



## Pod Fly, *Melanagromyza obtusa* (Mulloch) - Emerging Pest of Pigeonpea in Tamil Nadu

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### Abstract

In India, pigeonpea occupies 16% of the total agricultural area under pulses and contributes 17% of the total production. Among the yield limiting factors the biotic and abiotic stresses occupies prime position in pigeonpea cultivation. The pigeonpea pod fly, *Melanagromyza obtusa* is emerging as a threat to pigeonpea cultivation in Tamil Nadu. The hidden enemy causes 12-100% pod loss and the medium and long-duration pigeonpea are more prone to pod fly damage. The grubs emerging from the eggs initially scarp the seed surface and later mine into seed to feed the inner contents. The damaged seeds are unsuitable for consumption and also for seed purposes.

**Keywords:** Pigeonpea, Pod fly, Resistant, Seed damage

### Introduction

India contributes a major share of pigeonpea production in the World. The area, production and productivity of pigeonpea in India are 4.71 million hectares, 4.13 million tonnes and 877 kg ha<sup>-1</sup>, respectively (Annual Report, 2021-22). Pigeonpea contributes 16% of the total pulse area with 17% production in India. The biotic and abiotic constraints reduce productivity (Singh and Singh, 1990). More than 350 insect species are recorded as pests in pigeonpea around the world and 66% of them are causes infestation in India (Saxena *et al.*, 2022).

Among these, the gram pod borer *Helicoverpa armigera* (Hubner) (Lepidoptera; Noctuidae), spotted pod borer *Maruca vitrata* Fabricius (Lepidoptera; Crambidae), pod fly *Melanagromyza obtusa* (Mulloch) (Diptera; Agromyzidae) and pod bugs *Clavigralla* spp. (Hemiptera; Coreidae) causes damage during the flowering, pod maturity and pod formation stage. In pigeonpea, pod fly *M. obtusa* surpassed the damage caused by the other pod borers *viz.*, *H. armigera* and *M. vitrata* in recent years.

The pigeonpea pod fly *M. obtusa* infests 12-100% pods

leading to the loss of 2.4-95.0% seeds. The damage was severe in long duration pigeonpea than early types. The multi-blooming nature of long-duration pigeonpea provides continuous availability of amenable pod stage for its survival in the field. As this pest survives inside the seed it is challenging to manage.

### Damage Symptoms

The eggs are laid inside the pod wall and near to the seed or above the seed. The grubs emerging from the eggs initially feed on the seed surface and mine in to the developing seeds by making galleries (Figure 1a). As the grub damages inner contents, they are not suitable either as a grain or seed (Figure 1c). The damage leads to the development of saprophytic fungus.

### Life Cycle of Pod Fly

#### Eggs

The female prefers to lay eggs on partially matured pods. The eggs are translucent white with smooth posterior tapering and broad base. The eggs took 4.0 to 5.0 days for emergence (Moorthy *et al.*, 2022).

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### Maggots

The maggots emerging from eggs are translucent and later turn into creamy white. A few hours after hatching, the newly emerged maggots make small boreholes and feed on the epidermis (Moorthy et al., 2022). The developed maggots were cylindrical and creamy white and turn yellow before pupation. The feeding maggots pupate within 8 to 10 days above the grains, but inside the locule. They pass the pre-pupal stage of 0.5-1.0 days before pupation (Saxena et al., 2022).

### Pupa

Pupae are cylindrical and round at two ends. The freshly formed pupae were yellowish brown (Moorthy et al., 2022) and later turns into dark brown or blackish brown (Figure 1b). The pupal period lasts for 8-11 days (Moorthy et al., 2022). The pupa can withstand adverse weather conditions more than the other stages of the pod fly.

The last instar maggot makes a papery wall inside the pod surface to enable the adult flies to escape from the pod.

### Adults

The adults emerge from the pupa mostly during the morning hours. The adults are small, shiny and metallic blue. The adult abdomen was glossy black with the metallic surface.

The adult lives for 3 to 5 days (Saxena et al., 2018). *M. obtusa* completes a total life cycle in 28-37 days.

### Management

The hidden nature of this pest makes them difficult to manage. Integrated efforts are required for the effective management of pod fly is as follows.

- Early sowing reduces the incidence of pod fly.
- Intercropping with maize or sorghum or groundnut reduces the incidence.
- Continuous cultivation of pigeonpea in the same field may be avoided.
- Conserve natural enemies to reduce the pod fly menace.
- NSKE 5% application at 50% flowering reduces the pod fly incidence.
- The following insecticides can be applied to manage the pod fly (Prasanthi et al., 2021):
  - ✓ Thiamethoxam 25 WG @ 0.5 g l<sup>-1</sup> (or)
  - ✓ Imidacloprid 17.8 SL @ 0.5 ml l<sup>-1</sup> (or)
  - ✓ Lambda cyhalothrin 5 EC @ 0.8 ml l<sup>-1</sup> (or)
  - ✓ Lufenuron 5.4 EC @ 0.6 ml l<sup>-1</sup>.



(a) Galleries in the grains

(b) Pupae inside the pod

(c) Damaged pods

Figure 1: Pod fly damage in pigeonpea

### Conclusion

Pod fly, *Melanagromyza obtusa* damage is not noticed by the farmers until harvest, as the damage doesn't have any external symptoms. Most of the peasants notice the damage at the time of harvest and suffer more yield loss. The farmers should inspect the field at periodical intervals from the pod formation stage to ascertain the damage and apply management tactics for effective management.

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