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MITES (*ACARI*, *MESOSTIGMATA*) FROM SELECTED MICROHABITATS OF THE UJŚCIE WARTY NATIONAL PARK

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Abstract. The present work discusses the results of the faunistic studies over mites of *Mesostigmata* order made in the territory of Ujście Warty National Park (the mouth of the Warta River). The greatest number of specimens was represented by the family of *Ascidae* (107 specimens), *Parasitidae* (98) and *Trematuridae* (58). The most plentiful species that occurred in a collected material were *T. ovalis* (52 specimens), *H. calcaratus* (35), *L. ometes* (34) while in the greatest number of samples *H. calcaratus* (9 samples), *T. ovalis* (8) and *T. pyri* (8) were recorded.

Key words: mites, *Acari*, *Mesostigmata*, Ujście Warty National Park

INTRODUCTION

Created in 2001 the Ujście Warty National Park is one of the youngest national parks in Poland. It preserves biotops formed by periodical water floods especially by the Odra River and in a smaller scale by the Warta River. Thanks to that it creates a perfect breeding area for water birds but it also comprises a range of unique habitats for invertebrates' existence. The presence and number of mesostigmatic mites, depends possibly not only on a character of microhabitat, but also on periodic fluctuation of water level. Seasonal floods may be the reason of island/enclave presence of some mite species.

Acarologic studies made on this territory related mostly to the southern part comprising the area of the former Słońsk reservoir. Examination of *Mesostigmata* order was made by Madej [2000] who recorded 99 mite species.

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MATERIAL AND METHODS

The character of this work is faunistic and its main aim is to present the largest spectrum of mite species occurring in the territory on the Ujście Warty National Park, as well as an analysis of dependence between the species composition and the chosen microhabitats.

Table 1. List of collected samples
Tabela 1. Wykaz zebranych prób

Microhabitat – Mikrośrodowisko	Number of samples – Numer próby
Willow rot – Mursz z wierzby	1, 13, 43
Litter – Ściółka	2, 4, , 6, 8, 9, 11, 12, 14, 16, 18, 19, 25, 34, 36
Sawdust and willow bark – Trocinki i kora wierzby	3
Moss – Mech z pnia	5, 17, 42
Rot – Mursz z olszy czarnej	7, 35
Sediment on wood made by a river Osady na wierzbie naniesione przez rzekę	10, 15, 21
Sod – Darń z łąki	20, 38, 41
Nest stuffing of *Chlidonias niger* Wyściółka z gniazda *Chlidonias niger*	22
Stuffing from nest box of *Tadorna tadorna* Wyściółka ze skrzynki lęgowej *Tadorna tadorna*	23
Stuffing from nest box of *Anas platyrhynchos* Wyściółka ze skrzynki lęgowej *Anas platyrhynchos*	24, 26
Stuffing from nest of *Anser anser* Wyściółka z gniazda *Anser anser*	27, 28
Stuffing from nest of *Larus ridibundus* Wyściółka z gniazda *Larus ridibundus*	29, 30, 31
Stuffing from nest of *Cygnus olor* Wyściółka z gniazda *Cygnus olor*	32
Soil from sand-dune – Gleba pobrana z wydmy	33
Remainder of nest – Resztki gniazd	37
Feather and eggshells of *Anser anser* Pióra i skorupki jaj *Anser anser*	39
Stuffing from nest of *Vanellus vanellus* Wyściółka z gniazda *Vanellus vanellus*	40

During the ground works performed on 1-2 July 2002, 43 samples (Table 1) were collected. The samples were collected from various, randomly chosen microhabitats, as for example litter, rot wood or nest stuffing. The collected material was roused in Tullgren funnels and then stored in 90% alcohol. The next stage of the examination was a selection of *Mesostigmata* order mites and making moist specimen in lactofenol. The specimens prepared in such a way enabled indication of mites. The individuals difficult to identify, as well as those seldom occurring in our country, were preserved as persistent preparations in PVA. A list of species was made in the systematic order compliant

to the register of animals in Poland [Błaszak and Madej 1997, Wiśniewski 1997]. According to the frequency of the listed species in particular samples, constancy of occurrence and domination were determined and a preliminary analysis of selectiveness was presented.

RESULTS

The occurrence of 74 mite species of *Mesostigmata* order was recorded as the result of studies at the Ujście Warty National Park. They were classified to 3 subgenera, 19 families and 34 genera (Table 2). According to the accessible literature 10 were marked only to genus and they were treated as separate species during analysis.

The greatest number of species was represented by the family of *Ascidae* (107 specimens) then *Parasitidae* (98) and *Trematuridae* (58). The most plentiful species that occurred in the collected material were *T. ovalis* (52 specimens), *H. calcaratus* (35), *L. ometes* (34) while in the greatest number of samples *H. calcaratus* (9 samples), *T. ovalis* (8) and *T. pyri* (8) were recorded.

Table 2. List of mesostigmatic mites (F – female, M – male, D – deutonymph, P – protonymph, L – larva)
Tabela 2. Wykaz gatunków w kolejności systematycznej (F – samica, M samiec, D – deutonifa, L – larwa)

Suborder, family, species Rodzina, gatunek	Number of samples (numbers of individuals and sex or developmental stages) Numer próby (liczba osobników, płeć, stadium rozwojowe)
1	2
ANTENNOPHORINA	
CELAENOPSIDAE	
Celaenopsis badius C.L. Koch, 1839	9(2F), 13(1F, 2M, 2D, 1P)
GAMASINA	
ZERCONIDAE	
Prozercon fimbriatus C.L. Koch, 1839	11(1F)
Prozercon traegardhi (Halbert, 1923)	18(1F)
PARASITIDAE	
Cornigamasus lunaris (Berlese, 1882)	16(1D), 32(1D)
Gamasodes bispinosus (Halbert, 1915)	32(3D), 36(1D), 37(2M, 4D)
Gamasodes sp.	21(1F, 2M)
Parasitus fimetorum (Berlese, 1904)	20(2D), 40(1D)
Parasitus insignis (Holzman, 1969)	20(1D)
Vulgarogamasus kraepelini (Berlese, 1904)	6(1M), 8(1F), 9(1M)
Holoparasitus calcaratus (C.L. Koch, 1839)	1(2F, 1M), 6(2F), 7(1F), 9(2F, 1D), 12(1M), 14(1F), 16(1F, 2M), 17(8F, 4M), 18(8F, 1M)
Paragamasus (*Anidogamasus*) *runcatellus* (Berlese, 1903)	7(1F, 2M), 24(1M)
Paragamasus (*Anidogamasus*) *runciger* (Berlese, 1903)	1(1M)

1	2
Paragamasus sp. 1	17(9F, 7M)
Paragamasus sp. 2	18(9F, 3M)
Pergamasus (*Pergamasus*) *brevicornis* Berlese, 1903	12(1F, 1M), 17(1F)
Pergamasus (*Pergamasus*) *mediocris* Berlese, 1904	18(3F)
Pergamasus (*Thenargamasus*) *quisquiliarum* (Canestrini, 1882)	12(1F, 1M)
MACROCHELIDAE	
Geholaspis (*Geholaspis*) *longispinosus* (Kramer, 1876)	6(1F), 8(1F)
Holostaspella subornata Bregetova et Koroleva, 1960	21(1F)
Holostaspella sp.	18(1F)
Macrocheles (*Macrocheles*) *carinatus* (C.L. Koch, 1839)	1(1F)
Macrocheles (*Macrocheles*) *montanus* (Willmann, 1951)	12(1F), 17(1F)
Macrocheles (*Macrocheles*) *tridentinus* (G. et R. Canestrini, 1882)	6(1F), 7(2F), 8(5F, 1M)
EVIPHIDIDAE	
Alliphis siculus (Oudemans, 1905)	16(3F), 18(1F), 41(1M)
Eviphis ostrinus (C.L. Koch, 1836)	6(2F), 8(3F, 1D), 12(9F, 1D), 14(1F)
ASCIDAE	
Antennoseius bacatus Athias-Henriot, 1961	16(1F, 2M)
Asca bicornis (Canestrini et Fanzago, 1887)	16(1F), 19(3F)
Gamasellodes bicolor (Berlese, 1918)	6(1F), 12(2F), 16(1F), 41(1F)
Lasioseius confusus Evans, 1958	5(2F), 10(7F, 5M), 25(3F, 1M), 37(1F), 38(1F), 40(10F, 1M), 42(2F, 1M)
Melichares jüradeus (Schweizer, 1949)	43(1F)
Neojordensia sinuata Athias-Henriot, 1973	20(4F), 25(1M), 31(1M), 36(1F, 1M), 37(2F, 1M), 38(2M), 42(1F, 1M)
Proctolaelaps pygmaeus (Müller, 1860)	33(1F)
Arctoseius cetratus (Sellnick, 1940)	20(5F), 31(3F), 40(1F)
Arctoseius taeniolatus Athias-Henriot, 1961	16(2F) 18(6F, 1M)
Arctoseius sp.	16(1F)
Iphidozercon gibbus Berlese, 1903	37(1F)
Zerconopsis muestairi (Schweizer, 1949)	25(1F), 38(2F)
Zerconopsis sp.	38(4M)
Cheiroseius (*Cheiroseius*) *borealis* (Berlese, 1904)	38(2F)
Cheiroseius (*Posttrematus*) *curtipes* (Halbert, 1923)	38(2F)
Cheiroseius (*Posttrematus*) *longipes* (Willmann, 1951)	20(1F), 40(3F)
Cheiroseius (*Posttrematus*) *necorniger* (Oudemans, 1903)	5(1F), 22(1F), 38(3F), 41(2F), 42(1F)
Cheiroseius sp.	21(1F)
LAELAPIDAE	
Androlaelaps casalis (Berlese, 1887)	17(1F), 33(1F), 41(1F)
Hypoaspis (*Cosmolaelaps*) *vacua* (Michael, 1891)	16(2M)
Hypoaspis (*Geolaelaps*) *brevipilis* Berlese, 1904	1(1F, 1M), 6(3F), 16(2F)
Hypoaspis (*Geolaelaps*) *nolli* Karg, 1962	5(1F), 6(1F)
Hypoaspis (*Laelaspis*) *heselhausi* Oudemans, 1912	26(1F)

1	2
Ololaelaps placentula (Berlese, 1887)	12(1F)
VEIGAIAIIDAE	
Gamasolaelaps excisus (C.L. Koch, 1879)	21(1M)
Veigaia cervus (Kramer, 1876)	6(1F), 12(1F)
Veigaia nemorensis (C.L. Koch, 1839)	6(1F, 1D), 7(1F, 1D), 11(1D), 17(5F, 3D), 18(1F, 1D)
RHODACARIDAE	
Cyrtolaelaps mucronatus (G. et R. Canestrini, 1881)	1(3D)
Panteniphis mirandus Willmann, 1949	5(4D), 30(1D), 38(1D)
HALOLAELAPIDAE	
Leitneria pugio (Karg, 1961)	16(1F)
PACHYLAELAPIDAE	
Pachylaealaps furcifer Oudemans, 1903	8(1F)
DIGAMASELLIDAE	
Dendrolaelaps (*Dendrolaelaps*) *cornutus* (Kramer, 1886)	12(3F, 4M, 1D)
Dendrolaelaps (*Punctodendrolaelaps*) *arvicolus* (Leitner, 1949)	6(1F)
Dendrolaelaps (*Punctodendrolaelaps*) sp.	18(1F, 1M)
AMEROSEIIDAE	
Ameroseius corbiculus (Sowerby, 1806)	16(2F), 18(1M)
PHYTOSEIIDAE	
Amblyseius sp.	3(7F, 3M), 19(3F, 3M), 20(1F)
Typhlodromus pyri Scheuten, 1857	4(1F), 10(1F), 20(1F), 23(1F), 25(2F), 26(1F), 33(2F), 35(1F)
UROPODINA	
TRACHYTIDAE	
Trachytes aegrota (C.L. Koch, 1841)	6(1F, 1D), 12(4F, 7D, 1P), 19(1F)
POLYASPIDAE	
Polyaspis (*Dipolyaspis*) *criocephali* Wiśniewski, 1980	1(1D)
TREMATURIDAE	
Trichouropoda ovalis (C.L. Koch, 1839)	1(5F), 6(10M, 6D, 1L), 7(1F, 1M, 1D), 11(1D, 1P, 1L), 12(3F, 4M, 4D), 14(1F), 16(1M, 1D), 17(2F, 1M, 5D, 2P)
Trichouropoda rafalskii Wiśniewski et Hirschmann, 1984	17(1M), 26(1D)
Trichouropoda sp.	28(5D)
URODINYCHIDAE	
Dinychus arcuatus (Trägårdh, 1943)	41(1D)
Dinychus carinatus Berlese, 1903	8(1F, 1M)
Dinychus perforatus Kramer, 1886	17(1F)
Uroobovella pyriformis (Berlese, 1920)	1(7F, 1M, 2D)
UROPODIDAE	
Uropoda minima Kramer, 1882	12(1F)
Uropoda orbicularis (Müller, 1776)	12(1F)
Uropoda sp.	32(1D)

DISCUSSION AND CONCLUSIONS

Fourteen samples were gathered from litter, which makes 32.5% of all the collected samples, showing 44 mite species in this microhabitat. The greatest occurrence was noted by: *T. ovalis* (17.0%) being eudominant and *H. calcaratus* (9.5%), *E. ostrinus* (8.5%) and *T. aegrota* (7.5%) being dominants. The highest rate of constant occurrence was noted at *H. calcaratus* (42.8%), *T. ovalis* (35.7%) and *E. ostrinus* (28.6%), which were classified as accessorial species.

Thirteen samples were gathered from bird nests, what makes 30.2% of all collected samples, showing 16 mite species. As eudominants of this microhabitat recorded: *L. confusus* (25.0%) and *G. bispinosus* (18.7%), while *N. sinuata* (8.3%) and *A. cetratus* (8.3%) as dominants. Taking into account constancy of the occurrence, all the species were classified as accidents. These results are completely different from the previous ones in this microhabitat, where *Androlaelaps casalis*, as well as *Uroseius infirmus* [Gwiazdowicz 2003] were usually dominant.

Six samples were gathered from rot wood, what makes 13.9% of all samples, showing 15 mite species. As eudominants of this microhabitat recorded: *U. pyriformis* (18.2%), *Amblyseius* sp. (18.2%), *T. ovalis* (14.5%) and *C. badius* (10.9%) while *H. calcaratus* (7.3%) as dominant. Taking into account constancy of occurrence only *H. calcaratus* (33.3%) and *T. ovalis* (33.3%) were classified as accessorial species the rest as accidents.

Additionally six samples from moss and sod were collected what makes 13.9% of all samples, showing 27 mite species. *Paragamasus* sp. 1 (15.5%) and *H. calcaratus* (11.6%) classified as eudominants, while *N. sinuata* (7.8%), *Ch. necorniger* (6.8%) and *L. confusus* (5.8%) as dominants. Taking into account constancy of occurrence *Ch. necorniger* (66.7%), *L. confusus* (50.0%) and *N. sinuata* (50.0%) were classified as constants.

With regard to just few samples gathered from other microhabitats analysis of found mites was not proceeded.

Moreover, the similarity of clusters between groups of microhabitats was determined. The highest similarity of 41.9% was noted between nest stuffing and moss-sod, which may be connected with the fact that birds use them as a building material for stuffing nests. Similarity between moss and sod to litter was 36.6% while between rot wood and litter 27.1%. The lowest comparison was recorded between nest stuffing and litter (16.7%) and rot wood (12.9%).

74 mite species of *Mesostigmata* order were recorded in this work, including 48 species new for faun of the Ujście Warty National Park. Current mite list of this suborder recorded in the territory of the Ujście Warty National Park includes 147 species, thanks to that this park is one of the best investigated national parks in Poland. Taking into account a number of documented mite species Ujście Warty National Park is the forth one after Białowieża National Park (270 species), Pieniny National Park (269) and Wielkopolska National Park (266).

Species composition of *Mesostigmata* order found in Ujście Warty National Park is comparable to results obtained in the territory of the Narew National Park [Gwiazdowicz and Szadkowski 2000] and the Biebrza National Park. A distinct domination of mites of *Ascidae* family was observed; some species as for example *N. sinuata* were recorded only in these three parks. *Zerconopsis muestairi* was recorded in Poland only

at the Ujście Warty National Park. Therefore, it may be stated that acarofauna found in this park is specific and worth further investigating, including such microhabitats as nests, rotten wood and sod, which had been formerly examined only fragmentarily.

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ROZTOCZE (*ACARI*, *MESOSTIGMATA*) WYBRANYCH MIKROŚRODOWISK PARKU NARODOWEGO „UJŚCIE WARTY"

Streszczenie. Praca przedstawia wyniki badań faunistycznych nad roztoczami z rzędu *Mesostigmata* prowadzonymi na terenie Parku Narodowego „Ujście Warty". Najliczniej pod względem liczby osobników reprezentowane były rodziny *Ascidae* (107 osobników), *Parasitidae* (98) i *Trematuridae* (58). W zebranym materiale gatunkami najliczniej występującymi okazały się: *T. ovalis* (52 osobniki), *H. calcaratus* (35), *L. ometes* (34), z kolei w największej liczbie prób odnotowano *H. calcaratus* (9 prób), *T. ovalis* (8) i *T. pyri* (8).

Słowa kluczowe: roztocze, *Acari*, *Mesostigmata*, Park Narodowy „Ujście Warty"

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