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THE WOOD BORING INSECTS (COLEOPTERA: CERAMBYCIDAE AND BUPRESTIDAE) RECORDED AS THE NEW PESTS FOR *ACER UNDULATUM* POJARK FROM THE BABADAG MOUNTAIN (SW TURKEY)

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ABSTRACT

Acer undulatum Pojark is an endemic species of maple, known so far only from a very restricted area on Mount Babadağ (Fethiye district, Muğla province) in Southwestern Turkey, included in the IUCN Red List of Threatened Species in 1998. In the year 2015 we visited the locality where *Acer undulatum* grows, on the steep slopes near the summit of Mount Babadağ, in order to obtain further data for the study of the Cerambycidae and Buprestidae fauna associated with this tree. In this research, 6 species belonging to 2 families (Cerambyicidae and Buprestidae) of Coleoptera were captured and identified in the study area. These 6 species (*Trichoferus kotschyi*, *Ropalopus clavipes*, *Lioderina linearis, Anthaxia (Anthaxia) cebecii, Anthaxia (Anthaxia) semicuprea* and *Anthaxia (Anthaxia) bicolor*) are observed first time on *Acer undulatum* Pojark on Mount Babadağ.

KEYWORDS:
Cerambycidae, Buprestidae, *Acer undulatum*, endemic, new host, Babadağ- Turkey.

INTRODUCTION

Wood-boring is carried out by many insects either to obtain food or as a means of protecting their eggs, larvae and pupae. Many insects and a few other invertebrates are wood-borers. Some of them obtain both sustenance and shelter from the wood, while others use it only as their habitat. Certain species attack only living trees, others are found mainly in freshly felled or dying trees; a few infest only dry woodland, while others attack only old moist wood. Those that attack trees and fresh logs frequently bore and live in the inner bark for a variable period of time, before they penetrate the wood. They also can be considered to be inner back borers. Some insects that attack only freshly killed or felled trees can survive and develop slowly in dried wood. Therefore these species often continue boring into wood that has been dried and processed [1].

Acer undulatum, included in the IUCN Red List of Threatened Species in 1998 [2], is strictly localized near the peak of Mount Babadağ, in Muğla province (South West Anatolia, Turkey). The species grows on the steep, rocky slopes around the peak of the mountain, at an altitude of 1400 to 1900 meters [3]. The main purpose of this research was to study of the wood boring insects associated with this plant, especially those belonging to Cerambyicidae and Buprestidae (Coleoptera). It is well known how these families of Coleoptera can be harmful for the forest health. However, the species of Cerambycidae and Buprestidae that we found during our research, turned out "not to be deadly dangerous" for the living plant, as they attack the plant when already withering. The species were obtained by gathering the adults and breeding the larvae found under the bark and inside the wood. Samples of wood were taken to laboratory and adults emerged in 2015 and 2016. Below, we report the studied species, listing the original description, the whole range of distribution, and details about their host plants and known biology.

MATERIALS AND METHODS

This study was carried out on Mount Babadağ (Fethiye district, Muğla province) in Southwestern Turkey (Figure 1). The barks of trees were scrapped with a pen knife to collect insects that live under the tree barks. Collected adults were killed in a killing jar made by placing cotton wool soaked in chloroform into wide mouth glass container. After killing, the insect specimens were preserved either by pinning in the case of adults. The early stages were kept in the laboratory until adult emergence, after which they were killed and pinned.

FIGURE 1
Location of study area

RESULTS

Family Cerambycidae. 1. Trichoferus kotschyi (Ganglbauer 1883). *Hesperophanes kotschyi* Ganglbauer, 1883. Wien. ent. Zeit., 2, 12: 298. Type locality: "Cilicischen Taurus".

Distribution. Greece (Samos Isl.), Southern Turkey, Lebanon [4].

Host plants. *Ficus* sp.; *Ceratonia* sp.; *Cotinus coggygria* Scop.; *Ceratonia siliqua* L., *Quercus* sp. [5, 6], *Acer undulatum* (**new host record**).

Remarks. The larva feeds mostly under the bark of dead and dry trunks and branches, moving then inside the wood, where it digs the pupal cell. Adults emerge between May and August.

2. Ropalopus clavipes (Fabricius 1775). *Callidium clavipes* Fabricius, 1775. Syst. Entomol.: 188. Type locality: "Germany".

Distribution. South and Central Europe, Kazakhstan, Turkey, Iran [4].

Host plants. Polyphagous on deciduous trees, but also on conifers (*Picea excelsa* and *Abies cilicica*). Larvae in dead twigs and small branches of trees and bushes. Pupation in the wood [7]. *Acer undulatum* (**new host record**).

Remarks. The larva feeds under the bark of dead and dry branches, digging very large tunnels that are only partially filled with larval frass. The pupal cell is prepared inside the wood. Adults emerge between May and July.

3. Lioderina linearis (Hampe, 1870). *Callidium lineare* Hampe, 1870. Berl. Entomol. Zeits., 14: 335. Type locality: "Corfu" (Greece).

Distribution. Central Europe (Hungary, Slovakia, Austria), Balkan Peninsula and Turkey [4].

Host plants. *Amygdalus* sp., *Abies cephalonica* [8, 9]; *Juglans regia* (Çamliyayla, Içel, Turkey, P. Rapuzzi leg.); *Acer undulatum* (**new host record**).

Remarks. The female lays one egg on a very thin alive branch (few millimeters of diameter). The young larva feeds inside this small branch and then moves in the larger branch where it digs a "ring" inside the wood. This way, the branch easily breaks and fall. The larva stays inside the cut part of the branch and prepares the pupal cell inside the wood. Adults emerge between May and June.

Family Buprestidae. 1. Anthaxia (Anthaxia) cebecii Baiocchi & Magnani, 2018. *Anthaxia* (*Anthaxia*) *cebecii* Baiocchi & Magnani, 2018. Zootaxa, 4370 (3): 232. Type locality: "TURKEY (Muğla) 1701m., Mt. Babadağ (N slope), SE of Fethiye, 36°32'19''N 29°10'17''E".

Distribution. species endemic to Turkey.

Host plants. *Acer undulatum*, *Acer* sp. [10].

Remarks. The egg deposition occurs in April / May, and the larva feeds under the thick bark for at least one year, until the next spring, when it digs a rather deep pupal cell. The adult is usually completely formed already during the summer, but stays in its pupal cell until the next spring, thus passing a second winter in the wood, and emerging after two years from the egg deposition, usually in May.

2. Anthaxia (Anthaxia) semicuprea Küster, 1852. *Anthaxia semicuprea* Küster, 1852. *Die Käfer Europas*. Nach der Natur beschrieben.: 21. Type locality: "südöstlichen Deutschland und Ungarn".

Distribution. Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy (including Sicily), Macedonia, Montenegro, Romania, Serbia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine [11].

Host plants. *Acer* spp., *Acer undulatum* (**new host record**).

Remarks. The species has also been reported to develop on several species of Rosaceae [12], but this is probably due to misidentification of the very close *Anthaxia* (*A*.) *suzannae* Théry, 1942, and this data needs confirmation. The adultrs emerge usually in May.

3. Anthaxia (Anthaxia) bicolor Falderman, 1835. *Anthaxia bicolor* Falderman, 1835. Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou, 4: 149. Type locality: Caucasus.

Distribution. Armenia, Azerbaijan, Bulgaria, Croatia, Georgia, Greece, Iran, Iraq, Israel, Jordan, Lebanon, Macedonia, Romania, Russia (South European Territory), Syria, Turkey, Turkmenistan, Ukraine (Krym), Uzbekistan [11].

Host plants. Oleaceae, mostly *Fraxinus* species; *Acer undulatum* (**new host record**).

Remarks. *Acer undulatum* represent a new and unusual host-plant for this species, which we have always reared from *Fraxinus* species. The present report probably represents a deposition by a stray female. Adults emerge in early spring.

CONCLUSIONS

In this research, 6 species belonging to 2 families (Cerambyicidae and Buprestidae) of Coleoptera were captured and identified on Mount Babadağ (Fethiye district, Muğla province) in Southwestern Turkey. *Trichoferus kotschyi, Ropalopus clavipes* and *Lioderina linearis* are the cerambycid species seen first times on *Acer undulatum*. *Anthaxia (Anthaxia) cebecii, Anthaxia (Anthaxia) semicuprea* and *Anthaxia (Anthaxia) bicolor* are the buprestid species seen first times on *Acer undulatum*. So; *Acer undulatum* is the new host record for these 6 species. In their research; Baiocchi and Magnani has given *Anthaxia (Anthaxia) cebecii* as a new species for Turkey [10].

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