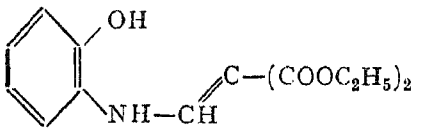
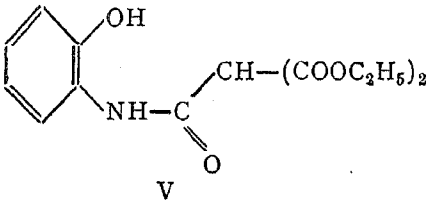
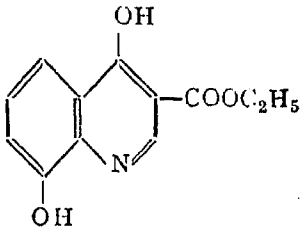


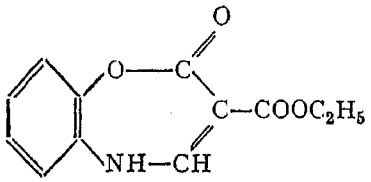
IV



V



VI



VII

thereby indicating the presence of aromatic OH groups in the molecules. The analysis of A corresponds to (IV) and that of B to (VI) or (VII). Since VII is not expected to show diazo coupling reaction, the structure of B may be (VI). Studies are in progress to elucidate the structures of A and B as well as the mechanism of formation of (III) from (I).

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Bombay-19, *May* 16, 1957.

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A PRELIMINARY NOTE ON THE LARVAL-PARASITES COMPLEX OF *EPILACHNA SPARSA* (HERBST) IN MYSORE

*Epilachna sparsa** (Herbst) (Coccinellidæ, Col.) is a major pest of potato and brinjal, and it also infests certain other cultivated and wild Solanaceous plants.[5] Recent investigations showed for the first time the existence of a complex of at least seven species of parasites in the primary, secondary and possibly also tertiary roles, with the larva of *Epilachna* as the focal insect. *Pleurotropis foveolatus* Crawford, *P. epilachnæ* Rohwer (Eulophidæ, Hym.) and *Tetrastichus* sp. (Tetrastichidæ, Hym.) were taken as the primary parasites, *Tetrastichus* sp. also behaving as a secondary parasite through *P. foveolatus*. *Pleurotropis* sp. and *Aximopsis* sp. (Eurytomidæ, Hym.) were obtained as secondary parasites through *Tetrastichus* sp. and *P. foveolatus* respectively. *Euplemus ? urozonus* Dalman (Eupelmidæ, Hym.) and *Elasmus* sp. (Elasmidæ, Hym.) also emerged from parasitised *Epilachna* grubs, but their exact role could not be definitely ascertained.

Collections made at random showed a total effective parasitisation of 74·3 *per cent.* of *Epilachna* larvæ during March and April. *P. foveolatus* and *Tetrastichus* sp. were the dominant species accounting together for nearly 93 *per cent.* parasitisation, and these two were present in almost equal proportions and, therefore, exercised a considerable measure of natural control of the pest.

P. foveolatus was the only larval parasite of *E. sparsa* previously recorded from Mysore. It was originally described[3] from here and its biology studied.[1,5,9] *Pleurotropis* sp. nr. *foveolatus* was recorded on *E. niponica coalescens* Mader from China.[7] A species of *Pleurotropis* was reported to have exercised unusually effective control of *E. dodecastigma* Mulsant and *E. vigintioctopunctata* (Fabricius) in Uttar Pradesh.[6]

P. epilachnæ was described[10] as parasitic on pupæ of *Epilachna* sp. from Coimbatore. This is the first record of this species from Mysore. Its natural incidence was about 2 *per cent.*

Pleurotropis sp., a form recognizably distinct from either *foveolatus* or *epilachnæ*, was obtained from a pupa of *Tetrastichus* sp. within an *Epilachna* grub. Species of *Pleurotropis* were reported in the past as secondary and tertiary parasites on Hymeoptera.[2,8]

Tetrastichus sp.: Although our specimens seem to satisfy the original description of *Tetrastichus epilachnæ* by Giard,[4] Mr. Kerrich, who, at our request, kindly examined this series, finds that it is distinct from *T. epilachnæ* from Austria in the British Museum collection,

which was determined by Dr. Ferriere (*in litt.*).

It is one of the common species in Mysore, parasitising both grubs and pupæ of *Epilachna*. In laboratory it completed its development in 11 to 13 days at the average maximum and minimum temperatures of 87·4° F. and 78·1° F. respectively and the average relative humidity of 64 *per cent.* Superparasitism is the general rule, 2 to 22 (average 8·7) parasites emerging from each host grub. Females were about four times as numerous as the males (113 males : 408 females).

This species also developed consistently in the secondary role on *P. foveolatus*, the extent of hyperparasitisation being nearly 10 *per cent.* *Aximopsis* sp., *Eupelmus* ? *urozonus* and *Elasmus* sp. were also obtained from parasitised *Epilachna* grubs, but they were present in less than 1 *per cent.* of the parasitised larvæ examined. *Aximopsis* was found to be a secondary parasite through *P. foveolatus*. The exact role of the latter two parasites is under investigation.

Detailed studies on this interesting parasite complex and the possibility of biological control of *Epilachna* are in progress.

Thanks are due to Dr. M. Puttarudriah, Government Entomologist, for encouragement and guidance. We are most grateful to the Director, Commonwealth Institute of Entomology, London, for kindly furnishing the original description of *T. epilachnæ* and determination of *Tetrastichus* sp., *Aximopsis* sp. and *Eupelmus* ? *urozonus*.

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Bangalore, *July* 24, 1956.

* This species has been regarded as *E. vigintiocto punctata* (Fabricius) by previous workers.

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SHORT STIGMA OFF TYPE PLANT IN PIGEON PEA (*CAJANUS CAJAN* MILLSP.)

THE method of growing a crop strain in isolation, at a sufficient distance with barriers of other crops surrounding it, is followed in order to avoid contamination through cross-pollination, in the case of naturally cross-pollinated crops, such as pigeon pea (*Cajanus cajan*), onion (*Allium cepa*), safflower (*Carthamus tinctorius*), etc., at the Agricultural Research Station, Niphad, District Nasik. In a new, early, high-yielding, bold-grained pigeon pea strain N. 282-7, thus grown in isolation, one plant having few flowers and distinctly slow growth as compared to the remaining plants of the culture, was observed in the year 1955-56.

In young buds of a normal pigeon pea plant the stigma lies above the level of the anthers; with the development of the buds, the filaments elongate and the anthers surround the stigma and burst the day before the flower opens and a mass of pollen is distributed all over the stigmatic surface leading to the formation of a pod (Fig. *Left*). While in the young buds of the newly observed plant, the stigma lies just below the level of the anthers. With the development of the bud, the filaments as well as style elongate but the elongation of style is slow as compared to that of the normal, the stigma remaining far below the level of anthers. As a result, the stigma lies down below in the tube formed by the union of 9 stamens (diadelphous) and does not grow further at the time of bursting of the anthers; hence the stigmatic surface does not come in contact with the pollen, leading to sterility (Fig. *Right*). No seed, either open-pollinated or selfed, could be obtained in the year 1955-56. The plant was carefully maintained by watering. During 1956-57, the plant has profusely flowered and all attempts to get seed by selfing and crossing are being made.

Left: Normal.
Right: Short stigma