

Mealworms (Genus: *Tenebrio*)

<i>Tenebrio molitor</i>	Mealworm, Yellow mealworm
<i>Tenebrio obscurus</i>	Mealworm, Dark mealworm

Summary

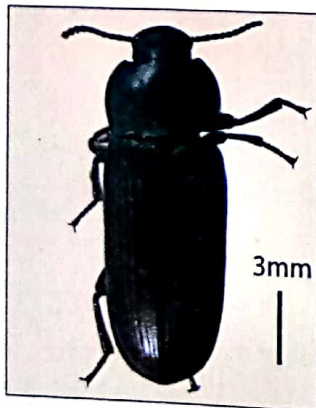
Feeding strategies	secondary pest, scavenger
Commodities attacked	damp and mouldy plant material, animal and plant origin
Distribution	worldwide
Economic importance	low
Eggs	laid amongst commodity
Larvae	elateriform, mobile, live amongst commodity
Adults	long lived, feed on commodity, can fly

Introduction

Members of the genera *Tenebrio* live under the bark of tree and in rotten wood. Two species, *T. molitor* and *T. obscurus*, are minor pests, mainly of aged residues of stored grain. Larvae of *T. molitor* are widely reared and sold as a pet food.

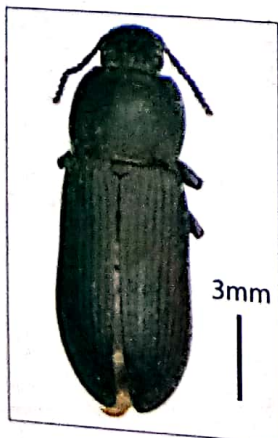
Identification

Adult *Tenebrio* are 12 to 18 mm long, parallel-sided and flattened (Figures 164–167). They are reddish brown to black depending on age of the specimen. Larvae are elateriform, brown and about 25–30 mm long when fully grown. Adults of the two species can be distinguished as below.



Far left: Figure 164 *Tenebrio molitor*, adult

Left: Figure 165 *Tenebrio molitor*, adult, thorax with glossy surface and pits on surface not touching each other



Far left: Figure 166 *Tenebrio obscurus*, adult

Left: Figure 167 *Tenebrio obscurus*, adult, thorax with matt surface and pits on surface touching each other

Identification of *Tenebrio* species associated with stored products

Punctures (pits) on pronotum of adult spread out and not touching each other (Figure 165), adult has slightly glossy appearance (Figure 164) *T. molitor*
 Punctures (pits) on pronotum of adult dense and touching each other (Figure 167), adult has matt appearance (Figure 166) *T. obscurus*

Physical limits and optimum rate of multiplication

Species	Conditions within which breeding takes place	Shortest development period, with optimum conditions	Maximum monthly rate of increase
<i>Tenebrio molitor</i>	14-30°C, r.h. > 30%	120 days at 25-27°C	

Population development of these insects is slow and very variable in length. Only one to two generations a year are typically produced. Adult beetles can live for one to two years. Larvae are highly resistant to cold (three weeks at -12°C) and low humidity.

Economic importance

Tenebrio spp. are minor pests and scavengers of a wide range of cereals and cereal products, especially if damp and in poor condition, such as aged residues. *T. molitor* is widely reared as a pet food.

Type of damage and symptoms

Larvae and adult *Tenebrio* spp. are general feeders and damage is not readily identifiable as being specifically caused by this insect. Infestation can lead to persistent disagreeable odours in the commodity due to secretion of benzoquinones from abdominal glands.

Ecology

In mills and grain storage, large populations of these insects usually only occur under conditions of poor storage and hygiene. Adults and larvae of this species readily prey on other insects present.

Monitoring

Tenebrio spp. are easily caught in pitfall type traps. Crevice traps are also effective and their efficacy can be improved with addition of food bait.

Geographical distribution

Species	Pest status	USA & Canada	Central & South America	Europe & N.Asia	Mediterranean basin	Africa	S. & SE. Asia	Australia & Oceania
<i>Tenebrio molitor</i>	●	X	X	X	X	X	X	X
<i>Tenebrio obscurus</i>	●	X	X	X	X	X	X	X

Pest status: ● minor to ●●●● major pest
 X: recorded

Tenebrio spp. are cosmopolitan but are most frequently encountered in temperate regions. They are unable to breed in hot tropical climates.