

## First record of the longhorn beetle *Cerambyx welensii* Küster, 1845 in North Macedonia (Coleoptera: Cerambycidae)

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### Abstract



The longhorn beetle *Cerambyx welensii* Küster, 1845 is recorded for the first time from the Republic of North Macedonia. Five specimens (1 male and 4 females) were collected in July 2021 with feeding traps in an oak forest at Tri Krushi (foothills of Kitka mountain), Drachevo, Skopje. All of the seven species of *Cerambyx* reported in Europe are now known to occur in North Macedonia.

**Key words:** Balkan Peninsula, distribution, feeding trap, oak forest, *Quercus pubescens*, sympatry

### Introduction

The Republic of North Macedonia is considered one of the biodiversity richest countries in South-East Europe, but faunistic researches are far from satisfactory. This particularly refers to the beetle fauna. Concerning the family Cerambycidae, the so-called longhorn beetles due to their long and stylized antennae, faunistic knowledge is quite insufficient. Literature on taxonomy and faunistics was scarce until the researches carried out during the past twenty years. Most older references (Apfelbeck 1907; Divac 1907), including those published during and after the period between World Wars (Doflein 1921; Breit 1929; Roubal 1932; Thurner 1957) do not contain precise information on the distribution and ecology of these species. One of the most important contribution to the study of the Macedonian Cerambycidae fauna are the works of Mikšić & Georgijević (1971, 1973) and Mikšić & Korpič (1985). In

recent years, faunistic findings in North Macedonia regarding longhorn beetles were mainly provided by Čurčić *et al.* (2003), Kovacs & Merkl (2013), Plewa *et al.* (2015), Cvetkovska-Gjorgjievska (2015), Georgiev *et al.* (2019) and Danilevsky (2021). According to Hristovski *et al.* (2015), a total of 176 cerambycid species are known for the fauna of Macedonia, but it is quite expected that diversity of longhorn beetles is undoubtedly higher.

Longhorn beetles constitute one of the most numerous groups of insects, with more than 35-36,000 species and more than 4000 genera in 8-9 subfamilies (Bouchard *et al.* 2011, Tavakilian & Chevillotte 2021, Nie *et al.* 2021). The subfamily Cerambycinae, perhaps the most hyperdiverse and evolved, constitutes a monophyletic group comprising 11-12,000 species extremely variable in their morphology and behaviour (Napp 1994; Hanks 1999; Rossa & Goczał 2021). Within the Cerambycinae, the type genus *Cerambyx* Linnaeus, 1758, includes 13 species distributed in the western Palearctic realm, of which seven are present in Europe (Bense 1995; Danilevsky 2021; Fauna Europaea 2021). Among them, six species have been reported to date from North Macedonia, namely *Cerambyx* (*Cerambyx*) *carinatus* Küster, 1845, *Cerambyx* (*Cerambyx*) *cerdo* Linnaeus, 1758,

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*Cerambyx (Cerambyx) dux* (Faldermann, 1837), *Cerambyx (Cerambyx) miles* Bonelli, 1812, *Cerambyx (Cerambyx) nodulosus* Germar, 1817 and *Cerambyx (Microcerambyx) scopolii* Fuessly, 1775 (Fauna Europaea 2021; Danilevsky 2021). In this paper we report for the first time the presence of *Cerambyx welensii* (Küster, 1845) in North Macedonia, the only European species that was yet to be recorded in the country.

## Material and methods

The specimens of *C. welensii* reported in the present study were collected with easy entry/difficult exit feeding traps, manufactured with commercial water bottles in which the bottleneck was cut and placed turned around as a funnel (Fig. 1). A 5-mm grid prevented the captured adults from drowning in the bait. Bait to lure insects consisted of a mixture of red wine, vinegar, commercial sugar (2 l + 100 ml + 500 g) and water to make up 5 litres of solution. Traps were fixed in the tree trunk at a height of 1.40–1.60 m, looking for shaded sites, preferably in north exposure, to protect the captured insects from sunlight and to prevent death from overheating (Fig. 1).



**Figure 1.** Feeding trap on a pubescent oak tree

Material examined:

*Cerambyx welensii* (Küster, 1845)

- **Locality:** Tri Krushi, foothills of Kitka Mt.; 41.926931, 21.521504 (WGS84); 450 m a.s.l.

- **Habitat:** Thirty to fifty year old solitary trees and fragmented scrublands of pubescent oak (*Quercus pubescens* Willd.). Degraded thermophilous open oak forest located in a cultural and recreational periurban area close to the locality of Tri Krushi, with a relatively high frequency of people, mainly during the summer period.

- **Dates:** 3-17 July 2020.

- **Collecting method:** Feeding traps.

- **Adults sampled:** 1 ♂ and 4 ♀♀ (voucher/references: WP902 – WP906). Leg.: Aleksandra Cvetkovska-Gjorgjievska, Det.: Luis M. Torres-Vila

In addition to the adults of *C. welensii* reported (n = 5 ex), numerous adults of *C. cerdo* (n = 28 ex) and *C. miles* (n = 36 ex) were also captured in the traps, which represents a frequency for each species of 7, 41 and 52%, respectively.

## Results and discussion

The longhorn beetle *C. welensii* is recorded for the first time from the Republic of North Macedonia. The life history of this saproxylic beetle can be summarized as follows. It is univoltine, with adults flying from late May to early August. Adults are large (25-60 mm long) with a blackish-brown body and show sexual dimorphism (body slightly larger in females and antennae longer in males). Adults feed mainly on sap and tree exudates or on mature fruits if available. Larvae are xylophagous in oak species, although they have also occasionally been reported from other broadleaf trees. Diel activity of adults (feeding, flight, male fights for mates, mating and egg-laying) takes place mainly at dusk and evening. Mated females wander over the host tree probing the bark with the ovipositor and lay eggs into suitable bark crevices and pruning wounds, mainly in sun-exposed trees. After hatching, neonate larvae bore directly into the inner bark and initiate feeding. Larval development usually lasts 2-3 years. Pupation occurs in late summer within a pupal cell in the sapwood. Adults emerge from pupae in the autumn but remain protected within the pupal cell to overwinter in a prereproductive stage until the following year, when they leave the tree trunk in late spring or early summer to resume the biological cycle (Torres-Vila *et al.* 2016, 2017).

*Cerambyx welensii* is a recognised thermophilous species, so that it is frequent in southern Europe and rarer in the centre and north of the continent. In Mediterranean countries, damages caused to trees by *C. welensii* can be very important. Larval galleries bored into sapwood and heartwood along the tree trunk

and main branches may cause severe physiological, mechanical and structural damage, and even tree death. In SW Iberia, the species is considered an emerging pest involved in oak decline (Torres-Vila *et al.* 2016). Reported records in Central Europe are often associated with thermophilous oak forests, open oak woodlands or wood pastures (IUCN 2021), which is consistent with the finding of *C. welensii* in the degraded open oak forest of Tri Krushi reported here. Interestingly, in the nearby locality of Pagarusha (also in the municipality of Drachevo), in a denser pubescent oak forest (Kitka Mts), only *C. cerdo* (n = 39) was captured using the same traps on the same dates.

Our results show that *C. welensii* coexists with the congeneric species *C. cerdo* and *C. miles* in the same open oak forest in North Macedonia. This observation supports that sympatry between *Cerambyx* species is not uncommon (Buse *et al.* 2013; Torres-Vila *et al.* 2017; Torres-Vila & Echevarría-León 2019; IUCN 2021), which in turn raises an interesting underlying ecological and evolutionary scenario (Torres-Vila & Bonal 2019). We are aware that the detection of *C. welensii* in the Republic of North Macedonia could be reasonably expected, since its occurrence in neighbouring countries (except Albania) was already reported (Fauna Europaea 2021). In any case, the new record provided here contributes to complete the known distribution of *C. welensii* in the Balkan Peninsula.

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