

GENUS *CERAMBYX* L., 1758 (COLEOPTERA: CERAMBYCIDAE) IN ROSACEOUS CORRIDORUL JIULUI (ROMANIA)

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Abstract

Coridorul Jiului is a Natura 2000 area located in the south-western part of Romania, benefiting from a climate with sub-Mediterranean influences that favours the presence of thermophilous species of the genus *Cerambyx*. Observations carried out in May-September 2022-2023 led to the identification of four species of *Cerambyx*, out of the five species present in the Romanian fauna: *C. cerdo*, *C. miles*, *C. welensii*, and *C. scopolii*. Although the suitable habitat is represented by forests with secular trees, the species have also been recorded in younger oak habitats, 50, 60 and 70 years old, with prematurely aged trees, due to the present in the area of forests planted on sandy soil that provides a poor nutrient environment for the trees. The species *C. cerdo* recorded the highest numerical abundance values, 154 individuals, compared to 4 and 7 individuals, respectively, for the other three species. The species populations are particularly notable in habitat 91M0 in Dealul Branului-Bălteni (north of the area) and Dâlga (south of the area). Our observations reveal that the oak forests in southwestern Romania are an important reservoir for populations of *Cerambyx* species, contributing to the conservation of longicorns biodiversity under the implementation of appropriate forest management strategies.

Keywords: distribution map, longhorns, saproxylic, South-Western Romania

1. INTRODUCTION

Deforestation practices, which have intensified over the past 200 years across Europe, modern forestry consisting of planting conifers in deciduous forests, and the extraction of dead wood material have led to the degradation of the habitat of an important group of forest insects, the saproxylic species, dependent on dead or dying wood (Speight, 1989; Thomas et al., 2002; Davies, 2008). Seibold et al. (2015) recommends forestry policies that aim to increase the amount of dead wood of large diameter, dead wood of broad-leaved trees, and dead wood in sunny areas, mandatory conditions for the conservation of saproxylic insects. According to Alexander (2004), the presence of saproxylic insects in habitats such as forests, woodlands, parklands, etc. is an indication of a mature, high-quality habitat, and of its stability. Among the species of saproxylic beetles are those of the genus *Cerambyx*. The genus *Cerambyx* is one of the 5,300 known genera of longhorn beetles

in the family Cerambycidae (Coleoptera) (Rossa and Goczał, 2021), with a Western Palaearctic distribution (Vives, 2000). Its taxonomy is considered complex and still unclear, so the number of species is not yet fully clear (Slama, 2015), currently most scientists accepting only 13 species. According to Danilevsky (2025), there are two subgenus, *Cerambyx* Linnaeus, 1758 and *Microcerambyx* Mikšić & Georgijevic, 1973.

In Europe, this genus is known according to 7 species: *C. carinatus* (Küster, 1846), *C. cerdo* Linnaeus, 1758, *C. dux* (Faldermann, 1837), *C. miles* Bonelli, 1812, *C. nodulosus* Germar, 1817, *C. welensii* Küster, 1846, and *C. (Microcerambyx) scopolii* Füssli, 1775 (Danilevsky, 2025). These species are also mentioned in Turkey (Özdikmen and Turgut, 2009).

In Romania, the first mentions of the genus *Cerambyx* date back to the end of the 19th century in Transylvania, in the paper Fauna transsylvanica by Seidlitz (1891). In the collection of Petri (1912) the *C. cerdo* and *C. scopolii* species are present, collected from Transylvania in 1902 and 1905, respectively, along with other species of *Cerambyx* from other geographical areas. Panin and Săvulescu (1961) dedicated an extensive monography to cerambycids, their research being continued in recent decades, and having references to the Cerambycidae fauna from the Oltenia area (Serafim, 1985; Serafim et al., 2004; Serafim and Chimişliu, 2009; 2010).

The purpose of this study is to contribute to the knowledge of the biodiversity of the genus *Cerambyx* in the ROSAC0045 Coridorul Jiului, with aspects regarding the biology and distribution of the populations of these species.

2. MATERIALS AND METHODS

Coridorul Jiului area description

ROSAC0045 Coridorul Jiului with an area of 71,452 ha, covers the territory of two counties, Dolj (73.76%) and Gorj (25.07%), with small areas also present in Olt and Mehedinți counties (Fig. 1). The area's coordinates are 23°16'30.655" E and 44°56'22.79" N, and the altitude ranges between 20 m and 404.9 m. a.s.l.

Methods

The studies were carried out during May – September 2022 - 2023 and consisted of investigating the habitats characteristic of Cerambycidae species, namely deciduous forests. In this area there are forests planted on sandy soil that provides a poor nutrient environment for the trees. The following type of habitats were investigated: 91M0, 91Y0, 91I0, 9170, 91F0, with veteran trees, fallen trees, old trunks, forest roads, paths. Individuals on the trunks were recorded, and their exoskeletons after the end of the flight period. The emergence holes of the longicorns were also analyzed. For the inventory and monitoring of *Cerambyx* species, the recommendations of Iorgu et al. (2015), and De Zan et al. (2017) were used. This protected area has a climate with dominant sub-Mediterranean and temperate continental influences. Geographic coordinates were recorded with a Garmin GPSmap 60 CSx and the GIS data was processed with ArcGIS Pro 3.5.0.

The status of the species was assessed based on the IUCN Red List of Threatened Species.

The identification of species in the genus *Cerambyx* and their nomenclature were carried out in accordance with Panin and Săvulescu (1961), De Zan et al. (2017), and Danilevsky (2025).

The data about the recorded specimens has been presented in the following order: date of observation/ specimens (♀ and ♂; exoskeleton or live/altitude/ locality/GPS coordinates).

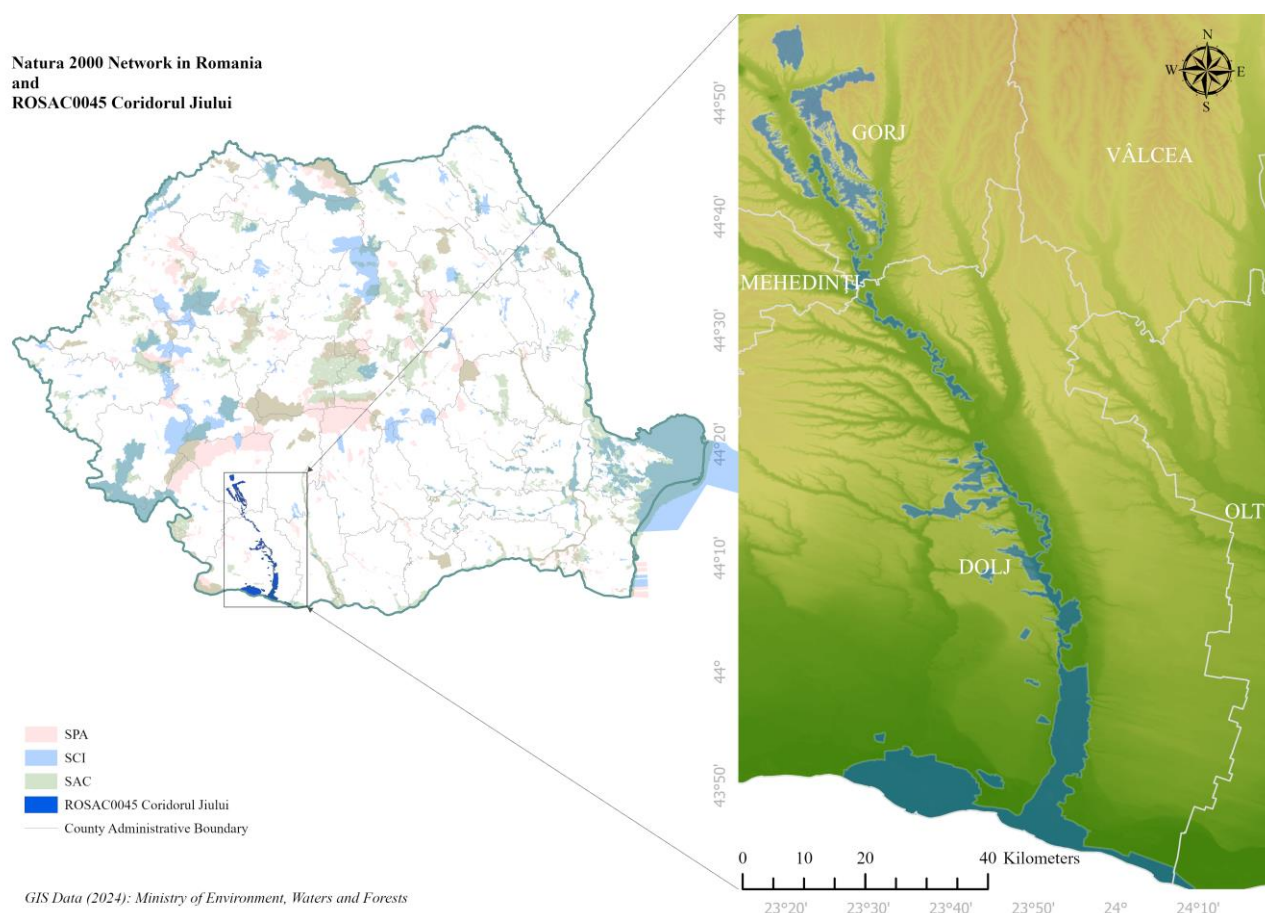


Figure 1. Location of ROSAC0045 Coridorul Jiului

3. RESULTS AND DISCUSSIONS

a. Taxonomic spectrum of species in the genus *Cerambyx*

Five of the 7 species known at European level have been identified in our country, these being the most widespread species of *Cerambyx* in Europe (De Zan et al., 2017). These are mentioned in the Oltenia area by Panin and Săvulescu (1961), Serafim (2009), Serafim and Chimișliu (2010). Regarding the Coridorul Jiului protected area, our observations led to the identification of four species of *Cerambyx* (Table 1). The species *C. nodulosus* was not recorded during the two years of observations, but previous reports date back to 1930, in Băile Herculane reported in the E. Worell collection (Tăușan and Bucșa, 2010), and 1965, in Cireșu (MH) (Serafim, 2009), both locations being in western Oltenia, but outside the study area. The influence of the sub-Mediterranean climate in the area provides favorable conditions for these thermophilous species. *C. cerdo*, *C. miles*, *C. welensii* are classified as Near Threatened in Europe, while *C. scopolii* is listed as Least Concern. *C. nodulosus* is also listed as Near Threatened (Nieto and Alexander, 2010).

Table 1. *Cerambyx* species in Coridorul Jiului

No.	Subfamily	Tribus	Genus	Subgenus	Species known in Oltenia	In Coridorul Jiului
1.	Cerambycinae Latreille, 1802	Cerambycini Latreille, 1804	<i>Cerambyx</i> Linnaeus, 1758	<i>Cerambyx</i> Linnaeus, 1758	<i>C. cerdo</i> Linnaeus, 1758	present
2.					<i>C. miles</i> Bonelli, 1812	present
3.					<i>C. nodulosus</i> Germar, 1817	absent
4.					<i>C. welensii</i> Küster, 1846	present
5.			<i>Microcerambyx</i> Mikšić & Georgijevic, 1973	<i>Microcerambyx</i> Mikšić & Georgijevic, 1973	<i>C. (M) scopolii</i> Füssli, 1775	present

b. Characterization of *Cerambyx* species from Coridorul Jiului

1. *Cerambyx cerdo* Linnaeus 1758 (Fig. 2a)

The species is widespread in Southern and Central Europe, Caucasus and in the Middle East up to northern Iran (De Zan et al., 2017). In Romania, Panin and Săvulescu (1961) reported it throughout the country; it is known its preference for old *Quercus* spp. trees, isolated in clearings.

In Coridorul Jiului area the species was previously reported in the Deleni, Gura Văii, and Gura Motrului forests (Serafim, 1985; Botu, 1998; Serafim et al., 2004, 2009), and was also observed during our research in these areas. In 2022, the species was identified in many forests in the area (Bărbuceanu et al., 2022), and recorded from 2023 in forests in the localities Peșteana Jiu, Olari, Piscuri, Văleni, Costești, Bădești, Pîrîu - Groșerea, Strâmba Jiu, Țânțăreni, Gura Motrului (Gorj County), Murgești, Bucovăț, Palilula, Bratovoești, Criva, Gura Văii, Dâlga, Murta-Colacu, Drănic, Bârza, Bistreț (Dolj County) (Fig. 3a).

Observations over the two years led to the recording of the great capricorn beetle in all habitats with *Quercus* species: 91M0, 91Y0, 91I0, 9170, 91F0, the species being common in the area. The period of activity was highlighted in May-August. The characteristic, ellipsoidal and wide emergence holes, on average 3 cm/1.5 cm, with sawdust present and reddish color of the inner walls (Buse et al. 2007) were observed in suitable habitats investigated throughout the area (Fig. 2b).

Large populations of the species were noted in habitat 91M0 in Dealul Branului-Bălteni, in the north of the area (Fig. 4a), and in the plateau with habitat 91M0, Dâlga, in the south of the area.

Thus, on a 150 m transect in habitat 91M0 in Dâlga on 20.06.2023, 15 individuals of *C. cerdo* were recorded at dusk during the flight period. These two *C. cerdo* reservoirs are of considerable importance for the conservation of the species in this area.

Buse et al. (2007) consider suitable trees to have a sun-exposed trunk with at least 60 cm in diameter, but in certain situations the diameter of the trees is not representative and instead the degree of aging is important.

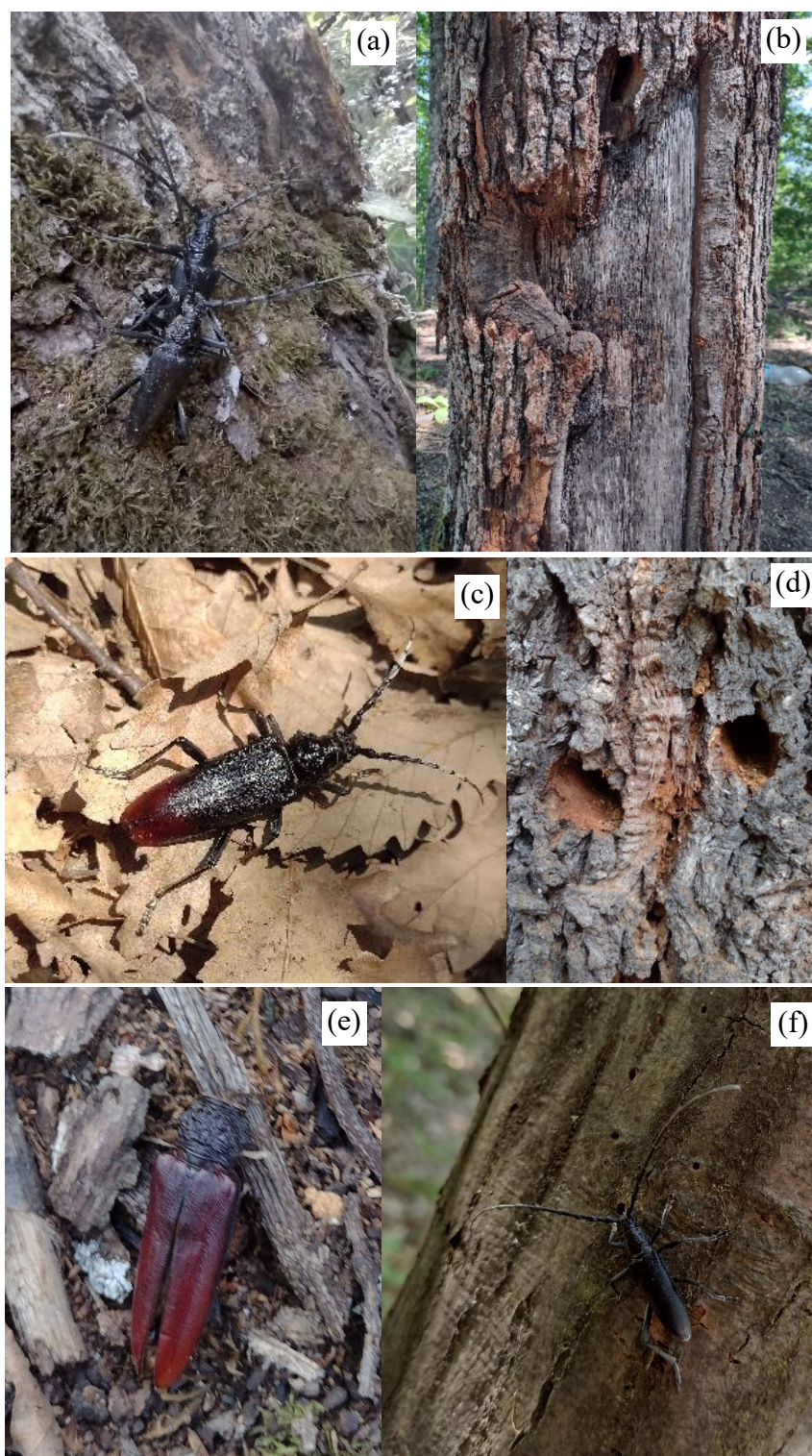


Figure 2. *Cerambyx* species in Coridorul Jiului: a. *C. cerdo* in copula; b. emergence holes of *C. cerdo*; c. *C. miles* female; d. emergence holes of *C. miles*; e. *C. welensii*; f. *C. scopolii*

Thus, in our study, emergence holes and adults of *C. cerdo* were highlighted on prematurely aged *Quercus* trees (oak, holm oak, oak) of 50-70 years old.

This premature aging is due to the fact that many forests in the area are located on sandy soil, which provides a poor nutritional environment for trees, and the association with the more arid climate in the Oltenia area leads to poor tree development. Many of the 50-70 year old trees in this region are prematurely aged trees, with basal branches or dry trunk portions optimal for colonization by this species. Such a situation was recorded in Cursaru Forest located in the northern half of the area in habitat 91M0 with an age of 50 years (Fig. 4b). Marianelli et al. (2011) also report that in central Italy smaller trees are suitable for *C. cerdo*.

2. *Cerambyx miles* Bonelli, 1812 (Fig. 2c)

It is an obligate saproxylic species, xerophilous, polyphagous, which prefers *Quercus* spp. It is distributed from Portugal to Lebanon. In Romania, Panin and Săvulescu (1961) mention it during the period 1953-1960 in several locations in Oltenia (Băile Herculane, Cleanov and Vânu Mare), Braşov, and Piteşti. Many populations in our country are now extinct (Nieto and Alexander, 2010). The species is known in the Coridorul Jiului area, being reported in its southern half, respectively, in the Gura Văii Forest in 1965 (Serafim, 2009), and recently in Bucovăţ, and Leamna (Serafim et al., 2004).

C. miles was only recorded in 2023 in *Quercus* forests in Piscuri-Stricata, Pârâu-Groşerea, Costeşti, in the northern half of the area, and in habitat 91M0, which represents new locations of the species (Fig. 3b). The literature mentions that this rare species in Europe has localized populations (Torres-Vila et al., 2023), and our data contribute to the knowledge of its distribution range.

Distribution in Coridorul Jiului in 2023

1.06.2023/1♂ exoskeleton remains /290 m a.s.l./Piscuri-Stricata Forest (44.80964° N, 23.38490° E); 24.07.2023/♀ /201 m a.s.l./ Pârâu-Groşerea Forest (44.70312° N, 23.48540° E); 24.07.2023/♀ /287 m a.s.l./ Costeşti Forest (44.74591° N, 23.42391° E); 24.07.2023/♀ /262 m a.s.l./ Costeşti Forest (44.74579° N, 23.42372° E).

Females of *C. miles* were recorded in full sun (about 34 - 35 °C) in the afternoon (13.30⁰⁰ - 15⁰⁰) of July 24, in Costeşti and Pârâu-Groşerea forests in habitat 91M0, with 90-year-old *Q. frainetto*. Two active females were observed flying from one oak to another at a low height of 1.5-2 m, and another female on a *Quercus* foliage. Since data in the literature are contradictory regarding their diurnal versus crepuscular/nocturnal behavior, Torres-Vila et al. (2023) studied the activity of the *C. miles* over two years and found that about 94% of the activity of *C. miles* is diurnal. Furthermore, oval-rounded emergence holes belonging to this species were noted (Fig. 2d) on the oak trunks at the mentioned locations.

Although such rounded holes were observed in many forests in the area over the past two years, in the absence of exoskeletons the presence of the species cannot be considered. Rounded holes were also observed in trunks with *C. welensii* exoskeletons nearby, so future studies are needed to highlight whether these emergence holes represent as well distinctive characters for *C. miles*, *C. welensii*, and *C. nodulosus*, as is the case of *C. cerdo*.

C. miles was observed in habitats where the great capricorn beetle is also present.

3. *Cerambyx welensii* Küster, 1845 (= *C. velutinus* Brullé, 1832) (= *Hammaticherus welensii* Küster, 1845) (Fig. 2e)

A xerophilous species of oaks, it is widespread from Spain to Iran (Hoskovec et al., 2025). In Romania it is considered to have important populations in the southwest of the country and poor ones in other regions (Mason et al., 2010). The species was first mentioned in the Oltenia area through specimens collected in 1936 and 1942 from Băile Herculane (CS) belonging to the Worell collection of the Natural History Museum Collections Of Sibiu (Tăușan and Bucșa, 2010). Subsequent reports in the Oltenia area belong to Panin and Săvulescu (1961), Ruicănescu (1992), Serafim and Chimisliu (2010).

The distribution of the species in the area is presented in Fig 3c, the species being already known in the southern half of the area, respectively in Leamna, Bucovăț (Serafim et al., 2004), and Gura Văii (Serafim, 1985, 2009). In 2022, the species was recorded in the Cursari and Bălteni forests (Bărbuceanu et al., 2022), and in 2023 new locations were recorded in the northern part of the area, in the Văleni and Costești forests, habitat 91M0.

Distribution in Coridorul Jiului in 2023

10.07.2023/ exoskeleton /174 m a.s.l./Văleni Forest (44.74660° N, 23.38441° E); 10.07.2023/ exoskeleton remains /192 m a.s.l./Văleni Forest (44.74679° N, 23.38536° E); 10.07.2023/ exoskeleton remains /Costești Forest (44.73076° N, 23.45511° E).

The species was observed in forests where *C. cerdo* was also present, confirmings that it lives in association with the great capricorn beetle. Matings and even hybridizations between individuals of these species have been observed in the forests of SW Spain (Torres-Vila and Bonal, 2019).

4. *Cerambyx scopolii* Füssli, 1775 (Fig. 2f)

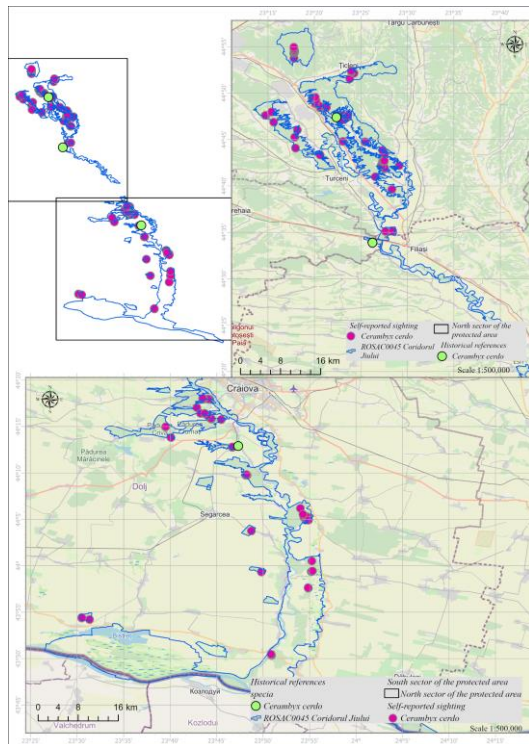
It is a saproxylic species with a stable population in Europe (IUCN). The polyphagous larvae develop in dying or freshly dead standing deciduous trees and fruit trees (Hoskovec et al., 2025).

The species was previously reported in the area in Gura Văii (Botu, 1998; Serafim, 2009). The distribution of the species in the area during the two years of study is presented in Fig. 3d.

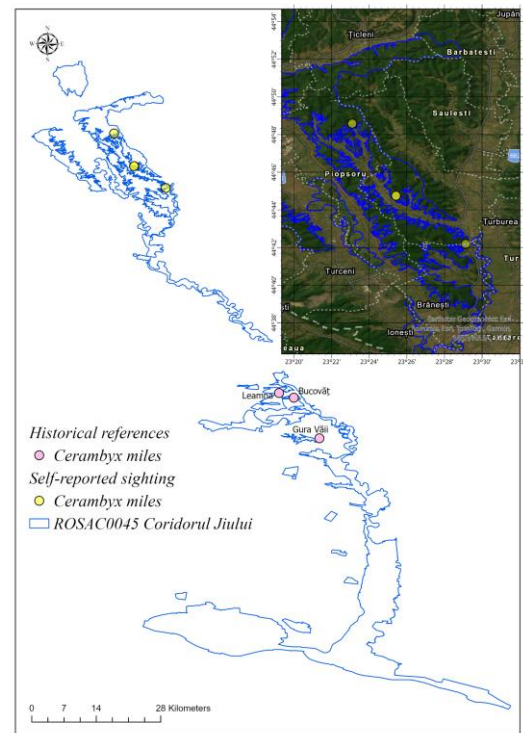
c. Abundance of *Cerambyx* species

Observations in the area during the two years highlighted large abundances of the species *C. cerdo*, the great capricorn beetle being a common presence in the area (Fig. 5). The other three species recorded low abundances, of 4 and 7 individuals, respectively, but round emergence holes were observed in several places near the exoskeletons of *C. miles* and *C. welensii*. So these species, locally, may also have important populations.

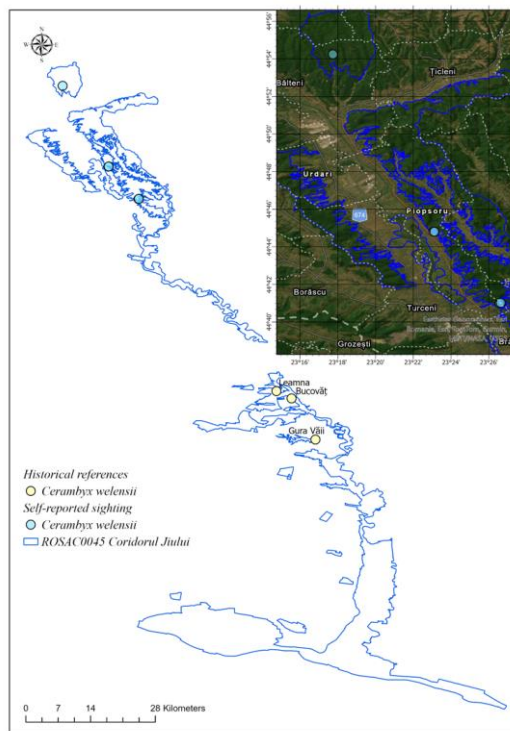
The status of a Natura 2000 protected species and the implicit measures have led to the prosperity of *C. cerdo* populations in some European regions, to the extent that it has come to be perceived as a pest in some places (Torres-Vila, 2017), a perception occasionally expressed by some foresters in Romania. In SW Spain, *C. cerdo* and *C. welensii* are considered responsible for the decline of oak in open oak woodlands, which requires improved forestry practices so that the damaging potential of these species is reduced (Torres-Vila et al., 2022). It must be taken into account that the conservation interest for *C. cerdo* and related species is determined by the essential role of the larvae in the wood degradation process and by the ability to modify their own habitat to create favorable living conditions for other saproxylic invertebrates, including predators and competitors, *C. cerdo* being considered an "ecosystem engineer" (Buse et al., 2008).



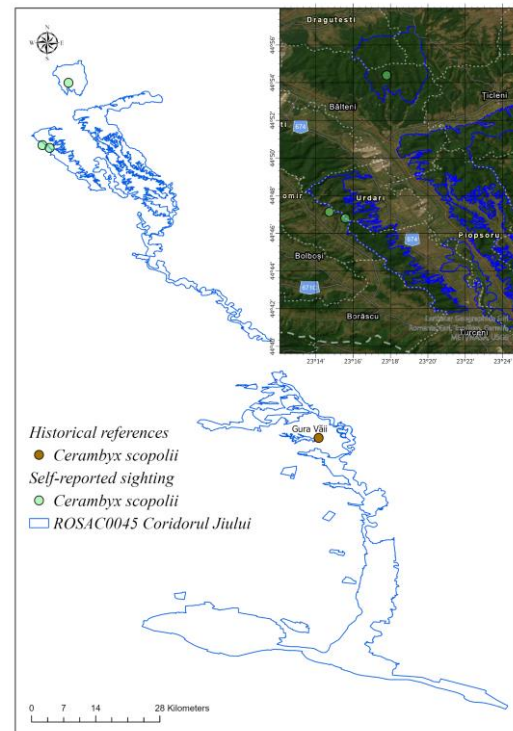
a.



b.



c.



d.

Figure 3. *Cerambyx* species - map of distribution in Coridorul Jiului

a. *C. cerdo*; b. *C. miles*; c. *C. welensii*; d. *C. scopoli*



Figure 4. 91M0 Habitat for *Cerambyx* spp.: a. Bâlteni Forest, June 30, 2022; b. Cursaru Forest, 50 years old trees, May 22, 2022

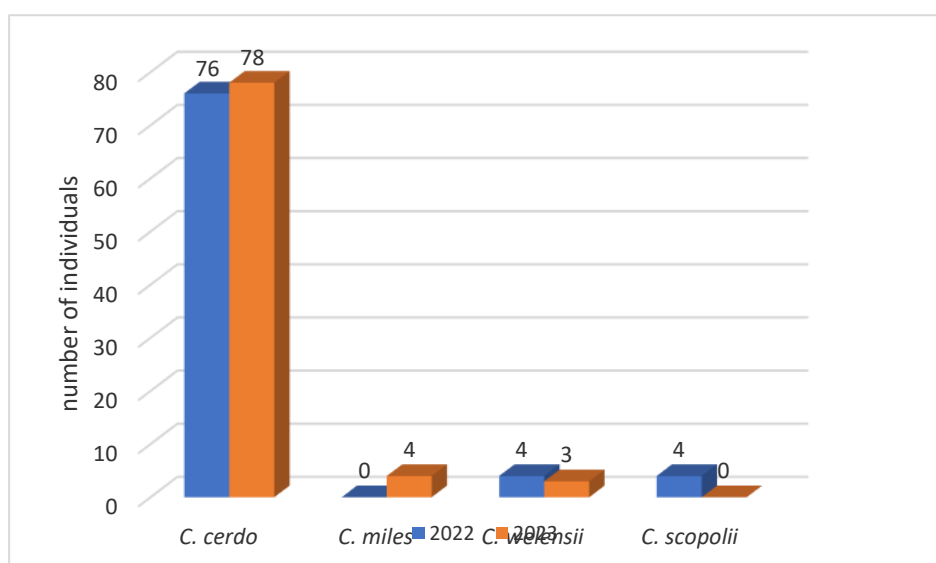


Figure 5. Abundance of *Cerambyx* species in Coridorul Jiului area, 2022-2023

4. CONCLUSIONS

In the Protected Natural Area Coridorul Jiului four species of *Cerambyx* genus were identified: *Cerambyx cerdo*, *C. miles*, *C. welensii*, and *C. scopolii*. The species *C. cerdo*, common in the area, benefits from protected species status, being included in the Natura 2000 network.

The species have also been recorded in younger oak habitats, 50, 60 and 70 years old with prematurely aged trees, in the absence of veteran trees. These saproxylic species dependent on dead wood in various stages of decomposition play an important role in forest ecosystems, thus, our study shows that oak forests in southwestern Romania can constitute an important reservoir for populations of *Cerambyx* species, contributing to the conservation of longicorns biodiversity under the implementation of appropriate forest management strategies.

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