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New findings of *Diacrisia metelkana* (Lederer, 1861) (Arctiinae, Erebidae, Lepidoptera) in Serbia

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Abstract: *Diacrisia* (= *Rhyparioides* Butler, 1877) *metelkana* (Lederer, 1861) is a rare and local species in Europe. The data on new records of this species in Serbia are presented, for localities Sombor (Bačka) and Čardak – Deliblatska peščara (Banat). In Sombor, male was caught by light trap type "Bečež" (light source mercury lamp 250 W), on July 25th, 2001. In Čardak, a male moth was found by mercury lamp (400 W Philips ML lamp) on July 3rd, 2020.

Keywords: *Diacrisia metelkana*, *Rhyparioides*, Serbia, Sombor, Deliblatska peščara, Lepidoptera, fauna.

1. Introduction

Diacrisia (= *Rhyparioides* Butler, 1877) *metelkana* (Lederer, 1861) is a rare species. The caterpillar's feeding depends on swamp plants. Even in localities where it is present, many years may pass without noticing its presence. As the species is related to wetland plants, and wetlands are prohibited and marked as highly endangered areas, each finding of this species is significant. In Romania, this species was designated as endangered (EN), according to the IUCN classification in 2000 and 2001 (Rákossy et al. 2003).

Freina and Witt (1987) stated that the species *D. metelkana* is widespread in Europe, through southern Russia, to East Asia and Japan. In this area, the localities where it was recorded are in the form of isolated oases. In Europe, it has been recorded in southwestern France (Dep. Deux-Sèvres, Marne), northern France (Reims), southern Belgium (Gaume), in Germany south from Berlin (Zossen), southern Slovakia, Hungary (Pecs, Com, Szomogy), Romania (Danube Delta and Banat) and Hungary (near Alsódabas) (Freina and Witt, 1987).

Titov and Volynkin (2019) also mention it for Bulgaria, the European part of Russia (Rostov, Samara, Voronezh and Krasnodar), the north-eastern part of the Caucasus (Dagestan). In Belarus, it is recorded in Zvanc (Kulak and Yakovlev, 2015), in Ukraine, in Turijsk in the Volyn region (Geryak et al. 2018).

The exact localities of the findings in Romania are Sulina (Danube Delta) and Satchinez (Banat) (König, 1975). For Hungary, it is mentioned for the Peszérpuszta, Alsónémedi, Izsák, Orgovány bog (Gozmány, 1973), Kiskunság (Bálint and Katona, 2001), Alsódabas, Hatvon, Gyón and the areas between the Danube and Tisza (Ócsa, Orgovány, Bugac, Sári and Puszta-Babád in Hanság and Nyírség regions) (Metelka, 2023), as well as Tápióságban, Selyem-réten, Orségben and Nyírség (HNP, 2023).

It is also listed as an endangered species in Hungary (Varga et al. 1990). In Germany it is marked as an extinct or lost species (Rennwald et al. 2011). In Bulgaria, it was recorded in two places: near Lake Shabla (Beshkow, 1992) and Ropotamo near Sozopol (Burgas) (König, 1985). In Serbia, it was recorded between Sombor and Bački Monoštor in the confluence of the Plazović (Kigyós) river into the DTD Vrbas – Bezdán canal (Vajgand, 1995). It was found there as an adult caterpillar that cocooned in the laboratory and hatched into a butterfly. It was recorded as a butterfly using a light trap in Čelarevo (Vajgand, 2016). In Croatia, it was recorded near Metković (Kučinić et al. 2014).

In Asia it has been recorded in two separate areas. The first is in Russia, in the southern part of the West Siberian Plain (Novosibirsk and Omsk) and Pavlodar in Kazakhstan, and the second is in Russia in the far east Jewish, Amur, Khabarovsk and Primorye; it was also found in Korea, Japan and China (Jingxi, Jilin, Liaoning, Jeilongjiang, Jiangsu, Dunbei, Nei Mongol, Habei, Shangdong, Zhejiang and Hunan) (Titov and Volynkin, 2019).

The paper presents data on two new findings of this species in Serbia. Moreover, it summarizes the previous knowledge on the earlier findings and extends it with the contemporary data.

2. Material and methods

For the purposes of monitoring and forecasting the number of butterflies that can be harmful in agriculture, collecting butterflies in the vicinity of Sombor has been conducted since 1994. A "Bečej" type light trap has been used. The trap uses a 250W mercury bulb. It has worked every night from the beginning of April to the middle of October. The collected insect was inspected, moths are determined every day in the "Agroprotekt" laboratory. The light trap is non-selective and traps thousands of insects every night. In the period from 2000 to 2007, the trap has been placed on the southern outskirts of Sombor, surrounded by agroecosystems. It is 1.5 km away from the DTD Vrbas – Bezdán canal (=Veliki Bački kanal). The altitude of the locality is 87 meters above sea level. The location of the site is in UTM square CR56 (locality 1 on Figure 1).

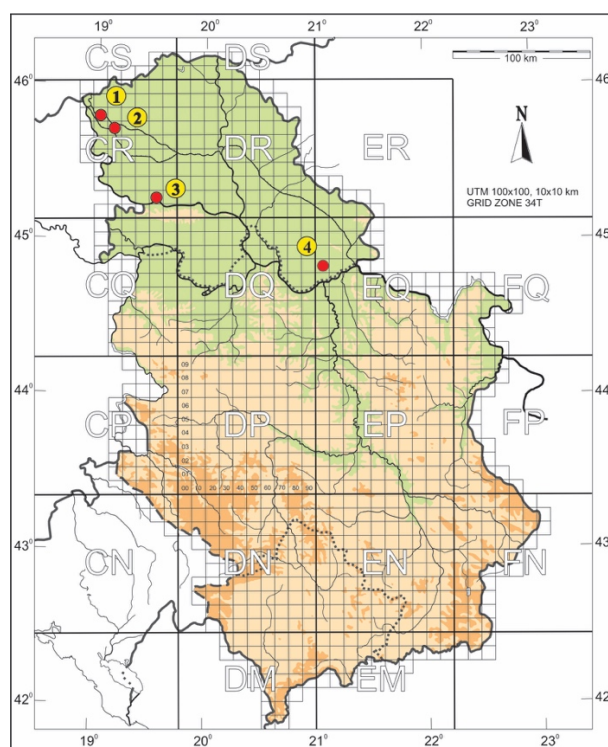


Figure 1. Map of Serbia with UTM grid. Localities of all *Diacrisia metelkana* findings in Serbia are marked with red spots. Numbers denote localities, as follows: 1) confluence of the Plazović (Kigyós) river, 2) Sombor, 3) Čelarevo, 4) Čardak – Deliblatska peščara.

The research of the fauna of Lepidoptera in the Special Nature Reserve "Deliblatska peščara" has been conducted since 2018. A mercury lamp was used to attract Lepidoptera (400 W Philips ML lamp) on the locality Čardak. The location of locality is in UTM square EQ06 (locality 4 on Figure 1). The altitude of the locality is 120 m. The collected adults were afterwards prepared, labeled, determined, photographed, and stored as dry specimens in entomological boxes in the private collections of authors.

3. Results and discussion

During 26 years and an average of 180 nights of research per year, only one specimen of *D. metelkana* was recorded using the light trap in the surrounding of Sombor (locality 2 on Figure 1). A male was recorded on July 25th, 2001.

Another male was caught on the locality Čardak, the Special Nature Reserve "Deliblatska peščara", on July 3rd, 2020 (Figure 2).



Figure 2. Locality Čardak in the Special Nature Reserve "Deliblatska peščara" (photo: Stojanović, D.V.).



Figure 3. *D. metelkana*- the pupal stage (photo: Stojanović, D.V.)



Figure 4. The locality of earlier finding - the confluence of the Plazović River (Kigyós) into the DTD Vrbas – Bezdán canal (photo: Vajgand, D.)

However, these are not the first findings of this species caught by the light trap. The first specimen, caught by the light trap, was a male individual recorded in Čelarevo (Vajgand 2016) (locality 3 on Figure 1), which is 60 km far from the location in Sombor.

Furthermore, at the confluence of the Plazović River (Kigyós) into the DTD Vrbas – Bezdán canal, a caterpillar was found on April 10, 1988, from which a female emerged on July 3rd of the same year (Vajgand, 1995). The pupal stage (Figure 3) follows the larval stage and precedes adult (imago) (Figure 8). The city of Sombor is 11.5 kilometers far from the locality of this finding, which is between Sombor and Bački Monoštor.

The localities of earlier findings of this species in the Autonomous Province Vojvodina, Serbia, are given chronologically in Figure 4 (the confluence of the Plazović River (Kigyós) into the DTD Vrbas – Bezdán canal).

These four findings are the only findings of *D. metelkana* in Serbia.

A common characteristic of three localities – Sombor, the confluence of the Plazović River (Kigyós) into the DTD Vrbas – Bezdán canal and Čelarevo – is that they are near canals and water biotopes. To the contrary, the last specimen found at the Čardak site on Deliblatska Peščara was recorded in a completely different environment. Figure 3 shows a dry, forest-steppe biotope that develops on sandy soil. This location is 10 kilometers away from the nearest body of water. The caterpillar occurs in wetlands and develops on *Caltha palustris*, *Taraxacum* spp., *Euphorbia* spp., and *Mentha aquatica* L. (Freina and Witt, 1987). Some of mentioned plant species are present near the Čardak locality.

3.1. Morphological description and biology

Male genital armature: Tegumen with shoulders, Juxta with symmetrical scobination on sides towards Harpes. Uncus elongate, oval thickened in the middle tapering towards the base. Cucculus oval at apex with one transverse fold below, joined to Sacculus on outer side of Valva. Slightly asymmetrical Harpa thicker in width with a reduced crease towards the Tegumen. The sacculus of the asymmetric Harpa, like a flap, extends along the outer edge of the Valva to the contact with the Vinculum.



Figure 5. *D. metelkana*, male genital armature from the locality Sombor (photo: Stojanović, D.V.)



Figure 6. *D. metelkana*, male aedeagus from the locality Sombor (photo: Stojanović, D.V.)



Figure 7. *D. metelkana*, habitus of adult male specimen from the locality Čardak with spread wings: dorsal view (left) and ventral view (right) (photo: Stojanović, D.V.)

Aedoeagus bent, wide with clustered scobination towards inner edge of arch. Scobination at the base of the root of the aedeagus fused with the scobination of the saccular wrinkled membrane. Tip of aedeagus capitate, oval.

Male genital armature of the sample caught in Sombor is shown on Figures 5 and 6. The male specimen *D. metelkana* found on the locality Čardak is shown on Figure 7. The female specimen *D. metelkana*, emerged from the caterpillar found on the Plazović River (Kigyós) into the DTD Vrbas – Bezdán canal, is shown on Figure 8.



Figure 8. *D. metelkana*, habitus of adult female specimen from the locality DTD Vrbas – Bezdán canal with spread wings: dorsal view (left) and ventral view (right) (photo: Stojanović, D.V.)

4. Conclusions

Thanks to long-term research on the butterfly fauna of Serbia, the species *D. metelkana* (Lederer, 1861) was recorded in two new localities in Serbia. One male was recorded on the southern outskirts of Sombor on July 25th, 2001 and another one at the Čardak locality on the Special Nature Reserve "Deliblatska peščara" on July 3rd, 2020.

Although this is not a new species for Serbia, every finding of this species is a significant contribution to the knowledge of the butterfly fauna of Europe, because findings of this species are extremely rare. Even on localities where the species was recorded in the past, there are studies that show that it disappeared, primarily due to the drying up of the wetlands, which is a favorable habitat of this beautiful species.

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