

# THE FIRST RECORD OF THE PEACOCK FLY *CALLOPISTROMYIA ANNULIPES* (MACQUART, 1855) (DIPTERA: ULIDIIDAE) IN CROATIA REVEALED BY SOCIAL MEDIA

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In Europe *Callopietromyia annulipes* (Macquart, 1855) is an alien species. It was introduced from North America in 2007 and has spread to more than ten European countries. The spread of the species has been observed since 2007 and the trend is still continuing, the species having recently been found in Croatia. Using social networks such as Facebook and iNaturalist, we can spot the spread of alien species to new areas, learn more about their ecology and speculate on the direction of potential expansion. Citizen science is an excellent tool for obtaining new knowledge, but as of today, its potentials are greatly underutilized.

**Key words:** social media, citizen science, biodiversity, introduced species

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*Callopietromyia annulipes* (Macquart, 1855) u Europi je alohtona vrsta, unesena iz Sjeverne Amerike 2007. godine, a do 2021. se proširila na više od deset zemalja Europe. Širenje vrste uočeno je još 2007. te se trend nastavlja do danas, kad je vrsta pronađena i u Hrvatskoj. Korištenjem društvenih mreža kao što su Facebook i iNaturalist možemo uočiti konkretna širenja pojedinih vrsta, doznati više o njihovoj ekologiji i zaključiti o smjeru mogućeg širenja u budućnosti. Građanska znanost je odličan alat za dolazak do novih saznanja, no njezini potencijali se u današnje vrijeme i dalje premalo iskorištavaju.

**Ključne riječi:** društvene mreže, građanska znanost, bioraznolikost, unesene vrste

## INTRODUCTION

The peacock fly *Callopietromyia annulipes* (Macquart, 1855) is a member of the picture-winged flies of the subfamily Otitinae, family Ulidiidae. The English name ‘peacock fly’ refers to the fly’s remarkable wing pattern and wings which are raised vertically and pointed forward, resembling a peacock tail (PINTILIOAIE & MANCI, 2020).

Current knowledge regarding the biology and ecology of the peacock fly is mostly related to the flora on which the fly has been found and which plays a role in its reproductive cycle. The fly lays eggs in dead or dying trees; puparia have been found under the bark of *Acer negundo* and adults have been discovered ovipositing on dead

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trees of *Robinia pseudoacacia* (Steyskal 1979). Various observations of the fly indicate its presence on the trees of deciduous forests (genera *Acer*, *Fagus*, *Populus*, and *Robinia*) (PINTILIOAIE & MANCI, 2020; KLASA & JAŁOSZYŃSKI, 2018; KAMENEVA & KORNEYEV, 2006; STEYSKAL, 1979). This fly can also be found in open and exposed places – on cars (PINTILIOAIE & MANCI, 2020; KAMENEVA & PEKARSKY, 2016; STEYSKAL, 1979), on flagpoles, handrails and curbstones (DVOŘÁK *et al.*, 2017), near small ponds or water reservoirs (DVOŘÁK *et al.*, 2017; KORNEYEV *et al.*, 2014) and even in vineyards (MERZ, 2007). Beer or wine traps have proven to be successful methods for sampling these dipterans (PINTILIOAIE & MANCI, 2020; DVOŘÁK *et al.*, 2019; DVOŘÁK, 2017; KORNEYEV *et al.*, 2014).

The peacock fly is a Nearctic species and is widespread in the United States and southern Canada (KAMENEVA & KORNEYEV, 2006). It was recently introduced to the Palearctic region. The first record of the fly in Europe came from Switzerland in 2007 (MERZ, 2007). Later on, this species was found to have spread rapidly through Europe. It was observed in Germany (MERZ & VAN GYSEGHEM, 2007), the Netherlands (SMITH & HAMERS, 2011), France (from a picture posted on Diptera.info website, in 2011), Slovenia (from an observation uploaded by Weites M. to Observation.org database, in 2011), Slovakia (KORNEYEV *et al.*, 2014), Hungary (KAMENEVA & PEKARSKY, 2016), Czechia (DVOŘÁK 2017), Belgium (RAVOET & FARINELLE, 2017), Poland (KLASA & JAŁOSZYŃSKI, 2018), Ukraine (DVOŘÁK *et al.*, 2019) and Romania (PINTILIOAIE & MANCI, 2020). Given the known European distribution of *Callopietromyia annulipes*, the species was expected to be found in Croatia as well. In this study we present the first records of this species in Croatia.

## MATERIALS AND METHODS

The photographs of the specimens were found in the Croatian Facebook group "Koji je ovo pauk/kucac?" ("Which spider/insect is this?") (three records) and on iNaturalist (two records).

The identification of the specimens was carried out by following the key to the genera of Ulidiidae of the United States and Canada by WALLACE (2021), supplemented by the key by STEYSKAL (1975) for species-level determination.

## RESULTS

The photographed specimens were identified as *Callopietromyia annulipes*, the peacock fly, thus confirming its presence in Croatia.

The list of records, along with all available information is given in Tab. 1. The map of *C. annulipes* records along with photographic evidence is presented in Fig. 1. and habitat photographs are presented in Fig. 2.

## DISCUSSION

The value of citizen science has already been confirmed through the numerous findings it has facilitated. Photographs taken by non-experts and posted online are used by experts not only to identify new records for known species (JONES *et al.*, 2019), but also to identify species unknown to science (KASALO *et al.*, 2021; SKEJO & CABAL-

**Tab. 1.** List of *Callopistromyia annulipes* observations from Croatia found on social media.

OBSERVER	DATE	LOCALITY	LINK
<i>Facebook</i>			
Matej Kopecki	May 29, 2018	near Mt Papuk, Croatia	<a href="https://www.facebook.com/groups/pauci.i.kukci/posts/2014223065493637">https://www.facebook.com/groups/pauci.i.kukci/posts/2014223065493637</a>
Dora Kolar	August 5, 2019	Mt Kunagora, Croatia	<a href="https://www.facebook.com/groups/pauci.i.kukci/posts/2293637107552230">https://www.facebook.com/groups/pauci.i.kukci/posts/2293637107552230</a>
Stefan Majnarić	August 24, 2019	Žutica forest, Croatia	<a href="https://www.facebook.com/groups/pauci.i.kukci/posts/2176102885972320">https://www.facebook.com/groups/pauci.i.kukci/posts/2176102885972320</a>
<i>iNaturalist</i>			
Vladimir Ribičić	September 20, 2018	near the city of Karlovac, Croatia	<a href="https://www.inaturalist.org/observations/17021950">https://www.inaturalist.org/observations/17021950</a>
ivan_humljani	July 14, 2019	Humljani, Croatia	<a href="https://www.inaturalist.org/observations/36971102">https://www.inaturalist.org/observations/36971102</a>



**Fig. 1.** Records of *Callopistromyia annulipes* (Macquart, 1855) from Croatia, both live specimens; photographs (B–D), and their localities on a map (A) (photographs by Ivan Grubišić).



**Fig. 2.** Habitat photographs of *Callopistromyia annulipes* from Croatia, Kunagora near Pregrada. Forest (B) populated by *Robinia pseudoacacia* (A), commonly known as black locust—a common habitat of *C. annulipes*. In the forest, the author of the Facebook post and these photographs, Dora Kolar, reported a population of *Fagus sylvatica* (common beech), *Cornus* sp. (dogwood), and *Quercus* sp. (oak) (photographs by Dora Kolar).

LERO, 2016). One of the most immediately noticeable benefits of paying attention to citizen science portals is the ability to detect invasive species earlier than is possible through conventional methods (LARSON *et al.*, 2020).

Alongside being useful as a tool for identifying species and their distribution, online databases can complement traditional methods in producing more robust results in complex research that requires a large amount of data, such as ecological niche modelling (HOCHMAIR *et al.*, 2020).

The fact that the first record of *C. annulipes* in Croatia remained unpublished for years although its importance is immediately apparent could imply two things. First, the value of citizen science is still not widely recognized and platforms such as iNaturalist are simply ignored when conducting research. For example, by surveying the records of *C. annulipes* on iNaturalist, one can learn of its presence in Spain, Serbia, and Bulgaria, countries for which no official publications regarding the issue have been produced. Second, there are certainly more undiscovered species and new distribution data for known species hiding in the ever-growing depths of online databases. Both of these points will become less true as more papers like this get published and thus testify to the value of citizen science.

It should be pointed out that not every new piece of data can lead to a publication such as this. In this case, the species is clearly distinguishable from its only congener and the genus *Callopistromyia* itself can be easily identified from photographs as well.

The photograph is only as good as the information it provides, and it often does not provide every essential detail. Yet even for taxa that cannot be readily identified from photographs, citizen science is a valuable asset in pointing researchers to the places where new discoveries can be made. Each record on citizen science portals should be critically examined and used only in the manner that is allowed by the data it provides. This should not be seen as a handicap of such portals but as a new aspect of the modern approach to research.

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