Acarologia
Open Science in Acarology

Know your campus: salient research potential of prostigmatic soil mite fauna (Acariformes: Prostigmata, Endeostigmata) within university campus area

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Original research

ABSTRACT

The study provides the list of soil mites from suborder Prostigmata in selected habitats of Morasko Campus of Adam Mickiewicz University in Poznan. Representatives of 21 families belonging to 58 genera and 139 species were found in 20 collected samples. One family, 11 genera and 26 species are new to the fauna of Poland and two species new to the fauna of Europe.

Keywords checklist; new record; prostigmatic mites; urbicenosis; Poland

Introduction

Although the history of the study of prostigmatic and endeostigmatic mites extends over more than two hundred years (Krantz and Walter 2009), the knowledge about these arthropods is still poor. The number of known species represents only a small fraction of their real richness and even less is known about their ecology and behavior. Moreover, when comparing mites (excluding ticks) with spiders, the former seems to have a much higher diversity, than the latter, despite having similar number of described species. Furthermore, scientific literature devoted to all mites and available through the internet is much poorer, than that related to spiders (Walter and Proctor 2010). There are several reasons for this situation, e.g. mites, with special reference to Prostigmata, are numerous and highly diverse, and their identification is not easy. The literature is still scanty and spotty among the members of the suborder. The identification keys, or comprehensive revisions and monographs on many (if not most) groups of Prostigmata are still relatively scarce. Descriptions of many species are often curt and lacking vital diagnostic features, indicating a vast demand for redescriptions. Additionally, the number of competent specialists is limited and their regard in wide academic and scientific communities is meager (Walter and Proctor 2010).

Mites and particularly Prostigmata however, have great potential as model organisms in various research areas of modern biology. For instance, they can serve as models in variety of studies, including ecology (Walter and Proctor 2010) or experimental evolution (Belliure *et al.* 2010). Thus, the aim of this study was not only to contribute to the checklist of prostigmatic

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mites in Poland, but also to create a list of species accessible in our immediate vicinity, i.e. surroundings of the university facilities, and make them available for those interested in carrying out the research on these arachnids.

Material and methods

A total of 20 samples of soil litter and plant debris were collected from 10 localities representing 10 different habitats (see Table 1) in western part of Morasko Campus of Adam Mickiewicz University in Poznań (Figure 1). The first sampling was carried out in winter, whereas the second one in spring 2019.

The sampling area is located in lowland in central-western Poland, whose landforms originated during glacial (Pleistocene), and postglacial (Holocene) periods. Most of the Morasko Campus are actually covered by buildings. Except for secondary plant community with *Pinus sylvestris* and *Padus serotina* as well as an alder forest, there are mostly regularly mowed lawns with sparsely distributed trees (mainly *P. sylvestris* and *Betula pendula*) and separated small tree stands.

Mites were extracted from samples using Berlese-Tullgren funnels (photo-eclectors) for 7-10 days and stored in 75% ethanol. Specimens of the family Nanorchestidae were additionally placed in 10% KOH to dissolve crystals of uric acid accumulated in the body, and then rinsed with distilled water. After that, specimens were mounted in Hoyer's medium on microscopic slides and heated for several days at 55 °C. They were studied with phase-contrast (Olympus BX 41) and interference-contrast (Olympus BX 51) microscopes supplied with a digital photographic camera Olympus E-5, and also with a phase-contrast microscope Nikon Eclipse 80i, equipped with DIC and DS-Fi3 camera system. Mite species were identified using keys and other taxonomic references by following authors: Bizarro *et al.* (2020), Booth *et al.* (1985), Fan Q.-H. (2004), Gabryś (2016), Gilyarov *et al.* (1978), Haitlinger (1986, 2002), Jesionowska (2010), Kaliszewski (1987, 1993), Kaźmierski (1998), Khaustov (2014), Krantz and Walter (2009), Łaydanowicz and Mąkol (2010), Magowski (1997), Mąkol (2010), Mąkol and Wohltmann (2012), Michocka (1987), Rack (1981), Smiley (1992), Stålstedt *et al.* (2016), Strandtmann (1971), Thor and Willmann (1941), Uusitalo (2010), Wohltmann *et al.* (2007), and Zacharda (1980).

The species found are divided into three categories, namely: (a) fully identified species, (b) those resembling known species but its identity uncertain (hence marked "cf."), and (c) those

Table 1 Habitats with coordinates and date of sampling.

No. and name of habitat	Coordinate	Date of sampling (W*/S**)
1. Ash-alder riparian forest (*Fraxino-Alnetum*)	52°28'10"N 16°55'56"E	19 Feb. 2019/05 May 2019
2. Secondary community with *Pinus sylvestris* and *Padus serotina*	52°28'7"N 16°55'50"E	19 Feb. 2019/05 May 2019
3. Reed bed with *Phragmites australis*	52°27'42"N 16°56'22"E	19 Feb. 2019/05 May 2019
4. *Artemisio campestris-Oenotheretum rubricaulis*	52°28'4"N 16°54'59"E	19 Feb. 2019/05 May 2019
5. Higrophilic community with *Potentilla anserina*	52°28'11"N 16°55'12"E	19 Feb. 2019/05 May 2019
6. Birch treestand	52°28'5"N 16°55'12"E	19 Feb. 2019/05 May 2019
7. Aspen treestand	52°28'01"N 16°55'10"E	19 Feb. 2019/05 May 2019
8. Fresh meadow with often reaped *Arrhenatheretum elatioris*	52°27'58"N 16°55'21"E	19 Feb. 2019/05 May 2019
9. Psammophilic swarth (*Koelerio-Corynephoretea*)	52°27'59"N 16°55'34"E	19 Feb. 2019/05 May 2019
10. Ecotone between swarth and lane	52°27'59"N 16°55'3"E	27 Feb. 2019/05 May 2019

* winter
** spring

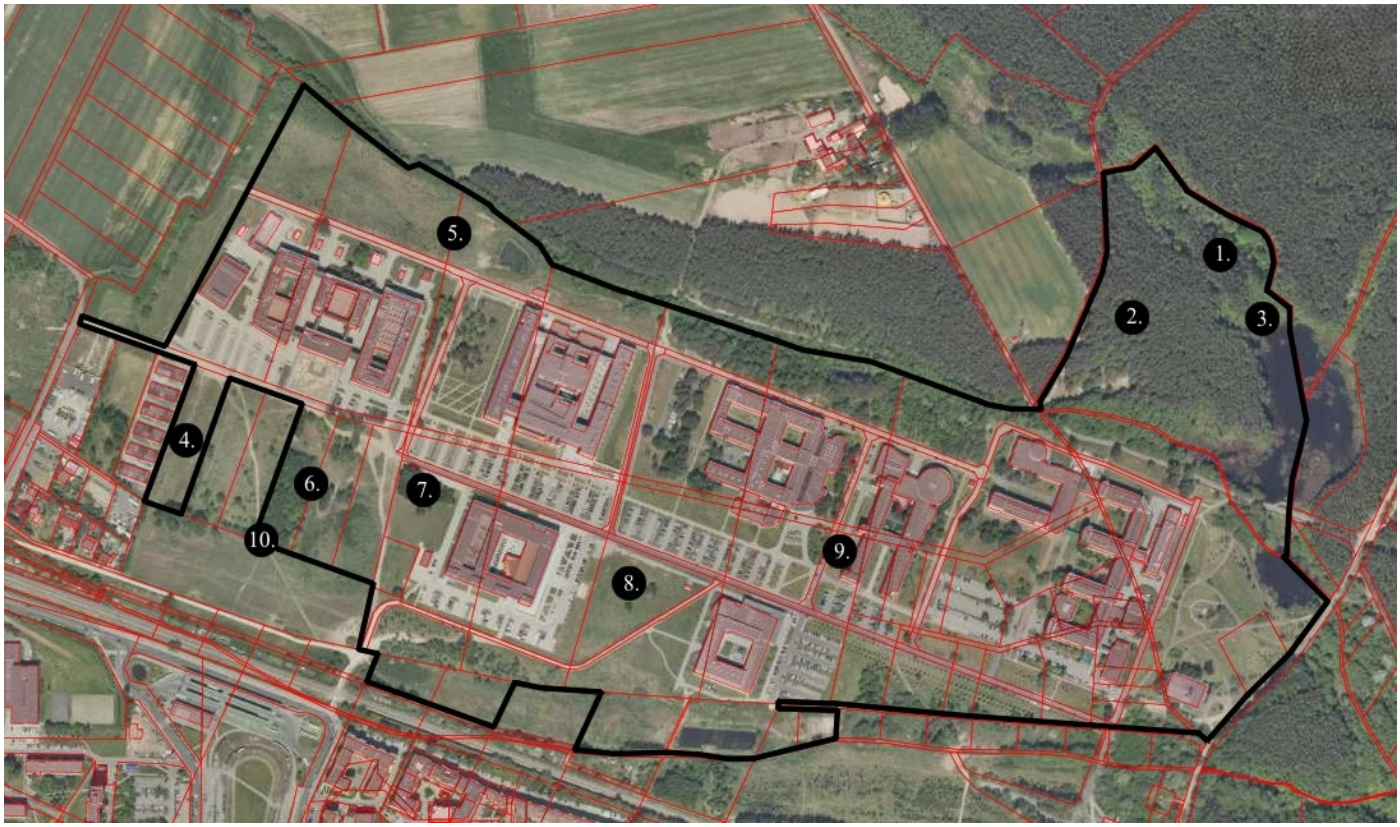

Figure 1 Study area with 10 sampling localities (nos. 1-10) and its border marked by black line.

whose identity could not be ascertained for technical reasons (bad position, missing diagnostic features) but not closely resembling known species (hence marked "sp. 1", "sp. 2", etc.). Species omitted from the count are individuals damaged beyond species recognition. Only fully named species are counted as new for Polish or European faunas. Genera *Echinoeupodes*, *Neoprotereunetes*, *Archidispus*, and *Pygmodispus* are also listed as new for respective faunas (for Poland or Europe) even though their representing species were not identified and therefore only indicated as "sp." (thus in abovementioned category c). In the list hereunder of recorded taxa the abbreviations "NP" and "NE" refer to taxa new to Polish and European faunas, respectively. Localities and seasons of sampling (W – winter, S – spring) following the number of the locality are marked according to the Table 1. The following symbols refer to the instars: female – ♀, male – ♂, tritonymph – tn, deutonymph – dn, protonymph – pn, larva – lv, unidentified nymph – n, unidentified instar – ?.

The collection of samples and specimens is deposited in the Department of Animal Taxonomy and Ecology, Adam Mickiewicz University in Poznań, except for Erythraeidae, which are deposited at the Department of Invertebrate Systematics and Ecology, Wrocław University of Environmental and Life Sciences.

Results

In the course of our study 868 individuals of 21 families belonging to 58 genera and 139 species were found. Selected representatives of the suborder Prostigmata are shown in Figure 2. The list of family level taxa is provided in systematic order following Krantz and Walter (2009); the list of genera and species within particular family – in alphabetical order.

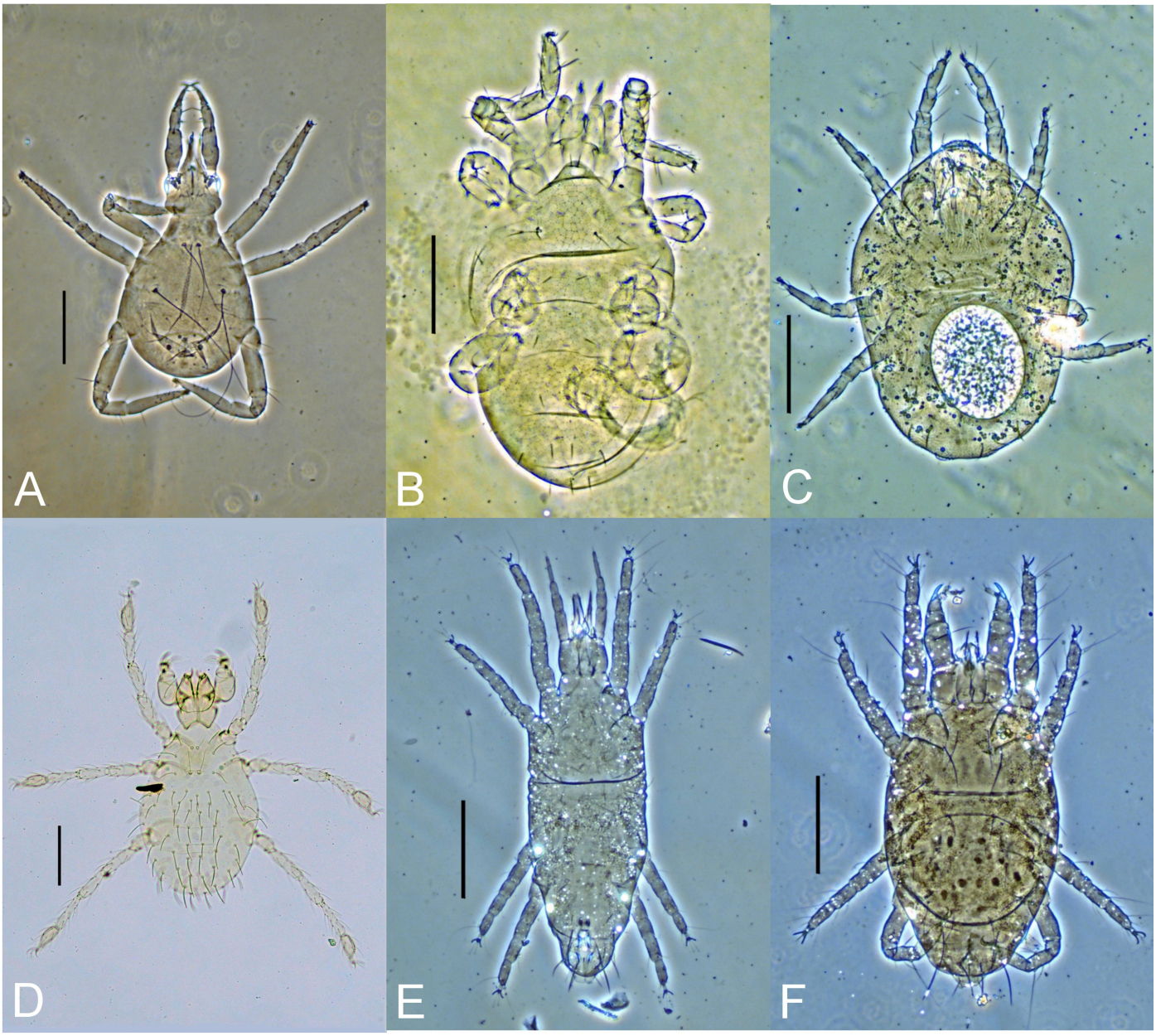

Figure 2 Representatives of Prostigmata found in Morasko Campus: A – Cunaxidae: *Armascirus bakeri* larva; B – Eupodidae: *Caleupodes reticulatus* adult female; C – Tydeidae: *Lorryia reticuloinsignia* adult female; D – Erythraeidae: *Abrolophus rudaensis* larva; E – Eupalopsellidae: *Eupalopsellus trudis* adult female; F – Stigmaeidae: *Agistemus gratus* adult female. Scale bars are 100 µm.

Superorder: Acariformes (=Actinotrichida)

- Order: Trombidiformes
- Suborder: Prostigmata (=Actinedida)
- Supercohort: Eupodides
  - Superfamily: Bdelloidea Dugès, 1834
  - Family: Bdellidae Dugès, 1834
  - Subfamily: Bdellinae Dugès, 1834

- Genus: *Bdella* Latreille, 1795
  - *Bdella dispar* C.L. Koch, 1839. Locality: 10W: 1 lv
  - *Bdella semiscutata* Thor, 1931. Locality: 7W: 5 ♀♀
- Genus: *Biscirus* Thor, 1913
  - *Biscirus silvaticus* (Kramer, 1881). Localities: 5S: 1 n 2 lv; 6S: 2 n; 7S: 5 n; 8S: 2 lv

– Subfamily: Cytinae Grandjean, 1938

- Genus: *Cyta* von Heyden, 1804
  - *Cyta latirostris* (Hermann, 1804) Localities: 3S: 3 ♀♀; 4W: 2 lv; 6W: 3 n, 6S: 3 ♀♀; 7S: 2 ♀♀ 1 lv; 10S: 3 n
  - *Cyta* sp.. Localities: 9W: 1 ♀

– Family: Cunaxidae Thor, 1902

– Subfamily: Bonziinae Den Heyer, 1978

- Genus: *Bonzia* Oudemans, 1927
  - *Bonzia halacaroides* Oudemans, 1927. Locality: 3W: 1 ♀

– Subfamily: Cunaxinae Thor, 1902

- Genus: *Armascirus* Den Heyer, 1978 NP
  - *Armascirus bakeri* Smiley, 1992 NP. Localities: 5S: 1 lv; 6S: 2 lv; 10W: 1 lv
- Genus: *Cunaxa* von Heyden, 1826
  - *Cunaxa setirostris* (Hermann, 1804). Localities: 1W: 1 lv; 3S: 2 n 1 lv; 4W: 1 ♀; 5W: 1n, S: 1 ♀; 6W: 4 ♀♀, 6S: 1n; 7S: 2 lv; 8W: 1 ♀
- Genus: *Dactyloscirus* Berlese, 1916
  - *Dactyloscirus inermis* (Trägårdh, 1905). Locality: 2S: 1 ♀ 1 n 4 lv

– Subfamily: Cunaxoidinae Den Heyer, 1978

- Genus: *Cunaxoides* Baker et Hoffmann, 1948
  - *Cunaxoides kielczewskii* Michocka, 1982. Localities: 4W: 1 lv; 5W: 1 dn 2 pn 2 lv, 5S: 1 ♀; 6S: 2 ♀♀; 8S: 2 ♀; 10S: 1 ♀

– Superfamily: Eupodoidea C.L. Koch, 1842

– Family: Cocceupodidae Jesionowska, 2010

- Genus: *Cocceupodes* Thor, 1934
  - *Cocceupodes mollicellus* (C.L. Koch, 1838). Localities: 1W: 7 ♀♀ 2 ♂♂, 1S: 1 ♀ 1 pn 1 lv; 2W: 1 pn, 2S: 1 ♂; 3W: 4 ♀♀ 2 dn 2 pn; 5W: 1 ♀
- Genus: *Filieupodes* Jesionowska, 2010
  - *Filieupodes filiformis* Jesionowska, 2010. Locality: 1W: 1 ♀ 4 ?; 1S: 1 ♀
  - *Filieupodes filistellatus* Jesionowska, 2010. Localities: 7S: 4 ♀♀; 8W: 4 ♀♀ 2 ♂♂; 9S: 5 ♀♀; 10S: 1 ♀
  - *Filieupodes shepardi* (Strandtmann, 1971) NP NE. Locality: 7W: 6 ♀♀
  - *Filieupodes* sp. 1. Locality: 3S: 2 dn
  - *Filieupodes* sp. 2. Locality: 8S: 1 ♀ 1 tn
- Genus: *Linopodes* C.L. Koch, 1835
  - *Linopodes* sp.. Localities: 2W: 1 ♀ 1 ♂ 2 tn; 3S: 3 ?; 5W: 1 ♀

– Family: Eupodidae C.L. Koch, 1842

– Subfamily: Benoinyssinae Fain, 1958

- Genus: *Benoinyssus* Fain, 1958
  - *Benoinyssus* cf. *occonori* Bizarro, Wurlitzer et Da Silva, 2020. Localities: 4W: 1 ?; 7S: 2 ♀♀
  - *Benoinyssus* cf. *serratus* Olivier et Theron, 1997. Localities: 3S: 3 ♀♀ 1 tn; 4S: 1 ♀; 6S: 2 ♀♀ 1 ?; 9S: 1 tn
  - *Benoinyssus* sp.. Localities: 8S: 1 ♀

– Subfamily: Eupodinae C.L. Koch, 1842

- Genus: *Caleupodes* Baker, 1987
  - *Caleupodes reticulatus* Baker, 1987. Locality: 2W: 4 ♀♀
- Genus: *Echinoeupodes* Khaustov, 2017 NP
  - *Echinoeupodes* sp.. Locality: 5S: 1 dn
- Genus: *Eupodes* C.L. Koch, 1835
  - *Eupodes voxencollinus* Thor, 1934. Localities: 1W: 1 ♀, 1S: 2 ♀♀ 3 ♂♂; 2W: 6 ♀♀ 1 ♂; 3S: 4 ♀♀; 5W: 4 ♀♀ 1 ♂, 5S: ♀ 1 ♂; 6W: 3 ♀♀ 2 ♂♂, 6S: 3 ♀♀ 3 ♂♂ 1 ?; 7S: 1 ♀; 8S: 1 ♀ 1 tn; 10W: 5 ♀♀ 1 tn
  - *Eupodes* cf. *voxencollinus* Thor, 1934. Locality: 4S: 4 ♀♀; 7S: 1 dn; 10S: 1 ♀
- Genus: *Neoprotereunetes* Fain et Camerik, 1994 NP
  - *Neoprotereunetes* sp. 1. Locality: 1W: 2 lv, 1S: 2 lv
  - *Neoprotereunetes* sp. 2. Locality: 4W: 1 lv
- Genus: *Pseudoeupodes* Khaustov, 2014 NP
  - *Pseudoeupodes porosus* Khaustov, 2014 NP. Locality: 4W: 1 pn; 8W: 6 ♀♀

– Family: Penthaleidae Oudemans, 1931

- Genus: *Penthaleus* C.L. Koch, 1836
  - *Penthaleus* cf. *major* (Dugès, 1834). Localities: 4W: 5 ♀♀, 4S: 1 ?; 8W: 1 ♀; 9S: 4 ♀♀ 1 ♂; 10W: 1 ♀

– Family: Rhagidiidae Oudemans, 1922

- Genus: *Coccorhagidia*, Thor, 1934
  - *Coccorhagidia clavifrons* (Canestrini, 1886). Locality: 8S: 1 ♀
- Genus: *Crassocheles* Zacharda, 1980 NP
  - *Crassocheles virgo* Zacharda, 1980 NP. Locality: 4W: 1 ♀; 7W: 1 ♀
- Genus: *Latoempodia* Zacharda, 1980 NP
  - *Latoempodia similis* Zacharda, 1980 NP. Locality: 4W: 2 ♀♀; 7W: 1 ♀
- Genus: *Parallelorhagidia* Zacharda, 1980
  - *Parallelorhagidia* sp.. Locality: 7S: 1 pn
- Genus: *Poecilophysis* Cambridge, 1876
  - *Poecilophysis (Dentocheles) pratensis* (C.L. Koch, 1835). Locality: 1S: 1 dn
  - *Poecilophysis (Procerocheles) faeroensis* (Trägårdh, 1931) NP*** Locality: 2W: 1 tn 1 dn
- Genus: *Shibaia* Zacharda, 1980
  - *Shibaia longisensilla* (Shiba, 1969). Locality: 5S: 1 dn
- Genus: *Thoria* Zacharda, 1980 NP
  - *Thoria brevisensilla* Zacharda, 1980 NP. Locality: 4W: 1 tn

- *Thoria uniseta* (Thor, 1909) NP. Localities: 6S: 1 ♀ 1 tn; 7S: 4 ♀♀ 2 ?
- *Thoria* cf. *uniseta* (Thor, 1909). Locality: 7W: 2 pn

– Superfamily: Tydeoidea Kramer, 1877

– Family: Ereynetidae Oudemans, 1931

– Subfamily: Ereynetinae Oudemans, 1931

* Genus: *Ereynetes* Berlese, 1883
  - *Ereynetes* sp.. Locality: 1W: 1 ?

– Family: Iolinidae Pritchard, 1956

– Subfamily: Tydaeolinae André, 1979

* Genus: *Coccalicus* Willmann, 1952
  - *Coccalicus lukoschusi* (André, 1980). Locality: 7S: 1 ♀
* Genus: *Microtydeus* Thor, 1931
  - *Microtydeus beltrani* Baker, 1944. Localities: 1W: 1 ♀; 3S: 2 ♀♀ 1 tn; 4S: 3 ♀♀; 5W: 1 ♀; 7S: 2 ♀♀; 9S: 3 ♀♀ 1 tn
  - *Microtydeus subterraneus* Wood, 1965 NP. Localities: 6S: 3 ♀♀ 1 tn 1 lv; 7S: 2 ♀♀
  - *Microtydeus subtilis* (C.L. Koch, 1838). Localities: 3S: 1 ♀; 7S: 1 ♀
* Genus: *Tydaeolus* Berlese, 1910
  - *Tydaeolus frequens* (Grandjean, 1938). Locality: 2W: 1 ♀
  - *Tydaeolus sphaeroclaviger* Kuznetzov, 1972 . Localities: 4S: 2 ♀♀; 8S: 4 ♀♀

– Family: Triophtydeidae André, 1979

– Subfamily: Triophtydeinae André, 1979

* Genus: *Triophtydeus* Thor, 1932
  - *Triophtydeus immanis* Kuznetzov, 1973. Localities: 3W: 3 ♀♀ 1 dn 5 ?; 7S: 1 ♀
  - *Triophtydeus* sp.. Locality: 2S: 2 dn

– Family: Tydeidae Kramer, 1877

– Subfamily: Tydeinae Kramer, 1877

* Genus: *Lorryia* Oudemans, 1925
  - *Lorryia arkadiensis* Panou et Emmanouel, 1995. Locality: 10W: 2 ♀♀
  - *Lorryia brevicula* (C.L. Koch, 1838). Locality: 1W: 4 ♀♀
  - *Lorryia* cf. *danielsoni* (Momen et Lindquist, 1995). Localities: 2W: 2 ♂♂ 3 tn; 3S: 2 ♀♀ 1 ♂; 4S: 1 ♀; 5W: 1 tn; 6S: 1 ♀
  - *Lorryia devexa* (Kuznetzov, 1973). Locality: 2W: 2 ♀♀ 1 tn, 2S: 1 tn
  - *Lorryia grandiinsignia* Kaźmierski, 1991. Localities: 4S: 3 ♀♀ 1 tn; 6W: 1 ♀
  - *Lorryia maga* (Kuznetzov, 1973). Locality: 1W: 1 n
  - *Lorryia matura* (Livshitz, 1973). Localities: 4S: 1 dn; 9W: 2 ♀♀ 1 ♂ 1 tn, 9S: 1 ♀
  - *Lorryia obnoxia* (Kuznetzov et Zapletina, 1972) NP. Locality: 6S: 1 ?
  - *Lorryia* cf. *obnoxia* (Kuznetzov et Zapletina, 1972). Locality: 7S: 1 ♀
  - *Lorryia* cf. *obstinata* (Livshitz, 1973). Locality: 6W: 4 tn 1 dn
  - *Lorryia opifera* (Kuznetzov, 1973). Locality: 7S: 1 ♀ 1 dn

- *Lorryia oregonensis* (Baker, 1970). Locality: 1W: 1 ♀ 1 ♂
- *Lorryia reticuloinsignia* Kaźmierski et Panou, 1997 NP. Locality: 4W: 2 ♀♀ 3 ♂♂ 1 dn, 4S: 1 ♂
- *Lorryia sororcula* Kuznetzov, 1975 NP. Locality: 6W: 5 ♀♀ 1 ♂, 6S: 3 ♀♀
- *Lorryia* cf. *tridactyla* (Weis-Fogh, 1947). Locality: 5W: 3 tn
- *Lorryia unigena* (Livshitz, 1973). Localities: 8W: 1 ♀ 1 tn; 10W: 4 ♀♀
- *Lorryia varsoviensis* Kaźmierski, 1978. Localities: 9S: 6 ♀♀; 10W: 1 ♀
- *Lorryia volgini* (Kuznetzov, 1973). Locality: 10S: 3 ♀♀

* Genus: *Metalorryia* André, 1980
  - *Metalorryia delicata* (Kuznetzov, 1971). Locality: 5W: 2 tn
* Genus: *Tydeus* C. L. Koch, 1835
  - *Tydeus californicus* (Banks, 1904) sensu Baker 1970. Locality: 7S: 1 ♀
  - *Tydeus kochi* (Oudemans, 1928) sensu Baker 1970. Localities: 4S: 1 dn; 5S: 2 ♀♀ 1 ♂ 1 tn 1 dn; 6S: 1 ♀ 2 ♂♂; 7S: 3 ♀♀ 1 ♂ 1 tn; 9S: 1 ♂
  - *Tydeus lindquisti* (Marshall, 1970). Localities: 7W: 2 ♀♀ 4 ♂♂; 8W: 3 ♀♀ 3 ♂♂, S: 4 ♀♀ 1 dn; 10W: 2 ♀♀ 1 ♂, 10S: 2 ♀♀ 7 ♂♂
  - *Tydeus* sp.. Locality: 2S: 2 pn

- Supercohort: Anystides
- Cohort: Parasitengonina
- Subcohort: Erythraiae
  - Superfamily: Erythraeoidea Robineau-Desvoidy, 1828
  - Family: Erythraeidae Robineau-Desvoidy, 1828
  - Subfamily: Balaustiinae Grandjean, 1947
    * Genus: *Balaustium* von Heyden, 1826
      - *Balaustium* cf. *nikae* Haitlinger, 1996. Localities: 4S: 2 dn 4 lv; 7S: 1 dn; 8S: 3 dn 2 lv; 9S: 3 dn 4 lv; 10S: 3 dn
      - *Balaustium* sp.. Locality: 9W: 1 lv
  - Subfamily: Callidosomatinae Southcott, 1957
    * Genus: *Abrolophus* Berlese, 1891
      - *Abrolophus artemisiae* (Schrank, 1803). Localities: 3W: 1 ♀ 1 dn; 4S: 1 ♀; 10W: 2 ♀♀, 10S: 2 ♀♀ 2 ♂♂
      - *Abrolophus* cf. *aitapensis* (Southcott, 1948). Localities: 5S: 1 lv; 8W: 3 lv, 8S: 3 lv
      - *Abrolophus miniatus* (Hermann, 1804). Localities: 3S: 1 dn; 6S: 2 ♀♀ 5 dn; 7S: 2 dn
      - *Abrolophus rudaensis* (Haitlinger, 1986). Locality: 4W: 3 lv
      - *Abrolophus rhopalicus* (C.L. Koch, 1837). Locality: 8W: 1 ♀ 2 ♂♂
  - Subfamily: Erythraeinae Robineau-Desvoidy, 1828
    * Genus: *Erythraeus* Latreille, 1806
      - *Erythraeus phalangoides* (De Geer, 1778). Locality: 10S: 1 dn
  - Subfamily: Leptinae Billberg, 1820
    * Genus: *Leptus* Latreille, 1796

- *Leptus molochinus* (C.L. Koch, 1837). Locality: 5W: 3 dn

- Supercohort: Eleutherengonides
- Cohort: Raphignathina
  - Superfamily: Raphignathoidea Kramer, 1877
  - Family: Caligonellidae Grandjean, 1944
    - Genus: *Caligonella* Berlese, 1910
      - *Caligonella humilis* (C.L. Koch, 1838). Locality: 10W: 1 ♀, 10S: 3 ♀♀ 1 dn
  - Family: Eupalopsellidae Willmann, 1952 NP
    - Genus: *Eupalopsellus* Sellnick, 1950 NP
      - *Eupalopsellus trudis* Summers, 1960 NP. Localities: 3S: 2 ♀♀; 4S: 2 ♀♀; 5W: 2 ♀♀; 7S: 2 ♀♀
  - Family: Raphignathidae Kramer, 1877
    - Genus: *Raphignathus* Dugès, 1833
      - *Raphignathus gracilis* (Rack, 1962). Localities: 4W: 6 ♀♀; 9W: 4 ♀♀ 2 ♂♂, 9S: 3 ♀♀
  - Family: Stigmaeidae Oudemans, 1931
    - Genus: *Agistemus* Summers, 1960 NP
      - *Agistemus gratus* Kuznetzov et Vainshtein, 1977 NP. Locality: 5W: 1 ♀
    - Genus: *Eustigmaeus* Berlese, 1910
      - *Eustigmaeus coronaria* (Kuznetzov, 1976) NP. Locality: 8S: 1 ♀
      - *Eustigmaeus* cf. *formosus* Kaźmierski et Dończyk, 2003. Locality: 8S: 3 ♀♀
      - *Eustigmaeus pinnatus* (Kuznetzov, 1977). Locality: 10W: 1 ?
      - *Eustigmaeus* cf. *pinnatus* (Kuznetzov, 1977). Locality: 10S: 1 ♀
      - *Eustigmaeus* cf. *frigida* (Habeeb, 1958). Locality: 5S: 2 ♀♀
      - *Eustigmaeus segnis* (C.L. Koch, 1836). Locality: 7S: 1 ♀; 9S: 2 ♀♀ 1 dn
    - Genus: Cheylos*tigmaeus* Willmann, 1951
      - *Cheylostigmaeus* sp.. Locality: 5S: 2 ♀♀
    - Genus: *Stigmaeus* C.L. Koch, 1836
      - *Stigmaeus corticeus* Kuznetzov et Vainshtein, 1977. Localities: 2W: 2 ♀♀; 4W: 5 ♀♀; 6W: 6 ♀♀ 1 dn, 6S: 1 ?; 8W: 6 ♀♀; 10W: 6 ♀♀
      - *Stigmaeus fusus* Summers, 1962 NP. Localities: 8S: 7 ♀♀; 9S: 6 ♀♀; 10S: 6 ♀♀
      - *Stigmaeus glypticus* Summers, 1962 NP. Locality: 8W: 6 ♀♀
      - *Stigmaeus longipilis* (Canestrini, 1889) NP. Localities: 1S: 5 ♀♀; 4S: 5 ♀♀
      - *Stigmaeus* cf. *longisetis* Wood, 1967. Locality: 1W: 1 ♀
      - *Stigmaeus pilatus* Kuznetzov, 1978. Locality: 7S: 1 ♀
      - *Stigmaeus* cf. *pulchellus* Kuznetzov, 1978. Locality: 10S: 1 ♀
      - *Stigmaeus rhodomelas* Berlese, 1910 NP. Locality: 5S: 3 ♀♀
      - *Stigmaeus sphagneti* (Hull, 1918). Locality: 5S: 1♀

- Cohort: Heterostigmatina

- Superfamily: Scutacaroidea Oudemans, 1916
- Family: Scutacaridae Oudemans, 1916
  - Genus: *Archidispus* Karafiat, 1959 NP
    - *Archidispus* sp.. Locality: 1S: 1 ♀
  - Genus: *Diversipes* Berlese, 1903
    - *Diversipes* sp.. Locality: 1S: 1 ♀
  - Genus: *Imparipes* Berlese, 1903
    - *Imparipes* sp. 1. Locality: 2W: 1 ♀
    - *Imparipes* sp. 2. Locality: 10S: 3 ♀♀
  - Genus: *Pygmodispus* Paoli, 1911 NP
    - *Pygmodispus* sp.. Locality: 2S: 1 ♀
  - Genus: *Scutacarus* Gross, 1845
    - *Scutacarus plumosus* (Paoli, 1911) NP. Locality: 7S: 1 ♀; 10S: 3 ♀♀
    - *Scutacarus* sp. 1 . Locality: 1S: 1 ♀; 2W: 1 ♀
    - *Scutacarus* sp. 2. Locality: 8S: 4 ♀♀
- Superfamily: Pygmephoroidea Cross, 1965
- Family: Microdispidae Cross, 1965
  - Genus: *Microdispus* Paoli, 1911
    - *Microdispus* sp.. Locality: 5S: 1 ♀
- Family: Pygmephoridae Cross, 1965
  - Genus: *Bakerdania* Sasa, 1961
    - *Bakerdania* sp.. Locality: 10S: 1 ♀
  - Genus: *Pediculaster* Vitzthum, 1929
    - *Pediculaster* sp. 1 . Localities: 6W: 6 ♀♀; 7W: 4 ♀♀
    - *Pediculaster* sp. 2 . Localities: 5W: 1 ♀; 8W: 4 ♀♀
  - Genus: *Siteroptes* Amerling, 1861
    - *Siteroptes avenae* (Mueller, 1905). Localities: 2S: 2 ♀♀; 5W: 1 ♀, 5S: 2 ♀♀; 10W: 1 ♀
- Superfamily: Tarsonemoidea Canestrini et Fanzago, 1877
- Family: Tarsonemidae Canestrini et Fanzago, 1877
  - Genus: *Neotarsonemoides* Kaliszewski, 1984
    - *Neotarsonemoides lucifer* Schaarschmidt, 1959. Localities: 2S: 1 ♀; 7S: 10 ♀♀
    - *Neotarsonemoides* sp. 1. Locality: 2W: 3 ♀♀
    - *Neotarsonemoides* sp. 2. Locality: 2W: 1 ♀
  - Genus: *Steneotarsonemus* Beer, 1954
    - *Steneotarsonemus* sp.. Locality: 1W: 1 ♀
  - Genus: *Tarsonemus* Canestrini et Fanzago, 1876
  - Subgenus: *Tarsonemus* Canestrini et Fanzago, 1876
    - *Tarsonemus annotatus* Livshitz, Mitrofanov et Sharonov, 1979 NP. Locality: 8S: 1 ♀
    - *Tarsonemus bachmaieri* Cooreman, 1958 NP. Localities: 5W: 1 ♀, 5S: 10 ♀♀

- *Tarsonemus bognari* Nemestothy et Mahunka, 1981 NP . Locality: 6S: 1 ♀
- *Tarsonemus* cf. *confusus* Ewing, 1922 . Locality: 8W: 10 ♀♀
- *Tarsonemus fusarii* Cooreman, 1941. Localities: 7W: 7 ♀♀; 10S: 1 ♀
- *Tarsonemus hermes* Suski, 1966. Locality: 3W: 3 ♀♀
- *Tarsonemus lenticulatus* Gheblealivand, Haddad et Magowski, 2018 NP NE. Localities: 1W: 1 ♀; 5W: 2 ♀♀, 5S: 1 ♀; 9W: 2 ♀♀
- *Tarsonemus limitatus* Kaliszewski, 1993. Localities: 7W: 1 ♀, S: 1 ♀; 8W: 3 ♀♀, 8S: 1 ♀; 10S: 1 ♀
- *Tarsonemus mixtus* Kaliszewski, 1993. Localities: 1W: 9 ♀♀, 1S: 1 ♀; 2S: 1 ♀; 3W: 2 ♀♀
- *Tarsonemus monoporus* Weis-Fogh, 1947 NP. Localities: 3S: 1 ♀; 5W: 4 ♀♀, 5S: 4 ♀♀
- *Tarsonemus myceliophagus* Hussey, 1963. Locality: 8S: 1 ♀
- *Tarsonemus peltatus* Kaliszewski, 1993. Localities: 1S: 8 ♀♀; 2S: 8 ♀♀; 3W: 6 ♀♀
- *Tarsonemus preaterius* Kaliszewski, 1993. Localities: 7S: 1 ♀; 8W: 11 ♀♀, S: 4 ♀♀; 9W: 13 ♀♀, 9S: 10 ♀♀
- *Tarsonemus regularis* Kaliszewski, 1993. Locality: 5S: 1 ♀
- *Tarsonemus schaarschmidti* Mahunka, 1969. Locality: 9W: 2 ♀♀
- *Tarsonemus violae* Schaarschmidt, 1960. Locality: 2W: 1 ♀
- *Tarsonemus waitei* Banks, 1912. Localities: 4S: 4 ♀♀; 5S: 2 ♀♀; 6S: 1 ♀; 7S: 3 ♀♀; 9W: 1 ♀
- *Tarsonemus* sp. 1 . Locality: 8W: 4 ♀♀
- *Tarsonemus* sp. 2 . Locality: 9W: 1 ♂

- Order: Sarcoptiformes
- Suborder: Endeostigmata
- Cohort: Alycina
  - Superfamily: Alycoidea Canestrini et Fanzago, 1877
  - Family: Nanorchestidae Grandjean, 1937
    - Genus: *Nanorchestes* Topsent et Trouessart, 1890
      - *Nanorchestes* cf. *llanoi* Strandtmann, 1982 . Localities: 1W: 3 ♀♀ 1 ♂; 10W: 1 ♀
      - *Nanorchestes* cf. *antarcticus* Strandtmann, 1963 . Localities: 2W: 1 ♀ 1 ♂; 3W: 1♀, 3S: 1 ♀ 1 ♂ 1 tn; 4W: 4 ♀♀ 2 n, 4S: 1 ♀; 6W: 2 ♀♀ 3 ♂♂; 7W: 3 n; 10W: 2 ♀♀ 2 ♂♂, 10S: 1 ♂
    - Genus: *Speleorchestes* Trägårdh, 1909
      - *Speleorchestes* cf. *pratensis* Willmann, 1936. Localities: 4W: 5 ♀♀ 4S: 4 ♀♀; 5S: 1 ♀
- Cohort: Terpnacarina
  - Superfamily: Terpnacaroidea Grandjean, 1939
  - Family: Terpnacaridae Grandjean, 1939
    - Genus: *Terpnacarus* Grandjean, 1939
      - *Terpnacarus subterraneus* Weis-Fogh, 1948 NP. Locality: 6W: 1 ♀

Discussion

With reference to previous data summarized in Bogdanowicz *et al.* (2008), Kaźmierski *et al.* (2018), and Mąkol and Wohltmann (2012), one family, 11 genera and 27 species recorded during present study are new to the fauna of Poland and two species are also new to the fauna of Europe (André 2004; Baker 2004; Silva *et al.* 2016; Magowski 2004; Uusitalo, and Judson 2004).

Majority of recorded species were found in one habitat only, whereas the most frequently occurring species were *Cunaxa setirostris*, *Eupodes voxencollinus*, *Microtydeus beltrani* and *Nanorchestes* cf. *antarcticus*, each found in more than five habitats. The latter may indicate that these four species display relatively low habitat selectivity.

A comparison of our results with those of other similar studies is difficult due to the scarcity of surveys on Prostigmata soil faunas carried out in limited spatial areas. Such studies usually deal with highly distinct habitats (e.g. subterranean in Skubała *et al.* 2013, marches in Dogan *et al.* 2015) or refer to narrower taxonomic scope. One of the few similar projects to ours, though covering a larger area, was carried out by Niedbała *et al.* (1982). During our investigation, 139 species were found with 868 examined individuals, whereas Niedbała *et al.* (1982) recorded 321 species represented by 8169 individuals. The latter work involved also Oribatida (Acariformes) and Gamasida (Parasitiformes), which were not included in our research. This means that in our study the no. of species per no. of specimens is four times higher than in Niedbała *et al.* (1982), despite involving narrower spectrum of systematic groups. The disproportion can be tentatively explained by a wider variety of habitats examined in our survey. Moreover, in our study only 20 samples were collected, while as many as 400 were examined by Niedbała *et al.* (1982). Thus, the species no./sample index amounts to 7.0 in our study, while it is 0.8 in Niedbała *et al.* (1982). Unfortunately, no exact number of samples per each particular mite group is given in the latter paper, rendering such comparisons hardly informative. When compiling the comparable aspects of these two datasets, the cohort Heterostigmatina is represented by 71 species in Niedbała *et al.* (1982) and by 36 in our study. The remaining Prostigmata, however, are represented by 50 species in Niedbała *et al.* (1982) and 99 in this study, testifying to nearly a twice higher diagnostic resolution in our approach, despite ca. 20 times lower number of samples examined. The number of species of the suborder Endeostigmata recorded in both studies was comparable and rather low.

No doubts, the regular sampling, even limited in space contributes to species richness. Łaydanowicz and Mąkol (2010) recorded as many as 13 species, representing four families and constituting almost nine percent of the Polish fauna of terrestrial Parasitengona mites, within a studied area of ca. 200 m^2, located in the vicinity of the university campus in Wrocław.

Some semi-aquatic or aquatic taxa i.e., representatives of the Hydrachnidia (water mites), as well as plant-associated mites, i.e., Tetranychidae (spider mites) were recorded in our material. Presence of the former can be explained by the proximity of the pond to the locality no. 2, whereas the latter finding is regarded accidental. Nevertheless, both should be considered as accidental in the typically soil habitats.

As mentioned before, our aim was not only to provide a local checklist of Prostigmata and Endeostigmata, but also to make the data on the presence of those mites in AMU Campus accessible to other biologists, who need material for their laboratory studies. This objective has been already met, since some of our early results were recently used for a molecular phylogenetic assay on Eupodoidea by Szudarek-Trepto *et al.* (2020). Further studies based on our findings are underway.

Systematic evaluation and comments on the mite material presented herewith will be a subject of a separate study.

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