



## Dipteran enemies of cultivated mushroom

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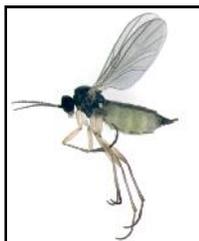
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The oyster mushroom specially *Pleurotus ostreatus* and *Pleurotus sajor-caju* is one of the most suitable fungal organism for producing protein rich food from various agrowastes without composting. It is popularly grown in the states of Orissa, Karnataka, Maharashtra, Andhra Pradesh, Madhya Pradesh, West Bengal and in the North-Eastern States of Meghalaya, Tripura Manipur, Mizoram and Assam. Mushroom cultivation specially *P.ostreatus* and *P.sajor-caju* in Cooch Behar district is hereby increasing day to day but still there is a rising trend in its demand. Mushroom growing as a cottage industry is quite valid for the SHG women due to its low capital investment and high yields obtained even under controlled rural condition. The infestation of dipteran flies on cultivated mushroom is an emerging problem. The most significant insect pests of our cultivated mushroom belongs to the Order Diptera (two-winged flies) comprising of three families Sciaridae, Phoridae and Cecidomyiidae.

**Sciaridae:** They are small (3-4 mm), delicate, flies which are dark grey/ black with large compound eyes and having long, threadlike antennae. Females are generally larger than males and their abdomens are often inflated with eggs. Adults do not fly readily but move rapidly across the growing surface in brief jumping flights. Adult flies may be present on mushroom production sites throughout the year but they are most numerous during May - November. On average, a mated female can lay 150-170 white, oval eggs singly, or in groups within the growing substrate. Depending on temperature, these eggs will hatch within three to four days to produce larvae. Sciarid larvae are white, elongate, legless maggots with a distinctive black shiny head. At this stage the larvae feed on developing mycelium and uncontrolled will burrow into pinheads and small buttons forming a sponge-like mass. Mature larvae are approximately 8.0 mm in length and can remove mycelial attachments at the base of the stalk



and in severe infestations may enter stalks and caps. Larval development is temperature-dependent but after approximately 12-15 days, the larvae transform into pupae. Adult emergence normally occurs following 5-7 days pupation. Subsequent infestations are caused by adult females, which are attracted to the fermentation odours produced during compost cool-down. Environmental conditions during the spawn-running period expedite the completion of a generation of sciarids within 14-21 days.

**Phoridae:** Adult phorids are somewhat smaller (2-3 mm) than sciarids but more robust. They are dark in colour with a hump-backed appearance with no apparent differences between male and female flies. Adult flies tend to remain on the compost surface or in close proximity to the cropping area. They are very active in the presence of light and have a characteristic rapid, jerky movement. The flight of adult phorids is limited by temperature and they are unable to fly when air temperature is below 12°C. Therefore, wild populations do not normally invade mushroom production houses between November and March and adults are most abundant in September - October. After mating, adult females are attracted to developing mushroom mycelia in spawned compost. The compost remains attractive to adult females throughout the entire spawn-run period, and is particularly susceptible during the second week. Mycelial development, which occurs following casing, renews attraction to adult females. Each female can lay up to 50 eggs in close proximity to developing mycelia. Duration of the life cycle is temperature dependent and will differ in relation to the environmental conditions associated with cropping periods. Increased air temperatures associated with spawn-run and case-run periods facilitate life cycle completion in 24-26 days. The lower temperatures following breaking and during cropping



periods may extend the life cycle to 40-50 days.

**Management option:**

- Personal access to production houses should be restricted.
- Sticky traps for adult flies can be installed within production houses.
- Use of biological control agent *Steinernema feltiae* provides an alternative and effective management tool. The spray machine must be well cleaned and free from pesticide residues and fine filters.
- The production houses may be sprayed or fumigated with aerosol formulations containing pyrethrins.

- Insecticide treatments must be done at immature stage and casing to achieve optimum control.
- Deltamethrin 25g/l may be applied by conventional way or as drenching.
- Minimum 7 days interval should be given between two consecutive spray and same chemical should not be repeated.
- Poison baiting can be done with Baygon diluted with water (1:10) and little sugar may be added to make it tasteful.

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