

CUCUJUS CINNABERINUS (SCOPOLI, 1774) (COLEOPTERA: CUCUJIDAE) IN ROSCI0045 CORIDORUL JIULUI, ROMANIA

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Abstract

The protection of the Natura 2000 species *Cucujus cinnaberinus* (Scopoli, 1774), protected by Romanian and European legislation, requires knowledge of distribution, threats and conservation status. In Romania the species is protected in only 9 Natura 2000 areas of the 442 SCI declared until 2021. All the protected areas in which the species is mentioned are located along the Carpathian Arch except ROSCI0135 Pădurea Bârnova – Repedea located in the Central Moldavian Plateau. The identification of the species in ROSCI0045 Coridorul Jiului brings new data about the distribution of the species and its conservation status. Observations on the species in larval stage were made by direct searches in specific habitats in the protected area. In the months of May, August and September 2022, *Cucujus cinnaberinus* was identified in several points along the protected area: Dăbuleni on poplar wood in the Danube River meadow, Foișor on poplar wood in the Jiului meadow, Bratovoiești in poplar wood of the former channels of the meanders Jiului River, Calopăr on ash wood from the Dâlga valley and Turburea on alder wood in the Gilortului meadow. The identification of *Cucujus cinnaberinus* Natura 2000 species requires further monitoring at the site and the implementation of appropriate protection and conservation measures.

Key words: *Cucujus cinnaberinus*, faunistic record, distribution, saproxylic beetle, Natura 2000

INTRODUCTION

The genus *Cucujus* includes 10 species, of which eight are present only in Asia, *C. haematodes* in Eurasia and *C. cinnaberinus* in Europe. *C. cinnaberinus* was described by J. A. Scopoli for the first time under the name *Meloe cinnaberinus* (Scopoli 1763) after a specimen found on a

cabbage plant (Horák, 2008a, Horák & Chobot 2009). Different synonyms of the species are known *Cucujus depressus* Fabricius, 1775, *Cucujus geniculatus* Reitter, 1893, *Cucujus sanguinolentus* (Linnaeus, 1767) (Horák&Chobot 2009, Nieto et al. 2010). *Cucujus cinnaberinus* is a European species being present from

Finland (Uusimaa, Kymi) and France (Sélestat) in west until Ural Mountains in east and from Sweden and Finland in north to Carpath Mountains in south the southernmost points are isolated in Italy – Lazio, Calabria where is extremely rare and localised exclusively within the Sila National Park (Venturio&Pranzini 2021). To the south and southwest of Romania it is reported in isolated locations being considered extinct in some countries (Bosnia and Herzegovina; Bulgaria; Croatia; Montenegro; Serbia) and also to the west of France and Spain. Three localities are known in Bulgaria, two of which have historical mentions (Borovets 1927, Nova Shipka Vill 1949) and in the south-eastern extremity a mention from 2008 near the Razdol Village (Guéorguiev, 2008). In recent years the species has been found in Belgium, being considered a colonization by rapid natural propagation (Thomaes *et al.*, 2020). The species attracted attention on her due to the IUCN Red List Assessments, being considered in the evaluations between 1986-1994 as Endangered (EN), in 1996 as Vulnerable (VU) and since 2010 as Near Threatened (NT) (Niето et al. 2010). The species is listed by Annex II of the Bern Convention and Annex IIa and IVa of the EU Habitats Directive but also in Romanian legislation by OUG 57/2007 Annex Anexa III, IVa. *C. cinnaberinus* has become the flagship species in protection of saproxylic organisms in the European Union (Gutowski et al., 2014, Bełcik et al., 2019) and umbrella species its protection serving to safeguard a wide community of saproxylic organisms (Mazzei et al., 2011; Horák et al., 2012).

The data on the presence of the species in Romania are deficient, being listed in only 8 Natura 2000 areas, all located in the mountainous area along the Carpathian

Arch, except ROSCI0135 Pădurea Bârnova – Repedeia, site located at south of Iași in the crossing zone from the Moldavian Plain towards the Jijia Depression and the Bârlad Plateau. In the last species assessments at EU biogeographical level of every country, made 2018, based on Habitats Directive - Article 17 reporting process, *Cucujus cinnaberinus* is reported in Romania in Alpine region where conservation status is considered favourable (FV) having a range surface of 700 km² and in Continental region with unknown (XX) conservation status and 800 km² range surface.

The observations on the distribution of the species are new for the literature, being also the southernmost points of species distribution in Romania, located outside the Carpathian Mountains, in continental biogeographical region. The presence of the species in the site requires further inventory and establishment of appropriate conservation measures. The protected area ROSCI0045 Coridorul Jiului is located entirely in the continental biogeographical region, the new distribution data and conservation status contributing to reducing the gaps of knowledge of *Cucujus cinnaberinus* in this region.

MATERIALS AND METHODS

Identification of the species at the larva stage was carried out during the inventory of the invertebrates species of ROSCI0045 Coridorul Jiului. Direct searches were carried out under the bark of fallen trees, mainly in the meadow area where the humidity of the wood is high. All observations were made during May-September period, 2022. The bark of decaying logs was removed mechanically, usually at the ends of the logs without exposing the entire trunk, to preserve the

microhabitats of the species. The number of individuals on the discovered surface, the species to which the tree belongs and the geographical coordinates were noted.

RESULTS AND DISCUSSIONS

During field investigations the species was identified in the following locations:

-22.05.2022, Bratovoști, 4W23+RX8 Bratovoști, 44.10204N 23.90496E, 68 m. alt, oak forest in which there are also other woody species ash, alder, poplar; pedunculate oak, common dogwood, field elm, common privet and locust tree; habitat type Natura 2000 91F0 - Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia* along the great rivers (*Ulmenion minoris*);

-27.08.2022, Dăbuleni, P3G8+5JV Sărata, 43.72548889N 24.06655156E, 26 m. alt, black poplar plantation along the Danube river, with the subarbutive layer invaded by *Amorpha fruticosa*; habitat type Natura 2000 92A0 - *Salix alba* and *Populus alba* galleries;

-28.08.2022, Turburea, MG65+4VC Poiana, 44.6603138N 23.509626E, 122 m. alt., alder, on the banks of Gilort river with woody vegetation of alder, poplar, white willow, common dogwood and locust tree; habitat type Natura 2000 92A0 - *Salix alba* and *Populus alba* galleries;

-29.08.2022, Foișor, 4V49+2XV Foișor, 44.10512246N 23.8699246E, 187m. alt., black poplar plantation, common dogwood and locust tree; habitat type Natura 2000 92A0 - *Salix alba* and *Populus alba* galleries;

-15.09.2022, Dâlga River, 5R65+QQC Calopăr, 44.1619357N 23.8093891E, 98 m., alt., in an ash trunk, there are also other woody species like turkey oak, sessile oak, hornbeam, linden tree, common spindle, common privet, common

dogwood and locust tree; habitat type Natura 2000 mixed oak forest. 91M0 - Pannonian-Balkan turkey oak - sessile oak forests.

C. cinnaberinus is associated with moist forest habitats, in mountain areas, located along rivers (Bussler, 2002; Horák, 2008b). The 4 larval stages lives under the bark of dead trees where they feed on fungi. Larval development takes two or more years, the short pupal stage is in July, and adults emerge in late summer, early fall, and adults are active the following spring (Palm 1959, Horák, 2008a). Adults fly actively from the second half of April until the end of May (Schlaghamerský et al., 2008) or June (Bussler, 2002). In all observations from ROSCI0045 Coridorul Jiului mentioned above, the species was identified in the larval stage. On October 15, the location in Bratovoști was rechecked and the species was also found only in larval stage. After Belcik et al., 2019, "suitable habitats strongly correspond to the occurrence of large and well-preserved forest complexes that are characterized by an ecological continuity; ... the mean tree diameter and distance to protected areas were the most important suitable habitat contributors". In the ROSCI0045 Coridorul Jiului, we identified *C. cinnaberinus* predominantly in black poplar plantations, of which those in the Danube meadow are periodically exploited and replanted. Among the five locations, the only forest with centuries-old trees is the one in Bratovoști. Larvae were also found on the trunk of a black elder (*Sambucus nigra* L.) with a small diameter (unpublished observations Domogled Valea Cernei National Park, Prunar). Even if the protected area is of low altitude, with forests arranged predominantly in the form of patches, some without connectivity, the species finds its favorable habitat in forest

areas where dead wood is preserved or is stored for long periods of time and where

moisture accumulates under the bark trunks favoring the development of fungi.

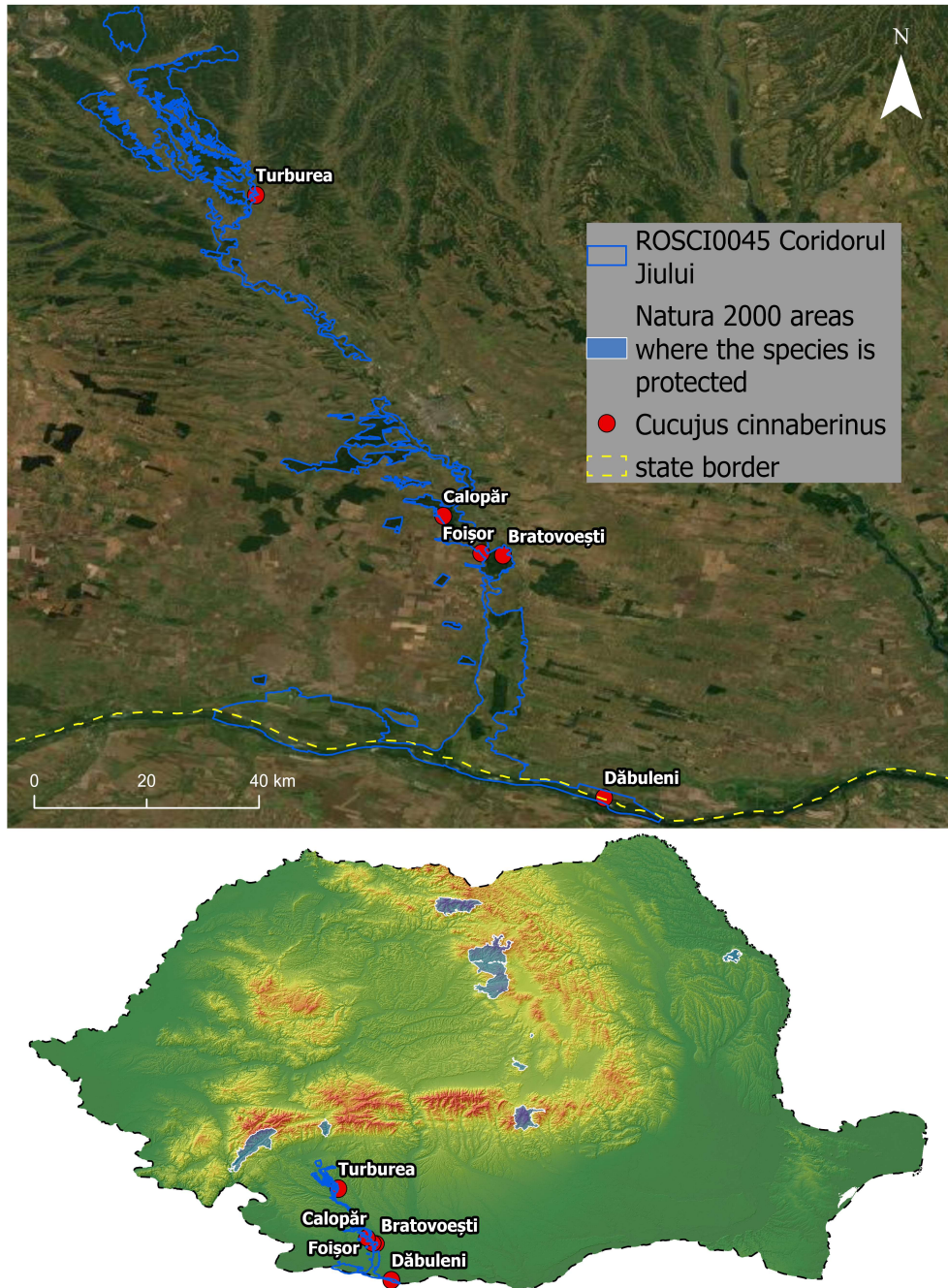


Figure 1. *Cucujus cinnaberinus* in the Natura 2000 areas in Romania



Figure 2. *Cucujus cinnaberinus* in Bratovoești forest

Through a forest management oriented towards the ecological requirements of the species, the protected area will fulfill an important role in the conservation of the species in Romania. In addition to being a flag and umbrella species, *Cucujus cinnaberinus* can also be considered a bioindicator species, especially in the lowland area where the impact of climate change on the microhabitats of the species is much higher. Correlations between mean annual precipitation and population density of the species were made by Mazzei et al, 2011.

CONCLUSIONS

During the observations from May to September 2022, on the invertebrate species in ROSCI0045 Corridorul Jiului, the protected species *Cucujus cinnaberinus* was identified in five locations scattered along the protected area. The species is present both in the natural oak groves with centuries-old trees (Bratovoești) but especially in the black poplar plantations in the meadow area (Dăbuleni, Foișor) or the alders and ash forests along the rivers (Foișor and Calopăr). These are the southernmost observations of the species outside the Carpathian range. In the plain area, the impact of climate change on the

populations of the species is higher than in the alpine areas, so the monitoring of the locations south of Craiova is also important for the collection of data with bioindicator relevance.

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