Progress report of work done for the period July 1st 1985 to January 15th 1986, under the USAID Grant RG/AID/3.

Experiment I : Study of the population dynamics of the beanfly *Ophiomyia phaseoli*, and collection of its native parasitoids.

Introduction : This is the end of a study which started in April 1984, and continued to July 1985. The details of how it was conducted is given in previous reports. This study was conducted at the In-service Training Institute Gannoruwa fields, to ascertain whether populations of bean flies were available though out the year, and the nature of their population fluctuations. Attempts were also made to correlate these fluctuations with environmental factors.

Results : The population fluctuations of this insect for the period March - July 1985 is depicted in Fig (1). As in previous data the insect was available throughout the entire period of study with a maximum of 534 adults per 100 seedlings, and a minimum of 199 adults per 100 seedlings. Rainfall data (as cumulative weekly totals) was included in the graph. The previously noticed relationaship between rainfall and population was seen. Populations were high in dry periods following rains.

The following suspected parasitoids of the beanfly were collected and identified at the Commenwealth Institute of Entomology (C.I.E.). Specimens are being maintained for comparison with new material being collected.

Suspected parasitoids of the beanfly *Ophiomyia phaseoli*

Order : Hymenoptera

Family : Eulophidae

1) *Teleopterus* spp.

Family : Eurytomidae

2) Plutarchia indefensa

Family : Pteromalidae

3) Halticoptera propinqua

4) Sphegigaster brunneicornis

5) Callitula sp.

Of these (2), (4) and (5) have been identified as parasitoids of this insect at Mahailluppallama by Fellows and Amarasena, T.A. XXXIII(2)

Experiment II : Study of the population dynamics of beanfly parasitoids. This study began when the previous one ended and was conducted at the In-Service fields.

Experimental technique : Bean seed (var:Topcrop) was planted at weekly intervals as the case of the study on beanfly population dynamics. The seedling thus obtained were allowed to grow for about 25 days. They were then uprooted and any beanfly pupae were dissected out. The pupae were placed in test-tubes closed with cotton wool. About 10 pupae were in each tube. Adult insects and parasitoids which emerged from the pupae were collected. Using the identified specimens returned by the C.I.E., for comparison, these parasitoids were identified.

Results : The population fluctuations of the beanfly and its pupal parasitoids during the period of this study Sept.-Dec. 1985 is depicted in fig (2). The most abundant parasitoid during this period was Sphegigaster brunneicornis, only on one occation was specimens of Plutarchia indefensa collected. This information definitely establishes S. brunneicornis and P. indefensa as pupal parasitoids.

Experiment III : Laboratory culture of the beanfly Ophiomyia phaseoli attempts to develop an efficient method for the laboratory culture of this insect was continued from the previous season. The chief problem was found to be a source of adult nutrition. In previous attempts the source of adult nutrition was diluted condensed milk. This was applied to a Mylar(R) film sheet for feeding. This was found to be superior to sugar and honey solutions in terms of fecundity. A technique developed by the State Department of Hawii used undiluted bees honey as a source of adult food. Water and bees honey were made available separately by streaking on a Mylar(R) sheet. Insects were found to feed readily on it. Adults fed on this diet were found to breed readily and a culture of the beanfly could be maintained in the laboratory, independent of field collections, except during periods of wet weather. This indicates this technique is suitable for laboratory culture of the insect in Sri Lanka.

Experiment IV : Study of the population dynamics of the cabbage caterpillar complex and their natural enemies. This study was a continuation of the one described in the previous reports. It was conducted in a plot of land adjacent to the glasshouses of the Entomology Division, C.A.R.I.

Results : The population fluctuations of the principal cabbage caterpillars Plutella xylostella, Crocidolomia binotalis Prodenia litura and Plusia spp. for the period May - Dec. 1985 is depicted in the figs (3) and (4). During this period the populations of P. xylostella was low in comparison to the previous one. The principal parasitoid of P. xylostella, Apanteles plutellae was not found during the period May - Dec. 1985. In general during this period populations were low and only on one occasion was a parasitoid of P. xylostella collected. A parasitoid of C. Binotalis was also collected.

Some of the parasitoids of the cabbage caterpillar complex were identified by the C.I.E. They were as follows:

Plutella xylostella (HOST)		
Tetrastichus sokolowski	)	order Hymenoptera
Tetrastichus spp.	)	fam. Eulophidae
Chrysonotomyia spp.	)	

Tetrastichus spp. was also found to parasitize _Apanteles plutellae_ (instance of hyperparasitism) _Copidosoma_ spp. (Hymenoptera: Encyrtidae) was identified from the pupae of _Plusia_ spp. From field collected egg masses of _Prodenia litura_ parasitoids have been bred out. This is interesting because no other parasitoid of _P. litura_ has been bred out.

Experiment V :

Objective Collection of egg parasitoids of _P. xylostella_.

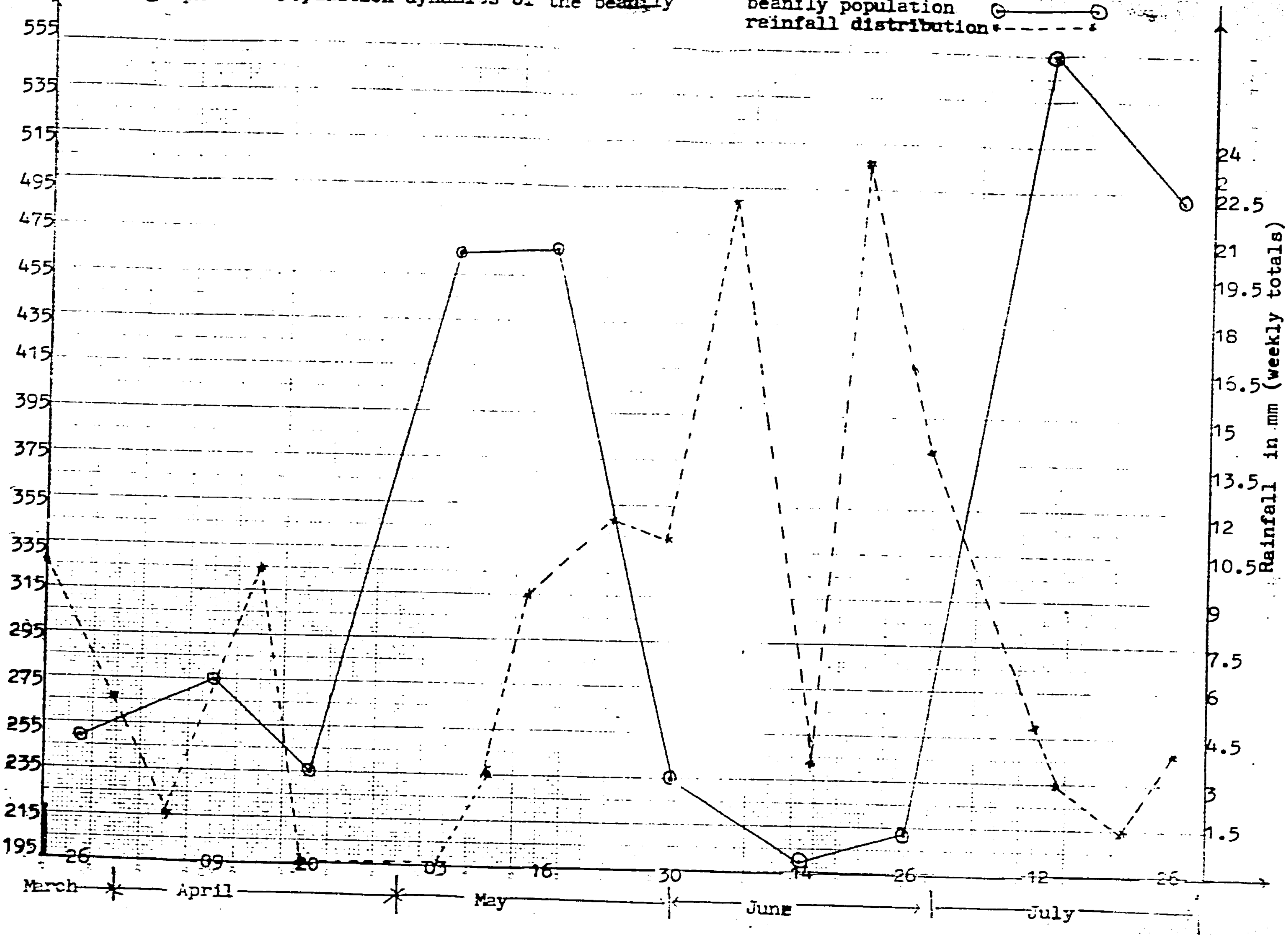
Background information : In their work on the major insect pests of Cabbage and their natural enemies by Nagarkatti and Jayantha, egg parasites of _P. xylostella_ was not recorded in India. In this study we used a modification of a technique employed by Otake et. al. to collect egg parasitoids of rice leaf hoppers.

Technique : Cabbage seedlings grown in pots, were exposed to adults of _P. xylostella_ from laboratory colonies for 2 days. These pots were then kept among unsprayed cabbage seedlings in the field for 3 days. They were then returned to the laboratory. The _P. xylostella_ eggs on these plants were collected by examining under a low powered microscope. They were placed in a test tube plugged with cotton wool and were examined daily. Any caterpillar hatching out was removed. From some of the remaining eggs, egg parasites could be obtained.

Results : When an egg was parasitised it could be noticed by its dark brown colour, which developed when the other caterpillars had hatched out. Using this technique 6 specimens of an egg parasitoid was collected and preserved in alcohol for identification.

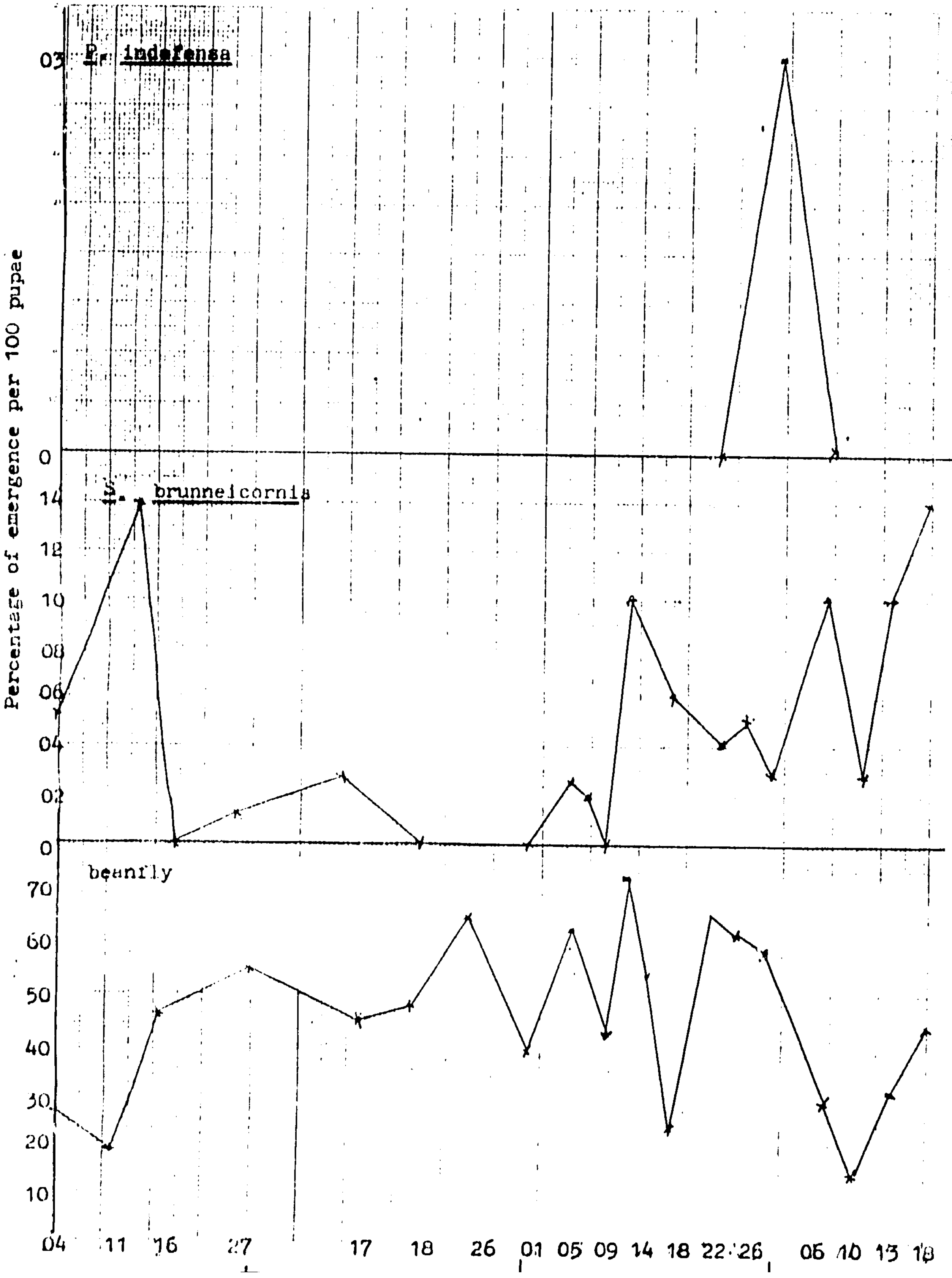
Experiment VI : Unsprayed plots of Snake gourd, Brinjal and Tomato were maintained. A pupae parasite of Dacus cucubitae was collected.

Graph 1 Population dynamics of the beanfly



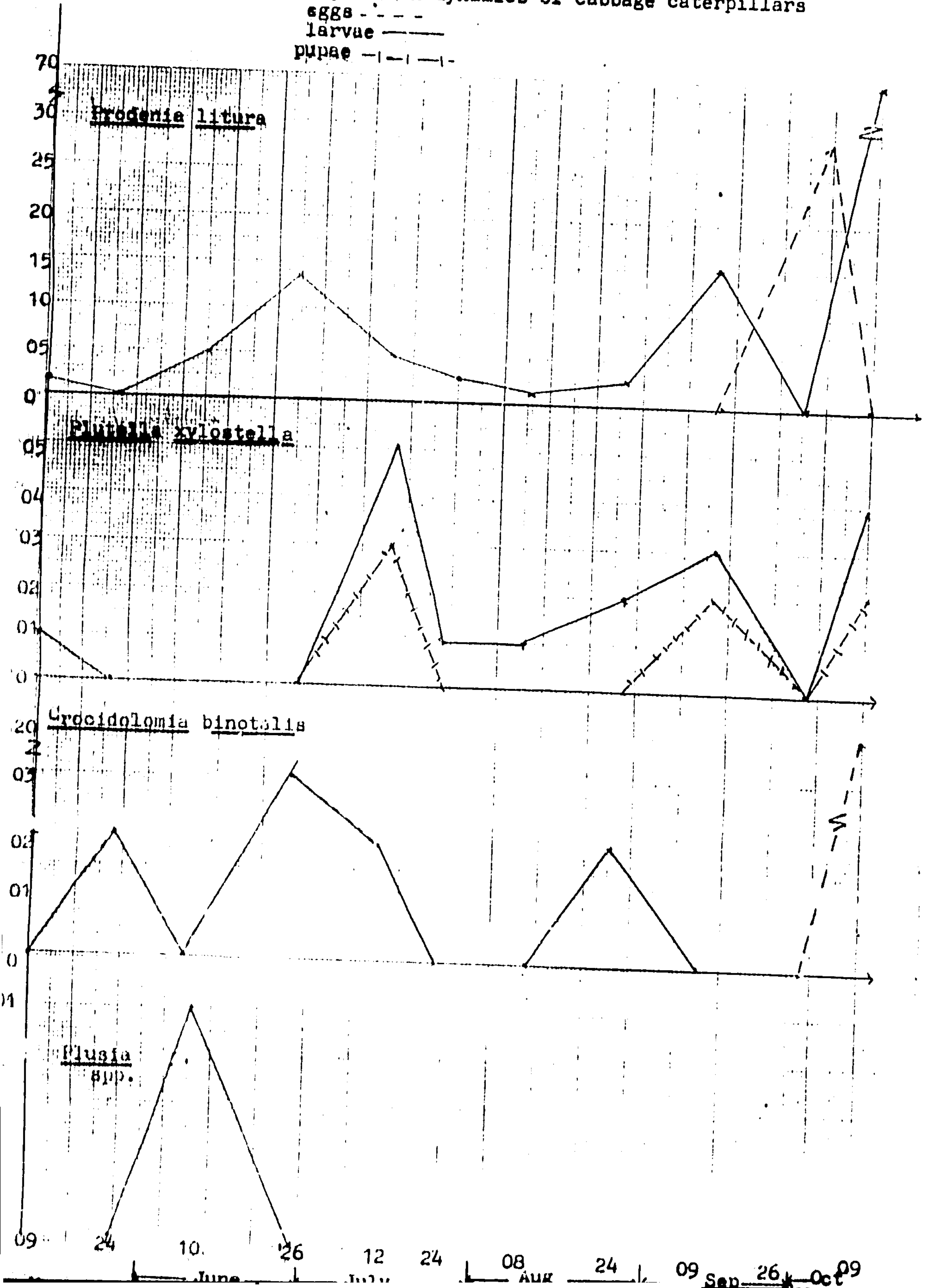
6a

Percentage of emergence of beanfly and its pupal parasitoids
~~graph~~ fig. 2

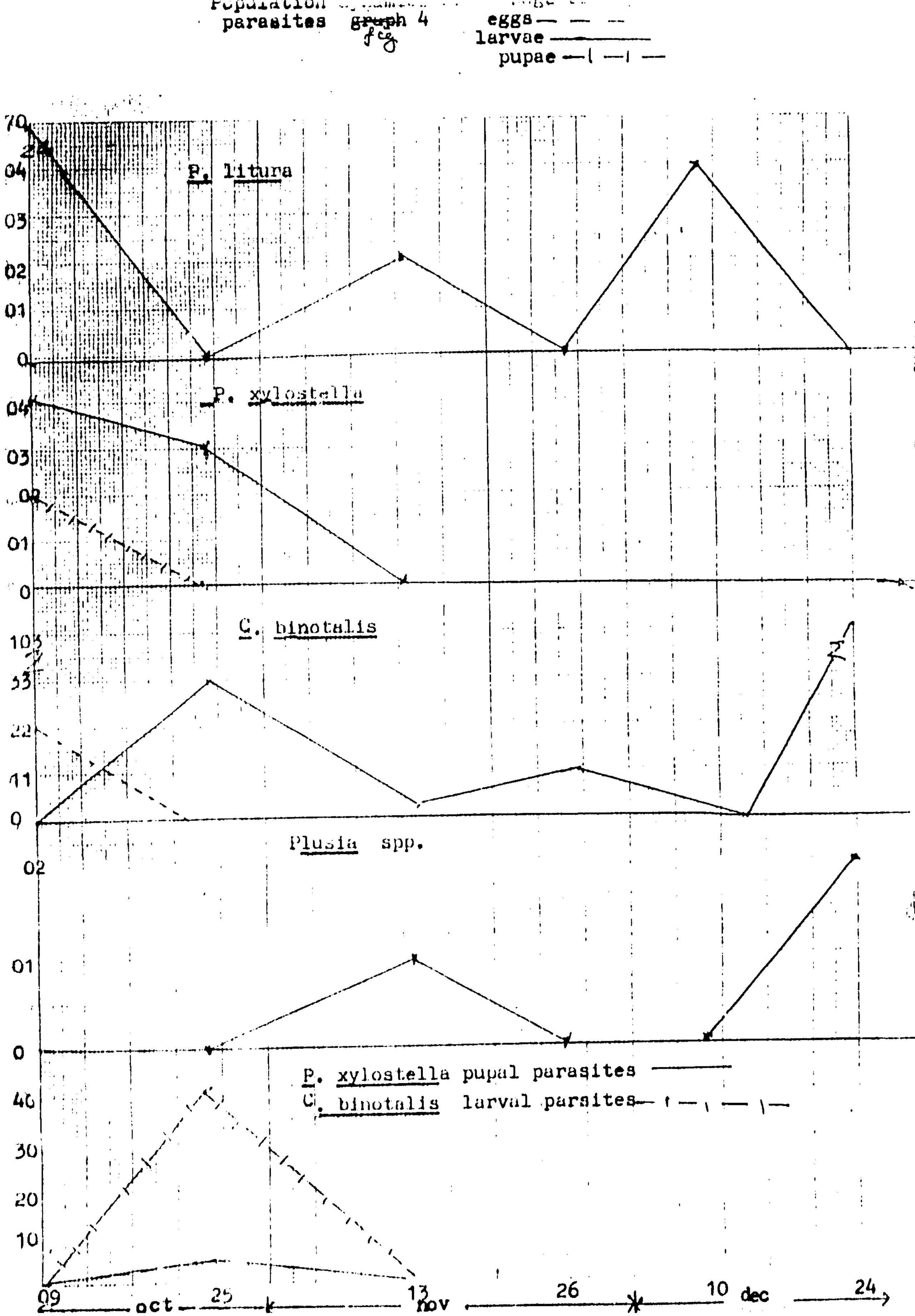


1'

fig 3 Population dynamics of cabbage caterpillars



Population dynamics ... parasites ~~graph~~ fig 4



Population dynamics of cabbage ... parasites ~~graph~~ fig 4