

# About the Record of Small Emperor Moth *Saturnia pavonia* (Linnaeus, 1758) — A New Species for the Moth's Fauna of the Republic of North Ossetia-Alania

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## To cite this article:

Vitaly Dobronosov, Roald Kaupush, Muslim Sarakuev. About the Record of Small Emperor Moth *Saturnia pavonia* (Linnaeus, 1758) — A New Species for the Moth's Fauna of the Republic of North Ossetia-Alania. *International Journal of Animal Science and Technology*. Vol. 7, No. 3, 2023, pp. 39-42. doi: 10.11648/j.ijast.20230703.11

Received: June 27, 2023; Accepted: July 18, 2023; Published: August 5, 2023

**Abstract:** The Small Emperor Moth — *Saturnia pavonia* L., is a moth of the family Saturniidae. This moth occurs throughout the Palearctic region — both eastern and western. Based on data on the distribution of the species in the South of Russia and the North Caucasus, we assumed the presence of *Saturnia pavonia* L. habitats on the territory of the RNO-A. The moth is classified as rare and endangered and listed in the Red Books of various ranks, obtaining new information about its distribution is an urgent task. The aim of the work was an inventory of the moth's fauna of the republic. Standard generally accepted methods of visual observations, biomaterial collection, photo fixation and office processing of entomological materials were applied. The research was carried out from 1985 to 2023, throughout the territory of RNO-A — from the steppe to the alpine belt, at absolute altitudes of 130-3500 m above the s. l. Many years of research have not yielded records of this species of moth. Finally, in the spring of 2023, the Small Emperor Moth was found in the west of the republic on the border with the Kabardino-Balkar Republic in wild-fruited plantings. This is the first and only discovery of this moth's species in North Ossetia.

**Keywords:** The Small Emperor Moth, *Saturnia pavonia* L., Distribution, Republic of North Ossetia-Alania, Kabardino-Balkar Republic, Caucasus

## 1. Introduction

*Saturnia pavonia*, the Small Emperor Moth, is a moth of the family Saturniidae. Sometimes, the incorrect genus name *Pavonia* is still used for this species. This moth occurs throughout the Palearctic region. Generally, distribution is Holarctic: Palearctic (both eastern and western). Pleistocene refuge: Polycentric — Iranian, Mediterranean and Caspian refuges [1].

The male has a wingspan of about 40-65 mm with brown and white forewings marked with red and orange fascia and a bold black and orange eyespot. The hindwings are orange with a similar eyespot. The female is larger with a wingspan of about 48-90 mm, but less brightly colored than the male, being generally grey and white but has all wings marked with eyespots similar to the male. Sometimes the eye-spots are

missing from all wings (ab. *obsoleta* Tutt), or abnormally shaped. Occasionally, a female may be colored as per the male, or be very dark grey [2].

The males of this species are diurnal (day-flying) and generally become active in the afternoon, flies from mid-April to late June looking for the rather sluggish females, which usually only fly at night. The flight time varies based on latitude, altitude and local weather. The species inhabits a range of habitats but is most often associated with heathlands, scanty grassland, woodland margins, shrublands and hedgerows, occurring altitude up to 2000 m above s. l. The caterpillar is black and orange at first, later becoming green with black rings and yellow and red spots [3].

The commonest food plant is heather (*Calluna*) but the moths has also been recorded feeding on other plants: lady's mantle (*Alchemilla*), alder (*Alnus*), madrones (*Arbutus*), birch

(*Betula*), dogwoods (*Cornus*), hawthorn (*Crataegus*), heath (*Erica*), beech (*Fagus*), meadowsweet and dropwort (*Filipendula*), strawberries (*Fragaria*), ash (*Fraxinus*), sea buckthorn (*Hippophae*), hop (*Humulus*), walnut tree (*Juglans*), loosestrife (*Lythrum*), apples (*Malus*), bog-myrtle (*Myricagale*), betoum (*Pistacia*), poplar (*Populus*), cinquefoils (*Potentilla*), plums (*Prunus*), pear (*Pyrus*), oaks (*Quercus*), buckthorns (*Rhamnus*), dogrose (*Rosa*), blackberry, raspberry (*Rubus*), docks, sorrels (*Rumex*), willows (*Salix*), elder (*Sambucus*), pepper trees (*Schinus*), common whitebeam (*Sorbus*), meadowsweets (*Spiraea*), elm (*Ulmus*), blueberry, lingonberry (cowberry), crowberry (*Vaccinium*).

The species overwinters as a pupa within a fibrous cocoon [2-4].

The aim of the work was an inventory of the moth's fauna of the Republic of North Ossetia-Alania (RNO-A).

To achieve this aim, we solved the following tasks: 1) analysis of the literature on the topic of the study (search depth 200 years; 2) studies of available collector biomaterial; 3) route visual examinations; 4) office and statistical processing of collected materials.

Published data (search depth 200 years) on the location of moths specifically in North Ossetia are missing. In a wider range, information on the distribution of the species in the "West Caucasus" and "East Caucasus" is given in the Catalog of Insects of the World [5] and in the Catalog of Moths and Butterflies (Lepidoptera) of Russia [6] and even more broadly "Caucasus" in many well-known publications [7-10].

Given the fact that the moth is classified as rare and endangered and listed in the Red Books of various ranks [11-15], obtaining new information about its distribution is an urgent task.

## 2. Materials and Methods

The following materials and equipment were used: literary sources (see references), collectible insects, Garmin eTrex 20x GPS navigator, digital cameras, aerial entomological nets, straighteners and pins, laboratory tweezers, and preparation needles.

Standard generally accepted methods of visual observations, biomaterial collection, photo fixation and office processing of entomological materials were applied [16]; survey of geodetic data by pocket GPS-navigator. All topographic data are presented in the WGS-84 coordinate system.

## 3. Experimental Procedures

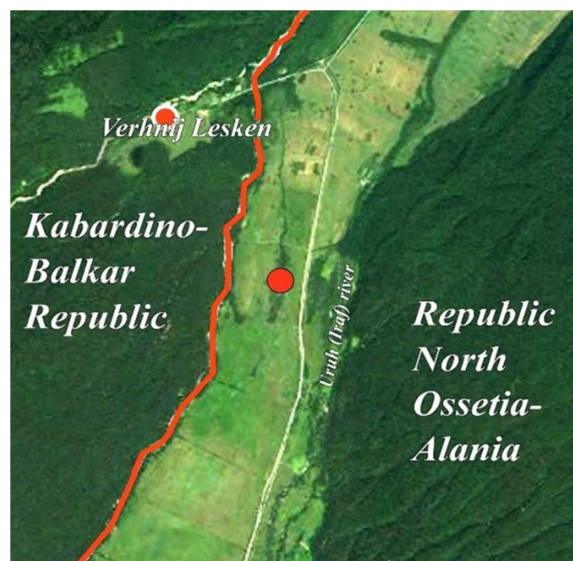
Our research was carried out from 1985 to 2023, throughout the territory of RNO-A — from the steppe to the alpine belt, at absolute altitudes of 130-3500 m above the s. l., both on routes and at stationary observation points.

## 4. Results

For the period from 1985 to 2022, we did not record a single

specimen of the Small Emperor Moth in the RNO-A. Finally, in the spring of 2023 (17.04.2023), a moth was found in the west of the republic on the border with the Kabardino-Balkar Republic (KBR) (Figure 1).

The habitat was the natural plot of wildly fruit trees and shrubs in lower mountain forest belt in the vicinity of the village of Verhnij Lesken (2,3 km to the southeast — 43°12'1.03"N, 43°45'16.86"E, 870 m above s. l.). A student of North Caucasus College of Mechanization, Forestry Automation and Management Muslim Sarakuev during field practice under the guidance of his teacher Roald Kaupush has recorded a female of a Small Emperor Moth (Figure 2).



**Figure 1.** Red circle — Location of the record; red line — border between republics.



**Figure 2.** Female of *Saturnia pavonia* L.

This is the first and only discovery of this moth's species in North Ossetia.

## 5. Discussion

Based on data on the distribution of the species in the South of Russia and the North Caucasus: in the Rostov region [12],

Stavropol Krai [13], the Chechen Republic [15], the Republic of Ingushetia [14], we assumed the presence of *Saturnia pavonia* L. habitats on the territory of the RNO-A.

Since in the Ciscaucasia and the North Caucasus, moths are found on the edges of forests, in thickets of shrubs in ravines, beams, on steep indigenous banks of rivers, on forest clearings and felling; meadow areas with shrubs or freestanding trees; mixed and broad-leaved forests, floodplains of small forest rivers, shrub thickets, we hoped for its records in similar types of habitats in RNO-A. Many years of research have shown that this species is very rare in the surveyed area and inhabits only the natural plot of wildy fruit trees and shrubs in the western part of the republic.

## 6. Conclusions

As a result of the study, we established a new habitat of *Saturnia pavonia* L. in the territory of RSN-A. The habitat is located in the west of the republic on the border with the KBR, in the vicinity of the village of Verhnij Lesken. It is the natural plot of wildy fruit trees and shrubs. This is the first and only record of this species in the republic. The habitation of these moths in the territory of KBR is very likely. There is no published data on the distribution of the moth in RNO-A and KBR, but there may be a phenomenon of "waves of life" — population waves, when insects disappear and appear after long time intervals. Our further research in this direction will continue.

## Conflict of Interest

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

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## Acknowledgements

We express our gratitude for the assistance in conducting scientific research to the National Museum of the Republic of North Ossetia-Alania and North Caucasus College of Mechanization, Forestry Automation and Management.

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