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Bogdan Wiśniowski [1], Agata Jirak-Leszczyńska[2]

Additions to the list of pteromalid wasps (Hymenoptera: Chalcidoidea, Pteromalidae) of Ojców National Park in Poland with records of seven species new to the Polish fauna

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[1] University of Rzeszów, Institute of Agricultural Sciences, Land Management and Environmental Protection, 1 Ćwiklińskiej Str., 35-601 Rzeszów, Poland,
ORCID: https://orcid.org/0000-0001-7101-9233, e-mail: bogdan.w@hotmail.com

[2] Complex of Landscape Parks of the Małopolskie Voivodeship, 1A Vetulaniego Str., 31-227 Kraków,
ORCID: https://orcid.org/0000-0002-3715-384X, e-mail: agata.jirak@gmail.com

Abstract: As a result of studies twenty-seven species of pteromalid wasps (Hymenoptera: Chalcidoidea: Pteromalidae) are recorded for the first time from Ojców National Park in southern Poland. One species, namely *Stinoplus jenningsi* Askew is newly recorded for continental Europe (known so far only from United Kingdom). Seven species are new to the Polish fauna: *Dibrachys fuscicornis* (Walker), *Eurydinota leptomera* Foerster, *Kaleva corynocera* Graham, *Plutothrix coelius* (Walker), *S. jenningsi*, *Syntomopus incisus* Thomson, and *Trigonoderus filatus* Walker. The other species are: *Callitula bicolor* Spinola, *Catolaccus ater* (Ratzeburg), *Cerocephala cornigera* Westwood, *Cheiropachus quadrum* (Fabricius), *Dinotiscus aponius* (Walker), *Dipara petiolata* Walker, *Gastracanthus pulcherrimus* Westwood, *Habritys brevicornis* (Ratzeburg), *Holcaeus stylatus* Graham, *Merismus nitidus* (Walker), *Merisus flagellatus* Boucek, *Mesopolobus dubius* (Walker), *M. fasciiventris* Westwood, *Platygerrhus ductilis* (Walker), *Plutothrix bicolorata* (Spinola), *Pseudocatolaccus nitescens* (Walker), *Pteromalus bedeguaris* (Thomson), *P. hieracii* (Thomson), and *Sphegigaster pallicornis* (Spinola). Currently, thirty-five species of pteromalid wasps are known from Ojców National Park, which is ca. 12% of the Polish Pteromalidae.

Key words: Chalcidoidea, Pteromalidae, parasitoids of xylophagous insects, parasitoids of forest pests, new records, distribution, faunistics.

INTRODUCTION

The hymenopteran family Pteromalidae Dalman, 1820 is one of the largest in the superfamily Chalcidoidea, with more than 3,500 species described in 588 genera (Noyes 2021), distributed worldwide. Morphologically diversified, with body length from 1 mm to

ca. 50 mm in the genus *Leptofenus* Smith, 1862 (Fernandes *et al.* 2019). Almost all European pteromalids are either recognized to be or thought to be parasitoids of other insects at various stages of their development: some species are egg parasitoids (sometimes predators), other develop in larvae, pupae, or even adult insects (Bouček & Rasplus 1991). Most hosts are larvae living in galls, or under bark; pteromalids may be ecto- or endoparasitoids, primary or secondary parasites (hyperparasites). Many species are of economic importance as they reduce populations of numerous insect pests of cultivated plants: in forestry and agriculture. Generally, the family is poorly studied in Poland. The first checklist of Polish species was published in 1997 (Wiśniowski 1997) and listed 265 species known mostly from single localities. The list was later updated by Jałoszyński (2016), who recorded two species of *Mesopolobus* Westwood, 1833 new to the fauna of Poland.

The first checklist of the family Pteromalidae of Ojców National Park was published in 2016 (Wiśniowski 2016). The list included only eight species: *Anogmus hohenheimensis* (Ratzeburg, 1844) (Skrzypczyńska 1995, 2004), *Cratomus megacephalus* (Fabricius, 1793) (Wiśniowski 1993, 2008), *Dinotiscus eupterus* (Walker, 1836) (Król & Ząbecki 1976), *Heydenia pretiosa* Foerster, 1856 (Wiśniowski 2007), *Lonchetron fennicum* Graham, 1956 (Wiśniowski 1993, 2008), *Mesopolobus pinus* Hussey, 1960 (Skrzypczyńska 1995, 2004), *Mesopolobus zetterstedtii* (Dalla Torre, 1898) (Skrzypczyńska 1995, 2004), and *Spalangia nigripes* Curtis, 1839 (Wiśniowski 2007).

This study aims to update the information concerning pteromalid wasps in both Ojców National Park and Poland.

MATERIAL AND METHODS

The specimens were either collected or reared over quite a long period of time during inventory research of various groups of Hymenoptera of Ojców National Park led by the first author while working for the Park. Most pteromalids were swept with a net in various habitats, quite often during inspection of fallen logs of forest trees. In some cases Moericke traps filled with ethylene glycol and water were used. The traps were emptied in ten-days intervals.

Some specimens were reared from galls collected usually in January because this allowed to start breeding under laboratory conditions immediately, without additional hibernation or freezing (which already was done under natural conditions). The galls were placed in glass jars covered with dense gauze and kept at room temperature; a few drops of water were added every third day to keep moisture in breeding jars. Emerging insects were collected, killed with ethyl acetate and glued onto triangular mounting cards. The same mounting procedure was applied to specimens collected with entomological net.

Specimens were either collected or reared by the first author, unless otherwise stated. Specimens were verified or determined by Dr. Mircea-Dan Mitroiu (Romania). The studied specimens are housed in the collection of the first author.

The species are listed in alphabetical order within subfamilies. For each locality, the UTM code is given. Notes on biology and distribution follow mainly Noyes (2021); additional sources are referenced when needed (e.g. records from Poland after Wiśniowski (1997)).

The images were taken with Nikon SMZ1270 stereomicroscope with DeltaPix Invenio 12EIII camera with DeltaPix InSight software. Stacks were combined with CombineZP software and then retouched using Adobe Photoshop 2021.

RESULTS

Family: **Pteromalidae** Dalman, 1820

Subfamily: Cerocephalinae Gahan, 1946

Cerocephala cornigera Westwood, 1832 (Fig. 1)

[DA16] Ojców: 20.06.1988, 1♀, on wooden wall; [DA16] Miotełka: 5.07.1989, 1♀, on wooden wall.

Distribution (in alphabetical order). Africa: Egypt, Tunisia; Asia: Armenia, Caucasus, Iran, Israel, Philippines; Europe: Belgium, Czech Republic, Denmark, France, Germany, Italy, Macedonia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, United Kingdom (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Associated with many species of scolytinae beetles (Coleoptera: Curculionidae Latreille, 1802: Scolytinae Latreille, 1804) of the following genera: *Hylesinus* Fabricius, 1801, *Phloeosinus* F. Chapuis, 1869, *Phloeotribus* Latreille, 1797, and *Scolytus* Geoffroy, 1762, developing on trees of the family Cupressaceae (*Thuja* L.) and Oleaceae (*Fraxinus* L., *Olea* L.), as well as beetles of the subfamily Anobiinae Fleming, 1821 (Coleoptera: Ptinidae Latreille, 1802) (Noyes 2021).

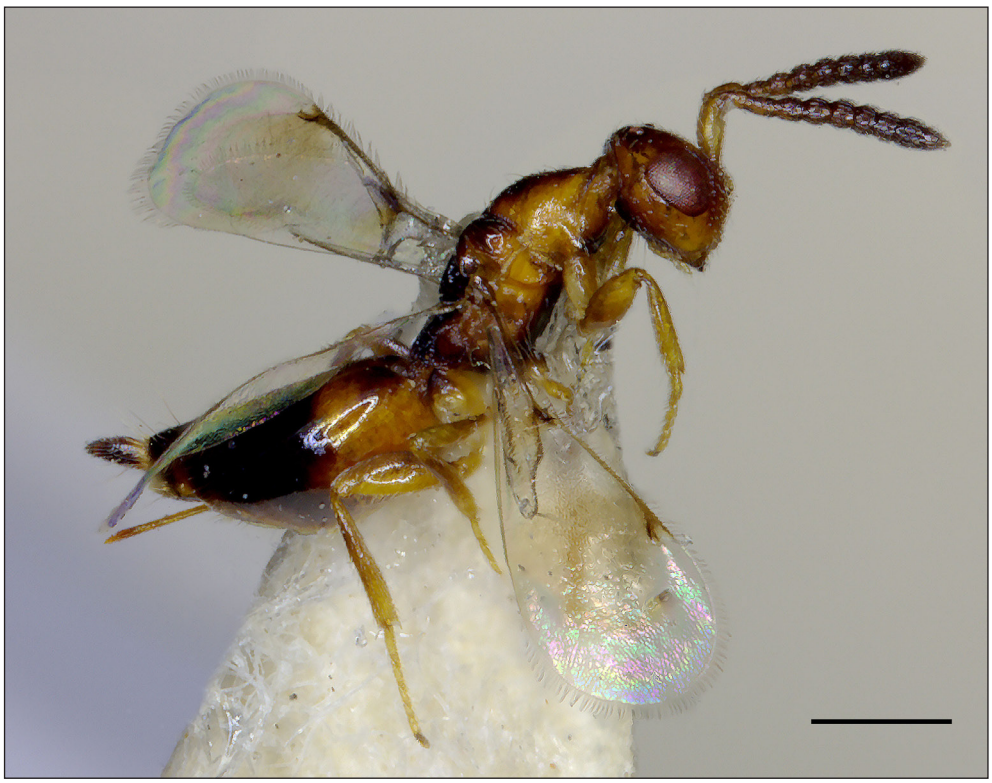

Fig. 1. *Cerocephala cornigera.* Female, lateral view. Scale bar = 0.5 mm.

Subfamily: Diparinae Thomson, 1876

Dipara petiolata Walker, 1833 (Fig. 2)

[DA16] Ojców, Złota Góra slope: 15-29.06.2003, 2♀♀, Moericke trap in oak-hornbeam forest (*Tilio-Carpinetum*).

Distribution. Asia: Iran; Europe: Belgium, Croatia, Czech Republic, Germany, Hungary, Italy, Moldova, Netherlands, Poland, Romania, Slovakia, Spain, Sweden, United Kingdom; North America: USA (Wiśniowski 1997, Gibson *et al*. 2021, Noyes 2021).

Biology: Biology unknown, but probably lives parasitic on larvae of some curculionid beetles (Coleoptera: Curculionidae) on roots of plants (Bouček & Rasplus 1991). According to Noyes (2021) curculionid beetle *Anthonomus gemmicola* Ter-Minassian, 1960 is primary host, but the beetle was not recorded from Poland, so far.

Fig. 2. *Dipara petiolata.* Female, lateral view. Scale bar = 0.5 mm.

Subfamily: Miscogastrinae Walker, 1833

Merismus nitidus (Walker, 1833)

[DA16] Młynnik: 15.04.2017, 2♀♀, reared from galls of *Lipara pullitarsis* Doskočil & Chvála, 1971 (Diptera: Chloropidae Verral, 1888) on *Phragmites australis* (Cav.) Trin. ex Steud.

Distribution. Asia: China; Europe: Belgium, Croatia, Czech Republic, Germany, Ireland, Netherlands, Poland, Romania, Sweden, Switzerland, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: The species of the genus *Merismus* Walker, 1833 are mainly parasitoids of leaf mining Diptera; primary parasitoid in pupae of *Cnemacantha rorida* (Fallén, 1820) (Diptera: Lauxaniidae Macquart, 1835) (László 2007).

Subfamily: Pteromalinae Dalman, 1820

Callitula bicolor Spinola, 1811

[DA16] Młynnik: 28.04.2017, 1♀, reared from galls of *Lipara pullitarsis* (Diptera: Chloropidae) on *Phragmites australis*.

Distribution. Africa: Morocco (Kissayi *et al.* 2021), North Africa; Asia: Azerbaijan, China, Iran, Kazakhstan, Russia (Siberia), Transcaucasus; Europe: Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Macedonia, Moldova, Netherlands, Poland, Portugal, Russia, Romania, Serbia, Slovakia, Spain (mainland and Canary Island), Sweden, Switzerland, Ukraine, United Kingdom; North America: Canada, USA (Wiśniowski 1997, Gibson *et al*. 2021, Noyes 2021).

Biology: Associated with many species of cecidomyid and chloropid flies developing on cereals (oat and wheat), including pests of economic importance, e.g. Hessian fly *Mayetiola destructor* (Say, 1817) (Cecidomyiidae Newman, 1835) and frit fly *Oscinella frit* (Linnaeus, 1758) (Chloropidae). Bouček & Rasplus (1991) mentioned reed *Phragmites australis* as an associated plant of *C. bicolor*, but neither the authors nor Noyes' database give information on *Lipara pullitarsis* as possible host of the pteromalid. *Lipara*-galls are always inhabited by a community of flies and wasps, including other chloropid flies. The actual host in this case cannot be defined with certainty (Noyes 2021).

Catolaccus ater (Ratzeburg, 1852)

[DA16] Dolina Sąspowska, Zabugaje: 1.07.1992, 1♀, in *Origano-Brachypodietum*.

Distribution. Asia: Armenia, Iran, Kazakhstan, Kirgizia, Russia (Central Asia, Primor'ye Kray, Siberia), Transcaucasus, Turkey, Turkmenistan; Europe: Austria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Moldova, Poland, Russia, Romania, Serbia, Slovakia, Spain (mainland and Canary Islands), Sweden, Ukraine, United Kingdom (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Associated with insects of various orders. Primary hosts include curculionid beetles (Coleoptera: Curculionidae), cecidomyid flies (Diptera: Cecidomyiidae), butterflies and moths (Lepidoptera: Erebiidae: Arctiinae Leach, 1815, Lymantriinae Hampson, 1893; Gelechiidae Stainton, 1854; Geometridae Leach, 1815; Noctuidae Latreille, 1809; Nymphalidae Rafinesque, 1815; Pieridae Swainson, 1820; Tortricidae Latreille, 1803; Yponomeutidae Stephens, 1829). Parasitoid hosts include hymenopterans of the family Bethylidae Foerster, 1856, Braconidae Latreille, 1829, and Ichneumonidae Latreille, 1802 (Noyes 2021). According to Bouček & Rasplus (1991) *C. ater* is a hyperparasite via *Apanteles* Foerster, 1862 (Braconidae).

Cheiropachus quadrum (Fabricius, 1787)

[DA16] Ojców: 8.06.1988, 1♀, on a log of European ash *Fraxinus excelsior* L.; [DA15] Ojców, Dolina Prądnika: 20.07.1988, 4♀♀ & 2♂♂, on logs of European ash *F. excelsior*; [DA16] Ojców: 28.05.1990, 1 ♂.

Distribution. Africa: Egypt, Morocco, Tunisia; Asia: Armenia, Caucasus, China, India,

Iran, Israel, Kazakhstan, Kirgizia, Lebanon, Pakistan, Turkey, Turkmenistan; Europe: Austria, Belgium, Bosnia Hercegovina, Croatia, Czech Republic, France, Germany, Hungary, Italy, Macedonia, Moldova, Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain (mainland and Canary Islands), Sweden, Switzerland, Ukraine, United Kingdom; North America: Canada, USA; South America: Argentina, Chile (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Primary host are among many species of xylophagous beetles developing in trees mainly of the family Fagaceae (*Quercus* L.), Rosaceae (*Cydonia* Mill., *Malus* Mill, *Prunus* L., *Pyrus* L.) and Ulmaceae (*Ulmus* L.). Most of host species represent the family Curculionidae (*Magdalis* Germar, 1824), especially subfamily Scolytinae (*Dryocoetes* Eichhoff, 1864, *Hylesinus*, *Ips* De Geer, 1775, *Phloeosinus*, *Phloeotribus*, *Pityogenes* Bedel, 1888, and many species of *Scolytus*) (Bouček & Rasplus 1991, Noyes 2021).

Dibrachys fuscicornis (Walker, 1836)

[DA16] Bukówki: 21.05.2012, 1♀, in Moericke' trap on wooden building, leg. R. Kaźmierczak.

First record to the Polish fauna.

Distribution. Europe: Bulgaria, Germany, Moldova, Netherlands, Poland (hereby recorded), Romania, Spain, Sweden, United Kingdom; North America: USA (Noyes 2021).

Biology: Primary hosts are known in the order Hymenoptera (Tenthredinidae Latreille, 1807), and Lepidoptera (Erebidae: Lymantriinae, Yponomeutidae) (Noyes 2021).

Dinotiscus aponius (Walker, 1848)

[DA16] Ojców: 8.06.1988, 1♀, 20.07.1988, 7♀♀ & 1♂, on logs of European ash *Fraxinus excelsior*.

Distribution. Asia: Armenia, China, Japan, Transcaucasus; Europe: Belgium, Czech Republic, Finland, France, Germany, Hungary, Ireland, Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovakia, Sweden, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Associated as primary parasitoid with many species of scolytinae beetles (Coleoptera: Curculionidae: Scolytine) of the following genera: *Dendroctonus* Erichson, 1836, *Hylesinus*, *Ips*, *Scolytus*, *Tomicus* Latreille, 1802, and *Xyleborus* Eichhoff, 1864, developing on trees of the family Betulaceae (*Betula* L.), Oleaceae (*Fraxinus*), Rosaceae (*Malus*), and Ulmaceae (*Ulmus*). Parasitoid hosts are known in the family Braconidae (*Coeloides filiformis* Ratzeburg, 1852, *C. melanotus* Wesmael, 1838) (Noyes 2021).

Eurydinota leptomera Foerster, 1878

[DA16] Ojców: 30.04.1992, 1♀, on window at the museum of Ojców National Park.

First record to the Polish fauna.

Distribution. Asia: Iran, Russia's Far East; Europe: Austria, Croatia, France, Germany, Italy, Poland (hereby recorded), Romania, Slovakia, Sweden (Bouček & Rasplus 1991, Gibson *et al.* 2021, Noyes 2021).

Biology: The parasitoid is associated with willows *Salix* L., but insect hosts are unknown (Bouček & Rasplus 1991, Noyes 2021).

Gastracanthus pulcherrimus Westwood, 1833

[DA16] Ojców: 12.06.1997, 1♀, on window at home; [DA16] Ojców, 'Drewniana Droga': 11.08.1997, 1 ♀, in oak-hornbeam forest (*Tilio-Carpinetum*),

Distribution. Asia: Iran; Europe: Belgium, Croatia, Czech Republic, Finland, France, Germany, Hungary, Ireland, Moldova, Netherlands, Poland, Romania, Slovakia, Spain, Sweden, United Kingdom (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Parasitoid of beetles of the family Buprestidae Leach, 1815 (*Sphenoptera* Dejean, 1833) and Byrrhidae Latreille, 1804 (*Byrrhus fasciatus* Forster, 1770). Associated with trees and shrubs of the family Betulaceae (*Betula*, *Corylus avellana* L.), Fagaceae (*Fagus sylvatica* L.), and Salicaceae (*Salix*).

Habritys brevicornis (Ratzeburg, 1844)

[DA16] Ojców, Krakowska Brama: 22.07.1989, 2♀♀, 28.06.1990, 1♀, on logs of black alder (*Alnus glutinosa* (L.) Gaertn.); [DA16] Ojców: 27.04.1991, 3♀♀, on window at home; [DA16] Dolina Zachwytu: 20.04.1993, 1♀, on logs of silver poplar (*Populus alba* L.).

Distribution. Asia: Iran (Hassan-Pashai-Mehr & Lotfalizadeh 2015), Kazakhstan; Europe: Belgium, Croatia, Czech Republic, Finland, France, Germany, Hungary, Netherlands, Poland, Romania, Serbia, Slovakia, Spain, Sweden, United Kingdom; North America: Canada, USA (Wiśniowski 1997, Gibson *et al*. 2021, Noyes 2021).

Biology: Host records include beetles (Coleoptera: Lymexylidae Fleming, 1821, Curculionidae: Scolytinae), flies (Diptera: Stratiomyidae Latreille, 1802), digger wasps (Hymenoptera: Crabronidae Latreille, 1802), and moths (Lepidoptera: Tortricidae), but most probably *H. brevicornis* is a parasitoid of crabronidae wasps nesting in decaying wood (Bouček & Rasplus 1991).

Holcaeus stylatus Graham, 1969

[DA16] Dolina Sąspowska: 8.06.1988, 1♀, on white fir logs (*Abies alba* Mill.).

Distribution. Asia: Russia (Primor'ye Kray); Europe: Czech Republic, Germany, Netherlands, Poland, Sweden, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Hosts unknown; probably parasite of Diptera developing in decaying wood (Bouček & Rasplus 1991).

Kaleva corynocera Graham, 1957 (Fig. 3)

[DA16] Miotełka: 26.06.1989, 1♀, on wall of wooden house.

First record to the Polish fauna.

Distribution. Asia: Azerbaijan, Kazakhstan; Europe: Belgium, Bulgaria, Croatia, Czech Republic, Moldova, Poland (hereby recorded), Romania (Mitroiu 2011), Serbia, Spain, Sweden, United Kingdom (Noyes 2021).

Biology: primary parasitoid of *Spilomena troglodytes* (vander Linden, 1829) (Hymenoptera: Crabronidae) nesting in insect tunnels in dead wood of pedunculate oak *Quercus robur* L. (Graham, 1969).

Fig. 3. *Kaleva corynocera.* Female, lateral view. Scale bar = 0.5 mm.

Merisus flagellatus Boucek, 1965

[DA16] Grodzisko: 27.07.1992, 1♀, in *Origano-Brachypodietum*.

Distribution. Asia: Kazakhstan, Russia (Primor'ye Kray); Europe: Czech Republic, Germany, Hungary, Moldova, Poland, Spain, Sweden (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid of wasps of the genus *Eurytoma* Illiger, 1807 (Hymenoptera: Eurytomidae Walker, 1832) developing in stems of reed grass *Calamagrostis* Adans. (Poaceae) (Noyes 2021). According to Bouček & Rasplus (1991) primary hosts are wasps of the genus *Tetramesa* Walker, 1848 (Hymenoptera: Eurytomidae) developing in grass stems.

Mesopolobus dubius (Walker, 1834)

[DA16] Dolina Sąspowska: 1.07.1992, 1♀, swept on leaves of *Quercus* L.

Distribution. Asia: Turkey; Europe: Andorra, Belgium, Croatia, Czech Republic, France, Germany, Hungary, Italy, Netherlands, Poland, Romania, Spain, Sweden, Ukraine, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid of gall wasps (Hymenoptera: Cynipidae Latreille, 1802) of the genera: *Andricus* Hartig, 1840, *Biorhiza* Westwood, 1840, *Cynips* Linnaeus, 1758, *Dryocosmus* Giraud, 1859, *Neuroterus* Hartig, 1840, *Trigonaspis* Hartig, 1840, and others developing on various species of *Quercus* (Noyes 2021).

Mesopolobus fasciiventris Westwood, 1833

[DA16] Dolina Zachwytu: 6.03.1990, 1♀ & 1♂, reared from galls of *Cynips longiventris* Hartig, 1840 on leaves of *Quercus robur*.

Distribution. Europe: Andorra, Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Moldova, Netherlands, Poland, Romania, Spain, Sweden, Ukraine, United Kingdom; North America: USA (Wiśniowski 1997, Noyes 2021).

Biology: Primary hosts of this parasitoid wasp are gall wasps (Hymenoptera: Cynipidae) of the genera: *Andricus*, *Biorhiza*, *Cynips*, *Diplolepis* Geoffroy, 1802, *Dryocosmus*, *Neuroterus*, and *Trigonaspis* developing on various species of *Quercus*. Parasitoid hosts are known in hymenopteran families Cynipidae *Synergus* Hartig, 1840), Eulophidae Westwood, 1829 (*Aulogymnus* Foerster, 1851, *Tetrastichus* Haliday, 1844), Eurytomidae, and Torymidae Walker, 1833 (Noyes 2021).

Platygerrhus ductilis (Walker, 1836)

[DA16] Ojców, north facing slope of Złota Góra: 14.06.1990, 1♀, on windfelled log of Norway spruce (*Picea abies* (L.) H. Karst.).

Distribution. Europe: Bulgaria, Croatia, Czech Republic, Hungary, Moldova, Montenegro, Netherlands, Poland, Romania, Serbia, Slovakia, Sweden, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid of beetles of the subfamily Anobiinae (Coleoptera: Ptinidae) and Scolytinae (*Ips*, *Scolytus*, *Tomicus*) developing in trees and shrubs (Noyes 2021).

Plutothrix bicolorata (Spinola, 1808) = *P. scenicus* (Walker, 1836)

[DA16] Grodzisko: 6.10.1987, 1♀, in *Origano-Brachypodietum*, leg. A. Klasa; [DA16] Ojców, North facing slope of Złota Góra: 14.06. 1990, 1♀, on windfelled log of Norway spruce (*Picea abies*).

Distribution. Europe: Belgium, Croatia, Czech Republic, Finland, Germany, Hungary, Italy, Moldova, Netherlands, Poland, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid of beetles of the subfamily Anobiinae (Coleoptera: Ptinidae) (Noyes 2021).

Plutothrix coelius (Walker, 1839)

[DA16] Ojców, North facing slope of Złota Góra: 14.06. 1990, 1♀, on windfelled log of Norway spruce (*Picea abies*).

First record to the Polish fauna.

Distribution. Europe: Belgium, Croatia, Germany, Hungary, Moldova, Netherlands, Norway, Poland (hereby recorded), Romania, Sweden, United Kingdom (Noyes 2021).

Biology: Parasitoid of beetles of the subfamily Anobiinae (*Anobium punctatum* (De Geer, 1774)), and scolytinae curculionids (*Xylechinus pilosus* Ratzeburg, 1837) (Noyes 2021).

Pseudocatolaccus nitescens (Walker, 1834)

[DA16] Miotełka: 17.08.1989, 3♀♀, on wooden wall of a house; [DA16] Ojców, 30.04.1992, 11♀♀, on window at the museum of Ojców National Park.

Distribution. Africa: Morocco; Asia: Kazakhstan, Turkey; Europe: Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Macedonia, Moldova, Montenegro, Netherlands, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain (mainland and Canary Islands), Sweden, Switzerland, Ukraine, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Associated with some beetle species (Coleoptera: Chrysomelidae Latreille, 1802: Bruchinae Latreille, 1802, e.g. *Bruchidius unicolor* Olivier, 1795; Curculionidae, e.g. *Cionus thapsi* Germar, 1821), as well as many species of cecidomyid flies (Diptera: Cecidomyiidae) developing on various plants (Noyes 2021). According to Bouček & Rasplus (1991) parasite in galls of Cecidomyiidae on herbaceous plants.

Pteromalus bedeguaris (Thomson, 1878)

[DA16] Ojców, serpentine road: 31.01-4.03.1987, 14♀♀ & 7♂, reared from galls of *Diplolepis rosae* (Linnaeus, 1758) (Hymenoptera: Cynipidae) on *Rosa canina* L.; [DA16] Grodzisko: 1-15.04.1990, 27♀♀ & 22♂♂; 2.07.1992, 3♀♀, on leaves of *Rosa* sp. in *Origano-Brachypodietum*; [DA16] Iwiny: 25.02.1997, 2♀♀ & 1♂, reared from galls of *D. rosae* on *Rosa* sp.; [DA16] Grodzisko, 'Skały Ciche': 10.03.1997, 13♀♀ & 12♂♂, reared from galls of *D. rosae* on *Rosa* sp.; [DA16] Ojców, Złota Góra: 10.03.1997, 4♀♀, reared from galls of *D. rosae* on *Rosa* sp.

Distribution. Asia: Iran, Kazakhstan, Kirgizia, Russia (Central Asia), Tadzhikistan, Transcaucasus, Turkey, Uzbekistan; Europe: Andorra, Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom; North America: Canada, USA (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Parasitoid in galls on various species of *Rosa* L. Primary hosts are gall waps of the genus *Diplolepis* as well as *Periclistus* Foerster, 1869 (Hymenoptera: Cynipidae). Parasitoid hosts are hymenopterans of the family Ichneumonidae Latreille, 1802 (*Orthopelma luteolator* Gravenhorst, 1829, *O. mediator* Thunberg, 1822), and Torymidae Walker, 1833 (*Glyphomerus stigma* Fabricius, 1793, *Torymus bedeguaris* (Linnaeus, 1758)) (Noyes 2021).

Pteromalus hieracii (Thomson, 1878)

[DA16] Ojców, serpentine road: 22.02.1997, 3♀♀ & 6♂♂, reared from stems of *Crepis biennis* L. with inner galls caused by an unknown galls wasp of the genus *Phanacis* Foerster, 1860 (Hymenoptera: Cynipidae).

Distribution. Europe: Andorra, Czech Republic, Denmark, France, Germany, Hungary, Netherlands, Poland, Spain, Sweden, Ukraine, United Kingdom (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid in galls caused by various species of gall wasps (Hymenoptera: Cynipidae) of the following genera: *Aulacidea* Ashmead, 1897, *Aylax* Hartig, 1840, *Biorhiza*, *Diastrophus* Hartig, 1840, *Isocolus* Foerster, 1869, *Phanacis*, *Timaspis* Mayr, 1881. Galls are formed on plants of the family Asteraceae Bercht. & Prsl., and Papaveraceae Juss. (Noyes 2021).

Sphegigaster pallicornis (Spinola, 1808) = *S. flavicornis* (Walker, 1833)

[DA16] Ojców, Stanisławówka: 1.05.1992, 1♀, on window at home.

Distribution. Asia: Kazakhstan, Turkey; Europe: Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Hungary, Ireland, Italy, Moldova, Netherlands, Poland, Romania, Serbia, Slovakia, Spain, Sweden, United Kingdom; North America: Canada (Wiśniowski 1997, Noyes 2021).

Biology: Parasitoid of leaf-miner flies of the genus *Phytomyza* Fallen, 1810 (Diptera: Agromyzidae Fallen, 1823) (Noyes 2021).

Stenomalina gracilis (Walker, 1834)

[DA16] Ojców, Stanisławówka: 5.02.1987, 12♀♀, 11.02.1987, 7♀♀, 1.05.1992, 17♀♀, on window at home.

Distribution. Africa: Morocco; Asia: China, Iran; Europe: Belgium, Croatia, Czech Republic, Germany, Hungary, Italy, Moldova, Montenegro, Netherlands, Poland, Romania, Serbia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom; North America: Canada (Wiśniowski 1997, Gibson *et al.* 2021, Noyes 2021).

Biology: Primary hosts are known in order Coleoptera: Curculionidae (e.g. various species of the genus *Ceutorhynchus* Germar, 1824), order Diptera: Agromyzidae (species of the genera *Agromyza* Fallén, 1810, *Melanagromyza* Hendel, 1920, *Phytomyza* Fallén, 1810 and others), Calliphoridae Brauer & Bergenstamm, 1889, Cecidomyiidae, Chloropidae, and Tephritidae Newman, 1834, order Hymenoptera (Cynipidae), and Lepidoptera (Tortricidae) (Noyes 2021). Commonly encountered on house windows during winters (Bouček & Rasplus 1991).

Stinoplus jenningsi Askew, 2011 (Fig. 4)

[DA16] Ojców, serpentine road: 8.03.1990, 2♀♀, reared from stems of *Crepis biennis* L. with inner galls caused by an unknown galls wasp of the genus *Phanacis* (Hymenoptera: Cynipidae).

New for continental Europe! First record to the Polish fauna.

Distribution. So far, known only from United Kingdom (Noyes 2021); Poland (hereby recorded).

Biology: Primary host is gall wasp *Timaspis lusitanica* Tavares, 1904 (Hymenoptera: Cynipidae) on *Crepis biennis* (Noyes 2021). In Ojców National Park the species was also reared from *Crepis biennis*, with many other species of parasitic Hymenoptera (compare this paper as well as Wiśniowski & Jirak-Leszczyńska 2021).

Syntomopus incisus Thomson, 1878

[DA16] Ojców, serpentine road: 22.02.1997, 5♀♀ & 4♂♂, reared from stems of *Crepis biennis* with inner galls caused by an unknown galls wasp of the genus *Phanacis* (Hymenoptera: Cynipidae).

First record to the Polish fauna.

Fig. 4. *Stinoplus jenningsi.* Female, lateral view. Scale bar = 0.5 mm.

Distribution. Asia: China, Kazakhstan, Turkey; Europe: Bulgaria, Czech Republic, Germany, Hungary, Italy, Netherlands, Poland (hereby recorded), Romania, Serbia, Slovakia, Spain (mainland and Canary Islands), Sweden, United Kingdom (Noyes 2021).

Biology: Primary hosts are known in order Diptera: Agromyzidae (*Melanagromyza* Hendel, 1920), and Hymenoptera (Cynipidae: *Phanacis hypochoeridis* (Kieffer, 1887)) developing on plants of the family Asteraceae (Noyes 2021). *Crepis biennis* is new host plant for *Syntomopus incisus*.

Trigonoderus filatus Walker, 1836 (Fig. 5)

[DA16] Ojców, slope of Złota Góra, 8.06.1996, 1♀, edge of oak-hornbeam forest (*Tilio-Carpinetum*).

First record to the Polish fauna.

Distribution. Europe: Belgium, Croatia, Czech Republic, France, Germany, Hungary, Netherlands, Poland (hereby recorded), Slovakia, Sweden, United Kingdom (Noyes 2021).

Biology: Parasitoid of longhorn beetle *Pogonocherus hispidus* (Linnaeus, 1758) (Coleoptera: Cerambycidae Latreille, 1802) (Noyes 2021).

Fig. 5. *Trigonoderus filatus.* Female, lateral view. Scale bar = 0.5 mm.

DISCUSSION

As a result of studies on the family of parasitoid wasp twenty- seven species were recorded in the area. One species, namely *Stinoplus jenningsi* is newly recorded for continental Europe (known so far only from United Kingdom). Seven species are new to Polish fauna: *Dibrachys fuscicornis*, *Eurydinota leptomera*, *Kaleva corynocera*, *Plutothrix coelius*, *S. jenningsi*, *Syntomopus incisus*, and *Trigonoderus filatus*. Most interesting community of pteromalids and other parasitic wasps in Ojców National Park was recorded in stems of *Crepis biennis* with inner galls caused by an unknown galls wasp of the genus *Phanacis* (Hymenoptera: Cynipidae).

Currently, thirty-five species of pteromalid wasps are known from Ojców National Park, which is ca. 12% of the Polish fauna (current state of knowledge, but surely still some more species to be recorded). The Park is rich in microhabitats and very diverse as far as plants and insects. Further research, if any will be carried in the future, should bring records of at least another 60-70 species of pteromalid wasps from this very diverse area.

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