

On the occurrence of *Eubria palustris* (GERMAR, 1818)  
(Coleoptera: Psephenidae) in Poland

O występowaniu *Eubria palustris* (GERMAR, 1818)  
(Coleoptera: Psephenidae) w Polsce

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**ABSTRACT:** The present paper summarizes data on the occurrence of *Eubria palustris* (GERM.) in Poland. So far, the species has been recorded from 25 localities. Based on author's own data and museum collections, 26 new sites are listed, including the first records from the Masovian Lowland, the Kraków-Wieluń Upland, the Western Beskid Mts. and the Pieniny Mts. Altogether, the data cover 18 (out of 25) regions proposed in the Catalogue of Polish Fauna and 42 UTM 10×10km squares. The findings are concentrated in the mountains and uplands of southern Poland and in northern lake districts; their locations coincide with the occurrence of calcium-rich springs. Contemporary data (after 1975) are from only 9 localities in 7 regions. It is concluded that *E. palustris* is rare in Poland and currently shows signs of regression. It is postulated that the species should be registered in the Red List of Polish beetles under EN (endangered) category and included in a comprehensive inventory programme.

**KEY WORDS:** Coleoptera, Psephenidae, *Eubria palustris*, new records, distribution, endangered species, Poland.

## Introduction

*Eubria palustris* (GERMAR, 1818) is the only species of *Eubria* LATREILLE, 1829 and Psephenidae LACORDAIRE, 1854, occurring in Europe. It is

widely distributed: from Spain to Western Siberia and from Italy to Southern Scandinavia (ALONZO-ZARAZAGA, JÄCH 2004; JÄCH et al. 2006).

Knowledge of the occurrence of *Eubria palustris* in Poland is fragmentary. Older data, although coming from as many as 13 regions (BURAKOWSKI et al. 1983), are too general and additionally hardly available since they are scattered in many obscure papers. After the publication of the Catalogue of Polish Fauna (BURAKOWSKI et al. 1983) the species was recorded only once – in the Bieszczady Mts. (BOROWIEC, KANIA 1995). It is not clear whether this fact resulted from inadequate research or a possible regression of populations. However, in many countries *E. palustris* was recognized as a species with a high risk of extinction (e.g. BINOT et al. 1998; BOUKAL et al. 2005; JÖRUM 2007). This situation prompted us to carry out the present study, in which we summarize available literature information, supplemented with previously unpublished data. We also make an attempt to assess the situation of *Eubria palustris* in Poland and identify threats to its habitats and populations.

## Methods and material

The presented data come from three sources:

1. Literature data and voucher specimens of previous authors were verified;
2. A survey of national museum collections was carried out, yielding over 80 specimens;
3. Specimens and data from author's collections and provided by other specialists were used. This included entomological and hydrobiological surveys conducted in various regions of Poland in years 1974–2009 (17 specimens).

Division of Poland into regions after Catalogue of Polish Fauna (BURAKOWSKI i in. 1973).

Symbols and abbreviations used in the text: \* – published data; ~ – approximate coordinates; coll. – collection; CR – critically endangered; cult. – reared; det. – identified; ex. – specimen (imago); h.sc. – hydrobiological scoop; ISEZ – Museum of Natural History, Institute of Systematic and Evolution of Animals, Polish Academy of Sciences, Kraków; leg. – collected; MIZ – Museum and Institute of Zoology, Polish Academy of Sciences, Warszawa; MNHW – Museum of Natural History, University of Wrocław, Wrocław; res. – nature reserve; s.n. – sweeping net; USMB – Upper Silesian Museum, Bytom; vic. – vicinity; VU – vulnerable.

## Results

A detailed list of findings of *Eubria palustris* in Poland is presented below (historical geographical names originally used on labels or in cited references are given in square brackets).

- Baltic Coast (Pobrzeże Bałtyku): Gdańsk [Danzig] (CF42), 3 ex., MIZ; Zaleskie [Saleske]\* (XA14), on marsh plants, infrequent (LÜLLWITZ 1916; there are three specimens in MIZ labeled “Coeslin / Lüllwitz”, they are probably voucher specimens collected in the town of Zaleskie).
- Pomeranian Lake District (Pojezierze Pomorskie): Leżno [Lessen bei Danzig]\* (CF32) (DOMMER 1850; LENTZ 1857, 1879; HORION 1955); Szczecin [Stettin]\* (VV62) (HORION 1955).
- Masurian Lake District (Pojezierze Mazurskie): Dąbrówno [Gilgenburg]\* (DE32) (LENTZ 1879; HORION 1955; BERCIO, FOLWACZNY 1979); Judyty [Juditten]\* (DF91) (VORBRINGER 1902; BERCIO, FOLWACZNY 1979); Ma-lesowizna-Turtul, on the shore of Turtul Pond (FF11), 23 VI 2006 – 1 ex., leg., det. et coll. K. KOMOSIŃSKI.
- Wielkopolska-Kujawy Lowland (Nizina Wielkopolsko-Kujawska): Gorzów Wielkopolski (WU14), alluvial alder-ash forest in the Czechówek park, spring systems with traces of a calcareous precipitation, 27 VI 2009 – 5 ex. (s.n.), leg. R. RUTA; Głogów [Glogau]\* (WT72) (LETZNER 1871, 1889; GERHARDT 1910).
- Masovian Lowland (Nizina Mazowiecka): Otwock (EC27), 28 VII 1914 – 1 ex., leg. Sz. TENENBAUM, MIZ; Pionki vic., ”Brzeźniczka” res. (EC30), 19 VII 2004 – 1 ex. from underbrush (s.n.), leg. et coll. M. MIŁKOWSKI.
- Lower Silesia (Dolny Śląsk): Oława [Ohlau]\* (XS64) (LETZNER 1871, 1889; GERHARDT 1910); Wrocław [Breslau]\* (XS46) (LETZNER 1871, 1889; GERHARDT 1910); Legnica [Liegnitz]\* (WS87) (LETZNER 1871, 1889; GERHARDT 1910); Świdnica [Schweidnitz]\* (XS03) (LETZNER 1889; GERHARDT 1910); Paczków [Patschkau]\* (XR49) (LETZNER 1889); Wałbrzych vic. [Waldenb. Geb.]\* (~WS92) (LETZNER 1889; GERHARDT 1910).
- Upper Silesia (Górny Śląsk): Gliwice-Łabędy [Laband, OS] (CA38), forest stream, 3 VII 1939 – 1 ex., leg. H. NOWOTNY, USMB; ”Łęczok” res. [Lenczokwald]\* (CA05), moist meadow (s.n.), 17 VI 1854 (ROGER 1856; LETZNER 1871, 1889; GERHARDT 1910); Chełmek (CA75), 12 VI 1900 – 1 ex., leg. S. STOBIECKI, ISEZ.
- Kraków-Wieluń Upland (Wyżyna Krakowsko-Wieluńska): Kraków - Wola Justowska (DA14), 14 V 1983 – 1 ex., leg. J. K. MŁYNARSKI, ISEZ.
- Świętokrzyskie Mts. (Góry Świętokrzyskie): Bodzentyn\* (DB94) (JAKOBSON 1904).

- Roztocze Upland (Roztocze): Zwierzyniec\* (FB30), 23 VII 1911 – 1 ex., leg. Sz. TENENBAUM, MIZ (TENENBAUM 1913); Bondyż (FB40), spring stretch of the River Szum, 14 V 1974, 1 larva (h.sc.), leg. W. KOWALIK, det. et coll. P. BUCZYŃSKI.
- Western Sudety Mts. (Sudety Zachodnie): Kaczorów [Ketschdorf]\* (WS64) (GERHARDT 1898, GERHARDT 1910); Wleń [Lähn]\* (WS45) (GERHARDT 1910); Bukowiec [Buchwald]\* (WS53) (GERHARDT 1910); Michałowice [Kiesewald]\* (WS43) (KOLBE 1913; 3 voucher specimens in MNHW); Świeradów Zdrój [Bad Flinsberg]\* (WS23) (HORION 1955); Kłodzko vic. [Grafschaft Glatz]\* (~XR18, assignment to the region after BURAKOWSKI et al. 1983, exact location of the record unknown) (LETZNER 1871, 1889; GERHARDT 1910).
- Eastern Sudety Mts. (Sudety Wschodnie): Kłodzko [Glatz]\* (~XR18, assignment to the region after BURAKOWSKI et al. 1983, exact location of the record unknown), on moist meadows, not rare, VII–IX (ZEBE 1852).
- Nowotarska Valley (Kotlina Nowotarska): Zakopane vic.\* (DV26) (ŁOMNICKI 1886); Zakopane (DV26), at the Cichy stream, VII 1913 – 1 ex., leg. E. MAZUR, MIZ.
- Western Beskid Mts. (Beskid Zachodni): Rytro (DV78), 6 VII 1929 – 2 exx., leg. Sz. TENENBAUM, MIZ; Wieliczka - Krzyszkowice (DA23), Krzyszkowicki Forest, 19 VI 1880 – 1 ex., leg. S. STOBIECKI, ISEZ; Wrząsowice (DA23), 14 VI 1898 – 4 exx., leg. S. STOBIECKI, ISEZ.
- Eastern Beskid Mts. (Beskid Wschodni): Arłamów, "Turnica" res.\* (FV19) (TRELLA 1925, 1938; in T. TRELLA's collection in ISEZ there are 31 specimens labeled "Przemyśl vicinity", probably some of them come from Turnica); Huta Polańska (EV47), 21 VII 1990 – 4 exx., moist meadow (s.n.), leg. D. KUBISZ; Brzozów - Podlesie (EA70), 9 VII 2004 – 1 ex., herb communities at the stream (s.n.), leg., det. et coll. D. TWARDY.
- Bieszczady Mts. (Bieszczady): Wetlina PGR\* (FV04), the vicinity of horse station of Nature Protection Guard (BOROWIEC, KANIA 1995); springs between Połonina Wetlińska and Smerek (FV04), 22 VII 1967 – 3 exx., leg. R. BIELAWSKI, MIZ; Połonina Wetlińska (FV04/14), by a spring, 22 VII 1967 – 13 exx., leg. M. MROCZKOWSKI, 4 exx., leg. B. BURAKOWSKI, MIZ; Przysłop (FV04) ad Bereżki, 4 XI 1967 – 1 larva (adult emerged 27 IV 1968), leg. et cult. B. BURAKOWSKI, MIZ; Cisna (EV95), 12 VII 1963 – 1 ex., A. RIEDEL, MIZ; Habkowce (EV95), 25 VII 1969 – 3 exx., MIZ; Bystre (EV96), 26 VI 2009 – 4 exx. (s.n.), leg. R. RUTA.
- Pieniny Mts. (Pieniny): Pieniński Stream (DV57), 6 VII 1928 – 5 exx., leg. Sz. TENENBAUM, MIZ; Krościenko (DV57), 12 VII 1928 – 4 exx., 23 VII 1928 – 6 exx., 7 VII 1939 – 1 ex., leg. Sz. TENENBAUM, MIZ; Wymiarki (DV57),

- 20 VII 1939 – 5 exx. on marsh, leg. Sz. TENENBAUM, MIZ; Sokolica (DV57), 10 VII 1928 – 2 exx., leg. Sz. TENENBAUM, MIZ; Kras (DV57), 15 VII 1929 – 1 ex., leg. Sz. TENENBAUM, MIZ.
- Tatra Mts. (Tatry): Biały Stream Valley (DV25), on meadow, 14 VII 1927 – 1 ex., leg. Sz. TENENBAUM, MIZ.

The list presented above includes 51 sites: 25 published previously and 26 unpublished. They are located in 18 regions (Fig.). We report *E. palustris* for the first time from the Masovian Lowland, the Kraków-Wieluń Upland, the Western Beskid Mts. and the Pieniny Mts.



Fig. Distribution of *Eubria palustris* in Poland (circles: UTM squares with data from before 1950, squares: 1951–1975, triangles: after the year 1976)

Ryc. Rozmieszczenie *Eubria palustris* w Polsce (kółka: kwadraty UTM ze stanowiskami z okresu do 1950 r., kwadraty: 1951–1975, trójkąty: po 1976 r.)

Altogether, the studied species has been recorded in Poland from 42 10×10 UTM squares. Vast majority of data comes from before 1951 (31 squares), and a large part even from the 19th century. In the years 1951–1975 *E. palustris* was recorded from four squares, after 1976 – from eight. Contemporary data are limited to six regions: the Masurian Lake District (1 site), the Wielkopolska-Kujawy Lowland (1), the Masovian Lowland (1), the Kraków-Wieluń Upland (1), the Eastern Beskid Mts. (2) and the Bieszczady Mts. (2). Both historical (from the years 1951–1975) and contemporary data come only from the square FV04 (vicinities of Wetlina in Bieszczady Mts.).

## Discussion

*Eubria palustris* occurs from lowlands to mountains, reaching the altitude of about 1700 m above sea level. It inhabits small streams, ponds, little water bodies located in forests, marshy meadows and marshy alder groves, boggy meadows, peat bogs and moist mountainous meadows. The larvae live in waters with a high content of calcium, where they stay under stones and among mosses (they have a negative phototaxis). They feed on algae, mainly diatoms. The adults occur in June and July among moist mosses and on waterside herbs and bushes (BOUKAL 2005; BURAKOWSKI et al. 1983; KLAUSNITZER 1996b; KOCH 1989). Because of habitat requirements of larvae, *E. palustris* is regarded as a beetle typical of upper parts of streams and springs, crenophile or crenobiont (GIUDICELLI, TALIN 1977; KLAUSNITZER 1996b; STAUDACHER, FÜREDER 2007).

The localities where *Eubria palustris* has been found are situated in a large part of Poland, however the majority is concentrated in the southern strip of highlands and mountains, here and there reaching the northern strip of uplands and lake districts. Only a few sites are known from central Poland (Fig.). Sweeping habitats suitable for *E. palustris* (including springs, marshes and swamps) is the collecting method commonly used in coleopterology, so habitats of *E. palustris* have been regularly penetrated. Furthermore, a very peculiar larva of this species (KLAUSNITZER 1996a) ought to be mentioned in hydrobiological studies e.g. in numerous papers devoted to monitoring of running waters. Even though in such studies the material is often identified to the family level, it is easy to recognize *E. palustris* as the only representative of Psephenidae. Hence, it is highly plausible that even during historical periods *E. palustris* has been rare in many regions, which results from scattered arrangement of potential habitats – locations of the findings, to a large extent, corresponds with the occurrence of calcium-rich spring systems (WOŁEJKO 2004).

Also a low number of contemporary findings presumably results from the truly rare occurrence of *Eubria palustris*. Its optimal habitats are prone to degradation, which has already been observed in many regions of Poland (PAWLACZYK et al. 2001; WOŁEJKO 2004). The species' vanishing in the Czech Republic is explained by changes of water conditions and forest structures, where this beetle usually occurs (BOUKAL 2005). It is also sensitive to organic pollution; its saprobity score (= Saprobie-Score) in the scale from 0 to 200 is 25 (OFENBÖCK et al. 2008).

In the described situation it is surprising that *Eubria palustris* was not included in the Red List of Polish Beetles – especially when the number of known sites was an important criterion in the risk estimation (PAWŁOWSKI et al. 2002). *Eubria palustris* was placed in red lists or red books in other countries, e.g. Germany (category “3” = VU), the Czech Republic (CR), Denmark (VU) and Great Britain (“RDB3” = Rare) (BINOT et al. 1998; BOUKAL 2005; FOSTER 2000; JÖRUM 2007) despite the fact that sometimes data from these countries were more abundant than from Poland. It seems necessary to place *E. palustris* in next editions of the national red list under the EN category. The red list criteria – “species facing a very high risk of extinction due to small populations, fragmented, insular range and/or a quick rate of population decline” (GŁOWACIŃSKI, NOWACKI 2004) – are certainly met. It is also worth considering a programme of the species survey, especially on the most promising wetlands in mountains, highlands and uplands of southern part of the country, and lake districts of northern Poland. A national monitoring of the quality of surface waters can also be a valuable source of data. The larvae of *E. palustris* are on the operational list of the macrozoobentos taxa (PRZEWOŻNY 2006), therefore they should be identified to the species level in every monitoring event.

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### STRESZCZENIE

*Eubria palustris* to jedyny przedstawiciel Psephenidae w Polsce. Wiedza o jego rozmieszczeniu jest bardzo niepełna i rozproszona w wielu publikacjach, a w ostatnim trzydziestoletciu opublikowano tylko jedno stanowisko. Autorzy przedstawili analizę danych literatu-

rowych, uzupełniając ją o nowe informacje i na tej podstawie dokonali oceny występowania i sytuacji omawianego gatunku w Polsce. Dotychczas podano 25 jego stanowisk. Autorzy podają 26 nowych: 19 opartych na zbiorach muzealnych i 7 z danych własnych. Zweryfikowano też, w miarę możliwości, okazy dowodowe ze stanowisk opublikowanych.

*Eubria palustris* wykazano z 18 krain (na 25), w tym po raz pierwszy z Niziny Mazowieckiej, Wyżyny Krakowsko-Wieluńskiej, Beskidu Zachodniego i Pienin. Dane pochodzą z 42 kwadratów UTM 10×10 km. Dane z 31 kwadratów pochodzą z okresu do 1950 r., z czterech – z lat 1951–1975, z 8 – po 1976 r. Współcześnie notowano gatunek tylko w obrębie Pojezierza Mazurskiego, Niziny Wielkopolsko-Kujawskiej, Niziny Mazowieckiej, Wyżyny Krakowsko-Wieluńskiej, Beskidu Wschodniego i Bieszczadów. Znane stanowiska leżą głównie w Polsce południowej (góry, pogórza, część wyżyn), w mniejszym stopniu na pojezierzach Polski północnej, tylko pojedynczo – w Polsce środkowej.

*Eubria palustris* łowiono w stadium imaginalnym w dość szerokim spektrum siedlisk, jednak jej larwy preferują górny bieg bogatych w wapń wód bieżących, w tym źródła, gdzie żyją pod kamieniami i wśród mchów. Ich rozmieszczenie w Polsce zbiega się w dużym stopniu z rozmieszczeniem źródeł bogatych w wapń.

Omawiany gatunek był i jest rzadko podawany z Polski. Biorąc pod uwagę liczne prace entomologiczne i hydrobiologiczne, w których mógłby być wykazany, w tym obfite piśmiennictwo dotyczące monitoringu wód, prawdopodobnie odpowiada to rzeczywiście rzadkiemu występowaniu. Rzadkość występowania wynika zapewne z nierównomiernego rozmieszczenia siedlisk i ich degradacji, na którą są one bardzo podatne. Ponadto, *E. palustris* jest bardzo wrażliwa na zanieczyszczenia. Należy wpisać gatunek na Czerwoną listę chrząszczy Polski (w kategorii EN) i przeprowadzić planową inwentaryzację jego stanowisk.

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