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CHEMICAL PHAGOSTIMULATION IN *EPILACHNA FULVOSIGNATA* (COLEOPTERA, COCCINELLIDAE)

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The Epilachninae is a group of leaf eating lady beetles particularly well suited for the study of problems associated with the chemical basis of host plant selection by insects. Many species of *Epilachna* are associated either with the Solanaceae or Cucurbitaceae, and *Epilachna fulvosignata* occurs frequently on *Solanum campylacanthum* in Uganda. The presence of two larval phagostimulants in this plant has been demonstrated. One is steam volatile and the other not so.

In order to detect the presence of phagostimulatory substances the materials to be tested were incorporated in agar solutions which were then poured and allowed to set in petri dishes. When set the agar gels were inverted, so that the smooth sides lay uppermost, and discs were cut from them with a cork borer. To compare the properties of two agars, two discs from each agar were placed in each of ten petri dishes (lined with damp filter papers) and the larvae added. After some 14-18 hours the dishes were examined and the agar discs scored on an arbitrary scale according to the area of surface damaged by the larvae. Initially such comparisons were made between 41 pairs of identical agars. An idea of the differences likely to arise from experimental errors was obtained by plotting the lowest score of each pair against the difference in score of that pair. In subsequent work two comparisons (each involving 10 dishes) were made of the agars concerned. If, in both comparisons, the differences were greater than the expected experimental error, they were attributed to genuine differences in phagostimulation.

Oil containing the volatile phagostimulant was prepared as follows. On successive days 8 kg lots of fresh *Solanum* leaves were deep frozen for 24 hours, extracted with 16 litres water for another 24 hours, expressed through cloth, and the filtrate steam distilled. The first 500 ml distillate were collected and stored in the refrigerator. When some four or five distillates had been obtained from successive batches of leaves they were bulked and distilled gently through a Vigreux column. The column temperature was raised slowly and the head maintained at 90°C for about half an hour before steam was allowed to pass over into the distillate. The distillate was redistilled in a Claisen flask, and the temperature maintained between 75°C 80°C until distillation ceased. A small drop of oil containing the phagostimulant separated out from the water in the distillation flask. It was extracted with ether.

This oil can be detected by the larvae in concentrations down to 2 p.p.m. agar solution. It is 95% one component but it is uncertain whether this major component is the phagostimulant. Only 0·3-0·5 ml oil have been obtained from 100 kg fresh leaves. The further fractionation of this oil and the identification of the phagostimulant has been undertaken by Dr. R. D. M. Murray of the Chemistry Department of Glasgow University.