



SOME ECOLOGICAL DATA OF COLEOPTERA IN A BEACH DUNE SYSTEM OF LONG ULCINJ BEACH IN MONTENEGRO

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SYNOPSIS

This paper presents some ecological characteristics of Coleoptera genus: *Erodium*, *Anomala*, *Cicindela*, *Oxythyrea*, *Scarabeus* from Long Ulcinj Beach dune system in South East part of Europe.

SINOPSIS

U radu su prikazani podaci o nekim ekološkim karakteristikama rodova (*Erodium*, *Anomala*, *Cicindela*, *Oxythyrea*, *Scarabeus*) na području Velike Ulcinjske plaže u jugoistočnom delu Evrope.

INTRODUCTION

The area of Long Ulcinj Beach is settled at the South East part of Adriatic Coast (fig. 1). This is the only psamohalophil ecosystem 13km long and 60-100m wide (fig.2). The Long Ulcinj Beach has been protected by the law as a natural monument with specific elements of protecting since 1968.

The vegetation characteristics of the ecosystem of Long Beach dunes have been taken over from Lakušić (1998).

• Vegetation is from the following communities: *Viticion agni-casti* Lakušić, 76, *Leucojo-Fraxinetum oxycarpe montenegrinum* Lakušić, *Periploco-Quercetum scutariensis* Černjavski, 49.



Figure 1: Map of investigated area.

- Microvegetation: *Amnophila arenaria*, *Agropyronum junceum*, with species *Avena sterilis*, *Bromus tectorum*, *B. villosus*, *Lagurus ovatus*, *Vulpia fasciculata*, *Cynodon dactylon* i dr.

- Characteristic species: *Eryngium maritimum*, *Atriplex hastata*, *A. tatarica*, *Salsola kali*, *Carlina corymbosa*, *Ononis variegata*, *Calistegia soldanella*, *Euphorbia paralias*, *Pancratium maritimum*, *Ephedra distachya*, *Reichardia picroides*, *Plantago indica*, *Teucrium polium* itd.

- On the wet part of dune sand there are: *Holoschenus vulgaris*, *Cyperus rotundus*, *Juncus acutus*, *J. maritimus*, *Arundo donax* itd.



Figure 2: Psamhalophil ecosystem at Long Ulcinj Beach. Foto: Nikčević.

The results of investigations for the period 2002-2003 are presented in the paper „About Some Interesting Species of the Ulcinj Area“ Pavičević et al., 2004. In this paper the following species from the ordo Coleoptera are described: *Cicindela*

littoralis nemoralis Olivier, *Cicindela trisignata siciliensis* Horn, *Scarabaeus semipunctatus* Fabricius, *Anomala matzenaueri* Reitter, *Oxythyrea dulcis abigailoides* Mikšić, *Erodius aff. orientalis*.

During the period from the 2003 to 2009 this ecosystem was under the great antropogenic influences (fig. 3). The objective of our investigation is to establish presence or absence of species recorded in earlier investigation, and to detect antropogenic influences; To determine the abundance of species on the localities; To introduce seasonal and daily dynamics of species occurrence; To represent termophilic characters of taxons and species; To demonstrate corelation between antropogenic influences and occurrence of *Coleoptera* species.



Figure 3a. Part of the beach near porto Milena with the most severe antropogenic influences.



Figure 3b. Part of the beach where the antropogenic influences have decreased.



Figure 3c. The middle part of the beach with original small dune ecosystem without antropogenic influences.



Figure 3d. The part of the beach near the Bojana River. Foto: Nikčević.

MATERIALS AND METHODS

The author used the following methods adapted by individual evaluation to the characteristics of existing ecosystems:

- Through the investigations the following ecological factors were observed: temperature, moisture, direction of winds;
- Other ecological factors observed as a constant.
- Antropogenic influences in period 2003 – 2009 observed as limiting ecological factors;
- The investigation were carried out in summer season, from June to August, from 9 to 17h, performed on the chosen localities of the Long Ulcinj Beach. Method of individual catching was used.

RESULTS AND DISCUSSION

RESULTS OF THE INVESTIGATIONS IN 2008

Table 1:

REMARK	SPECIES	JUNE	JULY	AUGUST
	<i>Scarabaeus semipunctatus</i> Fabricius, 1792	1 specimen		
Without specimens. Similar to earlier periods of investigations	<i>Oxythyrea dulcis abigailoides</i> Mikšić, 1978			
	<i>Anomala matzenaueri</i> Reitter, 1918	25 specimens	2 specimens	Dead specimens
	<i>Erodium orientalis</i> Brullé, 1832	2 specimens	10 specimens	Dead specimens
At the end of August and the beginning of September there are present three species of this genus on temperature of 35°C, moisture about 60%	<i>Cicindela sahlbergii albanica</i> Apfelbeck, 1909		Presence in small number on the transition from dry to wet part of sand in July; presence of other species of this genus does not differ from 2004 (presence all three species)	Presence from end of August to the beginning of September

	<i>Cicindela littoralis nemoralis</i> Olivier, 1790			Presence from the end of August and at the beginning of September near “Bratstvo i jedinstvo” resting place
	<i>Cicindela trisignata siciliensis</i> Horn, 1891			Presence at the end of August and the beginning of September

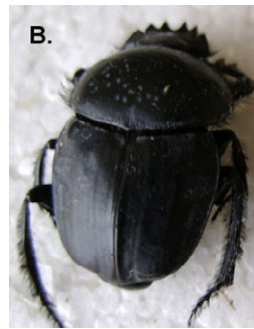


Figure 4: rare, endemic, endangered and characteristic psamohalophil species of Coleoptera in the Long Ulcinj Beach: A. *Oxythyrea dulcis abigailoides* Mikšić, 1978; B. *Scarabaeus semipunctatus* Fabricius, 1792; C. *Anomala matzenaueri* Reitter, 1918; D. *Erodium orientale* Brullé, 1832

THE RESULTS OF THE INVESTIGATIONS IN 2009

Table 2:

REMARK	SPECIES	JUNE	JULY	AUGUST
Moisture about 45%, temperature 36°C; wind northwestern	<i>Scarabaeus semipunctatus</i> Fabricius, 1792		one specimen in the middle part of the beach	the investigation was not possible because the localities are in private property
	<i>Oxythyrea dulcis abigailoides</i> Mikšić, 1978			
Moisture about 50%, temperature 33°C; wind southwestern	<i>Anomala matzenaueri</i> Reitter, 1918	2 specimens near rest house	20 specimens near hotels and 8 specimens near rest house	
Wetness about 50%, temperature 33°C; wind southwest <i>Amphimalon s. simpicissimus</i> – 2 specimens near rest house	<i>Erodium orientalis</i> Brullé, 1832	7 specimens near rest house	65 specimens near hotels, 20 specimens near rest house, 5 specimens in the central part, 1 specimen in the south part of the beach	
Wetness about 45%, temperature 36°C; wind northwest	<i>Cicindela sahlbergii albanica</i> Apfelbeck, 1909		present at the entire beach in large numbers at places with the greatest anthropogenic influences	
	<i>Cicindela littoralis nemoralis</i> Olivier, 1790		present in large numbers with <i>C. albanica</i> in the middle part of the beach with less elements of anthropogenic influences	
	<i>Cicindela trisignata siciliensis</i> Horn, 1891		Present in small number with the other two species in the middle and southern part of the beach near the Bojana River	

CONCLUSIONS

- During the period from 2003 to 2009 Long Ulcinj Beach experienced great anthropogenic influences bringing the changes in the ecosystems and species.

- Dune ecosystem is nowadays present only in the small part of the beach P= 2500mX50m with changed form of vegetation communities.

- The abundance of the species is directly proportional of anthropogenic factors.

- Endemic species are: *Anomala matzenaueri* Reitter, 1918 and *Erodius orientalis* Brullé, 1832. On the southern part of the beach anthropogenic influences are minor, but present of these two species are rare. On the northern part of the beach, with great anthropogenic influences, the number of individuals of these species is higher than in 2003. On this locality these species are not rare and are not endangered element of Coleoptera fauna at the Ulcinj Beach.

6. According to the results of investigations all species are termophilic and psamohalofilic.

7. The species are present throughout the hottest part of the day from 10-17 hours in July.

8. The species of the genera *Erodius* and *Anomala* are present in the northern part of the Beach at the same time.

9. In the central and southern parts of the Beach species *E. orientalis* is the most numerous, after this species *Anomala matzenaueri* is appearing.

10. *Cicindela* species, in the littoral part of the sand, in the morning are less numerous than in the evening.

11. The species *Scarabaeus semipunctatus* Fabricius, 1792, as the most characteristic species for this type of ecosystems, is determined only in one exemplar such as in 2003.

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