

NEW LOCALITY OF RARE SAPROXYLIC BEETLE *ENEDREYTES SEPICOLA* (FABRICIUS, 1792) (COLEOPTERA: ANTHRIBIDAE) IN POLAND WITH REMARKS ON THE BIOLOGY AND DISTRIBUTION OF THE SPECIES

Damian Bruder¹, Adrian Łukowski^{2,3}✉

¹Department of Forest Entomology, Poznań University of Life Sciences

Wojska Polskiego 71D, 60-625 Poznań, Poland

²Institute of Dendrology, Polish Academy of Sciences

Parkowa 5, 62-035 Kórnik, Poland

³Department of Game Management and Forest Protection, Poznań University of Life Sciences

Wojska Polskiego 71D, 60-625 Poznań, Poland

ABSTRACT

In Poland, *Enedreytes sepicola* (Coleoptera: Anthribidae) has been reported from places dispersed almost all over the country and occurred it in small numbers everywhere. In this study we described a new locality found in the Nowa Sól Forest District, Regional Directorate of the State Forests in Zielona Góra (UTM: WT53) and we contributed to the knowledge of the distribution of this rare and locally occurring species of the family Anthribidae. Eight beetles were reared from dead branches of hornbeam (*Carpinus betulus*). The locality in the Nowa Sól Forest District is one of the outermost west-situated place of occurrence of this species in Poland, and also the first one reported in the forests of the Lubusz Voivodeship. Furthermore, a brief summary has been made of data concerning the biology, ecology and distribution of this saproxylic species, on the basis of national and foreign literature.

Key words: Anthribidae, Coleoptera, *Enedreytes sepicola*, geographical distribution, new record

INTRODUCTION

Beetles (Coleoptera) are one of the largest orders of insects. They cover about 400 thousand species known to science of which approx. 16% are those belonging to the superfamily of Curculionoidea (Hammond, 1992). Among the beetles occurring in forests, one can distinguish commonly encountered and very rare species from a wide ecological spectrum required for the development of the large-scale forest complexes. The size of a forest determines the occurrence of specific microhabitats in which the mentioned group finds

suitable conditions for its development. These rarely occurring species are often referred to as the relics of natural or primary forests (Borowski, 2007). The presence of the relict species may indicate a relatively low transformation made by a man of the given ecosystem (Borowski, 2007; Tylkowski, 2014). Moreover, beetles are the largest group among the saproxylic insects, which are the organisms obligatory or facultatively connected with the wood of the dead or dying trees (Plewa et al., 2014).

✉ adrian.lukowski@gmail.com

About 1,300 saproxylic beetles have been noted in Poland, what constitutes about 21% of all local Coleoptera (Gutowski, 2006) and their biggest number is connected with the oak wood (Ammer, 1991). As it is reported by Plewa et al. (2014), there is an urgent need for research and observation of saproxylic beetles in connection with their biology and ecology, environmental preferences and in particular with their locality. The primary goal of any inventory of species in a particular area is to create an accurate map of the occurrence based on the obtained data which then provide a basis for developing the extent of occurrence on the national scale (Chrzanowski et al., 2013). The state of knowledge on the insects' locality in the successive Polish regions is still uneven, including those orders which are considered to be well recognized (eg. butterfly; Buszko, 1997). It is therefore important to conduct a comprehensive inventory on a local scale (Łukowski, 2015), especially of the less common taxonomic groups of insects (Borowski and Kieszek, 1999).

The aim of this paper is to contribute to the knowledge of locality in Poland of rarely or locally occurring member of the Anthribidae family: *Enedreytes sepicola*. The paper also presents a synthetic overview of the data concerning biology, ecology and the locality of the above mentioned species with notes concerning the Anthribidae family on the basis of the national and foreign literature.

MATERIAL AND METHODS

Nowa Sól Forest District (Regional Directorate of State Forests in Zielona Góra; Wielkopolsko-Kujawska Lowland) is located on the area of 13 squares in accordance with the UTM system 10 × 10 km: WT23, WT24, WT32, WT33, WT34, WT42, WT43, WT44, WT52, WT53, WT54, WT63, WT64. Field studies were ultimately carried out only within a UTM square: WT53. The data were collected in 2014 and 2015 during which a variety of habitats within the forest district were penetrated in the search of places with a lot of dead wood. In December 2014, the initial inventories were carried out in order to select the research positions. The surface in the Odra Forestry (division and separation: 232n) was selected. The share of oaks in this separation is 90% (146 years old), and hornbeam

covers the remaining area (103 years old). In addition, it is the Natura 2000 – Habitats Directive “Nowosolska Odra Valley” code no: PLH080014 and the bird area Natura 2000 “Central Odra River Valley” code no: PLB080004. The nearest village is Siedlisko.

Dead branches of oak and hornbeam were randomly collected on the above mentioned surface on January 31, 2015. They were placed in breeding tubes maintaining adequate moisture necessary for the development of the wood decaying fungi. The collected plant material was stored at room temperature. The chosen material at its thickest point ranged from 2 to 2.5 cm in diameter. The branches were kept in the tubes until May 2015. The bred insects were identified to the rank of species. The specimens were prepared and then their gender was determined. The collected, as the result of the research, evidence material does not contain species protected by law and is currently deposited in the collection of the main author. Naming and systematic arrangement were adopted in accordance to Wanat and Mokrzycki (2005).

RESULTS AND DISCUSSION

Enedreytes sepicola Fabricius, 1792 (Fig. 1) has been found in the discussed area among many widespread species of beetles. From the obtained plant material



Fig. 1. Male of *Enedreytes sepicola* (Fabricius, 1792) from D. Bruder's collection (photo by R. Witkowski)

Rys. 1. Samiec *Enedreytes sepicola* (Fabricius, 1792) z kolekcji D. Brudera (fot. R. Witkowski)

8 *E. sepicola* (5♂ and 3♀) specimen were reared. Imagines appeared from 17th to 23rd March 2015 (17th March 2 exx.; 19th March 2 exx.; 21st March 1 ex.; 22nd March 2 exx.; 23rd March 1 ex.). All grown specimens come from 3 branches of hornbeam *Carpinus betulus* L. (Fig. 2). The locality of this species in the Nowa Sól Forest District is one of the outermost to the west-situated places of existence in Poland and it is also its first finding in the woods of the Lubuskie Voivodeship. This observation confirmed its presence on the area of the Wielkopolska-Kujawy Lowland.

The Anthribidae Billberg family belongs to the Polyphaga suborder within it to the Curculionoidea superfamily. The phylogeny of the Curculionoidea superfamily shows that the Anthribidae are the primal group of weevils (Marvaldi et al., 2002; Marvaldi et al., 2009). This family is characterized by a great morphological and ecological diversity. Its global diversity is associated with mycetophagy of its larvae and adults develop mainly on wood-decaying fungi

of the Ascomycota type (Holloway, 1982; Oberprieler et al., 2007), which is rare among beetles as they generally prefer different groups of the Basidiomycetes (Basidiomycota) type. The locality of Anthribidae covers the whole Southern Europe, Central and Eastern Asia, Southern Africa, Central and Northern America, Australia and New Zealand. There are 3860 species known (in 1989: 3000 species were approximately known; Cmoluch, 1989) which homeland are mainly tropical countries (Rheinheimer, 2004). In Central Europe, the family is represented by about 30 species out of which 23 are found in Poland (Cmoluch, 1989; Wanat and Mokrzycki, 2005). However, Burakowski et al. (1992) indicates that *Ulorhinus bilineatus* Germar was vaguely disclosed from Silesia over a hundred years ago probably on the basis of an erroneous marking of the specimen. Therefore, it can be assumed that 22 species of the Anthribidae family have been recorded reliably on the Polish territory (Stachowiak, 2002).



Fig. 2. Feeding ground of *Enedreytes sepicola* (Fabricius, 1792) on common hornbeam (*Carpinus betulus* L.) with imago exit holes (photo by D. Bruder)

Rys. 2. Żerowisko *Enedreytes sepicola* (Fabricius, 1792) na grabie pospolitym (*Carpinus betulus* L.) z widocznymi otworami wylotowymi imagines (fot. D. Bruder)

The basic distinguishing features of *Enedreytes* Schoenh genus are: pronotum with two tufts of raised hair and slightly wavy but pronounced rib in its back part and eyes set very wide apart. Beetles of this kind are polyphags and they feed on trees and shrubs of the following families: Betulaceae, Fagaceae, Salicaceae and Hippocastanaceae. In Central Europe, the genus *Enedreytes* is represented by one species, *E. sepicola* Fabricius (= *Pseudeuparius sepicola*; Cmoluch, 1989). *Enedreytes sepicola* (Fig. 1), as the mycetophagic species growing at the cost of mycelium overgrowing wood, has a generally long period of imagines appearance which is observed from April to September. It can be assumed that this species, like the majority of national representatives of this family, reveals exorbitant thermal preferences and the peak of their appearance falls in the summer months (Wanat et al., 2011). Larvae of *E. sepicola* are obligatorily associated with the occurrence of dead wood and develop in the rotting branches of various deciduous trees. As the main host plant species of larvae have been given oak *Quercus* L. (Wanat et al., 2011; Widerberg et al., 2012; Plewa et al., 2014), and occasional species such as beech *Fagus* L., chestnut *Castanea* Mill. or hornbeam *Carpinus* L. (Delbol, 2013).

The species was disclosed in majority of European countries, ie. Austria (Holzinger 2014), Belgium (Delbol, 2013), Bulgaria (Löbl and Smetana, 2011), Croatia (Löbl and Smetana, 2011), the Czech Republic (Nakládal, 2011), Denmark (Löbl and Smetana, 2011), France (Löbl and Smetana, 2011), Great Britain (Löbl and Smetana, 2011), Germany (Büche and Möller, 2005), Georgia (Löbl and Smetana, 2011), Hungary (György, 2006), Italy (Löbl and Smetana, 2011), Luxembourg (Braunert, 2009), the Netherlands (Heijerman, 1993), Poland (Wanat and Mokrzycki, 2005), Portugal (Löbl and Smetana, 2011), Serbia (Löbl and Smetana, 2011), Slovakia (Cunev and Majzlan, 1998), Spain (Alonso-Zarazaga et al., 2004), Russia: South European Territory (Löbl and Smetana, 2011), Sweden (Widerberg et al., 2012), Switzerland (Löbl and Smetana, 2011), Turkey (Löbl and Smetana, 2011) and Ukraine (Löbl and Smetana, 2011). In some countries, it was included in the red list in the view of its rare occurrence where e.g. in the Czech Republic and Germany it received the EN category (*endangered*; Büche and Möller, 2005; Nakládal, 2011), and in Sweden the NT category (*near threatened*; Widerberg et al., 2012). In Poland this species is

rarely met usually in limited quantity what is indirectly confirmed by a relatively small number of published faunal reports on them and a small number of specimens in entomological collections. However, Wanat et al. (2011) claim that such a belief about some beetles from the Anthribidae family may prove to be incorrect due to their secretive lifestyle and the specific biology which results in a very local presence in the area. The fact that they have never been the subject of intense faunal study and that they are generally ignored in the cooperative publications about different groups of weevils should be taken into account.

The current locality of *E. sepicola* in Poland was set out (Fig. 3) on the basis of the review of the literature data, as well as of the online database (Biodiversity Map – National Biodiversity Information Network). In Poland, this species was usually observed in small numbers in the central and southwestern parts of the country. The biggest number of data regards the locality of this species in the Wielkopolska-Kujawy Lowlands. It was last recorded by the research teams: Wanat et al. (2011) and Plewa et al. (2014) always in small numbers. Previously, it was reported in this area by other authors, such as: Schumann (1908), Szulczewski (1922), Bałazy and Michalski (1982; 1984), Cmoluch (1989) and Bałazy et al. (1989). It was also quite often registered in the Mazowsze Lowland: in the Rogów Forest District (Borowski and Kieszek, 1999) and in the Puławy Forest District (Plewa et al., 2014) and in the Kampinos National Park (Marczak and Masiarz, 2013). In addition, there are stable populations on the periphery of the main coverage of *E. sepicola* around Przemyśl (Trella, 1930; Cmoluch, 1989; Burakowski et al., 1992) and on the Baltic seacoast, in the areas of Puck (Węgrzecki, 1932; Cmoluch, 1989) and Elbląg (Cmoluch, 1989). Only historical data exist for the positions in the area of Silesia (Weigel, 1806; Kuhnt, 1912; Cmoluch, 1989), Lower Silesia (Schummel, 1847; Leder, 1872 Polentz, 1949), and the Carpathians (Nowicki, 1873).

The paper presents the summary of current knowledge about rare recorded beetle species *Enedreytes sepicola*. So far, the available information about the range of occurrence and biology of this species is still insufficient to accurately determine the number and locality in our country. In most cases, the existence is usually confirmed on the basis of the observations of a few individuals. This work completed the state

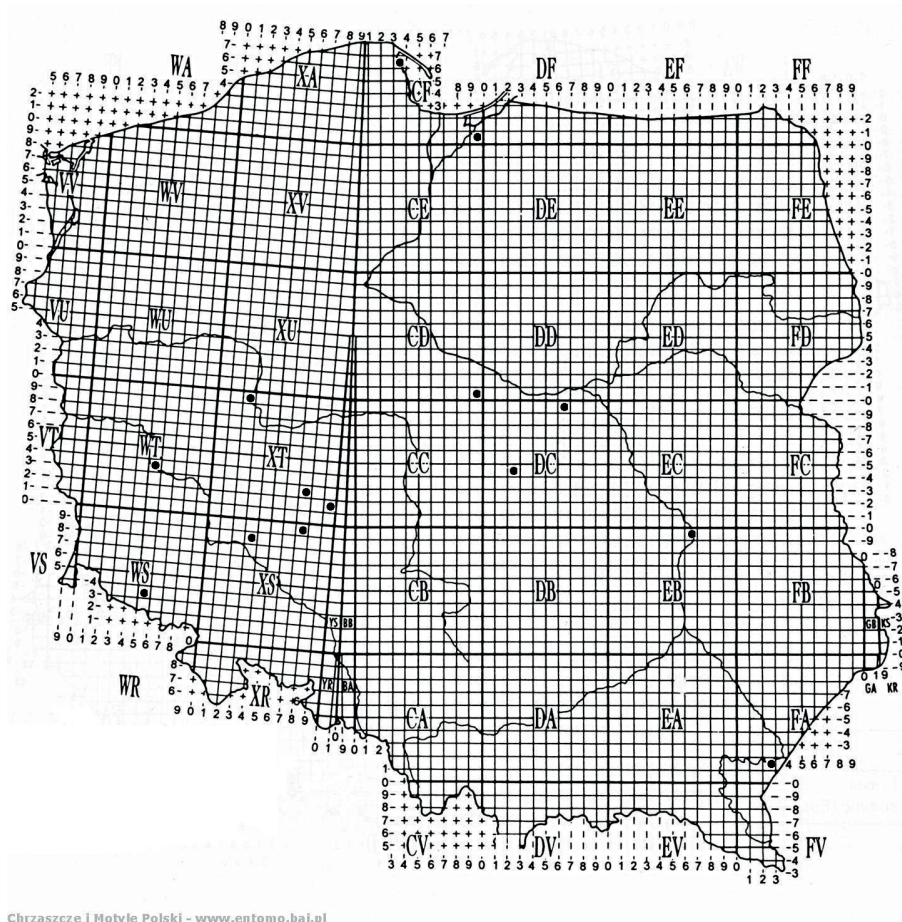


Fig. 3. Distribution of *Enedreytes sepicola* in Poland with the new locality (UTM: WT53) (www.entomo.bai.pl)

Rys. 3. Rozmieszczenie *Enedreytes sepicola* w Polsce wraz z nowym stanowiskiem (UTM: WT53) (www.entomo.bai.pl)

of knowledge about the locality of this species in Poland with a new position in the Nowa Sól Forest District. However, the current data give us no more than a rough idea of the possible locality of this species, as well as they do not inform about the yearly number of the individual populations.

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NOWE STANOWISKO RZADKIEGO SAPROKSYLICZNEGO CHRZĄSZCZA *ENEDREYTES SEPICOLA* (FABRICIUS, 1792) (COLEOPTERA: ANTHRIBIDAE) W POLSCE WRAZ Z UWAGAMI O BIOLOGII I ROZMIESZCZENIU GATUNKU

ABSTRAKT

Dotychczas w Polsce *Enedreytes sepicola* (Coleoptera: Anthribidae) został wykazany na miejscach rozproszonych niemal w całym kraju i wszędzie występował nielicznie. W pracy zebrano dane o występowaniu tego rzadko i lokalnie występującego przedstawiciela rodziny kobielatkowatych oraz opisano nowe stanowisko z Nadleśnictwa Nowa Sól w RDLP Zielona Góra. Osiem chrząszczy (5♂ i 3♀) zostało wyhodowanych w martwych gałęziach grabu pospolitego (*Carpinus betulus*). Stanowisko na terenie nadleśnictwa jest jednym z najdalej wysuniętych na zachód miejsc występowania gatunku na terenie Polski, a zarazem jest pierwszym jego stwierdzeniem w lasach województwa lubuskiego. Ponadto na podstawie literatury krajowej i zagranicznej przeprowadzono syntetyczny przegląd danych dotyczący biologii, ekologii i rozmieszczenia tego saproksylicznego gatunku.

Słowa kluczowe: Anthribidae, Coleoptera, *Enedreytes sepicola*, nowe stanowisko rozmieszczenie geograficzne