J. Insect Biodivers. Syst. 11 (in press) *Paper in Press, Proofed, Available online 24 September, 2024* *https://jibs.modares.ac.ir*

OPEN ACCESS

Tarbiat Modares University Press | Research Article | ISSN: 2423-8112
Entomological Society of Iran | Faunistic | https://zoobank.org/urn:lsid:zoobank.org:2E7325F8-6C09-4621-9A9A-9A95C7E4764B

The beetles (Coleoptera) associated with the Maamora cork oak forest in the north-west of Morocco

Hamza Habbaz
Laboratoire d'Ecologie et Environnement, Hassan II University of Casablanca, Faculty of Sciences Ben M'Sick, BP 7955 - Sidi Othman, Casablanca, Morocco [1]; *Centre d'Innovation, de Recherche et de Formation, Agence Nationale des Eaux et Forêts, BP. 763, Rabat - Agdal, Morocco* [2].
✉ *hamza.habbaz-etu@etu.univh2c.ma* *https://orcid.org/0009-0000-7117-1075*

Noureddin Maatouf
Centre d'Innovation, de Recherche et de Formation, Agence Nationale des Eaux et Forêts, BP. 763, Rabat - Agdal, Morocco.
✉ *noureddin_maatouf@yahoo.ca* *https://orcid.org/0000-0002-6288-7378*

Jean-Pierre Lumaret
Université Paul Valéry Montpellier III, Route de Mende, 34199 Montpellier Cedex 5, France.
✉ *jean-pierre.lumaret@univ-montp3.fr* *https://orcid.org/0000-0003-2926-3974*

Latifa Rohi
Laboratoire d'Ecologie et Environnement, Hassan II University of Casablanca, Faculty of Sciences Ben M'Sick, BP 7955 - Sidi Othman, Casablanca, Morocco.
✉ *rohilatifa@gmail.com* *https://orcid.org/0000-0002-4180-1117*

ABSTRACT. This study aims to explore and improve the understanding of the biodiversity of beetles in the Maamora forest, one of the largest cork oak forests in the world. A survey was carried out over two consecutive years (2021 and 2022), using both active and passive traps. A total of 8247 individuals were collected, representing 256 species, belonging to 42 families of Coleoptera order. Most of the beetle species belonged to the families Tenebrionidae (27 species), Carabidae (27 species) and Curculionidae (24 species). Out of the 256 species identified, 216 have been included in this document. We only selected species of high heritage value; 53 were saproxylic, including 6 rare species; 29 were endemic, and 26 species were identified as new records for the Moroccan entomofauna. These results provide the first checklist of beetle fauna in the Maamora forest, which will contribute new information on the distribution of beetles in the cork oak forests of Morocco.

Keywords: Biodiversity, inventory, distribution, endemic, saproxylic beetles

Received: December 20, 2023
Accepted: September 04, 2024
Available online: September 24, 2024
Subject Editor: Sabu K Thomas

Citation: Habbaz, H., Maatouf, N., Lumaret, J.-P. & Rohi, L. (2025) The beetles (Coleoptera) associated with the Maamora cork oak forest in the north-west of Morocco. *Journal of Insect Biodiversity and Systematics*, 11 (in press).

INTRODUCTION

Like the forests of the southern side of the Mediterranean basin, Moroccan forests contain a great variety of habitats rich in biodiversity (QCN, 2021). However, they are highly vulnerable, and face multiple crises characterized by significant biodiversity loss and disruption of forest habitats (Hoekstra et al., 2005). This vulnerability stems from both natural and anthropogenic pressures. The current changes, which are becoming increasingly stringent, are expected to intensify in the coming decades (Ali et al., 2022). To address these growing threats, it is necessary to adopt new management approaches and establish a coherent network of protected natural areas in Mediterranean countries (Galbraith & Stroud, 2022). Since 1996, the Maamora forest has been identified as a Site of Biological and Ecological Interest (SIBE) as part of the study on Protected Areas in Morocco (AEFCS, 1996). Located on the Atlantic coast of Morocco, this forest provides numerous ecological goods and services to society (recreational areas, pastures, timber, acorns, etc.). It is one of the most studied ecosystems in Morocco. Its flora is relatively well studied

Corresponding author: Hamza Habbaz, ✉ *hamza.habbaz-etu@etu.univh2c.ma*, *hamza96habbaz@gmail.com*

(Sauvage, 1961; Benabid, 2000; Aafi et al., 2005). The vascular flora of the Maamora forest represents 48% of the vascular flora of Moroccan cork oak forests and 9.3% of the overall vascular flora of Morocco (Sauvage, 1961; Benabid, 2000; Aafi, 2007). This forest is also home to diverse fauna, including over 700 arthropod species (Villemant & Fraval, 1993) and 150 bird species (Cherkaoui et al., 2007). However, studies on the entomological fauna are limited (Idrissi, 1982; Mahari, 1992; Villemant & Fraval, 1993; El Alami Idrissi, 2013), and information on the structure of beetle populations and their spatial distribution is relatively incomplete. This means that the forest managers have a significant responsibility to conserve this natural heritage. Over the past decades, human activities have exerted numerous pressures on this forest, leading to a reduction in its surface area. The continuous loss and alteration of the forest habitats are expected to have repercussions for the entomological community. The replacement and/or loss of native insect species often result in the destabilization of the original communities and a reduction in the ecological goods and services they provide (Murphy, 1988).

Knowledge about the conservation status of beetle populations in Morocco is limited. There is no list of rare and threatened species, highlighting the need to survey the Maamora forest entomofauna to help assign conservation priorities by identifying heritage species that require urgent protection measures. To update and complement existing information, a targeted inventory of beetles in the Maamora forest was conducted over two consecutive years (2021 and 2022) using various traps and visual collection techniques. The objectives of this study were to obtain a better understanding of the beetles in the forest and to assess the biological and heritage value of the forest habitats.

MATERIAL AND METHODS

Study area. The Maamora forest is located between the cities of Salé and Kénitra, along the Atlantic coast in north-west Morocco (Fig. 1). It extends eastwards along an area 40 km wide and 70 km long, following a bioclimatic gradient ranging from sub-humid to semi-arid (Belghazi & Mounir, 2016). This forest covers approximately 135,000 hectares, including 71,000 hectares of commercial plantations and 64,461 hectares of cork oak woodlands (Belghazi & Mounir, 2016), representing 17% of the total area of cork oak forests in Morocco and 25% of the area of Atlantic cork oak forests (Aafi, 2007). The topography of the forest is mostly flat, interrupted by a southwest-northeast oriented hydrographic network that divides it into five distinct Cantons named A, B, C, D, and E, respectively, and distributed from the sea level up to 300 metres in elevation (Fig. 1). For the purposes of this study, three sampling sites were chosen within the forest, identified as S1, S2 and S3. Only three of the five Cantons were selected for trap installation: site S1 in Canton A, site S2 in Canton C and site S3 in Canton E. Cantons B and D were not included in the study, as Canton B has similar vegetation and climatic characteristics to Canton C, just as Canton D is similar to Canton E. The climate is of the Mediterranean type, tempered by the influence of the Atlantic Ocean. The average temperatures range between 1.8°C in January (year 2005) and 38°C in August (year 2012), with annual rainfall ranging from 403 to 557 mm, according to years. Rains is generally concentrated in November, December, and January, but their distribution can vary from year to year. The dry period is relatively long, lasting up to 6 months, but atmospheric humidity is high, especially in the western part, which partly compensates for the aridity of the climate. Climatic data classify the western sectors of the Maamora forest as "warm sub-humid bioclimate" and the eastern sectors as "temperate semi-arid bioclimate" (Belghazi & Mounir, 2016). The natural vegetation of the Maamora consists mainly of cork oak trees (*Quercus suber* L.) and a few specimens of the Maamora pear (*Pyrus mamorensis* Trabut), an endemic species to the region. Mastic trees (*Pistacia lentiscus* L.), wild olive (*Olea europaea* ssp. *oleaster*), and green olive trees or mock privet (*Phillyrea latifolia* L.) are found on soils with shallow sand and red soil. The dwarf palm, *Chamaerops humilis* L., grows in dense clumps in the more open areas. Phoenician juniper (*Juniperus phoenicea* L.) can be found along the Atlantic coast, particularly around Lake Boughaba. The shrub and herb communities are highly diverse, with 402 recorded species (Métro & Sauvage, 1955; Sauvage, 1961; Aafi, 2007). The parts of the forest which have been impacted by commercial plantations are covered with introduced species: pine (*Pinus pinaster ssp. atlantica* H. del Vill., *Pinus halepensis* Mill., and *Pinus pinea* L.), eucalyptus (mostly *Eucalyptus camaldulensis* Dehn), and black wattle (or tannin acacia) trees (*Acacia mearnsii* De Wild.).

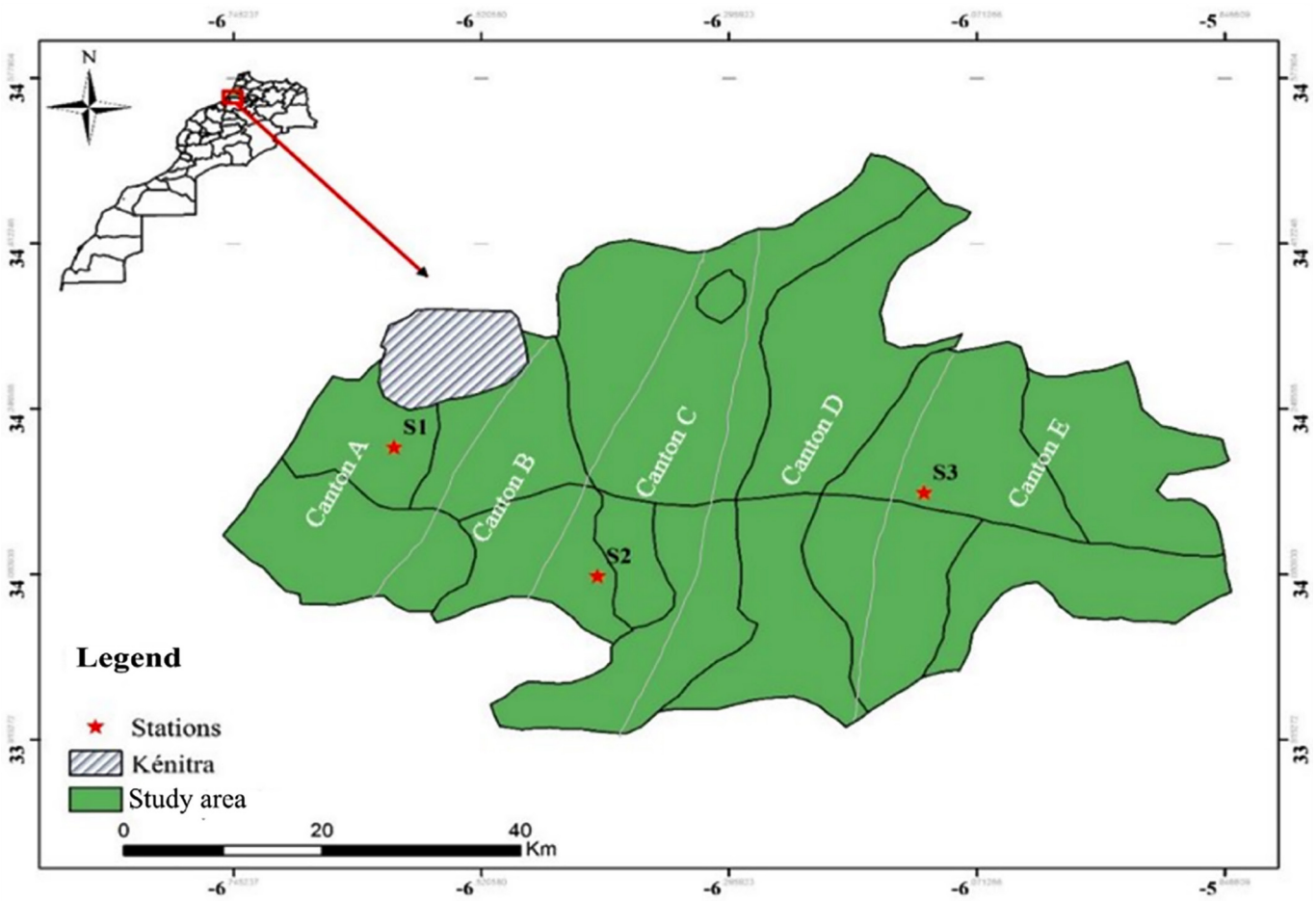

Figure 1. Maamora forest in Morocco and location of the studied stations (S1, S2, S3).

Site S1 is close to the sea and has a low rate of reforestation with commercial plantations. Site S2 is in the core of the forest, with a medium level of reforestation with commercial plantations. Finally, site S3 is located at the edge of the forest, under more marked continental influences, and shows a high rate of reforestation with commercial plantations. These differences in geographical location and species composition between the three study sites reflect the variations in vegetation conditions and climate within the Maamora forest.

Collection sites. Three sampling stations (named S1, S2, and S3, respectively) were chosen according to their location in the forest, their distance from the sea, and whether the plots were fenced (Fig. 1). Fencing prevents pruning and wood cutting by the local population and prevents cattle grazing in the undergrowth, which preserves the herbaceous and low shrub cover.

Station S1 (Canton A; Fig. 2A). Located in the western part of the forest (34°12'33.34''N, 06°35'54.78''W), at an elevation of 37 m, it belongs to the warm sub-humid bioclimate with maritime influences. This station was characterized by an open cork oak forest where cork oak was mixed with tannin acacia, within a semi-fenced plot.

Station S2 (Canton C; Fig. 2C). Located in the middle part of the forest (34°04'57.73''N, 06°24'38.31''W), at an elevation of 134 m, it belongs to the warm sub-humid bioclimate with maritime influences. This plot of old cork oak trees with a very dense understory was completely fenced and thus, protected from grazing.

Station S3 (Canton E; Fig. 2B). Located in the eastern part of the forest (34°09'36.1''N, 06°07'04.34''W), at an elevation of 164 m, it belongs to the semiarid bioclimate with temperate winters and continental influences. This unfenced station comprised a mixed cork oak forest with eucalyptus trees.

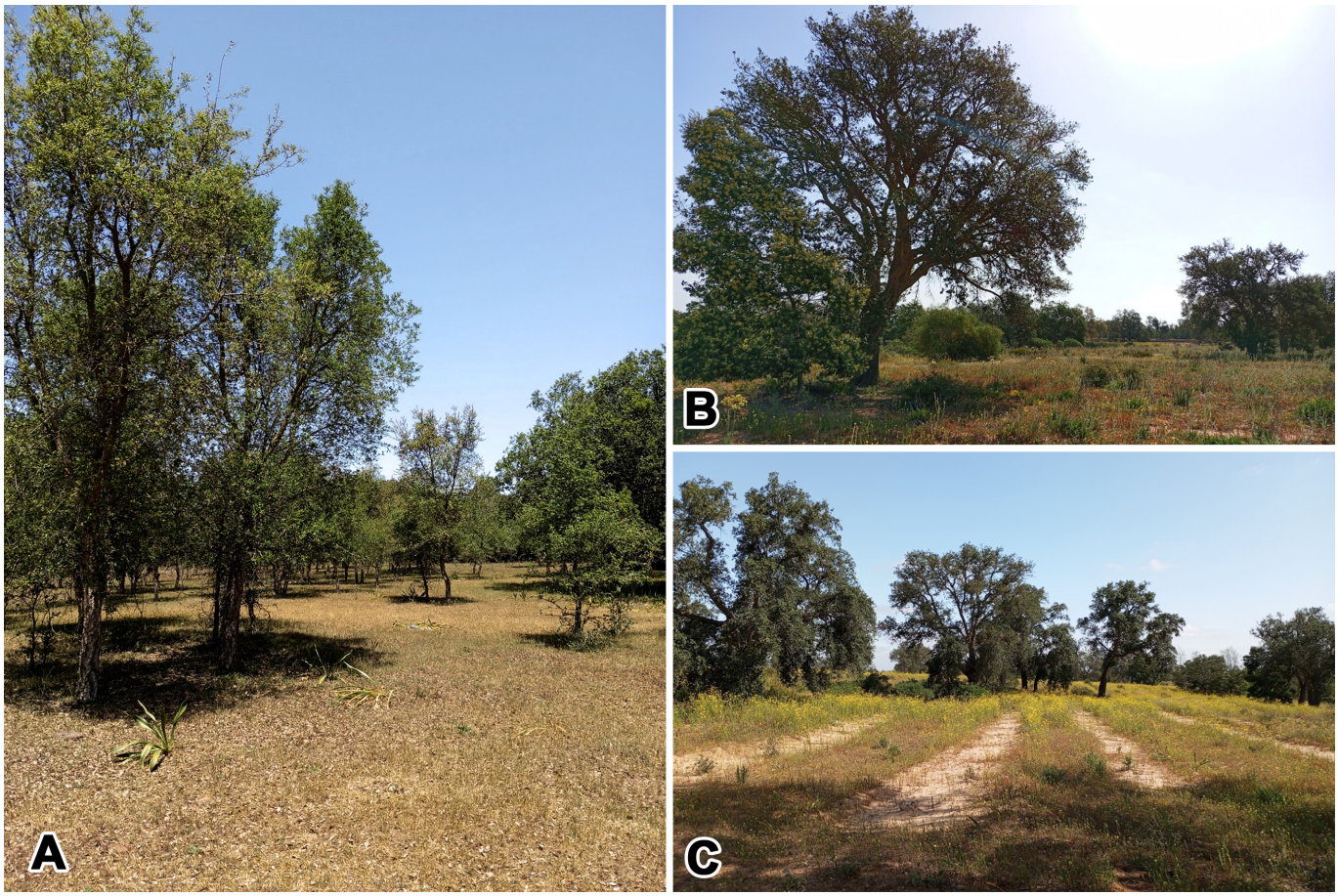

Figure 2. Sampling stations. **A.** Canton A (S1); **B.** Canton E (S3) and **C.** Canton C (S2).

Sampling methods. Several sampling methods were used: visual capture when checking the traps; and passive sampling systems with three types of traps:

1) Window trapping (interception traps): The traps consisted of a large transparent plexiglass panel (73 cm x 42 cm) that intercepted the beetles that struck it in flight. The insects were collected in a gutter fixed at the base of the trap, filled with water, and mixed with saline solution and a few drops of dishwashing detergent to reduce surface tension. This trapping method is effective for collecting xylophagous and saproxylic species (Ranius & Jansson, 2002; Brustel, 2004; Bouget et al., 2008). Their position was 1.20 m from the ground, in plots where dead wood was present (Bouget & Noblecourt, 2005).
2) Pitfall traps (Barber traps): The traps were made with plastic cups with a top diameter of 60 mm, placed with the opening at the ground level, and covered with wooden branches to prevent them from being trampled by animals. Pitfall traps allow for the capture of soil-dwelling invertebrates (Nageleisen & Bouget, 2009). The distance between the traps was 20 metres.
3) Coloured bowls: These traps consisted of coloured bowls (yellow (YCT), orange (OCT), white (WCT), and blue (BCT)) with a diameter of 15 cm and a height of 13 cm. They were filled halfway with a preservation mixture (soapy water + salt) and placed at a height of 1.5 m above the ground level, in cork oak clearings to attract species attracted to flowers.

The different traps were installed at three stations in Cantons A, C, and E. In each station, 13 traps were set up at a distance ranging from 15 to 20 metres apart (8 Barber traps, 4 coloured traps one of each of the following yellow, white, orange, and blue colours - and one window trap). Traps were checked every 3 weeks for a 7-month period (April to October) during two consecutive seasons (2021 and 2022). The specimens collected were first identified to the genus level using specific identification keys for each

family. For species confirmation, they were compared to verified specimens in the museum's collections of the CIRF (Centre for Innovation, Research, and Training) and the Museum of the Scientific Institute of Rabat (Morocco). Carabidae and Tenebrionidae identifications were confirmed by Dr. Piero Leo (Italian entomologist (Cagliari) specialist in Tenebrionidae). The specimens collected were counted and only individuals identified to the species level were studied. The species studied in this work are preserved in the museum's collections of the CIRF.

The distribution of the captured species and their level of endemism in Morocco were checked using the *Catalogue of Palaearctic Coleoptera* by Löbl & Smetana (2003, 2004, 2006, 2007, 2008, 2010, 2011, 2013). To assess the rarity and threat status of saproxylic species, we referred to the IUCN Red List of Threatened Species (2022), the European Red List of saproxylic beetles (Nieto & Alexander, 2010; Cálix et al., 2018), the Atlas of endangered invertebrates of Spain (Critically Endangered and Endangered Species) (Verdu & Galante, 2009), the Red List of Invertebrates of Spain (Verdu & Galante, 2006), the Red List of Mediterranean saproxylic beetles (García et al., 2018), the Red List of saproxylic and phytophagous beetles of Limousin (Chambord et al., 2013), and the studies of several authors, including Chavanon (2018), Labrique & Chavanon (2001), Prudhomme (2016), Velle (2004, 2011), and Villemant & Fraval (1993).

RESULTS

256 species belonging to 42 families were identified, but only 216 species were included in this study: 29 species were endemic to the region; 26 species were new to Morocco; 53 were considered saproxylic; 108 species were already known from Moroccan forest ecosystems. The families and species are presented in alphabetical order in Table 1. The species were classified according to the following criteria: **[S]** Saproxylic species; **[R]** Saproxylic species listed in the Red List of the Mediterranean region; **[N]** Species newly recorded for Morocco and **[E]** Endemic species. Table 2 compares the number of species according to the collection sites, with a distinction between saproxylic species (S), endemic species (E) and those that are new to Morocco (N).

Taxonomic hierarchy

Class Insecta Linnaeus, 1758

Order Coleoptera Linnaeus, 1758

Family Anobiidae Fleming, 1821

***Stegobium paniceum* (Linnaeus, 1758) [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, BCT; 1 spec., 05.VIII.2021, WCT; 3 spec., 13.V.2022, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, window trap; 1 spec., 02.VI.2022, window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Borowski, 2007).

***Xyletinus bucephalus* (Illiger, 1807) [S]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 22.VII.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Borowski, 2007).

Family Anthicidae Latreille, 1819

***Notoxus monoceros* (Linnaeus, 1760) [N] [S]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 1 spec., 02.VI.2022, WCT. 117 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VI.2022, Barber traps and YCT, OCT, WCT, and BCT; 2 specs., 23.VI.2022, OCT, and BCT.

Distribution. Palaearctic (Europe and Asia – Chandler et al., 2008).

***Notoxus trifasciatus* Rossi, 1792 [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 5 specs., 13.V.2022, YCT, WCT, and BCT; 5 specs., 2.VI.2022, YCT, WCT, and BCT. 45 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 5 specs., 2.VII.2021, Barber trap; 1 spec., 13.V.2022, YCT; 7 specs., 2.VI.2022, OCT, WCT, and BCT; 6 specs., 23.VI.2022, WCT and window trap. 11 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, Barber trap and WCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Chandler et al., 2008).

***Stricticollis transversalis* (A. Villa & J.B. Villa, 1833) [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 5 specs., 13.V.2022, YCT, WCT, and BCT; 5 specs., 02.VI.2022, YCT, WCT, and BCT. 45 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap, 5 specs., 02.VII.2021, Barber trap; 1 spec., 13.V.2022, YCT; 7 specs., 02.VI.2022, OCT, WCT, and BCT; 6 specs., 23.VI.2022, WCT and window trap. 11 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, Barber trap and WCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Chandler et al., 2008).

Family Anthribidae Billberg, 1820

***Bruchela rufipes rufipes* (Olivier, 1790)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Europe and Morocco – Magnano & Alonso-Zaragaza, 2011).

Family Brentidae Billberg, 1820

***Kalcapion semivittatum* (Gyllenhal, 1833)**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Sforzi, 2011).

***Ceratapion robusticorne* (Desbrochers des Loges, 1866)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, BCT.

Distribution. Western Palaearctic (Italy, Malta, Portugal, Spain, Algeria, Morocco, and Tunisia – Sforzi, 2011).

Family Buprestidae Leach, 1815

***Acmaeodera bipunctata kureimatica* Escalera, 1914**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 02.VII.2021, WCT; 1 spec., 02.VI.2022, YCT; 1 spec., 23.VI.2022, Barber trap.

Distribution. North Africa (Algeria and Morocco – Volkovitsh, 2006).

***Acmaeoderella adspersula* (Illiger, 1803) [S]**

Material examined. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT and window trap; 10 specs., 28.V.2021, YCT, BCT, and OCT; 9 specs., 02.VII.2021, YCT, WCT, and OCT; 2 specs., 20.IV.2022, YCT; 10 specs., 13.V.2022, YCT, OCT, and WCT; 26 specs., 02.VI.2022, YCT, OCT, WCT, and BCT; 31 specs., 23.VI.2022, Barber traps and YCT, WCT, and BCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, Barber trap, 5 specs., 13.V.2022; YCT, WCT, and BCT; 326 specs., 02.VI.2022, Barber traps and YCT, OCT, WCT, and BCT; 42 specs., 23.VI.2022, Barber traps and YCT, OCT, WCT, and BCT; 3 specs., 22.VII.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, Barber trap; 3 specs., 23.VI.2022, YCT, OCT, and WCT.

Distribution. Palaearctic (Europe, Asia, Morocco, Algeria, and Tunisia – Volkovitsh, 2006; Villemant & Fraval, 1993).

Acmaeoderella discoidea (Fabricius, 1787)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT; 2 specs., 28.V.2021, YCT; 1 spec., 20.IV.2022, YCT; 2 specs., 13.V.2022, OCT and WCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 4 specs., 28.V.2021, Barber trap; 37 specs., 20.IV.2022, Barber trap; 80 specs., 13.V.2022, YCT and Barber trap; 2 specs., 02.VI.2022, Barber trap and OCT. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 3 specs., 13.V.2022, WCT and Barber trap; 1 spec., 02.VI.2022, Barber trap.

Distribution. Palaearctic (Europe, North Africa, Syria, and Israel – Volkovitsh, 2006).

Acmaeoderella lanuginosa (Gyllenhall, 1817) (Fig. 3A)

Material examined. 5 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT; 5 specs., 28.V.2021, YCT and OCT; 3 specs., 20.IV.2022, YCT; 5 specs., 13.V.2022, YCT, WCT, and BCT; 1 spec., 02.VI.2022, BCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 13 specs., 20.IV.2022, Barber trap; 28 specs., 02.VI.2022, Barber trap and YCT, OCT, and BCT; 3 specs., 23.VI.2022, Barber trap and BCT. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT, and Barber trap.

Distribution. Western Palaearctic (Europe, Morocco, Algeria, Tunisia, Sinai, and Israel – Volkovitsh, 2006).

Agrilus biguttatus (Fabricius, 1777) [S]

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, sight capturing.

Distribution. Palaearctic (Europe, Iran, Syria, Algeria, and Morocco – Jendek, 2006).

Agrilus graminis mamorensis Théry, 1930 [E] [S]

Material examined. 5 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, YCT; 7 specs., 28.V.2021, YCT, OCT, WCT, and BCT; 1 spec., 02.VII.2021, OCT; 1 spec., 05.VIII.2021, WCT. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, YCT and WCT.

Distribution. Morocco (Jendek, 2006).

Anthaxia anatolica ferulae Gené, 1839

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, BCT.

Distribution. Western Palaearctic (Spain, France, Italy, Portugal, Algeria, Tunisia, and Morocco – Bily, 2006).

Anthaxia millefolii polychloros Abeille de Perrin, 1894

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, YCT; 1 spec., 02.VI.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, YCT; 1 spec., 02.VI.2022, YCT.

Distribution. Western Palaearctic (Europe and North Africa – Bily, 2006).

Anthaxia nitidula (Linnaeus, 1758) [S] [N]

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT; 2 specs., 13.V.2022, YCT and BCT.

Distribution. Western Palaearctic (Europe and Algeria – Bily, 2006; Prudhomme, 2016).

Anthaxia umbellatarum umbellatarum (Fabricius, 1787)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, YCT; 1 spec., 02.VI.2022, YCT. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 3 specs., 28.V.2021, YCT; 5 specs.,13.V.2022, YCT and OCT; 3 specs., 02.VI.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Bily, 2006).

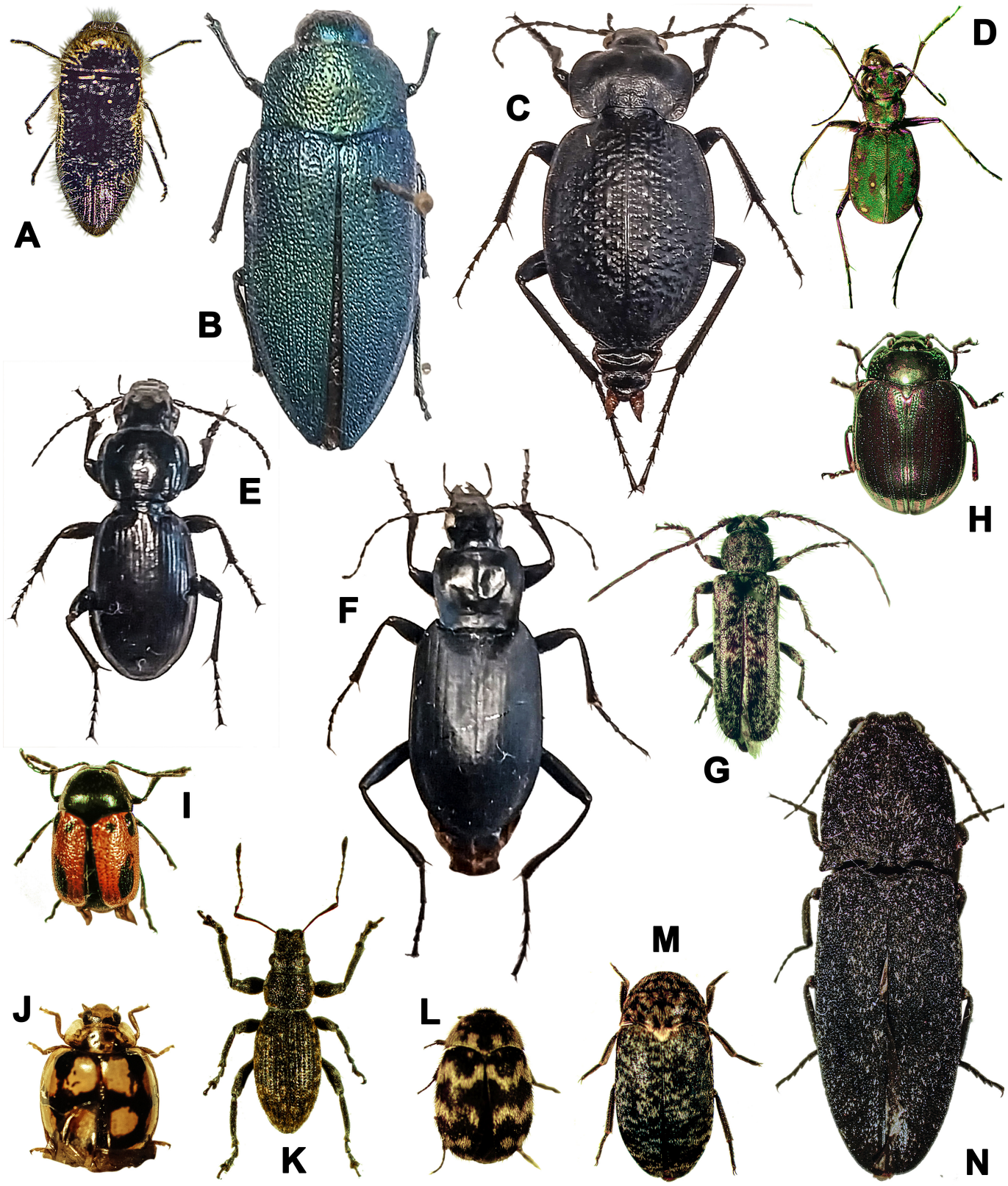

Figure 3. The beetles associated with the Maamora cork oak forest in the north-west of Morocco. **A.** *Acmaeoderella lanuginosa* (Gyllenhall, 1817); **B.** *Perotis unicolor igniventris* Escalera; 1914, **C.** *Carabus faminii favieri* Fairmaire, 1859; **D.** *Pterostichus globosus pecoudi* (Antoine, 1922); **E.** *Sphodrus leucophthalmus* (Linnaeus, 1758); **F.** *Cicindela maroccana* Fabricius, 1801; **G.** *Trichoferus ilicis* Sama, 1987; **H.** *Chrysolina americana* (Linnaeus, 1758); **I.** *Cryptocephalus rugicollis* Olivier, 1792; **J.** *Adalia decempunctata* (Linnaeus, 1758); **K.** *Brachyderes pubescens* Boheman, 1833; **L.** *Attagenus trifasciatus* (Fabricius, 1787); **M.** *Dermestes undulatus* Brahm, 1790; **N.** *Lacon punctatus punctatus* (Herbst, 1779) (photos by H. Habbaz and N. Maatouf).

***Habroloma triangulare* (Lacordaire, 1835)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, WCT; 1 spec., 20.IV.2022, YCT; 2 specs., 02.VI.2022, YCT and OCT; 1 spec., 23.VI.2022, YCT; 2 specs., 22.VII.2022, YCT and BCT. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Spain, France, Italy, Portugal, Algeria, Tunisia, and Morocco – Kuban, 2006).

***Perotis unicolor igniventris* Escalera, 1914 [E] [S]** (Fig. 3B)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, WCT; 1 spec., 13.V.2022, BCT.

Distribution. Morocco (Kuban, 2006).

Family: Cantharidae Imhoff, 1856

***Malthinus flaveolus* (Herbst, 1786) [N]**

Material examined. 11 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT, and WCT; 1 spec., 06.IV.2021, WCT.

Distribution. Western Palaearctic (Europe – Kazantsev & Brancuçci, 2007).

Family Carabidae Latreille, 1802

***Acinopus picipes* (Olivier, 1795)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, Barber trap; 1 spec., 16.IX.2021 Barber trap.1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 30.IV.2021, Barber trap; 5 specs., 28.V.2021, Barber trap; 1 spec., 16.IX.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia and Morocco – Kataev et al., 2003; Benyahia et al., 2016).

***Agonum numidicum* (Lucas, 1846)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (France, Italy, Portugal, Spain, Morocco – Bousquet, 2003a).

***Amara aenea* (De Geer, 1774)**

Material examined. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 3 specs., 20.IV.2022, YCT and BCT; 5 specs., 13.V.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Hieke, 2003).

***Anisodactylus binotatus* (Fabricius, 1787)**

Material examined. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – İto, 2003).

***Calathus circumseptus* Germar, 1824**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap; 3 specs., 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, and Morocco – Hovorka & Sciaky, 2003).

***Calathus fuscipes algiricus* Gautier des Cottes, 1866**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 1 spec., 30.IV.2021, Barber trap; 2 specs., 29.X.2021, Barber trap.

Distribution. North Africa (Algeria, Tunisia, and Morocco – Hovorka & Sciaky, 2003).

***Calathus mollis atticus* Gautier des Cottes, 1867**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 22.VII.2022, YCT.

Distribution. North Africa (Algeria, Libya, Tunisia, and Morocco – Hovorka & Sciaky, 2003).

***Carabus faminii favieri* Fairmaire, 1859 [E]** (Fig. 3C)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, Barber trap. 7 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 2 specs., 06.IV.2021, Barber trap; 2 specs., 30.IV.2021, Barber trap; 1 spec., 28.V.2021, Barber trap, 2 specs., 29.X.2021, Barber trap. 5 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap; 2 specs., 29.X.2021, Barber trap.

Distribution. Morocco (Bousquet et al., 2003).

***Carabus rugosus rugosus* Fabricius, 1792 [E]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap.

Distribution. Morocco (Bousquet et al., 2003).

***Cicindela maroccana* Fabricius, 1801** (Fig. 3F)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, OCT; 1 spec., 02.VI.2022, Barber trap. 5 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, Barber trap. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap.

Distribution. Western Palaearctic (Portugal, Spain, Tunisia, and Morocco – Puchkov & Matalin, 2003).

***Dromius agilis* (Fabricius, 1787) [N]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, window trap.

Distribution. Palaearctic (Europe and Asia – Kabak, 2003).

***Graphipterus exclamationis* (Fabricius, 1792)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, Barber trap.

Distribution. North Africa (Algeria, Tunisia, and Morocco – Hurka, 2003).

***Harpalus attenuatus* Stephens, 1828**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap; 6 specs., 20.IV.2022, Barber trap; 2 specs., 13.V.2022, Barber trap; 5 specs., 02.VI.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kataev et al., 2003).

***Harpalus serripes serripes* (Quensel, 1806)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kataev et al., 2003).

***Microlestes abeillei brisouti* Holdhaus, 1912**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, window trap; 1 spec., 16.IX.2021, Barber trap; 3 specs., 29.X.2021, Barber trap. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, YCT, BCT, and WCT; 1 spec., 13.V.2022, WCT.

Distribution. North Africa (Kabak, 2003).

***Ocys tachysoides* (Antoine, 1933)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, window trap.

Distribution. Western Palaearctic (Portugal and Morocco – Marggi et al., 2003).

***Paradromius linearis linearis* (Olivier, 1795)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, WCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kabak, 2003).

***Philorhizus quadrisignatus* (Dejean, 1825) [N]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 05.VIII.2021, YCT.

Distribution. Palaearctic (Europe, Algeria, and Israel – Kabak, 2003).

***Poecilus baeticus gharbensis* (Alluaud, 1927) [E]**

Material examined. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 30.IV.2021, Barber trap and YCT.

Distribution. Morocco (Bousquet, 2003b).

***Pterostichus elongatus* (Duftschmid, 1812)**

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, Barber trap; 9 specs., 29.X.2021, Barber trap; 1 spec., 20.IV.2022, Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 35 specs., 06.IV.2021, Barber trap; 13 specs., 30.IV.2021, Barber trap; 19 specs., 28.V.2021, Barber trap; 37 specs., 29.X.2021, Barber trap. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap; 2 specs., 30.IV.2021, Barber trap; 1 spec., 28.V.2021, Barber trap; 1 spec., 05.VIII.2021, Barber trap; 5 specs., 29.X.2021, Barber trap; 2 specs., 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Morocco, Afghanistan, Kazakhstan, and Turkey – Bousquet, 2003b).

***Pterostichus globosus pecoudi* (Antoine, 1922) [E]** (Fig. 3D)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap.

Distribution. Morocco (Bousquet, 2003b).

***Scarites terricola terricola* Bonelli, 1813**

Material examined. 5 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, Barber trap; 3 specs., 28.V.2021, Barber trap; 1 spec., 29.X.2021, Barber trap; 9 specs., 20.IV.2022, Barber trap; 2 specs., 13.V.2022, Barber trap; 2 specs., 02.VI.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap. 9 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 6 specs., 28.V.2021, Barber trap; 3 specs., 29.X.2021, Barber trap; 6 specs., 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap; 6 specs., 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Balkenohl, 2003).

***Sphodrus leucophthalmus* (Linnaeus, 1758)** (Fig. 3E)

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap; 1 spec., 29.X.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Casale, 2003).

***Syntomus foveatus* (Geoffroy, 1785)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 30.IV.2021, Barber trap; 6 specs., 28.V.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kabak, 2003).

***Trymosternus colombati* Antoine, 1934 [E]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap.

Distribution. Morocco (Kabak, 2003).

Family Cerambycidae Latreille, 1802

***Nathrius brevipennis* (Mulsant, 1839) [S] [R]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Sama & Löbl, 2010a).

***Stenopterus ater* (Linnaeus, 1767) [S] [R]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, OCT.

Distribution. Western Palaearctic (Europe and North Africa – Sama & Löbl, 2010a).

***Stictoleptura tangeriana* (Tournier, 1875) [E] [S]**

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT and BCT.

Distribution. Morocco (Villemant & Fraval, 1993; Sama & Löbl, 2010b).

***Trichoferus ilicis* Sama, 1987 [E] [S] [R]** (Fig. 3G)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.IX.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, WCT.

Distribution. Morocco (Sama & Löbl, 2010a).

Family Chrysomelidae Latreille, 1802

***Bruchidius biguttatus* (Olivier, 1800)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, BCT; 4 specs., 16.IX.2021, WCT, YCT, and OCT, and window trap; 1 spec., 20.IV.2022, window trap; 1 spec.,22.VII.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, WCT; 5 specs., 23.VI.2022, YCT, WCT, and window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Anton, 2010).

***Bruchidius cisti* (Fabricius, 1775) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 23.VI.2022, OCT.

Distribution. Western Palaearctic (Europe, Cyprus, and Turkey – Anton, 2010).

***Bruchidius rubiginosus* (Desbrochers des Loges, 1869)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, WCT.

Distribution. Western Palaearctic (Europe and North Africa – Anton, 2010).

***Cassida flaveola* Thunberg, 1794 [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, sight capturing.

Distribution. Palaearctic (Europe, Algeria, China, and Russia – Borowiec & Sekerka, 2010).

***Cassida vittata* Villers, 1789**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.IX.2021, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Borowiec & Sekerka, 2010).

***Chrysolina americana* (Linnaeus, 1758)** (Fig. 3H)

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, WCT.

Distribution. Western Palaearctic (Europe, North Africa, and Turkey – Kippenberg, 2010).

***Chrysolina kocheri* (Codina Padilla, 1961) [E]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Morocco (Kippenberg, 2010).

***Cryptocephalus rabatensis* Pic, 1953 [E]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, YCT; 5 specs., 30.IV.2021, YCT, OCT, and WCT; 1 spec., 20.IV.2022, BCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, YCT; 2 specs., 30.IV.2021, YCT and WCT.

Distribution. Morocco (Lopatin et al., 2010).

***Cryptocephalus rugicollis* Olivier, 1792** (Fig. 3I)

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, BCT.

Distribution. Western Palaearctic (Europe, North Africa, Jordan, and Turkey – Lopatin et al., 2010).

Family Cleridae Latreille, 1802

***Opilo domesticus* (Sturm, 1837) [S] [R]**

Material examined. 5 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 05.VIII.2021, WCT and YCT; 2 specs.,19.IX.2021, WCT and window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 16.IX.2021, window trap.

Distribution. Western Palaearctic (Europe, Morocco, Madeira Island, Tunisia – Villemant & Fraval, 1993; Löbl et al., 2007).

Family Coccinelidae Latreille, 1807

***Adalia decempunctata* (Linnaeus, 1758)** (Fig. 3J)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, window trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, WCT; 2 specs., 05.VIII.2021, OCT. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, YCT; 1 spec., 06.IV.2021, YCT; 1 spec., 30.IV.2021, window trap; 1 spec., 29.X.2021, OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kovar, 2007).

***Coccinella algerica* Kovář, 1977**

Material examined. 4 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT and WCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT; 1 spec., 13.V.2022, WCT.

Distribution. Western Palaearctic (Canarian Islands, Gibraltar, Italy, and North Africa – Bensusan et al., 2006; Kovar, 2007).

***Hyperaspis duvergeri* Fürsch, 1985**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, YCT.

Distribution. Western Palaearctic (Europe, Morocco, and Algeria – Kovar, 2007).

***Oenopia lyncea lyncea* (Olivier, 1808)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, window trap.

Distribution. Western Palaearctic (France, Italy, Portugal, Spain, Algeria, Morocco, and Tunisia – Kovar, 2007).

***Oenopia conglobata* (Linnaeus, 1758)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, YCT.

Distribution. Palaearctic (Europe, Asia and Morocco – Kovar, 2007; Benyahia et al., 2016).

***Platynaspis luteorubra* (Goeze, 1777)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, BCT; 1 spec., 02.VI.2022, YCT.

Distribution. Palaearctic (Europe, Asia and North Africa – Kovar, 2007).

***Rhyzobius chrysomeloides* (Herbst, 1792)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT.

Distribution. Western Palaearctic (Europe, North Africa, and Turkey – Kovar, 2007).

***Rhyzobius litura* (Fabricius, 1787)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, YCT.

Distribution. Western Palaearctic (Europe, North Africa, and Turkey – Kovar, 2007).

***Rodolia cardinalis* (Mulsant, 1850)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, OCT; 1 spec., 13.V.2022, window coloured trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kovar, 2007).

***Scymnus subvillosus* (Goeze, 1777)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 05.VIII.2021, OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kovar, 2007).

Family Corylophidae LeConte, 1852

***Orthoperus anxius* Mulsant & Rey, 1861**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, WCT.

Distribution. Western Palaearctic (France, Italy, Spain, Algeria, and Morocco – Bowestead, 2007).

Family Cryptophagidae Kirby, 1837

***Cryptophagus dentatus* (Herbst, 1793)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 22.VII.2022, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Johnson et al., 2007).

Family Curculionidae Latreille, 1802

***Brachycerus barbarus* (Linnaeus, 1758)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Spain, France, Italy, Tunisia, and Morocco – Colonnelli, 2011).

***Brachycerus muricatus* Olivier, 1790**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Morocco, Tunisia, and Turkey – Colonnelli, 2011).

***Brachyderes pubescens* Boheman, 1833** (Fig. 3K)

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, WCT and window trap; 4 specs., 02.VII.2021, YCT and OCT; 1 spec., 05.VIII.2021, window trap; 1 spec., 19.IX.2021, WCT; 3 specs., 29.X.2021, YCT, WCT, and BCT; 1 spec., 13.V.2022, BCT.

Distribution. Western Palaearctic (Spain, Portugal, France, Italy, Algeria, and Morocco – Villemant & Fraval, 1993; Pelletier, 2013).

***Brachypera zoilus* (Scopoli, 1763)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Skuhrovec, 2013).

***Charagmus griseus* (Fabricius, 1775)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 02.VI.2022, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Morocco, Libya, Syria, Cyprus, and Turkey – Velazquez de Castro, 2013).

***Ceutorynchus contractus* (Marsham., 1802)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, YCT.

Distribution. Palaearctic (Europe, Asia, Morocco, and Libya – Colonnelli, 2013).

***Coeliodes ilicis* (Bedel, 1885)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, YCT; 1 spec., 06.IV.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, window trap.

Distribution. Palaearctic (Europe, Asia, Algeria, and Morocco – Colonnelli, 2013).

***Coeliodes ruber* (Marsham, 1802)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, WCT.

Distribution. Western Palaearctic (Europe, Algeria, Morocco, Syria, and Israel – Villemant & Fraval, 1993; Colonnelli, 2013).

***Gronops lunatus* (Fabricius, 1775)**

Material examined. 9 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Europe, Canary Islands, Morocco, and Tunisia – Meregalli, 2013).

***Liophloeus tessulatus* (O. F. Müller, 1776) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, Barber trap.

Distribution. Western Palaearctic (Europe – Meregalli, 2013).

***Listroderes costirostris* Schoenherr, 1826**

Material examined. 8 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, Barber trap.

Distribution. Morocco, France, Portugal, Canary Islands, South Korea (Meregalli, 2013), Japan, South Africa, Australia, Pacific Islands, Hawaii, New Caledonia, New Zealand, Norfolk Island, United States, Argentina, Bolivia, Brazil, Chile, Uruguay, Venezuela (Morrone, 2013).

***Maurobaris spoliata* (Boheman, 1836)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Greece, France, Italy, Spain, Tunisia, Algeria, and Morocco – Prena, 2011).

***Mecinus pascuorum* (Gyllenhal, 1813) [N]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, WCT.

Distribution. Palaearctic (Europe, Canary Islands, and Asia – Caldara, 2013).

***Mecinus pyraster* (Herbst, 1795)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Caldara, 2013).

***Micrelus ferrugatus* (Perris, 1847)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, YCT; 1 spec., 06.IV.2021, YCT.

Distribution. Western Palaearctic (Europe, Canary Islands, Morocco, and Turkey – Colonnelli, 2013).

***Microplontus molitor* (Gyllenhal, 1837)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Europe and North Africa – Caldara, 2013).

***Orchestes erythropus* (Germar, 1821)**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 05.VIII.2021, OCT; 1 spec., 02.VI.2022, WCT.

Distribution. Western Palaearctic (Europe, Algeria, Morocco, and Tunisia – Villemant & Fraval, 1993; Caldara, 2013).

***Orchestes irroratus maroccanus* (Roudier, 1954)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap.

Distribution. North Africa (Algeria, Morocco, and Tunisia – Villemant & Fraval, 1993; Caldara, 2013).

***Orchestes rusci* (Herbst, 1795) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 22.VII.2022, YCT.

Distribution. Palaearctic (Europe and Asia – Caldara, 2013).

***Otiorhynchus cribricollis* Gyllenhal, 1834**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 16.IX.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Magnano & Alonso-Zarazaga, 2013).

Family Dasytidae Laporte, 1840

***Dasytes nigroaeneus* Küster, 1850**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, window trap; 7 specs., 20.IV.2022, YCT, WCT, and BCT. 307 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021,YCT, WCT, and OCT; 175 specs., 06.IV.2021, OCT and WCT, and window trap; 18 specs., 30.IV.2021, window trap, and YCT and OCT; 4 specs., 28.V.2021, window trap, and BCT; 13 specs.,20.IV.2022, OCT, YCT, and WCT, and window trap; 4 specs., 13.V.2022, OCT, YCT, and WCT. 2 specs., 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, YCT; 06.IV.2021, window trap; 14 specs., 30.IV.2021, window trap, and WCT; 23 specs., 20.IV.2022, YCT, OCT, and BCT; 6 specs., 13.V.2022, YCT, OCT, and BCT; 2 specs., 02.VI.2022, WCT, and window trap.

Distribution. Western Palaearctic (Europe, Syria, Algeria, and Morocco – Mayor, 2007a).

***Dasytes terminalis* Jacquelin du Val, 1863**

Material examined. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, YCT and WCT and a window trap; 2 specs., 20.IV.2022, OCT and WCT. 4 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap; 2 specs., 30.IV.2021, YCT; 2 specs., 20.IV.2022, BCT, and Barber trap, 1 spec., 13.V.2022; BCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, OCT.

Distribution. Western Palaearctic (France, Portugal, Spain, Algeria, and Morocco – Villemant & Fraval, 1993; Mayor, 2007a).

Family Dermestidae Latreille, 1804

Anthrenus angustefasciatus Ganglbauer, 1904

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, window trap; 1 spec., 20.IV.2022, WCT; 2 specs., 13.V.2022, WCT, and window trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, WCT, 1 spec., 13.V.2022; WCT.

Distribution. Western Palaearctic (Spain, Portugal, Italy, and Morocco – Hava, 2007b).

Anthrenus museorum (Linnaeus, 1761)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, WCT; 1 spec., 06.IV.2021, window trap; 3 specs., 13.V.2022, YCT; 1 spec., 02.VI.2022, YCT. 4 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT, BCT, and WCT; 1 spec., 02.VI.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Hava, 2007b).

Anthrenus pimpinellae (Fabricius, 1775)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, YCT.

Distribution. Palaearctic (Europe, Asia, Egypt, and Morocco – Hava, 2007b).

Attagenus smirnovi Zhantiev, 1973

Material examined. 4 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT and BCT; 1 spec., 13.V.2022, BCT. 4 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber traps; 1 spec., 02.VI.2022, WCT. 47 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT, WCT, BCT, and Barber trap; 8 specs., 13.V.2022, BCT, WCT, and Barber trap; 1 spec., 02.VI.2022, BCT.

Distribution. Palaearctic (Europe, Morocco, Oman, Russia, and Saudi Arabia – Hava, 2007b).

Attagenus trifasciatus (Fabricius, 1787) (Fig. 3L)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap; 1 spec., 30.IV.2021, WCT; 10 specs., 28.V.2021, WCT, OCT, YCT, and BCT, and window trap; 94 specs., 13.V.2022, WCT, OCT, YCT, and BCT, and window trap; 2 specs., 02.VI.2022, OCT; 1 spec., 23.VI.2022, Barber trap. 5 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, YCT and OCT.

Distribution. Western Palaearctic (Europe, North Africa, and Israel – Hava, 2007b).

Attagenus unicolor unicolor (Brahm, 1791)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, Barber trap. 14 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, OCT, WCT, BCT, and Barber trap, 2 specs., 13.V.2022; BCT and OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Hava, 2007b).

Dermestes frichii Kugelann, 1792

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, YCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 3 specs., 28.V.2021, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 30.IV.2021, Barber trap; 5 specs., 28.V.2021, Barber trap; 5 specs., 13.V.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Hava, 2007a).

***Dermestes undulatus* Brahm, 1790** (Fig. 3M)

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 23.VI.2022, sight capturing.

Distribution. Palaearctic (Europe, North Africa, and Asia – Hava, 2007a).

***Dermestes peruvianus* Laporte de Castelnau, 1840**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, BCT.

Distribution. Palaearctic and Neotropical (Europe, North Africa, Asia, and South America – Hava, 2007a).

***Thorictus castaneus castaneus* Germar, 1834**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap.

Distribution. Western Palaearctic (Morocco, Algeria, Libya, Egypt, Lebanon, and Syria – Löbl, 2007).

Family Elateridae Leach, 1815

***Ampedus balteatus* (Linnaeus, 1758) [N] [S] [R]**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, WCT.

Distribution. Palaearctic (Europe and Asia – Cate, 2007).

***Agriotes sordidus* (Illiger, 1807) [S]**

Material examined. 7 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, window trap and BCT.

Distribution. Western Palaearctic (Europe, Algeria, Canary Islands, and Morocco – Cate, 2007).

***Cardiophorus rufipes* (Goeze, 1777) [S]**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, window trap and WCT; 1 spec., 20.IV.2022, window trap; 1 spec., 02.VI.2022, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, window trap; 1 spec., 05.VIII.2021, window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Cate, 2007).

***Cebrio maculicollis* Fairmaire, 1856 [E] [S]**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, YCT, and BCT.

Distribution. Morocco (Sanchez-Ruiz & Löbl, 2007).

***Drasterius bimaculatus* (Rossi, 1790) [S]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, Barber trap.

Distribution. Palaearctic (Europe, North Africa, and Asia – Cate, 2007).

***Lacon punctatus punctatus* (Herbst, 1779) [S] [R]** (Fig. 3N)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, sight capturing.

Distribution. Palaearctic (Europe, Asia, and Morocco – Cate, 2007).

Family Geotrupidae Latreille, 1802

***Thorectes distinctus* Marseul, 1878** (Fig. 4A)

Material examined. 11 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, Barber trap; 1 spec., 20.IV.2022, Barber trap. 138 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 43 specs., 06.IV.2021, Barber trap; 9 specs., 30.IV.2021, Barber trap; 1 spec., 05.VIII.2021, Barber trap; 54 specs., 29.X.2021, Barber trap; 19 specs., 20.IV.2022, Barber trap. 17 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap; 7 specs., 06.IV.2021, Barber trap; 2 specs., 16.IX.2021, Barber trap; 11 specs., 29.X.2021, Barber trap; 2 specs., 20.IV.2022, Barber trap.

Distribution. North Africa (Algeria and Morocco – Löbl et al., 2006c).

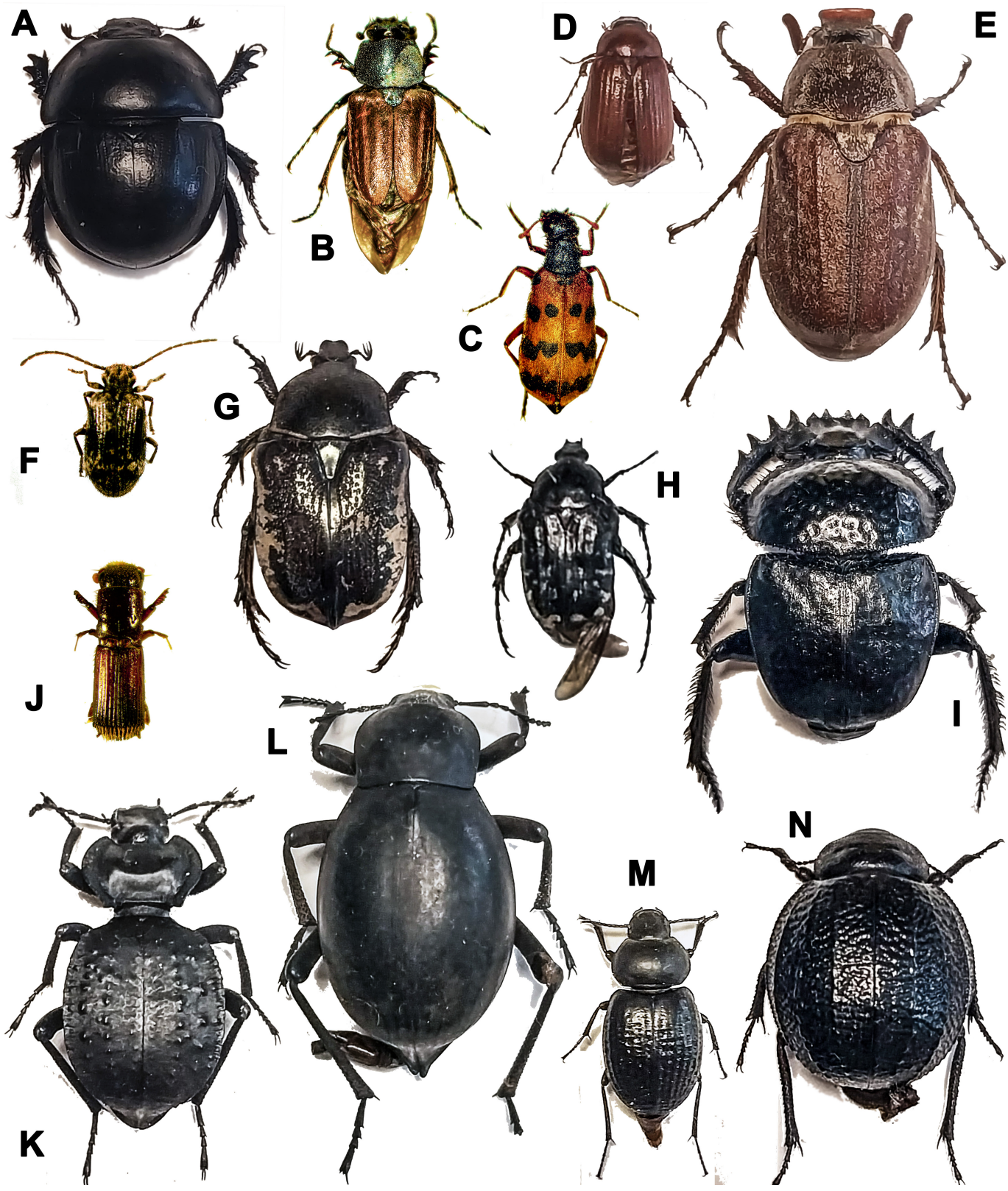

Figure 4. The beetles associated with the Maamora cork oak forest in the north-west of Morocco. **A.** *Thorectes distinctus* Marseul, 1878; **B.** *Eulasia goudouti* (Laporte, 1840); **C.** *Hycleus rufipalpis* (Escalera, 1909); **D.** *Euserica mamorensis* Baraud, 1965; **E.** *Sphodroxia maroccana* Ley, 1923; **F.** *Dignomus dilophus* (Illiger, 1807) (photos by A. Samih); **G.** *Aethiessa floralis* (Fabricius, 1787); **H.** *Oxythyrea funesta* (Poda, 1761); **I.** *Scarabaeus cicatricosus* Lucas, 1846; **J.** *Platypus cylindrus* (Fabricius, 1792); **K.** *Akis tingitana* Lucas, 1859; **L.** *Blaps ovipennis* Seidlitz, 1893; **M.** *Pachychila punctata mamorensis* Antoine, 1942; **N.** *Pimelia chrysomeloides subris* Koch, 1941 (photos by H. Habbaz and N. Maatouf).

***Typhaeus typhoeus* (Linnaeus, 1758)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, OCT. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, Barber trap; 1 spec., 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Europe and Morocco – Löbl et al., 2006c).

Family Glaphyridae Macleay, 1819

***Anthypna meles* (Fabricius, 1792)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, WCT. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, BCT, and Barber trap.

Distribution. North Africa (Algeria, Tunisia, and Morocco – Nikodym & Bezdek, 2006).

***Eulasia goudouti* (Laporte, 1840) [E]** (Fig. 4B)

Material examined. 11 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT, WCT, OCT, and BCT; 1 spec., 13.V.2022, BCT. 12 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, OCT, YCT, WCT, and BCT; 5 specs., 13.V.2022, YCT and BCT. 536 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT, OCT, WCT, and BCT; 243 specs., 13.V.2022, OCT, WCT, and BCT.

Distribution. Morocco (Nikodym & Bezdek, 2006).

Family Histeridae Gyllenhal, 1808

***Hister moerens* Erichson, 1834**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap.

Distribution. Western Palaearctic (Europe, Algeria, Tunisia, Morocco, and Turkey – Mazur, 2004).

***Hister maroccanus* Schmidt, 1887 [E]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, OCT.

Distribution. Morocco (Mazur, 2004).

***Hypocaccus brasiliensis* (Paykull, 1811)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber trap; 1 spec., 02.VI. 2022, OCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Mazur, 2004).

***Hypocaccus rugiceps* (Duftschmid, 1805) [N]**

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, WCT and YCT; 1 spec., 29.X.2021, Barber trap; 2 specs., 20.IV.2022, BCT. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, and China – Mazur, 2004).

***Pactolinus major* (Linnaeus, 1767)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Mazur, 2004).

***Saprinus acuminatus* (Fabricius, 1798)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, Barber trap; 2 specs., 29.X.2021, YCT and OCT; 2 specs., 20.IV.2022, WCT; 3 specs., 02.VI.2022, Barber trap and YCT. 10 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 3 specs., 29.X.2021, Barber trap; 1 spec., 13.V.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap. 14 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap, YCT, WCT, and BCT; 6 specs., 13.V.2022, YCT, WCT, and BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Mazur, 2004).

***Saprinus chalcites* (Illiger, 1807)**

Material examined. 8 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT and Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VI.2022, Barber trap. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT and BCT; 2 specs., 23.VI.2022, OCT, and WCT; 1 spec., 22.VII.2022, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Mazur, 2004).

***Saprinus figuratus* Marseul, 1855**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, BCT; 11 specs., 02.VI.2022, Barber trap, YCT, OCT, and BCT. 23 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, YCT, WCT, and BCT.

Distribution. Palaearctic (Spain, Asia, and North Africa – Mazur, 2004).

***Saprinus proximus simillimus* Wollaston, 1865**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap.

Distribution. North Africa (Mazur, 2004).

Family Laemophloeidae Ganglbauer, 1899

***Cryptolestes ferrugineus* (Stephens, 1831)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, window trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 1 spec., 30.IV.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, OCT.

Distribution. Palaearctic (Europe, Asia, Morocco, Canary Islands, and Madeira Island – Wegrzynowicz, 2007; Chavanon, 2018).

***Laemophloeus monilis* (Fabricius, 1787) [S]**

Material examined. 8 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, window trap; 1 spec., 13.V.2022, window trap.

Distribution. Western Palaearctic (Europe, Uzbekistan, Tunisia, Algeria and Morocco – Wegrzynowicz, 2007; Benyahia, 2016).

Family Latridiidae Erichson, 1842

***Corticarina cavicollis* (Mannerheim, 1844) [N]**

Material examined. 4 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap.

Distribution. Western Palaearctic and Nearctic (United States, Canada Venezuela, and Italy – Majka et al., 2009; Johnson, 2007).

***Corticarina curta* (Wollaston, 1854)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, WCT; 7 specs., 16.IX.2021, WCT, BCT, OCT, and window; 1 spec., 20.IV.2022, YCT and BCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 1 spec., 05.VIII.2021, window trap; 1 spec., 19.IX.2021, YCT; 1 spec., 29.X.2021, WCT; 1 spec., 20.IV.2022, WCT; 1 spec., 13.V.2022, BCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Johnson, 2007).

Family Leiodidae Fleming, 1821

***Agathidium marocanum* (Hlisnikovsky, 1968) [E] [S]**

Material examined. 14 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, Barber trap.

Distribution. Morocco (Perreau, 2004).

***Catops coracinus* Kellner, 1846**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, window trap; 23 specs.,06.IV.2021, Barber trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT.

Distribution. Palaearctic (Europe, Asia, Algeria, Tunisia, and Morocco – Perreau, 2004).

***Ptomaphagus tenuicornis mauritanicus* Jeannel, 1934**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Italy, Egypt, Libya, Tunisia, and Morocco – Perreau, 2004; de Faria e Silva et al., 2013).

Family Meloidae Gyllenhaal, 1810

***Actenodia distincta* (Chevrolat, 1840)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, YCT.

Distribution. Western Palaearctic (Italy, Morocco, Tunisia, and Algeria – Bologna, 2008).

***Cerocoma schaefferi* (Linnaeus, 1758) [N]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT.

Distribution. Western Palaearctic (Europe and Turkey – Bologna, 2008).

***Hycleus duodecimpunctatus* (Olivier, 1811) [N]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, OCT; 1 spec., 23.VI.2022, YCT. 1 spec., Canton A (34°12'33.34''N, 06°35'54.78''W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (France, Portugal, and Spain – Bologna, 2008).

***Hycleus rufipalpis* (Escalera, 1909)** (Fig. 4C)

Material examined. 6 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT; 27 specs., 28.V.2021, YCT, OCT, WCT, and BCT; 85 specs., 02.VII.2021, YCT, OCT, WCT, and BCT; 48 specs., 05.VIII.2021, YCT, OCT, WCT, and BCT; 22 specs., 13.V.2022, YCT, OCT, and WCT; 25 specs., 02.VI.2022, YCT, OCT, WCT, and BCT; 32 specs., 23.VI.2022, Barber trap, YCT, WCT, and BCT; 31 specs., 22.VII.2022, Barber trap and YCT. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 28 specs., 28.V.2021, WCT, YCT, and Barber trap; 38 specs., 02.VII.2021, Barber trap, YCT, OCT, and BCT; 1 spec., 20.IV.2022, BCT; 166 specs., 13.V.2022, Barber trap, YCT, WCT, OCT, and BCT; 575 specs., 02.VI.2022, Barber trap, YCT, WCT, OCT, and BCT; 79 specs., 23.VI.2022, Barber trap, YCT, WCT, OCT, and BCT; 2 specs., 22.VII.2022, Barber trap. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 1 spec., 02.VII.2021, BCT; 14 specs., 13.V.2022, Barber trap, YCT, WCT, and BCT; 20 specs., 02.VI.2022, Barber trap, YCT, OCT, WCT, and BCT; 26 specs., 23.VI.2022, Barber trap, YCT, WCT, and BCT; 1 spec., 22.VII.2022, BCT.

Distribution. Western Palaearctic (Canary Islands and Morocco – Bologna, 2008).

Family Melolonthidae Leach, 1819

***Euserica mamorensis* Baraud, 1965 [E]** (Fig. 4D)

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, OCT and WCT; 1 spec., 28.V.2021, window trap; 1 spec., 05.VIII.2021, window trap; 3 specs., 02.VI.2022, window trap. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 30.IV.2021, Barber trap; 37 specs., 28.V.2021, Barber trap, YCT, OCT, WCT, BCT, and window trap; 5 specs., 02.VII.2021, OCT, WCT, BCT, and window trap; 1 spec., 02.VI.2022, window trap; 1 spec., 23.VI.2022, window trap. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, window trap; 1 spec., 23.VI.2022, window trap.

Distribution. Morocco (Bezdek, 2006a).

***Hoplia argentea* (Poda, 1761) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, BCT.

Distribution. Western Palaearctic (Europe – Smetana, 2006a).

***Hoplia philanthus gagates* (Bedel, 1911)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, OCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, OCT.

Distribution. Western Palaearctic (Spain and Morocco – Micó et al., 2003; Smetana, 2006a).

***Sphodroxia maroccana* Ley, 1923 [E]** (Fig. 4E)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 02.VII.2021, Barber trap; 5 specs., 05.VIII.2021, Barber trap. 5 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 05.VIII.2021, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VII.2021, Barber traps; 4 specs., 23.VI.2022, BCT and YCT; 1 spec., 22.VII.2022, BCT.

Distribution. Morocco (Bezdek, 2006b).

Family Melyridae Leach, 1815

***Charopus rotundatus* Erichson, 1840**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, WCT.

Distribution. Western Palaearctic (Europe, Tunisia, Algeria, and Morocco – Mayor, 2007b).

***Colotes javeti* Jacquelin du Val, 1853**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap.

Distribution. Western Palaearctic (Spain, France, Italy, Portugal, Egypt, Tunisia, Algeria, and Morocco – Mayor, 2007b).

***Colotes punctatus* (Erichson, 1840)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, 1 spec., OCT; 05.VIII.2021, window trap; 1 spec., 16.IX.2021, Barber trap; 1 spec., 13.V.2022, Barber trap; 1 spec., 02.VI.2022, WCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 16.IX.2021, Barber trap; 2 specs., 22.VII.2022, Barber trap and WCT.

Distribution. Western Palaearctic (Europe and North Africa – Mayor, 2007b).

Family Mordellidae Latreille, 1802

***Mediimorda bipunctata* (Germar, 1827)**

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 02.VI.2022, WCT and YCT. 5 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VI.2022, YCT, OCT, WCT, and BCT; 4 specs., 23.VI.2022, WCT and BCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 23.VI.2022, WCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Horak, 2008).

***Mordella aculeata* (Linnaeus, 1758) [N]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, WCT; 6 specs., 20.IV.2022, WCT and OCT; 20 specs., 13.V.2022, YCT, OCT, and WCT; 3 specs., 02.VI.2022, YCT, OCT, and WCT. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT and BCT; 3 specs., 13.V.2022, YCT; 1 spec., 02.VI.2022, WCT. 5 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, OCT, YCT, and WCT; 2 specs., 02.VI.2022, WCT.

Distribution. Palaearctic (Europe and Asia (Horak, 2008); Albania, Austria, Belgium, Bosnia Herzegovina, Bulgaria, Belarus, China, Croatia, Czech Republic, Denmark, France, Georgia, Germany, Greece, Hungary, Italy, Japan, Kazakhstan, Macedonia, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Syria, Taiwan, and Turkey, Ukraine (Ruzzier et al., 2017).

***Variimorda ragusai* (Emery, 1876) [S]**

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, WCT.

Distribution. Western Palaearctic (France, Italy, and Morocco – Horak, 2008).

Family Nitidulidae Latreille, 1802

***Carpophilus hemipterus* (Linnaeus, 1758)**

Material examined. 5 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, window trap.

Distribution. Palaearctic (Europe, Asia, Algeria, Canary Islands, Egypt, Libya, Madeira Island, Tunisia and Morocco – Jelinek & Audisio, 2007; Chavanon, 2018).

***Epuraea aestiva* (Linnaeus, 1758) [N] [S]**

Material examined. 26 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, WCT, OCT, YCT, and BCT.

Distribution. Palaearctic (Europe and Asia – Jelinek & Audisio, 2007).

***Epuraea unicolor* (Olivier, 1790)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Jelinek & Audisio, 2007).

***Brassicogethes aeneus* (Fabricius, 1775)**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 8 specs., 06.IV.2021, OCT and WCT; 1 spec., 28.V.2021, WCT; 1 spec., 20.IV.2022, YCT; 1 spec., 02.VI.2022, WCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, window trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Jelinek & Audisio, 2007).

Family Oedemeridae Latreille, 1810

***Oedemera barbara* (Fabricius, 1792) [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, YCT. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT; 1 spec., 13.V.2022, YCT.

Distribution. Western Palaearctic (Europe, North Africa, and Turkey – Švihla, 2008). Larvae in rotten wood, saproxylophagous. Anthophagous flower-feeding adults (Prudhomme, 2016).

***Oedemera simplex* (Linnaeus, 1767) [S]**

Material examined. 4 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, YCT, OCT, and BCT; 2 specs., 02.VI.2022,YCT and WCT.

Distribution. Western Palaearctic (Europe and North Africa – Švihla, 2008). Larvae in rotten wood, saproxylophagous. Anthophagous flower-feeding adults (Prudhomme, 2016).

Family Ptinidae Latreille, 1802

***Dignomus dilophus* (Illiger, 1807) [S]** (Fig. 4F)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, window trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap.

Distribution. Western Palaearctic (Spain, Portugal, Algeria, Tunisia, and Morocco – Borowski, 2007).

***Dignomus gibbicollis* (P. H. Lucas, 1846) [S]**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 2 specs., 13.V.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap.

Distribution. Western Palaearctic (Spain, Portugal, Algeria, and Morocco – Borowski, 2007).

***Mesocoelopus niger* (P. W. J. Müller, 1821) [S]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Morocco, and Turkey – Borowski, 2007).

***Mizodorcatoma dommeri* (Rosenhauer, 1856) [S]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, BCT.

Distribution. Western Palaearctic (France, Italy, Spain, Algeria, Morocco, and Tunisia – Borowski, 2007).

***Ptinus bidens* Olivier, 1790 [N]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, window trap.

Distribution. Western Palaearctic (Europe and the Canary Islands – Borowski, 2007).

***Ptinus spitzyi* A. Villa & G. B. Villa, 1838**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 29.X.2021, Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap.

Distribution. Western Palaearctic (Europe and North Africa – Borowski, 2007).

Family Phalacridae Leach, 1815

***Olibrus affinis* (Sturm, 1807)**

Material examined. 4 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, WCT, BCT, and OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Švec, 2007).

***Stilbus testaceus* (Panzer, 1796)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, OCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Švec, 2007).

Family Scarabaeidae Latreille, 1802

***Aethiessa floralis* (Fabricius, 1787)** (Fig. 4G)

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber traps; 20 specs.,20.IV.2022, WCT and Barber traps; 10 specs., 13.V.2022, YCT, OCT, WCT, BCT, and Barber traps. 8 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, WCT, YCT, and BCT. 114 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT, OCT, WCT, BCT, and Barber trap; 62 specs., 13.V.2022, OCT, YCT, WCT, BCT, and Barber trap; 1 spec., 23.VI.2022, YCT.

Distribution. Western Palaearctic (Spain, Malta, France, Israel, and North Africa – Smetana, 2006b).

***Otophorus haemorrhoidalis* (Linnaeus, 1758)**

Material examined. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 23.VI.2022, YCT and WCT.

Distribution. Palaearctic (Europe, Asia, Algeria, and Morocco – Dellacasa & Dellacasa, 2006).

***Labarrus lividus* (Olivier, 1789)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 23.VI.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Dellacasa & Dellacasa, 2006).

***Esymus merdarius* (Fabricius, 1775)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, window trap.

Distribution. Palaearctic (Europe, Asia, Algeria, and Morocco – Dellacasa & Dellacasa, 2006).

***Subrinus sturmi* (Harold, 1870)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 23.VI.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Dellacasa & Dellacasa, 2006).

***Onitis alexis septentrionalis* Balthasar, 1942**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 22.VII.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Bezdek & Krell, 2006).

***Onthophagus maki* (Illiger, 1803)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, OCT; 1 spec., 23.VI.2022, WCT.

Distribution. Western Palaearctic (Spain, France, Portugal, Italy, and North Africa – Löbl et al., 2006b).

***Onthophagus similis* (Scriba, 1790)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 02.VI.2022, BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Löbl et al., 2006b).

***Onthophagus vacca* (Linnaeus, 1767)**

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 14 specs., 28.V.2021, Barber trap; 5 specs., 29.X.2021, Barber trap; 5 specs., 20.IV.2022, Barber trap; 4 specs., 13.V.2022, Barber trap; 7 specs., 02.VI.2022, Barber trap. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, OCT; 2 specs., 13.V.2022, YCT and Barber trap.

Distribution. Palaearctic (Europe, Asia, and Morocco – Löbl et al., 2006b).

***Oryctes nasicornis grypus* (Illiger1803)**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 06.IV.2021, sight capturing.

Distribution. Palaearctic (Europe, Algeria, Tunisia, and Morocco – Krell, 2006).

***Oxythyrea funesta* (Poda, 1761) [S]** (Fig. 4H)

Material examined. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT; 45 specs., 28.V.2021, YCT, OCT, WCT, and BCT; 31 specs., 20.IV.2022, YCT, OCT, WCT, and BCT; 57 specs., 13.V.2022, YCT, OCT, WCT, and BCT; 14 specs., 02.VI.2022, YCT, OCT, and WCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber trap; 30 specs., 13.V.2022, YCT, OCT, and BCT; 14 specs., 02.VI.2022, YCT, OCT, WCT, and BCT; 1 spec., 23.VI.2022, OCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 2 specs., 02.VII.2021, Barber trap and OCT; 14 specs., 20.IV.2022, Barber trap, OCT, WCT, and BCT; 52 specs., 13.V.2022, YCT, WCT, OCT, and BCT; 18 specs., 02.VI.2022, YCT, OCT, and WCT; 42 specs., 23.VI.2022, YCT, WCT, and BCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Smetana, 2006b).

***Phyllopertha horticola* (Linnaeus, 1758) [N]**

Material examined. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, OCT and YCT.

Distribution. Palaearctic (Europe and Asia – Zorn, 2006).

***Protaetia (Netocia) morio heyrovskyi* (Balthasar, 1935)**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, YCT and OCT. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, OCT, and WCT.

Distribution. North Africa (Algeria, Tunisia, and Morocco – Smetana, 2006b).

***Scarabaeus cicatricosus* Lucas, 1846** (Fig. 4I)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, Barber trap; 1 spec., 13.V.2022, Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 1 spec., 06.IV.2021, Barber trap; 2 specs., 28.V.2021, Barber trap; 1 spec., 29.X.2021, Barber trap; 1 spec., 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Spain, Portugal, Algeria, and Morocco – Löbl et al., 2006a).

***Scarabaeus sacer* Linnaeus, 1758**

Material examined. 4 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa –Löbl et al., 2006a).

***Tropinota squalida pilosa* Brullé, 1832**

Material examined. 10 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, OCT, WCT, and BCT. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber trap; 1 spec., 13.V.2022, WCT. 3 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, WCT, BCT, and Barber trap; 2 specs., 13.V.2022, YCT.

Distribution. Palaearctic (Asia and North Africa – Smetana, 2006b).

***Tropinota hirta* (Poda, 1761)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 13.V.2022, Barber trap.

Distribution. Western Palaearctic (Europe, Morocco, Kazakhstan, and Turkey – Smetana, 2006b).

Family Scolytidae Latreille, 1804

***Dryocoetes autographus* (Ratzeburg, 1837) [N] [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, window trap.

Distribution. Palaearctic (Europe, Asia, Algeria, and Madeira Island – Knizek, 2011).

***Ernoporicus fagi* (Fabricius, 1798) (= *Eidophelus fagi*) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 16.IX.2021, BCT; 1 spec., 29.X.2021, OCT.

Distribution. Western Palaearctic (Europe and Turkey – Knizek, 2011).

***Hypoborus ficus* Erichson, 1836**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, WCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Knizek, 2011).

***Platypus cylindrus* (Fabricius, 1792)** (Fig. 4J)

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, window trap; 1 spec., 02.VII.2021, window trap; 1 spec., 23.VI.2022, BCT. 34 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, window trap; 2 specs., 23.VI.2022, window trap and OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Knizek, 2011).

***Xyleborus monographus* (Fabricius, 1792) [S]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 02.VII. 2021, window trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 7 specs., 06.IV.2021, window trap; 2 specs., 28.V.2021, window trap; 1 spec., 02.VII.2021, WCT; 1 spec., 05.VIII.2021, window trap; 1 spec., 20.IV.2022, window trap; 1 spec., 02.VI.2022, window trap; 8 specs., 22.VII.2022, window trap. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, window trap; 1 spec., 02.VII.2021, window trap; 1 spec., 20.IV.2022, YCT; 2 specs., 23.VI.2022, window trap and BCT.

Distribution. Palaearctic (Europe, Asia, Algeria, and Morocco – Villemant & Fraval, 1993; Knizek, 2011).

Family Scraptiidae Mulsant, 1856

***Scraptia ophthalmica* Mulsant, 1856** (*S. schotti* Leblanc, 2012) **[S]**

Material examined. 3 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, window traps. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, WCT; 1 spec., 02.VII.2021, YCT; 2 specs., 05.VIII.2021, YCT and OCT; 1 spec., 19.IX.2021, YCT and window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, OCT.

Distribution. Western Palaearctic (France, Spain, Italy, and Morocco – Leblanc et al., 2008). The specimens from Corsica, Algeria, Morocco, and Tunisia were considered as a new species and described by Leblanc (2012) under the name of *Scapia schotti* n. sp. Saproxylophagous larvae, flower-feeding adults.

***Anaspis flava* (Linnaeus, 1758) [N] [S]**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 12 specs., 06.IV.2021, WCT and window trap.

Distribution. Western Palaearctic (Europe and Lebanon – Leblanc et al., 2008).

Family Scydmaenidae Leach, 1815

***Scydmaenus tingitanus* (Franz, 1962) [E] [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, Barber trap.

Distribution. Morocco (Vit, 2004).

Family Silphidae Latreille, 1806

***Silpha tristis* Illiger, 1798**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe, Asia, and Morocco – Rozicka & Schneider, 2004; El Harche et al., 2022).

***Silpha olivieri* Bedel, 1887**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Tunisia, and Morocco – Rozicka & Schneider, 2004).

***Thanatophilus sinuatus* (Fabricius, 1775)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia to Japan, Algeria, Tunisia, and Morocco – Rozicka & Schneider, 2004; El Harche et al., 2022).

Family Staphylinidae Latreille, 1802

***Bolitobius cingulatus* (Mannerheim, 1830) [N]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia – Smetana, 2004).

***Eusphalerum torquatum torquatum* (Marsham, 1802)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Madeira Island, and Morocco – Smetana, 2004).

***Gabrius appendiculatus* Sharp, 1910 [N]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 29.X.2021, Barber trap. 9 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, YCT, OCT, WCT, and BCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Palaearctic (Europe and Asia – Smetana, 2004).

***Micropeplus staphylinoides* Marsham, 1802**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap.

Distribution. Western Palaearctic (Europe, Algeria, Tunisia and Morocco – Smetana, 2004; Benyahia et al., 2016).

***Ontholestes marginalis* (Gené, 1836)**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, YCT.

Distribution. Western Palaearctic (Spain, Portugal, Italy, France, Tunisia, Algeria, and Morocco – Smetana, 2004; Tronquet et al., 2019).

***Oxytelus sculptus* Gravenhorst, 1806 [S]**

Material examined. 1 spec., Canton E (34°09’36.1"N, 06°07’04.34"W), 30.IV.2021, Barber trap; 1 spec., 29.X.2021, window trap. 36 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 7 specs., 06.IV.2021, Barber trap; 46 specs., 29.X.2021, Barber trap and YCT. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 19.III.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and Morocco – Smetana, 2004).

***Xantholinus linearis* (Olivier, 1795)**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 28.V.2021, window trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, window trap.

Distribution. Palaearctic (Europe, Asia, and North Africa; introduced in the Nearctic region – Smetana, 2004; Tronquet et al., 2019).

Family Tenebrionidae Latreille, 1802

***Adelostoma sulcatum* Duponchel, 1827**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 22.VII.2022, Barber trap.

Distribution. Palaearctic (Spain, Greece, Asia, and North Africa – Löbl et al., 2008a; Labrique & Chavanon, 2001).

***Akis tingitana* Lucas, 1859 [E]** (Fig. 4K)

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap; 2 specs., 28.V.2021, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

***Alphasida (Glabrasida) iblanensis reymondi* Antoine, 1952 [E]**

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, Barber trap. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 1 spec., 30.IV.2021, Barber trap; 2 specs., 28.V.2021, Barber trap.

Distribution. Morocco (Soldati, 2008; Pérez-Vera & Ávila, 2012).

***Arthrodeis globulosus* Escalera, 1922 [E] [S]**

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VI.2022, Barber trap. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a; Viñolas et al. 2017).

***Blaps ovipennis* Seidlitz, 1893 [E] [S]** (Fig. 4L)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 1 spec., 05.VIII.2021, Barber trap; 3 specs., 19.IX.2021, Barber trap; 1 spec., 29.X.2021, Barber trap; 3 specs., 20.IV.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

***Cheirodes brevicollis* (Wollaston, 1864) [S]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 13.V.2022, OCT.

Distribution. Palaearctic (Spain, Malta, Italy, Asia, and North Africa – Iwan & Löbl, 2008; Chavanon, 2018).

***Cheirodes sardous sardous* Gené, 1839 [S]**

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap.

Distribution. Palaearctic (Europe, Asia, and North Africa – Iwan & Löbl, 2008; Chavanon, 2018).

***Erodius granipennis* Fairmaire, 1871 [E]**

Material examined. 5 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 30.IV.2021, Barber trap; 8 specs., 28.V.2021, Barber trap; 1 spec., 02.VII.2021, Barber trap; 22 specs., 20.IV.2022, Barber trap; 16 specs., 13.V.2022, Barber trap; 133 specs., 02.VI.2022, Barber trap; 33 specs., 23.VI.2022, Barber trap. 9 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 3 specs., 06.IV.2021, Barber trap; 47 specs., 30.IV.2021, Barber trap; 35 specs., 28.V.2021, Barber trap; 93 specs., 20.IV.2022, Barber trap; 38 specs., 13.V.2022, Barber trap; 15 specs., 02.VI.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap. 16 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 1 spec., 29.IX.2021, Barber trap; 20 specs., 20.IV.2022, Barber trap; 15 specs., 13.V.2022, Barber trap; 2 specs., 02.VI.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

***Heliotaurus ruficollis tangerianus* Escalera, 1922 [E]**

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, WCT.

Distribution. Morocco (Novak & Pettersson, 2008).

Isomira melanophtalma (Lucas, 1846)

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, OCT; 3 specs., 02.IV.2021, window trap; 2 specs., 30.IV.2021, window trap and OCT; 4 specs., 13.V.2022, OCT and window trap. 6 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, window trap.

Distribution. Western Palaearctic (Portugal, France, Italy, Croatia, Bosnia, Algeria, and Morocco – Novak & Pettersson, 2008).

Latheticus oryzae Waterhouse, 1880

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, YCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Löbl et al., 2008a).

Misolampus goudotii Guérin-Méneville, 1834 [S]

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 05.VIII.2021, Barber trap.

Distribution. Western Palaearctic (Morocco, Algeria, Balearic Islands – Löbl et al., 2008a; Rosas-Ramos et al., 2020).

Pachychila alluaudi (Peyerimhoff, 1925) [E] [S]

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

Pachychila punctata mamorensis Antoine, 1942 [E] [S] (Fig. 4M)

Material examined. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 28.V.2021, Barber trap; 8 specs., 05.VIII.2021, Barber trap. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 11 specs., 30.IV.2021, Barber trap; 17 specs., 28.V.2021, Barber trap; 4 specs., 02.VII.2021, Barber trap; 18 specs., 05.VIII.2021, Barber trap; 15 specs., 19.IX.2021, Barber trap; 1 spec., 29.X.2021, Barber trap; 11 specs., 20.IV.2022, Barber trap; 2 specs., 13.V.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap; 4 specs., 23.VI.2022, Barber trap; 149 specs., 22.VII.2022, Barber trap. 5 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 3 specs.,02.VII.2021, Barber trap; 11 specs., 05.VIII.2021, Barber trap; 3 specs., 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

Pimelia capillata Solier, 1836 [S]

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap.

Distribution. North Africa (Morocco et Algeria Löbl et al., 2008a).

Pimelia platynota Fairmaire, 1875 [E] [S]

Material examined. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap; 2 specs., 02.VI.2022, Barber trap. 31 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 20.IV.2022, Barber trap; 2 specs., 22.VII.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap; 1 spec., 22.VII.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

Pimelia chrysomeloides subris Koch, 1941 [E] [S] (Fig. 4N)

Material examined. 60 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 39 specs., 06.IV.2021, Barber trap; 32 specs., 30.IV.2021, Barber trap; 17 specs., 28.V.2021, Barber trap; 3 specs., 29.X.2021, Barber trap; 4 specs., 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap; 2 specs., 22.VII.2022, Barber trap. 2 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap; 1

spec., 28.V.2021, Barber trap; 3 specs., 05.VIII.2022, Barber trap; 2 specs., 16.IX.2021, Barber trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 13.V.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a; Mas-Peinado et al., 2021).

Scaurus gigas Waltl, 1835 [S]

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 02.VII.2021, Barber trap; 1 spec., 29.X.2021, Barber trap; 6 specs., 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap; 4 specs., 02.VI.2022, Barber trap; 2 specs., 22.VII.2022, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 05.VIII.2021, Barber trap; 1 spec., 16.IX.2021, Barber trap; 1 spec., 22.VII.2022, Barber trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap; 1 spec., 13.V.2022, Barber trap.

Distribution. Western Palaearctic (Spain, Portugal, Algeria, and Morocco – Löbl et al., 2008b).

Sepidium aliferum Erichson, 1841 [S]

Material examined. 10 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 12 specs., 06.IV.2021, Barber trap; 3 specs., 30.IV.2021, Barber trap; 5 specs., 20.IV.2022, Barber trap. 12 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 20.IV.2022, Barber trap.

Distribution. Western Palaearctic (Spain, Algeria, Tunisia, and Morocco – Löbl et al., 2008a).

Stenosis mamorensis Théry, 1924 [E] [S]

Material examined. 1 spec., Canton C (34°04'57.73"N, 06°24'38.31"W), 30.IV.2021, Barber trap. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 06.IV.2021, Barber trap; 2 specs., 28.V.2021, Barber trap; 3 specs., 02.VII.2021, Barber trap; 2 specs., 05.VIII.2021, Barber trap; 3 specs., 16.IX.2021, Barber trap; 3 specs., 20.IV.2022, Barber trap; 1 spec., 02.VI.2022, Barber trap; 1 spec., 23.VI.2022, Barber trap. 2 specs., Canton E (34°09'36.1"N, 06°07'04.34"W), 22.VII.2022, Barber trap.

Distribution. Morocco (Löbl et al., 2008a).

Zophosis minuta (Fabricius, 1775) [S]

Material examined. 3 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 06.IV.2021, Barber trap; 17 specs., 30.IV.2021, Barber trap; 13 specs., 28.V.2021, Barber trap; 1 spec., 05.VIII.2021, Barber trap; 4 specs., 19.IX.2021, Barber trap; 57 specs., 20.IV.2022, Barber trap; 55 specs., 13.V.2022, Barber trap; 28 specs., 02.VI.2022, Barber trap; 4 specs., 23.VI.2022, Barber trap. 4 specs., Canton A (34°12'33.34"N, 06°35'54.78"W), 28.V.2021, Barber trap; 4 specs., 02.VII.2021, Barber trap; 18 specs., 05.VIII.2021, Barber trap; 33 specs., 20.IV.2022, Barber trap; 27 specs., 13.V.2022, Barber trap; 21 specs., 02.VI.2022, Barber trap; 4 specs., 23.VI.2022, Barber trap; 3 specs., 22.VII.2022, Barber trap. 1 spec., Canton E (34°09'36.1"N, 06°07'04.34"W), 20.IV.2022, Barber trap; 3 specs., 13.V.2022, Barber trap; 2 specs., 02.VI.2022, Barber trap; 2 specs., 23.VI.2022, Barber trap; 1 spec., 22.VII.2022, Barber trap.

Distribution. Western Palaearctic (Portugal, Spain, Morocco and Tunisia – Lefèvre, 1885; Löbl et al., 2008a; López-Pérez, 2016).

Family Trogidae MacLeay, 1819

Trox fabricii Reiche, 1853 [S]

Material examined. 2 specs., Canton C (34°04'57.73"N, 06°24'38.31"W), 19.III.2021, Barber trap; 3 specs., 06.IV.2021, Barber trap; 2 specs., 19.IX.2021, Barber trap; 12 specs., 29.X.2021, Barber trap.

Distribution. Western Palaearctic (Spain, Portugal, Italy, and North Africa – Pittino, 2006).

Family Trogossitidae Latreille, 1802

Tenebroides mauritanicus (Linnaeus, 1758) [S]

Material examined. 1 spec., Canton A (34°12'33.34"N, 06°35'54.78"W), 29.X.2021, OCT.

Distribution. Palaearctic (Europe, Asia, and North Africa – Kolibac, 2007).

Table 1. List of species collected in the Maamora forest at sites S1, S2 and S3, and their status: [**S**] Saproxylic species; [**R**] Saproxylic species listed in the Red List of the Mediterranean region; [**N**] Species newly recorded for Morocco and [**E**] Endemic species.

Families	Species	Status	S1	S2	S3
Anobiidae	*Stegobium paniceum* (Linnaeus, 1758)	S	*	*	
	Xyletinus bucephalus (Illiger, 1807)	S	*		
Anthicidae	*Notoxus monoceros* (Linnaeus, 1761)	N, S	*	*	
	Notoxus trifasciatus Rossi, 1792	S	*	*	*
	Stricticollis transversalis (A. Villa & J.B. Villa, 1833)	S	*	*	
Anthribidae	*Bruchela rufipes rufipes* (Olivier, 1790)		*		
Brentidae	*Kalcapion semivittatum* (Gyllenhal, 1833)			*	
	Ceratapion robusticorne (Desbrochers des Loges, 1866)			*	
Buprestidae	*Acmaeodera bipunctata kureimatica* Escalera, 1914				*
	Acmaeoderella adspersula (Illiger, 1803)	S	*	*	*
	Acmaeoderella discoidea (Fabricius, 1787)		*	*	*
	Acmaeoderella lanuginosa (Gyllenhall, 1817)		*	*	*
	Agrilus biguttatus (Fabricius, 1777)	S	*		
	Agrilus graminis mamorensis Théry, 1930	E, S	*	*	
	Anthaxia anatolica ferulae Gené, 1839			*	
	Anthaxia millefolii polychloros Abeille de Perrin, 1894		*		*
	Anthaxia nitidula (Linnaeus, 1758)	N, S			*
	Anthaxia umbellatarum umbellatarum (Fabricius, 1787)		*	*	*
	Habroloma triangulare (Lacordaire, 1835)			*	
	Perotis unicolor igniventris Escalera, 1914	E, S		*	*
Cantharidae	*Malthinus flaveolus* (Herbst, 1786)	N		*	
Carabidae	*Acinopus picipes* (Olivier, 1795)		*		*
	Agonum numidicum (Lucas, 1846)		*		
	Amara aenea (De Geer, 1774)		*		
	Anisodactylus binotatus (Fabricius, 1787)		*		
	Calathus circumseptus Germar, 1824		*		
	Calathus fuscipes algiricus Gautier des Cottes, 1866			*	
	Calathus mollis atticus Gautier des Cottes, 1867		*		
	Carabus faminii favieri Fairmaire, 1859	E	*	*	*
	Carabus rugosus rugosus Fabricius, 1792	E		*	
	Cicindela maroccana Fabricius, 1801		*	*	*
	Dromius agilis (Fabricius, 1787)	N			*
	Graphipterus exclamationis (Fabricius, 1792)				
	Harpalus attenuatus Stephens, 1828		*		
	Harpalus serripes serripes (Quensel, 1806)		*		
	Microlestes abeillei brisouti Holdhaus, 1912		*	*	
	Ocys tachysoides (Antoine, 1933)			*	
	Paradromius linearis linearis (Olivier, 1795)			*	
	Philorhizus quadrisignatus (Dejean, 1825)	N		*	
	Poecilus baeticus gharbensis (Alluaud, 1927)	E	*		
	Pterostichus elongatus (Duftschmid, 1812)		*	*	*
	Pterostichus globosus pecoudi (Antoine, 1922)	E		*	
	Scarites terricola terricola Bonelli, 1813		*	*	*
	Sphodrus leucophthalmus (Linnaeus, 1758)		*		
	Syntomus foveatus (Geoffroy, 1785)		*		
	Trymosternus colombati Antoine, 1934	E		*	
Cerambycidae	*Nathrius brevipennis* (Mulsant, 1839)	S, R	*		
	Stenopterus ater (Linnaeus, 1767)	S, R	*	*	
	Stictoleptura tangeriana (Tournier, 1875)	E, S			*
	Trichoferus ilicis Sama, 1987	E, S, R	*	*	
Chrysomelidae	*Bruchidius biguttatus* (Olivier, 1800)		*		*
	Bruchidius cisti (Fabricius, 1775)	N	*		
	Bruchidius rubiginosus (Desbrochers des Loges, 1869)		*		*
	Cassida flaveola Thunberg, 1794	N	*		

Families	Species	Status	S1	S2	S3
	Cassida vittata Villers, 1789				*
	Chrysolina americana (Linnaeus, 1758)			*	
	Chrysolina kocheri (Codina Padilla, 1961)	E	*		
	Cryptocephalus rabatensis Pic, 1953	E	*	*	
	Cryptocephalus rugicollis Olivier, 1792		*	*	
Cleridae	*Opilo domesticus* (Sturm, 1837)	S, R	*	*	
Coccinelidae	*Adalia decempunctata* (Linnaeus, 1758)		*	*	*
	Coccinella algerica Kovář, 1977		*		*
	Hyperaspis duvergeri Fürsch, 1985		*		
	Oenopia lyncea lyncea (Olivier, 1808)			*	
	Oenopia conglobata (Linnaeus, 1758)		*		
	Platynaspis luteorubra (Goeze, 1777)		*	*	
	Rhyzobius chrysomeloides (Herbst, 1792)				*
	Rhyzobius litura (Fabricius, 1787)			*	
	Rodolia cardinalis (Mulsant, 1850)		*	*	
	Scymnus subvillosus (Goeze, 1777)			*	
Corylophidae	*Orthoperus anxius* Mulsant & Rey, 1861		*		
Cryptophagidae	*Cryptophagus dentatus* (Herbst, 1793)		*	*	
Curculionidae	*Brachycerus barbarus* (Linnaeus, 1758)			*	
	Brachycerus muricatus Olivier, 1790			*	
	Brachyderes pubescens Boheman, 1833			*	
	Brachypera zoilus (Scopoli, 1763)		*		
	Charagmus griseus (Fabricius, 1775)				*
	Ceutorynchus contractus (Marsham, 1802)			*	
	Coeliodes ilicis (Bedel, 1885)		*	*	
	Coeliodes ruber (Marsham, 1802)			*	
	Gronops lunatus (Fabricius, 1775)		*		
	Liophloeus tessulatus (O. F. Müller, 1776)	N	*		
	Listroderes costirostris Schoenherr, 1826		*		
	Maurobaris spoliata (Boheman, 1836)		*		
	Mecinus pascuorum (Gyllenhal, 1813)	N	*		*
	Mecinus pyraster (Herbst, 1795)		*		
	Micrelus ferrugatus (Perris, 1847)		*		
	Microplontus molitor (Gyllenhal, 1837)		*		
	Orchestes erythropus (Germar, 1821)			*	
	Orchestes irroratus maroccanus (Roudier, 1954)			*	
	Orchestes rusci (Herbst, 1795)	N	*		
	Otiorhynchus cribricollis Gyllenhal, 1834				*
Dasytidae	*Dasytes nigroaeneus* Küster, 1850		*	*	*
	Dasytes terminalis Jacquelin du Val, 1863		*	*	*
Dermestidae	*Anthrenus angustefasciatus* Ganglbauer, 1904		*	*	*
	Anthrenus museorum (Linnaeus, 1761)		*	*	*
	Anthrenus pimpinellae (Fabricius, 1775)		*	*	*
	Attagenus smirnovi Zhantiev, 1973		*	*	*
	Attagenus trifasciatus (Fabricius, 1787)		*	*	*
	Attagenus unicolor unicolor (Brahm, 1791)		*	*	
	Dermestes frichii Kugelann, 1792		*	*	*
	Dermestes maculatus De Geer, 1774		*		
	Dermestes peruvianus Laporte de Castelnau, 1840		*		
	Thorictus castaneus castaneus Germar, 1834		*		
Elateridae	*Ampedus balteatus* (Linnaeus, 1758)	N, S, R		*	
	Agriotes sordidus (Illiger, 1807)	S	*		
	Cardiophorus rufipes (Goeze, 1777)	S	*	*	
	Cebrio maculicollis Fairmaire, 1856	E, S	*		
	Drasterius bimaculatus (Rossi, 1790)	S	*		
	Lacon punctatus punctatus (Herbst, 1779)	S, R	*		
Geotrupidae	*Thorectes distinctus* Marseul, 1878		*	*	*
	Typhaeus typhoeus (Linnaeus, 1758)		*		*
Glaphyridae	*Anthypna meles* (Fabricius, 1792)			*	*

Families	Species	Status	S1	S2	S3
	Eulasia goudoti (Laporte, 1840)	E	*	*	*
Histeridae	*Hister moerens* Erichson, 1834			*	
	Hister maroccanus Schmidt, 1887	E			*
	Hypocaccus brasiliensis (Paykull, 1811)		*	*	
	Hypocaccus rugiceps (Duftschmid, 1805)	N		*	*
	Pactolinus major (Linnaeus, 1767)			*	
	Saprinus acuminatus (Fabricius, 1798)		*	*	*
	Saprinus chalcites (Illiger, 1807)		*	*	
	Saprinus figuratus Marseul, 1855		*	*	*
	Saprinus proximus simillimus Wollaston, 1865			*	
Laemophloeidae	*Cryptolestes ferrugineus* (Stephens, 1831)		*	*	*
	Laemophloeus monilis (Fabricius, 1787)	S		*	
Latridiidae	*Corticarina cavicollis* (Mannerheim, 1844)	N		*	
	Corticarina curta (Wollaston, 1854)		*	*	*
Leiodidae	*Agathidium marocanum* Hlisnikovsky, 1968	E, S			*
	Catops coracinus Kellner, 1846			*	*
	Ptomaphagus tenuicornis mauritanicus Jeannel, 1934			*	
Meloidae	*Actenodia distincta* (Chevrolat, 1840)				*
	Cerocoma schaefferi (Linnaeus, 1758)	N			*
	Hycleus duodecimpunctatus (Olivier, 1811)	N	*		*
	Hycleus rufipalpis (Escalera, 1909)		*	*	*
Melolonthidae	*Euserica mamorensis* Baraud, 1965	E	*	*	*
	Hoplia argentea (Poda, 1761)	N	*		
	Hoplia philanthus gagates (Bedel, 1911)		*	*	
	Sphodroxia maroccana Ley, 1923	E	*	*	*
Melyridae	*Charopus rotundatus* Erichson, 1840			*	
	Colotes javeti Jacquelin du Val, 1853			*	
	Colotes punctatus (Erichson, 1840)		*		*
Mordellidae	*Mediimorda bipunctata* (Germar, 1827)		*	*	*
	Mordella aculeata Linnaeus, 1758	N	*	*	*
	Variimorda ragusai (Emery, 1876)	S			*
Nitidulidae	*Carpophilus hemipterus* (Linnaeus, 1758)		*		
	Epuraea aestiva (Linnaeus, 1758)	N, S		*	
	Epuraea unicolor (Olivier, 1790)			*	
	Brassicogethes aeneus (Fabricius, 1775)		*	*	*
Oedemeridae	*Oedemera barbara* (Fabricius, 1792)	S		*	*
	Oedemera simplex (Linnaeus, 1767)	S		*	
Ptinidae	*Dignomus dilophus* (Illiger, 1807)	S	*	*	*
	Dignomus gibbicollis (P. H. Lucas, 1846)	S	*	*	
	Mesocoelopus niger (P. W. J. Müller, 1821)	S	*		
	Mizodorcatoma dommeri (Rosenhauer, 1856)	S			*
	Ptinus bidens Olivier, 1790	N		*	
	Ptinus spitzyi A. Villa & G. B. Villa, 1838		*	*	*
Phalacridae	*Olibrus affinis* (Sturm, 1807)			*	
	Stilbus testaceus (Panzer, 1796)		*	*	
Scarabaeidae	*Aethiessa floralis* (Fabricius, 1787)		*	*	*
	Otophorus haemorrhoidalis (Linnaeus, 1758)		*		
	Labarrus lividus (Olivier, 1789)		*		
	Esymus merdarius (Fabricius, 1775)		*		
	Subrinus sturmi (Harold, 1870)				*
	Onitis alexis septentrionalis Balthasar, 1942		*		
	Onthophagus maki (Illiger, 1803)		*		
	Onthophagus similis (Scriba, 1790)		*		
	Onthophagus vacca (Linnaeus, 1767)		*	*	*
	Oryctes nasicornis grypus (Illiger1803)				*
	Oxythyrea funesta (Poda, 1761)	S	*	*	*
	Phyllopertha horticola (Linnaeus, 1758)	N	*		
	Protaetia (Netocia) morio heyrovskyi (Balthasar, 1935)		*	*	
	Scarabaeus cicatricosus Lucas, 1846			*	*

Families	Species	Status	S1	S2	S3
	Scarabaeus sacer Linnaeus, 1758		*	*	
	Tropinota squalida pilosa Brullé, 1832		*	*	*
	Tropinota hirta (Poda, 1761)			*	
Scolytidae	*Dryocoetes autographus* (Ratzeburg, 1837)	N, S	*	*	*
	Ernoporicus fagi (Fabricius, 1798) (= *Eidophelus fagi)*	N	*	*	*
	Hypoborus ficus Erichson, 1836			*	
	Platypus cylindrus (Fabricius, 1792)		*		
	Xyleborus monographus (Fabricius, 1792)	S			*
Scraptiidae	*Scraptia ophthalmica* Mulsant, 1856 (*S. schotti* Leblanc, 2012)	S	*	*	*
	Anaspis flava (Linnaeus, 1758)	N, S		*	
Scydmaenidae	*Scydmaenus tingitanus* (Franz, 1962)	E, S		*	
Silphidae	*Silpha tristis* Illiger, 1798		*		*
	Silpha olivieri Bedel, 1887		*		
	Thanatophilus sinuatus (Fabricius, 1775)			*	
Staphylinidae	*Bolitobius cingulatus* (Mannerheim, 1830)	N	*		
	Eusphalerum torquatum torquatum (Marsham, 1802)			*	
	Gabrius appendiculatus Sharp, 1910	N	*	*	*
	Micropeplus staphylinoides Marsham, 1802			*	
	Ontholestes marginalis (Gené, 1836)		*		
	Oxytelus sculptus Gravenhorst, 1806	S	*	*	*
	Xantholinus linearis (Olivier, 1795)		*	*	
Tenebrionidae	*Adelostoma sulcatum* Duponchel, 1827			*	*
	Akis tingitana Lucas, 1859	E	*	*	
	Alphasida (Glabrasida) iblanensis reymondi Antoine, 1952	E		*	*
	Arthrodeis globulosus Escalera, 1922	E, S	*	*	
	Blaps ovipennis Seidlitz, 1893	E, S		*	
	Cheirodes brevicollis (Wollaston, 1864)	S	*		
	Cheirodes sardous sardous Gené, 1839	S		*	
	Erodius granipennis Fairmaire, 1871	S	*	*	*
	Heliotaurus ruficollis tangerianus Escalera, 1922	E	*		
	Isomira melanophtalma (Lucas, 1846)			*	*
	Latheticus oryzae Waterhouse, 1880			*	
	Misolampus goudotii Guérin-Méneville, 1834	S			*
	Pachychila alluaudi Peyerimhoff, 1925	E, S	*		
	Pachychila punctata mamorensis Antoine, 1942	E, S	*	*	*
	Pimelia capillata Solier, 1836	S			*
	Pimelia platynota Fairmaire, 1875	E, S	*	*	*
	Pimelia chrysomeloides subris Koch, 1941	E, S	*	*	*
	Scaurus gigas Waltl, 1835	S	*	*	*
	Sepidium aliferum Erichson, 1841	S	*	*	
	Stenosis mamorensis Théry, 1924	E, S	*		*
	Zophosis minuta (Fabricius, 1775)	S	*	*	*
Trogidae	*Trox fabricii* Reiche, 1853	S		*	
Trogossitidae	*Tenebroides mauritanicus* (Linnaeus, 1758)	S		*	

Table 2. Number of species according to sampling sites: **S1** (warm sub-humid bioclimate with maritime influences; open cork oak forest); **S2** (warm sub-humid bioclimate with maritime influences; old cork oak trees with dense understory); and **S3** (semiarid bioclimate with temperate winters, a mixed cork oak forest with eucalyptus trees).

	Stations		
Species	S1	S2	S3
Saproxylic	34	36	24
Endemic	18	18	13
new for Morocco	12	11	10
Total	139	131	86

DISCUSSION

The beetle fauna of the cork oak forest of Maamora constitutes an essential link for the functioning and dynamics of this forest ecosystem, with a significant richness and diversity of the beetle population. 256 species belonging to 42 families were identified, most of them belonging to the Tenebrionidae and Carabidae families, each with 27 species, and Curculionidae with 24 species. Previous studies on the entomofauna of the Maamora forest have reported the presence of 104 beetle species (El Alami Idrissi, 2013; Villemant & Fraval, 1993; Idrissi, 1982). These results complete the studies of previous authors and provide useful information on the differentiated methodology for collecting these beetles (Table 3).

Table 3. Number of species according to sampling methods: pitfall traps, coloured bowls (yellow, orange, white, and blue), window traps and visual collection.

Families	Number of species			
	Pitfall traps	Coloured bowls	Window traps	Visual collection
Anobiidae		1	1	
Anthicidae	1	2		
Anthribidae	1			
Brentidae		2		
Buprestidae		11		1
Cantharidae		1		
Carabidae	19	2	3	
Cerambycidae		2	2	
Chrysomiledae		6	2	1
Cleridae			1	
Coccinilidae		9	1	
Corylophidae		1		
Cryptophagidae			1	
Curculionidae	12	8		
Dasytidae		2		
Dermestidae	2	7		1
Elateridae	1	3	1	1
Geotrupidae	2			
Glaphyridae		2		
Histeridae	4	4	1	
Laemophloeidae			2	
Latridiidae		1	1	
Leiodidae	2			
Meloidae		4		
Melolonthidae	1	2	1	
Melyridae	1	2		
Mordellidae		2	1	
Nitidulidae		3	1	
Oedemeridae		2		
Ptinidae	3	1	2	
Phalacridae		2		
Scarabaeidae	6	9	1	1
Scolytidae		2	3	
Scraptidae		2		
Scydmaenidae	1			
Silphidae	3			
Staphylinidae	4	2	1	
Tenebrionidae	17	3	1	
Trogidae	1			
Trogossitidae		1		
Total species	**81**	**101**	**27**	**5**

The pitfall traps collected 81 species. The colored bowls (yellow, orange, white and blue) contributed to the collection of 101 species. The window traps collected 27 species, and 5 species were collected visually from the field. Out of the sampled species, 53 were saproxylic, including 6 species considered rare according to the Red List of Saproxylic Beetles in the Mediterranean region: *Nathrius brevipennis*, *Stenopterus ater*, *Trichoferus ilicis*, *Opilo domesticus*, *Ampedus balteatus*, and *Lacon punctatus punctatus* (Nieto & Alexander, 2010; García et al., 2018). The results show a much lower number of species at site S3, compared with the two other sites (Table 2). The analysis of certain taxonomic groups, particularly saproxylic beetle assemblages, makes it possible to monitor trends in forest environments (Rossi & Vallauri, 2013). Saproxylic beetles are highly sensitive to changes and disturbances (such as fires, collection of dead wood, overgrazing, etc.), and their qualitative (rarity) and quantitative study can provide information on the degradation and resilience of the environment (Blandin, 1986; Speight, 1989).

AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: All authors contributed to the study conception and design. H. Habbaz and N. Maatouf: compiled the species records and background data, taxonomic revisions of the species names, and drafted the original manuscript; J-P. Lumaret: revised the taxonomy, contributed to the analysis, and reviewed the literature; L. Rohi: drafted and revised the manuscript. The authors read and approved the final version of the manuscript.

FUNDING

This research received no specific grant from any funding agencies.

AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the insect collection of the Centre for Innovation, Research, and Training - National Agency for Water and Forests, BP. 763, Rabat - Agdal, Morocco, and are available from the curator, upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

ACKNOWLEDGMENTS

We would like to thank the Director of the Centre for Innovation, Research, and Training in Rabat (National Agency for Water and Forests) for his hospitality and support in carrying out this work. Thanks to Vikki Bengtsson (BSc Env. Biology, Pro Natura Foundation, Gothenburg, Sweden) for reviewing the manuscript. We are also grateful to Amine Samih (Doctoral student in the field of entomology – Hassan II University) and El Ayyachi El Mnouar (Technician in the field of forest management - National Agency for Water and Forests Rabat, Morocco) for their guidance, assistance, and contribution in collecting the field data. Special thanks to Dr. Piero Leo (Private entomologist, Cagliari, Italy) for his invaluable identification of some specimens. We thank also the reviewers for their constructive comments.

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سخت‌بال‌پوشان (Coleoptera) مرتبط با جنگل بلوط ماامورا در شمال غرب مراکش

حمزه هباز[۱،۲*]، نورالدین معطوف[۲]، ژان-پی‌یر لوماره[۳]، لطیفه روحی[۱]

۱ آزمایشگاه اکولوژی و محیط زیست، دانشگاه حسن II کازابلانکا، دانشکده علوم بن‌مسیک، سیدی عثمان، کازابلانکا، مراکش.
۲ مرکز نوآوری، تحقیق و آموزش، آژانس ملی آب و جنگل‌ها، رباط - اگدال، مراکش
۳ دانشگاه پل والری مونپلیه III، جاده ماند، مونپلیه سیدکس ۵، فرانسه

* پست الکترونیک نویسنده مسئول مکاتبه: *hamza.habbaz-etu@etu.univh2c.ma*

| **تاریخ دریافت:** ۲۹ آذر ۱۴۰۲ | **تاریخ پذیرش:** ۱۴ شهریور ۱۴۰۳ | **تاریخ انتشار:** در حال چاپ |

چکیده: هدف این تحقیق، بررسی و بهبود دانش تنوع زیستی سخت‌بال‌پوشان در جنگل ماامورا، یکی از بزرگترین جنگل‌های بلوط چوب‌پنبه‌ای در جهان، می‌باشد. مطالعات در طول دو سال متوالی (۲۰۲۱ و ۲۰۲۲) با استفاده از تله‌های فعال و غیرفعال انجام شد. در مجموع ۸۲۴۷ نمونه جمع‌آوری شد که نمایانگر ۲۵۶ گونه از ۴۲ خانواده از راسته Coleoptera بودند. بیشتر گونه‌های سوسک متعلق به خانواده‌های Tenebrionidae (۲۷ گونه)، Carabidae (۲۷ گونه) و Curculionidae (۲۴ گونه) بودند. از ۲۵۶ گونه شناسایی‌شده، ۲۱۶ مورد در این مقاله گنجانده شده‌اند. ما فقط گونه‌های با ارزش زیستی قابل توجه را انتخاب کردیم؛ ۵۳ مورد چوبخوار شامل ۶ گونه نادر؛ ۲۹ مورد اندمیک بودند و ۲۶ گونه به عنوان رکوردهای جدید برای فون مراکش شناسایی شدند. بر اساس نتایج این تحقیق، نخستین فهرست سخت‌بال‌پوشان در جنگل ماامورا تهیه شده که اطلاعات جدیدی درباره توزیع سوسک‌ها در جنگل‌های بلوط چوب‌پنبه‌ای مراکش فراهم می‌کند.

واژگان کلیدی: تنوع زیستی، فهرست‌برداری، انتشار، بومی، سوسک‌های چوبخوار