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Population Estimation of Leafminer (Diptera: Agromyzidae) Associated with Successive Stages of Mung Bean *Vigna radiata* (Linn.) Wilczek

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Abstract

Present study deals with the Mung bean variety K851 cultivated at three locations of Biratnagar by designing an experiment randomized Block design. Flies reared from the successive stages of Mung bean plant were identified as:*Melanogromyza sojae* (Zehnther), internal stem and root feeder, *Ophiomyia phaseoli* (Tryon) external stem and root feeder and *Liriomyza sativae* Blanchard, Leaf mining one. Their field populations under natural condition were regulated by parasitic fauna and other mortality factors. Under certain conditions their population become high and cause economic loss. Population of these flies were found to be highest at seedling stages reaching up to the extent of 88.6% and it was found to decrease with the successive stage of plant growth reaching up to the extent of 0.56%.

Keywords: Diptera, Agromyzidae, Population, Successive stage, RBD

Introduction

Leaf miners belong to order Diptera, family Agromyzidae. All agromyzids feed on plant tissues, seeds, pods, roots, stems etc. More than 2000 species of agromyzid flies are known to the world. Over 150 species of cultivated plants through out the world are attacked by agromyzid species. The mung bean (*Vigna radiata*) is cultivated for human food in Asia and near by Island and also in Africa. It is the source of canned bean sprout found in the market. The average yield of mung bean is about 400 pound per acre, but the farmers are not getting this yield due to heavy infestation. The mung bean is also grown in Terai region of Nepal. But in the absence of good agronomic practices and plant protection method, farmers do not get expected yield. Seeds of resistant varieties are not available. As per Thapa (1991) *Chromatomyia hartic-ola* (Goureau), *Melanagromyza sojae*(Zehnt-ner), *Ophiomyia centrosematis* (de Meijere) and *Liriomyza trifolii*(Burgess) are agromyzid insect pests associatied with *Vigna radiata* in the world. Thapa (1991) has described the following agromyzid flies: *O. centrosematis, M. sojae* and *Tropicomyia vigneae* (Seguy) from this host plant in Pantanagar. The population of these flies were generally under control due to certain climatic factor and due to the presence of natural enemies. Chemical control is difficult as they are internal feeder. Different species were found in different stages of plant growth and each species has got its own niche. Their biology and feeding behaviour were also different. Under certain favourable condition their population increases extensively and cause great damages to crop. Present study deals with mung bean variety K851 sown at three different locations. Estimation of leaf miners population of one of the locations is presented in Table 1. Three species: *M. sojae, L. sativae* and *O .phaseoli* were reared during the study period.

Materials and Methods

Mung variety K851 was sown with all the agronomic practices in experimental field.The design of experiment was RBD. The present field consists of 66 plots each of 1.0 m^2. 5 gm of seeds were sown in each plot. Plant samples were collected from each plot as per schedule and the plants of each plot were kept in properly labeled polythene bag tied with rubber band. The plants sample was taken to laboratory for rearing of flies. Date of sample collection, date of emergence, of flies were recorded. Reared flies were kept separately in the glass vials and the total flies' emerged were counted. Population of the plant during the time of sample collection was also noted.

Results and Discussion

The number of flies decreased with successive stages of the plant. More files were reared during the early stage then the latter successive stages. The total number of flies emerged from 1650 plants was found to be 176. Powdyal (2003) has reported that with the advancement in the age of *Vigna mungo* Heeper, the number of the flies reared varied with the tendency to decrease in number. With regard to species determination the flies' specimen were identified as *M. sojae*, *O.phaseoli* and *L.sativae*. Thapa (1997, 2000) had reported *Melanagromyza hibsci* Spencer, *M. sojae, O. centrosematis, and C. horticola* as a pest in *Vigna radiata* from this locality.During the present research *O. phaseoli* was reared first in *Vigna radiata* from Nepal.

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Table1. Representing numbers of Files emerged corresponding to the successive stages of plant.

Date of sample collection	No. of plants taken	No. of flies emerged	No. of flies/plant	% of flies emerged
2004-4-24	330	155	0.469	88.06%
2004-5-4	330	10	0.03	5.68%
2004-5-11	660	10	0.01	5.68%
2004-5-26	330	1	0.001	0.56%