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**Original research paper**Received: 7/04/2021  
Accepted: 26/05/2021**NEW INFORMATION ON THE WOODLOUSE FAUNA  
(MALACOSTRACA, ISOPODA, ONISCIDEA) OF NATURE  
RESERVES IN POLAND**Artsiom M. Ostrovsky<sup>1</sup>, Oleg R. Aleksandrowicz<sup>2</sup><sup>1</sup> *Gomel State Medical University, Belarus*  
*e-mail: arti301989@mail.ru*<sup>2</sup> *Institute of Biology and Earth Sciences, Pomeranian University in Słupsk, Poland*  
*e-mail: oleg.aleksandrowicz@apsl.edu.pl***Abstract**

This is the first study on the woodlouse fauna of from 5 nature reserves in the Mazowian Lowland (Bukowiec Jabłonowski, Mosty Kalińskie, Łosiowe Błota, Jezioro Kiełpińskie, Klimonty) and from 2 nature reserves in the Pomeranian Lake District (Ustronie, Dolina Huczka) are presented. A total of 8 species of woodlice were found. The number of collected species ranged from 1 (Dolina Chuczka, Mosty Kalińskie, Klimonty) to 5 (Łosiowe Błota). The most common species in the all studied reserves was *Trachelipus rathkii*.

**Key words:** woodlouse fauna, nature reserves, Poland, Isopoda, species

**INTRODUCTION**

Woodlice are key organisms for nutrient cycling in many terrestrial ecosystems; however, knowledge on this invertebrate group is limited as for other soil fauna taxa. By 2004, the world's woodlouse fauna (Isopoda, Oniscidea) included 3637 valid species (Schmalfuss 2003). The fauna of terrestrial isopods in Europe has been active studied since the beginning of the XX century and is now well studied (Jeffery et al. 2010). In Poland 37 isopod species inhabiting terrestrial habitats have been recorded so far, including 12 in Mazovia and 16 in Pomerania (Jędrzyzkowski 1979, 1981, Razowski 1997, Piksa and Farkas 2007, Astrouski and Aleksandrowicz 2018). In the studies carried out so far on terrestrial isopods of Poland, mostly natural and urban environments were examined. The woodlouse fauna of nature reserves are poorly known in Poland. There is information about woodlice from the Kulin reserve (Jędrzyzkowski and Staręga 1980) and Las Bielański reserve (Jędrzyzkowski 1985) only. Thus,

the aim of the study was a preliminary inventory of the fauna of invertebrates, including woodlice, of some reserves in Mazovia and Pomerania.

## MATERIAL AND METHODS

The woodlice were collected by hand in plant debris, rotten wood, bedding, stubbing, etc. They were preserved in 96% ethanol. After identification they were deposited in the collections of the Zoological Department of Pomeranian University in Słupsk. Species identifications are based on Hopkin (1991). As a supporting sources, Urbański (1952) and Malinkova (2009) were also used.

The study was carried out between 07–25.06.2019 in seven nature reserves of Poland (Tab. 1). Five of them locate in Mazovian Lowland (Bukowiec Jabłonowski, Mosty Kalińskie, Łosiowe Błota, Jezioro Kiełpińskie, Klimonty) and two locates in Pomeranian Lake District (Ustronie, Dolina Huczka) (Centralny Rejestr Form Ochrony Przyrody).

1. The Bukowiec Jabłonowski is a forest nature reserve (established in 1990, area of 37.74 ha). It is located in the Mazowieckie Voivodeship. It adjoins the south-eastern border of the city of Legionowo, near Warsaw. Object of protection – forest stand of different age and species with stands of European beech and black birch. The age of individual oaks and beeches reaches 160 years.

2. The Mosty Kalińskie is a landscape phytocenotic natural reserve (established in 2015, area of 201.44 ha). It is located in the Okuniewsko-Rembertowskie Forests. Along the Długa River, valuable riverside communities have survived, including in particular riparian forests, rushes and herbal communities. The purpose of protection is to preserve a fragment of the Długa River valley with a mosaic of forest and open habitats.

3. The Łosiowe Błota is a peat bog phytocenotic natural reserve (established in 1980, area of 31.64 ha). It is located in the area of Las Bemowski, near Warsaw. The purpose of creation was to preserve in their natural communities of fens locations of rare and protected plant species.

4. The Ustronie is a forest natural reserve (established in 1958, area of 10.94 ha). It is located about 6 km from Czersk. The purpose of its creation was to preserve a protected fragment of stand of various ages and species with impressive specimens of very old pines, oaks and beeches. Plant communities occurring in the reserve are: not fully natural subcontinental oak-hornbeam forest (*Tilio-Carpinetum*), continental mixed forest (*Quercus roboris-Pinetum*), marsh birch (*Vaccinio uliginosi-Betuletum pubescentis*) and currant alder (*Ribonigri-Alnetum*).

5. The Kiełpińskie Lake water nature reserve is the oxbow lake of the Vistula (established in 1988, area of 20.54 ha). It is located in the Łomianki, near Warsaw. The reserve includes the oxbow lake, as well as meadows, pastures and arable land of the 50 m wide coastal belt. The aim of protection is to preserve the Vistula oxbow lake with its characteristic fauna and flora.

6. The Dolina Huczka is a forest reserve (established in 2007, area of 11.95 ha). It was created to preserve valuable forest and spring biocenoses in “Słupia Valley”

Landscape Park. There are the acidic and fertile beech forests, oak-hornbeam forests and riparian forests. An important element of forests are tree stand fragments of natural origin, often exceeding the age of 150 years.

7. The Klimonty is a forest reserve (established in 2015, area of 109,20 ha). It is located near Klimonty (Mazowsze). It was created to preserve the wetland ecosystems as well as the complex of alder and riparian forests that constitute refuges for protected and endangered species of plants and animals.

Table 1

Nature reserves in Poland where samples were taken

No.	Date	Nature reserve	Location map
1	08.06.2019	Bukowiec Jabłonowski 52.385 N, 20.938889 E	
2	07.06.2019 22.06.2019	Ustronie 53.756667 N, 18.004167 E	
3	10.06.2019 25.06.2019	Mosty Kalińskie 52.295833 N, 21.266389 E	
4	08.06.2019 23.06.2019	Łosiowe Błota 52.256944 N, 20.861111 E	
5	21.06.2019	Dolina Huczka 54.281944 N, 17.315556 E	
6	08.06.2019 23.06.2019	Jezioro Kiełpińskie 52.361944 N, 20.873056 E	
7	10.06.2019	Klimonty 52.168333 N, 22.54 E	

## RESULTS AND DISCUSSION

In the list of species taxonomy was followed during Schmalfuss (2003).

Order ISOPODA Latreille, 1817

Suborder ONISCIDEA Latreille, 1802

Infraorder LIGIAMORPHA Vandel, 1943

### Family Armadillidiidae Brandt, 1833

*Armadillidium pulchellum* (Zenker, 1798) *A. pulchellum* is a Central European species with a relatively far north-eastern distribution. In Poland, this species is associated with deciduous and mixed forests in the north-eastern part of the country (Domiński 1970).

Material examined: Ustronie nature reserve, 1♀, 07.06.2019.

**Family Philosciidae Kinahan, 1857***Philoscia muscorum* (Scopoli, 1763)

Material examined: Łosiowe Błota nature reserve, 15♀, 08.06.2019.

**Family Porcellionidae Verhoeff, 1918***Porcellio scaber* Latreille, 1804. The natural distribution positions of this species are associated with the beech forests of Pomerania. In the rest of the country, it is synanthropic in homes, greenhouses, parks and gardens (Jędrzycki 1979).

Material examined: Jezioro Kiempinskie nature reserve, 1♀, 23.06.2019.

**Family Oniscidae Latreille, 1802***Oniscus asellus* Linnaeus, 1758. In Poland, it inhabits a relatively narrow coastal area. In the rest of the area, it is only synanthropic (Jędrzycki 1979).

Material examined: Bukowiec Jabłonowski nature reserve, 6♀, 3♂, 08.06.2019.

Łosiowe Błota nature reserve, 2♀, 08.06.2019; 1♀, 23.06.2019.

Dolina Chuczka nature reserve, 1♀, 21.06.2019.

**Family Trachelipodidae Strouhal, 1953***Trachelipus rathkii* (Brandt, 1833)

Material examined: Bukowiec Jabłonowski nature reserve, 6♀, 08.06.2019.

Łosiowe Błota nature reserve, 33♀, 08.06.2019; 6♀, 4♂, 23.06.2019.

Mosty Kalińskie nature reserve, 1♀, 10.06.2019; 7♀, 25.06.2019.

Jezioro Kiempinskie nature reserve, 2♂, 08.06.2019; 2♂, 23.06.2019.

Klimonty nature reserve, 1♀, 10.06.2019.

*Porcellium conspersum* (C. Koch, 1841). The Central European species occurs in deciduous and mixed forests all over Poland (Dominiak 1970).

Material examined: Łosiowe Błota nature reserve, 14♀, 2♂, 23.06.2019.

**Family Trichoniscidae Sars, 1899***Hyloniscus riparius* (C. Koch, 1838). Considered Jędrzycki (1979) as a synanthropic species.

Material examined: Łosiowe Błota nature reserve, 11♀, 2♂, 08.06.2019; 3♀, 1♂, 23.06.2019.

*Trichoniscus pusillus* Brandt, 1833. Considered Jędrzycki (1979) as a synanthropic species.

Material examined: Ustronie nature reserve, 4♀, 22.06.2019.

Jezioro Kiempinskie nature reserve, 1♀, 08.06.2019.

Until now, only two nature reserves have information on the woodlice fauna. These are the suburban reserves of Kulin (Jędrzycki and Staręga 1980) in the Pomeranian Lake district and Las Bielański (Jędrzycki 1985) in the Masovian Lowland. During the research carried out in the years 1974-1977 in the xerothermic reserve Kulin (in vicinity of Włocławek, Kujawsko-Pomorskie Voivodeship), the presence of 8 species were established, and 2 of them were synanthropic (Jędrzycki

and Staręga 1980). The most numerous were *Ligidium hypnorum* (Cuvier, 1792), *Trichoniscus pusillus* Brandt, 1833, *Trachelipus rathkii* and *Armadillidium opacum* (C. Koch, 1844).

As a result of 6 years of research, Jędrzyckowski (1985) found 10 species (of which 4 were synanthropic) in the Las Bielański reserve. The most numerous were *Ligidium hypnorum*, *Armadillidium opacum* and *Trachelipus rathkii*.

In our investigations total of 8 common woodlouse species from 6 families were found. The number of collected species varied from 1 (Dolina Chuczka, Mosty Kalińskie, Klimonty) to 5 (Łosiowe Błota).

The most common species in the studied reserves was *Trachelipus rathkii*. It was found in 5 reserves: Łosiowe Błota, Bukowiec Jabłonowski, Mosty Kalińskie, Jezioro Kiempinskie, Klimonty. It is a cosmopolitan eurytopic species common throughout the territory (Dominiak 1970).

*Oniscus asellus* was found in 3 reserves: Łosiowe Błota, Dolina Chuczka, and Bukowiec Jabłonowski. According to Jędrzyckowski (1979) in Poland it is a synanthropic species. Inhabits city parks and green areas there. Two reserves are located in the immediate vicinity of Warsaw: Łosiowe Błota and Bukowiec Jabłonowski. Probably *Oniscus asellus* acts as a synanthrope there. Dolina Chuczka is within the range of natural distribution of this species.

*Trichoniscus pusillus* has been recorded in two reserves, Jezioro Kiempinskie and Ustronie. In Poland, it is common throughout the country, it occurs in moist places in the soil among the roots of herbaceous vegetation and in the litter (Dominiak 1970). Considered Jędrzyckowski (1979) as a synanthropic species.

Most of the species, 5 are found in the Łosiowe Błota reserve. It is a peat bog phytocenotic natural reserve near Warsaw. The conditions of bog biocenoses are optimal for woodlouse (Dominiak 1970). The proximity of the city park Las Bemowski led to the appearance of the synanthropic species *Oniscus asellus*.

*Philoscia muscorum* has not been known to date from protected areas. According to Jędrzyckowski (1979) *Philoscia muscorum* occurs on the Baltic coast in its natural habitats and as a synanthropic species, it was known only from Gdańsk-Oliwa and Poznań. *Philoscia muscorum*, numerous in our collections in the suburban reserve Łosiowe Błota, was not found by Jędrzyckowski (1981) in Warsaw and on Mazovia in 1979-1985. The occurrence in the Łosiowe Błota reserve may indicate an extension of its range deep into the country.

The species *Ligidium hypnorum* and *Armadillidium opacum* that were most numerous in the two reserves (Jędrzyckowski and Staręga 1980, Jędrzyckowski 1985) in 1974-1985 were not found by us in any of the reserves.

Our small materials allow us to expand our knowledge of the woodlice fauna of the Polish nature reserves.

## CONCLUSIONS

Thus, this is the first study on the woodlouse fauna of the five nature reserves in Mazovian Lowland and the two in Pomeranian Lake District. In this study faunistic data concerning 7 species of terrestrial isopods in Mazovian Lowland and 3 species in Pomeranian Lake District are presented.

Our results are preliminary. Although woodlice are very common and reach high numbers, they are not often the subject of research. This is probably due to the difficulties of species identification. Undoubtedly, further special studies will expand the faunistic lists of woodlice in protected areas.

This research was conducted with the financial support A.M. Ostrovsky by Polish Committee of UNESCO in 2019.

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NOWA INFORMACJA O STONOGACH (MALACOSTRACA, ISOPODA,  
ONISCIDEA) W REZERWACH PRZYRODY W POLSCE

**Streszczenie**

W krótkiej notatce przedstawiono nowe dane dotyczące rozmieszczenia w Polsce 8 gatunków równonogów lądowych: *Porcellio scaber* Latreille, 1804 prosionek szorstki, *Trichoniscus pusillus* Brandt, 1833 stonożek drobny, *Philoscia muscorum* (Scopoli, 1763) podliśc zwiny, *Porcellium conspersum* (C.L. Koch, 1841) prosionek upstrzony, *Hyloniscus riparius* (C.L. Koch, 1838), *Trachelipus rathkii* (Brandt, 1833) prosionek pospolity, *Oniscus asellus* Linnaeus, 1758 stonoga murowa, *Armadillidium pulchellum* (Zenker, 1798) kulanka nadobna. Jest to pierwsze badanie fauny laskowatych równonogów lądowych z 5 rezerwatów przyrody na Nizinie Mazowieckiej (Bukowiec Jabłonowski, Mosty Kalińskie, Łosiowe Błota, Jezioro Kiełpińskie, Klimonty) oraz z 2 rezerwatów przyrody na Pojezierzu Pomorskim (Ustronie, Dolina Huczka). Liczba zebranych gatunków wahała się od 1 (Dolina Chuczka, Mosty Kalińskie, Klimonty) do 5 (Łosiowe Błota). Najczęstszym gatunkiem we wszystkich badanych rezerwach był eurytopowy gatunek pospolity (*Trachelipus rathkii*).

**Słowa kluczowe:** fauna stonóg, rezerваты przyrody, Polska, Isopoda, lista gatunków