



STUDIA UNIVERSITATIS  
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# Biogeography of the Carpathians

Cluj-Napoca 2017



Ecological and evolutionary  
facets of biodiversity

The Second Interdisciplinary Symposium,  
28-30 September 2017, Cluj-Napoca, Romania

# BIOLOGIA

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of the Carpathians**  
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Ecological and evolutionary facets of biodiversity**

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==== POSTER ABSTRACT ====

**Changes in the Carpathian fauna of Dasytidae and Malachiidae beetles  
in the context of climate change**

Vladyslav Mirutenko<sup>1,✉</sup>

The beetles of Dasytidae and Malachiidae families are characterized by similar biological traits and ecological requirements. The flying period of these species mainly depends of several habitat particularities: altitude, temperature, and humidity.

The analysis of changes in the phenology of species was performed for the Ukrainian part of the Carpathians and was based on the study of museum collections. First recordings for this species from the Transcarpathian Lowland date back to the third decade of April during the 1950's. Furthermore, the highest number of specimens was recorded through an extended period, spanning from the end of May until July. Since the beginning of the 1960's until the 1980's the first recordings were dated by mid-May, and the period with highest density of individuals shifted to the second half of June – mid July. Since the mid-1980's to the beginning of 2010's the first recordings for these species came in the second decade of April, while the highest number of beetles were registered between mid-May and mid-June. In this last period of recordings, the end of the flight occurred 10-20 days earlier, comparable to the first recordings dating back 30-50 years.

On the south-western foothills, during the 1950's, the first records were dated by mid-April, and since the 1960's to mid-1980's by the beginning of May. Since mid-1980's to the late 2000's the period of the flight shifted by ten days (in average) comparable with the middle of last century, and it begun in early April. The periods with highest number of recorded individuals were shifted from mid-May to late June, shifting in 1960-80's with one-two weeks later.

In the 1950's, in the mountainous areas, the beginning of flight was recorded in the second decade of May. From the 1960's - to mid 1980's adults were recorded from late May to the second half of August. Since the mid-1990's to the late 2000's

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#### POSTER ABSTRACT

adults were active from early May to late July. The highest number of beetles was recorded in the early - mid June, comparable to the mid-century period and to the recent years. In the 1960-70's, the period of peak recordings shifted to the end of June – July, which was a significant change.

Also, it should be noted that over the past decades, some species of Southern European and Mediterranean origins have expanded the boundaries of their ranges reaching new regions, including the Carpathians. Standing proof is *Clanoptilus spinipennis* (Germ. 1824), a species that had a South European-Asia Minor distribution in the beginning of the 20<sup>th</sup> century, in present days extended its range to Central and Eastern Europe, including the Carpathian region. Another species, *Anthomalachius strangulates* (Ab. de Perrin 1885), spread from the Balkans and Central Europe to Northern and Eastern Europe. Conversely, *Clanoptilus falcifer* (Ab. de Perrin 1882) expanded its areal from Central-East Europe and Asia Minor to the Balkan Peninsula and the Carpathians.

Climate in the Carpathian Region had a high dynamic during the last century. In the 1960's – early 1980's period temperatures contributed to more later appearance of beetles, with a comparable phenology in the 1950's. But since the late 1980's to the present time an opposite tendency has been observed. Adults appear in present period more early than they were 40-50 years ago.

Similar phenological shifts and changes in faunal structure are typical for all insects trophically related to vegetation. As a result of change in temperature conditions the insects expanded their areals in an accelerated manner. This last process can probably lead to the emergence of secondary generations during the same year, this effect posing real threats to vegetation in the case of plant pests.

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