acrylamide gel according to the method of B. J. Davis[2]. The current supplied was 3 mA per tube at 100 V for 60 minutes. Amido-Schwartz 1% in 7% acetic acid was used to stain the gels and 7% acetic acid v/v was used for destaining and preservation. Electrophoretic pattern of haemolymph protein of diseased larvae during advanced stage, *i.e.*, two days prior to death was compared with that of the healthy individuals.

The haemolymph of healthy *S. litura* larvae showed thirteen protein bands with poorly stained diffused bands at the lower end of the column and well-stained conentrated bands at the top (Fig. 1). The latter two extensively stained and broad bands at the top appear to be a combination of two or more protein fractions. In the case of larvae infected with a nucleopolyhedrosis virus, a decrease in the concentration of the two main slow moving protein fractions and almost total depletion of the other protein bands has been observed (Fig. 1). This result is in close conformity with the earlier reports[3, 4]. The staining intensity of the various bands by Amido-Schwartz is indicative of the relative protein concentration. From the pattern developed, it is apparent that there are a few complex bands with similar mobilities and character. This should be subjected to further separation.

Since fat body, (the primary tissue infected by the nucleopolyhedrosis virus of all lepidopterous insects) is the site of synthesis of haemolymph proteins[5,6], the decrease in the total protein may be due to suppression of host protein synthesis and/or of its degradation because of severe functional lesions of the fat body.

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A NOTE ON NEMATODE FUNGAL COMPLEX IN CROSSANDRA (*CROSSANDRA UNDULAEFOLIA* SALISB.) IN COIMBATORE

IN recent years a marked decline in the cultivation of Crossandra in and around Coimbatore, Tamil Nadu, has been noticed. The seedlings do not establish well on transplanting. The grown-up plants appear chlorotic and exhibit wilt symptoms in many areas. Survey of Crossandra fields was therefore carried out

to ascertain any possible nematode-fungal complex on this crop. Infested soil and root samples were collected from different localities. Centrifugal flotation technique[2] was adopted for the nematode recovery.

The examination of soil and root samples have shown the presence of two nematode species *Pratylenchus delattrei* and *Helicotylenchus dihystera* consistently in association with crossandra. The population of *Pratylenchus* ranged from 95 to 286 per gm of root and 83 to 524 per 250 cc of soil respectively. Similarly, the population of the spiral nematode, *Helicotylenchus*, ranged from 5 to 269 per gm of roots and 22 to 238 per 250 cc of soil. Species of other genera, *Rotylenchulus*, *Hoplolaimus*, *Tylenchorhynchus* and *Xiphinema* were noticed in negligible numbers in one or two localities only. The roots with distinct lesions, when plated on agar medium, yielded *Fusarium solani*.

Reports of association of *Pratylenchus* spp. with the *Fusarium* spp. causing wilt diseases in lucerne[1], pea[3], etc., and *Helicotylenchus multicinctus* and *Rhizoctonia* complex on banana[5], and *H. dihystera* and *Phytophthora cinnamomi* on pine[4] are well known. A similar association may be present in the decline of Crossandra around Coimbatore.

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MATERNAL INFLUENCE ON BACTERIAL LEAF BLIGHT REACTION IN RICE

THE influence of maternal parent on the expression of bacterial leaf blight disease, incited by *Xanthomonas oryzae* (Uyeda *et* Ishiyama) Dowson, in rice has not been studied in detail so far. Ratho *et al.* (1975) from their diallel analysis studies, reported the presence of maternal effect and other reciprocal differences for both tillering stage as well as boot leaf stage reactions of this disease[2]. The present paper reports the reciprocal differences in respect of 21 crosses and their reciprocals tested at tillering and boot leaf stages of plant growth.

The parents used in the present study were, Taina-3 mut. 587–4, (T. 3 mut) Lacrosse × Zenith-Nira (LZ-Nira), Wase aikoku-3, the resistant donors, Tkm-6 the moderately resistant and Ambemohor, Ratna and Padma the susceptible parents. Crosses were made in a complete diallelic pattern. The 42 F_1's along with the parents were grown in two sets, each in a complete randomised block design with two replications under high nitrogen fertilization (100 kg N/ha). The plants were clip inoculated (one set at tillering stage and the other at boot leaf stage) with the bacterial cell suspension (ca. 10^8 cells/ml) prepared from a 48 hr old culture of a virulent isolate (Isolate-I) of *X. oryzae* grown on potato sucrose agar medium. The length of lesion developed below the point of inoculation was measured on the 15th day after inoculation. Significant reciprocal difference in disease reaction was estimated for each cross by F test where

$$F = \frac{\text{Larger variance}}{\text{Smaller variance}}$$

of the cross and its reciprocal involved.

The data on the presence of significant reciprocal difference in different crosses are presented in Table I. Among the 21 cross combinations, significant reciprocal differences could be detected only in six crosses at tillering stage and eleven at boot leaf stage, out of which four were common for both the stages. The cross combinations LZ-Nira × Wase aikoku-3, LZ-Nira × T. 3 mut., Wase aikoku-3 × T. 3 mut. and Tkm-6 × Padma exhibited significant reciprocal differences at both the stages. The first three crosses involved resistant × resistant parents while the last one was between moderately resistant and susceptible parents. The crosses involving Ratna as the susceptible parent in Ratna × T. 3 mut. and Ratna × LZ-Nira had significant differences only at tillering stage. Hence, it is seen that, of all the crosses involving resistant parents, the one between moderately resistant × susceptible parents and the other two between the resistant × susceptible parents showed significant differences only at tillering stage. Highly signi-