



On the discovery of *Arytrura musculus* (Ménétriés, 1859) (Lepidoptera: Erebidae) in Croatia

TONI KOREN*
MLADEN ZADRAVEC
BORIS LAUŠ

Association Hyla, I. Lipovac 7, HR-10000 Zagreb,
Croatia

***Correspondence:**

Toni Koren
E-mail: koren.toni1@gmail.com

Key words: Lonjsko Polje; Natura 2000;
new country record; distribution

Abstract

Background and purpose: The moth fauna of Croatia is still insufficiently surveyed. During the last several years, several overviews of the moth fauna for several locations were published and several new species for the country had been found. Only two species from Annexes II and IV of the Habitats Directive are listed for Croatia. There are historical records of a third species, but it has been omitted from the Croatian reference list due to a lack of recent records. Presented here is the first record of a fourth species from the Annexes – *Arytrura musculus*.

Materials and methods: This survey was carried out on one location in Nature Park Lonjsko Polje, on 17.6.2016. The habitat at the location is typical for the area, consisting of floodplain oak forests with *Genista tinctorial* L. Two pyramidal light traps were used.

Results: One specimen of *Arytrura musculus* was found. This is a rare and disjunctly distributed species across Eastern Europe. The closest known populations to the Croatian locality are situated in Hungary, 122 and 130 km away.

Conclusions: This species needs to be added onto the Croatian reference list and as a Natura 2000 target species for Lonjsko Polje Nature Park at the earliest possible convenience. Detailed surveys of the entire Lonjsko Polje Nature Park and other wetland areas in northern Croatia are needed in order to ascertain the distribution, assess the status and assure the long-term conservation of this species in the country.

INTRODUCTION

The moth fauna of Croatia, as well as most of the ex-Yugoslavian countries like Bosnia and Herzegovina, Montenegro, and FYR of Macedonia is still insufficiently surveyed. While large parts of the country still remain insufficiently studied, during the last few years new overviews of the moth fauna of several smaller parts of Croatia were published, greatly contributing to the general knowledge about the moth diversity within the country. This mainly includes Krk Island (1), central Istria (2, 3) and Kopački Rit Nature Park (4). Recently several Macroheterocera species were recorded as additions to the country's rich moth fauna, e.g. *Antitype suda* (Geyer, 1832) (5), and *Chersotis multangula* (Hübner, 1803) (6). On the other hand, dozens of Microlepidoptera species are still being recorded as new members of the Croatian fauna (e.g. 7, 8, 9, 10). Still, many unpublished records exist, usually in the private collections and/or museums. With the publication of such data, the knowledge about the moth fauna of Croatia would be greatly increased, and the creation of the checklists of Lepidoptera of Croatia would be more plausible.



Figure 1. Habitat on which *Arytrura musculus* was recorded in Lonjsko Polje, and the collected specimen.

Special attention should be given to the species listed in the Annexes II and IV of the Habitats Directive (COUNCIL DIRECTIVE 92/43/EEC). In regard to moths, only two species are listed as present in Croatia, *Eriogaster catax* (Linnaeus, 1758) and *Euplagia quadripunctaria* (Poda, 1761) (11). Historical records exist for a third species, *Erannis ankeraria* (Staudinger, 1861) (12), but it was not included due to a lack of recent records. Here we present the first record of the fourth species, the Erebid *Arytrura musculus* (Ménétriés, 1859).

MATERIAL AND METHODS

A single specimen was recorded during a moth survey in Lonjsko Polje, Lipovljani municipality, Kraljeva Velika settlement, Željan stream, 17.6.2016, N: 45.386817°, E: 16.787983°, 141 m a.s.l., leg. M. Zadavec. The Natura 2000 site Lonjsko Polje (HR2000416) is located in the Sava River floodplain. Its boundaries are practically identical with the borders of the Lonjsko Polje Nature Park. The survey location is located within the “Josip Kozarac” Forestry Unit, in the centre of the Park. The habitat is typical for the area, consisting of floodplain oak forests (As. *Alno-Quercion roboris* Ht. 1938, National Habitat Classification Code: E.2.2) with *Genista tinctoria* (13). Two pyramidal light traps were used in the field, and two hours were spent at the locality. The collected specimen was spread, identified, and stored in the private collection of the first author (Koren, Zagreb). The light traps were set up on a macadam road connecting the settlements

Kraljeva Velika and Trebež, through the forest sections. The stream Željan flows by the road in that part, crossing from one side to the other. Two drainage canals, moving water from the forest and into the stream, are also present (Figure 1). For the identification of the collected material we used standard identification keys (14).

RESULTS AND DISCUSSION

This rare noctuid species is disjunctly distributed across parts of south-eastern Europe and Asia. In Europe, it is very local, with most records originating from Eastern Europe (Ukraine, Russia, Hungary, and Romania) (15, 16). It is known also from northern Serbia (17). Recently it was also discovered in Italy (18). The closest locations to the Croatian one are in Hungary, approx. 122 km and 133 km away, at Pécsi-sík and Kis-Balaton, respectively (19).

The country within Europe with most records is probably Hungary, where during the last decades the knowledge about the distribution of this species has been drastically increased (see 15). The most probable reason is that formerly insufficiently surveyed parts of Hungary are being surveyed (15). However, the data about its biology and ecology are still not sufficient and according to the Hungarian Red Book it is considered to be a critically endangered species (15).

It has one generation per year, and it flies during June and July. It is considered to be a tertiary, possibly an in-

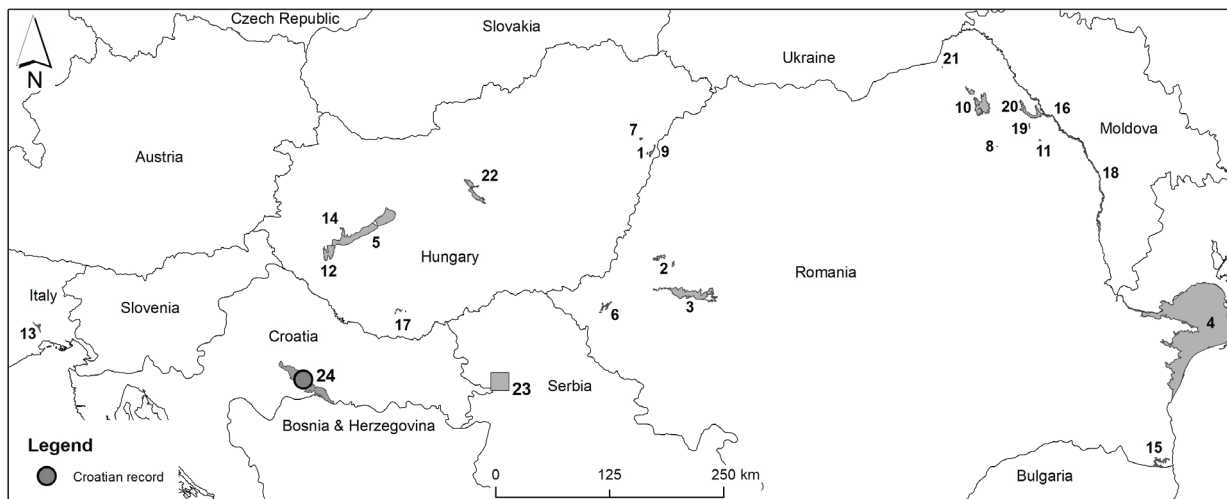


Figure 2. The distribution of *A. musculus* in central Europe with the new record from Croatia. 1 - Csobos-tó, 2 - Dealul Mocrei - Rovina - Ineu, 3 - Defileul Mureșului, 4 - Delta Dunării, 5 - Balaton, 6 - Mlaștina Satchinez, 7 - Martinkai-gelegő, 8 - Lunca Mircești, 9 - Kék-Kálló-völgye, 10 - Dealul Mare - Hârlău, 11 - Fânațele Bârca, 12 - Kis-Balaton, 13 - Risorgive dello Stella, 14 - Tapolcai-medence, 15 - Pădurea Hagieni - Cotul Văii, 16 - Pădurea Medeleni, 17 - Pécsi-sík, 18 - Râul Prut, 19 - Sărăturile din valea Ilenei, 20 - Sărăturile Jijia Inferioară, 21 - Turbăria de la Dersca, 22 - Turjánvidék, 23 - Čelarevo, 24 - Lonjsko Polje.

terglacial, relict (15). It inhabits special wetland habitats like marshes, mires and bogs – habitats that have in the past greatly diminished in their extent across all of Europe, and in some countries are still disappearing. Due to its size and colouration, it cannot be confused with any other European species.

This species is listed both in Annexes II and IV of the Habitats Directive, Annex II containing species requiring the designation of Special Areas of Conservation (SACs), while Annex IV contains species in need of strict legal protection (COUNCIL DIRECTIVE 92/43/EEC).

In total, 22 Natura 2000 sites were designated for the long term survival of this species within the European Union (Fig. 2), one in Italy, eight in Hungary and 13 in Romania (5). This species needs to be added to the Natura 2000 site Lonjsko Polje (HR2000416), as well as the reference list of Natura 2000 species for Croatia, at the earliest possible convenience. The area of Lonjsko Polje contains a different array of wetland habitats, including riparian forests and wet meadows, river banks and embankments. The species' larval food plant, *Salix caprea* L., is also present in the surroundings. This corresponds to the known habitat preferences of this species. As suggested by Baranyi et al. (15), aside from light trapping, the search for the overwintering specimens as well as larvae could be used to gain additional data about the occurrence of this species.

Also, detailed surveys of the whole Lonjsko Polje area, as well as other wetland areas in northern Croatia (e.g. Žutica Forest, Kopački Rit, Aljmaški Rit) is needed in order to establish the distribution, assess the status, and assure the long term conservation of this rare species.

Acknowledgements

This moth was collected within the project „Monitoring of the stag beetle (*Lucanus cervus*) in Nature Park Lonjsko Polje in 2016” and we are immensely grateful to the Park officials for their support. Moth surveying was carried out with permission from the Ministry of Environmental and Nature Protection (Permit No.: 517-07-1-1-16-4, issued on 28 April 2016).

REFERENCES

- HABELER H 2008[2003] Die Schmetterlinge der Adria-Insel Krk – Eine ökofaunistische Studie. Esperiana – Buchreihe zur Entomologie, pp 221
- KOREN T, LADAVAC LJ 2013 Diversity of Macroheterocera (except fam. Noctuidae [sensu novo] and fam. Geometridae) of central Istria, Croatia. *Natura Croatica* 22(1): 73-94
- KOREN T, VUKOTIĆ K, ČRNE M 2015 Diversity of the moth fauna (Lepidoptera: Heterocera) of a wetland forest: A case study from Motovun forest, Istria, Croatia. *Periodicum Biologorum* 117 (3): 399-414. <https://doi.org/10.18054/pb.2015.117.3.2945>
- VIGNJEVIĆ G, ZAHIROVIĆ Ž, TURIĆ N, MERDIĆ E 2010 Moths (Lepidoptera: Heterocera) of Kopački rit Nature Park - Results of preliminary research. *Entomologia Croatica* 14(3-4): 17-32
- MRNJAVIĆ VOJVODA A, MIHOČI I, VAJDIĆ M, KUČINIĆ M 2014 *Anatype suda* (Geyer, 1832) (Lepidoptera: Noctuidae), new species of noctuid fauna of Croatia, found in the Biokovo Nature Park. *Natura Croatica* 23(2): 379-388
- KOREN T, GOMBOC S 2015 First Record of *Chersotis rectangula* ([Denis & Schiffermuller], 1775) in Croatia with new data for *Chersotis multangula* (Hubner, 1803) (Lepidoptera: Noctuidae). *Šumarski list* 139(9-10): 441-445
- FAZEKAS I 2009 Contribution to the Microlepidoptera fauna of Balkans, Nr. 1 (Lepidoptera). *Natura Somogyiensis* 15: 181-194
- RICHTER I, PASTORÁLIS G 2015 New findings of case-bearing moth species of *Goniodoma* and *Coleophora* genera from the

- Balkans (Lepidoptera: Coleophoridae). *Microlepidoptera.hu* 8: 29-42
9. ŠUMPICH J 2013 Faunistic records of some Microlepidoptera from Croatia. *Entomologia Croatica* 17(1-4): 13-33
 10. ZELLER-LUKASHORT H C, KURZ M E, LEES D C, KURZ M A 2007 A review of *Micropterix* Hübner, 1825 from northern and central Europe (Micropterigidae). *Nota lepidopterologica* 30(2): 235-298
 11. ANONYMOUS 2015 Uredba o izmjenama Uredbe o ekološkoj mreži. *Narodne Novine* 105(2015)
 12. MIHOCI I, FRANJEVIĆ M 2011 Rare and threatened geometrid moth *Erannis ankeraria* in Croatia: historical review, data analysis & perspectives. *Šumarski list* 135(7-8): 353-360
 13. DZZP 2014 Nacionalna klasifikacija staništa (IV. verzija). Državni zavod za zaštitu prirode, pp 157
 14. NOWACKI J 1998 The noctuids (Lepidoptera, Noctuidae) of Central Europe. František Slamka, Bratislava, pp 51
 15. BARANYI T, JÓZSA Á CS, BERTALAN L 2006 *Arytrura musculus* (Ménétriés, 1859). In: Varga Z (ed) *Natura 2000 fajok kutatása I. – Natura 2000 species studies I. Dél-Nyírség-Bihari Tájévédelmi és Kulturális Értéktörző Egyesület, Debrecen*, 71-87
 16. CORDUNEANU C, BALAN C, SURUGIU I 2007 Lepidoptera of Humid Area “Orășeni Vale” (Orășeni Vale, Botoșani County, Romania). *Entomologica Romanica* 12: 113-120
 17. VAJGAND D K 2016 CONTRIBUTION TO THE STUDY OF LEPIDOPTERA OF ČELAREVO (VOJVODINA, SERBIA). *ACTA ENTOMOLOGICA SERBICA* 21: 49-92
 18. HUEMER P, MORANDINI C, MORIN L 2004 New records of Lepidoptera for the Italian fauna (Lepidoptera). *Gortania* 26: 261-274
 19. EEA 2010 *Arytrura musculus*. Accessed 1.9.2016: http://eunis.eea.europa.eu/species/196450/conservation_status;jsessionid=5946556848664682D65815DC135DCFA3?d=49653-s=2&tab=conservation_status&d=49653-o=2&d=49653-p=1&idSpecies=196450