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Cunctochrysa cosmia (Navás, 1918) – a species of green lacewings new to Poland (Neuroptera: Chrysopidae)

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Abstract: *Cunctochrysa cosmia* (Navás, 1918) was recorded in Poland for the first time. The redescription of species is given. The new distinguishing characters to its most closely related species are presented. Morfological characters of the studied species as well as illustrations are given. A key to the polish species of the genus *Cuncochrysa* is also provided.

Key words: *Cunctochrysa*, taxonomy, faunistic, bionomy, distribution, Poland.

INTRODUCTION

Currently 31 species of green lacewings are known from Poland. In recent years three new species have been added: *Chrysopa gibeauxi* (Leraut, 1989) (Tillier *et al*. 2014), *Chrysopa walkeri* McLachlan, 1893 (Dobosz & Zamorski 2015) and the following mentioned *Cunctochrysa cosmia* (Navás, 1918). Navas (1918) described this species from Spain, Huesca Province as *Chrysopa cosmia*. After verification of type material, Hölzel (1973) synonymized it with *Chrysopa nigricostata* Brauer, 1851. In the late eighties of the twentieth century, Leraut (1988) described *Cunctochrysa bellifontensis* – a species closely related to *Cunctochrysa albolineata* (Killington, 1935), which were synonymized by Aspöck *et al.* (2001). Lately, the type specimen of *Ch. cosmia* was critically considered by Monserrat *et al.* (2014) and as a consequence it was erected back to the species range and transferred to the genus *Cunctochrysa* Hölzel, 1970. Those authors recognized *Cunctochrysa bellifontensis* as a synonym of *Cunctochrysa cosmia*.

The species belonging to the genus *Cunctochrysa* can be distinguished among the others by the characteristic structure of male genitalia, especially by axe-shaped *arcessus* (Fig. 6b, c). The similar ventral hook occurs also in the males of *Atlantochrysa* Hölzel, 1970. That may signify the close relationship between the two genera. Ten species are known to date (Aspöck *et al*. 2001, Monserrat *et al.* 2014, Oswald 2018), three of which are found in Europe. The others are known from Africa and Asia.

MATERIAL AND METHODS

The material examined in this study was collected during the field research. Currently the specimens are deposited in the Collection of Department of Natural History in the Upper Silesian Museum in Bytom (USMB). The photographs were taken with the use of Nikon D700 camera (lens AF-S Micro Nikkor 60 mm).

The terminal segments of abdomen with genitalia structures were separated from the bodies of dry specimens, as well as wet specimens (stored in alcohol). Than they were macerated in a 10% solution of potassium hydroxide (KOH). The whole was then placed in glycerin. The drawings of postabdomen and genitalia were made with a camera lucida on the basis of slides prepared before.

The particular locations were grouped according to the division into zoogeographical regions used in the *Polish Fauna Catalog*. In the list of positions, individual locations have coordinates of the corresponding UTM (Universal Transverse Mercator) code. The map was generated in the G. Gierlasinski version 5.2 program.

Abbreviations:

AL – Adam Larysz

CG – Czesław Greń;

HS – Henryk Szołtys;

MB – Marek Bunalski

MD – Michał Dobosz

MW – Marek Wanat

RD – Roland Dobosz

RESULTS AND DISCUSSION

The genus *Cunctochrysa* is represented by two species in Poland: *C. albolineata* and *C. cosmia.* The two species are very similar and the differences between them are barely visible. According to this, during identification a group of features should be considered. A key to the species is given below.

Key to the species:

— All transverse veins in costal area of forewings dark (expressly darkest the first) (Fig. 1). Pedicellus slightly darker in its exterior part. Pronotum with yellowish-white middle stripe. Lateral margins along the stripe green turn into greenish-black in the edges (Fig. 2). Abdomen with two dark greenish-brown sashes in the pleural part (Fig. 3). Setation of abdomen definitely dark …….....***C. cosmia***

— First transverse vein in costal area of forewing pale – if dark, than the other transvers veins are dark only in its distal parts, near joints of costal and subcostal veins. Pedicellus uniformly green. Pronotum with small, dark, round spots. Middle stripe whitish-green, without darker margins. Abdomen in pleural area greenish-brown, with no sashes along the abdomen. Setation of abdomen definitely pale. (Fig. 5) ..... ***C. albolineata***

Cunctochrysa cosmia (Navás, 1918)

Cunctochrysa albolineata: Dobosz 1993 [part], 1996 [part]

Except the species description, there is lack of data concerning the measurements of representatives of this species (Navás 1918, Monserrat *et al.* 2014, Monserrat 2016). Forewing length of examined specimens is in the range 9 to 13 mm (holotype 12 mm). Head light-green with four symmetrically placed dark spots on clypeus and genae (often the spots joint together making the dark band). Vertex light-green, discolored in faded specimens. The first antennal segment pale-green, the second little darker, slightly brown colored in its exterior part. The rest of segments gradually darken to the top of antennae. Pronotum with yellowish-white middle stripe, lateral margins greenish-brown. The area between middle stripe and margins pale-green. Pronotum covered by black setae, especially in its fore part, less dense in the back.

The symmetrical discoloration or spots may occur on the dorsal part of mesonotum. Mesonotum with a few short black setae and single pale long setae, especially in its fore part. Legs pale-green, the distal part of tibia brown, tarsi light-brown, last segment of tarsi little darker. Claws hook-curved, with rectangular extension at the base. Along the mesonotum yellowish middle stripe run same as on pronotum. Wings narrow with visible marked apex, hyaline. Both pairs of wings with costal vein (*C*) and the rest of longitudinal veins green all over their length. On the basal part of wing some veins: radial sector (*RS*), median vein and cubital veins may have brown dim (especially on forewings). Transvers veins of costal area dark-brown.

The remaining transverse veins (including both external and internal rows) brown. Pterostigma ratherly long, weakly visible, greenish. Small, black setae on the margins of wings. Similar setae occur on veins of both pair of wings, but not so dense as those on margins. Intermedial cell (*im*) extended, triangular. Pseudomedia reaches the external row of transvers veins. Abdomen in coloration generally similar to pronotum. Abdominal tergites with yellowish middle stripe, with greenish borders. Setae pale at the basal part of abdomen, gradually darken and more dense at the apical part. Pleurites are contrasted to tergites and sternites, colored brownish-green to black, creating two distinguished dark stripes along the abdomen. Dorsal part of abdomen greenish-yellow, with light-brown setae, darker setae at the apical part. On trichobotrial surface (*callus cerci*) setae pale and dense.

Taxonomic remarks:

Reffering to the lack of significant differences between the male genitalia structures in considered genus (Fig. 6a, b), morphological characters are more useful in determination of species. Besides of key features, there are no distinctive taxonomical characters simplifying the identification of both species. The dimness of pedicellus is rather weakly visible. Significant problems in the identification of species can also be caused by specimens fading under the influence of external factors and storage conditions. While identifying individual specimens, a set of features should be taken into account. Additional information to distinguish them is their biology and habitat preferences. *C. albolineata* is a species associated with deciduous trees and shrubs, with mainly moist habitats. It is a typical arboreal species, occurring in all varieties of biotopes from parks, gardens, shrubs, mid-town afforestation to various types of deciduous and mixed forests. Occurs both in the lowlands and in the mountains. In Central Europe up to about 1,300 m above sea level, in the south it reaches up to 2,100 m (Middle East) (Aspöck *et al.* 1980, Monserrat *et al.* 2014). In a few publications, this species was also noticed from conifers. Probably part of this data may concern the previously unrecognized *C. cosmia*. *C. cosmia* is an extremely mountainous species, especially in climatic conditions of the Pyrenean Peninsula (Monserrat *et al.* 2014), preferring different species of pines (*Pinus* sp.).

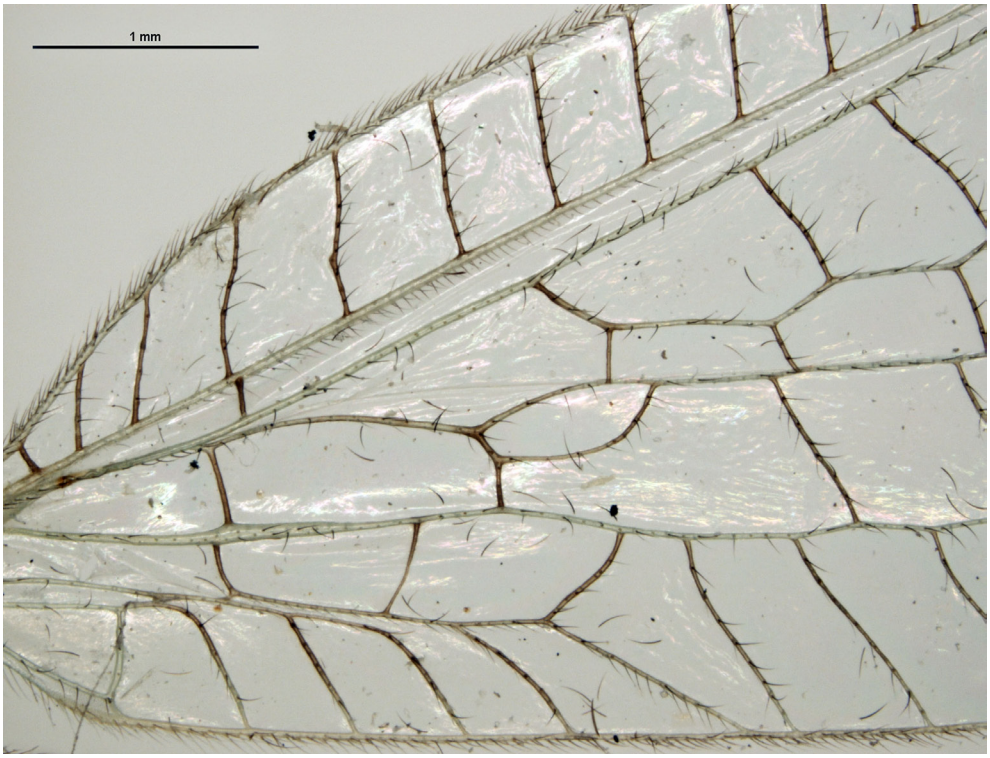

Fig. 1. *Cunctochrysa cosmia* proximal part of wing (photo A. Larysz).

Fig. 2. *Cunctochrysa cosmia* head, pronotum, mesonotum and metanotum (photo A. Larysz).

Fig. 3. *Cunctochrysa cosmia* abdomen – lateral view (photo A. Larysz).

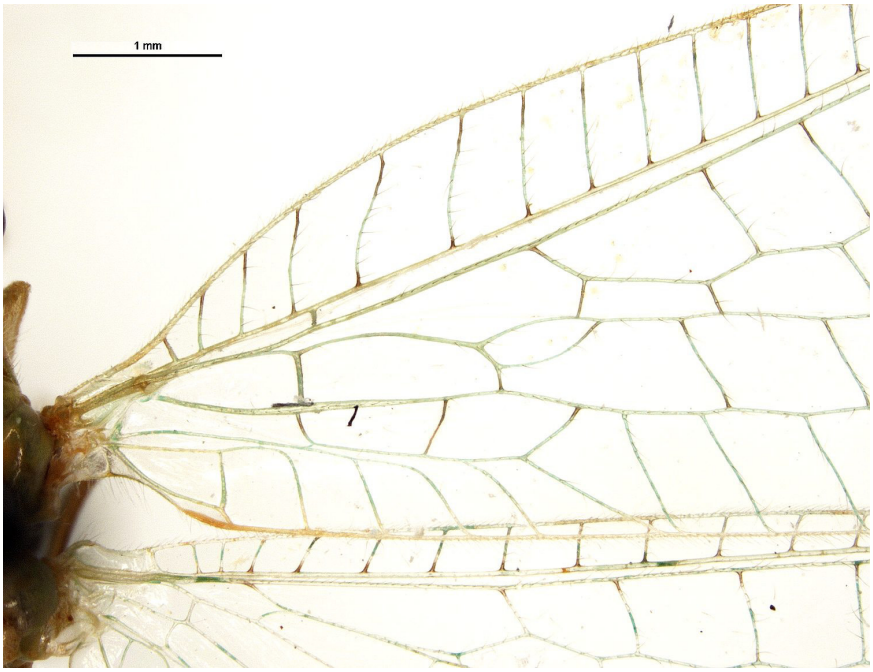

Fig. 4. *Cunctochrysa albolineata* proximal part of wing (photo A. Larysz).

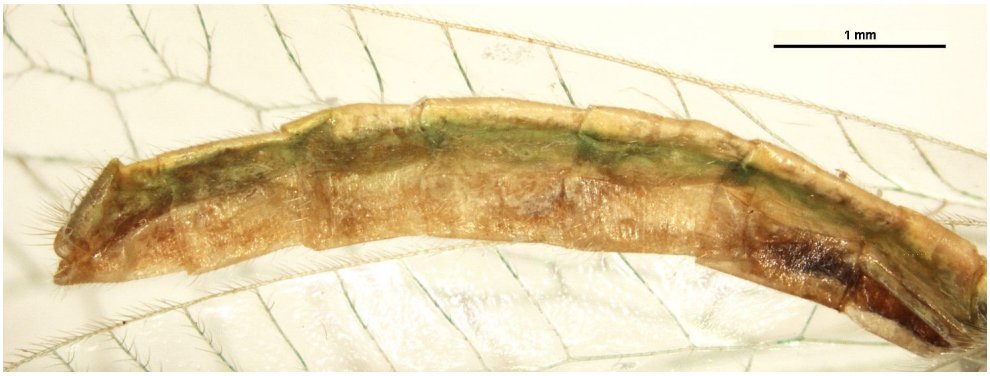

Fig. 5. *Cunctochrysa albolineata* abdomen – lateral view (photo A. Larysz).

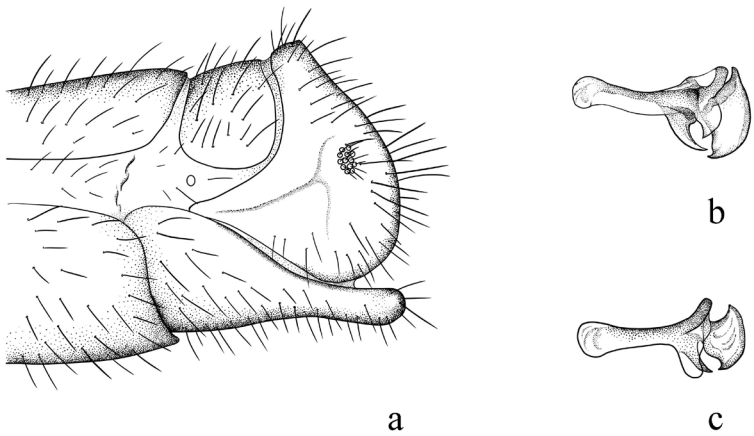

Fig. 6. *Cunctochrysa cosmia*: genital segments – lateral view (a); male genitalia – lateral view (b); *Cunctochrysa albolineata* male genitalia – lateral view (c) (drawings Ł. Junkiert).

Distribution in Poland (Fig. 7) [new data with asterix]:

Baltic coast: *Dźwirzyno [WA20], 11.06.1989, 1♀, RD; *Hel pine forest [CF55] coastal pine forest, 21.06.1998, 1♂ 4♀♀, RD; *Jastarnia [CF46] dunes, 22.06.1996, 2♀♀, RD.

Pomeranian Lake District: *Kaleńsko ad Kostrzyń [VU63], 03.07.2008, 3♀♀, ad lucem, MB.

The Wielkopolsko-Kujawska Lowland: *Głuchów [WT64], 03.07.1997, 1♀, CG.

Podlasie: *Sobibór ad Włodawa [FC80], Sobiborski PK, ad lucem, 10.07.2001, 1♀, MW.

Upper Silesia: *Lubliniec outskirts [CB21], 09.07.1993, 2♀♀, MD; *Brynek [CA39], 16.07.1998, 1♂, HS; *Brynek [CA39] ad lucem, 23.07.1998, 1♂, HS; *Wojciechów ad Olesno [CB14] herbaceous plants sand mine, 31.05.1999, 1♂, RD; *Mysłowice Ćmok [CA66], UV lamp, 22.07.2015, 1♀, AL.

The Krakowsko-Wieluńska Upland: Pustynia Błędowska [CA97] (Dobosz 1993, 1996).

Fig. 7. Distribution of *Cunctochrysa cosmia* in Poland. ● – bibliographic data, ■ – unpublished data.

Indicating the locations in Poland was possible thanks to the revision of material in the collection of USMB. This species is probably wider distributed than it can be expected. Species was noticed only from six zoogeographical regions according to *Polish Fauna Catalog*.

General distribution:

Great Britain (Plant 1993), Spain (Monserrat *et al.* 2014), France (Leraut 1988), Netherlands (Lock & San Martin 2013; without exact locality), Romania (Monserrat *et al.* 2014), Georgia (Duelli *et al.* 2015), Italy (Letardi 2017) and Bulgaria (Dobosz & Popov 2018).

Ecology:

The biology of *C. cosmia* is weakly known which is conditioned by the recently restored species status. It is known that the first specimen was captured on a pine (*Pinus* sp.) at an altitude of 840 m (Navás 1918, Monserrat *et al.* 2014). Based on the latest data, mainly from the Pyrenean Peninsula, it is considered to be an exceptionally mountainous species (670 to 2100 m) associated with pinewood forests, in particular with pines (mainly from *P. silvestris*, but also *P. pinaster* and *P. nigra*). On the other hand, data from Bulgaria come between the sea level and 170 m (Dobosz & Popov 2018). No data available on larvae and wintering stages. The emergence of imagines from April to September (the apogee of appearance July-August) (Monserrat *et al.* 2014). In Poland all specimens were caught in habitats with the dominant pine (*Pinus silvestris*). Most of the specimens come from coastal crowberry coniferous forests, (*Empetro nigri-Pinetum cladonietosum*) and inland *Cladonia*-Scots pine forest (*Cladonio-Pinetum*) on the outskirts of the Błędowska Desert.

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