

## ENDEMIC BUTTERFLIES IN THE LEPIDOPTERA COLLECTION PRESERVED AT THE "LUCIAN BLAGA" UNIVERSITY OF SIBIU

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**Abstract.** The study presents data on Macrolepidoptera endemic species of Lepidoptera Collection from the "Lucian Blaga" University of Sibiu. This collection is composed of 21 families, 334 genera and 560 species; among these species, there can be found also 8 endemic species of Macrolepidopterans collected from the mountains of Romania. Most species come from the Carpathian habitats (Babele, Jepilor Valley, Caraiman, Peak Vârful cu Dor (Bucegi), Zagan Mountain (Ciucas Massif), Balea Lake (Făgăraș), Rodna Mountains). The endemic species of the collection are: *Parnassius mnemosyne wagneri* Bryk, 1925, *Erebia epiphron transsylvanica* Rebel, 1908, *E. melas carpathicola* Popescu-Gorj & Alexinschi, 1959, *E. manto trajanus* Hormuzachi, 1895, *Erebia melas carpathicola* Popescu-Gorj & Alexinschi, 1959, *E. pronoe regalis* Hormuzachi, 1937, *Erebia cassioides neleus* (Freyer, 1833), *Boloria pales carpathomeridionalis* Crosson & Popescu-Gorj, 1963. Therefore the paper brings important contributions to the knowledge regarding the distribution of endemic species and highlights and the areas generate and conserve endemic species.

**Keywords:** Lepidoptera, collection, endemic species.

**Rezumat. Specii endemice de fluturi din Colecția Universității "Lucian Blaga" din Sibiu.** Lucrarea prezintă date referitoare la speciile de macrolepidoptere endemice din Colecția de Lepidoptere a Universității "Lucian Blaga" din Sibiu. Această colecție are în componență 21 familii, 334 genuri, 560 specii între acestea găsiindu-se și 8 specii de macrolepidoptere endemice, colectate din câteva masive muntoase ale României. Majoritatea speciilor provin din habitatele Munților Carpați (Babele, Valea Jepilor, Caraiman, Vârful cu Dor (Munții Bucegi), Muntele Zăgan (Masivul Ciucas), Lacul Bălea (Munții Făgăraș), Munții Rodnei). Speciile endemice din colecție sunt: *Parnassius mnemosyne wagneri* Bryk, 1925, *Erebia epiphron transsylvanica* Rebel, 1908, *E. melas carpathicola* Popescu-Gorj & Alexinschi, 1959, *E. manto trajanus* Hormuzachi, 1895, *E. melas carpathicola* Popescu-Gorj & Alexinschi, 1959, *E. pronoe regalis* Hormuzachi, 1937, *E. cassioides neleus* (Freyer, 1833), *Boloria pales carpathomeridionalis* Crosson & Popescu-Gorj, 1963. Astfel, lucrarea aduce contribuții importante la cunoașterea distribuției speciilor endemice și evidențiază zonele endemogeneratoare și endemoconservatoare din care provin.

**Cuvinte cheie:** lepidoptere, colecție, specii endemice.

### INTRODUCTION

Being among the most colourful among the taxa of invertebrates, now it is known more about the ecology and taxonomy of butterflies than about any other major group of insects. Over time, there have been, achieved collections, studies and research to learn more about the biology and ethology of butterflies. Lepidoptera species are made up of distinct communities, living in specific sub-regions, in different geographical and ecological conditions. These features contribute to the value of the biological indicators of different species of butterflies (SZEKELY, 2003a).

This paper aims to present butterfly endemic species (Rhopalocera) from the Lepidoptera collection of the "Lucian Blaga" University of Sibiu (STANCĂ-MOISE, 2015b, c; 2016a, b). All the eight species of butterflies listed in the paper, are found in the list of endemic species for Romania (RÁKOSY, 1997). Endemic species are the species that have as area of distribution only a certain restricted, well-defined geographical area, such as a forest, a lake, or other well-defined area or habitat (RÁKOSY, 1997; BURNAZ, 2008). Although no list of this nature can ever be considered comprehensive, it is hoped that the list is a complete and updated one (SZEKELY, 1999b). From the literature and personal observations, the paper provides information on each endemic species, including collecting settlements and extensive details on the distribution in Romania, biology, ecology and ethology, host plants, hibernation period, flight of each species, as well as the degree of IUCN endangerment (RÁKOSY, 2003, 2005).

The list renders systematically the family, subfamily and species. Each species is attributed to one of the habitats according to current research and based on personal observations in the field. These ecological affinities belong to three main categories namely species dependent on alpine zone (1500-2500 m), typical to subalpine habitats (1000-1500 m), and a species from Dobrogea area, flying at altitudes of 0-800 m.

### MATERIALS AND METHODS

Most species were collected from the mountains, especially from the Southern and Eastern Carpathians. The nomenclature is in accordance with the systematic list of the catalog of Lepidoptera of Romania (RÁKOSY et al., 2003). For each endemic subspecies, there are listed: collection data, the day, the month, the year, the city and altitude.

### RESULTS AND DISCUSSIONS

Below it is the systematic list of endemic species existing in the collection of the "Lucian Blaga" University of Sibiu.

**Family PAPILIONIDAE**

*Parnassius mnemosyne wagneri* Bryk, 1925

**Biogeographical region:** North-Muntenia, Dobrudja, Moldavia

**Habitat type:** wooded steppe, bush areas, limestone areas, steppe meadows, karst canyons

**Status:** very local

**Altitude:** 0-800 m

**Flight period:** ½ May - ½ June

**Protection status:** VU, NT

**Larval food plants:** *Corydalis solida*, *C. cava*, *C. intermedia*.

**Overwintering stage:** Hibernates in egg stage.

**Migratory status:** nonmigratory

**No. of specimens:** 2♂♂, Canaraua Fetii (DB), May 24, 25, 1997, 150 m. alt., 1♀, Canaraua Fetii (DB) (SZEKELY, 2006), May 26, 1997, 150 m. altitude.

**Family NYMPHALIDAE**

**Subfamily SATYRINAE**

*Erebia ephron transsylvanica* Rebel, 1908

**Biogeographical region:** the Eastern Carpathians, the Southern Carpathians (eastern part)

**Habitat type:** alpine, sub-alpine meadows, alpine, sub-alpine rock lawns, alpine, sub-alpine bush areas

**Status:** very local, common, very common

**Altitude:** 1200-2500 m.

**Flight period:** ½ June-August

**Protection status:** VU, NT

**Larval food plants:** *Nardus stricta*, *Festuca ovina*, *F. rubra*, *Poa annua*, *Deschampsia flexuosa*, *D. cespitosa*.

**Overwintering stage:** Hibernates in larva stage.

**Migratory status:** nonmigratory

**Records:** Bucegi Mountains, Rodna Mountains, Ciucaș Mountains, Ceahlău Mountains, Piatra Craiului Mountains, Făgăraș Mountains, Negoiu, Parâng Mountains, Bicazul Gorges

**No. of specimens:** 1♂, Babele (Bucegi Mountains), August 11, 1984, 1♀, Zăgan Mountain (Ciucaș Massif) (SZEKELY, 1994), July 20, 1993, 1700 m alt.

*Erebia manto trajanus* Hormuzachi, 1895

**Biogeographical region:** the Eastern Carpathians, the Southern Carpathians

**Habitat type:** sub-alpine meadows, sub-alpine rock meadows, sub-alpine bush areas

**Status:** localized, common, very common

**Altitude:** 1200-2000 m.

**Flight period:** ½ July - ½ September

**Protection status:** VU, NT

**Larval food plants:** *Festuca rubra*

**Overwintering stage:** Hibernates in larva stage.

**Migratory status:** nonmigratory

**Records:** Bucegi Mountains, Piatra Arsă, Retevoiu, Retezat Mountains, Rodna Mountains, Ciucaș Mountains, Arjana Mountains, Pietrosu, Berghina, Parâng Mountains, Babele, Hășmașu Mare, Ecem, Piatra Singuratică, Călimani Mountains, Făgăraș Mountains (Capra), Rarău-Giumalău Mountains

**No. of specimens:** 1♀, Jepilor Valley (Bucegi Mountains), August 11, 1994, 1800 m alt.

*Erebia gorge fredericikoenigi* Varga, 1999

**Biogeographical region:** the Eastern Carpathians (Ceahlău), the Southern Carpathians, the Apuseni Mountains

**Habitat type:** sub-alpine meadows, sub-alpine rock meadows, sub-alpine slopes

**Status:** localized, rare

**Altitude:** 1200-2400 m.

**Flight period:** July - ½ August

**Protection status:** VU, NT (RÁKOSY, 2002)

**Larval food plants:** *Poa minor*, *Poa alpina*, *Sesleria varia*

**Overwintering stage:** Hibernates in larva stage.

**Migratory status:** nonmigratory

**Records:** Bucegi Mountains (SZEKELY, 2003b), Godeanu-Țarcu Mountains, Parâng Mountains, Negoiu, Apuseni Mountains, Chile Runcului, Piatra Craiului Mountains, Retezat Mountains, Stănuleți, Borăscu, Scărișoara, Pietrii Peak, Peleaga, Bucura

**No. of specimens:** 1♂, Bălea Lake (Făgăraș Mountains), July 29, 1994, 2200 m alt.

*Erebia melas carpathicola* Popescu-Gorj & Alexinschi, 1959

**Biogeographical region:** the Eastern Carpathians

**Habitat type:** limestone areas, rock slopes, debris slopes, juniper areas, bush areas, rock meadows

**Status:** very local, rare

**Altitude:** 1000-2000 m.

**Flight period:** ½ June-July

**Protection status:** VU, NT

**Larval food plants:** *Festuca ovina*

**Overwintering stage:** Hibernates in larva stage

**Migratory status:** nonmigratory

**Records:** Hășmașu Mare Mountains, Hășmașu Mic Mountains, Harghita Mountains, Hășmașu Negru Mountains, Ciucaș Mountains, Ecem, Piatra Singuratică

**No. of specimens:** 1♂, Rodna Mountains, July 23, 1985.

*Erebia pronoe regalis* Hormuzachi, 1937

**Biogeographical region:** the Southern Carpathians, Retezat Mts.

**Habitat type:** sub-alpine meadows, sub-alpine, alpine rock meadows, sub-alpine, alpine bush areas, juniper areas

**Status:** very local, common

**Altitude:** 1400-2200 m.

**Flight period:** ½ July-August

**Protection status:** VU, NT

**Larval food plants:** *Festuca ovina*

**Overwintering stage:** It hibernates in the larval stage.

**Migratory status:** nonmigratory

**Records:** Bucegi Mountains, Piatra Craiului Mountains, Piatra Arsă, Caraiman, Babele, Jepilor Valley (2000 m), Retezat Mountains

**No. of specimens:** 1♂, Caraiman (Bucegi Mountains), August 1, 1990, 2100 m alt.

*Erebia cassioides neleus* (Freyer, 1833)

**Biogeographical region:** the Southern Carpathians (West)

**Habitat type:** sub-alpine meadows, sub-alpine, alpine rock meadows, sub-alpine, alpine bush areas

**Status:** very local, common

**Altitude:** 1400-2500 m

**Flight period:** ½ July-August

**Protection status:** EN, VU, NT

**Larval food plants:** *Festuca ovina*

**Overwintering stage:** It hibernates in the larval stage.

**Migratory status:** nonmigratory

**Records:** Retezat Mountains, Arjana Mt., Cerna Mountains, Godeanu Țarcu Mountains

**No. specimens:** 1♂, Cerna Mountains, June 9, 2000, 2000 m. alt.

Subfamily **HELICONIINAE**

*Boloria pales carpathomeridionalis* Crosson & Popescu-Gorj, 1963

**Biogeographical region:** the Southern Carpathians

**Habitat type:** alpine sub-alpine meadows, alpine tundra, alpine sub-alpine rocky slopes (RÁKOSY, 1993)

**Status:** very local, common

**Altitude:** 1600-2500 m

**Flight period:** ½ June-July (G1), August-September (G2)

**Protection status:** VU, NT

**Larval food plants:** *Viola calcarata*

**Overwintering stage:** It hibernates in the larval stage.

**Migratory status:** nonmigratory

**Records:** Bucegi Mountains, Babele, Valea Zănoagei, Cocora Mountains, Moraru Mt., Valea Obârșiei, Bolboci, Bușteni, Caraiman, Valea Făgăraș Mountains, Capra Peak, Bâlea Lake, Parâng Mountains, Mt. Surul, Jepii Mari, Furnica peak, Coștila, altitude 2000 m., Omul, Piatra Arsă

**No. of specimens:** 2♂♂, Babele (Bucegi Mountains), August 11, 1981, 1♀, Vârful cu Dor (Bucegi Mountains), 28.VIII.1998.

## CONCLUSIONS

The Lepidoptera fauna diversity in Romania is reflected not only by the large number of papers: (SZEKELY, 1996, 1999a, b, 2008, 2010, 2011, 2014; MOISE, 2011a, b, c, d; STANCĂ-MOISE, 2015a, d, e; STANCĂ-MOISE, 2016c, d, e, f; STANCĂ-MOISE, 2017a, b), but also by numerous collections kept in museums in Romania (POPESCU-GORJ, 1964; NEMEȘ & VOICU, 1973; KÖNIG, 1975; CIOCHIA & BARBU, 1980; CIOCHIA & STANCĂ, 2000; MARCU & RÁKOSY, 2002; SZÉKELY & CERNEA, 2007), from amateur collectors or educational institutions. Of the 560 common species, Lepidoptera Collection of the "Lucian Blaga" University contains also rare and endemic fauna of Romania. These taxa are very important in scientific and biogeographical terms (SZEKELY,

1995). These endemic species can easily become threatened or extinct species if their habitat is changed, especially, but not only because of human activities (including the introduction of new species).

After analysis the 560 species belonging to 334 genera and 21 families from the collection of Lepidoptera of the "Lucian Blaga" University of Sibiu, we have identified eight taxa (13 species), distributed in the families: Papilionidae (1 species), Satyridae (7 species).

Regarding the habitat preferences, 7 species are dependent on alpine and subalpine zone (1000-2500 m) and one species prefers low altitude habitats in Dobrogea (0-800m). Most specimens come from the habitats of the Carpathians (Babele, Jepilor Valley, Caraiman, Vârful cu Dor (Bucegi), Zagan Mountain (Ciucas Massif), Balea Lake (Făgăraș), Rodna Mountains. The basis of trophic larvae is limited preferring a small number of plant species that are presented in the paper. According to the degree of endangerment all are EN, VU or NT taxa.

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