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Updated distribution of the elusive Roach’s mouse-tailed dormouse, *Myomimus roachi* Bate, 1937 (Mammalia: Rodentia: Gliridae) in Bulgaria

Nedko Nedyalkov¹, Georgi Popgeorgiev², Anna Staneva³

¹ National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, nedko@nmnhs.com
² National Museum of Natural History, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria, georgi.popgeorgiev@gmail.com
³ BirdLife International, Cambridge, UK, staneva.anna@gmail.com

Abstract: *Myomimus roachi* is one of the rarest and least studied mammals of the Western Palearctic. It is rare and sparsely distributed in the Southeastern Balkans and Western Anatolia. After its initial finding in 1959, the species was recorded only sporadically. All available data for the species distribution in Bulgaria are summarised and three new country records are reported, which all together increases the number of squares on the 10×10 km grid where the species has been recorded to 24. The current species habitats and threats are discussed.

Keywords: *Myomimus roachi*, Bulgaria, distribution, threats, conservation

Introduction

In Europe, five species of dormice are found. The rarest, the Roach’s mouse-tailed dormouse (*Myomimus roachi*), occurs only in the Southeastern Balkans and in several isolated localities in Western Anatolia. It is one of the rarest and least known mammal species in the Western Palearctic (Kryštufek, 2008). Peshev et al. (1960) reported the mouse-tailed dormouse as a new member for the European fauna under the name *M. personatus* subsp. n. on the base of several specimens caught in Southeastern Bulgaria. Thereafter the species was found in the neighbouring Turkish Thrace and along the Western Anatolian coastline (Mursaloğlu, 1973; Kurtunur, 1975). Unlike the rest of the European dormice, the mouse-tailed dormouse avoids forest habitats. It has been found in vineyards, on the edge of maize and cereal fields and in arable lands with sparse old trees (oak, peer and walnut trees; Peshev et al., 1960; Kryštufek & Vohralik, 2005).

Bulgarian zoologists had caught the mouse-tailed dormouse predominantly on the ground surface (at that time snap traps were set only on the ground) and supposed that it was ground dwelling similar to its relative living in the Kopet Dag Mountain in Turkmenistan (Peshev et al., 1960). Later, in 1970s and 1980s in Turkish Thrace the species was captured mainly on trees (Kurtunur & Özkan, 1990).

The Roach’s mouse-tailed dormouse is a protected species (Annexes 2 and 3 of the Bulgarian Biological Diversity Act; VU in the Bulgarian Red Data Book (Popov, 2015); Annex 2 of Council Directive 92/43/EEC or the Habitats Directive). The latest data for its distribution are summarised by Milchev & Georgiev (2012). Its biology and ecology are still poorly studied and generally unknown, no specific research has been...
done on the species in Bulgaria. The species is occasionally recorded during faunistic surveys; the most recent records come from studies on the diet of owls. So far, 36 dormice have been caught and 20 have been found in the diet of owls.

**Material and methods**

The bulk of data were collected in 2011–2012 during the project for mapping species within Natura 2000 network. Within this project, all known locations until 2010 have been checked by live-trapping: Sherman and Longworth traps (bailed with peanut butter, apple, sunflower seeds) were set in suitable habitats. Traps were set on the ground surface and on some old trees: oaks (*Quercus* sp.), walnut trees (*Juglans regia*) and pear trees (*Pyrus communis*) at a height of 1.5–2 m. About 2000 trap-nights were realised. As an additional method for species detection, pellets from the barn owl (*Tyto alba*) from 17 localities and the little owl (*Athene noctua*) from two localities were collected. Pellets were drained and after that carefully cleaned; bones, skulls and jaws were separated and used for determination of mammals. The minimum number of individuals (MNI) was identified by the maximum count of fragments identified from the left and right mandibula, the maxilla or separate teeth. A total of 21 species were identified from 4400 small mammals in the diet of *Tyto alba* and 13 in *Athene noctua*. Live-trapping was also done in the summers of 2016 and 2017.

The study area encompassed the territory of Southeastern Bulgaria and the species distribution is presented using squares of the 10×10 km Military Grid Reference System grid (MGRS). We combined all previously unpublished observations and georeferenced published data into a GIS database, to update...
the current known distribution of the Roach’s mouse-tailed dormouse.

Results

The species was not caught in traps during the 2011–2012 field seasons, despite the efforts (more than 2000 trap-nights). However, it was found in the barn owl pellets. Remains from *M. roachi* have been found in Generalovo and Izvorovo villages (Popov & Nedyalkov, 2013). At both locations, *M. roachi* was presented by a single specimen found among 151 (0.7%) and 356 (0.3%) prey items of small mammals, respectively. The mouse-tailed dormouse represented a negligible part of the diet of *T. alba* – 0.045% (from 4400 prey items) in Southeastern Bulgaria, which was close to the previously reported proportions (Milchev & Georgiev, 2012).

During faunistic surveys in 2017 in the region of the Sakar Mountain (MG33; Fig. 1) one adult female of *M. roachi* was caught by trapping on 6 May 2017. The specimen had the following measures (in mm): body length – 96, tail – 92, ear height – 10, hind foot – 21 and weight – 35 g. After examination, the dormouse was released at the same point where it had been caught. The mouse-tailed dormouse was caught on an old (about 40–50 years old) oak tree (*Quercus* sp.) at 1.8 m height. The dominant habitat type in this locality was semi-open grassland with shrubs: blackthorn (*Prunus spinosa*), Jerusalem thorn (*Paliurus spin-a-christi*) and single trees or small forest patches of *Quercus* sp. (about 40–50 years old) and pear trees (*Pyrus communis*). This was the first catch of the species since 1978, when an adult mouse-tailed dormouse was caught around Burgas (Gorno Ezerovo Village, now part of the city), leg. Alexander Prostov. The specimen is stored and exhibited in the National Museum of Natural History at the Bulgarian Academy of Sciences, Sofia.

Our findings confirmed the presence of the species in the surroundings of Izvorovo Village, found previously from the region in the remains from the diet of the barn owl (materials of B. Milchev, in Peshev et al., 2004). We present two new localities where the species was recorded: Generalovo Village and MG33 in
the Sakar Mountain. The current species distribution is presented on Fig. 1 on the basis of our and previously published data (Heinrich, 1936; Peshev et al., 1960; Markov, 1964; Angermann, 1966; Peshev & Angelova, 1967; Peshev & Spassov, 1985; Peshev et al., 2004; Georgiev, 2004; Milchev & Georgiev, 2012; Nedyalkov, 2013). Altogether, the species was found in 24 MGRS squares (10×10 km) in Southeastern Bulgaria.

Discussions

Previous studies have reported that the species is ground-dwelling; it has been caught mainly on the ground surface and, thus, resembles its relative from the Kopet Dag Mountain – *M. personatus*, the only other known species at that time (Peshev et al., 1960). Habitats in Bulgaria are quite similar with these in Turkish Thrace (Kryštufek & Vohralík, 2005).

Our data from radio-tracked survey on three mouse-tailed dormice (two female and one male), conducted in Turkish Thrace, have revealed that *M. roachi* spends much of its time on trees and lives in tree-holes and cavities at 1.5–2 m height, but also crosses wide open areas (150–200 m). It probably spends some time searching for fruits or insects (grasshoppers, crickets) on the ground (N. Nedyalkov, A. Staneva, personal data). In captivity, the species eats willingly insects and different fruits (Buruldağ & Kurtonur, 2001).

The species habitat has been under anthropogenic pressure for a long time, mainly due to forestry activities: planting and replacing the native habitats – woods of mainly *Quercus–Carpinus* and the semi-open habitats with shrubs and trees, with alien or atypical species such as the black pine (*Pinus nigra*), black locust (*Robinia pseudoacacia*), Atlas cedar (*Cedrus atlantica*). According to the national forestry database, there are multiple plantations at different stages (2–50 yearsFig. 3. Habitat of *Myomimus roachi* in the Sakar Mountain (UTM: MG33), SE Bulgaria.
old) within the range of *M. roachi* (886 071.8 ha), with only the black pine covering 37.5% of this territory.

In the last few years, the species faces a new threat – a new practice for maintaining pastures has appeared in the region of Sakar Mountain and Dervent hills. In order to get subsidies for open pastures, the farmers use heavy-duty shredders to completely remove shrubs and trees. This practice not only changes the habitats through removing the hedgerows and fruit trees, but directly kills and exposes for future degradation other animals, such as tortoises (*Testudo* sp.), hedgehogs (*Erinaceus roumanicus*), hares (*Lepus europaeus*). In addition, fires are common events during the autumn drought and every year they destroy big part from the suitable for the dormouse habitats.

Haas (1959) suggested that the mouse-tailed dormouse has vanished from the Middle East in the near past because of habitat changes – loss of fruit trees (*Zizyphus* sp.) as a result of intensive human cultivation. The species was quite common and used to be the predominant glirid during the Middle and Late Pleistocene but disappeared suddenly during the Late Bronze Age (Tchernov, 1975).

According to the last mapping project conducted in Bulgaria, the mouse-tailed dormouse is listed for 21 sites from Natura 2000 network, but still 50% from the known records lie outside the frame of Natura 2000. Its national population is estimated at 2226 adult individuals (Popov & Nedyalkov, 2013), but one should take it with a grain of salt. This estimation is made based on scarce population data and suitable habitats.

Bulgaria is the only country in the EU responsible to protect this species, but still not a single active conservation or monitoring project on the species has been launched. A big gap exists in our knowledge (for its biology and ecology) about this species, compared to the rest of the European dormice. There is need for urgent conservation efforts preventing further habitat degradation. A monitoring scheme should be launched as soon as possible.

**Acknowledgments**

The field survey in 2011–2012 was realised within a project for mapping species and habitats in the frame of Natura 2000 network. The field survey in 2016–2017 was supported by the project “Restoration and sustainable management of the imperial eagle’s foraging habitats in key Natura 2000 sites in Bulgaria” (LIFE14 NAT/BG/001119) conducted by the Bulgarian Society for the Protection of Birds.

We thank Nikolay Tzankov, Dimitar Plachiyski and Yordan Koshev for their help and company during the fieldwork. Yurii Kornilev checked and improved our English.

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**References**


Kurtonur C., Özkan B. 1990 New records of *Myomimus roachi* (Bate 1937) from Turkish Thrace.


Research article

Coleoptera (Insecta) from Ashgabat City and Köýtendag Nature Reserve, with nine first records for Turkmenistan

Borislav Guéorguiev¹, Ottó Merkl², Michael Schülke³, Hans Fery⁴, Valentin Szénási⁵, David Král⁶, Zbyněk Kejval⁷, Tamás Németh⁸, Dezső Szalóki⁹

Introduction

We give a list of beetles collected from two regions of Turkmenistan in May 2015. The first site is the Botanic Gardens in Ashgabat City and the second one is the Köýtendag Nature Reserve, Köýtendag Mts., south-eastern Turkmenistan. All material was collected by Prof. Pavel Stoev from the National Museum of Natural History, Bulgarian Academy of Sciences, Sofia, during a Rapid Environmental Assessment survey carried out by an international team of zoologists in the Köýtendag Mts.

The new faunistic information is presented concerning the recent data for the distribution of the Palaearctic beetles (see the sources in part “Material and methods”), thus previous faunistic studies in the region are not considered.

Material and methods

The present study is based on the identification of 245 specimens belonging to 15 families of the order Coleoptera. The arrangement of the families and statuses of the taxa follow the recent editions of the catalogues of the Palaearctic Coleoptera (volumes 4–8, Löbl & Smetana, 2007–2013 and volumes 1 and 3, Löbl & Löbl, 2016–2017). The names of authors who identified the species are given with their shortened first name and full surname at each family (in the part “List of taxa”).

Description of the localities

№ 01: Ashgabat City, Botanic Gardens, 37.954N 58.346E, under stones, leaf litter, dense, mostly dry mixed forest, 22.V.2015.


Keywords: Coleoptera, Turkmenistan, new records, first records

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Figures 1–2 (photos courtesy of Pavel Stoev). Locality № 07: the passage Gyrkgyz dere, a collecting site for *Chlaenius extensus*, *Quedius novus*, *Q. scintillans* and *Cyphogenia aurita aurita*. 
Coleoptera (Insecta) from Ashgabat City and Köytendag Nature Reserve, with nine first records for Turkmenistan

- № 02: Lebap Province, Köytendag District, Köytendag Town, 37.508N 65.993E, in close proximity to the river, dry, under stones, 24.V.2015.
- № 03: Lebap Province, Köytendag District, approx. 10 km from Köytendag Town towards Garlyk Village, desert, in close proximity to the road, dry, 24.V.2015.
- № 04: Lebap Province, Köytendag District, Gursun Magdanly Village (= Svintsovoy rudnik), around Kaptarhana Cave (Pigeon Cave), 37.828N 66.410E, grassland, 24.V.2015.
- № 06: Lebap Province, Köytendag District, Köytendag Mts., from Köytén Village towards Gyrkgyz dere, some 8–9 km from, close to the road, approx. 950 m a.s.l., under stones, 25.V.2015.
- № 07: Lebap Province, Köytendag District, Köytendag Mts., Gyrkgyz dere, along the track, 37.936N 66.595E, under stones, 25.V.2015 (Figs 1–2).
- № 10: Lebap Province, Köytendag District, Köytendag Mts., Hojapil Village, Umbar dere (the canyon with the waterfall), along the track, 37.936N 66.653E, under stones, 25.V.2015 (Fig. 3).

Figure 3 (photo courtesy of Pavel Stoev). Locality № 10: the canyon Umbar dere, a collecting site for three species first reported from Turkmenistan: Chlaenius extensus, Quedius novus, and Galeruca jucunda.
Figures 4–5 (photos courtesy of Pavel Stoef). Localities № 5, № 15 and № 19: grasslands surrounding the Köytendag Nature Reserve Headquarter, a collecting site for some widely distributed species, such as *Apotomus rufithorax*, *Syntomus fusco-maculatus*, *Hybosorus illigeri*, *Augyles turanicus*, *Cheirodes brevicollis*, *Gonocephalum rusticum*, *G. setulosum setulosum*, *Chaetocnema hortensis*, and *Sharpia rubida*. 
- № 16: Lebap Province, Köýtendag District, Köýtendag Mts., Garlyk Village, around Gulshirin Cave (= Geofizicheskaya), on shrubs, grass and under stones, 37.673N 66.395E, 28.V.2015.
- № 17: Lebap Province, Köýtendag District, Köýtendag Mts., Garlyk Village, Suuv Oyuk Sinkhole (the sinkhole with the blind loaches), around the sinkhole and in the water, 37.597N 66.406E, 29.V.2015.

Note: Entries № 5, № 15 and № 19 refer to the same locality (Figs 4–5), but to different dates and collecting methods.

**Abbreviations for specimen depositories**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHF</td>
<td>Hans Fery collection, Berlin, Germany (property of the Naturhistorisches Museum Wien, Vienna, Austria)</td>
</tr>
<tr>
<td>DKCP</td>
<td>David Král collection, Prague, Czech Republic (deposited in NMPC)</td>
</tr>
<tr>
<td>HNHM</td>
<td>Hungarian Natural History Museum, Budapest, Hungary (Ottó Merkl)</td>
</tr>
<tr>
<td>NMNHS</td>
<td>National Museum of Natural History, Sofia, Bulgaria (Borislav Guéorguiev)</td>
</tr>
<tr>
<td>NMPC</td>
<td>Prague National Museum, Prague, Czech Republic (Jiří Hájek)</td>
</tr>
</tbody>
</table>

**List of the taxa**

**Family Carabidae** (det. B. Guéorguiev)

*Acinopus (Acinopus) laevigatus* Ménétriés, 1832. Material examined: № 06 (1 ♀, NMNHS). Distribution: Balkan Peninsula (Croatia, Bulgaria, Greece), Romania, Moldova, Ukraine, southern part of European Russia, Transcaucasia (Armenia, Azerbaijan), northern Levant (Turkey, Israel), Iran, Iraq, Central Asia (from Turkmenistan and Kazakhstan to Gansu, Xinjiang and northernmost parts of Pakistan and India).


*Asaphidion transcaspicum* (Semenov, 1889). Material examined: № 10 (1 ♂, NMNHS). Distribution: Bulgaria, Georgia, Azerbaijan, Iran, Central Asia (from Turkmenistan to Xinjiang), eastern Siberia.

*Bembidion (Ocyturanes) dyscheres* Netolitzky, 1943. Material examined: № 14 (2 ♂♂, 1 ♀, NMNHS). Distribution: Iran, Central Asia (from Turkmenistan to Tajikistan and Pakistan).

*Bembidion (Peryphus) obscurellum turanicum* Csiki, 1928. Material examined: № 10 (1 ♀, NMNHS). Distribution: Turkey, Iran, Central Asia (from Turkmenistan to Mongolia and Kashmir), eastern Siberia, northern China.

*Bembidion (Philochthus) aeneum athalassicum* De Monte, 1953. Material examined: № 15 (1 ♂, 3 ♀♀, NMNHS). Distribution: Ukraine, Azerbaijan, Uzbekistan (Neri & Gudenzi, 2013). Notes: The record from the Köýtendag Nature Reserve is the first one of the halobiont *B. aeneum* (s.l.) German, 1823 from Turkmenistan. According to Paolo Neri (pers. comm.),
the ssp. *athalassicum* occurs in environments with clays containing high percentage of NaCl.

**Broscus punctatus** (Dejean, 1828). Material examined: № 01 (1 ♂, NMNHS). Distribution: southern Levant (Egypt, Sinai), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (Uzbekistan, Kyrgyzstan, Tajikistan, Afghanistan), Nepal, northern India, south China.

**Calathus (Neocalathus) ambiguus ambiguus** (Paykull, 1790). Material examined: № 10 (2 ♂♂, 6 ♀♀, NMNHS). Distribution: Europe, western Siberia, Transcaucasia, northern Levant (Turkey, Syria, Israel), Iran, Central Asia (from Turkmenistan and Kazakhstan to Afghanistan).

**Calosoma (Caminaria) maderae dsungaricum** Gebler, 1833. Material examined: № 01 (1 ♀, NMNHS). Distribution: eastern Mediterranean region (Greece, Turkey, Cyprus, Syria), Romania, Ukraine, southern part of European Russia, Caucasus, Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Kuwait), Central Asia (from Turkmenistan and Kazakhstan to Mongolia, Gansu, Xizang and Pakistan).

**Chlaenius (Chlaeniellus) extensus** Mannerheim, 1825. Material examined: № 07 (1 ♀, NMNHS); № 10 (1 ♀, NMNHS; Fig. 6). Distribution: Iran, Uzbekistan, Kyrgyzstan, Tajikistan, southern Siberia. Recently, Schnitter (2016) reported “*Chlaenius (Chlaeniellus) near extensus*” as a new taxon for Mongolia. Notes: First record from Turkmenistan. Mandl (1983) stated that this species and *Chl. vestitus* (Paykull, 1790) are morphologically very similar and differ only in body size. The same author (ibid.) suggested that the former could be a subspecies of the latter. This needs verification because both species co-occur in Iran and Kopet Dagh (a mountain range situated in north-eastern Iran and south-western Turkmenistan; ibid.; Azadbakhsh & Nozari, 2015). These territories, as well as the south part of Kazakhstan are perhaps the areas where these two taxa interbreed.


**Parophonus (Ophonomimus) interstitialis** (Reitter, 1889). Material examined: № 15 (1 ♂, NMNHS). Distribution: Armenia, Iran, Iraq, Central Asia (from Kazakhstan and Turkmenistan to Pakistan).


**Syntomus fuscomaculatus** Motschulsky, 1844. Material examined: № 15 (2 ♀♀, NMNHS); № 21 (1 ♀, NMNHS). Distribution: Mediterranean region, southern part of European Russia, Caucasus, Transcaucasia, Levant, Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan and Kazakhstan to Mongolia and Pakistan), Bhutan, India.
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_Trechus_ (Trechus) _quadristriatus_ (Schrank, 1781). Material examined: № 10 (1 ♂, 2 ♀♀, NMNHS). Distribution: Europe, north-western Africa, Caucasus, Transcaucasia, Levant, Middle East, Central Asia (from Turkmenistan to Xinjiang).

**Family Gyrinidae** (det. H. Fery)

*Gyrinus* (Gyrinus) _distinctus_ Aubé, 1838. Material examined: № 11 (1 ♂, 1 ♀, CHF; 2 ♂♂, NMNHS). Distribution: Europe (except for the northern parts); in Africa: Egypt, Libya and parts of the Afrotropical Region; in Asia: northern Levant (Turkey, Cyprus, Syria, Lebanon), Middle East (Iran, Iraq, United Arab Emirates), Central Asia (Kazakhstan, Uzbekistan, Kyrgyzstan, Mongolia, Afghanistan), China (northern and western regions), Kashmir. Notes: First record from Turkmenistan.

*Hydaticus* (Prodaticus) _cf. pictus_ (Sharp, 1882). Material examined: № 17 (2 ♂♂, CHF; 1 ♂, 1 ♀, NMNHS). Distribution: Syria, Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (Kazakhstan and Turkmenistan to Pakistan) (Temreshev, 2015).

*Hydroporus planus* (Fabricius, 1782). Material examined: № 11 (1 ♂, CHF, NMNHS). Distribution: Europe, Morocco, Algeria, Turkey, Lebanon, Iran, Iraq, Turkmenistan, Kazakhstan, Kirgizistan, western Siberia.

*Nebrioporus airumlus* (Kolenati, 1845). Material examined: № 11 (1 ♂, 1 ♀, CHF; 1 ♂, 2 ♂♂, NMNHS). Distribution: Poland, Ukraine, southern part of Russia, Caucasus, Transcaucasia, Turkey, Israel, Iran, Central Asia (Kazakhstan and Turkmenistan to Mongolia and Pakistan), eastern Siberia, large parts of China, Kashmir, northern India.

**Family Dytiscidae** (det. H. Fery)

*Gabrius hissaricus* Schillhammer, 2003. Material examined: № 13 (2 ♂♂, NMNHS, 1 ♂, SCH); № 20 (1 ♂, SCH). Distribution: Tajikistan, Turkey (?). Notes: First record from Turkmenistan. The species was described from the Gissar range in Tajikistan. It was later recorded from Erzincan province of Turkey by Özgen & Khachikov (2013). Since a highly similar species, *Gabrius armeniacus* Coiffait, 1966, has been recorded from Armenia, this record requires confirmation.

*Quedius* (Raphirus) _novus_ Eppelsheim, 1892. Material examined: № 07 (1 specimen, NMNHS); № 08 (1 specimen, SCH); № 10 (3 specimens, NMNHS, 2 specimens SCH); № 13 (1 specimen, SCH). Distribution: recorded from Tajikistan and Uzbekistan (Schülke & Smetana, 2015). Notes: First record from Turkmenistan.

*Quedius* (Raphirus) _scintillans_ (Gravenhorst, 1806). Material examined: № 07 (1 specimen, SCH). Distribution: western Palaearctic, from North Africa across Europe to the Middle East (Iran, Israel, Lebanon, Syria, Turkey) and Middle Asia (Afghanistan, Turkmenistan, Uzbekistan) (Schülke & Smetana, 2015).

*Sepedophilus rufulus* (Hochhuth, 1849). Material examined: № 13 (2 specimens, NMNHS, 1 specimen SCH); № 14 (6 specimens, NMNHS, 4 specimens SCH). Distribution: whole Caucasus and Transcaucasia (Russia, Georgia, Azerbaijan, Armenia, north-eastern Turkey), Middle East (Iran, Iraq), Middle Asia (Afghanistan, Turkmenistan, Uzbekistan), northern Pakistan, India (Kashmir) (Schülke & Smetana, 2015).

*Thinodromus behnei* Gildenkov, 2000. Material examined: № 14 (1 specimen, NMNHS, 1 specimen SCH). Distribution: western part of Tajikistan (Gissar Alai
and Zarafshan Mountain ranges) (Gildenkov, 2001). Notes: First record from Turkmenistan.

*Trichophya pilicornis* (Gyllenhal, 1810). Material examined: № 13 (2 specimens, NMNHS, 1 specimen SCH). Distribution: whole Palaearctic region (Canary Islands and Spain in the west to east Siberia and the Russian Far East), also adventive in the Nearctic region (Schülke & Smetana, 2015). Records from the eastern part of the Palaearctic and from the Himalaya (Uttarakhand, Himachal Pradesh) require confirmation. The species lives in leaf litter and under bark. It has also been reported from old mines, where it was probably transported with pit wood. Notes: First record from Turkmenistan.

**Family Hybosoridae** (det. D. Král & B. Guéorguiev)

*Hybosorus illigeri* Reiche, 1853. Material examined: № 15 (1 ♀, NMNHS). Distribution: Subcosmopolitan (species with an extremely wide distribution, extending from south parts of Europe to India and South Africa including Madagascar; it has been also introduced to large parts of the Nearctic and Neotropical Regions. Widely distributed in Turkmenistan (Nikolaev, 1987).

**Family Scarabaeidae** (det. D. Král)

*Phaeadoretus comptus* (Ménétriès, 1849). Material examined: № 15 (2 specimens, DKCP; 2 specimens, NMNHS); № 19 (1 specimen, NMNHS). Distribution: known from whole Middle Asia, Azerbaijan, Iran and Afghanistan. Widely distributed in Turkmenistan (Nikolajev, 1987).

*Pleurophorus apicipennis* Reitter, 1892. Material examined: № 15 (1 specimen, DKCP; 9 specimens, NMNHS). Distribution: widely distributed in western Asia (from Turkey and Turkmenistan in the west to the Xinjiang in China in the east).

**Family Heteroceridae** (det. B. Guéorguiev)

*Augyles turanicus* (Reitter, 1887). Material examined: № 19 (1 ♀, NMNHS; Fig. 7). Distribution: Algeria, Georgia, Levant (Turkey, Syria, Israel), Middle East

**Family Elateridae** (det. T. Németh)

*Aeoloides figuratus* (Germar, 1844). Material examined: № 15 (1 specimen, NMNHS); № 19 (1 specimen, HNHM; 3 specimens, NMNHS). Distribution: Caucasus, Transcaucasia, Arabian Peninsula, Central Asia to Pakistan.

*Agriotes (Agriotes) meticulosus* Candèze, 1863. Material examined: № 15 (2 specimens, NMNHS). Distribution: Caucasus, Transcaucasia, Arabian Peninsula, Iran to Pakistan.

**Family Ptinidae** (det. B. Guéorguiev)

Family Coccinellidae (det. O. Merkl & B. Guéorguiev)

*Coccinella* (*Coccinella*) *septempunctata* Linnaeus, 1758. Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: whole Palaearctic region (south to northern Vietnam); deliberately introduced to North America.

Family Tenebrionidae (det. O. Merkl)

*Adesmia* (*Adesmia*) *planidorsis* Reitter, 1916. Material examined: № 16 (1 specimen, NMNHS); № 17 (1 specimen, NMNHS). Distribution: Tajikistan, Turkmenistan, Uzbekistan (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 15 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia, Xinjiang and Pakistan), Sahelian and Saharan parts of Africa (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *aurita aurita* (Pallas, 1781). Material examined: № 07 (1 specimen, NMNHS). Distribution: southern part of European Russia, Afghanistan, Iran, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan, China (Xinjiang) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

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*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

*Cheiroides* (*Pseudanemia*) *brevicolliis* (Wollastion, 1864). Material examined: № 02 (1 specimen, NMNHS); № 09 (1 specimen, NMNHS); № 12 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, Canary Islands, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia and China) (Löbl et al., 2008; Medvedev & Nepesova, 1985).
to Afghanistan), Sahelian and Saharan parts of Africa (Löbl et al., 2008; Medvedev & Nepesova, 1985).


Omophlus sp. Material examined: № 09 (1 specimen, NMNHS).

Opatroides punctulatus parvulus (Faldermann, 1837). Material examined: № 15 (2 specimens, NMNHS). Distribution: Afghanistan, Armenia, Azerbaijan, Iran, Tajikistan, Turkmenistan, Turkey, Pakistan, Uzbekistan, western India (Löbl et al., 2008; Medvedev & Nepesova, 1985).

Thriptera longipilis Reitter, 1895. Material examined: № 03 (1 specimen, NMNHS); № 04 (1 specimen, NMNHS). Distribution: Afghanistan, Tajikistan, Turkmenistan (Löbl et al., 2008; Medvedev & Nepesova, 1985).

Zophosis (Oculusia) punctata punctata Brullé, 1832. Material examined: № 09 (1 specimen, NMNHS). Distribution: Mediterranean region (southern Europe, North Africa, Turkey, Levant), Transcaucasia (Armenia, Azerbaijan), Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Xinjiang and Pakistan) (Löbl et al., 2008; Medvedev & Nepesova, 1985).

Family Meloidae (det. D. Szalóki)

Ctenopus sinuatipennis (Fairmaire, 1892). Material examined: № 17 (1 specimen, HNHM). Distribution: Turkmenistan, Uzbekistan, China (Xinjiang).

Family Anthicidae (det. Z. Kejval)

Cordicollis margeanicus (Pic, 1894). Material examined: № 15 (1 ♂, 1 ♀, NMNHS; 1 ♂, 1 ♀, ZKDC). Distribution: Ukraine, southern Russia, Turkey, Syria, Azerbaijan, Iran, Iraq, Central Asia (from Turkmenistan to Mongolia and Afghanistan) (Chandler et al., 2008). Notes: In the Palaearctic catalogue (Chandler et al. 2008), the species is listed under Cordicollis Marseul, 1879 but is to be treated as Cordicollis Pic, 1894 (ICZN 2016, Opinion 2377).

Cyclodinus reitteri (Pic, 1892). Material examined: № 15 (5 ♂, 4 ♀, NMNHS; 5 ♂, 3 ♀, ZKDC); № 19 (8 ♂, 4 ♀, NMNHS; 2 ♂, 2 ♀, ZKDC). Distribution: southern Russia, Azerbaijan, Syria, Turkmenistan, Uzbekistan, Afghanistan (Chandler et al., 2008).

Family Chrysomelidae (det. B. Guéorguiev)

Chaetocnema (Chaetocnema) hortensis (Geoffroy, 1785). Material examined: № 19 (1 ♀, NMNHS). Distribution: Europe, Macaronesia (Azores, Madeira), Morocco, Tunisia, Levant, Georgia, Azerbaijan, Middle East (Iran, Iraq, Arabian Peninsula), Central Asia (from Turkmenistan to Mongolia), eastern Siberia, Russian Far East, China (Jiangsu).

Galeruca (Galeruca) jucunda (Faldermann, 1837). Material examined: № 10 (1 ♂, NMNHS; Fig. 9). Distribution: Europe (excluding the northern and eastern parts), Caucasus, southern Siberia, Turkey, Azerbaijan, Syria, N Iran, Afghanistan, Mongolia, China (Inner Mongolia, Xizang) (Beenen, 2010; Mirzaei & Nozari, 2016). Notes: First record from Turkmenistan.

Family Curculionidae (det. V. Szénási)

Corigetus sp. Material examined: № 09 (1 specimen, NMNHS).
Coleoptera (Insecta) from Ashgabat City and Köytendag Nature Reserve, with nine first records for Turkmenistan

Hypera (Hypera) postica (Gyllenhal, 1813). Material examined: № 10 (2 specimens, NMNHS). Distribution: whole Europe (including Caucasus and Transcaucasia), North Africa, Turkey to Xinjiang; accidentally introduced to Japan and North America.

Phacephorus nebulosus (Fåhraeus, 1840). Material examined: № 10 (1 specimen, HNHM); № 15 (3 specimens, HNHM; 2 specimens, NMNHS). Distribution: southern part of European Russia, Ukraine, Central Asia to China and eastern Siberia.

Sharpia rubida (Rosenhauer, 1856). Material examined: № 15 (3 specimens, NMNHS); № 19 (2 specimens, NMNHS). Distribution: Mediterranean region (southern Europe, North Africa, Levant), Transcaucasia (Armenia, Azerbaijan), Central Asia (from Turkmenistan, Uzbekistan).

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