



## THE CONTRIBUTION TO THE KNOWLEDGE OF ENTOMOFAUNA OF THE MORINJ BAY-MONTENEGRO

Jelena NIKČEVIĆ

Republic Institution for the Protection of nature, Trg Bećir Bega Osmanagića 7, 81000 Podgorica,  
e-mail: jnikcevic@cg.yu

### Key word:

biodiversity,  
insects,  
orthoptera,  
habitat

### SYNOPSIS

This paper presents the diversity of insect species of Morinj bay in Boka Kotorska – Montenegro. The information about insects ordo except ordo Orthoptera belongs to various entomological experts (data of fauna Coleoptera are from literature. The data of species about orthopteroid fauna are from investigation work (Pavićević, D., Nikčević J., Zatezalo A. Četković, A. 2006: Orthopteroid fauna of hygrophile habitats in the coastal area of Montenegro, II International Symposium of Ecologist of the Republic of Montenegro, The book of abstracts and programme, Kotor, and from these author/s investigations between 2005 and 2008 year). The information about ecological distribution, endemism and habitats of species are present in this paper.

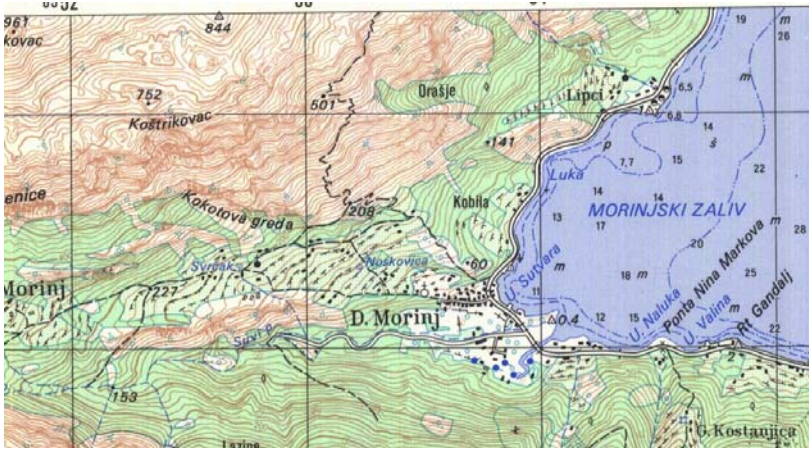
### Key word:

biodiverzitet,  
insekti,  
pravokrilci,  
staništa

### SYNOPSIS

U radu je dat prikaz dosadašnjih saznanja o fauni insekata Morinjskog zaliva u Boki Kotorskoj. Informacije o fauni tvrdokrilaca (Coleoptera) preuzeti su iz literature. Podaci o fauni ortopteroidnih insekata odnose se na objavljene rezultate istraživanja: Pavićević, D., Nikčević J., Zatezalo A. Četković, A. 2006: Orthopteroid fauna of higrofhile habitats in the coastal area of Montenegro, II International Symposium of Ecologist of the Republic of Montenegro, The book of abstracts and programme, Kotor, kao i na rezultate istraživanja autora tokom 2005-2008 godine. Takodje, u radu su prezentirani podaci o distribuciji, endemizmu i ekološkim karakteristikama pravokrilaca.

## INTRODUCTION



Map of investigated area R: 1:25 000



Foto 1. Morinj bay in Boka Kotorska



Foto 2. terrestrial part of Morinj bay – investigated area

The investigated area belongs to UNESCO heritage. This territory is one of territory with the greatest biodiversity of entomofauna species. The fauna of insect species from the Morinj bay of Montenegro is not known such as the some other groups of biological diversity. The fauna of fam. Syrphidae (ordo Diptera) are known from the literature- dr A.Vujić. At this area these are presens insects from 2 ordo, 25 families and 111 species: **Ordo Diptera** with family Drosophilidae and Syrphidae; **Ordo Coleoptera** with families: Carabidae, Hydrophilidae, Silphidae, Staphylinidae, Cerambycidae, Scydmaenidae, Malachiidae, Dasytidae, Elateridae, Buprestidae, Erotylidae, Coccinellidae, Oedemeridae, Anthicidae; Mordellidae; Alleculidae; Tenebrionidae, Scarabaeidae, Lucanidae, Cerambycidae, Chrysomelidae, Curculionidae ( Novak, P. ,1952 : Kornjasi jadranskog primorja, JAZU, Zagreb; Fam. Carabidae (underground species, E. Pretner 1977: Podzemna fauna Coleoptera, Canu glasnik odelj. prir. nauka , knj. 2, Titograd ). Exept these informations, in this paper there are data about **Ordo Orthoptera** from the investigation work during the period from 2005 to 2008 year.

## MATERIAL AND METHODS

Material of orthopteroid insects was collected in summer and autumn period during 2005/2008. On dependance on differences in the taxonomic group collecting were realised with different methods (collecting with mowing and method with individual catching). Collected material was identified by using keys: Harz, K. (1969): The Orthoptera of Europe. Vol. I. The Hague. Harz, K. (1975): The Orthoptera of Europe. Vol. II. The Hague, Harz, K., Kaltenbach, A. (1976): The Orthoptera of Europe. Vol. III. The Hague. Us, P. (1992): Favna Ortopteroidnih insektov Slovenije, Slovenska Akademija Znanosti in Umetnosti, Razred za prirodoslovne nauke, Biološki Institut Jovana Hadžija, br. 12., Ljubljana.

## RESULTS AND DISCUSSION

The orthopteroid species with ecological characteristics, distribution, locality and remarks are present in the table. Some data of these insects are from the paper : Pavičević, D., Nikčević J., Zatezalo A. Četković, A , 2006. The other insect species from different orders are present only with taxonomical belongings (from: Novak, P. , 1952; Pretner, E., 1977; Glumac, S. 1956).

From the literature there are next insect species:

**ORDO DIPTERA – Fam. Drosophilidae:** *Drosophila (Drosophila) immigrans* Sturtervant.; **Fam. Syrphidae :** *Cheilosia albitarsis* Meig., *Cheilosia barbata* Loew., *Cheilosia latifacies* Loew., *Cheilosia latifrons* Zett., *Cheilosia mutabilis* Fall., *Cheilosia scutellata* Fall., *Cheilosia soror* Zett., *Triglyphus primus* Loew, *Cheilosia brachyptera* Pal., *Cheilosia schnabli* Beck., *Platycheirus scutatus* Meig. , *Melanostoma transfugum* Zett., *Scaeva pyrastris* L., *Syrphus ribesi* L., *Volucella inanis* L., *Volucella pellucens* L., *Volucella zonaria* P., *Merodon aberans* Egg., *Merodon constans* Ross., *Merodon erivanica* Par., *Ferdinandea aurea* Ro., *Heringia virens* Fabr. var. *varipes* Meig., *Triglyphus primus* Loew., *Cheilosia brachyptera* Pal., *Paragus pulcherrimus* Strobl., *Platycheirus scutatus* Meig., *Epistrophe balteata* Deg., *Lasiopticus pyrastris* L., *Syrphus corollae* Fabr., *Syrphus ribestris* L., *Sphaerophoria scripta* L. var. *dispar* Loew., *Volucella inanis* L., *Volucella pellucens* L., *Volucella zonaria* Poda., *Eristalis arbutorum* L. *Eristalis pratorum* Meig., *Eristalomyia tenax* L. var. *campestris* Meig. *Eristalomyia tenax* L. var. *hortorum* Meig., *Eristalinus sepulcralis* L., *Myiatropa florea* L. var. *Bigoti* Macq., *Myiatropa florea* L. var. *flavofemorata* Strobl., *Myiatropa florea* L. var. *florea* L., *Myiatropa florum* L. var. *nigrotarsata* Schin., *Lampetia aberrans* Egg., *Lampetia albifrons* Meig., *Lampetia funesta* Fabr., *Syrpitta pipiens* L., *Eumerus argyropus* Loew., *Ferdinandea aurea* Rond., *Lampetia constans* Rossi. (Glumac, S. (1956): Syrphidae –Diptera Juznog Primorja Jugoslavije, Glasnik prirodnjackog muzeja srpske zemlje, knj.8).

**ORDO COLEOPTERA :Fam. Carabidae :** *Carabus caelatus s. procerus* Rtt., *Carabus convexus s. reductus* Mull., *Nebria brevicollis* F., *Chlaenius flavipes* Men., *Licinus silphoides* Rossi., *Bradycellus verbasci* Duft., *Pterostichus melas s. italicus* Dej. *Brachynus crepitans* L., *Brachynus crepitans a. costatus* Mull., **Fam. Hydrophilidae :** *Limnoxenus niger* (Zschach), *Hydrous piceus* (L.), *Ochthebius granulatus s. ljutensis* Mull., *Hydraena Kaufmanni* Gglb .,*Hydraena sicula* Kies., **Fam.Silphidae :***Speonesiotes dorotkanus s. rotundipennis* Mull.; **Fam. Staphylinidae :***Philonothus appendiculatus* Shp., *Staphylinus flavopunctatus* Latr., *Atheta deplanata* Grav., :**Fam. Cerambycidae***Spondylis buprestoides* L., *Cerambyx cerdo* L., *Leptura cordigera* Fuessly., **Fam. Scydmaenidae:** *Euconnus Motschulskyi* Sturm., *Euconnus a. europaeus* Csiki., *Euconnus nanus* Schaum., *Leptomastax Stussineri* Rtt., **Fam. Pselaphidae :***Tychus rufus v. morio* Rtt.; **Fam. Malachiidae :** *Malachius marginellus* Ol ; **Fam. Dasytidae :** *Danacaea marginata a. rufula* Schils., **Fam. Elateridae :***Compsolacon crenicollis* Men., *Hypnoidus alysidotus* Kies., *Athous cingulatus* Mill., **Fam. Buprestidae:** *Anthaxia cichori* Ol., *Meliboeus episcopalis* Mann., **Fam. Erotylidae :***Triplax Marseuli* Bed., **Fam. Coccinellidae :** *Subcoccinella vigintiquatuorpunctata* L., *Coccidula rufa* Hbst., *Rhizobius litura* F., *Clitostethus arcuatus* Rossi, *Clitostethus arcuatus a. Heegeri* Gglb., *Scymnus punctilum* Wse., *Scymnus auritus* Thubg., *Scymnus subvillosus a. juniperi* Mtsch., *Scymnus pallidivestris* Muls., *Scymnus frontalis a. quadripustulatus* Hbst., *Scymnus Apetzi* Muls., *Scymnus Apetzi a. quadriguttatus* Mull., *Scymnus rubromaculatus* Goeze., *Scymnus quadrimaculatus* Hbst., *Scymnus 4-maclatus a. bilunulatus* Wse. ; **Fam. Oedemeridae:***Oedemera barbara* F.,*Oedemera rufofemorata* Germ., *Oedemera nobilis* Scop., **Fam. Anthicidae :***Tomoderus dalmatinus* Rtt., **Fam. Mordellidae :***Mordellistena micans* Germ., **Fam. Alleculidae :***Podonta dalmatina* Bdi., **Fam. Tenebrionidae :***Blaps gigas* L., *Blaps gigas v. occulta* Seidl., *Laena ferruginea* Kust., *Cylindronotus dermestoides* Ill., **Fam. Scarabaeidae :***Sisyphus Schaefferi* L., *Copris hispanus* L., *Onthophagus taurus* Schrb.,*Onthophagus ruficapillus* Brulle, *Onthophagus verticicornis* Laich., *Onthophagus coenobita* Hbst., *Onthophagus lemur* F., *Aphodius erraticus* L. H., *Aphodius haemorrhoidalis* L., *Aphodius obliteratus* Panz., *Aphodius Sturmi* Har., *Anisoplia pubipennis* Blanch., *Anisoplia flavipennis* Brulle., *Osmoderma eremita* Scop., **Fam. Lucanidae :** *Lucanus cervus a. capreolus* Sulz., **Fam. Cerambycidae :***Spondylis buprestoides* L., *Cerambyx cerdo* L., *Leptura fulva* Deg., *Leptura cordigera* Fuessly., *Strangalia verticalis* Germ., *Strangalia septempunctata* F., *Stenopterus flavicornis* Kust., *Ropalopus clavipes* Fab., *Phymatodes testaceus a. similis* Kust., *Pyrrhidium sanguineum* L.,*Plagionotus floralis* Pall.,*Purpuricenus Kaehleri a. litoralis* Depoli, *Parmena balteus* L., *Parmena pubescens v. hirsuta* Kust., *Dorcatypus tristis* l., *Calamobius filum* Rossi., *Exocentrus punctipennis* Muls., *Agapanthia Boeberi* Fsch., *Agapanthia cardui* L., *Agapanthia violacea* Fab., *Oberea erythrocephala a. insidiosa* Muls., **Fam. Chrysomelidae :***Labidostomis longimana v. dalmatina* Lac., *Chrysomela menthastris* Suffr., **Fam. Curculionidae :***Apion aeneum* F., *Apion burdigalense* Wenck., *Apion laevicolle* Kirby., *Otiorrhynchus lugens* Germ., *Smicronix seriepilosus* Tourn., *Tychius Sharpi* Tourn., *Cionus unguatus* Germ., *Otiorrhynchus (Dodecasticus) crivoscianus*

Apf., **Fam. Carabidae (underground species):** *Neotrechus paganettii* (Ganglbauer), *Laemostenus (Odontosphodrus) elongatus* Dejean *Kulzeria dorohtkanus* Reitter subsp. *rotundipenis* G. Muller, *Speonesiotes narentinus* (L. Miller), *Pholeunella ganglbaueri* (Apfelbeck), *Pholeunella erberi* (Schaufuss)

**ORDO ORTHOPTERA**

**Data of orthopteroid species:**

**Table 1. Distribution analysis revealed the presence of inhabiting the European, Mediterranean, Mediterranean-submediterranean, Oromediterranean-mediterranean, Tropic-mediterranean, Tropic-pontomediterranean, Ponto-mediterranean and Endemic kind of orthopteroid species**

	EU	M	MS	OM	TR-M	TR-PM	PM	E
<b>SUBORDO ENSIFERA</b>								
<b>Mantidae</b>								
** <i>Mantis religiosa</i> Linneus, 1758	+							
<b>Empusidae</b>								
** <i>Empusa fasciata</i> - Brulle 1836			+					
<b>Tettigonidae</b>								
** <i>Acrometopa servillea macropoda</i> (Burmeister, 1839)			+					
** <i>Barbitistes ocskayi</i> Charpentier, 1850			+					Endemic mediterranean/submediterranean species
* <i>Barbitistes yersini</i> Brunner von Wattenwyl, 1878			+					
+ <i>Leptophyes punctatissima</i> (Bosc, 1792)	+							
* <i>Leptophyes laticauda</i> (Frivaldsky, 1868)			+					
+ <i>Phaneroptera nana</i> Fieber, 1853							+	
* <i>Poecilimon komareki rumijae</i> Karaman, 1972		+						Endemic mediterranean
+ <i>Tylopsis liliifoliae</i> (Fabricius, 1973)			+					
** <i>Conocephalus conocephalus</i> (Linnaeus, 1767)					+			
+ <i>Saga natoliae</i> Serville 1839			+					
+ <i>Saga pedo</i> (Pallas, 1771)	+							
+ <i>Tettigonia viridisima</i>	+							

Linneus, 1758								
+ <i>Decticus albifrons</i> (Fabricius, 1775) ?			+					
** <i>Eupholidoptera chabrieri schmidti</i> (Charpentier, 1825)			+					Endemic species of mediterranean/submediterranean
+ <i>Pachytrachis frater</i> (Brunner von Wattenwyl, 1882)			+					
* <i>Pachytrachis striolatus</i> (Fieber) 1853			+					
+ <i>Pholidoptera dalmatica</i> (Krauss, 1878)		+						Endemic species of mediterranean
+ <i>Pholidoptera maritima</i> Zeuner, 1931			+					
+ <i>Platycleis escalerae</i> Bolivar 1899			+					
+ <i>Platycleis grisea</i> (Fabricius, 1781)			+					
+ <i>Platycleis intermedia</i> (Serville, 1839)			+					
+ <i>Sepiana sepium</i> (Yersin) 1854		+						
+ <i>Rhacocleis germanica</i> (Herrich-Schaeffer, 1840)	+							
** <i>Ephippiger discoidalis</i> (Fieber, 1853)			+					Endemic species of Balkan peninsula
<b>Oecanthidae</b>								
** <i>Oecanthus pellucens</i> (Scopoli) 1763			+					
<b>SUBORDO CAELIFERA</b>								
<b>Tetrigidae</b>								
** <i>Tetrix ceperoi</i> (Bolivar, 1887)							+	
** <i>Tetrix subulata</i> (Linne, 1758)	+							
<b>Acrididae</b>								
** <i>Pezottetix giornaie</i> (Rossi, 1794)	+							
** <i>Anacridium aegyptum</i> (Linneus 1764)						+		
** <i>Calliptamus italicus</i> (Linneus 1758)			+					
** <i>Acrida turrita</i> (Linnaeus, 1758)						+		

** <i>Acrida ungarica ssp. mediterranea</i> (Herbst 1786)							+		
*. <i>Aiolopus strepens</i> (Latreille) 1804	+								
** <i>Aiolopus thalassinum</i> (Fabricius 1781)	+								
** <i>Locusta migratoria cinerescens</i> (Linneus, 1758)							+		
** <i>Oedaleus decorus</i> (Germar, 1826)								+	
** <i>Oedipoda coerulescens</i> (Linnaeus, 1758)	+								
** <i>Oedipoda germanica</i> (Latreille, 1804)	+								
** <i>Oedipoda miniata</i> (Pallas, 1771)								+	
* <i>Omocestus rufipes</i> (Zetterstedt, 1821)	+								

\* Data from Pavićević, D., Nikčević J., Zatezalo A. Četković, A (2006): Ortopteroid fauna of hygrophile habitats in the coastal area of Montenegro, II International Symposium of Ecologist of the Republic of Montenegro, The book of abstracts and programme, Kotor.

\*\* Data from authors investigations between 2006 and 2007 years

+ Data from investigation of 2008 year

## CONCLUSIONS

Distribution analysis revealed the presence of inhabiting the European, Mediterranean, Mediterranean-submediterranean, Oromediterranean-mediterranean, Tropic-mediterranean, Tropic-pontomediterranean, Ponto-mediterranean and Endemic kind of species.

### European species: 14

*Mantis religiosa*, *Leptophyes punctatissima*, *Saga pedo*, *Tettigonia viridissima*, *Platycleis albopunctata*, *Rhacocleis germanica*, *Tetrix subulata*, *Tetrix nutans*, *Pezotettix giornae*, *Aiolopus strepens*, *Aiolopus thalassinum*, *Oedipoda coerulescens*, *Oedipoda germanica*, *Omocestus rufipes*

### Mediterranean species: 2

*Poecilimon komareki rumije*, *Sepiana sepium*

### Mediterranean-submediterranean species: 17

*Empusa fasciata*, *Acrometopa servillea macropoda*, *Barbitistes ocskayi*, *Barbitistes yersini*, *Leptophyes laticauda*, *Tylopsisi lilifolia*, *Saga natoliae*, *Decticus albifrons*, *Eupholidoptera chabrieri*, *Pachytrachis frater*, *Pachytrachis striolatus*,

*Pholidoptera maritima*, *Platycleis escalerae*, *Platycleis intermedia*, *Ephippiger discoidalis*, *Oecanthus pellucens*, *Calliptamus italicus*

**Tropic-mediterranean species: 1**

*Conocephalus conocephalus*

**Tropic-pontomediterranean species: 4**

*Anacridium aegyptum*, *Acrida turita*, *Acrida ungarica mediterranea*, *Locusta migratoria cinerescens*

**Oromediterranean-mediterranean species: no data**

**Ponto-mediterranean species: 4**

*Phaneroptera nana*, *Tetrix ceperoi*, *Oedaleus decorus*, *Oedipoda miniata*

**Endemic species:**

**Endemic species mediterranean-submediterranean: 2**

*Barbitistes ocskayi*, *Eupholidoptera chabrieri schmidtii*

**Balkan endemic species: 2**

*Barbitistes yersini*, *Ephippiger discoidalis*

**Mediterranean endemic species: 1**

*Pholidoptera dalmatica*

**Endemic species of Coastal Adriatic Mountains:1**

*Poecilimon komareki Rumijae*

**Endemic species of Dinaridi: no data**

The orthopteroid fauna of Morinj bay has 42 species until now. The six (6) species determined from the investigation (Pavićević et al., 2006). The information about 36 species belongs to investigation from 2006 -2008 years.

The data from 2008 year have conclusions about the species with typical Mediterranean and xerophil characteristics on the lower habitats from the coastal Adriatic zone. It may be a result of changing marsh and mesophil grassland near the Morinj river (ecological determined such as changing habitat types with irreversible ecological characteristics) according to the anthropogenic influences.

The data of some characteristic species with oromediterranean characteristics and species from Dinaridi are absent.

The results of investigation of 2008 year gave a information of species with typical xerophil Mediterranean area, such as one species endemic with coastal Adriatic mountains.

The reason for that ecological kind of picture of orthopteroid insects, nowday, will be reasearch in the next years of investigations.

#### REFERENCES

- Egon Pretner (1977): Podzemna fauna Coleoptera, Canu glasnik odelj. prir. nauka knj. 2, Titograd.
- Glumac, S.(1956): Syrphidae –Diptera Južnog Primorja Jugoslavije, Glasnik prirodnjačkog muzeja srpske zemlje, knj.8.Beograd.
- Pavićević,D., Nikčević J., Zatezalo A.Četković, A (2006): Ortopteroid fauna of higrofhile habitats in the coastal area of Montenegro, II International Symposium of Ecologist of the Republic of Montenegro, The book of abstracts and programme, Kotor.
- Novak, P. (1952) : Kornjaši jadranskog primorja, JAZU, Zagreb.

