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INSECT PEST COMPLEX OF YEAR ROUND COUNTRY BEAN (*Lablab perpureus L.*) DURING SUMMER SEASON

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Abstract

The study was conducted at the experimental field of entomology department, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh during March to July 2009 in order to know the insect pest complex found in heat tolerant year round country bean (IPSA Seem 2) field during summer season. During the study period the insect pests: Aphid (*Aphis spp.*), Pod borer (*Maruca testularis* G. & *Helicoverpa armigera*), Bean bug (*Coptosoma cribrarium* F), Leaf eating caterpillar (*Plusia oricalchea* Fb), Hairy caterpillar (*Spilarctia obliqua*), Green semilooper (*Plusia oricalchea* Fb.), Coreid bug (*Leptoglossus spp.)*, Hooded hopper (*Leptocentrus Taurus* Fb.) & Leaf beetle (*Madurasia obscurella* Jacoby) were found in the year round country bean field. Among the insect pests; Aphid (*Aphis spp.*), Bean bug (*Coptosoma cribrarium* F), Leaf eating caterpillar (*Plusia oricalchea* Fb), Green semilooper (*Plusia oricalchea* Fb.), Hooded hopper (*Leptocentrus Taurus* Fb.) & Leaf beetle (*Madurasia obscurella* Jacoby) were found at the vegetative stage; Aphid (*Aphis spp.*), Hairy caterpillar (*Spilarctia obliqua*), Bean bug (*Coptosoma cribrarium* F), Pod borer (*Maruca testularis* G. & *Helicoverpa armigera*) & Hooded hopper (*Leptocentrus Taurus* Fb.) were found at flowering stage while Pod borer (*Maruca testularis* G. & *Helicoverpa armigera*), Aphid (*Aphis spp.*), Bean bug (*Coptosoma cribrarium* F) & Coreid bug (*Leptoglossus spp.)* were found at flowering stage.

KeyWords: Insect pest complex, Year round country bean

Introduction

Country bean, *Lablab purpureus* (Lin.) is a common and popular vegetable in Bangladesh. This bean frequently known as Seem, Hyacinth bean, Indian bean, Egyptian kidney bean and Bovanist bean (Rashid, 1999). It contains 4.5% protein in pod, 25% protein in dry seed (Rashid, 1976). It also content with appreciable amount of vitamin, phosphate, calcium and sodium (Gopalan *et al,* 1982). This crop is also important for its atmospheric nitrogen fixation (Kalra, 1979).

The pest complex of country bean depends on geographical position and weather condition of the growing areas. It appears that there have been variations of country bean pest complex in different countries and parts of the season. In India, country bean has been reported to be

attacked by more than 57 species of pestiferous arthropods (Govindan, 1974). In Mayanmer, country beans have been reported to be attacked by 14 arthropod pests (Shroff, 1920). In Bangladesh, country bean has been frequently reported to be infested with various species of aphids including *Aphis craccivora* and *A. medicagenis* Koch (Homoptera: Aphididae); bean bug, *Coptosoma cribrarium* F. (Hemiptera: Plataspidae); green semilooper, *Plusia oricalchea* Fb. (Lepidoptera: Pyralidae); hooded hopper, *Leptocentrus Taurus* Fb. (Homoptera: Membracidae); leaf miner, *Cosmopterix spp*. (Diptera: Agromyzidae); leaf weevil, *Blosyrus oniscus* Ol. (Coleoptera: Curculionidae); pod borers, *Maruca vitrata*; *M. testularis* and *Helicoverpa armigera*, (Lepidoptera: Pyralidae); shoot borer, *Sagra carbunchulus* H. and *S. femorata* D. (Lepidoptera: Pyralidae); shoot weevil, *Alcides collaris* P. (Coleoptera: Curculionidae) and the mite, *Tetranychus spp*. (Acarina) (Begum, 1993; Karim, 1995; Das, 1998; Islam, 1999). Alam *et al.* (2008) reported plume moth, *Sphenarches anisodactylus* W. (Lepidoptera: Pterophoridae) as borer pest of country bean that fed mainly on flowers. In Bangladesh, pod borers have been frequently attacking various crops including country beans and causing severe damage to the crop (Rahman and Rahman, 1988; Ahmed *et al*., 2003). Butani & Jotwani (1984) reported aphid as the most common pest all over the world which is responsible for feeding damage and transmission of plant virus (Kennedy, 1976). Among these insect pests, only a few species occur in most places of the country, and may often cause economic damages. Therefore, the present study was undertaken to know the insect pest complex of year round country bean grown during summer season.

Materials and Methods

The study was conducted at the Research field of Entomology Department in Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur, Bangladesh during the period from March to July 2009.

Location

The study area is situated at 24.09 N latitude and 90.26 E longitudes with an elevation of 8.4 meter from the sea level (Haider *et al*., 1991).

Soil

Soil of the study site was silty clay loam in texture belonging to Salna series. The area represents the Agro-Ecological Zone of Madhupur tract (AEZ-28) with P^H 5.8-6.5, CEC25.58 (Haider *et al.*, 1991).

Climate

The experimental site is situated in the subtropical climatic zone characterized by heavy rainfall during the month from May to September (Anon. 1988).

Land Preparation

The soil was well prepared and good tilth was ensured for commercial crop production. The land size was 31m in length and 21m in width. The land was divided into 3 blocks, each block contains 10 plots. Each plot contains one row with 7 pits per row and one plant per pit. The plot size was 5m x 2m and plot to plot distance was 1m and block to block distance was 2m and plant to plant distance was 75 cm. Standard dosages of cow dung and fertilizers were applied as recommended by Zaman (1992) for country bean @ 15000, 20, 60 and 60 kg of cow dung, urea, TSP and MP per hectare, respectively.

Collection of Seed, Seedling Raising and Transplanting

The seed of year round country bean variety (IPSA seam 2) was collected from the Department of Horticulture, BSMRAU, Gazipur. Seeds were sown at the rate of 1 seed per bag at 9th March. Seedlings with good vigor were transplanted in the main field on 23rd March 2009. At the time of transplanting, the polyethylene bag was cut and removed carefully in order to keep the soil intact with the root of the seedlings.

Cultural Practices

After transplanting a light irrigation was given. Subsequent irrigations were applied in all the plots as and when needed. Propping of each plant by bamboo sticks was provided to facilitate creeping of the plants and to avoid their lodging. Trellis was built by bamboo sticks vertically using GI wire for support and to allow normal creeping. The bamboo sticks were 2 meter high from ground level. Weeding and mulching in the plots were done, whenever necessary.

Monitoring the Incidence of Pests at different growth stages

For the purpose of studying the incidence of insect pests, a close monitoring of field was done twice a week. The incidence of pest was observed through visual search, sweep net and

aspirators wherever whichever was suitable in all plots and their number per plot was noted. The specimens were brought to the laboratory for description and identification. For identification and confirmation some species were reared in the laboratory.

For recording aphid incidence, top 5 cm of infested shoot & inflorescence was considered and number of aphid infested shoot & inflorescence were recorded. The aphids from the selected parts were gently brushed off and collected in a Petri-dish and counted by magnifying glass and recorded the number. For pod borer incidence, the infested inflorescences & pods were counted and their number per inflorescence & pod was recorded.

Data Collection

Data was collected from the experimental plots on the following parameters**:**

1. Population and total number of insect pests at vegetative stage
2. Population and total number of insect pests at flowering stage
3. Population and total number of insect pests at fruiting stage

The collected data were properly compiled, coded, tabulated and analyzed by using Microsoft excel software for proper interpretation.

Results and Discussion

Taxonomic status of the insect pests found in country bean (*Lablab purpureus* Lin.) field

During the experimental period different insect pests were found in different growth stages in the year round country bean (*Lablab purpureus* Lin.) field as presented in Table 1. The insect pests were under different family and order. Thus the taxonomic status of the observed insect pests were: Aphid, Aphis spp. (Homoptera: Aphididae); Bean bug, *Coptosoma cribrarium* (Hemiptera: Plataspidae); Leaf eating caterpillar, *Amsacta albistriga* W. (Lepidoptera: Arctiidae); Green semilooper, *Plusia oricalchea* (Lepidoptera: Pyralidae); Hooded hopper, *Leptocentrus Taurus* Fb. (Homoptera: Membracidae); Leaf beetle, *Madurasia obscurella* Jac. (Coleoptera: Chrysomelidae); Pod borer, *Maruca testularis* G. & *Helicoverpa armigera* (Lepidoptera: Pyralidae); Coreid bug, *Leptoglossus spp.* (Hemiptera: Coreidae) and Hairy caterpillar, *Spilarctia obliqua* (Lepidoptera: Arctiidae)

Incidence of insect pests at different growth stages of country bean (*Lablab purpureus* Lin.)

The incidence of insect pests found at experimental plot has been shown in Table 2. At the vegetative stage six (6) insect pests were found to infest year round country bean. They were listed in descending order of their incidence as aphid (*Aphis spp.*), bean bug (*Coptosoma cribrarium*), leaf eating caterpillar (*Amsacta albistriga* W.), green semi looper (*Plusia oricalchea*), hooded hopper (*Leptocentrus Taurus* Fb.) and leaf beetle (*Madurasia obscurella* Jacoby). At the flowering stage the incidence of insect pests in descending order are as Aphid (*Aphis spp.*), hairy caterpillar (*Spilarctia obliqua*), bean bug (*Coptosoma cribrarium*), pod borer (*Maruca testulalis* G.) and hooded hopper (*Leptocentrus Taurus* Fb.). At the fruiting stage, the insect pests found are presented in descending order as pod borer (*Maruca testulalis* G.), Aphid (*Aphis spp.*), bean bug (*Coptosoma cribrarium*) and Coreid bug (*Leptocoriza acuta*). Thus aphid and bean bug was common in all the growth stages.

Aphid, pod borer and bean bug found common in both flowering and fruiting stage. Ahmed et al. (2003) also found all the insect pests infesting country bean at North Edilpur and South Mohadebpur in winter season except hairy caterpillar and coried bug. Thus hairy caterpillar and coried bug are the insect pests prevailing in the summer season in IPSA Seem 2.

Morphological description and Nature of damage of different insect pests at different growth stages

Name of the insect: Aphid

Description of pest: Adults were small in size, pear-shaped, brown or black in color, occurred both in alate and apterous forms. The insects crowded together in clusters upon the top of the stalks and on pods.

Symptom of damage: Both adult and nymphs sucked the sap from ventral surface of tender leaves, growing shoots thus growth of vines retarded. At flowering stage sucked sap of flower and flower stalks thus infested flower bud fell off. At fruiting stage both nymphs and adults suck sap from mature and immature pods. The infested pods shriveled and became malformed.

Name of the insect: Pod borer

Description of pest: Full-grown caterpillars were light brown and greenish in color with irregular brownish-black spots on dorsal, lateral and ventral side. Adults were medium sized slender moth with head, thorax and abdomen fuscous brown in color. Fore wings were

fuscous brown with a white spot. Hind wings were semi-hyaline white with a fulvous-brown distal patch.

Symptom of damage: Young caterpillars fed on reproductive parts of flower and moved from one flower to another. Later they webbed the inflorescence. The infested flowers were found either with 1-3 or webbed together becoming totally damaged. At fruiting stage, caterpillars fed on both mature and immature pod by boring. Infested pod did not develop and become malformed.

Name of the insect: Bean bug

Description of pest: Adults were small, oval shaped, greenish, strongly convex with scutellum covering most part of abdomen and wing. Nymphs were ovate in shape and pale green in color.

Symptom of damage: Nymphs and adults sucked sap on tender shoots, ventral surface of leaves and sometimes on tender fruits.

Name of the insect: Hairy caterpillar

Description of pest: The adult is dull yellow with oblique line of black dots on hind wings. The dorsal side of the abdomen is red with dull yellow ventral side.The full grown larva is darkened with yellowish brown abdomen having numerous pale white brown and black hairs and measures about 43 mm.

Symptom of damage: The young gregarious caterpillars feed on chlorophyl from lower surface of leaf giving a peculiar membranous appearance. They scrape the green part of leaves. Only leave the midribs and cross veins.

Name of the insect: Leaf eating caterpillar

Description of insect: Adults were light-yellowish with dorsal black spots. Caterpillars were hairy, pink orange to brown in color.

Symptom of damage: Fed on the young leaves, caused defoliation of vines. The caterpillars were very active and moved from one plant to another.

Name of the insect: Hooded hopper

Description of insect: The adults were small bugs. They were characterized by the pronotum that extended back wards over the entire abdomen and had two horn-like processes laterally. They moved by a peculiar jumping motion.

Symptom of damage: Adults and nymphs caused damage by sucking the sap from succulent plant parts.

Name of the insect: Leaf beetle

Description of insect: Adults were small, oval shaped, brownish in color and had two black stripes on body.

Symptom of damage: Made holes which were comparatively large and less in number.

Name of the insect: Green Semilooper

Description of insect: Moth is dark, body 12-16 mm long and wing expanse of 32 mm. Irregular light markings on forewings, hind wing is of lighter colour and is darker towards the edges then towards base. Caterpillar is about 1.5 mm, when freshly hatched and grows to 30-35 mm. The semilooper is green with tubercles on the body from which arise thin hairs and its anal segment is humped. Only three pairs of prolegs are present.

Symptom of damage: It is a specific pest causing appreciable damage. Caterpillar feed on leaves causing defoliation. The caterpillar is often found on underside of the leaf which may also be lightly folded.

Name of the insect: Coreid bug

Description of insect: It is about 15 mm (0.6 inch) long, basic colour is dull tan, covered with so many dark pits that it appears to be brown or black. Have enlarged or flattened extensions on their legs, hence the common name leaf-footed bug.

Symptom of damage: These insects suck juices from shoot & fruits of country beans.

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Tables

Table 1. Taxonomic status of the insect pests found in year round country bean (*Lablab purpureus* Lin.) field during summer season.

Common Name	Scientific Name	Family Name	Order Name
Aphid	Aphis spp.	Aphididae	Homoptera
Bean bug	Coptosoma cribrarium	Plataspidae	Hemiptera
Leaf eating caterpillar	Amsacta albistriga W.	Arctiidae	Lepidoptera
Green semilooper	Plusia oricalchea	Pyralidae	Lepidoptera
Hooded hopper	Leptocentrus Taurus Fb.	Membracidae	Homoptera
Leaf beetle	Madurasia obscurella Jac.	Chrysomelidae	Coleoptera
Pod borer	Maruca testularis G. Helicoverpa armigera	Pyralidae	Lepidoptera
Coreid bug	Leptoglossus spp.	Coreidae	Hemiptera
Hairy caterpillar	Spilarctia obliqua	Arctiidae	Lepidoptera

Table 2. Incidence of insect pests at different growth stages (according to descending order of incidence) in year round country bean field during summer season.

Vegetative stage	Flowering stage	Fruiting stage
Aphid (1)	Aphid (1)	Pod borer (1)
Bean bug (2)	Hairy caterpillar (2)	Aphid (2)
Leaf eating caterpillar (3)	Bean bug (3)	Bean bug (3)
Green semilooper (4)	Pod borer (4)	Coreid bug (4)
Hooded hopper (5)	Hooded hopper (5)	
Leaf beetle (6)		

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