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Taxonimic Data for Pieridae Family (Rhopalocera) of the Sharr Mountain and its Surroundings (Mavrovo and Pollog)

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Abstract: *This research was carried out in the Sharr mountain massif, Pollog valley and Mavrovo National Park (northwestern part of the Republic of Macedonia). Although in the past this territory was explored several times by different local and international researchers, we still considered that it needs to be explored again. This animal group requires a special study research consideration and attention and also special a special approach towards finding any eventually new species or species that may be in extinction for this territory. Hitherto, 500 specimens belonging to the family Pieridae were found and 16 species have been determined belonging to 7 genera and 3 subfamilies. Samples were collected at 18 stations of different heights above the sea level and in different habitats. For each survey station data were recorded on each habitat type, height above sea level (Altitude), geographical latitude and length (Longitude).*

Keywords: *Rhopalocerofaunae, Pieridae, Distribution, Sharr Mountain, Macedonia*

Introduction

Sharr Mountain is the largest massif mountain in the Republic of Macedonia which is located in the northwestern part of Republic of Macedonia and which includes a length of 85 km, and a width of 15-20 km with an area of 1607 km². Sharr Mountain is located in a northern latitude 420 41'43" East and 200 34' 51" which begins with an elevation of 600 - up to 2747m, the highest peak is Tito VRV which interlocks a large number of different forest and grassy generations to the alpine zone. Sharr Mountain is one of the richest massifs, with subordinated types of Rhopalocera, Diurna (butterflies of the day) not only in Macedonia but also in the Balkan Peninsula. Pollogu Valley is a low valley located at 380-550m above sea level and which lies between the Sharr Mountain and the Dry Skopje Mountain. It has almost a meridian stretch and its length is 44 km and width 7 km (West-East), with an area of 250 km2 that ranks immediately after the Pelagonija and Skopje. It is consisted of Tetova valley (Lower Polog) and the valley of Gostivar or Vardar (Upper Polog). Mavrova National Park is a south integrated part of Sharr Massif Mountain at an altitude of 800-2100m above the sea level and it is characterized by a Rhopalocera fauna which requires a more detailed exploration for the eventuality of finding any new type. Rhopalocera fauna (Lepidoptera, Rhopalocera), in the function of which this study was undertaken, it presents scientific, practical and ecological interest. Dubbed else as 'flying flowers' for the possession of stunning colors, these butterflies of the day constitute the most significant group of Lepidoptera, with nearly 174.250 species collected in 126 families. Today, the world recognizes at around 17,500 species of butterflies of the day (Rhopalocera, Diurna), while in Europe live at around 482 types and in the Republic of Macedonia live 201 types. If we account these 201% types in (%), it appears that 46% of the total European number are located in Macedonia and based on the area of the territory this is a very high percentage. This richness primarily is consisted by the presence of the two climates: Mediterranean and Continental in the Republic of Macedonia. Abdija, Xh., Beadini, N., Beadini, Sh., Rexhepi, B. (2013). For the Macedonian Lepidoptera fauna in total are recognized only

three researchers: Austrians, Rebel, H., & Zerny, H. (1931); Thurner, J. (1964); then also researchers, such as: Scheider P., Jaksič P., (1990) and Krpač, V. et al. (2010). In the edition of Krpaç et al., 2008 are reported 201 species of Rhopalocera in the Republic of Macedonia. Until now there are recognized superficial fauna studies for Sharr massif Mountain Rhopalocera Fauna and its surroundings, Dime, M. (2002). In the research of all these authors, it is still left out space for the Rhopalocera fauna to be studied.

Materials and Methods

During this research it was studied the Pieridae family with over 500 exemplars that were met at research stations within the territory of the Sharr Massif Mountain, Pollogu Valley and in the National Park of Mavrovo, the latest is considered to be a continuity of Sharri Massif Mountain. The collection of material is done through special entomological networking for the capture of these butterflies. Butterflies are caught during their flight or during their stay on the flowers, shrubs and spontaneous vegetation. All material is ticketed at the collection place with the data and place of its collection, date of collection, biotope and name of the collector; also with special notes for vegetation (grass, shrub, and tree). After capturing, the objects were set and preserved in envelopes and entomological mattresses. The material for the study was collected from 18 stations for three years, within March - October of the calendar years 2011 to 2012 and 2013 in the northwestern territory of Republic of Macedonia. On the map of the country, this territory consists one tenth of the total territory of the Republic of Macedonia (Figure 1). In most stations were made several gatherings of the material in different months and different hours of the day. In these expeditions it was marked the violation of the most characteristic habitats as regards flora and height of the sea. At each survey stations were taken information on the characteristics of the habitat, altitude, geographic position in GPS and the date of collection of the fauna material. The research work of almost three years has resulted in the collection of over 500 adult individuals (male and female) to Rhopalocera (Pieridae) which are saved in the scientific fund of the study program of Biology, the Department of Zoology of athematics and Natural Sciences Faculty of the State University of Tetova.

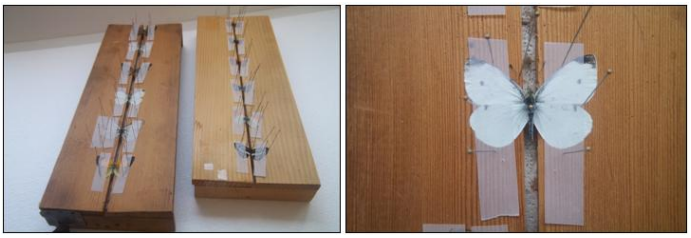


Photo 1. Butterfly specimen (pressed)

The determinations were performed in science laboratory of Nature Science Museum in Skopje, with the help of stereomicroscope of the M5A Wild type (Vladimir T. Krpač), based on morphological characteristics used for the determination of the systematic units. At times, the accuracy of determination was also necessary to study their genitals to confirm the accuracy of determination.

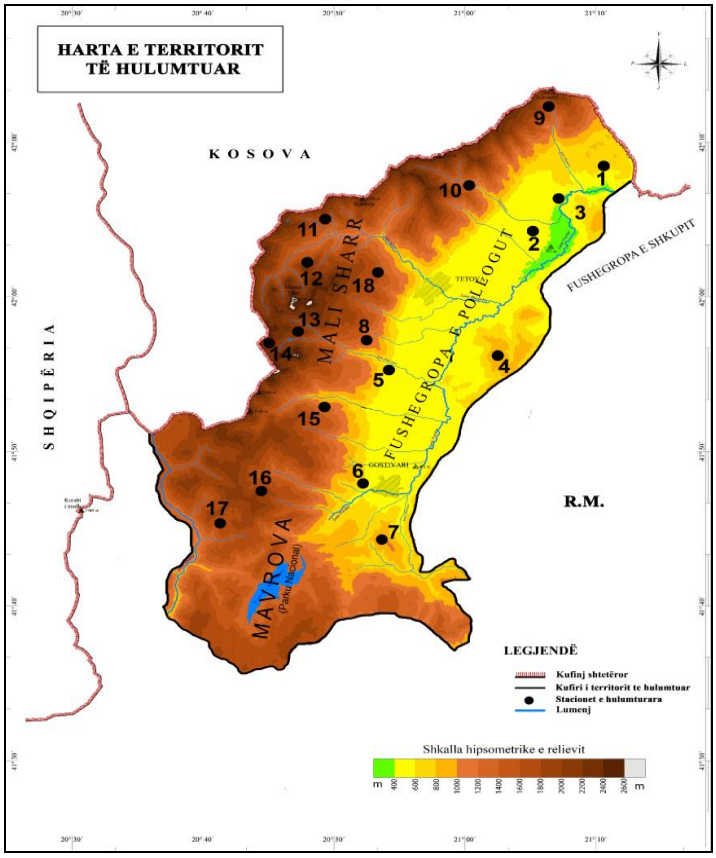
Photo 2. Official butterfly (Pieridae) of Sharr Mountain, Tetovo, Macedonia

In this determination sub-species have not been taken into consideration. The number of copies that were taken into consideration for determination was above 5 in order to obtain more accurate information. In order to unify our results with the percentage of the Rhopalocera we were based on the new nomenclature of Fauna Europaea (2010): version 2.4., while their determination was based according to the authors Tolman, T. & Levington, R. (2012). Auflage (Europas und Die Schmetterlinge Nordwestafrikas. Stuttgart).

Table 1. Check list of the species found from the Family Pieridae within the explored territory (Sharr Mountain, Pollog Valley and the National Park of Mavrovo)

Nr.	(Family)	(Genus)	(Species)	Data	Latitude	Longitude	Altitude	(Location)
1.	Pieridae (Duponchel, 1832)	Leptidea (Billberg, 1820)	*Leptidea sinapis* L.	02.06.2011	N 41 0 54' 31.15"	E 20 0 52' 68.98"	610 m	Pirok (Sharr Mountain)
2.	Pieridae	-	*Leptidea duponcheli* Staud.	09.06.2013	N 42 0 05' 47.10"	E 21 0 08' 02.41"	448m	Nerasht (Pollog Valley)
3.	Pieridae	Anthocaris (Boisduval, 1833)	*Anthocaris cardamines* L.	06.07.2013	N 42 0 00'47.20"	E 20 0 55' 57.96"	1149 m	Lisec
4.	Pieridae	-	*Anthocaris gruneri*H & Sch.	10.05.2012	N 41 0 52' 07.84"	E 20 0 58' 56.98"	510 m	Nerashtë
5.	Pieridae	Aporia (Hübner, 1819)	*Aporia crataegi* L.	16.06.2013	N 42 0 04' 16.08"	E 21 0 05' 38.02"	475m	Përshevc (Pollog Valley)
6.	Pieridae	Pieris (Schrank, 1801)	*Pieris brassicae* L.	30.08.2012	N 41 0 57' 35.14"	E 20 0 53' 45.32"	620 m	Kamenjan (Sharr Mauntain)
7.	Pieridae	-	*Pieris krueperi* Staud.	26.06.2012	N 42 0 07' 43.03"	E 21 0 12' 13.20"	710 m	Jazhincë (Pollog Valley)
8.	Pieridae	-	*Pieris mannii* Mayer	04.07.2013	N 41 0 45' 47.51"	E 20 0 50' 01.45"	887m	Vrutok (Sharr Mountain)
9.	Pieridae	-	*Pieris rapae* L.	06.07.2013	N 42 0 02' 46.01	E 20 0 55' 19.59"	1149 m	Lisec (Sharr Mountain)
10.	Pieridae	-	*Pieris ergane* Geyer	30.06.2012	N 41 0 44' 46.82"	E 20 0 55' 29.69"	620m	Llakovicë (Pollog Valley)
11.	Pieridae	-	*Pieris napi* L.	01.09.2012	N 41 0 35' 37.12"	E 20 0 40' 20.84"	1180 m	Mavrovë (Bistra)
12.	Pieridae	-	*Pieris balcana* Lork.	26.06.2012	N 42 0 07' 43.03"	E 21 0 12' 13.20"	710 m	Jazhincë (Pollog Valley)
13.	Pieridae	Pontia (Fabricius, 1807)	*Pontia edusa* Fabr.	25.08.2012	N 42 0 05' 41.58"	E 21 0 02'40.68	679m	Tearcë (Sharr Mountain)
14.	Pieridae	Colias (Fabricius, 1807)	*Colias croceus* Four.	10.06.2012	N 41 0 52' 07.84"	E 20 0 58' 56.98"	510 m	Radiovc (Pollog Valley)
15.	Pieridae	-	*Colias alfacariensis* Ribbe	22.06.2013	N 41 0 42' 06.98"	E 20 0 45' 26.05"	1011 m	Mavrovë (Radikë)
16.	Pieridae	Gonepteryx (Leach, 1815)	*Gonepteryx rhamni*L.	19.07.2013	N 42 0 05' 47.10"	E 21 0 08' 02.41"	448m	Nerasht (Pollog Valley)

Figure 1. Map of the explored territory for the family Pieridae (Sharr Mountain, Pollog Valley and Mavrovo National Park) within the Republic of Macedonia



With numbers from 1-18 and the black dots are evidenced stations (locations) within the mapped territory: 1. Jazhincë, 2. Përshevcë-Jegunovc, 3. Nerashtë, 4. Radiovc, 5. Pirok, 6. Raven, 7. Llakovicë, 8. Kamenjan, 9. Luboten, 10. Tearcë-Jelloshnik, 11. Brodec-Veshall, 12. Popova Shapka (Kodra e Diellit), 13. Rakovec-Bistravec, 14. Liqeni i Zi, 15. Negotinë-Llomnicë, 16. Mavrovë-Radikë, 17. Mavrovë-Bistra 18. Lisec-Gajre.

Results and Discussion

The results of our research are presented in Table 1 in which are given all information: family, genus, type, date, altitude, geographic length and width of these localities. From the Table 1 it can be seen that our research has resulted from the determination of 16 species of Pieridae family that belong to 7 genera within 3 Rhopalocera sub-order. As compared with the published data for Sharr Mountain, Austrian researchers, Rebel, H., & Zerny, H. (1931) have described only four species of Pieridae family in this respective territory. But Thurner J., (1964) has found 22 species in the Republic of Macedonia, while only 13 species belong to the Pieridae family in Sharri Mountain. Referred to the later data from the researcher Melovski, M. (2002), who has done an exploration during 1995-1998 and 2000 in Sharr Mountain, proves that from all 102 Rhopalocera species, 14 species belong to the Pieridae family. Detailed research about Sharr Mountain was done by Scheider P., Jaksič P., (1990) during the years (1986, 1988, 1998), but we should have in mind that this provides only data from the Sharr Mountain in

genereal (Macedonia and Kosova's part) and reports of 147 Rhopalocerave species, where 18 of these species belong to the Pieridae family. If we refer to publications of Krpač V. and Mihajlova B., (1997); Micevski, N., Micevski, B., (2002/2003) about the butterfly fauna in the territory of the Republic Macedonia so far there are found only 24 species of Pieridae family. If we make a comparison between the researched territory and the total territory of the Republic of Macedonia, we can conclude that this territory is very rich and possesses a lot of Rhopalocera types, and this is enabled from the diversity of habitats that this territory owns, even though in the aspect of the surface it includes only 1/10 or in percentage it is 9.4% from the total territory of the Republic of Macedonia. Thus, if we calculate the presence of Pieridae within the territory of the Republic of Macedonia, 66.6% from the general number are present in this territory. These findings clearly show that the percentage of the present species speakes to a significant number of Pieridae family and which is expressed with a higher percentage compared to other territories explored in the Republic of Macedonia.

4. Conclusions

Our research is focused on the Ropalocerofauna of the massif mountain of Sharr, Pollog Valley and Mavrovo National Park and it can be considered as one of the most valuable research because it determines a percentage of the Pieridae family in this territory (16 species or expressed in percentage are 66.6% from the species of this family that are found in this territory of the Republic of Macedonia from the total 24). Therefore, we conclude that to this group has been required specific and more dimensional research character. The research has been focused on the possibility of the presence of the exact number of family Pieridae and seeking to find new species or eventual extinction of any species for the territory in research. During this exploration no example was found from the Pieridae genus Eurema Hübner, (1819) although previous explorers have mentioned two species of Euchloe ausonia, Hübner, and the species of Euchloe penia, Freyer. Thus, we conclude that 500 specimens belonging to the family Pieridae were found. Out of this number, 16 species have been determined belonging to 7 genera and 3 subfamilies. Samples were collected at 18 stations of different heights above the sea level and in different habitats (See Figure 1).

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