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A contribution to knowledge of fauna of Kampinos
National Park: Scarabaeidae.
Part 2: Subfamilies: Aphodiinae, Scarabaeinae.

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ABSTRACT: paper presents new localities of 31 species of subfamilies Aphodiinae and Scarabaeinae in Kampinos National Park. Among presented species, 24 are new for studied area and one of them, *Aphodius (Chilothorax) conspurcatus* (LINNAEUS, 1758), is new to Mazovian Lowland.

KEY WORDS: Scarabaeidae, coprofagous beetles, Kampinos National Park, faunistics, new records, Masovian Lowland.

Introduction

The family Scarabaeidae tends to be divided into two quasi-systematic groups, that is Scarabaeidae laparosticti – comprising representatives of subfamilies Aegialiinae, Aphodiinae, and Scarabaeinae – and Scarabaeidae pleurosticti – comprising representatives of subfamilies Cetoniinae, Dynastinae, Melolonthinae, Sericinae, and Rutelinae.

In the Polish fauna, the group *Scarabaeidae laparosticti* is represented by 92 species (BYK 2016), including Aegialiinae – 4, Aphodiinae – 68, Scarabaeinae – 20. The species from this group are represented by saprophages and coprophages (GÓRZ 2003).

From the area of Kampinos National Park, only 8 species from this group have been hitherto recorded: *Rhysothorax rufus* (FABRICIUS, 1792) (MARCZAK & al. 2012), *Rhyssemus puncticollis* BROWN, 1929 (BYK & MINKINA 2014), *Aphodius (Acrossus) rufipes* (LINNAEUS, 1758), *Aphodius (Aphodius) fimetarius* (LINNAEUS, 1758), *Aphodius (Bodilopsis) rufus* (MOLL, 1782), *Aphodius (Bodilopsis) sordidus sordidus* (FABRICIUS, 1775), *Aphodius (Planolinus) fasciatus* (OLIVIER, 1789), *Aphodius (Volinus) sticticus* (PANZER, 1798) (KUBISZ & al. 2000).

The aim of the following study is to supplement the data concerning the occurrence of the representatives of the subfamilies Aegialinae, Aphodiinae, and Scarabaeinae from the area of the Kampinos National Park.

Material and methods

The presented data come from the authors' researches and the field work, which has been intensified in recent years. The evidence specimens are stored in the authors' collections and the natural science collections of the Kampinos National Park.

In the study, the following abbreviations have been used: SPA – Strict Protection Area, KNP – the Kampinos National Park, IBL-2 – a screen trap, IBL-5 – a barrier trap, Trox trap – an original, modified Barber's trap with 5 dm³ in capacity, with the bait consisting of a rotting liver. Next to each locality, the code for a corresponding UTM grid square has been provided. The species new to the Mazovian Lowland have been marked with [*]. The nomenclature for taxa has been adopted after LÖBL and SMETANA (2006).

Species overview

Aphodiinae LEACH, 1815

Aphodius (Acrossus) depressus (KUGELANN, 1792)

– DC69 SPA Zamczysko: 1-31 V 2011 (2 exx.), 1-30 VI 2011 (1 ex.), into an IBL-2 trap in the habitat of Tilio-Carpinetum, 1-30 VI 2011 (1

ex.), 1-31 VII 2011 (1 ex.), into an IBL-5 trap hung on an oak; DC79 Brzozówka, 4 IV 2011, 1 ex., in horse feces; DC79 SPA Debły: 1-30 IV 2011 (2 exx.), 1-31 V 2011 (2 exx.), 1-30 VI 2011 (3 exx.), 1-31 V 2015 (5 exx.), 1-30 VI 2015 (2 exx.), into an IBL-2 trap in the habitat of *Tilio-Carpinetum*, 1-30 IV 2011 (1 ex.), 1-31 V 2011 (2 exx.), 1-30 VI 2011 (1 ex.), into an IBL-5 trap hung on an oak; DC89 SPA Sieraków: 1-30 IV 2011 (1 ex.), 1-31 V 2011 (10 exx.), 1-30 VI 2011 (2 exx.), 1-31 VIII 2011 (1 ex.), 1-31 V 2015 (2 exx.), 1-30 VI 2015 (4 exx.), into an IBL-2 trap in the habitat of *Tilio-Carpinetum*; DC89 SPA Zaborów Leśny: 1-31 V 2011 (1 ex.), into an IBL-5 trap hung on an oak, 1-31 V 2015 (25 exx.), 1-31 VII 2015 (5 exx.), into an IBL-2 trap in habitat of *Tilio-Carpinetum*; DC89 Truskaw, 18 VII 2015, 5 exx., in horse feces.

A forest species commonly encountered in the whole Poland (BURAKOWSKI & al. 1983, BUNALSKI 2004).

New to the Kampinos National Park.

Aphodius (Acrossus) rufipes (LINNAEUS, 1758)

– DC79 Mosionka, 25 VIII 2011 (10 exx.), in horse feces; DC79 SPA Debły, 1-31 VIII 2011 (1 ex.), 1-31 V 2015 (1 ex.), into an IBL-2 trap in a habitat of *Tilio-Carpinetum*; DC89 SPA Sieraków, 1-31 V 2011 (1 ex.), 1-30 VI 2011 (1 ex.), 1-31 VII 2011 (2 exx.), 1-31 VIII 2011 (1 ex.), 1-30 VI 2015 (5 exx.), into an IBL-2 trap in a habitat of *Tilio-Carpinetum*; DC89 SPA Zaborów Leśny, 1-31 VII 2015, 3 exx., into an IBL-2 trap in a habitat of *Tilio-Carpinetum*; DC89 Pocięcha, 26 VII 2009, 1 ex., on ground; DC89 Truskaw, 18 VII 2015, 1 ex., in horse feces.

A common species in the whole Poland encountered in open and forest ecosystems (BURAKOWSKI & al. 1983, BUNALSKI 2004).

From the area of the KNP, it was recorded earlier from the SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

Aphodius (Agrilinus) ater (DE GEER, 1774)

– DC79 Brzozówka, 4 IV 2011 (3 exx.), 12 V 2011 (1 ex.), in horse feces; DC89 Łosiówka, 25 IV 2013, 1 ex., in elk feces; DC89

Pociecha, 12 III 2010, 1 ex., on the ground; DC89 Truskaw, 18 VII 2015, 4 exx., in horse feces.

A species occurring probably in the whole Poland (BURAKOWSKI & al. 1983), locally forming numerous populations (BUNALSKI 2004). It is a species most often collected from forest areas or near them (BUNALSKI 2006).

New to the Kampinos National Park.

Aphodius (Agoliinus) nemoralis ERICHSON, 1848

– DC79 Brzozówka, 11 IV 2011, 4 exx., in cow dung; DC89 Izabelin, 25 IV 2013, 4 exx., in elk feces; DC89 Łosiówka, 25 IV 2013, 57 exx., in elk feces; DC89 Niepust: 15 IV 2011 (1 ex.), 17 IV 2011 (4 exx.), in elk feces; DC89 SPA Sieraków, 12 III 2010, 1 ex., in flight; DC89 SPA Zaborów Leśny, 20-30 VI 2009, 1 ex., into a Barber trap; DC89 Pociecha, 10 V 2010, 1 ex., in horse feces; DC89 Truskaw, 26 IV 2013, 13 exx., in elk feces.

A forest species distributed probably in the whole Poland (BURAKOWSKI & al. 1983), locally numerously encountered (BUNALSKI 2004).

New to the Kampinos National Park.

Aphodius (Aphodius) fimetarius (LINNAEUS, 1758)

– DC69 Zamość, 28 V 2010, 1 ex., in cow dung; DC79 Brzozówka: 11 VII 2008 (1 ex.), 4 IV 2011 (14 exx.), in horse feces, 7 V 2015 (5 exx.), in cow dung; DC89 Łosiówka, 25 IV 2013, 3 exx., in elk feces; DC89 Niepust, 15 IV 2011, 1 ex., in elk feces; DC89 Pociecha, 10 V 2010, 4 exx., in horse feces.

The most common national representative of the genus *Aphodius* (BURAKOWSKI & al. 1983). A Eurybiont encountered in different habitats (BUNALSKI 2006).

From the area of the KNP, it was recorded earlier from the SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

Aphodius (Bodilopsis) rufus (MOLL, 1782)

– DC79 Brzozówka, 19 V 2015, 1 ex., in cow dung.

A common species in the whole Poland, encountered in open and forest habitats (BURAKOWSKI & al. 1983, BUNALSKI 2004). From the area of the KNP, it was earlier recorded from the SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

Aphodius (Bodilopsis) sordidus sordidus (FABRICIUS, 1775)

– DC79 Brzozówka, 22 IX 2011, 1 ex., in horse feces, 19 V 2015, 1 ex., in cow dung.

A common species which prefers open areas, but it was also collected from forest areas (BUNALSKI 2006), probably distributed in the whole Poland (BURAKOWSKI & al. 1983).

From the area of the KNP, it was earlier recorded from the SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

**Aphodius (Chilothorax) conspurcatus* (LINNAEUS, 1758)

– DC79 Brzozówka: 2 X 2010 (1 ex.), 4 IV 2011 (1 ex.), in horse feces.

A species inhabiting northern parts of the European continent (DOMINIAK 2005). In the whole area of its occurrence, very rarely reported (BURAKOWSKI & al. 1983). In Poland, it is known from sparse and dispersed localities. In the Catalogue of the Polish Fauna, it was recorded from 7 regions: the Pomeranian Lakeland, the Masurian Lakeland, the Wielkopolsko-Kujawska Lowland, the Białowieża Forest, Lower Silesia, Roztocze, and the Krakowsko-Wieluńska Upland (BURAKOWSKI & al. 1983). In later years, it was recorded from the Lublin Upland (BUNALSKI & SZWAŁKO 1989), the Baltic Coast (DOMINIAK 2005) and the Świętokrzyskie Mountains (BIDAS 2007). The species considered as a forest one (BUNALSKI 2006).

New to the Mazovian Lowland and the Kampinos National Park.

Aphodius (Chilothorax) distinctus distinctus (MÜLLER O.F., 1776)

- DC79 Brzozówka: 2 X 2010 (1 ex.), 4 IV 2011 (4 exx.), 19 V 2011 (1 ex.), in horse feces; DC89 Niepust, 17 IV 2011, 1 ex., in elk feces; DC89 SPA Sieraków, 28 IV 2012, 1 ex., in flight; DC89 Pociecha, 10 V 2010, 1 ex., in horse feces; DC89 Truskaw, 26 IV 2013, 1 ex. in elk feces and 7 exx. in horse feces.

One of the most common species of the genus *Aphodius* (BURAKOWSKI & al. 1983). It is encountered both in forests and in open areas.

New to the Kampinos National Park.

Aphodius (Esymus) pusillus pusillus (HERBST, 1789)

- DC79 Brzozówka, 12 V 2011, 1 ex., in horse feces.

A ubiquitous species (BUNALSKI 2006), distributed probably in the whole Poland (BURAKOWSKI & al. 1983).

New to the Kampinos National Park.

Aphodius (Euorodalus) coenosus (PANZER, 1798)

- DC89 Łosiówka, 25 IV 2013, 3 exx., in elk feces; DC89 Niepust, 17 IV 2011, 2 exx., in elk feces.

In Poland, the species more rarely and sporadically encountered (BURAKOWSKI et al. 1983), by BUNALSKI (2004) considered as a local species. BUNALSKI's (2006) observation that the species can be associated with forest area in the case of the collected specimens is justified. New to the Kampinos National Park.

Aphodius (Eupleurus) subterraneus subterraneus (LINNAEUS, 1758)

- DC79 Brzozówka, 4 IV 2011, 3 exx., in horse feces.

A species known from almost whole Poland, not rare. It inhabits both forest areas, as well as those open (BUNALSKI 2006). New to the Kampinos National Park.

Aphodius (Liothorax) plagiatus (LINNAEUS, 1767)

- DC79 Brzozówka, 19 V 2015, 1 ex., in cow dung.

A hygrophilic species (BUNALSKI 2004), reported from few localities in different parts of the country (BURAKOWSKI & al. 1983, BUNALSKI 1999). New to the Kampinos National Park.

Aphodius (Melinopterus) prodromus (BRAHM, 1790)

- DC79 Brzozówka: 4 IV 2011 (43 exx.), in horse feces, 11 IV 2011 (1 ex.), w odchodach krowy; DC89 Łosiówka, 25 IV 2013, 1 ex., in elk feces; DC89 Niepust, 17 IV 2011, 2 exx., in elk feces; DC89 Truskaw, 26 IV 2013, 11 exx., in horse feces.

One of the most common species from the genus *Aphodius* (BURAKOWSKI & al. 1983). Encountered in open and forest areas. New to the Kampinos National Park.

Aphodius (Melinopterus) sphacelatus (PANZER, 1798)

- DC79 Brzozówka, 4 IV 2011, 5 exx., in horse feces.

A species similar to *Aphodius prodromu*, though considerably more rare. It forms abundant populations only at certain spots (BUNALSKI 2006). Encountered in open areas and in the vicinity of forests.

New to the Kampinos National Park.

Aphodius (Nimbus) contaminatus (HERBST, 1783)

- DC79 Brzozówka, 17 IX 2009, 1 ex., on the ground.

An especially rarely encountered species (BUNALSKI 1996), known only from a few regions (BURAKOWSKI & al. 1983). It is a species that prefers open areas.

New to the Kampinos National Park.

Aphodius (Otophorus) haemorrhoidalis (LINNAEUS, 1758)

- DC79 Brzozówka: 11 VII 2008 (1 ex.), in horse feces, 19 V 2015 (3 exx.), in cow dung.

A common species which is a ubiquist (BUNALSKI 2006), probably distributed in the whole Poland (BURAKOWSKI & al. 1983). New to the Kampinos National Park.

Aphodius (Planolinoides) borealis GYLLENHAL, 1827

- DC69 SPA Zamczysko, 1-31 V 2011, 1 ex., into an IBL-5 trap hung on an oak w the habitat of *Tilio-Carpinetum*; DC79 SPA Debły: 1-31

V 2011 (2 exx.), into an IBL-5 trap hung on an oak in the habitat of *Tilio-Carpinetum*; 1-31 V 2015 (1 ex.), into an IBL-2 trap in the habitat of *Tilio-Carpinetum*; DC89 SPA Zaborów Leśny: 1-31 V 2015 (2 exx.), 1-31 VII 2015 (1 ex.), into an IBL-2 trap in the habitat of *Tilio-Carpinetum*; 1-30 VI 2015 (1 ex.), into an IBL-5 trap hung on a hornbeam in the habitat of *Tilio-Carpinetum*.

A forest species (BUNALSKI 2004) with a mountain-boreal range (BUNALSKI & SZWAŁKO 1990), reported from the country from sparse localities in 10 regions.

New to the Kampinos National Park. Earlier recorded from the town situated at the border adjacent to a park—Palmir (DD80) (BYK 2012).

Aphodius (Planolinus) fasciatus (OLIVIER, 1789)

– DC79 Brzozówka, 11 IV 2011, 7 exx., in horse feces; DC89 Łosiówka, 25 IV 2013, 3 exx., in elk feces; DC89 SPA Sieraków, 4 IV 2010, 3 exx., in doe feces; DC89 Pocięcha, 10 V 2010, 7 exx., in horse feces; DC89 Truskaw, 26 IV 2013, 2 exx., in elk feces.

A forest species (BUNALSKI 2004), distributed probably in the whole Poland (BURAKOWSKI & al. 1983).

From the area of the KNP, it was recorded earlier from the SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

Aphodius (Rhodaphodius) foetens (FABRICIUS, 1787)

– DC79 Brzozówka, 11 VII 2008, 1 ex., in horse feces; DC89 SPA Zaborów Leśny, 1-10 VI 2009, 1 ex., into a Barber trap.

A common species, locally numerous (BUNALSKI 2004), distributed probably in the whole Poland (BURAKOWSKI et. al. 1983). The species prefers open areas, but it is also encountered in forest areas (BUNALSKI 2006).

New to the Kampinos National Park.

Aphodius (Teuchestes) fossor (LINNAEUS, 1758)

– DC89 SPA Zaborów Leśny, 10-19 VII 2009, 1 ex., into a Barber trap.

One of the most common species from the genus *Aphodius* (BURAKOWSKI & al. 1983). Encountered both at open and forest areas (BUNALSKI 2006). New to the Kampinos National Park.

Aphodius (Volinus) sticticus (PANZER, 1798)

- DC79 SPA Debły: 1-30 VI 2011 (1 ex.), into an IBL-5 trap hung on an oak, 1-31 V 2015 (4 exx.), into a IBL-2 trap in the habitat of *TilioCarpinetum*; DC89 SPA Sieraków, 1-30 VI 2015, 2 exx., into an IBL-2 trap in habitat of *Tilio-Carpinetum*; DC89 SPA Zaborów Leśny: 20-31 VIII 2009 (1 ex.), into a Barber trap, 1-30 IV 2011 (1 ex.), 1-31 V 2011 (1 ex.), into an IBL-5 trap hung on an oak, 1-31 VI 2015 (3 exx.), into an IBL-2 trap in the habitat of *Tilio-Carpinetum*.

A forest species associated with sand areas, occurring probably in the whole Poland (BURAKOWSKI & al. 1983).

From the area of the KNP, it was recorded earlier from SPA Czerwińskie Góry (DC59) by KUBISZ & al. (2000).

Oxyomus sylvestris (SCOPOLI, 1763)

- DC89 Łosiówka, 25 IV 2013, 1 ex., in elk feces; DC89 Niepust, 12 IV 2011, 1 ex., on the ground.

A rarely and sporadically encountered species, although it is probably distributed in the whole country (BURAKOWSKI & al. 1983). It is encountered at open and forest areas.

New to the Kampinos National Park

Psammodyus asper (FABRICIUS, 1775)

- DD70 Ruska Kępa, 5 VI 2015, 6 exx., collected from grass roots growing out of the sand brought by the Vistula River.

A species encountered rarely and locally, associated with sandy habitats at the verges of waters and inland dunes (BURAKOWSKI & al. 1983).

New to the Kampinos National Park. Within the area of the KNP, it is encountered exclusively beyond the main complex of the park – in the Vistula enclave “Ruska Kępa” situated in the environs where the Narew River flows into the Vistula River.

Rhysemus puncticollis BROWN, 1929

- DC89 Niepust, 18 IV 2008, 1 ex., on the ground; DD70 Ruska Kępa, 5 VI 2015, 3 exx., collected from grass roots growing out of the sand brought by the Vistula River.

A species recorded from Poland recently (BYK & MINKINA 2014). According to the analysis of the evidence material, it turned out to be a species more common than *Rhyssesus germanu* (LINNAEUS, 1767) (BYK & MINKINA, idem) recorded from Poland earlier.

From the area of the KNP, it was recorded earlier from the environs of Izabelina (DC89) (BYK & MINKINA, idem).

Scarabaeinae LATREILLE, 1802

Copris (Copris) lunaris (LINNAEUS, 1758)

– DC69 Korfowe, 23 VI 2010, 2 exx., from the side of a sandy road, including 1 ex. run over.

A species associated with well-sunlit sandy and loess soils (BURAKOWSKI et. all 1983).

New to the Kampinos National Park.

Onthophagus (Onthophagus) taurus (SCHREBER, 1759)

– DC69 Zamość, 28 V 2010, 4 exx., in cow dung; DC79 Brzozówka, 19 V 2015, 3 exx., in cow dung.

A common species, locally numerous (BURAKOWSKI et al. 1983), probably distributed in the whole Poland (BURAKOWSKI et al. 1983).

New to the Kampinos National Park.

Onthophagus (Palaeonthophagus) coenobita (HERBST, 1783)

– DC79 Brzozówka, 8 VI 2012, 1 ex., in horse feces; DC89 Izabelin, 24 IV 2013, 1 ex., in boar feces

A common species, locally numerous (BUNALSKI 2004), probably distributed in the whole Poland (BURAKOWSKI & al. 1983). New to the Kampinos National Park.

Onthophagus (Palaeonthophagus) fracticornis (PREYSSLER, 1790)

– DC89 Niepust, 17 IV 2011, 1 ex., in elk feces.

The most common representative of the genus *Onthophagus* (BURAKOWSKI & al. 1983).

New to the Kampinos National Park.

Onthophagus (Palaeonthophagus) joannae GOLJAN, 1953

– DC69 Zamość, 22 VI 2011, 1 ex., in cow dung.

It has turned out many times to be numerous more at foothills and mountains, and rarer towards North (BUNALSKI 2006). New to the Kampinos National Park.

Onthophagus (Palaeonthophagus) nuchicornis (LINNAEUS, 1758)

– DC79 Brzozówka: 11 VII 2008 (2 exx.), in horse feces, 19 V 2015, 1 ex., in cow feces; DC79 Ławy: 15-26 VI 2015 (4 exx.), 27 VI – 14 VII 2015 (7 exx.), into a Trox trap in the habitat of *Festuco psammophilae-Koelerietum glaucae*; DC89 Niepust: 15-26 VI 2015 (2 exx.), 27 VI – 14 VII 2015 (8 exx.), into a Trox trap in the habitat of *Arctostaphylo-Callunetum*.

A species widely distributed in the whole Poland (BURAKOWSKI & al. 1983). New to the Kampinos National Park

Conclusion

Based on the literature and the contemporary data collected in the last years from the area of the Kampinos National Park, 32 representatives of the subfamilies Aegialiinae, Aphodiinae, and Scarabaeinae were recorded. It constitutes nearly 35% of the national fauna of Scarabaeidae. Among the recorded species, one is new to the Mazovian Lowland—*Aphodius conspurcatus*, and as many as 24 have never before been reported from the area of the Kampinos National Park.

A relatively large number of the species associated with forests (7) and a small number of the species preferring open areas (5), and the presence of species preferring the sands of inland dunes point to the specific character of the Kampinos National Park. Within the area of the park, the grazing of horses and livestock is becoming less frequently encountered, hence the decrease in the food substrate for species that prefer feces of these animals. On the other hand, a large amount of forest live undulates, mainly the elk, creates existence conditions for forest coprophages that feed on feces of these animals. This contributes to the fact that out of over 73% of the area covered with forests and sections of open inland dunes, the Kampinos National Park is an invaluable area where ideal living conditions for forest coprophages and psammophilic species exist.

The following can be included as rarely encountered: *Aphodius borealis*, *A. conspurcatus*, *A. contaminatus* oraz *A. plagiatus*. Relatively rarely reported are also the following: *Aphodius sphacelatus*, *Psammodytes asper* and *Rhyssalus puncticollis*.

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