

State of Knowledge of Butterfly Fauna of Albania, with Three New Species for the Country

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Abstract: The butterfly fauna of Albania, a country located in a Mediterranean biodiversity hotspot, has remained poorly studied, even though 201 species have been reported. It was expected that new species would be added to the country's checklist because of their geographic ranges and known occurrence in adjacent, usually better surveyed regions. We recorded two new species (*Anthocharis damone*, *Melitaea diamina*) during faunal field explorations in 2003-2012 and a third (*Cacyreus marshalli*) during a tourist visit to Tiranë, thus increasing to 204 the number of species recorded in the country. In addition, we provide the first chronological records of *Colias aurorina* and *Pieris balcana*. We also confirmed the occurrence of *Apatura metis*, which was recorded in this country more than 80 years ago. For the species recorded we have extended their known geographical ranges in southern Europe. At present, Albania is the country in the western Balkans with the second highest number of butterfly species recorded after Greece (235) and ahead of Macedonia (203).

Key words: The Balkans Peninsula, biodiversity hotspot, distribution, first records, Lepidoptera

Introduction

Even though the butterfly fauna of Albania is one of the richest in Europe, it has been poorly studied (REBEL & ZERNY 1931, MISJA 2005, KUDRNA *et al.* 2011, VEROVNIK & POPOVIĆ 2013a). The recent monograph on the Albanian Rhopalocera included 178 species (MISJA 2005) but the records of several species (*Pyrgus foulquieri*, *Spialia sertorius*, *Pontia daplidice*, *Tarucus theophrastus*, *Lycaena hippothoe*, *Hipparchia alcyone*, *Satyrus actaea*, *Coenonympha tullia* and *Coenonympha gardetta*) and (or) their presence in this country (and some of them in the Balkans) seem doubtful, as the known ranges of some of these species are limited to SW Europe (TOLMAN & LEWINGTON 2008, KUDRNA *et al.* 2011, VEROVNIK & POPOVIĆ 2013b). Many species were reported by MISJA (2005) only from single localities and their occurrence in Albania is doubtful. For example, the only record of *Euphydryas maturna* is based on a specimen without a label and known locality from the collection

of the Museum of Natural History in Tiranë (MISJA 2005). In this case, it is not even certain whether the specimen was collected in Albania.

The annotated checklist of Albanian butterflies by VEROVNIK & POPOVIĆ (2013b) includes 196 species but these authors did not review the data from the book by MISJA (2005). This may have caused some discrepancies in the number of species in the Albanian checklist. Two further species should be added to the country's list based on records published by MISJA (2005). *Euchloe penia* has been reported from one locality (Gram-Kumbull) in Eastern Albania, near the border with Macedonia, whereas *Pseudochazara cingovskii* has been reported from two sites (Shtikë-Gramos and Qafa e Qarrit) in the south-east, near the border with Greece. Although not discussed in the revised Albanian checklist (VEROVNIK & POPOVIĆ 2013b), another species, *Apatura metis*, was reported from Tiranë by REBEL & ZERNY (1931) as the form *Apatura ilia metis*.

On the other hand, several species (*Muschampia tessellum*, *Carterocephalus palaemon*, *Heteropterus morpheus*, *Colias hyale*, *Melitaea aurelia*, *Hipparchia semele* and *Nymphalis vaualbum*) were added to the Albanian list based on single unconfirmed records only or their known occurrence in adjacent countries (VEROVNIK & POPOVIĆ 2013b). None of these species, except for *Hipparchia semele* sensu lato (i.e. the *H. semele* group), were included in the Albanian butterfly fauna by MISJA (2005). This means that the number of species confirmed for Albania is in fact slightly lower than that actually reported. However, the latest updated checklist of the butterflies of Albania contains 198 species and indicates several other species expected to occur (ŠAŠIĆ *et al.* 2015). Including *E. penia*, *P. cingovskii* and *A. metis*, the number of species reported sums up to 201.

In this paper, we provide the first records of three butterfly species, which are new for the fauna of Albania, and the first chronological records of *Colias aurorina* and *Pieris balcana* recently reported for the country (VEROVNIK & POPOVIĆ 2013a). We also confirm the occurrence of *Apatura metis*, which was first recorded in this country more than 80 years ago.

Materials and Methods

Distributional data on Albanian butterflies were collected during faunal, mainly chiropterological, field studies of different regions of the country between 2003 and 2012 (eight trips in total) by the first author and his colleagues. Butterflies were observed and photographed on different occasions and in different habitats. In some cases specimens were also collected with a hand net for further identification. One species (*C. marshalli*) was recorded opportunistically during a tourist visit to Tiranë. We identified butterflies to species level based on their external characteristics following LAFRANCHIS (2004), TOLMAN & LEWINGTON (2008). To separate *P. balcana* and *P. napi* we used the characters provided by ZIEGLER (2013).

Results

Anthocharis damone BOISDUVAL, 1836

Borsh (N 40° 04.481', E 19° 51.360', 43 m a.s.l.), 2 May 2010, one male (Fig. 1.) collected in a rocky river gorge overgrown with bushes and old plane trees (Fig. 2.), leg. K. Sachanowicz.

Anthocharis damone is known from a few localities in Europe: in southern Italy (Calabria, Sicily - Mt. Etna); Greece (Corfu, Mitzekele Mts., Parnassus and Ghiona Massifs, Taygetos), Macedonia (Treska

Valley, Radika Valley, Galičica) and European Turkey. It also occurs in Israel, Lebanon, Anatolia, Syria, Northern Iraq and Iran (KRPAČ *et al.* 2011, TOLMAN & BERNHARD 1994, TOLMAN & LEWINGTON 2008). The present record in Albania fills the gap in the species distribution between Macedonia and Corfu (KUDRNA *et al.* 2011), and indicates the wider occurrence of this species in the South-western Balkans. According to the IUCN Red List Category, *A. damone* has LC status in Europe (VAN SWAAY *et al.* 2010).

The host-plant of the larvae of this species is *Isatis tinctoria* L. (Brassicaceae) that grows on hot, rocky slopes on limestone. Females lay eggs on flower buds, and caterpillars feed on flowers and developing seeds. Pupation takes place on dry plant-stems (TOLMAN & BERNHARD 1994, TOLMAN & LEWINGTON (2008). A univoltine species, the imagoes appear from early April to late May, according to season and altitude.

Cacyreus marshalli BUTLER, 1898

Tiranë (N 41° 19.766', E 19° 49.154', 112 m a.s.l.), 23 August 2009, one male (Fig. 3) netted when resting on red flowers of *Pelargonium* sp. at the Miniri Hotel, leg. S. Łuczkowski.

In Europe, this South African species was accidentally introduced to the Balearic Islands at the end of the 1980s and spread quickly to other Mediterranean Sea islands and countries (TOLMAN & LEWINGTON 2008). Single specimens have been observed also in other parts of Europe, most likely transported there with the host plants *Pelargonium* sp. The latest records of this species come from Slovenia (POLAK 2009), Croatia (KOSMAČ & VEROVNIK 2009), Greece (ANASTASIOU *et al.* 2010, MARTINOPOULOU *et al.* 2011, ALEXIOU 2014) and Bulgaria (LANGOUROV & SIMOV 2014). Its IUCN status in Europe is NA (VAN SWAAY *et al.* 2010).

Melitaea diamina (LANG, 1789)

Recorded at two sites: near Lepushë (N 42° 32.150', E 19° 40.898', 1472 m a.s.l.) and near Bashkimi (N 42° 34.362', E 19° 44.415', 1383 m a.s.l.) on 23 June 2011; single individuals were observed and netted (Fig. 4) on mountain grassland at a forest edge (Fig. 5), leg. K. Sachanowicz.

Melitaea diamina is distributed from Northern Spain northwards to South Fennoscandia through Central Europe, across temperate Asia to Japan (KUDRNA *et al.* 2011). In the Balkans, the species is known from a few localities from Croatia to Montenegro, in Bulgaria, and from one locality in Macedonia; it has not been reported from Greece (TOLMAN & LEWINGTON



Fig. 1. Male upperside (a) and underside (b) of *A. damone*, Borsh, 2 May 2010, leg. K. Sachanowicz



Fig. 2. Habitat of *A. damone*, Borsh, 2 May 2010 (photo: K. Sachanowicz)

2008, KUDRNA *et al.* 2011). The larval host-plant is *Valeriana* sp. The eggs are laid in batches on the leaves. The species hibernates as small larvae in a silken web (TOLMAN & LEWINGTON 2008). The IUCN status in Europe is LC (VAN SWAAY *et al.* 2010).

Colias aurorina HERRICH-SCHÄFFER, 1850

Moravë (N 40° 34.907', E 20° 50.000', 1369 m a.s.l.), 6 July 2011, one male (Fig. 6) and one female collected in a dry glade in a mountain forest (Fig. 7) with pine and fir trees, as well as with the suspected larval host-plant of this species – *Astragalus* sp., leg. K. Sachanowicz.

Colias aurorina is distributed from the Southern Balkans eastwards to Asia Minor, Caucasus and Iran (KUDRNA *et al.* 2011). In Europe it has one of the smallest geographic ranges among the *Colias* species: it is restricted to the mountains of Greece and South-eastern Albania (TOLMAN & LEWINGTON 2008, KUDRNA *et al.* 2011, VEROVNIK & POPOVIĆ 2013a). Two published records of this species from 2012 were from the same area of the Grammos Mts – the locality in Dardhë (VEROVNIK & POPOVIĆ 2013a) is situated at less than 10 km from our first record of this species near Moravë.



Fig. 3. Upperside (a) and underside (b) of *C. marshalli*, Tiranë, 23 August 2009, leg. S. Łuczowski



Fig. 4. Upperside (a) and underside (b) of *M. diamina*, near Lepushë, 23 June 2011, leg. K. Sachanowicz.



Fig. 5. Habitat of *M. diamina*, near Lepushë, 23 June 2011 (photo: K. Sachanowicz)

The larval host-plant is *Astragalus* sp., e.g. *A. creticus*, *A. parnassi* and *A. thracicus*. Ova are laid on the upper side of its leaves; it hibernates as a small larva (TOLMAN & LEWINGTON 2008, VEROVNIK & POPOVIĆ 2013a). The IUCN status in Europe is LC (VAN SWAAY *et al.* 2010).

Pieris balcana LORKOVIĆ, 1970

Qafa e Thores (N 42° 23.447', E 19° 42.793', 1541 m a.s.l.), 12 August 2007, one male (Fig. 8) collected in a glade in a young mountain beech forest (Fig. 9), leg. K. Sachanowicz. The identification of this specimen was confirmed by Heiner Ziegler (pers. comm).

Pieris balcana is a European endemic species known only from the Balkans and a part of cen-

tral Europe: Bosnia and Herzegovina, Macedonia, Bulgaria, Northern Greece (TOLMAN & LEWINGTON 2008), Croatia (TVRTKOVIĆ *et al.* 2012), Serbia (POPOVIĆ *et al.* 2013) and Romania (TÖRÖK & CUZEPAN 2014). It was recorded at one site in South-eastern Albania in 2012 (VEROVNIK, POPOVIĆ 2013a). According to KUDRNA *et al.* (2011), the taxonomic status of *P. balcana* as a separate species is not clear.

Apatura metis FREYER, 1829

Kamicë (N 42° 13.083', E 19° 21.663', 8 m a.s.l.), 7 September 2012, several individuals observed and photographed (Fig. 10) on the shore of Lake Shkoder (Skadar) overgrown with *Phragmites* sp. and *Salix* sp. (Fig. 11), leg. K. Sachanowicz.



Fig. 6. Male Upperside (a) and underside (b) of *C. aurorina*, Moravë, 6 July 2011, leg. K. Sachanowicz.



Fig. 7. Habitat of *C. aurorina*, Moravë, 6 July 2011 (photo: K. Sachanowicz)



Fig. 8. Male Upperside (a) and underside (b) of *P. balcana*, Qafa e Thores, 12 August 2007, leg. K. Sachanowicz.



Fig. 9. Habitat of *P. balcana*, Qafa e Thores, 12 August 2007 (photo: K. Sachanowicz)

Apatura metis is known from Eastern and South-eastern Europe (KUDRNA *et al.* 2011). It has been reported from Austria, Hungary, Slovenia, Northern Serbia, Bulgaria, Northern Greece (TOLMAN & LEWINGTON 2008) and from the Lake Skadar in Montenegro near the border with Albania (JAKŠIĆ 1988). A bivoltine species, it occurs in hot wooded river margins with its larval host-plant *Salix alba* L. Its IUCN status in Europe is LC (VAN SWAAY *et al.* 2010).

Discussion

As a result of our study we have increased the number of butterfly species known for Albania to 204. Further, for the recorded species we have extended their known geographical ranges in Southern Europe (KUDRNA *et al.* 2011). Currently, Albania has the second highest number of butterfly species recorded in the Western Balkans after Greece (235 species, see: PAMPERIS 2009) and is ahead of Macedonia (203 spe-



Fig. 10. Female Upperside (a) and underside (b) of *A. metis*, Kamicë, 7 September 2012 (photo: K. Sachanowicz)



Fig. 11. Habitat of *A. metis*, Kamicë, 7 September 2012 (photo: K. Sachanowicz)

cies, see: VEROVNIK & POPOVIĆ 2013b). However, the list of Albanian butterflies seems far from complete and the presence of other species is expected, which indicates that the fauna of this small country is one of the most diverse in Europe (ŠAŠIĆ *et al.* 2015).

References

ALEXIOU S. 2014. The butterflies (Lepidoptera: Papilionoidea & Hesperioidea) of Mt. Imittos, Attiki, Greece. – *Parnassiana Archives*, **2**: 25-52. URL: https://www.academia.edu/9107415/The_butterflies_Lepidoptera_Papilionoidea_and_Hesperioidea_of_Mt_Imittos_Attiki_Greece.
ANASTASIOU H., N. GHAVALAS & J. G. COUTSIS 2010. First record

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of *Cacyreus marshalli* in Greece, and comments on the potential occurrence of *Zizeeria karsandra* on the Greek island of Crete (Lepidoptera: Lycaenidae). – *Phegea*, **38** (3): 85-92. URL: http://www.phegea.org/Phegea/2010/Phegea_38-3_85-92.pdf.

JAKŠIĆ P. 1988. Privremene karte rasprostranjenosti dnevnih leptira

- Jugoslavije (Lepidoptera, Rhopalocera). – *Jugoslavensko entomološko društvo, Posebna izdanja*, **1**: 1-14.
- KOSMAČ M. & R. VEROVNIK 2009. First record of *Cacyreus marshalli* (Lepidoptera: Lycaenidae) from the Balkan Peninsula. – *Nota lepidopterologica*, **32** (1): 81-82. URL: http://www.socourlep.eu/tl_files/nota/bd32_1/09_Marko.pdf.
- KRPAČ V., C. DARCEMON, M. KRPAČ & M. LEMONNIER-DARCEMONT 2011. Fauna of butterflies (Papilionoidea) in the National Park Galičica, Republic of Macedonia. – *Nota lepidopterologica*, **34** (1): 49-78. URL: http://www.socourlep.eu/tl_files/nota/bd34_1/07_Krpac.pdf.
- KUDRNA O., A. HARPKE, K. LUX, J. PENNERSTORFER, O. SCHWEIGER, J. SETTELE & M. WIEMERS 2011. Distribution Atlas of Butterflies in Europe. Halle: Gesellschaft für Schmetterlingsschutz e.V, 576 pp.
- LANGOUROV M. & N. SIMOV 2014. *Cacyreus marshalli* (BUTLER, 1989) (Lep.: Lycaenidae), a new species for Bulgaria. – *Entomologist's Rec. J. Var.*, **126**: 190-192.
- LAFRANCHIS T. 2004. Butterflies of Europe. New field guide and key. Paris, Diatheo, 351 pp.
- MARTINOU A. F., D. PAPACHRISTOS & P. G. MILONAS 2011. Report of the Geranium Bronze Butterfly, *Cacyreus marshalli*, for mainland Greece, short communication. – *Hellenic Plant Protection Journal*, **4**: 31-34.
- MISJA K. 2005. Fluturat e Shqipërisë, Macrolepidoptera (Rhopalocera, Bombyces et Sphinges, Noctuidae, Geometridae). Tiranë: Akademia e Shkencave e Shqipërisë, Instituti i Kërkimeve Biologjike, 247 pp.
- PAMPERIS L. N. 2009. The Butterflies of Greece. Athens, Editions Pamperis, 768 pp.
- POLAK S. 2009. Geranium Bronze *Cacyreus marshalli* (BUTLER, 1989). A new butterfly species for the Slovenian fauna. 2nd Slovenian Entomological Symposium, 7-8 February 2009, Ljubljana.
- POPOVIĆ M., M. ĐURIĆ, F. FRANETA & R. VEROVNIK 2013. On the extremely rich butterfly fauna (Lepidoptera: Rhopalocera) of the south-eastern foothills of Stara Planina Mts in Serbia. – *Phegea*, **41** (4): 74-81.
- REBEL H. & H. ZERNY 1931. Die Lepidopterenfauna Albanien. – *Denkschriften der Akademie der Wissenschaften Wien, Mathematisch-naturwissenschaftliche Klasse*, **103**: 37-161.
- ŠAŠIĆ M., M. POPOVIĆ, S. CUVELIER, M. ĐURIĆ, F. FRANETA, M. GASCOIGNE-PEES, T. KOREN, D. MAES, B. MICEVSKI, N. MICEVSKI, M. S. MØLGAARD, C. VAN SWAAY, I. WYNHOF & R. VEROVNIK 2015. Contribution to the knowledge of the butterfly fauna of Albania. – *Nota Lepidopterologica*, **38** (1): 29-45. doi: 10.3897/nl.38.8814
- VAN SWAAY C., A. CUTTELOD, S. COLLINS, D. MAES, M. LÓPEZ MUNGUIRA, M. ŠAŠIĆ, J. SETTELE, R. VEROVNIK, T. VERSTRAEL, M. WARREN, M. WIEMERS & I. WYNHOF 2010. European Red List of Butterflies. Luxembourg, Publications Office of the European Union, 47 pp.
- TOLMAN T. & T. BERNHARD 1994. Significant extensions to the known range of *Anthocharis damone* Boisduval, 1836 in Greece (Lepidoptera: Pieridae). – *Phegea*, **22** (4): 177-180.
- TOLMAN T. & R. LEWINGTON 2008. Butterflies of Britain and Europe. London, Harper Collins Publishers, 528 pp.
- TÖRÖK S.-C. & G. CUZEPAN 2014. Butterfly (Insecta: Lepidoptera) hot spots in Sibiu county (Transylvania, Romania). – *Brukenthal. Acta Musei*, **9** (3): 469-490.
- TVRTKOVIĆ N., M. ŠAŠIĆ, I. MIHOČI, M. VUKOVIĆ & M. BJELIĆ 2012. Review of the butterfly fauna (Hesperioidea & Papilionoidea) of the Dinara Mountain Range. – *Natura Croatica*, **21**: 471-481.
- VEROVNIK R. & M. POPOVIĆ 2013a. First record of the Greek Clouded Yellow (*Colias aurorina* HERRICH-SCHÄFFER, 1850) for Albania. – *Natura Sloveniae*, **15** (1): 27-32.
- VEROVNIK R. & M. POPOVIĆ 2013b. Annotated checklist of Albanian butterflies (Lepidoptera, Papilionoidea and Hesperioidea). – *ZooKeys*, **323**: 75-89. doi: 10.3897/zookeys.323.5684
- ZIEGLER H. 2013. *Pieris balcana*. URL: http://www.euroleps.ch/seiten/s_art.php?art=pier_balcana.

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