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CHALCOLESTES COLORAENEUS (ODONATA, ZYGOPTERA, LESTIDAE) SP. NOV. FROM ROMANIA

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ABSTRACT

This paper describes a new Chalcolestes species – Chalcolestes coloraeneus collected from Romania. This new species shows morphological similarities with Chalcolestes viridis by the metallic iridescent colour of the body and by the yellow to pale brown colour of the lower part of the head; it also shows similarities with Lestes dryas in the pruinosity of the last abdominal segments and with Lestes virens, Lestes sponsa and Lestes dryas by the long fringing hairs on the inferior male annal appendages. Chalcolestes coloraeneus can be separated by the other Lestes and Chalcolestes species by the male dark coppery metallic colour with green and reddish reflections and especially by the shape and colour of the male anal appendages.

INTRODUCTION

Chalcolestes Kennedy, 1920 (Kennedy 1920b) is a genus of Zygoptera, consisting of two species: *Chalcolestes parvidens* (Artobolevskij, 1929) and *Chalcolestes viridis* (Vander Linden, 1825) (Wildermuth & Martens 2019). Both species are cited in the Romanian fauna – *Chalcolestes viridis* as *Lestes viridis* (Cîrdei & Bulimar 1965).

MATERIAL AND METHODS

One Zygopteran male was accidentally collected into a Barber pitfall trap for Opiliones filled with ethanol 85°, during 05 – 09 August 1998, locality Valea Mânăstirii, Gorj county. It is preserved in ethanol 75-80°. The specimen was observed under binocular, both in alcohol and in dry state. For the species identification, the following resources were used:

- Kennedy C. H., 1920b, Forty-two hitherto unrecognized genera and subgenera of Zygoptera, The Ohio Journal of Science, vol XXI, No.2: 83-88.
- Cîrdei F., Bulimar F., 1965, Fauna Republicii Populare Române, Insecta, volumul VII, fascicula 5 Odonata, 274 pg.
- Askew R. R., 2004, The dragonflies of Europe (second edition), 308 pg.
- Boudot J.-P., Doucet G., Grand D., 2019, Cahier d'identification des libellules de France, Belgique, Luxembourg & Suisse, 151 pg.
- Wildermuth H., Martens A., 2019, Die Libellen Europas, 958 pg.
- Smallshire D., Swash A., 2020, Europe's Dragonflies – A field guide to the damselflies and dragonflies, pdf-e-resource.

RESULTS AND DISCUSSIONS
Results

Systematic
Odonata Fabricius 1792
Zygoptera Selys 1840
Lestidae Selys 1840

Chalcolestes coloraeneus sp. nov. Babalean
(Figures. 1 – 9)

Etymology
The name is a compound word treated as a noun in the nominative singular standing in apposition to the generic name and refers to the colour of the holotype.

Material examined: Holotype imago male Cce-VM-Ro-AFB, collected by Anda Felicia Babalean, deposited in author private collection. It will be donated to Naturalis Biodiversity Center – Leiden. Label: Cce – *Chalcolestes coloraeneus*, VM – Valea Mînăstirii, Ro – Romania, AFB – Anda Felicia Babalean, coordinates: 44º49'21.43"N, 22º56'06.89"E, elevation 196m (Pro Google Earth).

Diagnosis
Chalcolestes coloraeneus can be separated by the European Lestes and Chalcolestes species by the male dark coppery metallic colour with green and reddish reflections and especially the shape and colour of the male annal appendages.

Diagnoză
Specia *Chalcolestes coloraeneus* poate fi separată de celelalte specii ale genurilor Lestes și Chalcolestes prin culoarea generală cupru metalic, cu reflexii verzi și roșii a masculului și în special prin forma și culoarea apendicilor anali masculi.

Description of the holotype
Measurements: total – 39 mm; head, from the most external part of one eye to the other – 4,46 mm; forewing – 22 mm; hindwing – 21 mm.

General colour – Figs. 1, 2, 3: dark coppery (bronzy) metallic, with green and red metallic iridescence under the light of the binocular both in alcohol and in dry state.

Head – Figs. 1, 3, 4: vertex, frons, postclypeus dark bronzy; anteclypeus, labrum, mandible, labium yellowish brown (pale brown in dry state); occiput monocolor, dark bronzy; eyes gray-brown, antenna dark brown.

Thorax – Figs. 1, 3, 4: prothorax dark bronzy with yellow lateral spots (yellowish to pale brown in dry state); synthorax dark bronzy, iridescent.

Head and thorax covered with very thin and long white hairs visible in the dry state.

Legs: brown with a yellow stripe; with long spines.

Wings – Figs. 1, 5, 6: hyaline pale brown, dark-brown veins; pterostigma extending on two cells, brown yellowish with dark upper and lower contours; discoidal cells of the fore- and hindwings almost equal (the difference in size is almost imperceptible); the upper segment of the arculus equals the lower.

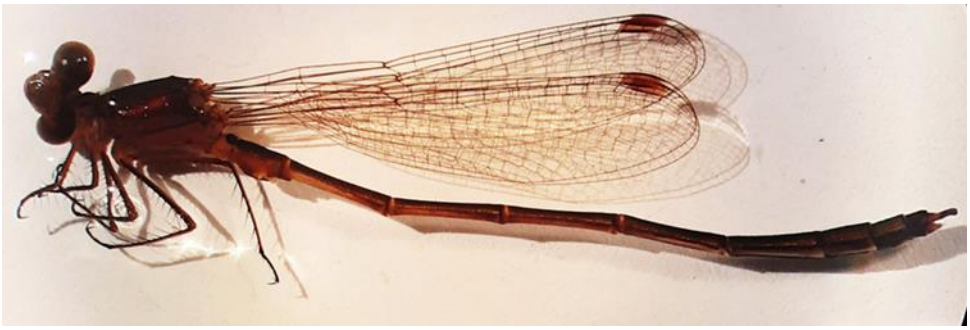

Figure 1. *Chalcolestes coloraeneus* – general aspect in lateral view

Figure 2. *Chalcolestes coloraeneus* – pruinescence on the last two abdominal segments (in the dry state)

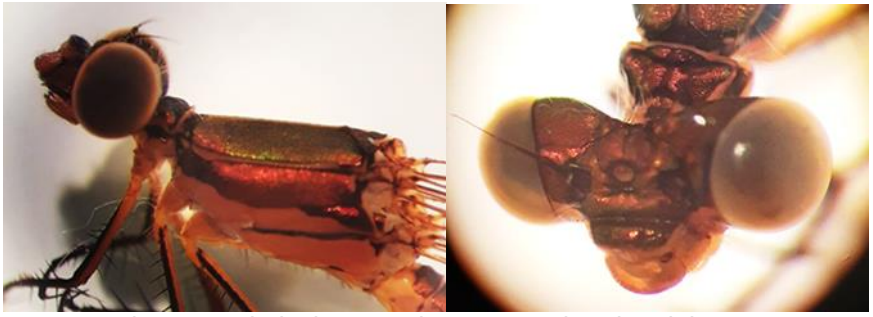

Figure 3. *Chalcolestes coloraeneus* – head and thorax

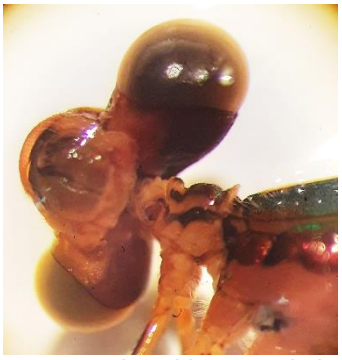

Fig. 4. *Chalcolestes coloraeneus* – head in ventral view and prothorax in lateral view

Abdomen – Fig. 2: dark bronzy iridescent on dorsal; yellow in alcohol / pale brown in dry state on ventral, with a large longitudinal brown band on each sternit. Segments S 9 and S10 with a discrete blue pruinescence visible only in the dry state.

Annal appendages

Superior (external) appendages – Fig. 7: medially curved, touching each other; blunt tip; the medial (internal) side with a flat denticulated area; external side with small denticles; one internal basal strong spine; colour almost entirely brown with one large yellow basal spot on the external side of each appendage.

Inferior (internal) appendages – Fig. 7: lighter colour then the superior appendages; triangular and three-dimensional shape with an internal hairy excrescence (/tubercle/spur); blunt tip; the tip and the external sides covered with long fringing hairs (setae).

Accessory genitalia – Figs. 8, 9: hamuli anteriores rounded; vesica spermalis dark brown; the head of the ligula (aedeagus) covered by a membrane and provided with spiniform structures.

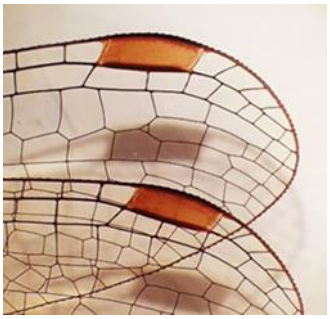

Figure 5. *Chalcolestes coloraeneus* – pterostigma

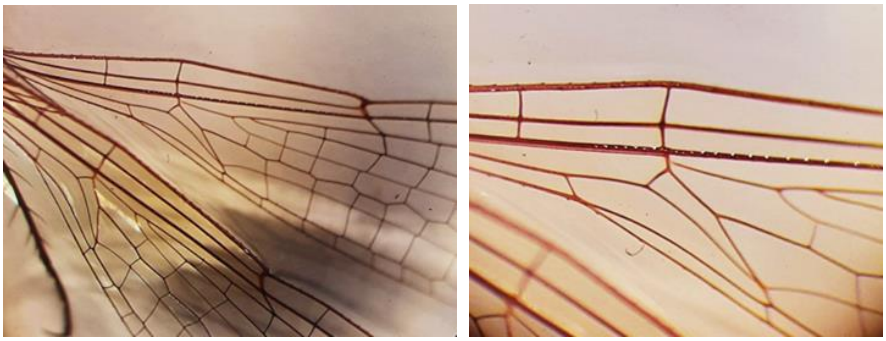

Figure 6. *Chalcolestes coloraeneus* – the discoidal cells and arculus

Discussions

Compared with other Lestes and Chalcolestes species, *Chalcolestes coloraeneus* shows similarities with *Chalcolestes viridis* by the metallic iridescent colour of the body and by the yellowish / pale brown colour of the lower part of the head according to Askew (2004). It also shows similarities with *Lestes dryas* in the pruinosity of the last abdominal segments and with *Lestes virens*, *Lestes sponsa* and *Lestes dryas* by the long fringing hairs on the inferior male annal

appendages (Askew 2004, pg. 59, Figs 38-43). *Chalcolestes coloraeneus* can be separated by the other species by the male dark coppery metallic colour with green and reddish reflections and by the male anal appendages.

The aedeagus is a character used in Odonata systematic and phylogenetic studies, for defining the genera and inferring phylogenetic relationships (for instance Kennedy 1920a). The comparison of the penis head of *Chalcolestes viridis* (Cordero-Rivera & Córdoba-Aguilar 2010, pg. 338, Fig. 15-4(e)) with that of *Chalcolestes coloraeneus* is not possible by simply comparing the photographs.

Recent collecting effort gave no results in finding more specimens males and females of this species. *Chalcolestes coloraeneus* may be an extinct species due to habitat degradation. The odonatological literature reports Zygoptera endemic species restricted to a very small area, sometimes to a single stream, these species being “under imminent threat” (for instance Dijkstra et al. 2007, Vilela et al. 2020).

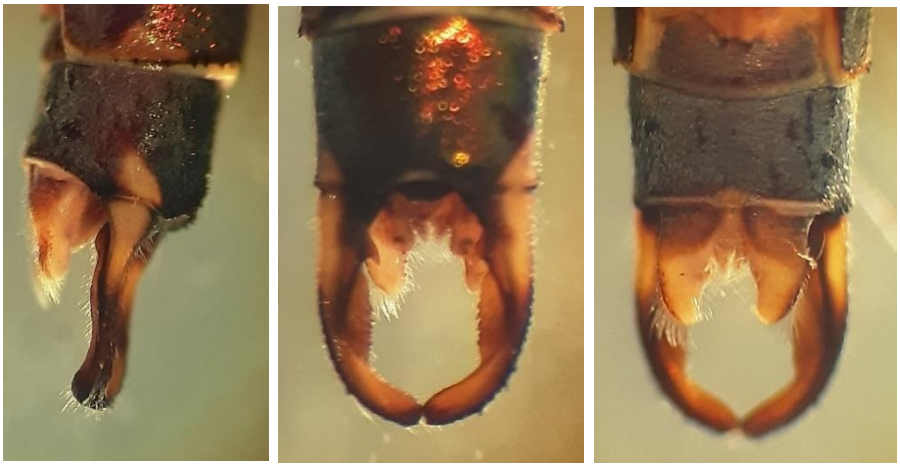

Figure 7. *Chalcolestes coloraeneus* – the anal appendages in lateral view (left), dorsal view (middle) and ventral view (right)

Figure 8. *Chalcolestes coloraeneus* – the accessory genitalia in ventral view (left) and in lateral view (right)

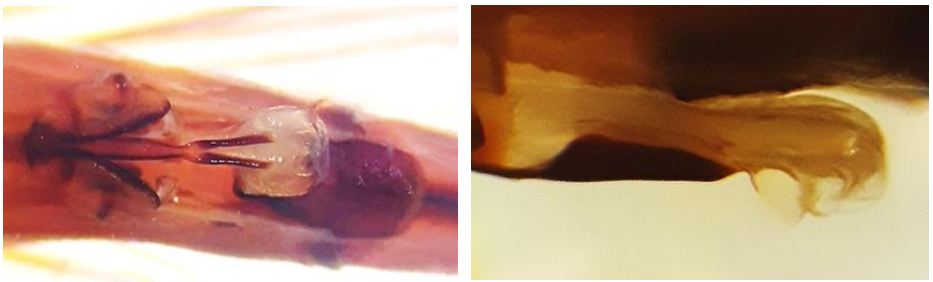

Figure 9. *Chalcolestes coloraeneus* – the aedeagus in ventral view (left) and in lateral view (right)

CONCLUSIONS

Further sampling is important to complete the description of this new species with the female and larvae or to establish its status as *extinct species*.

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