

**CONTRIBUTION TO THE KNOWLEDGE  
OF THE BUTTERFLY FAUNA OF THE REPUBLIC OF MACEDONIA  
(LEPIDOPTERA: PAPILIONOIDEA & HESPERIOIDEA)**

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**Abstract** - A faunistic account of 121 observed species of butterflies is given for the territory of Republic of Macedonia during the first week of June. Despite short period of the time large part of Macedonia was surveyed and several interesting observations were made. Among these new sites for some rare species like *Melitaea arduinna*, *Spialia phlomidis*, *Gegenes nostrodamus*, *Colias caucasica*, *Satyrrium pruni*, *Satyrrium w-album*, *Tarucus balkanicus*, *Cupido alcetas*, and *Araschnia levana* should be mentioned. *Melitaea telona* is reported for the first time for Macedonia. The lack of faunistic surveys and priorities in butterfly conservation in Macedonia are stressed.

**KEY WORDS:** faunistics, distribution, threatened species, conservation, Rhopalocera

**Izvleček** – PRISPEVEK K POZNAVANJU FAVNE DNEVNIH METULJEV MAKEDONIJE (LEPIDOPTERA: PAPILIONOIDEA IN HESPERIOIDEA)

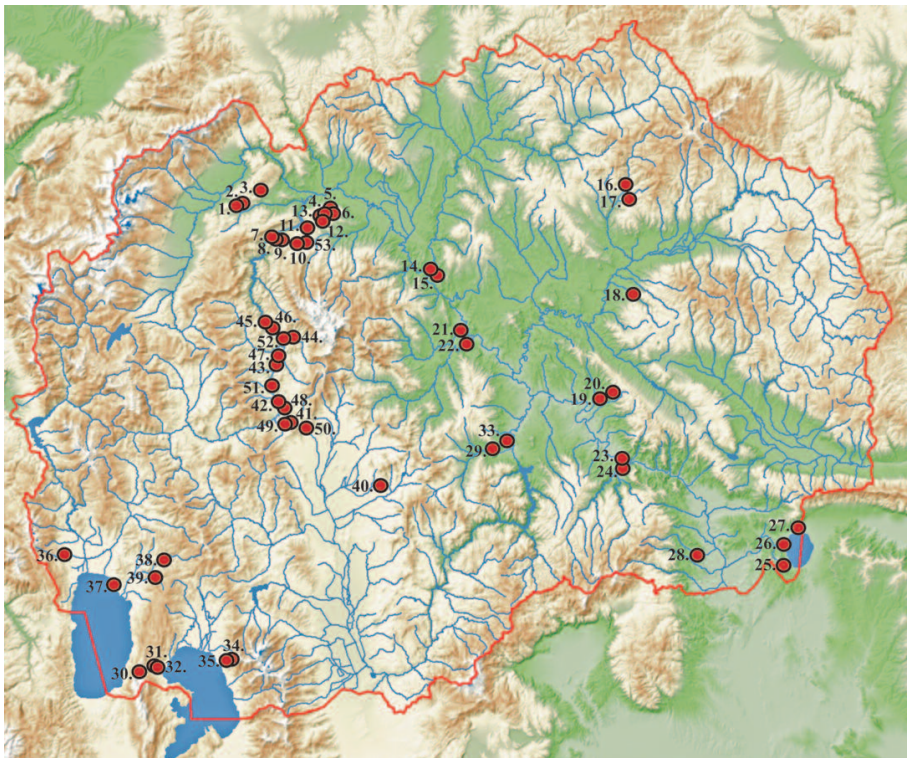
Članek obravnava 121 vrst dnevnih metuljev, opaženih v Republiki Makedoniji v prvem tednu meseca junija. Kljub kratkemu obdobju raziskave je bil vanjo zajet velik del Makedonije in najdene so bile številne zanimive vrste. Med njimi velja

izpostaviti nove podatke o razširjenosti vrst *Melitaea arduinna*, *Spialia phlomidis*, *Gegenes nostradamus*, *Colias caucasica*, *Satyrrium pruni*, *Satyrrium w-album*, *Tarucus balkanicus*, *Cupido alceas* in *Araschnia levana*. Vrsta *Melitaea telona* je prvič najdena v Makedoniji. Članek obravnava tudi problematiko pomanjkanja favnističnih raziskav in prednostne naloge v varstvu metuljev v Makedoniji.

**KLJUČNE BESEDE:** favnistika, razširjenost, ogrožene vrste, varstvo, Rhopalocera

## Introduction

Despite long history of butterfly research and publication of the distribution atlas of butterflies in Macedonia (Schaider & Jakšić 1989) the knowledge on the current distribution and threats are far from complete. Several newly discovered species,



**Figure 1.** Distribution of visited sites during the survey of butterfly fauna in June 2008. The numbering corresponds with the list of localities.

**Slika 1.** Razporeditev obiskanih lokalitet med raziskavo v Makedoniji v juniju 2008. Oštevilčenje ustreza seznamu lokalitet.

including conspicuous ones like *Gonepteryx cleopatra* (Linnaeus, 1767) (Krpáč and Mihajlova 1997), *Araschnia levana* (Linnaeus, 1758) (Thomas 1993), *Melitaea aurelia* Nickerl, 1850 (Micevski et al. 2009) and *Carterocephalus palaemon* (Pallas, 1771) (Verovnik & Micevski 2008), are a good indication of that. Certainly one of the major reasons for the insufficiencies is the lack of publication of faunistic records, especially in the past few decades. Thus, after Rebel (1913) and Thurner (1964), no faunistic surveys covering the entire territory of Macedonia were published. Unfortunately the butterfly atlas (Schaidler & Jakšić 1989) provides only 10x10 km square presence data, which is not precise enough for conservation purposes and the data behind the distribution maps remain inaccessible. Therefore one of our main aims of the present paper is to encourage publication of the field survey reports on the butterflies encountered in Macedonia.

The butterfly fauna of Macedonia is one of the richest in Europe with up to now 203 species recorded, however some species requiring confirmation. The high butterfly diversity in such a small country is a combination of butterfly rich mountainous regions and gorges with several relict species that are otherwise rare in Europe west of Russia. These specific habitats are also among best surveyed in Macedonia leaving relatively large areas of the country still unexplored. This is especially true for the eastern part of the country where exciting new discoveries are most likely.

## Material and methods

Field survey was undertaken from 31.5.2008 to 8.6.2009 and in total 53 sites were visited (fig. 1). The butterflies were mostly netted using entomological nets and released after identification. Only few specimens were collected for determination using genital examination. The production of genital slides was done in a standard procedure. The taxonomy and nomenclature follows the updated Fauna Europaea Lepidoptera list (<http://www.faunaeur.org>).

## Results

### List of localities

The list of localities contains a short description of the habitat, coordinates and date of the observations.

1. Tetovo, bellow quarry at village Grupčin, dry calcareous grasslands, partially overgrown with junipers, 531 m, 41°58,254; 21°06,447; 31.5. 2008.
2. Tetovo, above and W of village Grupčin, mostly intensively grazed meadows, rocky slopes and bushes, 557 m, 41°58,145; 21°07,284; 31.5.2008.
3. Skopje, small gorge W of village Bojane, steep rocky slopes and screes, bushes, 644 m; 41°59,895; 21°11,352; 31.5.2008.



**Figure 2.** *Melitaea telona*, a new species of the fauna of the Republic of Macedonia.

**Slika 2.** *Melitaea telona*, nova vrsta za favno metuljev Republike Makedonije.

4. Mt. Vodno, above village Sopište, mostly overgrown steep slopes and screes, 569 m; 41°57,035; 21°25,023; 31.5. 2008.
5. Mt. Vodno, at Orašec well on SE slope of Mt Vodno, small wet meadow, 737 m; 41°57,200; 21°24,692; 31.5.2008.
6. Mt Vodno, small road towards the top E of the Sopište village, steep rocky meadows, pine woods, 41°57,412; 21°25,207; 31.5.2008.
7. Treska valley, along the road to Kozjak dam on the E side of Treska valley, steep rocky slopes and screes, 839 m; 41°53,144; 21°13,478; 1.6.2008.
8. Mt. Suva Planina, ridge above Kozjak lake W of Nova Breznica, screes below the ridge, dry calcareous grasslands, humid open woods, 1054 m; 41°53,320; 21°13,694; 1.6.2008 and 8.6.2008.
9. Mt. Suva Planina, plateau W of Nova Breznica, dry calcareous grasslands, wet meadows in the depressions; 1036 m; 41°53,424; 21°14,256; 1.6.2008.
10. Mt. Suva Planina, pastures above village Nova Breznica, overgrazed rocky pastures, 811 m; 41°53,284; 21°16,627; 1.6.2008.
11. Mt. Vodno, village Sveta Petka, road verge, orchards, 673 m; 41°56,499; 21°20,240; 1.6.2008.
12. Mt. Vodno, small sandy hill S of the village Sopište, dry, partially overgrown grasslands, 602 m; 41°56, 657; 21°25,089; 1.6.2008.
13. Mt. Vodno, small gully above Gorno Solnje village, steep rocky slopes, bushes and small screes, 677 m; 41°57,020; 21°23,883; 1.6.2008.
14. Veles, Pčinja River valley at St. Jovan monastery, path in the woods, bushes 256 m; 41°49,482; 21°41,170; 1.6.2008.
15. Veles, parking area along the main highway N of the town, mesophilous grasslands, bushes, 300 m; 41°48,420; 21°40,890; 1.6.2008.
16. Stip, valley of Zletovska reka N of Zletovo, rocky slopes in a small side gorge, wet meadows along the stream, 501 m; 41°59,974; 22°15,097; 2.6.2008.



17. Štip, small valley E of Tursko Rudare village, rocky slopes and screes, cultivated meadows, light deciduous woods, 543 m; 41°58,899; 22°15,679; 2.6.2008.
18. Štip, wide stream alluvium SE of the village Radanje, sparsely vegetated stony and sandy areas, bushes, 543 m; 41°46,358; 22°16,315; 2.6.2008.
19. Negotino, along the road on the S side of Mt. Konečka, mesophilous to dry grasslands, forest edge, 370 m; 41°33,728; 22°11,297; 2.6.2008.
20. Negotino, at the bottom of the Mt. Konečka E of the town, arid slopes with steppe vegetation, partially overgrown, 256 m; 41°33,064; 22°09,952; 2.6.2008.
21. Veles, last part of Topolka gorge, steep arid slopes with sparse grassy vegetation, partially overgrown, 224 m; 41°41,915; 21°46,927; 3.6.2008.
22. Veles, lower part of Babuna valley W of a small village, steep rocky slopes, mostly overgrown with bushes, humid grassy places along the river, 201 m; 41°40,223; 21°47,482; 3.6.2008.
23. Demir Kapia, W bank of Vardar River E of the town, white willow forest belt near the river, abandoned fields, 107 m; 41°24,947; 22°14,700; 3.6.2008.
24. Demir Kapija, S side of Bošava river in the town, light oak and willow woods, gravels along the road, 124 m; 41°24,333; 22°14,878; 3.6.2008.
25. Dojran, slopes above Star Dojran, dry stony meadows, bushes, 208 m; 41°10,707; 22°42,597; 4.6.2008.
26. Dojran, along the road NW of Nov Dojran, small abandoned quarry, wet meadow at a spring, 165 m; 41°13,800; 22°41,685; 4.6.2008.
27. Dojran, S of the village Nikoli, mesophilous grasslands, pastures, hedges, 176 m, 41°15,589; 22°45,207; 4.6.2008.
28. Gevgelija, Kovanska Reka valley NW of the village Negorci, forest path, fields, small meadows, 138 m; 41°12,004; 22°27,526; 4.6.2008.
29. Drenovo, Raec Gorge, rocky slopes, screes, bushes, 203 m; 41°26,200; 21°52,108; 4.6.2008.
30. Mt. Galičica, E slope of the mountain along the road to the pass, road verges, dry calcareous grasslands, oak woods, 1258 m; 40°58,583; 20°52,625; 5.6.2008.
31. Mt. Galičica, at the pass, rocky montane meadows, screes, forest edge, 1565 m; 40°57,208; 20°49,884; 5.6.2008.
32. Mt. Galičica, above Oteševo on the road to the pass, clearings with dry grasslands in oak woods, 1128 m; 40°58,284; 20°52,695; 5.6.2008.
33. Drenovo, NE of Raec gorge, dry stony meadows, 240 m; 41°27,197; 21°54,214; 5.6.2008.
34. Prespa, small valley above Kurbinovo from monastery of St. George upwards, mesophilous grasslands, deciduous woods, dry grasslands further upwards, 1154 m; 40°59,257; 21°05,523; 5.6.2008.
35. Prespa, small valley just above Kurbinovo village, wet meadows along the stream, thermophilous grasslands on the slopes, 1010 m; 40°59,024; 21°04,675; 6.6.2008.

36. Ohrid, lower part of the Belička River valley W of Dolna Belica, pastures, wet meadows, bushes, 737 m; 41°12,371; 20°37,876; 6.6.2008.
37. Ohrid, at a small rocky outcrop along the road E of Struga, rocky slopes, overgrown ruins, fields, 695 m; 41°08,470; 20°45,748; 6.6.2008.
38. Ohrid, slopes W of Openica village, above the road, abandoned dry grasslands on steep slopes, orchards near the village, 832 m; 41°11,614; 20°52,356; 6.6.2008.
39. Ohrid, lower part of small side valley E of Leskoec, road verge, mesophilous grasslands, bushes, 819 m; 41°09,636; 20°50,967; 6.6.2008.
40. Prilep, Markovi Kuli, dry grasslands, rocky slopes, 781 m; 41°21,620; 21°32,547; 7.6.2008.
41. Prilep, Barbaras pass, road verge, dry rocky grasslands, pastures, 823 m; 41°30,417; 21°16,591; 7.6.2008.
42. Treska valley, at turn towards village Lokve, abandoned field, mesophilous grasslands, 527 m; 41°32,773; 21°14,311; 7.6.2008.
43. Treska valley, south of Modrište, wet meadows, bushes, 501 m; 41°37,930; 21°13,920; 7.6.2008.
44. Treska valley, in the side valley W of Belica village, dry grasslands, forest edge, rocky slopes, 526 m; 41°40,929; 21°16,620; 7.6.2008.
45. Treska valley, at the upper part of Kozjak Lake, overgrown dry grasslands, stony grassy places near the lake, 490 m; 41°42,247; 21°12,496; 7.6.2008.
46. Treska valley, small side valley before Kozjak Lake, road verge, bushes, small meadows, 485 m; 41°41,838; 21°13,754; 7.6.2008.
47. Treska valley, N of Modrište, dry rocky slopes, mesophilous grasslands near the river, 496 m; 41°38,519; 21°14,424; 7.6.2008.
48. Treska valley, around the entrance to Pešna cave, fields, bushes, dry grasslands, screes, 537 m; 41°32,778; 21°14,935; 7.6.2008.
49. Prilep, along the road W of Barbaras pass, road verge, dry rocky grasslands, pastures, 830 m; 41°50,629; 21° 27,291; 7.6.2008.
50. Prilep, along the road N of Debrešte village , 845 m; dry stream bed, bushes, overgrazed pastures, 41°29,408; 21°18,962; 7.6.2008.
51. Treska valley, S of Dragovdol, road verge, dry, partially overgrown grasslands, 515 m; 41°35,320; 21°13,144; 7.6.2008.
52. Treska valley, at turn to Belica village, abandoned field, mesophilous grasslands, 490 m; 41°40,847; 21°15,312; 7.6.2008.
53. Mt. Suva Planina, along the road S of Govrlevo, rocky grassland and bushes, 635 m; 41°54,995; 21°20,457; 8.6.2008.

#### List of species

Butterfiles are listed in taxonomical order following the nomenclature of the 2010 Fauna Europaea Lepidoptera list (<http://www.faunaeur.org>).

**Table 1.** The distribution of butterfly species observed during the field trip in Macedonia. The localities are numbered as in the List of localities chapter. D&S stands short for Denis & Schiffermüller.

**Tabela 1.** Razširjenost dnevnih metuljev opaženih med raziskavo v Makedoniji. Lokalitete so oštevilčene kot v seznamu lokalitet. D&S je okrajšava za Denis & Schiffermüller.

Species	Localities
<b>HESPERIIDAE</b>	
<i>Erynnis tages</i> (Linnaeus, 1758)	8, 9, 13, 31, 34, 35
<i>Carcharodus alceae</i> (Esper, 1780)	3, 8, 16, 17, 18, 22, 23, 25, 26, 27, 28, 29, 30, 41, 44, 48
<i>Carcharodus lavatherae</i> (Esper, 1783)	1, 4, 8, 13, 46, 47, 49, 51
<i>Carcharodus flocciferus</i> (Zeller, 1847)	31
<i>Carcharodus orientalis</i> Reverdin, 1913	17, 18, 36, 37, 40, 23
<i>Spialia phlomidis</i> (Herrich-Schäffer, 1845)	3, 13, 18, 19, 20, 21
<i>Spialia orbifer</i> (Hübner, 1823)	1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 15, 17, 18, 22, 29, 31, 32, 33, 34, 35, 36, 38, 39, 43, 44
<i>Muschampia cribrellum</i> (Eversmann, 1841)	8, 9, 13
<i>Pyrgus sidae</i> (Esper, 1784)	16, 17, 31, 34, 35, 36
<i>Pyrgus malvae</i> (Linnaeus, 1758)	3, 9, 19, 31, 32, 34, 35, 41, 52
<i>Pyrgus serratulae</i> (Rambur, 1839)	1, 2, 34, 44
<i>Pyrgus armoricanus</i> (Oberthür, 1910)	6, 8, 16, 17, 18, 19, 22, 23, 26, 32, 36, 38, 43, 44, 46, 49
<i>Carterocephalus palaemon</i> (Pallas, 1771)	9
<i>Thymelicus lineola</i> (Ochsenheimer, 1808)	4, 5, 8, 13, 15, 19, 22, 29, 33, 34, 36, 43, 44, 46, 49
<i>Thymelicus sylvestris</i> (Poda, 1761)	4, 6, 8, 8, 9, 15, 16, 17, 18, 21, 23, 24, 25, 27, 28, 29, 30, 35, 40, 44, 48, 49, 51, 52
<i>Thymelicus acteon</i> (Rottemburg, 1775)	26, 43
<i>Ochlodes sylvanus</i> (Esper, 1777)	8, 9, 13, 16, 22, 23, 24, 26, 27, 28, 29, 33, 35, 38, 43, 44, 52, 53
<i>Gegenes nostradamus</i> (Fabricius, 1793)	23, 24
<b>PAPILIONIDAE</b>	
<i>Zerynthia cerisy</i> (Godart, 1824)	11, 16, 17, 18, 22, 23, 24, 28
<i>Parnassius mnemosyne</i> (Linnaeus, 1758)	9, 31
<i>Iphiclides podalirius</i> (Linnaeus, 1758)	1, 8, 9, 10, 13, 16, 17, 22, 30, 31, 35, 40
<i>Papilio machaon</i> Linnaeus, 1758	1, 8, 8, 13, 22, 25, 26, 29, 30, 33
<b>PIERIDAE</b>	
<i>Leptidea sinapis</i> (Linnaeus, 1758)	4, 5, 17, 34, 43, 44, 46, 48
<i>Leptidea duponcheli</i> (Staudinger, 1871)	8, 9, 18, 22, 28, 29
<i>Anthocharis cardamines</i> (Linnaeus, 1758)	4, 8, 9, 31

<b>Species</b>	<b>Localities</b>
<i>Euchloe ausonia</i> (Hübner, 1804)	2, 3, 8, 9, 17, 18, 36, 40, 43, 49, 50
<i>Euchloe penia</i> (Freyer, 1852)	7, 8, 45, 46
<i>Aporia crataegi</i> (Linnaeus, 1758)	1, 8, 9, 12, 16, 17, 18, 19, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 46, 47, 48, 49, 51, 52, 53, 54
<i>Pieris brassicae</i> (Linnaeus, 1758)	16, 22, 23, 25, 26
<i>Pieris krueperi</i> Staudinger, 1860	21, 22
<i>Pieris mannii</i> (Mayer, 1851)	8, 18, 21, 22, 23, 24, 31, 50
<i>Pieris rapae</i> (Linnaeus, 1758)	1, 2, 3, 4, 5, 8, 11, 12, 13, 16, 17, 23, 25, 26, 27, 28, 31, 35, 37, 40, 43, 44, 45, 46, 49, 50, 52
<i>Pieris ergane</i> (Geyer, 1828)	3, 4, 44
<i>Pieris napi</i> (Linnaeus, 1758)	4, 6, 9, 12, 22, 23, 25, 26, 28, 29, 31, 34, 43, 46
<i>Pieris balcana</i> Lorkovi, 1968	17, 18, 22
<i>Pontia edusa</i> (Fabricius, 1777)	1, 2, 5, 8, 9, 13, 16, 17, 18, 22, 23, 25, 26, 27, 31, 33, 36, 37, 40, 43, 44, 45, 47, 48, 49, 50, 51, 52
<i>Colias crocea</i> (Geoffroy, 1785)	1, 2, 3, 4, 5, 6, 8, 9, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 40, 43, 44, 45, 46, 48, 49, 50, 52, 53
<i>Colias caucasica</i> Staudinger, 1871	31
<i>Colias alfacariensis</i> Ribbe, 1905	3, 8, 9, 12, 13, 22, 31, 44, 48, 50
<i>Gonepteryx rhamni</i> (Linnaeus, 1758)	8, 9, 27, 34, 36, 44, 52
<i>Gonepteryx farinosa</i> (Zeller, 1847)	22
<b>RIODINIDAE</b>	
<i>Hamearis lucina</i> (Linnaeus, 1758)	7, 8, 31, 34
<b>LYCAENIDAE</b>	
<i>Lycaena phlaeas</i> (Linnaeus, 1761)	2, 3, 6, 17, 18, 21, 22, 23, 25, 27, 28, 31, 35, 38, 40, 43, 47, 50
<i>Lycaena dispar</i> (Haworth, 1802)	43
<i>Lycaena virgaureae</i> (Linnaeus, 1758)	35
<i>Lycaena tityrus</i> (Poda, 1761)	9, 21, 31, 34, 35, 43
<i>Lycaena alciphron</i> (Rottensburg, 1775)	16, 22, 35, 43, 47
<i>Callophrys rubi</i> (Linnaeus, 1758)	4, 8, 12, 13, 16, 17, 18, 31, 34, 35, 43, 44, 46, 49, 51, 53
<i>Satyrrium w-album</i> (Knoch, 1782)	13
<i>Satyrrium pruni</i> (Linnaeus, 1758)	38, 39
<i>Satyrrium spini</i> ([D&S], 1775)	1, 3, 16, 21, 22, 24, 25, 37
<i>Satyrrium ilicis</i> (Esper, 1779)	1, 2, 10, 15, 16, 17, 18, 19, 25, 28, 43, 44, 50, 53
<i>Lampides boeticus</i> (Linnaeus, 1767)	50



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Species	Localities
<i>Leptotes pirthous</i> (Linnaeus, 1767)	34
<i>Tarucus balkanicus</i> (Freyer, 1844)	3, 18, 20, 21, 22, 29, 33
<i>Cupido minimus</i> (Fuessly, 1775)	1, 2, 4, 5, 6, 7, 8, 8, 9, 13, 17, 18, 29, 30, 31, 46, 48
<i>Cupido osiris</i> (Meigen, 1829)	1, 2, 4, 5, 6, 8, 8, 9, 10, 13, 16, 29, 30, 31, 34, 35, 36, 44, 46, 48
<i>Cupido argiades</i> (Pallas, 1771)	26, 27, 43
<i>Cupido alcetas</i> (Hoffmannsegg, 1804)	43
<i>Celastrina argiolus</i> (Linnaeus, 1758)	18, 23, 27, 28, 30, 49, 50
<i>Pseudophilotes vicrama</i> (Moore, 1865)	5, 29, 31, 33, 34
<i>Scolitantides orion</i> (Pallas, 1771)	3, 9, 13, 16, 46, 49
<i>Glaucopsyche alexis</i> (Poda, 1761)	9, 31, 34, 35, 38, 43, 44, 47, 48
<i>Iolana iolas</i> (Ochsenheimer, 1816)	4, 13, 28, 44, 46, 48, 50
<i>Phengaris arion</i> (Linnaeus, 1758)	48
<i>Plebejus sephirus</i> (Frivaldzky, 1835)	31
<i>Plebejus argus</i> (Linnaeus, 1758)	1, 3, 5, 6, 8, 9, 11, 13, 17, 18, 27, 32, 34, 35, 36, 39, 41, 42, 43, 44, 46, 48, 49, 50, 51, 52, 53
<i>Plebejus idas</i> (Linnaeus, 1761)	1, 3, 5, 8, 10, 12, 13, 16, 17, 18, 19, 32, 35, 38, 44, 50
<i>Plebejus argyrognomon</i> (Bergsträsser, 1779)	36, 43
<i>Aricia eumedon</i> (Esper, 1780)	8, 9, 31
<i>Aricia agestis</i> ([D&S], 1775)	3, 4, 8, 8, 9, 12, 13, 16, 17, 18, 19, 21, 22, 25, 28, 29, 30, 31, 34, 35, 37, 40, 41, 44, 46, 47, 49, 50
<i>Aricia anteros</i> (Freyer, 1838)	32, 34, 46, 49
<i>Cyaniris semiargus</i> (Rottemburg, 1775)	8, 9, 31, 34, 35, 36, 39, 41, 43, 48
<i>Polyommatus escheri</i> (Hübner, 1823)	46
<i>Polyommatus dorylas</i> ([D&S], 1775)	8, 9, 30, 31, 46
<i>Polyommatus amandus</i> (Schneider, 1792)	16, 17, 30, 34, 35, 43, 47, 48
<i>Polyommatus thersites</i> (Cantener, 1835)	13, 17, 18, 19, 21, 22, 25, 29, 30, 32, 33, 36, 48
<i>Polyommatus icarus</i> (Rottemburg, 1775)	1, 2, 3, 5, 6, 7, 8, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53
<i>Polyommatus bellargus</i> (Rottemburg, 1775)	3, 4, 7, 8, 9, 10, 12, 13, 16, 18, 19, 21, 29, 30, 31, 32, 34, 35, 43, 44, 45, 46, 47, 48, 49, 51, 53
<b>NYMPHALIDAE</b>	
<i>Libythea celtis</i> (Laicharting, 1782)	13, 17, 29
<i>Argynnis pandora</i> ([D&S], 1775)	16, 18, 19, 22

Species	Localities
<i>Argynnis niobe</i> (Linnaeus, 1758)	13, 16, 34, 35, 36, 43
<i>Issoria lathonia</i> (Linnaeus, 1758)	1, 2, 4, 5, 6, 8, 8, 9, 10, 12, 13, 16, 17, 18, 19, 21, 22, 23, 25, 27, 28, 29, 30, 31, 34, 35, 36, 38, 40, 44, 46, 47, 49, 50, 52, 53
<i>Brenthis daphne</i> (Bergsträsser, 1780)	37, 38, 43, 44, 48
<i>Brenthis hecate</i> ([D&S], 1775)	8, 19, 34, 35
<i>Boloria euphrosyne</i> (Linnaeus, 1758)	8, 9, 10, 30, 31, 34, 35, 41, 49, 50, 53
<i>Boloria dia</i> (Linnaeus, 1767)	52
<i>Vanessa atalanta</i> (Linnaeus, 1758)	16, 23, 27, 29, 34, 35
<i>Vanessa cardui</i> (Linnaeus, 1758)	2, 8, 17, 22, 25, 26, 31, 35, 36, 37, 50
<i>Aglais io</i> (Linnaeus, 1758)	14, 16, 23, 27, 28
<i>Aglais urticae</i> (Linnaeus, 1758)	2, 9, 28, 31, 49
<i>Polygonia c-album</i> (Linnaeus, 1758)	3, 11, 13, 16, 17, 22, 23, 27, 28, 29, 34, 43, 44, 46, 52
<i>Polygonia egea</i> (Cramer, 1775)	25, 27
<i>Araschnia levana</i> (Linnaeus, 1758)	27
<i>Nymphalis polychloros</i> (Linnaeus, 1758)	14, 16, 17, 18, 25, 29, 48
<i>Euphydryas aurinia</i> (Rottemburg, 1775)	8, 9, 30, 31
<i>Melitaea cinxia</i> (Linnaeus, 1758)	3, 8, 8, 13, 16, 17, 31, 32, 34, 35
<i>Melitaea phoebe</i> ([D&S], 1775)	1, 2, 8, 9, 12, 16, 17, 26, 27, 30, 31, 34, 35, 36, 37, 39, 48, 49, 52
<i>Melitaea telona</i> Fruhstorfer, 1908	8, 13, 17, 36
<i>Melitaea arduinna</i> (Esper, 1783)	17, 34, 35
<i>Melitaea trivialis</i> ([D&S], 1775)	1, 6, 8, 9, 10, 12, 13, 15, 17, 18, 22, 24, 27, 28, 31, 33, 34, 35, 37, 38, 39, 40, 42, 43, 44, 47, 48, 51
<i>Melitaea didyma</i> (Esper, 1778)	1, 2, 8, 8, 9, 10, 12, 13, 15, 17, 18, 22, 23, 24, 25, 26, 27, 29, 30, 31, 34, 35, 37, 39, 40, 42, 43, 44, 47, 48, 49, 50, 51, 52
<i>Melitaea athalia</i> (Rottemburg, 1775)	8, 9, 10, 13, 32, 34, 35, 43, 49, 53
<i>Limenitis reducta</i> Staudinger, 1901	2, 4, 7, 8, 8, 9, 13, 16, 17, 25, 28, 35, 37, 43, 45, 49, 50
<i>Kirinia roxelana</i> (Cramer, 1777)	18, 22, 23, 25, 29, 50
<i>Pararge aegeria</i> (Linnaeus, 1758)	13, 22, 23, 31, 34, 36, 41
<i>Lasiommata megera</i> (Linnaeus, 1767)	2, 4, 6, 8, 12, 13, 16, 18, 21, 31, 36
<i>Lasiommata petropolitana</i> (Fabricius, 1787)	30, 31
<i>Coenonympha arcania</i> (Linnaeus, 1761)	8, 30
<i>Coenonympha leander</i> (Esper, 1784)	5, 6, 8, 9, 16, 31, 34, 35, 46, 49
<i>Coenonympha pamphilus</i> (Linnaeus, 1758)	1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 31, 34, 35, 36, 38, 39, 40, 41, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53

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Species	Localities
<i>Maniola jurtina</i> (Linnaeus, 1758)	1, 2, 4, 5, 6, 8, 10, 12, 13, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53
<i>Hyponephele lycaon</i> (Kühn, 1774)	17
<i>Hyponephele lupina</i> (Costa, 1836)	22, 29
<i>Erebia medusa</i> ([D&S], 1775)	8, 9, 10, 31, 32, 34, 35, 36, 49
<i>Melanargia galathea</i> (Linnaeus, 1758)	1, 17, 36, 47, 53
<i>Melanargia larissa</i> (Geyer, 1828)	1, 2, 3, 4, 6, 10, 12, 13, 15, 16, 17, 18, 20, 21, 22, 24, 25, 26, 29, 30, 33, 37, 40
<i>Hipparchia volgensis</i> (Mazochin-Porshnjakov, 1952)	2, 3, 17, 18, 21, 22, 25, 53
<i>Brintesia circe</i> (Fabricius, 1775)	27, 29
<i>Chazara briseis</i> (Linnaeus, 1764)	2, 21
<i>Pseudochazara anthelea</i> (Hübner, 1824)	2, 6, 14, 16, 18, 21, 22, 50

## Discussion

Given the early season and an only week long survey 121 species encountered is an extremely high count. This list comprises roughly 60% of the butterflies known in the Republic of Macedonia. Due to early season only a single locality was visited in Macedonian mountains, well known for high butterfly diversity (Thurner 1964, Jakšić 1998, Micevski & Micevski 2002-2003) and only one observed species, *Colias caucasica*, could be considered predominantly montaneous. The high butterfly diversity observed is certainly linked to several extremely butterfly rich sites. The plateau E of Kozjak Lake has a pooled 59 recorded species, almost half of all species observed. Similarly 63 species were observed in a bit wider area of the middle Treska valley. Fifty-three species were observed on the southern slopes of Mt Vodno and at village Kurbinovo near Lake Prespa. The biggest surprise was the region near Zletovo in NE Macedonia where 58 species together were observed at 2 sites. This region in general is much less studied than some of the previously mentioned sites and no published records exist. All these sites and regions are characterized by great variety of habitats including unimproved lightly grazed grasslands, abandoned partially overgrown grasslands, steep rocky slopes or screes.

The most common species on the trip was *Polyommatus icarus* which was recorded at 49 sites closely followed by *Maniola jurtina* (45 sites), *Colias crocea* (42 sites) and *Coenonympha pamphilus* (40 sites). Among species found at more than half of the sites some are unexpected like *Melitaea trivia* and *Melanargia larissa*, the latter being much more common than *Melanargia galathea*. For some rare species that were found in new regions some additional information is given:

- *Spialia phlomidis* – First recorded for the Republic of Macedonia by Alberti (1922) near Raec gorge. According to the distribution map in Schaidler & Jakšić (1989), so far found only west of Vardar. Therefore the records from Radanje in NE



**Figure 3.** *Tarucus balkanicus* was found at several new sites in Macedonia.

**Slika 3.** *Tarucus balkanicus* je bil najden na nekaj novih lokalitetah v Makedoniji.

Macedonia and those from Konečka Mts. are new for this species and well extend its distribution towards NE in Macedonia. The butterflies were observed in dry rocky places; in Radanje mud puddling was seen.

- *Muschampia cribrellum* – The species is extremely rare in Macedonia and was known from a single site (Lorković 1983). The three new sites discovered during the trip are in the same general region and have been described in detail by Verovnik & Micevski (2009).

- *Carterocephalus palaemon* – First record for Macedonia, but discussed in detail by Verovnik & Micevski (2008).

- *Gegenes nostradamus* – Very rare species in Macedonia and according to the distribution map in Schaidler & Jakšić (1989) found only in Gevgelia in the Vardar valley. Two specimens at each site were observed near Demir Kapija, typically resting and patrolling along sandy roads.

- *Colias caucasica* – Although the record for Galičica Mts. is not new (Tolman & Lewington 1997), a fresh male observed on two occasions patrolling along small valley on 5<sup>th</sup> of June is a very early season record.



- *Satyrrium pruni* – Recorded only by Thurner (1964) north of Struga. The two new records of this species come from the same region close to Ohrid Lake. Single specimens were observed flying in the bushes at Leskoec and Openica E of Ohrid.

- *Satyrrium w-album* – Only known from three squares according to Schaidler & Jakšić (1989). The new record from south side of Mt. Vodno is in the centre of the three.

- *Tarucus balkanicus* – the species has a very limited range in Macedonia with records scattered in the southern half of the country (Schaidler & Jakšić 1989). Records from Bojane NW of Skopje, Radanje and Konečka Mts. are new and represent a wide extension of the known distribution of this species in Macedonia.

- *Cupido osiris* – Known only from Ohrid region, Šar Planina Mts. and two squares in SE Macedonia (Schaidler & Jakšić 1989). This is clearly an underrepresentation of the range of this species in Macedonia. Actually this species was among



**Figure 4.** The ridge above Kozjak Lake is one of the butterfly richest places in Macedonia with several rare species like *Euchloe penia*, *Euphydryas aurinia*, and *Muschampia cribrellum* present.

**Slika 4.** Greben nad jezerom Kozjak je eden izmed vrstno najbolj bogatih območij za metulje v Makedoniji. Med drugim smo tu našli vrste *Euchloe penia*, *Euphydryas aurinia* in *Muschampia cribrellum*.



the commonest blues and was observed at 20 sites during the trip. It was recorded in multiple localities south of Mt. Vodno, Zletovska reka in NE Macedonia, E of Prespa Lake at Kurbinovo and at several sites in central part of Treska valley.

- *Cupido alcetas* – Very rare species in Macedonia known only from Ohrid and Šar Planina – Lešok (Thurner 1964, Schaidler & Jakšić 1989). A single specimen was observed in central part of Treska valley in wet meadows.

- *Polyommatus escheri* – Known only from Raec gorge in Macedonia (Thurner 1964). The species was found at a single site in central part of Treska valley and the detailed information on this find was published separately (Micevski et al. 2009).

- *Araschnia levana* – The species was definitely rare in Macedonia with only two published records Thomas 1993 and Micevski & Micevski 2002-2003, however in the last years it has been found at several new localities (Micevski B., pers. observ.). The species was found near forest edge north of Lake Dojran.

- *Melitaea arduinna* – This species is extremely rare in Macedonia and also elsewhere in Europe. It has been known from Pletvar pass (Thurner 1964), middle part of Vardar valley and environs of Bitola (Schaidler & Jakšić 1989). We found the species unexpectedly in the valley E of Tursko Rudari in NE Macedonia and at village Kurbinovo E of Lake Prespa. At both sites fresh males were observed patrolling along the paths or streams. Two fresh females were found on 6.6. at Kurbinovo where males were found puddeling.

- *Melitaea telona* – this species was probably not mentioned for Macedonia due to its disputable separate species status. It is still missing from the most used field guides like Tolman & Lewington (1997) and Lafranchis (2004). A separate species status under a different name *M. ogygia* was first advocated by Varga (1967) and confirmed by different larval morphology and ecology by Russell et al. (2007). Also the molecular data show clearly that *M. telona* is different and not even closely related to *M. phoebe* (Leneveu et al. 2009). Although the species can be identified safely only by larvae, the typically marked adults are also different from *M. phoebe*. Such typical specimens were observed at four sites during our trip and in three sites they were observed together with *M. phoebe*, so comparison in the field was possible. The species was first discovered on the ridge E of lake Kozjak, than at Gorno Solnje on the same day, all in the region S of Mt. Vodno. It was also found at Tursko Rudari in NE Macedonia and at Dolna Belica north of Ohrid Lake. As these sites are wide apart it is very likely that the species is widespread in Macedonia. The confirmation of the presence of this species should be made by breeding experiments or search of the larval nests in the field.

This short survey has proven that butterfly fauna of Macedonia is very diverse and abundance of butterflies is a good indicator of still well preserved natural and seminatural habitats. Traditional farming practices are still widespread in the country, maintaining the rich diversity. However, this is bound to change due to current demographic processes and economic pressure. The effect of the first are already visible in omnipresent abandonment of haying and low intensity pasturing in more remote areas, whereas intensification is still limited to environs of large towns and cities in the flatlands. These processes will certainly affect the butterflies, especially

habitat specialists. Unfortunately Republic of Macedonia is totally unprepared in terms of butterfly conservation with no legislation covering their protection and protection of their habitats. Certainly an important step forward would be a national red list of threatened butterfly species, however much more field work is needed to make a competent list. With this publication we hope to encourage further surveys in Macedonia and publication of faunistic records.

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