



**Common name: Hide Beetle**

**scientific name: *Dermestes maculatus* DeGeer (Insecta: Coleoptera: Dermestidae)**

## Introduction

The hide beetle, *Dermestes maculatus* DeGeer, feeds on carrion and dry animal products. These beetles form aggregations around resources where individuals will feed and mate, attracted by pheromones secreted by males. Aggregations can vary in size, but small sources of food usually have approximately one to 13. The adult beetles have forensic significance in helping to estimate the post mortem interval in suicide or homicide cases.

These insects are also pests of the silk industry in Italy and India, and infest stored animal products such as dried fish, cheese, bacon, dog treats, and poultry.

Another beetle of both forensic and economic importance in the Dermestidae is *Dermestes lardarius*.

This beetle can be distinguished from *Dermestes maculatus* as it has a yellow band of hairs on the top half of each elytron (Gennard 2007).



**Figure 1.** Dorsal view of an adult hide beetle, *Dermestes maculatus* DeGeer. Photograph by Joyce Gross, University of California – Berkeley.

## Distribution

*Dermestes maculatus* is native throughout the continental United States and Canada, and also Hawaii. It is also known to occur in Oceania, Australia and southeast Asia, and Italy (Integrated Taxonomic Information System 2009, Veer et al. 1996).

## Description

**Eggs:** *Dermestes maculatus* eggs are typically laid in batches of three to 20. The amount of eggs a single female can lay over a lifetime varies greatly, ranging from 198 to 845

**Larvae:** The bodies of the larvae are covered in rows of hairs of different lengths, called setae. The underside of the abdomen is typically yellowish-brown while the dorsal surface is typically dark brown, usually with a central yellow line. Two long horn-like protrusions are located on the upper surface of the last segment, partially hidden by surrounding hairs. The protrusions, called urogomphi, curve upward and away from the tip of the abdomen. This distinguishes the larvae from larvae of *Dermestes lardarius*, which has the urogomphi curving downward toward the tip of the abdomen.



**Figure 2.** Larva of the hide beetle, *Dermestes maculatus* DeGeer. Photograph by Lyle J. Buss and Brianna Shaver, University of Florida.

**Pupae:** The last larval skin will usually provide a protective covering for the pupa. The end of the pupal chamber toward the surface can be closed by either debris from the substance which the larvae bore into or from the last larval skin (Hinton 1945). The pupae are an oval shape, usually smaller than the larvae, and do not have the many long hair-like projections (Kulshrestha and Satpathy 2001).

**Adults:** *Dermestes maculatus* adults range in size from 5.5 to 10.0 mm. Each side of the thorax has a band of white hairs. The underside of the abdomen is primarily white with black spots at the sides, and a large black patch on the last segment. The elytra are dark brown or black, with hairs that are mostly black, yellow, or white. The antennae are short and segmented with a club at the tip. The edges of the abdominal end of the elytra are serrated and end in a small spine projecting straight out (Haines and Rees 1989, Hinton 1945).



**Figure 3.** Ventral view of an adult hide beetle, *Dermestes maculatus* DeGeer. Photograph by Joyce Gross, University of California - Berkeley.

Frass: Frass, or feces, from *Dermestes maculatus* appear dark brown, fibrous, and resemble horse hair. Evidence of frass can indicate the past presence of beetles

## Life Cycle and Biology

The life cycle of *Dermestes maculatus* on either a carcass in dry-decay or in stored animal products requires approximately five to seven weeks to complete under optimum conditions. The adults consume the remains of the carcass or the animal product. Pheromones, secreted by males through a gland on the base of the abdomen, are used to attract females. Males and females will mate multiple times and the female will lay eggs within 24 hours of the first mating. Eggs are laid in cracks of the matter on which they are feeding. Females are capable of laying eggs continuously.

Larvae will pass through five to 11 instars, the number of instars increasing with unfavourable conditions. During the last 10 days of the final instar, the larvae will seek out a place to pupate, typically within the meat or a non-food substance such as wood. Exposed pupae that have failed to find a suitable pupal chamber are often cannibalized by larvae. Larvae without a suitable place to pupate can delay pupation by over 20 days, but at the cost of lower adult body mass and increased risk to fatal disease. Survivorship for individuals is the highest between 25°C and 30°C.

Once adults, the beetles can disperse to other food sources by flying. Adult beetles typically live between four to six months.

The presence of these beetles can be detected through identification of their feces, which appears dark brown and stringy. Evidence of these beetles also may be indicated by round-edged bite marks on furniture as well as the corpse. The hotter and drier the conditions the corpse is kept in limits fly larval development on the corpse, as they need softer material to eat. These conditions are more favourable to the hide beetles such as *Dermestes maculatus*

Due to their ability to clear skin and hair off bodies cleanly, *Dermestes maculatus* can be used to clean bones to assist with forensic cases. Cleaned bones can offer evidence of demographical information, such as age and gender, or evidence of trauma, and possibly marks left in the bone by knives or saws. The beetles are particularly useful for small, delicate bones, which may be harmed by chemical means of cleaning bone. Progress needs to be monitored, however, as the beetles may begin to consume bone if left without other sources of food for too long.

## Treatment

Due to this pest habits, it will be necessary to try and find the source first, so check for dry foods such as dog biscuits or bagged dry pet food. Roof area may have a dead rodent, possum or bird which they are feeding on. If located then remove this if possible, (sometimes it maybe in the wall. Treatment using insecticide and dust by Exopest can be applied to the direct area and surrounding locations such as cupboards. Wipe out before treatment but leave in place as a residual after treatment. Ring Exopest for further clarification on 03 8696 9000