

## Beetles (Coleoptera) from seaside beach and dunes in the regions of Świnoujście, Międzyzdroje and Wiselka (Poland) located along the southern coast of the Baltic Sea

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A total of 118 species of beetles (*Coleoptera*) from 21 families were found from the end of May to the middle of September in Świnoujście (in 2002, 2004, 2005), Międzyzdroje (2000) and in Wiselka (2004). The fauna was collected using Barber's pitfall traps, entomological scoop and collecting dead and alive specimens of beetles.

*Coleoptera* were studied in the following habitats: 1 km along sandy beach, white dune with the plant community *Elymo-Ammophiletum arenariae*, and grey dune with the plant community *Helichryso-Jasionetum litoralis*.

The most numerous beetle families were: *Staphylinidae* (23 species), *Chrysomelidae* (14 species), *Coccinellidae* (12 species), *Curculionidae* (11 species), *Elateridae* (10 species) and *Scarabaeidae* (9 species). The beetle assemblies of sandy beach and dunes included xerophilous, termophilous, halophilous and psammophilous species. The most interesting of them with respect to dunes and seaside beach were: *Aegialia arenaria* (Fabricius), *Coccinella undecimpunctata* Linnaeus, *Coniocleonus hollbergi* (Fahraeus), *Hoplia parvula* Krynicki, *Hypocaccus metallicus* (Herbst), *Negastrius pulchellus* (Linnaeus), *Omonadus floralis* (Linnaeus), *Onthophagus taurus* (Schreber), *Otiorhynchus atroapterus* (De Geer), *Oxythyrea funesta* (Poda), *Philopodon plagiatus* Schaller, *Phylan gibbus* (Fabricius), *Sitona grisea* (Fabricius), *Typhaeus typhoeus* (Linnaeus), *Tytthaspis sedecimpunctata* (Linnaeus), *Xantholinus rhenanus* Coiffait.

Three species are placed in the Red List of Threatened Animals of Poland: *Typhaeus typhoeus* (Linnaeus) (NT - nearly threatened category), *Hoplia parvula* Krynicki (LC - least concern) and *Otiorhynchus atroapterus* (De Geer) (EN - endangered category).

Key words: *Coleoptera*, Baltic Sea coast, beach, white and grey dune, north-western Poland.

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## INTRODUCTION

Manifold families and species of beetles inhabiting the beaches and dunes of the Baltic Coast located within the present boundaries of Poland have been studied since the 19<sup>th</sup> century. Various parts of the shoreline were penetrated by both Polish and German entomologists.

The fauna of sea shore beetles found on the eastern part of Poland's Baltic Coast, i.e. on Hel Peninsula, was studied by Węgrzecki (1932), Bartoszyński (1937) and Jędrzejczak (2002), on regions of Gdańsk Gulf by Burzyński (1973), whereas those on the Vistula Spit were described by Aleksandrowicz (2004a, 2004b). Entomological studies along the central part of the Polish Baltic Coast, mainly from the Słowiński National Park, were carried out by Cykowski (1979a, 1979b), Kaczmarek (1978, 1985), Aleksandrowicz et al. (2004c), Wiater (2006) and Marczak and Komosiński (2006). Most reports and papers, however, deal with the shoreline of West Pomerania. Data on many beetles of this region have been published by, among others, Kleine (1940), von Varendorf (1912), and Letzner (1847) for the shores of Uznam and Rugia Islands, by Habelmann (1854, 1861) and Pfeil (1854) for the Międzyzdroje beach located on Wolin Island, as well as by Jäger (1892) for the beach in Świnoujście on Uznam Island. Pawłowski (1966) has published an index of beetles on the beach near Pobierowo, whereas the areas of shore dunes of Wolin and Uznam Islands were studied by Wolender and Zych (2003, 2005, 2006). Also a number of reports have been published in the journal *Wiadomości Entomologiczne* („Entomological News”) of the Polish Entomological Society concerning single species found within the Baltic coastal zone (Bunalski 1992, 1995; Kania, Zawadzki 1994; Wanat 1993).

The aim of this study was to present the species and families of beetles captured along the beach and dunes near the town of Świnoujście (Uznam and Wolin Island), as well as Międzyzdroje and the village Wiselka (Wolin Island), located in the western part of the Polish Baltic Coast. We have

omitted the index of taxa of ground beetles (*Carabidae*) developed for dune areas of Wolin and Uznam Islands, which has been published already by Wolender and Zych (2003, 2005, 2006).

## AREA OF STUDY AND METHODS

The study area includes 1 km of beach, of the width ranging between about 70 m near Świnoujście and 40 m in Wiselka and Międzyzdroje, as well as white and grey dunes located near the studied beach. In physical and geographic terms, the studied areas are located within the Middle European Lowland province, the Southern Baltic Coast subprovince, Szczecin Coast macroregion, and Uznam and Wolin mesoregions (Kondracki 2000). According to the division adopted in the „Catalogues of Poland's Fauna”, the areas represent a part of the Baltic Coast (Figure 1).

This Baltic beach, near the bottom of the white dune, is inhabited by salt-tolerant plants (halophytes) represented by sea sandwort *Honckenya peploides* (L.) Ehrh., European searocket *Cakile maritima* Scop. and Russian thistle *Salsola kali* L. Pioneering dune vegetation species (psammophytes), belonging to the *Elymo-Ammophiletum arenariae* dune grass association, grow on the white dune. The species characteristic for this vegetation association include European beachgrass *Ammophila arenaria* (L.) Lk. and blue lyme grass *Elymus arenarius* (L.) Hochst. Behind white dunes lies the grey dune covered with the *Helichryso-Jasionetum litoralis* community represented by sheep's-bit *Jasione montana* L., dwarf everlast *Helichrysum arenarium* (L.) Moench, narrow-leaved hawkweed *Hieracium umbellatum* L., red fescue *Festuca rubra* L. and field sagewort *Artemisia campestris* L. Farther away from the sea-shore, the herbal vegetation gradually turns into shrubs, such as sea buckthorn *Hippophae rhamnoides* L. and silverberry *Elaeagnus commutata* Bernh. or dwarf trees, such as pine *Pinus sylvestris* L. (Piotrowska 2002; Piotrowska, Celiński 1968).

The studies were carried out from the end of May till middle of September on the beach and dunes of Świnoujście (in 2002, 2004, 2005), Międzyzdroje (in 2000) and Wiselka (in 2004). The beetles were captured using standard entomological methods, i.e. Barber's pitfall traps arranged in transects of 10 traps each, located both on the white and grey dunes. The insects were also swept off from grasses and shrubs of the dunes, collected when found dead or captured alive when spotted.

Data on beetle species distribution in Poland, their ecological ranges, as well as nomenclature

and taxonomy were adopted from „Catalogues of Poland's Fauna” composed by various authors. Threat categories were taken from the „Red list of threatened animals in Poland” (Pawłowski et al. 2002).

## RESULT

In all, we have found and captured 118 species belonging to 21 families of beetles. The analysis results of the material are presented in Table 1.

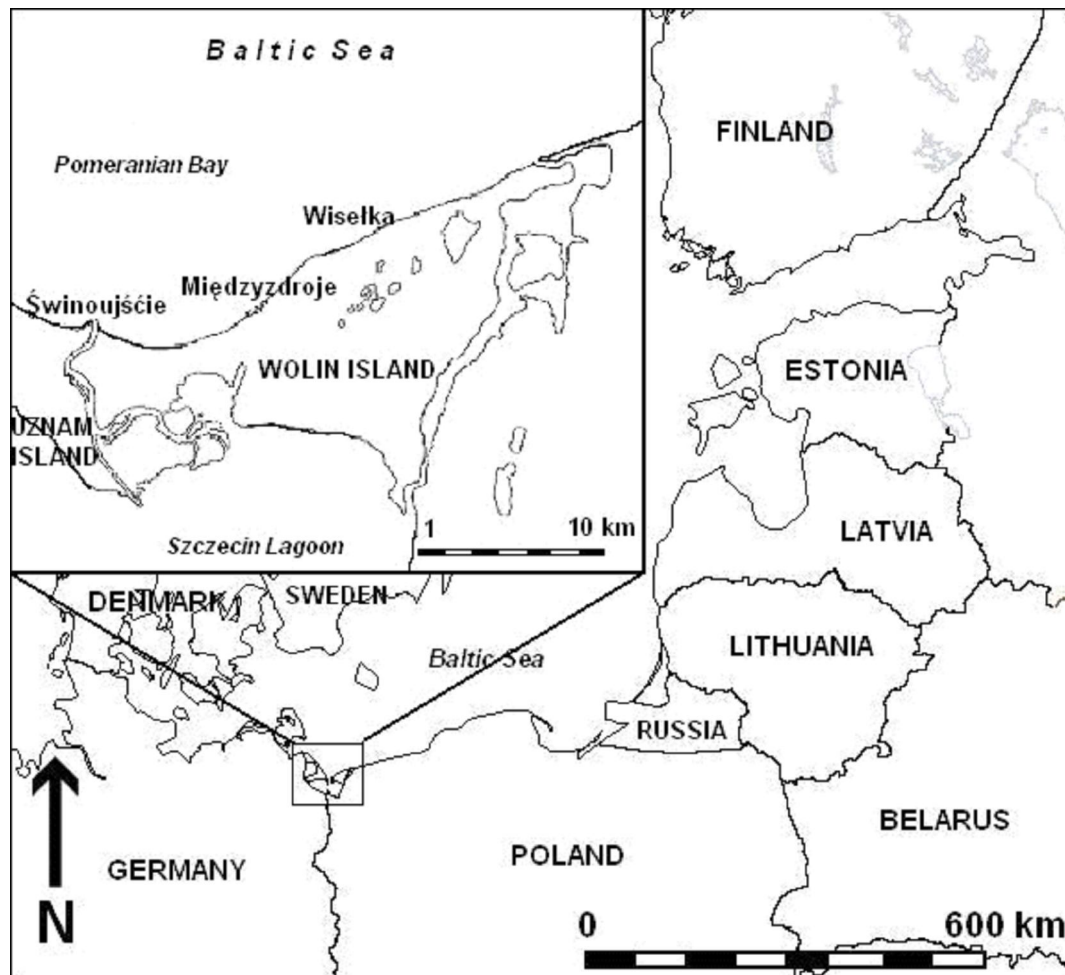


Fig. 1. The examined seaside beach and dunes in the regions of Świnoujście, Międzyzdroje and Wiselka.

Table 1. List of beetles *Coleoptera* (without ground beetles *Carabidae*) recorded from seaside beach and dunes in the regions of Świnoujście, Międzyzdroje and Wiselka.

No.	Species	Seaside beach and dunes of regions of:		
		Świnoujście	Międzyzdroje	Wiselka
1. Family: <i>Anthicidae</i>				
1.	<i>N. monoceros</i> (Linnaeus)	+	+	
2.	<i>Omonadus floralis</i> (Linnaeus)	+		
2. Family: <i>Byrrhidae</i>				
1.	<i>Byrrhus pilula</i> (Linnaeus)		+	++
3. Family: <i>Cantharidae</i>				
1.	<i>Cantharis fusca</i> Linnaeus	++		
2.	<i>Rhagonycha fulva</i> (Scopoli)	+		
4. Family: <i>Cerambycidae</i>				
1.	<i>Clytus arietis</i> (Linnaeus)	+		
2.	<i>Corymbia rubra</i> (Linnaeus)	++	++	
3.	<i>Leptura quadrifasciata</i> Linnaeus	+		
4.	<i>Lepturalia nigripes</i> (De Geer)	+		
5.	<i>Rutpela maculata</i> (Poda)	+		
6.	<i>Spondylis buprestoides</i> (Linnaeus)		+	
7.	<i>Stenurella melanura</i> (Linnaeus)	++		
5. Family: <i>Chrysomelidae</i>				
1.	<i>Agelastica alni</i> (Linnaeus)	++		+++
2.	<i>Cassida margaritacea</i> Schaller	++		
3.	<i>C. vittata</i> Villers	++		++
4.	<i>Chrysomela cuprea</i> Fabricius	+		
5.	<i>C. populi</i> Linnaeus	++	+	
6.	<i>Chrysolina staphylea</i> (Linnaeus)	+		
7.	<i>C. sturmi</i> (Westhoff)	+		
8.	<i>Cryptocephalus sericeus</i> (Linnaeus)	++		
9.	<i>Galeruca tanacetii</i> (Linnaeus)	+	+	
10.	<i>Leptinotarsa decemlineata</i> (Say)	+++		+
11.	<i>Linaeidea aenea</i> (Linnaeus)	+		
12.	<i>Oulema melanopus</i> (Linnaeus)			+
13.	<i>Phyllotreta atra</i> (Fabricius)		+	
14.	<i>Smaragdina cyanea</i> (Fabricius)	++		
6. Family: <i>Coccinellidae</i>				
1.	<i>Anatis ocellata</i> (Linnaeus)	++	+	+
2.	<i>Coccinella septempunctata</i> Linnaeus	++	+	+
3.	<i>C. quinquepunctata</i> Linnaeus	++		
4.	<i>C. undecimpunctata</i> Linnaeus	+		
5.	<i>C. quattuordecimpustulata</i> (Linnaeus)	+		
6.	<i>Halyzia sedecimguttata</i> (Linnaeus)	+		+
7.	<i>Hippodamia septemmaculata</i> (De Geer)	+		
8.	<i>H. tredecimpunctata</i> (Linnaeus)	++		
9.	<i>H. variegata</i> (Goeze)	+		
10.	<i>Propylea quattuordecimpunctata</i> (Linnaeus)	+		
11.	<i>Thea vigintiduopunctata</i> (Linnaeus)	+		
12.	<i>Tytthaspis sedecimpunctata</i> (Linnaeus)	+		
7. Family: <i>Curculionidae</i>				
1.	<i>Coniocleonus hollbergi</i> (Fahraeus)	+		
2.	<i>Hylobius abietis</i> (Linnaeus)	+++	+++	++
3.	<i>Hypera arator</i> (Linnaeus)		+	
4.	<i>Otiorhynchus atroapterus</i> (De Geer)	++		
5.	<i>O. raucus</i> (Fabricius)		++	
6.	<i>Philopodon plagiatu</i> s (Schaller)	+++	+	

7.	<i>Sitona gressorius</i> (Fabricius)	+		
8.	<i>S. grisea</i> (Fabricius)	+		
9.	<i>S. lineatus</i> (Linnaeus)		+	
10.	<i>S. puncticollis</i> Stephens		+	
11.	<i>Strophosoma capitatum</i> (De Geer)		+	
8. Family: <i>Dermestidae</i>				
1.	<i>Dermestes murinus</i> Linnaeus		+	
9. Family: <i>Elateridae</i>				
1.	<i>Agriotes lineatus</i> (Linnaeus)		+	+
2.	<i>A. sputator</i> (Linnaeus)	+		
3.	<i>Agrypnus murinus</i> (Linnaeus)	+++	+++	+++
4.	<i>Ampedus cinnabarinus</i> (Eschscholtz)	+		
5.	<i>Crepidophorus mutilatus</i> (Rosenhauer)		+	
6.	<i>Hypnoidus riparius</i> (Fabricius)	+		
7.	<i>Melanotus erythropus</i> (Gmelin)	+		
8.	<i>Negastrius pulchellus</i> (Linnaeus)	+		
9.	<i>Selatosomus aeneus</i> (Linnaeus)	++		++
10.	<i>S. cruciatus</i> (Linnaeus)	+		
10. Family: <i>Geotrupidae</i>				
1.	<i>Geotrupes stercorarius</i> (Linnaeus)	+	++	+++
2.	<i>G. stercorosus</i> (Hartmann in Scriba)	+++	+++	++
3.	<i>G. vernalis</i> (Linnaeus)	++	+++	+++
4.	<i>Typhaeus typhoeus</i> (Linnaeus)			+
11. Family: <i>Histeridae</i>				
1.	<i>Hypocaccus metallicus</i> (Herbst)	+		
12. Family: <i>Melyridae</i>				
1.	<i>Clanoptilus marginellus</i> (Olivier)	+		
2.	<i>Malachius aeneus</i> (Linnaeus)	+		
13. Family: <i>Mordellidae</i>				
1.	<i>Variimorda villosa</i> (Schrank)	++		++
14. Family: <i>Nitidulidae</i>				
1.	<i>Glischrochilus quadriguttatus</i> (Fabricius)		+	
15. Family: <i>Phalacridae</i>				
1.	<i>Phalacrus caricis</i> Sturm	+++		
16. Family: <i>Scarabaeidae</i>				
1.	<i>Aegialia arenaria</i> (Fabricius)	+		
2.	<i>Anomala dubia</i> (Scopoli)	+++		+
3.	<i>Aphodius fimetarius</i> (Linnaeus)	+		
4.	<i>A. rufipes</i> (Linnaeus)		+	
5.	<i>Hoplia parvula</i> Krynicky			+
6.	<i>Onthophagus taurus</i> (Schreber)		+++	
7.	<i>Oxythyrea funesta</i> (Poda)	+		
8.	<i>Rhizotrogus solstitialis</i> (Linnaeus)	+		
9.	<i>Serica brunnea</i> (Linnaeus)		+	
17. Family: <i>Scydmaenidae</i>				
1.	<i>Scydmaenus tarsatus</i> Müller et Kunze	++		
18. Family: <i>Silphidae</i>				
1.	<i>Aclypea opaca</i> (Linnaeus)	+		
2.	<i>A. undata</i> (Müller)			+
3.	<i>Nicrophorus humator</i> (Gleditsch)		++	
4.	<i>N. investigator</i> Zetterstedt	+	+++	+
5.	<i>N. vespilloides</i> Herbst		+++	++
6.	<i>Oiceoptoma thoracica</i> (Linnaeus)	++	+	+
7.	<i>Phosphuga atrata</i> (Linnaeus)	++	+++	+
8.	<i>Silpha carinata</i> Herbst		++	

9.	<i>S. obscura</i> Linnaeus	++		
10.	<i>Thanatophilus rugosus</i> (Linnaeus)		+	
19. Family: <i>Staphylinidae</i>				
1.	<i>Aleochara bipustulata</i> (Linnaeus)	+++		
2.	<i>Anotylus tetracarlinatus</i> (Block)		+	
3.	<i>Anthophagus caraboides</i> (Linnaeus)		++	
4.	<i>Hypnoidus riparius</i> (Fabricius)		+	
5.	<i>Ocypus olens</i> (Müller)		+	++
6.	<i>O. ophthalmicus</i> (Scopoli)	+	+++	++
7.	<i>O. similis semialatus</i> Müller		+	
8.	<i>Ocyusa maura</i> (Erichson)		+	
9.	<i>Oxygoda alternans</i> (Gravenhorst)		+	
10.	<i>Oxytelus rugosus</i> (Fabricius)	+		
11.	<i>O. sculptus</i> Gravenhorst		+	
12.	<i>Paederus fuscipes</i> Curtis			+
13.	<i>Philonthus decorus</i> (Gravenhorst)		+	
14.	<i>P. splendens</i> (Fabricius)		++	++
15.	<i>Quedius molochius</i> (Gravenhorst)	+		
16.	<i>Staphylinus caesareus</i> Cederhjelm	++	+	+++
17.	<i>Stenus nigritulus</i> Gyllenhal		+	
18.	<i>S. similis</i> (Herbst)	+	++	+
19.	<i>Tachyporus hypnorum</i> (Fabricius)	+	++	
20.	<i>Thiasophila angulata</i> (Erichson)		+	
21.	<i>Xantholinus linearis</i> (Olivier)		+	
22.	<i>X. rhenanus</i> Coiffait		+	
23.	<i>Zyras humeralis</i> (Gravenhorst)		+	
20. Family: <i>Tenebrionidae</i>				
1.	<i>Lagria hirta</i> (Linnaeus)	+++		
2.	<i>Phylan gibbus</i> (Fabricius)	+		
3.	<i>Tenebrio obscurus</i> Fabricius	+		
21. Family: <i>Trogidae</i>				
1.	<i>Trox sabulosus</i> (Linnaeus)	+		
2.	<i>T. scaber</i> (Linnaeus)	+	+	

Legend for table:

+++ - very numerous species (over 21 exx.),

++ - numerous species (11-20 exx.),

+ - single species (below 10 exx.).

The following families were represented by the highest number of species: *Staphylinidae* (23 species), *Chrysomelidae* (14), *Coccinellidae* (12), *Curculionidae* (11), *Elateridae* (10) and *Scarabaeidae* (9).

The following species were captured in large numbers (more than 20 specimens) on the beach and dunes: near Świnoujście - *Leptinotarsa decemlineata* (Say), *Hylobius abietis* (Linnaeus), *Philopodon plagiatus* (Schaller), *Agrypnus murinus* (Linnaeus), *Geotrupes stercorosus*

(Hartmann in Scriba), *Aleochara bipustulata* (Linnaeus), *Anomala dubia* (Scopoli), *Lagria hirta* (Linnaeus); near Międzyzdroje - *Hylobius abietis* (Linnaeus), *Agrypnus murinus* (Linnaeus), *Geotrupes stercorosus* (Hartmann in Scriba), *G. vernalis* (Linnaeus), *Onthophagus taurus* (Schreber), *Nicrophorus investigator* Zetterstedt, *N. vespilloides* Herbst, *Phosphuga atrata* (Linnaeus), *Ocypus ophthalmicus* (Scopoli); and near Wiselka - *Agelastica alni* (Linnaeus), *Agrypnus murinus* (Linnaeus),

*Geotrupes stercorarius* (Linnaeus), *G. vernalis* (Linnaeus), *Staphylinus caesareus* Cederhjelm.

On the fragment of the beach and dunes in Świnoujście 80 species were captured, mainly of the families *Chrysomelidae* and *Coccinellidae* (12 species each). In Międzyzdroje 50 species were captured, of which as many as 19 species belonged to *Staphylinidae*; 27 species were collected in Wiselka with *Staphylinidae* as the most frequently occurring family (6 species).

Sea shore beaches and dunes are typical habitats for species preferring open and sunlit areas. In all, we have captured 36 such species, which were most common near Świnoujście (27 species).

We have found a number of xero-, thermo-, halo-, and psammophilous species, characteristic for sandy beaches and dunes, i.e.: *Omonadus floralis* (Linnaeus), *Coccinella undecimpunctata* Linnaeus, *Tytthaspis sedecimpunctata* (Linnaeus), *Coniocleonus hollbergi* (Fahraeus in Schoenherr), *Otiorhynchus atroapterus* (De Geer), *Philopodon plagiatus* Schaller, *Sitona grisea* (Fabricius), *Negastrius pulchellus* (Linnaeus), *Hypocaccus metallicus* (Herbst), *Aegialia arenaria* (Fabricius), *Hoplia parvula* Krynicki, *Onthophagus taurus* (Schreber), *Oxythyrea funesta* (Poda), *Xantholinus rhenanus* Coiffait, *Phylan gibbus* (Fabricius).

Rare for the Polish Baltic Coast were the following species: *Coccinella quinquepunctata* Linnaeus, *Halyzia sedecimguttata* (Linnaeus), *Hippodamia septemmaculata* (De Geer), *Otiorhynchus atroapterus* (De Geer), *Crepidophorus mutilatus* (Rosenhauer), *Hypnoidus riparius* (Fabricius), *Leptusa pulchella* (Mannerheim), *Xantholinus rhenanus* Coiffait, *Trox scaber* (Linnaeus).

Four species of rare beetles that are known to exist in few sites in Poland were found: *Hypnoidus riparius* (Fabricius), *Glischrochilus quadriguttatus* (Fabricius), *Tenebrio obscurus* Fabricius.

We have also found an *Elateridae* species, *Crepidophorus mutilatus* (Rosenhauer), that has not been evidenced so far to inhabit the western part of the Polish Baltic Coast.

Rare species enlisted on the „Red list of threatened animals in Poland” (Pawłowski et al. 2002) comprised the following: *Typhaeus typhoeus* (Linnaeus) referred to as nearly threatened (NT), *Hoplia parvula* Krynicki, a species of least concern (LC) and *Otiorhynchus atroapterus* (De Geer), an endangered species (EN).

## DISCUSSION

The studies have demonstrated the presence of 118 beetle species (not including the *Carabidae* family) and most presumably, the list is not complete. However, due to the specific habitat values of this part of the coastline, as well as due to lacking data on the *Coleoptera* fauna, it seems important to present the list of beetle species that will complete the faunistic knowledge on the western part of Poland's Baltic Coast. The observation of 36 beetle species inhabiting sandy beaches and dunes renders this area as an interesting ground for coleopterological studies.

The authors of existing reports on the studies in this area (beach and dunes), published mainly during the 19th century, did not find such a great number of beetles. For comparison, those authors found as follows (not including the *Carabidae* family): Letzner (1847) - 25 species of beetles, Habelmann (1854, 1861) - 32 species, Pfeil (1854) - 20 species, and Jäger (1892) - 29 species. The highest number, 114 species (without *Carabidae*) were found by Pawłowski (1966) in the coastal habitat near Pobierowo, located to the east from our area of study.

Among the dominant beetle families occurring on the coastal beach and dunes, the highest numbers of species were represented by the families *Chrysomelidae* and *Coccinellidae*, which was also reported by other authors, including Pawłowski (1966), Burzyński (1973) and Cykowski

(1979a, 1979b), who studied the central and eastern parts of the Polish Baltic Coast.

The dominating *Staphylinidae* family was mainly represented by widespread and common species, which inhabit wood and wood hollows, and which have probably arrived at the study sites from the pine forest adjacent to the dunes. This effect was most often observable on the dunes of Międzyzdroje. In our studies of the dunes and the beach, we have also found species typical for sunny areas (according to Poland's Fauna Catalogues): *Ocypus ophthalmicus* (Scopoli), *O. similis semialatus* Müller, *Staphylinus caesareus* Cederhjelm, *Xantholinus rhenanus* Coiffait.

A large number of rove beetles that inhabit *Empetro-nigri Pinetum*, as many as 133 species, were also found by Smoleński (1999), who studied the Słowiński National Park.

Within the superfamily *Scarabaeoidea* 13 species were captured, most abundantly represented by forest species of the genus *Geotrupes*. Aleksandrowicz et al. (2004), who studied the scarab fauna of the dunes in the Słowiński National Park, found as many as 35 species, some of which were also found in our studies: *Aegialia arenaria* (Fabricius), *Anomala dubia* (Scopoli), *Aphodius fimetarius* (Linnaeus), *A. rufipes* (Linnaeus), *Geotrupes stercorarius* (Linnaeus), *G. stercorosus* (Hartmann in Scriba), *G. vernalis* (Linnaeus), *Hoplia parvula* Krynicki, *Serica brunnea* (Linnaeus), *Typhaeus typhoeus* (Linnaeus).

We have found 12 *Coccinellidae* beetles species on the seaside beaches and dunes. Jędrzejczak (2002) found 11 species of this family on the beach in Hel, Cykowski (1979b) found 6 species in the sea shore zone of the bottom of the gray dunes of the Słowiński National Park, whereas Pawłowski (1966) noted as many as 22 species of this family on the beach near Pobierowo.

The dune habitat, due to its strong sun exposure, is a perfect place to find interesting species

of the family *Curculionidae*, which are typical for the sea shore areas, unprecedented in other parts of Poland. These include: *Philopodon plagiatus* (Schaller), *Sitona grisea* (Fabricius), and *Otiorhynchus atroapterus* (De Geer), a species commonly found in our studies, also reported from the Słowiński National Park by Marczak and Komosiński (2006) and by Wiater (2006).

The abundance of the *Curculionidae* and *Coccinellidae* species was due to their adaptation to the extremes of the environment of the sandy dunes and beaches; hence the high abundance of *Philopodon plagiatus* (Schaller), which develops in dune biotopes.

A number of species penetrated into the beach and dunes from the adjacent forest areas, e.g. *Staphylinidae* and *Silphidae* species.

Interesting and rare species, listed on the Red List of Endangered Species in Poland (Pawłowski et al. 2002) include those found in our studies: *Hoplia parvula* Krynicki, known from few places in Poland and reported by Cykowski (1979a, 1979b), Bunalski (1995), and Aleksandrowicz et al. (2004), *Otiorhynchus atroapterus* (De Geer), reported also by Kania and Zawadzki (1994), as well as *Typhaeus typhoeus* (Linnaeus), also reported from the Słowiński National Park (Aleksandrowicz et al. 2004).

The adverse environment of the beach and dune habitats, i.e. big fluctuations of temperature and insolation, cause a wide ecological plasticity of the beetles occurring in these habitats. Therefore, we observed here also species that are typical for open areas as well as eurytopic species migrating from forest biotopes.

## CONCLUSIONS

The list of beetle species captured on the beach and dunes of the Polish Baltic Coast presented here, surely does not represent their complete index. Earlier reports by various authors, mainly from the 1970's, listed the species occurring in



the central part of the Coast, i.e. from the Słowiński National Park, from the vicinity of Pobierowo or Łeba, while never moving further westward, towards the western part of Poland's Baltic Coast. Therefore, due to the long term of the observations, frequency of penetration, and quite large area of the study, it seems necessary to report the presently observed species composition of the coleopteran fauna.

This paper may contribute to creating a new, more complete list of beetle species in these interesting areas of the western part of the Polish Baltic Coast, exceptionally specific in terms of the habitat and the climate; it will also create a basis for future references to the presented list of the observed beetles species.

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