

COMPARATIVE BIOLOGY OF *Aproaerema modicella* DEVENTER (GELECHIIDAE : LEPIDOPTERA) IN SOYBEAN AND GROUNDNUT

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ABSTRACT

Comparative biology of *Aproaerema modicella* (Deventer) was studied on the two principal hosts viz., soybean and groundnut to select the better host for mass culturing of this insect under controlled conditions for laboratory studies. It was concluded that soybean is better suited for mass culturing and it is evidenced by the fact, that more number of eggs, high hatching per cent, shorter larval and pupal periods with low larval mortality, higher pupal weight and high per cent adult emergence with more of females were noticed when reared on soybean.

The leafminer *Aproaerema modicella* (Deventer) is one of the major constraints in the production of soybean and groundnut in India. Among the plant species infested by *A. modicella*, soybean and groundnut are the principal hosts (Mohammed, 1981). Greengram *Phaseolus aureus* (Roxb) (Prasad et al., 1971), Pigeon pea, *Cajanus cajan* (L.) (Lefroy and Howlett, 1909), Lucerne, *Medicago sativa* (L.) (Sandhu, 1978) are also infested by this species.

However no information on the suitable host plant for mass culturing of *A. modicella* is available. Keeping this view, an experiment was conducted to study its comparative biology on the principal host plants soybean and groundnut and to standardize the method for mass culturing of this insect.

MATERIALS AND METHODS

To select the most preferred host for mass culturing of *A. modicella*, two principal host plants viz., Co1 soybean and CO 1 groundnut were utilized. Soybean and groundnut plants were raised in pots of 25cm diameter at the rate of one plant per pot. One pair (♀ & ♂) of freshly emerged adults reared on groundnut was released on 30 day old soybean and groundnut plant individually on the same day and confined with polyester film cage of 25 cm diameter of 90 cm height. Ten per cent sucrose solution was provided as food for the adult moths. Every day the adults were transferred to fresh plants to the respective host of the same age. This was continued till the death of the gravid female. Data on fecundity, incubation period, larval and pupal duration, pupal weight and sex ratio were recorded on

both the hosts. The first generation adults from the respective host plants were introduced at the rate of one pair to the same host plant species and data gathered for three more generations.

RESULTS AND DISCUSSION

In the comparative biology of the leaf miner on soybean and groundnut for four generations, there was a clear indication of the preference for oviposition and higher per cent egg hatching on soybean than on groundnut. However the mean egg period was same on both the hosts studied (Table-1).

The larval and pupal period in each generation was lesser on soybean than on groundnut while the pupal period was 0.5 day less on soybean. The larval mortality was observed to be higher on groundnut (11.1%). The mean pupal weight was 2.11 and 2.81 mg on groundnut and soybean respectively over four generations, with a reduction of 0.70 mg on an average when the larva developed on groundnut (Table 1).

The percentage of adults developed was higher in soybean (78.4) than groundnut (74.2). More number of females were produced on soybean as

evidenced by the male and female ratio of 1:1:13 while it was 1:0.77 on groundnut indicating more production of males (Table-1).

The period from egg to adult was reduced by 2.3 days on soybean. Thus, it is evident that by the time the insects complete six generations on soybean, it could complete only five generations on groundnut.

The above findings viz., more number of eggs, high hatching, short larval and pupal periods with low larval mortality, higher pupal weight and high per cent of adults produced with more of females when reared on soybean indicated that soybean was a preferred host plant for mass culturing of the leaf miner and it might also be possible to get more number of generation on soybean than on groundnut. So it is suggested that soybean might be the better host for mass culturing of this insect. The only other work on this aspect reported by Gujarati et al., (1973) under field studies indicating the preference of soybean to groundnut by *A. modicella* even in the predominant groundnut growing area of Maharashtra supported the present findings.

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TABLE 1. BIOLOGY OF *A. MODICELLA* ON SOYBEAN AND GROUNDNUT

Generation	Number of eggs laid per female	Egg hatching (%)	Period (Mean days)			Pupal weight (mg)	Larval mortality (%)	Number of adults emerged	Sex ratio	Adult emergence (%)
			Egg	Larva	Pupa					
SOYBEAN										
I	73	94.5	3.1	12.3	5.6	2.87	8.7	63	1 : 1.1	86.3
II	70	94.2	3.3	12.5	5.5	2.89	1.5	65	1 : 1.17	92.9
III	66	84.8	3.0	11.8	5.5	2.79	14.3	48	1 : 1.13	72.7
IV	60	73.3	2.8	11.6	5.4	2.68	15.9	37	1 : 1.05	61.7
Mean	67.3	86.7	3.1	12.1	5.5	2.81	10.1	53.31	1 : 1.13	78.4
S.D.	5.6	10.0	0.2	0.4	0.08	0.09	6.5	13.2		13.9
GROUNDNUT										
I	68	92.6	3.2	14.1	6.2	2.12	1.6	62	1 : 0.82	91.2
II	62	91.9	3.3	14.3	6.1	2.16	3.5	55	1 : 0.77	88.7
III	60	78.3	3.1	13.6	6.0	2.11	17.0	39	1 : 0.77	65.0
IV	54	66.7	2.9	13.4	5.8	2.06	22.2	28	1 : 0.65	51.9
Mean	61	82.4	3.1	13.9	6.0	2.11	11.1	46	1 : 0.77	74.2
S.D.	5.7	12.4	0.2	0.5	0.2	0.04	10.1	15.4		18.9

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GERMINATION AND VIGOUR OF SESAMUM (*Sesamum indicum* L.) CV. CO.1 SEEDS RELATIVE TO THE POSITION OF CAPSULE ON THE PLANTS

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ABSTRACT

Seeds of sesamum cv. Co.1 collected from the capsules in upper and lower portions of the main shoot, first and second primary branches from the bottom of the plants and secondary branches borne in the first and second primary branches borne were evaluated. Recovery of bigger sized seeds retained by B.S.S. 12 x 12 sieve was more from the second primary branches and from the lower portion of the plant. Seeds obtained from the second primary branch recorded more germination and vigour. Bigger seeds and the seeds collected from the lower portion of the branches proved superior.

Sesamum is an important oil seed crop in the rained as well as irrigated farming systems. Maintenance of adequate plant population stands foremost in influencing the sesamum yield, which in turn is largely determined by the seed quality.

Sesamum cv. Co.1 is characterised by bushy nature with main shoot as well as branches bearing the capsules and by the indeterminate pattern of growth. Seed

formation and maturation in different capsules are temporally and specially separated. Their quality may be influenced by the position on the plant as was reported in carrot Hegarty, 1971, peas Gzhesyuk and Guretski, 1980 and rape Diepenbrock, 1982. Hence, an experiment was conducted in sesamum cv. Co.1 with the objective of evaluating seed germination and vigour as related to their position on the plants.

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