

THE STATUS OF THE DAMON BLUE
POLYOMMATUS (AGRODIAETUS) DAMON
 (DENIS AND SCHIFFERMÜLLER, 1775)
 (PAPILIONOIDEA: LYCAENIDAE,
 POLYOMMATINI) IN THE CROATIAN
 BUTTERFLY FAUNA

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Mihoci, I., Vajdić, M. & Šašić, M.: The status of the Damon Blue *Polyommatus (Agrodiaetus) damon* (Denis and Schiffermüller, 1775) (Papilionoidea: Lycaenidae, Polyommataini) in the Croatian butterfly fauna. *Nat. Croat.*, Vol. 15, No 1–2, 15–25, 2006, Zagreb.

This paper presents the first verified find of the species *Polyommatus (Agrodiaetus) damon* (Denis and Schiffermüller, 1775) (syn.: *ausonia* Verity, 1915) (Lycaenidae, Polyommataini) in the Croatian butterfly fauna. The real status and presence of this species in Croatia was uncertain until the recent discovery. The Damon Blue was found in south-eastern Croatia, at the locality Gornja Korita on Kamešnica Mountain (990 m a.s.l.) on September 1 and 2, 2005. The biology, ecology and protection measures of the *P. damon* are also discussed.

Keywords: *Polyommatus (Agrodiaetus) damon*, Lycaenidae, butterfly fauna, Croatia, status

Mihoci, I., Vajdić, M. & Šašić, M.: Status vrste *Polyommatus (Agrodiaetus) damon* (Denis and Schiffermüller, 1775) (Papilionoidea: Lycaenidae, Polyommataini) u fauni danjih leptira Hrvatske. *Nat. Croat.*, Vol. 15, No 1–2, 15–25, 2006, Zagreb.

U radu se navodi prvi precizan nalaz danjeg leptira *Polyommatus (Agrodiaetus) damon* (Denis and Schiffermüller, 1775) (syn.: *ausonia* Verity, 1915) (Lycaenidae, Polyommataini) za faunu danjih leptira Hrvatske. Status ove vrste u fauni danjih leptira Hrvatske bio je do ovog nalaza nejasan. Vrsta *P. damon* zabilježena je terenskim istraživanjem faune danjih leptira na planini Kamešnici na 990 m nadmorske visine u mjestu Gornja Korita. U radu se raspravlja o biologiji, ekologiji i mogućim potrebnim mjerama za zaštitu ove vrste kao i ostalih montanih vrsta plavaca u fauni danjih leptira Hrvatske.

Ključne riječi: *Polyommatus (Agrodiaetus) damon*, danji leptiri, Hrvatska, status

INTRODUCTION

The butterfly fauna of Croatia has been the subject of many taxonomic and zoogeographical investigations.

In the past centuries, many entomologists, especially foreigners studied the butterfly fauna of Croatia. In 1811 Ernst Friedrich Germar was the first entomologist to visit Dalmatia (surroundings of Dubrovnik) and record several butterfly species (GERMAR, 1817). After Germar, multiannual studies of butterfly fauna in the 19th and the beginning of the 20th century in Croatia were done by MANN, 1857, 1867, 1869; VUKOTINVIĆ, 1879; REBEL, 1891, 1895, 1919; KOČA, 1900, 1901; ABAFY-AIGNER, 1896, 1910; GALVAGNI, 1902, 1909; SPRÖNGERTS, 1906; GUŠIĆ, 1917; GRUND, 1908, 1913, 1916 and Karl Schawerda and Hermann Stauder (STAUDER, 1919/1920, 1920/ 1921, 1923).

Many contributions to the Lepidoptera of Croatia in the 20th century were made by HAFNER, 1930, 1994; BURGERMEISTER, 1964; MOUCHA, 1965; MLADINOV, 1976–1980; MLADINOV & LORKOVIĆ, 1979, 1985 and LORKOVIĆ, 1927, 1976, 1989, 1993, 1997, LORKOVIĆ *et al.*, 1992.

In 1985 Mladinov and Lorković were the first to publish a tabular survey reporting on the distribution of mountain Lepidoptera in the butterfly fauna of Croatia. According to MLADINOV & LORKOVIĆ (1985) five mountain lycaeniids were known in the Croatian butterfly fauna. They referred only to species that live between 800 m a.s.l. and 1800 m a.s.l. and are not present in the lowlands.

As some of the mountain areas in Croatia have still not been the subject of systematic faunistic research (e. g. Dinara Mountain, Kamešnica Mountain, Svilaja Mountain, some mountain areas in north-western Croatia) we can expect more mountain faunistic elements discovered in that area.

The mountain lycaeniid butterfly *Polyommatus (Agrodiaetus) damon* (Denis & Schiffermüller, 1775) is distributed (in its European range) over mountain areas from 1000 m a.s.l. to 2100 m a.s.l. – in northern and eastern Spain; in the central Pyrenees, Cevennes, Haute-Savoie and Jura Mts. in France; in northern and central peninsular Italy; Switzerland; southern Germany; the Czech Republic; Slovakia; Hungary; southern Poland; Estonia; Latvia and Greece (Grammos Massif to Mt. Timphristos) (TOLMAN & LEWINGTON, 1997). In our surroundings this Euro-Siberian species (HRUBÝ, 1964) is present in Slovenia (according to CARNELUTTI (1992) Ex?; according to ČELIK & REBEUŠEK (1996) and Fauna Europaea (<http://faunaeur.org/>) present), Bosnia and Herzegovina (REBEL, 1904; SIJARIĆ, 1966, 1980; LELO, 2000, 2004), south-western Serbia (TOLMAN & LEWINGTON, 1997) and the Republic of Macedonia (SCHAUER & JAKŠIĆ, 1988; TOLMAN & LEWINGTON, 1997).

According to TOLMAN & LEWINGTON (1997) *P. damon* is a univoltine butterfly with adults flying from mid July to the end of August. Larval host-plants are species from the *Onobrychis* genus (HESSELBARTH *et al.*, 1995), particularly *O. montana* DC. and *O. alba* (W.K.) Desv. Larvae are attended by ants *Lasius niger*, *L. alienus* and *Formica praetensis*. Eggs are laid on dry plant remains inside a bush of the food plant (TUZOV *et al.*, 2000). Regarding geographical range and vertical distribution (1000 m a.s.l.–2100 m a.s.l.) the Damon Blue hibernates as an ovum, the first or the second instar larva (TOLMAN & LEWINGTON, 1997).

MATERIAL AND METHODS

Butterflies were observed and some specimens collected with an entomological net at the locality Donja Korita at 695 m a.s.l. and Gornja Korita at 990 m a.s.l. on Kamešnica Mountain, south-eastern Croatia. Specimens are now kept in the butterfly collection of the Department of Zoology of the Croatian Natural History Museum, Zagreb and two collected Damon Blues in the Central Butterfly Collection (CNHM), inventory numbers 9315 and 9316. For systematic classification we have used KARSHOLT & RAZOWSKI (1996) and taxonomic determination was done by wing morphology according to TOLMAN & LEWINGTON (1997).

RESULTS AND DISCUSSION

While observing and collecting butterflies on Kamešnica Mountain (Fig. 1) we first came upon the Damon Blue *P. damon* (Fig. 2) at Gornja Korita on September, 1st 2005 and once again on September, 2nd 2005. In addition, we observed males only fluttering over wet stones near a freshwater spring and collected two of them.



Fig. 1. Finding locality of the *Polyommatus (Agrodiaetus) damon* (Denis & Schiffermüller, 1775) in Croatia

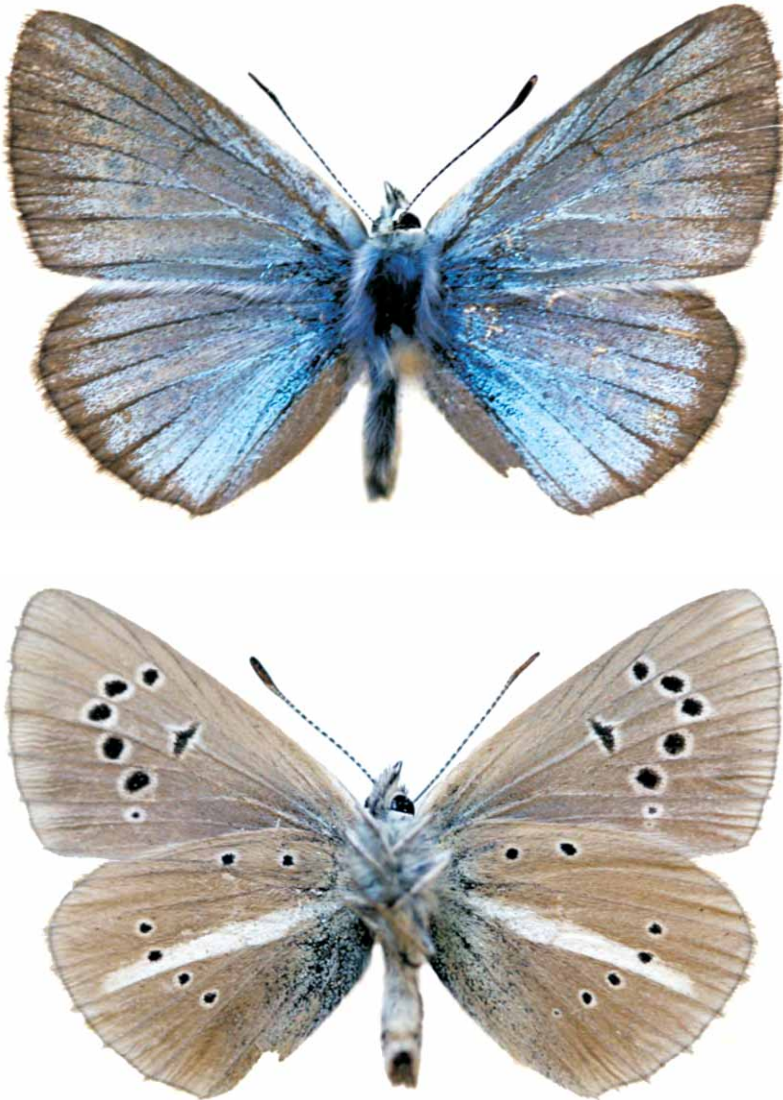


Fig. 2. *Polyommatus (Agrodiaetus) damon* (Denis & Schiffermüller, 1775) – ♂: wings upper- and under-side, Gornja Korita-Kamešnica Mt., September, 1st & 2nd 2005, leg. I. Mihoci (photo: I. Pavlinić)

In an overview of previous scientific papers on butterflies of Croatia we found three papers mentioning *P. damon*. In 1869, for the first time, Jozef Mann published the presence of *P. damon* for Dalmatia (MANN, 1869). He visited Dalmatia from Clissa [=Klis], Sign [=Sinj], across many Dalmatian islands, over Ragusa [=Du-

brovnik/ to Gravosa /=Gruž/ but also including Cattaro /=Kotor/ in Montenegro. Beside that lowland area he visited three mountain areas: Mt. Biokovo, Mt. Prolog (inexact: in Croatia near Vrgorac, BH near Ljubuški, or BH near Livanjsko polje?) and Mt. Svilaja in the years 1850, 1862 and 1868. In his paper from 1869 there is no exact date and locality of discovery so we cannot conclude with certainty that the *P. damon* was detected in Croatia and is inherent to the Croatian butterfly fauna.

In 1923 Herman Stauder cited Mann's paper on the discovery of the Damon Blue in Dalmatia, commenting that the Damon Blue had not been found in that area until Mann's field trips and also that it is very rare »...sonst nicht bekannt geworden, also ebenfalls große Rarität.« (STAUDER, 1923).

In the last of many papers Ljudevit Vukotinović published the find of *Lycaena damon* F. for Susedgrad near Zagreb. According to VUKOTINOVIĆ (1879) the Damon Blue was recorded in May and June. Knowing the biology and life-cycle of this mountain species, we must agree with Lorković's statement from the paper »Distribution of mountain Macrolepidoptera Fauna in Croatia« that the *L. damon* mentioned refers to some unclear species (in the Appendix: Wrongly cited Lepidoptera species in older Croatian literature-discussion and correction (MLADINOV & LORKOVIĆ, 1985). That is because adults of the Damon Blue are active from mid July to the end of August and could not have been observed in May/June and also can hardly be found in the lowlands at all (Zagreb-Susedgrad are at approx. 100 m a.s.l.). In addition, systematic investigation of the Lycaenidae from Agram /=Zagreb/ and its surroundings were done in the following years by Arnošt Grund but also without detection of the Damon Blue (GRUND, 1908).

We have surveyed many papers that have contributed to the knowledge of the Dalmatian butterfly fauna and the butterfly fauna of mountain areas in Croatia and none of them mention the Damon Blue (NICHOLL, 1899; KOČA, 1900, 1901; GALVAGNI, 1902, 1909; SPRÖNGERTS, 1906; ABAFI-AIGNER, 1896, 1910; GIBBS, 1913; GRUND, 1908, 1913, 1916; STAUDER 1919/1920, 1920/1921; LIPSCOMB, 1961; BIRKETT, 1964; BRETHERTON *et al.*, 1966; NEW, 1966; VARGA, 1975; HABELER, 1976; WIEMERS, 1982, 1983; MLADINOV & LORKOVIĆ, 1985; KUČINIĆ *et al.*, 1994; KUČINIĆ *et al.*, 1995).

The Damon Blue was found at Gornja Korita on Kamešnica Mountain at 990 m a.s.l. near a spring in open woodland. All specimens collected were males, gathered on the wet stones. According to TOLMAN & LEWINGTON (1997) *P. damon* is usually found on dry scrubs and open woodland at lower altitudes (1000 m a.s.l.) and at highest altitudes (2100 m a.s.l.) in sheltered gullies or hollows on open grassy slopes.

Discussing the distribution of mountain Macrolepidoptera fauna in Croatia MLADINOV & LORKOVIĆ (1985) adduced five mountain lycaeniids: *Lycaena candens* (Herich-Schäffer, 1844) ssp. *leonhardi*, *Aricia artaxerxes* (Fabricius, 1793) ssp. *balcanica*, *Aricia anteros* (Freyer, 1838), *Aricia eumedon* (Esper, 1780) and *Polyommatus eros* (Ochsenheimer, 1808) the distribution of which is relatively well known although no recent research has been carried out. The present distribution of mountain lycaeniids in Croatia will be better known after additional field investigations and it could then be used in comparative faunistic analyses which are the best indicator of the faunis-

tic value of an investigated areas. Therefore, future investigations of the Damon Blue and other mountain lycaeniids must be focused on determining the complete distribution in Croatia, the borders of the range and according to habitat characteristics and state, the possible requirements for protection measures.

According to KUDRNA (1986) the highest known chorological index of the mentioned mountain lycaeniids is for *Aricia anteros* (14) and *Aricia artaxerxes balcanica* (12). This indicates that *Aricia anteros* and *Aricia artaxerxes balcanica* are an endemic European species restricted to a very small territory (e.g. a mountain range) with low stocks. All other mountain lycaeniids mentioned are relatively successful (CI: 7–10) although they live in predominantly isolated colonies. The most important measures in the conservation of mountain lycaeniids in Croatia are in habitat conservation, preservation of traditional mountain meadows and pastures, emphasise on traditional meadow mowing as well as preventing forestry intensification/woodland succession. It has been shown that habitat loss is a major factor in the decline of butterfly abundance and diversity. In order to ensure the abundance and diversity of mountain lycaeniids in Croatia certain protection measures must be taken with respect to systematic faunistic research, ecological studies, monitoring and ultimately legal protection of species or/and habitat.

As we have determined (for the first time) the exact locality and date of finding the Damon Blue in Croatia, we can with certainty introduce the species into the list of butterflies present in Croatia.

Appendix

Other butterflies observed or collected on Kamešnica Mountain
(Systematic according to KARSHOLT & RAZOWSKI, 1996)

Locality Donja Korita, September, 1st 2005, leg. & obs. I. Mihoci

Pieridae, Pierinae, Pierini

Pieris mannii (Mayer, 1851), obs.

Pieris ergane (Geyer, 1828), three males, summer brood, coll. CNHM

Lycaenidae, Lycaeninae, Polyommadini

Aricia agestis (Denis & Schiffermüller, 1775), one male, coll. CNHM

Locality Gornja Korita, September, 1st & 2nd 2005, leg. & obs. I. Mihoci

Pieridae, Pierinae, Pierini

Pieris mannii (Mayer, 1851), one male, summer brood, coll. CNHM

Pieris ergane (Geyer, 1828), two males & one female, summer brood, coll. CNHM

Pieridae, Coliadinae

Colias croceus (Fourcroy, 1785), obs.

Lycaenidae, Polyommatus

Aricia artaxerxes (Fabricius, 1793), one female, coll. CNHM

Polyommatus dorylas (Denis & Schiffermüller, 1775), four males, coll. CNHM

Polyommatus icarus (Rottemburg, 1775), obs.

Polyommatus (Meleageria) bellargus (Rottemburg, 1775), one male, coll. CNHM

Polyommatus (Meleageria) coridon (Poda, 1761), four males, coll. CNHM

Polyommatus (Agrodiaetus) damon (Denis & Schiffermüller, 1775), two males, coll. CNHM

Nymphalidae, Libytheinae

Libythea celtis (Laicharting, 1782), one female, coll. CNHM

Nymphalidae, Heliconinae

Argynnis paphia (Linnaeus, 1758), obs.

Nymphalidae, Nymphalinae, Nymphalini

Vanessa atalanta (Linnaeus, 1758), obs.

Nymphalidae, Limenitinae

Limenitis reducta Staudinger, 1901, obs.

Nymphalidae, Satyrinae, Elymniini

Lasiommata maera (Linnaeus, 1758), one female, coll. CNHM

Nymphalidae, Satyrinae, Coenonymphini

Coenonympha pamphilus (Linnaeus, 1758), one male, coll. CNHM

Nymphalidae, Satyrinae, Maniolini

Maniola jurtina (Linnaeus, 1758), obs.

Nymphalidae, Satyrinae, Satyrini

Hipparchia semele (Linnaeus, 1758), two females, coll. CNHM

Brintesia circe (Fabricius, 1775), obs.

Chazara briseis (Linnaeus, 1764), four females, coll. CNHM

ACKNOWLEDGEMENTS

The research was supported by a grant of the PINMATRA/2003/024 project and project 0183007 of the Croatian Ministry of Science, Education and Sports. We would like to thank Igor Pavlinić, MSc, (CNHM) for photographing the collected specimens.

Received September 19, 2005

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S A Ž E T A K

**Status vrste *Polyommatus (Agrodiaetus) damon*
(Denis and Schiffermüller, 1775) (Papilionoidea: Lycaenidae,
Polyommadini) u fauni danjih leptira Hrvatske**

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Status vrste *Polyommatus (Agrodiaetus) damon* (Denis and Schiffermüller, 1775) u Hrvatskoj do ovog nalaza bio je nejasan. Do sada je vrsta bila zabilježena u dva navrata. Jozef Mann 1869. navodi vrstu *P. damon* za prostor Dalmacije ali bez navoda lokaliteta i datuma nalaza (MANN, 1869), a Ljudevit Vukotinić spominje je u radu »Fauna leptirah u okolišu zagrebačkom« 1879. godine za područje Susedgrada (VUKOTINOVIĆ, 1879). Malo je vjerojatno, poznavajući biologiju i ekologiju ove montane vrste plavca, da je vrsta pronađena na tako niskoj nadmorskoj visini i da je aktivnost imaga bila zabilježena u svibnju-lipnju. U radu o rasprostranjenju montanih makrolepidoptera u Hrvatskoj MLADINOV & LORKOVIĆ (1985) u dodatku »Pogrešno navedene vrste Lepidoptera u starijoj literaturi Hrvatske« navode »...a za *Lycaena damon* se ne zna koja je to vrsta mogla biti«.

Vrsta *P. damon* zabilježena je terenskim istraživanjem faune danjih leptira na planini Kamešnici na 990 metara nadmorske visine u mjestu Gornja Korita. Vrsta je zabilježena 1. i 2. rujna 2005. na istom lokalitetu i predstavlja prvi precizan/siguran nalaz vrste na prostoru Hrvatske te se može uvrstiti na listu danjih leptira Hrvatske.

Montane vrste makrolepidoptera zabilježene u Hrvatskoj, pa tako i plavaca *Lycaena candens* (Herrich-Schäffer, 1844) ssp. *leonhardi*, *Aricia artaxerxes* (Fabricius, 1793) ssp. *balcanica*, *Aricia anteros* (Freyer, 1838), *Aricia eumedon* (Esper, 1780), *Polyommatus eros* (Ochsenheimer, 1808) i *P. damon* ugrožene su prije svega zbog nestanka staništa (planinskih livada i pašnjaka), prestanka stočarenja i tradicionalnog načina košnje, kao i kaptiranja planinskih izvora. Za prikaz stvarnog stanja faune danjih leptira planinskih područja, stvarnog rasprostranjenja vrste *P. damon* u Hrvatskoj, ekologije i moguće ugroženosti staništa, pa tako i vrste, potrebno je mnogo više dodatnog terenskog rada.