

New Hide Beetle (*Dermestes maculatus*) Recorded On Salted Dry Fishes from Pakistan

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Abstract: There are many species which cause infestation in many ways. For estimation of infestation a laboratory work has started, during experiments a new species of *Dermestes maculatus* has been observed on dry salted fishes at Karachi coast.

Keywords: Dermestidae, *Dermestes maculatus*, salted dry fishes, Pakistan.

INTRODUCTION

Dermestid beetles belong to order Coleoptera and family Dermestidae. Adult and larvae of Dermestid beetles are known to feed on dried meat. Dermestid species commonly known as “museum beetles” (as these can be used to remove meat from the skeleton of the museum specimens. They infest hides of animal, if not properly processed and salted. Several dermestid species had been recorded infesting dried fish or fish meal [1]. *Dermestes carnivore* has been recorded from Indonesia, Philippines and Pakistan [1]. *Dermestes maculatus* has been recorded and identify from salted curing yards and during beetles culturing in the laboratory, Karachi.

MATERIAL AND METHODS

A. Collection of Insects from Salted Fish Curing Yards

The present research work was started from collection, preservation, identification and culture of insect etc. Insects (Dermestid beetles) were also collected from different dry fish curing yard (salted and unsalted) located in Bangali Para Karachi which were brought in the laboratory. Collected samples were preserved in different bottles for identification. All bottles have labeled with date, place, time and number of insect and larvae). Beetles were identified on the basis of the morphological characters as described by [2, 3].

B. Culturing Dermestid Species in the Laboratory

Different fishes were purchased from Karachi fish harbor for culturing of Dermestid beetles and brought in

the laboratory. Fish were dried for one week to observed life cycle of larvae and beetles were fed on cured fishes. Larvae and Beetles are feed on cured fishes. Beetles have complete metamorphosis (the immature stages are totally different in appearance from the adults [2]. Insects comprises several distinct stages.

RESULTS AND DISCUSSION

Coleoptera, an order commonly called Beetles, is an order of insects which contains more species than any other order in the animal kingdom. Order Coleoptera consist of 20 super families and 170 families. Family Dermestidae belongs from order Coleoptera [4]. Most species of the family Dermestidae feed almost exclusively on materials of animal origin, such as bone, leather, fur, wool and silk. However, some species may be partly or wholly subsist on plant material, and a few feed exclusively on vegetable and some species of family Dermestidae knows as stored food feeder pest in the world.

About half of the species of Dermestid that occur around the world, including Pakistan are household pests, museum pests or are associated with stored products. Many of these species are not serious pests. In some groups, for example *Dermestes thylodrias*, both adults and larvae are harmful to human goods, even if the damage caused by the larvae is more important [2].

In Pakistan, the members of this order found predated on weeds and from juicy to dry plant materials even this wide range of foraging opportunity useful in widespread structural and functional diversity of beetles. Resulted into addition of number of taxa and categories into hierarchy by motivated researchers. This diversity can easily be observed from different collections in the various institutions in Pakistan [4].

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The representatives of 95 families comprising 1,239 genera and 2,619 species have been recorded in various institutions of the country. Some of these families have now gone into synonymy. Thus, reducing the number of families significantly [4].

Following study is an inventory of the collections identified and located in our different institutions with respect to their arrangement. Therefore, whatever the name was tagged to the different samples were listed in alphabetical order in each family. Most of these collections have been identified at the British Museum of Natural History in London. Each species is followed by a number 1, 2, 3 or 4 in parentheses. These figures respectively, suggesting that the samples are in the National Museum, Karachi (NMK), University of Agriculture, Faisalabad (UAF), Pakistan Forest Institute, Peshawar (PFIP) and the University of Karachi, Karachi (UOK) [4].

Most common Dermestid beetles species producing infestation on cured fishes and causing heavy loss to cured fish industries. Dermestid species, *Necrobia rufipes* (DeGeer) and other adult beetles such as *Tribolium castaneum*, *Trododerma granarium* and *Lasioderma serricornis* had been found on dry salted cured fishes from different countries. Several Dermestid species have been recorded causing infestation on dried fishes and fish meal and all Dermestes beetles are common and cosmopolitan.

Below described the integrated taxonomic information system about Order Coleoptera and family Dermestidae [1, 5]. Scientific Classification of Dermestidae is as under:

Kingdom:	Animalia
Phylum:	Arthropoda
Class:	Insect
Order:	Coleoptera
Infraorder:	Bostrichiformia
Superfamily:	Bostrichoidea
Family:	Dermestidae
Subfamily:	Dermestinae

Dermestid species (salted dry cured fish pest) that have been described includes *Dermestes atr*, *Dermestes maculatus*, *Dermestes fruschii*, *Dermestes carnivore*, *Dermestes lardarius*, *Dermestes rnoratus*, *Dermestes signatus*, *Dermestes haemorrhoidalis* and *Dermestes perivianus*.

In Pakistan *D. maculatus* were collected in the laboratory and during development of life cycle and

after that analysis it is observed that most of the *D. maculatus* ranges in size of 5 to 11mm and larvae in size of 6–17 mm. showing maximum and minimum length of adult and larvae of *D. maculatus* in plate 1 and 2.



Figure 1: Different length of *D. maculatus* larvae measurement (Photograph by Hamid Badar Usman, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).

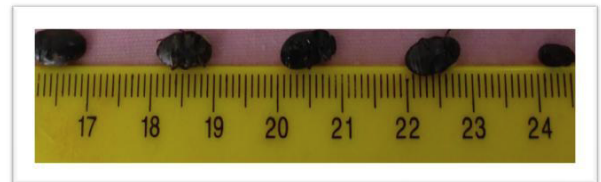


Figure 2: Different length of *D. maculatus* adult measurement (Photograph by Hamid Badar Usmani, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).



Figure 3: Dorsal View of the larva of *Dermestes maculatus* (Photograph by Hamid Badar Usmani, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).



Figure 4: Ventral view of larvae of *Dermestes maculatus* . (Photograph by Hamid Badar Usmani, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).



Figure 5: dorsal view of adult Hide beetle *D. maculatus* DeGeer. (Photograph by Hamid Badar Usmani, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).



Figure 6: Ventral view of adult Hide beetle *D. maculatus* DeGeer. (Photograph by Hamid Badar Usmani, Asst Biologist, Marine Fisheries Dept, Karachi, Pakistan).

Habit and Habitat of the Dermestid Beetles

Mature larvae of hide beetles have the habit of boring into various hard surfaces to pupate, usually

prefer softwoods. Some can climb 24 to 36 feet and bore into posts, studs and rafters seriously weakening and "honeycombing" these structures. Larvae are particularly troublesome in poultry houses, damaging yellow pine, foam insulation.

Adult hide or leather beetles and larvae prefer to feed on raw skins and hides. Each female can lay up to 800 eggs. The life cycle is completed in 60 to 70 days. These larvae have a habit of boring into wood and other hard materials to pupate. Sometimes structural timbers may be damaged.

The adults of the various species can be recognized by these characters, but some of these can be seen clearly only with a low-power microscope [2]. *Dermestes maculatus* and *Necrobia rufipes* (DeGeer) are the main cured fish pest [1]. *Dermestes ater*, *Dermestes carnivorus*, *Dermestes frischii*, *Dermestes haemorrhoidalis*, *Dermestes lardarius*, *Dermestes maculatus*, *Dermestes Peruvians* are some specific dermestid beetles and all above mentioned dermestid beetles are recorded from cured fish in the world [2].

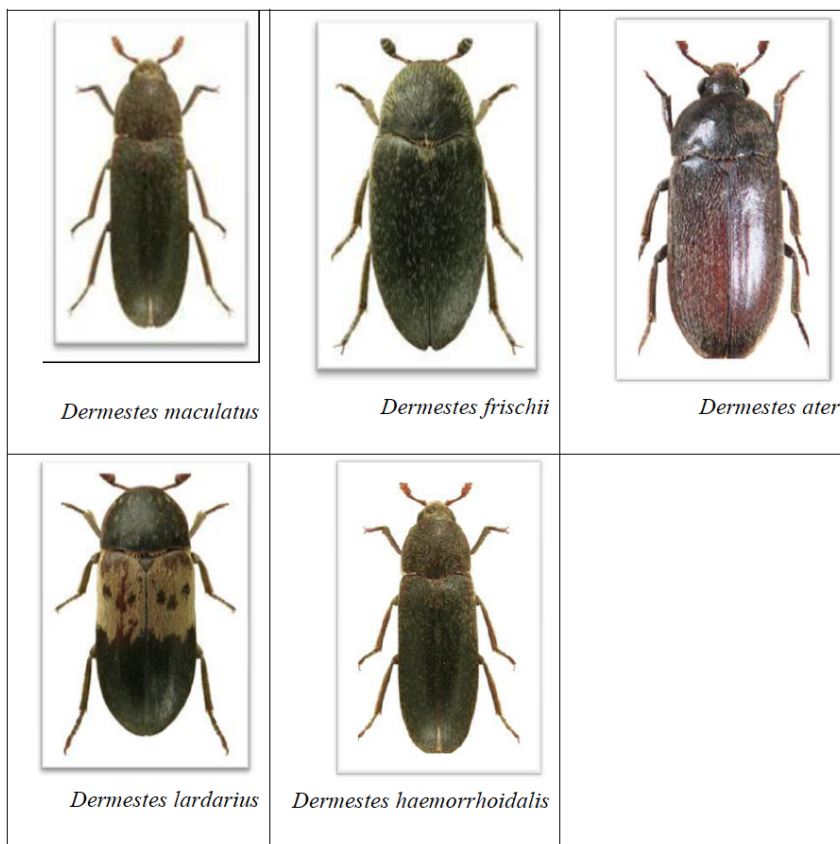


Figure 7: Some different Dermestid Spp.

Source: www.pestsoluton.co.pk

Distribution of the Dermestid Beetles in the World

Dermestes maculatus is a species of Dermestid beetle with a worldwide distribution, and it is present in all continents and European countries except Antarctica. The most common beetles pest are Dermestes species and *Necrobia rufipes* (DeGeer) and other adult beetles are also found on cured fishes such as *Tribolium castaneum*; *Trogoderma granarium* and *Lasioderma serricorne* from different countries. Several Dermestes species have been recorded infesting on dried fishes.

According to previous studies *Dermestes maculatus* DeGeer was reported from Sub Saharan Africa [6]; Egypt [7]; Asia [8]; and Zambia [9] on cured fishes. *Dermestes frischii* Kugelmann more abundant in the North America and Arabian Peninsula [6]; Sahalian Francophone and Africa [10] and Zambia [11] attack both type of fishes (freshwater and marine). *Dermestes ater* Kuster was recorded from Zambia [9] and Bangladesh [8] third one common cured fish pest beetle *Dermestes carnivorous* Fabricius is not unknown cured fish beetle, this beetle was recorded from Philippines Indonesia and Pakistan [1]. *Dermestes lardarius* Kuster; *Dermestes haemorrhoidalis* Kuster and *Dermestes peruvianus* Laporte de Castelnau were recorded from Bangladesh [8] during infestation on cured salted fishes but are not regarded as significant pest. *Necrobia rufipes* (DeGeer) is a beetle of the family Cleridae and commonly found on cured fish in

many regions around the world. *Necrobia ruficollis* (Fabricius) was recorded from Bangladesh [1, 8].

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