



Role of Pulse Beetle (*Callosobruchus spp.*) in Stored Mung Bean Grains their Damage and Life Cycle

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Introduction of Mung bean (*Vigna radiata L.*)

- Mung bean is native crop of India and belongs to the Fabaceae (Family: *Leguminosae*, Sub-family: *Papilionaceae*) family and is one of the most important pulse crops.
- It's a drought resistant crop and also suitable for farming in dry areas.
- Mung beans known as Golden beans, Green gram and Moong beans.
- It is an excellent source of protein (25%), minerals, vitamins and dietary fibre.
- About 54% of world production is grown in India and about 14% of India production is contributed by Madhya Pradesh state .

Taxonomic Classification of Pulse Beetle

SYSTEMATIC POSITION		
Binomial name :- <i>Callosobruchus chinensis</i> (Linnaeus,1758)		
1.	Kingdom	Animalia
2.	Phylum	Arthropoda
3.	Sub-Phylum	Uniramia
4.	Class	Insecta
5.	Super-Class	Hexapoda
6.	Order	Coleoptera
7.	Family	Chrysomelidae / Bruchidae
8.	Genus	Callosobruchus
9.	Species	C. chinensis

Favourable Conditions

- The optimum temperature for development of Pulse beetle adults is 25 to 35°C.
- And relative humidity is about 70 to 75%.
- For Pulse Low beetle dose applications of irradiation can be used to disinfect stored grains.

Popular Species

In India, Pulse beetles are mostly three species that cause damage:-

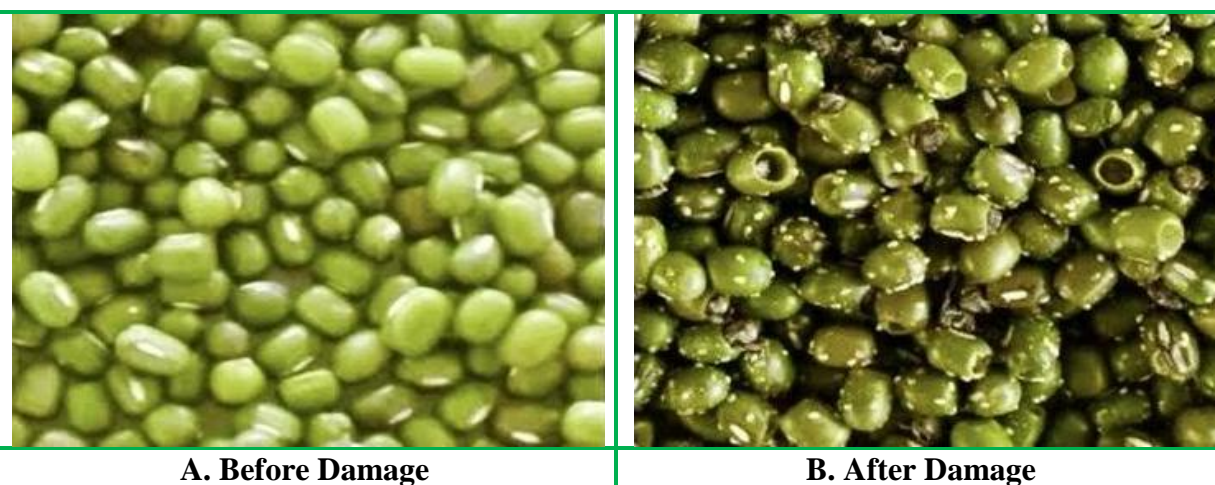
1. *Callosobruchus chinensis*
2. *Callosobruchus maculatus*
3. *Callosobruchus analis*

Species	Characteristics	Life Cycle (days)
1. <i>Callosobruchus chinensis</i>	Size is small Male antennae :- Serrate type Female antennae :- Pectinate type	21 to 24 days

2. <i>Callosobruchus maculatus</i>	Large in size and Both male and females have serrate type antennae.	24 to 28 days
3. <i>Callosobruchus analis</i>	Intermediate in size. Both male and females have long and erected type antennae.	28 to 35 days

Damage of Pulse Beetle (*Callosobruchus spp.*) in Stored Mung bean grain

- It is the Primary storage pest and Internal Feeder
- Damage is done by only grub stage.
- Infested grain is often covered by the traders into flour.
- Pulse beetles cause both quantitative and qualitative losses in mung bean grains.
- Its highest damage is from March to September .
- It could eat away the entire seed content leaving only the shell.
- Due to borer into the grains the seed weight and seed viability affected.
- And results in overall loss of weight, loss of seed viability and altered nutritional quality.



A. Before Damage

B. After Damage

Life cycle

Pulse beetles have complete metamorphosis of the four stages (egg, Larva, pupa and adult) in their life cycle and complete 9-15 generations in a year.

1. Egg

- Eggs are laid after copulation in 72 hours of mating.
- Fresh eggs are translucent white in colour.
- Eggs are laid singly on to the grains
- Eggs are 0.75 mm long oval- or spindle-shaped.
- The egg period ranges from 8 to 9 days.

2. Larva

- The hatching occurs from 5 to 9 days after the oviposition
- Larva is 6-7mm.long, oval-shaped and creamy white in colour with black mouth.
- The young larva, on emergence, bores into grains
- Larval stage is 14-20 days.

3. Pupa

- Fully grown larva and pupate inside the grain.
- Pupa cells prepared beneath the seed coat.
- The Pupal stage is 4-28 days.

4. Adult

- Adults are short-lived which do not feed on stored produce.
- Adults are 3-4mm.long with an oval shaped body.

- Female adults are chocolate coloured.
- Adults are small reddish- brown in colour and with distinctive patterns like spots near the mid- dorsal side of the elytra.
- Abdomen do not cover the entire area, called pygidium.
- Life of an adult varies from 5-20 days.