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PEST COMPLEX OF MUNG BEAN IN INDIA

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ABSTRACT

Pests recorded on mung bean in India have been reviewed and a check list of the pests has been given. The pests listed include 14 genera and 22 species of Coleoptera, 3 genera and species of Diptera, 16 genera and 23 species of Hemiptera, a single species of Hymenoptera, 28 genera and 34 species of Lepidoptera, 4 genera and species of Orthoptera, and 2 genera and species of Thysanoptera among the insects, 12 species of nematodes representing 8 genera, 2 genera and species of mites and a millipede species. Weevils *Atactogaster orientalis* (Chevrolat) and *Myllocerus laetivirens* Marshall (Curculionidae: Coleoptera) and the spittle bug *Poophilus costalis* Walker (Aphrophoridae : Hemiptera) are new records on mung bean in Rajasthan.

Pulses are the major source of proteins in Indian dietary. Mung bean, *Vigna radiata* (L.) Wilczek is the only pulse crop which can be grown round the year. It is grown in about 2.5 m ha and is an important component of the cropping systems in Rajasthan, Madhya Pradesh. Haryana, Orissa, Maharashtra and Uttar Pradesh. In Rajasthan, the crop is grown mixed in various combinations with pearl millet, clusterbean and moth bean in dry farming conditions. Possibility of unusual incidence and record of new insect pests calls for regular surveillance of the pest complex on different crops. This paper reviews the recorded pest complex of mung bean in India and also reports some new pests recorded on this crop in Rajasthan.

PEST COMPLEX OF MUNG BEAN

Mung bean, black gram and moth bean have almost indentical pest fauna (Srivastava, 1964). Singh and Singh (1977) considered black gram to be preferred more than mung bean by the pests. Earlier, pests on mung bean have been listed or described by Fletcher (1919), Ayyar (1940). Srivastava (1964), Nayar et al. (1976), Srivastava and Singh (1976), Saxena (1978), Singh and van Emden (1979), Tropical Development and Research Institute (Anon., 1981) and Lal (1985). Based on these works and on observations, a check list of the pests of mung bean in India is given in Table 1. Pest incidence studies in mung bean have been done by Pal et al. (1977) and Singh and Singh (1976).

COLEOPTERA

Apionidae

Ayyar (1940) and Nayar et al. (1976) mentioned the weevil *Apion ampulum* Faust. as a pest of mung bean.

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1	2	3	4
	HYMENOPTERA		
Apidae	*Ceratina binghami* Ckll.	Carpenter bee	m
	LEPIDOPTERA		
Arctiidae	*Amsacta albistriga* Moore	Red hairy caterpillar	ms
	Amsacta lactinea Cramer	Black hairy caterpillar	ms
	Amsacta moorei Butler	Red hairy caterpillar	ms
	Spiolosoma obliqua (Walker) (*Diacrisia obliqua*)	Bihar hairy caterpillar	ms
Gelechiidae	*Anarsia ephippias* (Meyrick)	Shoot borer	m
	Aproaerema modicella Deventer (*Stomopteryx nerteria* Meyr., *S. subsecivella* Zeller, *Biloba subsecivella* (Zell.)	Groundnut leaf miner	m
Gracillaridae	*Acrocercops phaseospora* Meyrick	Leaf miner	m
	Gracillaria soyella V.D.	Leaf miner	
Lycaenidae	*Euchrysops cnejus* (Fabricius) (*Catochrysops cnejus*)	The Gram blue	ms
	Lampides boeticus (L.) (=*Cosmolyce boetica* L. *Polyommatus boeticus* L.)	Long tailed blue	
Lymantriidae	*Euproctis scintillans* (Walker) (=*Porthesia scintillans* Walker)	Tussock caterpillar	m
Noctuidae	*Achaea janata* Linn.	Castor semilooper	?
	Adisura atkinsoni Moore	Field bean borer	m
	Agrotis ipsilon (Hubn.)	Greasy cutworm	?
	Anomis flava F.	Green semilooper	m
	Anticarsia irrorata D.	Green leaf caterpillar	
	Azazia rubricans Boisd.	Green semilooper	m
	Autographa nigrisigna Walker (=*Plusia nigrisigna* Walker)	Semilooper	?
	Eublemma hemirhoda Walker	Flower webber	m
	Heliothis armigera Hb.	Gram pod borer	?
	Plusia chalcytis F.	Semilooper	?
	P. daubei F.	Semilooper	?
	P. peponis F.	Semilooper	?

* First record

$ M - minor, ms - moderatle serious, s - serious

? - status doubtful or not known

1	2	3	4
	Spodoptera exigua (Hbn.)	Cutworm	m
	Spodoptpra litura (F.) (=*S. littoralis*, *Prodenia litura*)	Tobacco cutworm	m
	Thysanoplusia orichalcea (Fabr.) (=*Plusia orichalcea*, *Diachrysia orichalcea*)	Pea semilooper	m
Pyraustidae	*Lamprosema indicata* F. (*Nacoleia vulgaris* Guen.)	Leaf roller	m
	Maruca testulalis (Geyer)	Pod borer	ms
	Ostrinia nubilalis (Hub.)	Corn borer	m
Sphingidae	*Herse convolvuli* Linn.	Sweet potato sphinx	?
	Acherontia styx (Westwood)	Til leaf caterpillar	ms
Tortricidae	*Cydia critica* (Meyrick) (*Eucosma critica*)	Tur leaf caterpillar	m
	C. melanaula (Meyrick)	Lear rollr	m
	C. ptychora (Meyrick) (*Laspeyresia ptychora* Meyr.)	Cowpea seed moth	ms
	ORTHOPTERA		
Acridiidae	*Chrotogonus trachypterus* Blanchard	Surface grasshopper	m
	Colemania sphenarioides Bolivar		m
	Hieroglyphus nigrorepletus Bolivar	Kharif grasshopper	m
	Oxya velox Fabricius (=*O. chinensis* Thunb.)		
	THYSANOPTERA		
Thripidae	*Caliothrips indicus* (Bagnall)	Groundnut thrip	m
	Megalurothrips distalis Karny		
	NON–INSECT PESTS ARTHROPODA : DIPLOPODA		
	Ktenostreptus sp.	Millipede	m
	ARTHROPODA : ARACHNIDA		
Tetranychidae	*Tetranychus neocaledonicus* André (=*T. cucurbitae* Rahman & Sapra)	Cucurbit mite	m
	Tarsonemus sp.		m

* First record

$ M - minor, ms - moderately serious, s – serious,
? status doubtful or not known

DIPTERA

Agromyzidae

Ophiomyia phaseoli Tryon is reported to breed on mung bean in Rajasthan (Anonymous, 1970). Peter Ooi (1973) regarded *O. phaseoli* as the most important pest of mung bean. In Punjab, it attacks the summer mung bean crop in seedling stage (Chhabra and Kooner, 1985).

Platystomatidae

Siddappaji and Gowda (1980) reported *Rivellia* sp. damaging the root nodules of mung bean and other pulse crops sown in July.

HEMIPTERA

Aleyrodidae

Nene (1972) studied the population dynamics of *Bemisia tabaci* Genn. on mung bean. Murugesan et al. (1977) worked out a method of prediction of incidence of *B. tabaci* and yellow mosaic virus in mung bean. Kooner et al. (1977) screened 504 lines of mung bean against *B. tabaci* and yellow mosaic virus. Murugesan and Chelliah (1978) studied the effect of YMV infested mung bean plants on *B. tabaci*. Nariani (1980) established that YMV could be transmitted by *B. tabaci* from mung bean to black gram. Yein and Singh (1982) studied the effect of fertilizers and pesticides on the whitefly incidence in mung bean. Rangaraju and Chenulu (1980) devised a new method of counting whiteflies in mung bean crop. Chhabra et al. (1980) studied the resistance behaviour of 91 cultivars of mung bean and found cv ML 194, ML 195, ML 235 and 15127 as resistant to *B. tabaci*.

Aphididae

Misra (1969) regarded *Aphis craccivora* Koch togetherwith YMV as the major limiting factor in the production of mung bean in Orissa. Panda and Kanaka Raju(1972) screened 25 varieties of mung bean for resistance against *A. craccivora*. They observed aphid population to be more in summer crop than in other (rainy and winter) seasons. YMV was severe in summer and winter crops. Sharma and Verma (1977) observed that *A. craccivora* could transmit the cowpea banding mosaic virus in mung bean. Kanaka Raju and Panda (1983) studied the influence of mung bean varieties on the biology of *A. craccivora*.

Aphrophoridae

Spittle bugs *Clovia puncta* Walker (Verma, 1979) and *Poophilus costalis* Walker (Verma, 1986b) feed upon mung bean plants besides several other cultivated and wild plants in Rajasthan. Apparently there is no economic damage caused to the crops.

Cicadellidae

Pruthi (1940) first described *Empoasca kerri* Pruthi infesting mung bean in India. Gupta and Saxena (1971) worked out the effects of intensity of infestation by *E. kerri* on the growth and yield of mung bean plants. Populations of *E. kerri* prefer to infest yellow mosaic virus infected plants of mung bean rather than healthy plants (Reghupathy et al., 1975). Black gram intercrop in mung bean was found to increase the intensity of jassids in mung bean (Singh and Singh, 1978). The populations tend to increase on mung bean plants from late April or early May to late September, with peak in mid or late July to mid or late August (Chaudhary et al., 1980). Chhabra et al. (1981) reported *E. terminalis* Distant as another jassid infesting mung bean crop in Punjab. Varietal resistance against *E. kerri* has been reported in mung bean (Sachan, 1982).

Lygaeidae

Bhattacharjee (1959) reported *Lygaeus pandurus* Scopoli feeding on several pulses. Zakir (1982) recorded it on cowpea at Udaipur. Chopra (1971) stated the corrrect species and name of this bug found widely distributed in northern India as *Spliostethus mecilentus* Stal. In Rajasthan, we have observed that these bugs occur and feed both on summer as well as rainy season crops of mung bean.

Chauliops fallax Scott was recorded on mung bean by Rawat and Sahu (1968) and it has since become an important pest of mung bean and urd in Madhya Pradesh (Rawat and Sahu, 1973). The period of activity of the bug in Himachal Pradesh is late July to late August (Lal, 1974) and August to September in Madhya Pradesh (Rawat and Sahu, 1973).

Pentatomidae

Gupta and Gupta (1972) reported severe attack of *Bagrada cruciferarum* Kirkaldy on mung bean and black gram in Harayana. Verma (1986b) observed that these bugs attack the kharif mung bean crop in post-flowering stage at Udaipur. The green stink bug, *Nezara viridula* Linn. was first reported on mung bean, soybean and other pulses by Singh (1973). Singh and Rawat (1982) observed the peak infestation of summer mung bean in the end of June in Madhya Pradesh While feeding, *N. viridula* also injects a fungus *Nematospora* sp. into the developing seeds (Singh and van Emden, 1979).

LEPIDOPTERA

Arctiidae

The hairy caterpillars reported to feed upon mung bean plants in Rajasthan are *Amsacta moorei* Butler (Srivastava and Mishra, 1968; Verma, 1982) and *A. lactinea* Cramer (Verma, 1982).

Gelechiidae

Sinha et al. (1975) studied the effect of mung bean varieties on the growth and development of *Spilosoma obliqua* Walker. Gupta et al. (1979) found mung bean as a moderately suitable host for the larval development of *S. obliqua*.

Prasad et al. (1971) for the first time recorded *Aproaerema modicella* Deventer attacking mung bean as a stem borer. Das and Misra (1984) also included mung bean as an alternate host of *A. modicella*.

Lycaenidae

Banerjee and Pramanik (1964) reported the outbreak of *Euchrysops cnejus* (Fabr.) on 70% of mung bean plants in a field in West Bengal. The average pods reported damaged were 22%. Thakur et al. (1972) reported *Lampides boeticus* (L.) attacking off season summer crop of pea in Himachal Pradesh. Srivastava et al. (1975 b.) studied the relative susceptibility of 11 cultivars of mung bean to *E. cnejus*. Both *E. cnejus* and *L. boeticus* exist together but the former is more common on cowpea (Saxena, 1978). Singh (1979) studied the varietal susceptibility of mung bean to *E. cnejus*. Verma (1986b) observed *L boeticus* to be the only significant pest on summer mung bean crop at Udaipur, which was conspicuously absent in the kharif crop.

Lymantriidae

Subba Rao et al. (1974) recorded *Euproctis scintillans* (Walker) feeding on mung bean leaves in Tamilnadu.

Noctuidae

Lefroy (1909) recorded the green semilooper. *Azazia rubricans* Boisd. as a pest of black gram but Fletcher (1914) regarded it as a minor pest of probably all pulses including mung bean. *A. rubricans* was further recorded on mung bean and other pulses by Puttarudraiah and Raju (1952) and Subramaniam and Muthukrishnan (1958). Fletcher (19 4) recorded *Plusia signata* Fabr. as a pest on mung bean. Chhabra and Kooner (1985) mentioned another green semilooper *Anomis flava* F. as a regular pest of kharif mung bean in Punjab.

Agrotis ipsilon (Hbn.) was observed to feed on mung bean by Sengupta and Behura (1957). Jayaramaiah et al. (1975) observed a large number of *Achaea janata* Linn. feeding on the floral parts of mung bean in Madhya Pradesh. They successfully reared *A. janata* on mung bean. Babu et al. (1979) noted *Thysanoplusia orichalcea* (Fabr.) and *Spodoptera litura* (L) feeding on mung bean foliage. Tiwari (1979) reported *Adisura atkinsoni* Moore as an important pest of mung bean in Madhya Pradesh. Singh and Rawat (1980) recorded mung bean as a host of *Thysanoplusia*

orichalcea besides soybean and 14 other plant species at Jabalpur, Madhya Pradesh. Islam et al. (1984) also recorded *T. orichalcea* and *S. litura* on mung bean.

Chaudhary and Sharma (1981) observed mung bean to be the host for *Heliothis armigera* Hbn. during June to August in Haryana. Jayaraj (1982) regarded mung bean plants the least preferred for oviposition by *Heliothis armigera*. Verma (1986 b) found no incidence of *Heliothis armigera* in mung bean, although the pest was simultaneously present in other crops. Black gram also remains free of this pest in Rajasthan (Anon., 1986).

Fletcher (1914) considered *Lamprosema indicata* F. as a minor pest of mung bean and other pulses. Kapoor et al. (1972) recorded *L. indicata* infesting soybean in Madhya Pradesh. *L. dieminalis* (Gn.), a major pest of mung bean (Peter Ooi, 1973) was recorded by Kapoor and Gangrade (1973) on soybean.

Tortricidae

Cydia ptychora (Meyrick) is reported in India as a pest of pigeon pea (Fletcher, 1919), cowpea (Gubbaiah et al., 1975), soybean (Kumar et al., 1981; Singh and Jakhmola, 1983 a) and groundnut (Panchabhavi, 1982). Recently the pest has been recorded also on mung bean in Rajasthan (Verma, 1986 a).

Sphingidae

Trehan and Pingale (1946) reported *Herse convolvuli* Linn. as a pest of mung bean in Bombay Province. Sengupta and Behura (1957) also mentioned mung bean as a host of *H. convolvuli*. Sesamum leaf caterpillar, *Acherontia styx* (Westwood) is stated to sometimes heavily attack the summer crop of mung bean in Punjab (Chhabra and Kooner, 1985).

ORTHOPTERA

Acrididae

A number of grasshoppers are known to feed upon mung bean foliage. Bhatia et al. (1964) reported *Hieroglyphus nigrorepletus* Bolivar as a pest of mung bean in Kutch district of Gujarat.

THYSANOPTERA

There are very few specific reports of thrips infesting mung bean. Kooner et al. (1982) recorded heavy damage by *Caliothrips indicus* (Bagnall) in blossoming crop of mung bean. The extent of damage has been reported to the tune of 54.3% (Chhabra and Kooner, 1985). Saxena (1985) reviewed the thrips of economic importance in

India and listed *Thrips tabaci.* Lind., *Scirtothrips dorsalis* Hood and *C. indicus* (Bagnall) on black gram.

Non-insect pests of mung bean (Lower animals)

A miltipede, *Ktenostreptus* sp. (Diplopoda) was reported feeding on flowers of mung bean crop by Siddappaji et al. (1979). Gupta et al. (1975) studied the incidence of the mite *Tetranychus neocaledonicus* André on mung bean and evaluated different methods of eatimating its population. None of the 80 genotypes of mung bean screened by Singh and Chauhan (1984) were resistant against the mite *Tarsonemus* sp., although cv K 851 was less susceptibile. Mite infestation was at its peak just before pod formation.

Prasad et al. (1971) first reported *Maloidogyne javanica* as a pest on mung bean. Mathur et al. (1973) and Hussaini and Seshadri (1976) screened several cultivars of mung bean against the root knot nematode *M. javanica* and *M. incognita* Bopaiah et al. (1976) studied the effect of root knot nematode on the root nodulation and symbiotic nitrogen fixation in mung bean. The relative susceptibility of mung bean varieties to *Rotylenchus reniformis* was studied by Gupta and Yadav (1982). Several other species of nematodes are also recorded as pests on mung bean (Anonymous, 1981)

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