Dermestidae (Insecta: Coleoptera) of Niavaran Museum with a new record for Iran

Shima Shahrabi¹, Samin Seddigh², Bita Sodaie¹ and Marcin Kadej³

¹ Department of Archaeology, College of human Science, Varamin-Pishva Branch, Islamic Azad University, Varamin, Iran.
² Department of Plant Protection, College of Agriculture, Varamin-Pishva Branch, Islamic Azad University, Varamin, Iran.
³ Department of Invertebrate Biology, Evolution and Conservation, University of Wrocław, Poland.

ABSTRACT. Museum collections are national assets of any country and also are very susceptible to pest damage. Moreover pests in a museum, library or archive environment can cause severe damage to highly valuable and irreplaceable materials. Hence, constantly monitoring of the collections against pest activity is essential in museums. Dermestidae family is known as one of serious pests in the museum collections which feed on various products and cause high infestation. In current study, we present the results of monitoring of all parts of two buildings of The Niavaran Palace Complex, including the private library and Ahmad Shahi Pavilion in Tehran, Iran. The following species of the dermestids have been collected and recorded for the first time from Tehran and Niavaran Museum: Thylodrias contractus Motschulsky, 1839, Attagenus lobatus Rosenhauer, 1856, Anthrenus (Anthrenops) coloratus Reitter, 1881, A. (Anthrenus) picturatus picturatus Solsky, 1876. Moreover, Thylodrias contractus Motschulsky, 1839 is recorded for the first time from Iran.

Key words: Dermestidae, Iran, New record, Niavaran museum

Introduction

Dermestidae (Insecta: Coleoptera) is a diverse family with about 1500 cosmopolitan species worldwide (Háva, 2015b). Dermestids have a variable habitats; their larvae feed mainly on animal materials and dead insects, and few are able to live partly or entirely on vegetable material (i.e. Trogoderma granarium Everts, 1989, (Kadej, 2012a)). Sometimes the adults are found in the same habitats as the larvae and feed on the same materials like it is in case of Dermestes Linnaeus, 1758 and Thylodrias Motschulsky, 1839. But in most cases the adults do not feed or they may feed on pollen and nectar (Peacock, 1993). Dermestidae (mainly larvae) can feed on various on a variety of dead animals and animal products, such as skeletons, skins, animal hair, feathers, natural fibers, dead insects; occasionally they feed on stored plants’ material such as certain spices and grains. For this reason some dermestids are classified as household and museum pests and are well-known all over the world as...
New dermestid record of Iran

pests of stored woolen fabrics and other materials (Hinton, 1945; Aitken, 1975; Veer et al., 1996; Black, 2004; Feroz et al., 2015). Some of the species are associated with carcasses and for this reason might be useful in criminal investigations or in forensic entomology (Catts & Goff, 1992; Peacock, 1993). Many dermestid species are also used in taxidermy and by natural history museums to clean animal skeletons (Ghahari & Háva, 2017).

Till date, one hundred twenty three species representing 12 genera (Table 1) belonging to the family Dermestidae have been reported from Iran.

Currently it comprises several buildings and a museum including: Niavaran Palace Museum (completed in 1968), Ahmad Shahi Pavilion (or Kushk-e Ahmad-Shahi), Sahebqaraniyeh Palace (from the time of Nasir al-Din Shah of Qajar dynasty), Jahan Nama museum and the private library, and other cultural, historical and natural attractions including the Blue Hall, Private Cinema, Jahan Nama Gallery, and Niavaran Garden. In the present paper we list the species of Dermestidae that have been found indoors of two buildings of Niavaran Place Complex (The library and The Ahmad Shahi Pavilion).

Table 1. The List of Dermestidae genera which are found in Iran.

<table>
<thead>
<tr>
<th>Index</th>
<th>Genus</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dermestes Linnaeus, 1758</td>
<td>Háva &amp; Kalik, 1999; Háva, 2007; Háva &amp; Herrmann, 2011; Bulak et al., 2013</td>
</tr>
<tr>
<td>2</td>
<td>Rhopalosilpha Arrow, 1929</td>
<td>Háva, 2007, 2015b</td>
</tr>
<tr>
<td>3</td>
<td>Thorictus Germar, 1834</td>
<td>Háva, 2007, 2015a; Zhantiev, 2011</td>
</tr>
<tr>
<td>4</td>
<td>Attagenus Latreille, 1802</td>
<td>Mroczkowski, 1968; Modarres Awal, 1997; Tezcan et al., 2004; Zhantiev, 2005; Háva, 2007; Háva &amp; Herrmann, 2011</td>
</tr>
<tr>
<td>5</td>
<td>Paranovelsis Casey, 1900</td>
<td>Háva &amp; Herrmann, 2010; Háva et al., 2013a; Háva et al., 2014</td>
</tr>
<tr>
<td>7</td>
<td>Ctesias Stephens, 1830</td>
<td>Háva, 2005; Háva et al., 2014</td>
</tr>
<tr>
<td>9</td>
<td>Hirtomegatoma Pic, 1931</td>
<td>Háva, 2007</td>
</tr>
<tr>
<td>10</td>
<td>Megatoma Herbst, 1791</td>
<td>Mroczkowski, 1962</td>
</tr>
<tr>
<td>11</td>
<td>Phradonoma Jacquelin du Val, 1859</td>
<td>Tezcan et al., 2004; Háva, 2006, 2007; Herrmann &amp; Háva, 2008; Bulak et al., 2013</td>
</tr>
<tr>
<td>12</td>
<td>Trogoderma Dejean, 1821</td>
<td>Modarres Awal, 1997; Abivardi, 2001; Khormali et al., 2002; Háva, 2007; Háva &amp; Herrmann, 2011; Mehрабadian et al., 2011; Bulak et al., 2013; Forghani &amp; Marouf, 2015</td>
</tr>
</tbody>
</table>

Material and methods

Study area

This investigation was carried out in two buildings of Niavaran palace complex including private library and Ahmad Shahi pavilion. Ahmad Shahi covers an area of 800 square meters in two stories with ornamental items made of different materials. The private library is located in the eastern part of the Palace, in two floors and one underground floor in a 770 square meter area. This library consists of about 23,000 books, and more than 350 artifacts and paintings. All the samples were collected from all parts of these two buildings.
Data collection

Insect samples were collected from all the items in the hall including decorative items, furniture, carpets, signs, curtains, clothes, and also from the surface of the earth precisely in June and July 2017. The specimens were collected by hand or by using the aspirator. Trapping was carried out simultaneously during sampling. Yellow and blue sticky cards and light traps were used for trapping. Insects collected from museum palaces were kept in separate glasses of 96% ethanol and were coded. All the specimens were transferred to Entomology Laboratory of Varamin-Pishva Branch, Islamic Azad University. Identification down to species level has been done by Dr. Marcin Kadej (University of Wroclaw, Poland).

Results

In total, four species of Dermestidae, the representatives of three genera have been collected from Niavaran Museum, Tehran. Thylodrias contractus Motschulsky, 1839 is newly recorded for Iran. The list of species is given below.

Subfamily: Trinodinae Casey, 1900
Tribe: Thylodriini Semenov-Tian-Shanskiy, 1909
Genus: Thylodrias Motschulsky, 1839

Thylodrias contractus Motschulsky, 1839

Diagnosis. 2.0-3.0 mm in length. Thinly covered with short, pale hairs-clubbed, 9-segmented antennae uniform in thickness along length. Median ocellus between compound eyes. In Male: Resting elytra meet at along top third of length, then diverge to reveal abdomen. Long narrow body with thin appendages. Females are wingless with larviform body. Larvae are about 3.0 mm in length with single transverse row of hairs across the dorsum at each segment (Mertins, 1981).

Chorotype: worldwide (Nardi & Háva, 2013).

Remark: First record for Iran.

Subfamily Attageninae Laporte de Castelnau, 1840
Tribe: Attagenini Laporte de Castelnau, 1840
Genus: Attagenus Latreille, 1802

Attagenus lobatus Rosenhauer, 1856


Distribution outside Iran: Holarctic (Háva, 2015b). Centralasiatic-Europeo Mediterranean; this species was introduced to the USA (Háva et al., 2011; Háva et al., 2013b).

Remark: This species feeds on stored products (Modarres Awal, 1997). First record for Tehran province.

Subfamily: Megatominae Leach, 1815
Tribe: Anthrenini Gistel, 1848
Genus: Anthrenus Geoffroy, 1762

Anthrenus (Anthrenops) coloratus Reitter, 1881

Distribution in Iran: Fars (Jahrom, Shiraz) (Karami et al., 2004), Sistan and Baluchestan (Nikshahr) (Herrmann et al., 2010), references with no specific locality given (Herrmann et al., 2010; Bulak et al., 2013; Háva, 2015b).

Distribution outside Iran: Holarctic (Háva, 2015b), Tajikistan; Turano-Europeo-Mediterranean species with extension to Canary Islands, USA (Beal, 1998; Háva, 2003b, 2007).

Remark: First record for Tehran province.

Anthrenus (Anthrenus) picturatus picturatus Solsky, 1876

Distribution in Iran: Northern Iran (Mroczkowski, 1962), references with no specific locality given (Tezcan et al., 2004; Háva, 2007; 2015b; Herrmann et al., 2010; Bulak et al., 2013).
Distribution outside Iran: Afghanistan, Azerbaijan, Corsica, Georgia, Kazakhstan, Kyrgyzstan, Poland, Russia, Slovakia, South Africa (Pretoria), Tajikistan, Turkey, Turkmenistan, Uzbekistan, (Háva, 2015b).

Remark: First record for Tehran province.

Discussion
Some synanthropic species of Dermestidae are classified as serious pests of stored products and museum collections (Peacock, 1993; Kadej, 2012a, 2012b; Kadej et al., 2013). Some of them are representatives of such genera like Dermites Linnaeus, 1758, Anthrenus Geoffroy, 1762, Attagenus Latreille, 1802, Trogoderma Dejean, 1821 or Reesa Beal, 1967. Due to the worldwide distribution the most common and well known species are Anthrenus (Nathrenus) verbasci (Linnaeus, 1767) or Trogoderma glabrum (Herbst, 1783). Among species that were found during this survey inside the Niavaran Museum (Tehran, Iran) there were only four species, represented three genera. Only one species, Thylodrias contractus Motschulsky, 1839, was recorded as larva while three other species (Attagenus lobatus Rosenhauer, 1856, Anthrenus (Anthrenops) coloratus Reitter, 1881 and A. (s. str.) picturatus picturatus Solsky, 1876) were found as adults. All of above mentioned species have been previously recorded as pests from the private houses, storages, shops, and different collections as well (Peacock, 1993; Modarres Awal, 1997; Beal, 1998). It is suspected that new species will be found in the Niavaran Museum in the nearest future because of rich and variable set of the habitats that can be inhabited by dermestids. Based on these findings providing systematic and detailed inspections of the places where the skin and larder beetles can develop is recommended.

Acknowledgments
This research was supported by the Varamin-Pishva Branch of the Islamic Azad University. We express our sincere appreciation. We also thank Niavaran palace complex staff for their kindly support and cooperation.

Conflict of Interests
The authors assert that there is no conflict of interest regarding the publication of this paper.

References


Mroczkowski, M. (1968) Rozmieszczenie Dermestidae (Coleoptera) na świecie wraz z katalogiem wszystkich znanych gatunków [Distribution of the Dermestidae (Coleoptera) of the world with a catalogue of all known species]. Annales Zoologici, 26, 15–19. [in Polish].


سوسک‌های خانواده Dermestidae (Insecta: Coleoptera) موزه نیاوران به همراه یک گزارش جدید برای ایران

شیما شهرابی، ثمین صدیق*، بیتا سودایی و مارسین کادج

1 گروه باستان‌شناسی، دانشکده علوم انسانی، دانشگاه آزاد اسلامی واحد ورامین-بیضای، ورامین، ایران.
2 گروه گیاهپزشکی، دانشکده کشاورزی، دانشگاه آزاد اسلامی واحد ورامین-بیضای، ورامین، ایران.
3 گروه بیولوژی مهره‌داران، تکامل و حفاظت، دانشگاه وروکلاو، لهستان.

* پست الکترونیکی نویسنده مسئول مکاتبه: seddigh@iauvaramin.ac.ir

چکیده: آثار موجود در موزه‌ها دارای های ملی هر کشوری هستند که نسبت به بسیاری از آفات نیز آسیب پذیرند. علاوه بر این آفات می‌توانند در یک موزه کتابخانه داشته باشند. این آفات رو به نظر می‌رسد که بر مجموعه‌ها جهت بررسی فعالیت آفات در موزه‌ها ضروری است. خانواده Dermestidae که بر روی محصولات مختلف تغذیه کرده و باعث آلودگی و رنگ‌آمیختگی می‌شوند. در این تحقیق، برای بررسی آفات نیاوران تهران، مجموعه‌ی کتابخانه سلطنتی و کوشک احمد شاهی را از این آفات گیر کرده و این آفات را تهیه کرده‌اند. در نهایت، خانواده Dermestidae برای اولین بار در ایران گزارش شد.

واژگان کلیدی: Dermestidae، ایران، گزارش جدید، موزه نیاوران