Beetles (Coleoptera) new for the fauna of the Białowieża Forest including a species new for Poland

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Plewa, R., Jaworski, T., Tarwacki, G., Sućko, K., Konwerski, S., Królik, R., Lasoń, A., Melke, A., Przewoźny, M., Ruta, R., Szołtys, H. & Hilszczański, J. 2019: Beetles (Coleoptera) new for the fauna of the Białowieża Forest including a species new for Poland. — Entomol. Fennica 30: 114–125. https://doi.org/10.33338/ef.84086

The paper presents new data on the occurrence of 69 beetle species collected in 2017 in the Białowieża Forest, NE Poland. The list contains representatives of 27 families: Anthribidae, Bostrichidae, Ciidae, Cleridae, Coccinellidae, Corylophidae, Cryptophagidae, Curculionidae, Dasytidae, Elateridae, Endomychidae, Eucnemidae, Histeridae, Laemophloeidae, Latridiidae, Leiodidae, Lycidae, Melandryidae, Mycetophagidae, Ptinidae, Ripiphoridae, Salpingidae, Staphylinidae, Tenebrionidae, Tetratomidae, Throscidae, and Zopheridae. The majority of the species represents saproxylic, i.e. dead wood-dependent, beetles. Biology and distribution of some rarely recorded species are briefly discussed. All species are reported for the first time from the Białowieża Forest and, furthermore, *Corticaria crenicollis* Mannerheim, 1844 (Latridiidae) is new for the fauna of Poland.

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Received 22 June 2018, accepted 19 September 2018

1. Introduction

Research on the fauna of beetles of the Polish part of the Białowieża Forest began in the first half of the 20th century and focused mainly on bark beetles (Curculionidae, Scolytinae), and later also on longhorn beetles (Cerambycidae) (Karpiński 1933, 1949). A number of studies were later carried out by Burakowski (e.g. 1962a, 1962b, 1975, 1988), which has contributed significantly to the knowledge about the bionomics and descriptions of the developmental stages of many species. In subsequent years, the Białowieża Forest was still an important object of coleopterological research, as evidenced by many publications documenting number of species new for this area, and also for Poland. Faunistic exploration of the Białowieża Forest was intensified in 1980's and at the beginning of 1990's. As a result, over 380 species of beetles were newly recorded from the Białowieża Forest by Kubisz and Szwałko (1991) and Borowiec *et al.* (1992). Moreover, several long-term studies on beetles of the Białowieża Forest were initiated in 1980's (Gutowski & Kubisz 1995, Gutowski 2004). The results of these papers were later summarized in the Catalogue of the fauna of Białowieża Primeval Forest (Gutowski & Jaroszewicz 2001), and thus far, it is the only forest area in Poland with such a comprehensive study. In a consequence, the number of Coleoptera of this area was estimated as approximately 3,200 species (Gutowski & Jaroszewicz 2004).

Further research in the Białowieża Forest has focused on the zooindication-based valuation of forests based on the species composition and abundance of epigeic (i.e. living on the soil surface) and saproxylic (i.e. associated with dead wood and wood-decaying fungi) beetles (Szujecki 2001, 2006, 2017). The latest works were based on the analysis of saproxylic beetle assemblages in the tree tops of mature oak stands of this area (Plewa *et al.* 2014, 2017).

Although the area of the Białowieża Forest has been quite well investigated in terms of beetle fauna, a number of unlisted species should be expected to occur there. This is mainly due to the spatial extent and habitat diversity of the area, its inaccessibility, and the continuity of natural processes. Our study provides data on the occurrence of beetle species new for the fauna of the Białowieża Forest and Poland.

2. Materials and methods

All beetles were collected using 12-funnel traps (purple, polytetrafluoroethylene (PTFE)-covered) equipped with a collection chamber half-filled with ethylene glycol to preserve captured insects (Fig. 1). A total of 335 traps were dis-

Fig. 1. Purple multiple funnel trap exposed in one of the sampling sites in the Białowieża Forest in 2017.

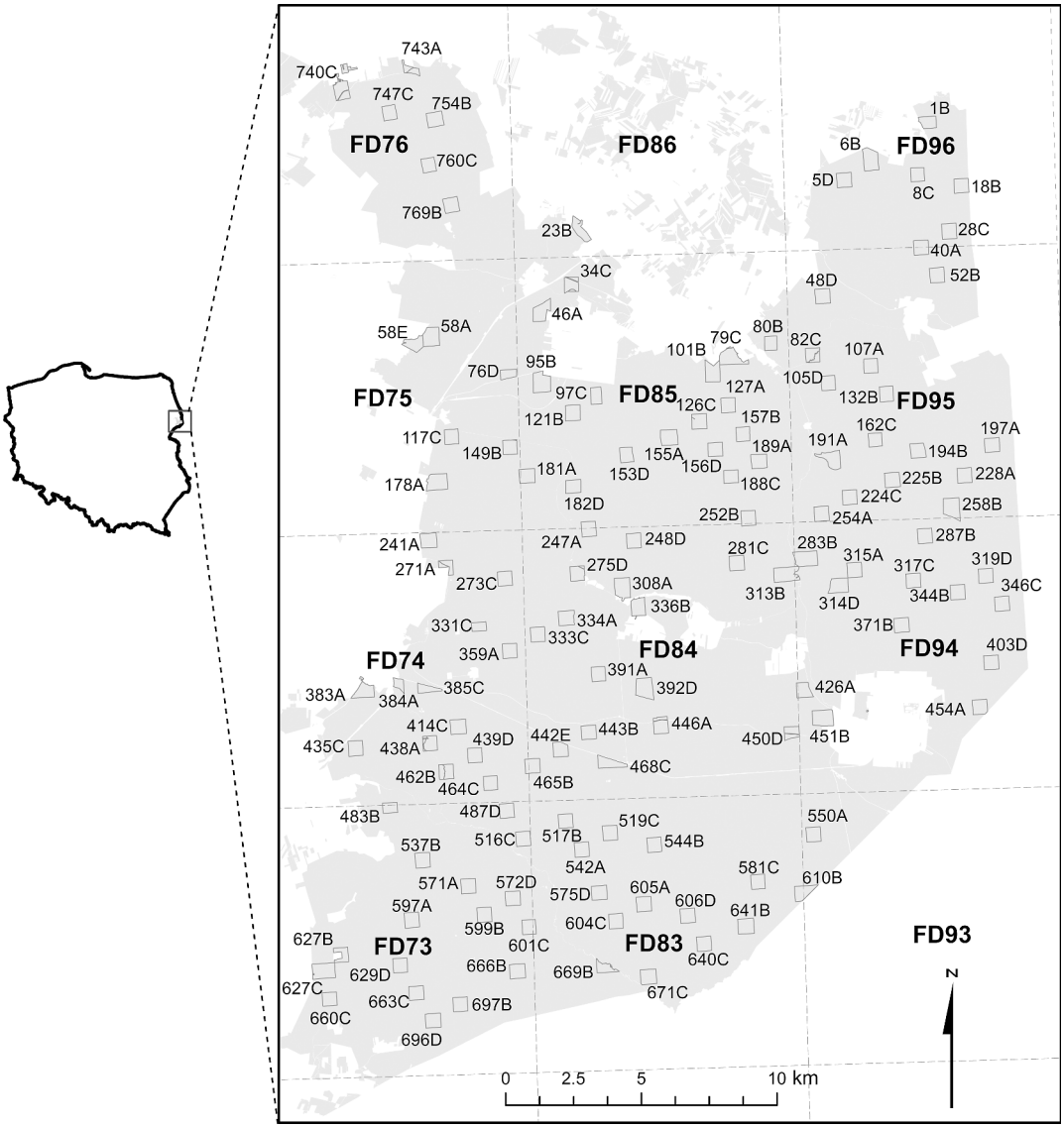

Fig. 2. Study sites within UTM squares.

played from mid-May to mid-September 2017 in selected sites of the study area in the Białowieża Forest (Fig. 2). The traps were hanged on the lower braches of trees at a height of 3–5 m above the ground level, and were emptied every 1–1.5 month.

The beetles were identified by all authors. Determinations of some taxa were further confirmed by RP (Latridiidae), SK (Leiodidae), RK (Ciidae), AM (Staphylinidae), MP (Eucnemidae), RR (Corylophidae), AL and HS (Elateridae). Identification of several species of Latridiidae was confirmed also by W. H. Rücker. Taxonomic nomenclature follows Catalogue of Palaearctic Coleoptera by Löbl and Smetana (2007, 2008, 2011) with further amendments by Löbl and Löbl (2015).

The list of beetle families and species is presented in alphabetical order. The locality names, i.e. Białowieża, Browsk, Hajnówka, refer to the areas administered by the three local forest districts (i.e. Białowieża Forest District, Browsk Forest District, and Hajnówka Forest District, respectively), while BNP refers to the area of

Białowieża National Park. Symbols in square brackets are designations of the forest territorial units (so-called "subcompartments"), according to the territorial division of the Białowieża Forest. To avoid unnecessary duplication of data in the systematic part of the paper, the location of each subcompartment within the particular UTM (Universal Transverse Mercator) square is shown in Fig. 2. Numbers of collected individuals of beetles are provided, followed by the information about trapping duration (Arabic and Roman numerals indicate days and months of 2017, respectively).

3. Annotated list of new Coleoptera species of the Białowieża Forest

Anthribidae

Gonotropis dorsalis (Gyllenhal, 1813)
Browsk: [6B] 1 ex. 25.V.–19.VI.

Phaeochrotes pudens (Gyllenhal, 1833)
Białowieża: [454A] 1 ex. 4.VIII.–7.IX., [281C] 1 ex. 24.VI.–7.VIII., [336B] 1 ex. 7.VIII.–12.IX.
Browsk: [82C] 3 exx. 19.VI.–4.VIII., [58A] 1 ex. 22.VI.–7.VIII., [58E] 7 exx. 22.VI.–7.VIII., [58E] 1 ex. 7.VIII.–12.IX.
Hajnówka: [516C] 1 ex. 6.VIII.–13.IX., [629D] 5 exx. 21.VI.–4.VI., [660C] 3 exx. 21.VI.–4.VIII., [660C] 4 exx. 4.VIII.–11.IX.

Pseudeuparius sepicola (Fabricius, 1792)
Hajnówka: [241A] 1 ex. 25.VI.–8.VIII.

Bostrichidae

Lyctus pubescens Panzer, 1792
Białowieża: [606D] 1 ex. 19.V.–20.VI.

Rhyzopertha dominica (Fabricius, 1792)
Browsk: [58E] 1 ex. 22.VI.–7.VIII.
Remarks: A cosmopolitan species, which has been introduced to many countries from the Indo-Malayan region. In the tropics, it develops on the branches of various tree species. In the temperate zone, the larvae have adapted to feeding in cereal grains and in stored food products (Burakowski *et al.* 1986, Borowski & Węgrzynowicz 2012). The Białowieża Forest is the second locality in Poland, in which this species has been found in natural conditions, i.e. outside of the synanthropic environments (Klejdysz & Nawrot 2010).

Ciidae

Orthocis linearis (Sahlberg J. R., 1901)
Browsk: [40A] 1 ex. 19.VI.–3.VIII., [157B] 1 ex. 24.V.–20.VI.
Hajnówka: [334A] 1 ex. 25.VI.–9.VIII., [572D] 1 ex. 22.V.–20.VI.
Remarks: Currently, the species has been recorded from the Wielkopolsko-Kujawska Lowland and the Małopolska Upland (Plewa & Królik 2013). At the turn of the 19th and 20th centuries, it was reported also from the Masovian Lowland and the Eastern Beskidy Mountains (Królik 2002, 2008).

Cleridae

Korynetes caeruleus (De Geer, 1775)
Browsk: [760C] 1 ex. 8.VIII.–13.IX., [121B] 1 ex. 21.VI.–6.VIII., [181A] 1 ex. 21.VI.–6.VIII., [97C] 1 ex. 23.V.–20.VI.
Hajnówka: [435C] 1 ex. 19.V.–24.VI.

Coccinellidae

Nephus quadrimaculatus (Herbst, 1783)
Białowieża: [450D] 1 ex. 20.V.–22.VI.
BPN: [317C] 1 ex. 24.V.–21.VI., [371B] 1 ex. 20.V.–23.VI.

Oenopia impustulata (Linnaeus, 1767)
Browsk: [740C] 2 exx. 17.V.–23.VI., [34C] 1 ex. 21.VI.–7.VIII.

Corylophidae

Arthrolips nana (Mulsant et Rey, 1861)
Białowieża: [581C] 1 ex. 18.V.–20.VI.
Browsk: [157B] 1 ex. 24.V.–20.VI.
Hajnówka: [384A] 3 exx. 24.VI.–7.VIII., [438A] 1 ex. 18.V.–24.VI., [438A] 1 ex. 24.VI.–7.VIII.

Cryptophagidae

Antherophagus similis Curtis, 1835
Browsk: [8C] 1 ex. 19.VI.–3.VIII.

Ephistemus reitteri Casey, 1900
Browsk: [126C] 1 ex. 24.V.–20.VI.
Hajnówka: [438A] 2 exx. 24.VI.–7.VIII.

Ootypus globosus (Waltl, 1838)
Browsk: [156D] 1 ex. 6.VIII.–9.IX.

Curculionidae

Xyleborus dryographus (Ratzeburg, 1837)
Białowieża: [544B] 1 ex. 22.VI.–8.VIII.
Hajnówka: [359A] 1 ex. 9.VIII.–14.IX., [438A] 2 exx. 18.V.–24.VI.

Dasytidae

Dasytes fusculus (Illiger, 1801)
BNP: [105D] 1 ex. 22.VI.–9.VIII.

Trichoceble floralis (Olivier, 1790)
Białowieża: [392D] 1 ex. 24.VI.–7.VIII.
BNP: [344B] 1 ex. 22.V.–20.VI.
Browsk: [82C] 1 ex. 19.VI.–4.VIII., [76D] 1 ex. 21.VI.–7.VIII.
Hajnówka: [414C] 1 ex. 18.V.–24.VI., [537B] 1 ex. 19.V.–23.VI.

Elateridae

Cidnopus pilosus (Leske, 1785)
Browsk: [769B] 1 ex. 17.V.–23.VI.

Podeonius acuticornis (Germar, 1824)
Białowieża: [308A] 1 ex. 25.V.–24.VI.
BNP: [315A] 1 ex. 20.V.–25.VI.
Remarks: So far, the species has been known only from Rogalin on the Warta River near Poznań (Buchholz 1987). This species is listed in the Polish Red Data Book of Animals as well as in the IUCN Red List of Threatened Species (category CR – critically endangered) (Pawłowski *et al.* 2002, Buchholz 2004a).

Larval development takes place in the hollows of oaks or beeches. Larvae are predatory and feed on small larvae of other insects, e.g. beetles from the genus *Cossonus* Schellenberg J. R., 1798 or on larvae of mycetophilid flies. Larval development lasts at least three years (Buchholz 1987, 2004a).

Sericus subaeneus (Redtenbacher W., 1842)
Hajnówka: [462B] 1 ex. 18.V.–24.VI.
Remarks: Thus far, the species has been recorded only from Southern Poland. A summary of the literature of this species was presented by Tarnawski *et al.* (2007). The species is listed in the Polish Red Data Book of Animals and in the IUCN Red List of Threatened Species (category VU – vulnerable species) (Pawłowski *et al.* 2002, Buchholz 2004b).

The species inhabits moist soils that are rich in organic matter, preferably in cool and shaded sites. Larvae live in soil under moss and herbaceous plants, feeding on their underground parts. The development of the species takes 3–4 years (Burakowski 2002).

Endomychidae

Symbiotes gibberosus (Lucas P. H., 1846)
Browsk: [48D] 1 ex. 25.V.–19.VI.
Hajnówka: [597A] 1 ex. 19.V.–23.VI.
Remarks: The species has been recorded very rarely. Nowadays known from the Wielkopolsko-Kujawska Lowland (Jałoszyński & Konwerski 2005, Przewoźny 2013), Lower and Upper Silesia (Szołtys & Grzywocz 2014).

Eucnemidae

Isorhipis melasoides (Laporte, 1835)
Białowieża: [581C] 7 exx. 18.V.–20.VI., [581C] 1 ex. 20.VI.–4.VIII., [610B] 1 ex. 18.V.–20.VI., [610B] 1 ex. 20.VI.–4.VIII., [610B] 1 ex. 4.VIII.–8.IX., [605A] 1 ex. 20.VI.–8.VIII., [606D] 1 ex. 20.VI.–8.VIII.
BNP: [224C] 1 ex. 23.V.–23.VI., [315A] 1 ex. 20.V.–25.VI., [315A] 2 exx. 25.VI.–8.VIII., [189A] 1 ex. 24.V.–24.VI., [132B] 1 ex. 25.V.–22.VI., [162C] 2 exx. 24.V.–22.VI., [162C] 1 ex. 22.VI.–8.VIII., [191A] 2 exx. 24.V.–23.VI., [258B] 7 exx. 24.V.–22.VI.
Browsk: [5D] 1 ex. 25.V.–19.VI., [48D] 2 exx. 19.VI.–4.VIII., [82C] 2 exx. 25.V.–19.VI., [769B] 1 ex. 8.VIII.–13.IX., [117C] 2 exx. 22.V.–21.VI., [76D] 1 ex. 21.VI.–7.VIII., [156D] 1 ex. 24.V.–20.VI.
Hajnówka: [334A] 1 ex. 22.V.–25.VI., [384A] 2 exx. 19.V.–24.VI., [438A] 1 ex. 24.VI.–7.VIII., [462B] 2 exx. 18.V.–24.VI., [414C] 1 ex. 18.V.–24.VI., [439D] 1 ex. 18.V.–24.VI., [519C] 1 ex. 18.V.–22.VI., [542A] 1 ex. 17.V.–22.VI., [604C] 1 ex. 17.V.–20.VI., [483B] 1 ex. 23.VI.–5.VIII., [537B] 1 ex. 19.V.–23.VI., [571A] 6 exx. 22.V.–23.VI., [571A] 1 ex. 23.VI.–5.VIII., [601C] 1 ex. 18.V.–20.VI., [599B] 2 exx. 18.V.–20.VI.
Remarks: The species is rare and sporadically encountered. So far, it has been recorded from six regions in Poland (Hilszczański *et al.* 2015).

The larval development takes place in moist, yet still undecomposed hardwood of broadleaved trees (Burakowski 1991, Buchholz 2008). The

authors (RP and TJ) observed infested hardwood of standing dead beech (*Fagus sylvatica* L.) infested with tinder fungus (*Fomes fomentarius* L. (Fr.)) in Wielkopolsko-Kujawska Lowland (vicinity of Koźminiec village, 17.II.2016).

Histeridae

Carcinops pumilio (Erichson, 1834)
Browsk: [743A] 1 ex. 23.VI.–8.VIII.

Laemophloeidae

Cryptolestes weisei (Reitter, 1880)
Hajnówka: [697B] 1 ex. 17.V.–21.VI.

Laemophloeus monilis (Fabricius, 1787)
Białowieża: [248D] 1 ex. 25.V.–24.VI.

Lathropus sepicola (Müller P. W. J., 1821)
BNP: [107A] 1 ex. 22.VI.–8.VIII.

Latridiidae

Corticaria crenicollis Mannerheim, 1844
Hajnówka: [629D] 1 ex. (male), 18.V.–21.VI.
Remarks: New species for Poland. It has been recently recorded from the Białowieża Forest based on two specimens (male and female, ex cult. VI.2013) reared from rotting wood of aspen (*Populus tremula* L.) (unpublished data, see Hilszczański *et al.* 2014 for detailed characteristics of the habitat). The species is known from few European countries: the Czech Republic (Bohemia), Slovakia (Zahradník 2017), Bosnia and Herzegovina, Belarus, Russia (Central and North European Territory), Finland, Norway and Sweden as well as from Asia: Russia (east and west Siberia) (Johnson 2007).

The existing data on *C. crenicollis* habitats are not conclusive. Some of literature data refer to the association of this species with dead wood and wood-decaying fungi living under the bark of aspen, birch (*Betula* spp.) and oak (*Quercus* spp.) (e.g. Rücker 1992). However, other studies suggest the relationship between *C. crenicollis* and ants, namely *Formica rufa* Linneaus (Päivinen *et al.* 2002). On the other hand, earlier records indicate the connection of this species with synanthropic environments, i.e. old wine cellars (Strzelczyk & Stegner 1992). The present study indicates that *C. crenicollis* is also a forest species.

Corticaria foveola (Beck, 1817)
Browsk: [747C] 1 ex. (male), 23.VI.–8.VIII.
Remarks: The species was recorded in Poland (from Masurian Lake District) more than 80 years ago (see Horion 1961 and the references cited therein).

Leiodidae

Sciodrepoides alpestris Jeannel, 1934
Hajnówka: [627B] 1 ex. 21.VI.–4.VIII.

Lycidae

Benibotarus taygetanus (Pic, 1905)
BNP: [225B] 1 ex. 22.VI.–8.VIII., [197A] 1 ex. 25.VI.–9.VIII.
Hajnówka: [443B] 1 ex. 25.VI.–9.VIII.
Remarks: So far, the species has been known only from four regions of Poland, i.e. the Masurian Lake District, the Upper Silesia, the Eastern and the Western Beskidy Mountains, and the Bieszczady Mountains (Burakowski *et al.* 1985, Szafraniec *et al.* 1999, Szczepański *et al.* 2015, Plewa & Borowski 2016, Twardy 2016).

Melandryidae

Anisoxya fuscula (Illiger, 1798)
Białowieża: [446A] 1 ex. 20.V.–22.VI.
Browsk: [155A] 1 ex. 20.VI.–5.VIII

Osphya bipunctata (Fabricius, 1775)
Białowieża: [671C] 10 exx. 18.V.–20.VI.
Browsk: [754B] 2 exx. 17.V.–23.VI.
Hajnówka: [487D] 1 ex. 18.V.–22.VI., [489A] 2 exx. 18.V.–22.VI., [601C] 1 ex. 18.V.–20.VI.
Remarks: A rare species, known only from few localities, mainly in Western and Southern Poland (Kubisz *et al.* 2014).
The results of recent studies carried out in the oak stands indicate its preferences for treetops (Plewa *et al.* 2011, 2014, 2017).

Mycetophagidae

Litargus balteatus LeConte, 1856
Hajnówka: [575D] 1 ex. 17.V.–22.VI.
Remarks: Sub-cosmopolitan expansive species known in Poland since 1991 (Burakowski *et al.* 2000).

Ptinidae

Hemicoelus fulvicornis (Sturm J., 1837)
Białowieża: [403D] 1 ex. 19.VI.–4.VIII.

Ptinus pilosus Müller P. W. J., 1821
Browsk: [40A] 1 ex. 19.VI.–3.VIII., [155A] 1 ex. 24.V.–20.VI., [155A] 1 ex. 20.VI.–5.VIII.

Ripiphoridae

Pelecotoma fennica (Paykull, 1799)
Browsk: [82C] 1 ex. 19.VI.–4.VIII.

Salpingidae

Rabocerus gabrieli (Gerhardt, 1901)
BPN: [287B] 1 ex. 22.V.–19.VI.

Staphylinidae

Acrotona parens (Mulsant et Rey, 1852)
Browsk: [743A] 1 ex. 23.VI.–8.VIII.
Hajnówka: [331C] 1 ex. 24.VI.–9.VIII., [359A] 1 ex. 25.V.–24.VI.

Amischa (*Amischa*) *filum* (Mulsant et Rey, 1870)
Browsk: [156D] 1 ex. 6.VIII.–9.IX.
Remarks: Third country record. The species was recorded as new for Poland from Zawoja, southern Poland (Melke & Szafraniec 2003) and recently also from the Karkonosze Mountains (Mazur *et al.* 2016).

Atheta (*Mocyta*) *amplicollis* (Mulsant et Rey, 1874)
Hajnówka: [247A] 1 ex. 25.VI.–8.VIII., [275D] 1 ex. 25.VI.–8.VIII., [385C] 1 ex. 24.VI.–7.VIII., [575D] 1 ex. 22.VI.–6.VIII.
Remarks: Second country record. Previously the species has been recorded from Wrocław-Wojnów (Borowiec 1990).

Atheta (*Microdota*) *boreella* Brundin, 1948
BNP: [258B] 1 ex. 22.VI.–7.VIII.
Browsk: [156D] 1 ex. 20.VI.–6.VIII.
Remarks: Fourth country record. Recently recorded from Babia Góra (Melke & Szafraniec 2003).

Atheta (*Badura*) *cauta* (Erichson, 1837)
Hajnówka: [385C] 1 ex. 19.V.–24.VI.

Atheta (*Mocyta*) *clientula* (Erichson, 1839)
Browsk: [178A] 1 ex. 21.VI.–6.VIII., [769B] 1 ex. 23.VI.–8.VIII.
Remarks: The species is rarely collected. Recently recorded from Lower Silesia (Klukowski *et al.* 2010).

Atheta (*Atheta*) *pfaundleri* Benick G., 1940
BNP: [313B] 1 ex. 8.VIII.–15.IX.
Remarks: Second country record. Previously the species has been recorded from Poland from Borecka Forest (Melke & Maciejewski 1999).

Calodera riparia Erichson, 1837
Hajnówka: [438A] 1 ex. 18.V.–24.VI.

Carpelimus (*Trogophloeus*) *heidenreichi* Benick L., 1934
Hajnówka: [359A] 1 ex. 24.VI.–9.VIII., [438A] 1 ex. 24.VI.–7.VIII.
Browsk: [149B] 1 ex. 21.VI.–6.VIII., [743A] 1 ex. 23.VI.–8.VIII.
Remarks: Third country record. Previously the species has been recorded from Lublin Upland (Staniec 2000) and Kampinos Forest (Marczak *et al.* 2013).

Carpelimus (*Taenosoma*) *lindrothi* (Palm, 1943)
Browsk: [52B] 1 ex. 23.V.–19.VI.

Carpelimus (*Trogophloeus*) *subtilis* (Erichson, 1839)
Hajnówka: [273C] 1 ex. 23.V.–25.VI., [331C] 1 ex. 25.V.–24.VI., [438A] 1 ex. 18.V.–24.VI.

Dochmonota rudiventris (Eppelsheim, 1886)
Hajnówka: [438A] 1 ex. 18.V.–24.VI.
Białowieża: [606D] 1 ex. 19.V.–20.VI.
Browsk: [156D] 1 ex. 24.V.–20.VI.
Remarks: Third country record. Recently recorded in the vicinities of Skwierzyna (Renner & Messutat 2007).

Enalodroma hepatica (Erichson, 1839)
Białowieża: [641B] 1 ex. 20.VI.–4.VIII.
Hajnówka: [666B] 1 ex. 20.VI.–3.VIII.

Euconnus (*Cladoconnus*) *denticornis* (Müller P. W. J. et Kunze, 1822)
Hajnówka: [517B] 1 ex. 18.V.–22.VI.
Browsk: [740C] 1 ex. 23.VI.–8.VIII.
Remarks: One of the few presently known localities in Poland. Recently the species was recorded in the vicinity of Poznań (Jałoszyński 2003).

Euconnus (*Euconnus*) *hirticollis* (Illiger, 1798)
Hajnówka: [542A] 1 ex. 17.V.–22.VI.

Eutheia scydmaenoides Stephens, 1830
Białowieża: [451B] 1 ex. 8.VIII.–15.IX.
BNP: [283B] 1 ex. 20.V.–25.VI.
Hajnówka: [442E] 1 ex. 22.VI.–7.VIII.

Euthiconus conicicollis (Fairmaire, 1855)
BNP: [194B] 1 ex. 22.VI.–8.VIII.

Holobus flavicornis (Lacordaire, 1835)
Hajnówka: [271A] 1 ex. 24.V.–25.VI.

Meotica filiformis (Motschulsky, 1860)
Hajnówka: [384A] 1 ex. 24.VI.–7.VIII., [438A] 2 exx. 18.V.–24.VI., [438A] 2 exx. 24.VI.–7.VIII., [464C] 1 ex. 18.V.–22.VI.
Białowieża: [451B] 1 ex. 25.VI.–8.VIII.
BNP: [162C] 1 ex. 24.V.–22.VI., [162C] 1 ex. 22.VI.–8.VIII., [258B] 1 ex. 24.V.–22.VI., [314D] 1 ex. 20.V.–25.VI.
Browsk: [5D] 1 ex. 25.V.–19.VI., [6B] 1 ex. 25.V.–19.VI., [95B] 1 ex. 23.V.–21.VI.
Remarks: The species was recorded as new for Poland about a decade ago (Renner & Messutat 2007). Recently also found in Kampinos Forest (Marczak *et al.* 2012) and in the Spała-Rogów forests complex (Mokrzycki *et al.* 2013).

Othius volans Sahlberg J. R., 1876
Browsk: [1B] 1 ex. 17.V.–19.VI.
Remarks: Third country record. Previously known only from Borecka Forest (Melke & Maciejewski 1999) and from the Słowińskie Błota Reserve, by the Baltic Sea (Sławska & Smoleński 2003).

Philonthus (*Philonthus*) *jurgans* Tottenham, 1937
Browsk: [127A] 1 ex. 24.V.–20.VI.
Remarks: Rarely encountered species. Recently recorded in the Gipsowa Góra Reserve, in Silesia (Melke & Grzywocz 2002), and from the Częstochowska Upland (Kościelny 2005).

Phloeonomus sjobergi Strand, 1937
Browsk: [153D] 1 ex. 20.VI.–5.VIII., [178A] 1 ex. 21.VI.–6.VIII.

Quedius truncicola Fairmaire, 1856
Browsk: [79C] 1 ex. 22.VI.–4.VIII.

Reichenbachia juncorum (Leach, 1817)
Białowieża: [581C] 1 ex. 18.V.–20.VI.
Remarks: Rarely found, recently recorded from Świętokrzyskie Mountains (Byk 2007).

Scydmaenus hellwigii (Herbst, 1792)
BNP: [162C] 1 ex. 22.VI.–8.VIII., [225B] 1 ex. 22.VI.–8.VIII., [283B] 1 ex. 25.VI.–8.VIII., [319D] 1 ex. 22.V.–23.VI., [346C] 1 ex. 22.V.–26.VI.
Browsk: [23B] 1 ex. 7.VIII.–13.IX., [48D] 1 ex. 19.VI.–4.VIII., [80B] 1 ex. 19.VI.–4.VIII., [182D] 1 ex. 21.VI.–6.VIII., [188C] 1 ex. 20.VI.–5.VIII., [740C] 1 ex. 23.VI.–8.VIII.
Hajnówka: [333C] 1 ex. 22.V.–24.VI., [383A] 1 ex. 24.VI.–5.VIII., [464C] 1 ex. 22.VI.–7.VIII., [597A] 1 ex. 19.V.–23.VI., [669B] 1 ex. 20.VI.–3.VIII., [627C] 1 ex. 21.VI.–4.VIII.

Thamiaraea hospita (Märkel, 1845)
BNP: [317C] 1 ex. 8.VIII.–9.IX.
Hajnówka: [391A] 1 ex. 25.VI.–9.VIII.

Tachinus (*Tachinus*) *bipustulatus* (Fabricius, 1793)
Hajnówka: [334A] 1 ex. 25.VI.–9.VIII.
BNP: [258B] 1 ex. 22.VI.–7.VIII.

Tachinus (*Tachinus*) *marginatus* (Fabricius, 1793)
BNP: [228A] 1 ex. 20.V.–23.VI.
Remarks: The species is currently very rarely encountered. Last records were published several decades ago (Trella 1929, Szujecki 1963).

Tinotus morion (Gravenhorst, 1802)
Browsk: [156D] 1 ex. 24.V.–20.VI.

Tenebrionidae

Pentaphyllus testaceus (Hellwig, 1792)
Białowieża: [252B] 1 ex. 25.V.–25.VI.

Tetratomidae

Tetratoma fungorum Fabricius, 1790
Hajnówka: [663C] 1 ex. 17.V.–21.VI.

Throscidae

Trixagus leseigneuri Muona, 2002
Browsk: [46A] 1 ex. 19.V.–21.VI.
Hajnówka: [384A] 3 exx. 7.VIII.–12.IX.
Remarks: Thus far, the species has been recorded in two regions of Poland: the Wielkopolsko-Kujawska Lowland (Renner & Messutat

2007, Przewoźny 2011) and Upper Silesia (Szołtys & Grzywocz 2014).

The species was recently separated from the very similar *T. carinifrons* (Bonvouloir, 1859) (Muona 2002).

Zopheridae

Synchita separanda (Reitter, 1882)

Białowieża: [426A] 1 ex. 20.V.–25.VI.

Remarks: The species has been encountered very rarely, currently known from two regions of Poland: the Wielkopolsko-Kujawska Lowland and the Pomeranian Lake District (Kubisz *et al.* 2015).

4. Discussion

Our research revealed 69 Coleoptera species new for the fauna of the Polish part of Białowieża Forest, despite the fact that this area has been considered relatively well known in this respect (Gutowski & Jaroszewicz 2001, 2004). To our best knowledge, only few other studies have recently provided data on so many new species for this area (e.g. Szujecki 2001, Greń *et al.* 2017). Considering the relatively most up-to-date list by Gutowski and Jaroszewicz (2004), with 3,138 Coleoptera species, later publications in which new species were recorded (e.g. Greń *et al.* 2017), unpublished materials (K. Sućko, pers. comm.), as well as our results, the total number of known beetle species of the Białowieża Forest is approximately 3,250.

The large number of new species in the present study can be explained by two main reasons. First, the intensive trapping effort with both the number of traps used and the duration of trapping. This holds for both, taxa with different habitat requirements and phenology, since traps were located in various areas of the Białowieża Forest and were exposed for almost the entire growing season of 2017. Second, the large number of species collected may be explained by the high effectiveness of the traps used in our study.

The multiple funnel trap was invented by Dr. Staffan Lindgren (hence the name *Lindgren funnel trap*) (Lindgren 1983). These traps are successfully used for surveying, monitoring and, to a lesser extent, control of bark- and wood-boring beetles, mainly scolytids, buprestids, and cerambycids. In recent years, a number of trap modifications were designed in order to optimize trapping of the target insects. These include the length of the trap (e.g. Miller & Crowe 2010), trap color (Francese *et al.* 2010) and the use of various substances to increase the slipperiness of the trap surface and therefore enhance its efficacy (Francese *et al.* 2013). Taking into account the results of our research, as well as those of other authors, which show the high effectiveness of the trap type used here, these traps might be a very useful tool for studies focusing on various families of beetles.

Many of the captured beetles were caught in small numbers, which may reflect their rarity in the studied area. In fact, the list of the present study includes species, which are considered very rare or even absent in many areas. Particularly noteworthy are dead wood-dependent (saproxylic) species: *Podeonius acuticornis*, *Isorhipis melasoides*, *Synchita separanda*, *Trixagus leseigneuri*, *Symbiotes gibberosus* and *Benibotarus taygetanus*. Some other species, however, were captured relatively frequently, hence it is difficult to explain their absence in previous studies. The answer may be, again, the high efficiency of the traps used for trapping in the present study, and/or the increase of these species' abundances to the level, which allowed their detection.

In conclusion, the Białowieża Forest remains one of the most important areas regarding fauna of beetles. Using multiple funnel traps, as well as other trapping techniques, more new species could be detected in this area.

Acknowledgements. The authors would like to thank Wolfgang H. Rücker (Neuwied, Germany) for identification of Latridiidae. We also thank two anonymous reviewers who provided helpful comments on earlier drafts of the manuscript. The study was financed by the Polish State Forests, National Forest Holding under the project number 500-443.

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