

A review of the subfamily Acaenitinae Förster, 1869 (Hymenoptera, Ichneumonidae) from Ukrainian Carpathians

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Academic editor: Francisco Hita Garcia

Abstract

Ichneumonid wasps of the subfamily Acaenitinae Förster, 1869 are reviewed for the first time from the Ukrainian Carpathians. Two species, *Coleocentrus exareolatus* Kriechbaumer, 1894 and *C. heteropus* Thomson, 1894 are new records for Ukraine. *Arotes annulicornis* Kriechbaumer, 1894 is considered to be a junior synonym of *A. albicinctus* Gravenhorst, 1829 (**syn. nov.**). A key to species of *Coleocentrus* of the Carpathians is provided.

Keywords

Parasitoids, Ichneumonidae, Acaenitinae, Ukraine, new records, new synonymy

Introduction

The subfamily Acaenitinae Förster, 1869 worldwide includes about 344 species placed in 27 genera, 8 genera and 42 species of which are found in the Western Palaearctic (Yu et al. 2012).

Rather little is known of the biology of acaenitines. Some Acaenitini are koinobiont endoparasitoids (Shaw and Wahl 1989, Zwakhals 1989). These authors observed that *Acaenitus dubitator* (Panzer, 1800) develops as a koinobiont endoparasitoid of an endophytic curculionid. The female wasp oviposits into first and second instar host larvae and parasitization appeared to retard host development. Three ichneumonid larval instars were discerned and the final instar apparently killed its host about the time unparasitized weevil larvae were pupating. The acaenitine larva then spun a tough parchment-like cylindrical cocoon within the host's pupation chamber (Shaw and Wahl 1989).

The Ukrainian Carpathians are part of the Eastern Carpathians mountain chain and rise in the west of Ukraine within the Lviv, Ivano-Frankivsk, Transcarpathian and Chernivtsi regions. The Carpathians of Ukraine extend from north-west to south-east as a stripe 270 km in length and 100-110 km in width. The Ukrainian Carpathians have an average height of 1000 m and the highest point is 2061 m a.s.l., with relatively soft rocks. Such high-altitude zones as foothill oak forest zone (300–400 m a.s.l.), beech forest zone (400–1300 m a.s.l.), coniferous boreal forest zone (900–1600 m a.s.l.), subalpine and alpine zone (1400–2061 m a.s.l.) can be recognised.

The Acaenitinae fauna of Ukraine is poorly studied. Up to now, there are only 10 recorded species (Besser 1835, Meyer 1934, Kasparyan 1981), but there are no data about distribution of the acaenitins in the Ukrainian Carpathians, while the Romanian fauna is more species-rich and comprises 22 species (Constantineanu and Pisica 1977), some of which can possibly also be distributed in the Ukrainian part of the Carpathians.

Materials and methods

This study is mainly based on specimens collected by standard sweep netting in various locations in the Ukrainian Carpathians in 2009-2013. The material deposited in the collection of the Vasyl Stefanyk Precarpathian National University in Ivano-Frankivsk was also studied. The *ovipositor-hind tibia index* (in text OTI), which is the length of the ovipositor projecting beyond the apex of the metasoma divided by the length of the hind tibia, is used. Terminology was Townes (1969) followed. Some specimens of European species of acaenitines were examined from the following collections:

HNHM: Hungarian Natural History Museum, Hungary;

ZMLU: Lunds Universitet, Zoologiska Institutionen, Sweden;

ZIN: Zoological Institute, Russian Academy of Sciences, Russia.

Taxon treatments

Arotes Gravenhorst, 1829

Type species

Arotes albicinctus

Diagnosis

This genus is characterized by the combination of the following characters: clypeus transverse and basally flat, with transverse ridge, supra-antennal area with crest between antennal sockets, propodeum with well defined carinae, claws of all tarsi with appressed acute tooth, fore wing with areolet absent, intercubitus distal

to vein 2m-cu, first metasomal tergite with white long setae on lateral and ventral parts.

***Arotes albicinctus* Gravenhorst, 1829**

Nomenclature

Arotes annulicornis Kriechbaumer, 1894, syn. nov.

Materials

- a. country: Ukraine; stateProvince: Transcarpathian Region, Rakhiv District; verbatimLocality: 4 km NE of Kvasy; verbatimElevation: 1000 m; verbatimLatitude: 48° 10' 19.08" N; verbatimLongitude: 24° 18' 09.16" E; eventDate: 15 June 2012; individualCount: Varga; sex: female; recordedBy: Varga; occurrenceID: 227706D0-357E-5F69-B067-89CD89AB35F2
- b. country: Ukraine; stateProvince: Transcarpathian Region, Rakhiv District; verbatimLocality: 4 km NE of Kvasy; verbatimElevation: 1000 m; verbatimLatitude: 48° 10' 19.08" N; verbatimLongitude: 24° 18' 09.16" E; eventDate: 24 June 2013; sex: 1 male, 2 females; recordedBy: Varga; occurrenceID: 25DDC219-07C5-5C57-AE8B-8240B17B8F70

General features: Fore wing 13 mm long. Nervellus broken near the middle. Mandible with lower tooth longer than upper tooth. Flagellum with 37 segments. Head polished, face and partly clypeus with median longitudinal wrinkles. In dorsal view temples parallel behind eyes. Notauli strong. Mesopleuron, metapleuron, scutellum, mid and hind coxa and hind femur densely and clearly punctate. Metasoma polished, without well defined punctation. OTI 2.3. Hind femur robust.

Female. Head, mesosoma and metasoma black. Coloration of first and second tergites varies (see "Taxon discussion") (Fig. 1a, b, c). Clypeus and mandibles black. Flagellum black with white ring, scape and pedicel black. Legs black: all coxae, trochanters and trochantelli almost black, fore and mid tibiae and tarsi ventrally, apex of fore and mid femora, base of hind femur and tibia and tarsomeres 2–5 of hind tarsus white.

Male. Coloration as in female, but differs by face, tegula entirely and pedicel partly yellow. Flagellum yellow ventrally, without white ring. First and second tergites with wide apical light stripes (Fig. 1d).

Distribution

Albania (Kolarov 1992), Austria (Kazmierczak 1991), Azerbaijan (Meyer 1934), Belarus (Tereshkin 1989), Bulgaria (Kolarov 1997), China (Sheng and Sun 2007), former Czechoslovakia (Sedivy 1989), Finland (Hellén 1940), France (Aubert 1968), Georgia (Meyer 1934), Germany (Horstmann 2001), Hungary (Aubert 1969), Iran (Masnadi-Yazdinejad et al. 2010), Italy (Masi 1948), Korea (Uchida 1955),

Netherlands (Zwakhals 1989), Poland (Kazmierczak 2004), Portugal (Blanchard 1840), Romania (Constantineanu and Pisica 1977), Armenia, Russia (Altay Terr., Chita Reg., Irkutsk Reg., Khabarovsk Terr., Primor'ye Terr.) (Kasparyan and Khalaim 2007), Spain (Anento and Selfa 1996), Turkey (Kolarov 1995), Ukraine (Besser 1835), United Kingdom (Kloet and Hincks 1945).

Hosts: *Plagionotus* (Sheng et al. 2002), *Plagionotus arcuatus* (Constantineanu and Pisica 1977) (Cerambycidae).

Taxon discussion

The main distinguishing characters, between *A. albicinctus* Gravenhorst, 1829 and *A. annulicornis* Kriechbaumer, 1894, given by various authors are the coloration of the first and second tergites of metasoma, which are entirely black in *A. annulicornis* Kriechbaumer, 1894 and light-coloured posteriorly in *A. albicinctus* Gravenhorst, 1829, and pterostigma, which is reddish centrally in *A. annulicornis* Kriechbaumer, 1894 and entirely fuscous in *A. albicinctus* Gravenhorst, 1829. Kolarov (1997) and Constantineanu and Pisica (1977) gave another character, the length of ovipositor sheaths, which are slightly shorter than body in *A. annulicornis* Kriechbaumer, 1894 and as long as the body in *A. albicinctus* Gravenhorst, 1829.

My examination of the holotype of *A. annulicornis* Kriechbaumer, 1894, which is deposited at HHNM, demonstrated that the first and the second tergites have light-coloured (though very weak) posterior margins. The three of mentioned above females (collected in the same locality) have first and second tergites varies from entirely black to white-striped. The coloration of the pterostigma is also varies in the studied specimens: from yellowish-brown centrally with fuscous margins to entirely fuscous. The ovipositorial sheaths are as long as the body in the specimens with black tergites, so no evident differences between the two species, *A. annulicornis* Kriechbaumer, 1894 and *A. albicinctus* Gravenhorst, 1829, may be found. *A. annulicornis* Kriechbaumer, 1894 is therefore a junior synonym (syn. nov.).

Notes

The another European species, *A. ustulatus* Kriechbaumer, 1894, differs from *A. albicinctus* Gravenhorst, 1829 in coloration of legs (which are red except coxae) and in the possession of a fuscous spot on the apex of the fore wing.

***Coleocentrus* Gravenhorst, 1829**

Type species

Ichneumon excitator

Diagnosis

This genus is characterized by the combination of the following characters: clypeus transverse and basally flat, apex with median tubercle, supra-antennal area without crest between antennal sockets, epicnemial carina absent, propodeum with carinae varying from complete to absent (usually only dorsal longitudinal carinae), claws of fore and mid tarsi simple, fore wing with areolet present (petiolate triangular) or absent; if absent (*C. exareolatus* Kriechbaumer, 1894), then intercubitus basal to vein 2m-cu, tergites 2–3 of metasoma with basolateral grooves, male parameres with ventral emargination.

Coleocentrus exareolatus Kriechbaumer, 1894

Materials

- a. country: Ukraine; stateProvince: Transcarpathian Region, Rakhiv District; verbatimLocality: 4 km NE of Kvasy; verbatimElevation: 1000 m; verbatimLatitude: 48° 10' 19.08" N; verbatimLongitude: 24° 18' 09.16" E; eventDate: 27 May 2011; sex: 2 males; recordedBy: Varga; occurrenceID: 2EE23DCD-C099-50A7-A13B-4FADE0F0A7ED
- b. sex: female; institutionCode: ZIN; occurrenceID: 8BDE5E5F-576E-5B66-BB7B-9A041737D2D6

General features: Fore wing 17 mm long (in female) and 12-14 mm long (in male), areolet absent. Nervellus broken at upper 0.25. Mandible with equal teeth or lower tooth slightly longer than upper tooth. Flagellum with 37-38 segments. Head polished. In dorsal view temples parallel to narrowed behind eyes. Propodeum with weak apical carina. Metasoma matt, without well defined punctation. OTI 2.7.

Female. Head and mesosoma black. Clypeus basally black, apically brownish. Mandibles black. Flagellum brownish. Pterostigma yellowish. Tegula yellow. Legs generally red, fore and mid tibia and tarsus yellowish-red, hind tibia and tarsus fuscous. Metasoma black with narrow apical white bands on tergites.

Male. Head and mesosoma black. Face and clypeus black. Mandibles black. Flagellum black. Scape and pedicel yellow dorsally. Pterostigma yellowish. Tegula yellow. Legs: hind coxa red, fore and mid coxae, trochanters and trochantelli, tibiae and fore tarsus yellow, fore and mid femora, hind trochanter and trochantellus yellowish-red, hind tibia and tarsus fuscous. Metasoma black with narrow apical white bands on tergites.

Distribution

Belarus (Tereshkin 1987), Bulgaria (Kolarov 1997), Germany (Horstmann 2001), Hungary (Kiss von Zilah 1924), Latvia (Ozols 1958), Poland (Kazmierczak 2004), Romania (Constantineanu and Pisica 1977), Russia (Kamchatka Reg., Sankt

Petersburg, Sakhalin Reg., Khabarovsk Terr., Primor'ye Terr.) (Meyer 1934, Kasparyan and Khalaim 2007), new for Ukraine.

Hosts: Unknown.

Notes

The female of another European species with fore wing without areolet, *C. soldanskii* Bischoff, 1915, has black coxae and two yellow spots on the lower part of face.

Coleocentrus excitator (Poda, 1761)

Materials

- a. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 5 May 2012; sex: male; recordedBy: Varga; occurrenceID: 73E4ADF2-8EE9-562D-85C3-3DD975432E23
- b. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 6 May 2012; sex: male; recordedBy: Varga; occurrenceID: DF5187CC-7535-5129-BEFE-15D019923B68
- c. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 12 May 2012; sex: 2 females; recordedBy: Varga; occurrenceID: E89EF07B-E955-53A7-B0A2-87B4A84C10CE
- d. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 19 May 2012; sex: female; recordedBy: Varga; occurrenceID: 83B9B75F-A4E3-57B3-8689-373E73C887B3
- e. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 29 May 2012; sex: 1 male, 3 females; recordedBy: Varga; occurrenceID: F29672C6-3B84-5CB4-9EFB-6E55CEA511E5
- f. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 30 May 2011; sex: female; recordedBy: Varga; occurrenceID: C86896AD-E066-5B20-BAA8-D8A3AABFDDDD9
- g. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 31 May 2012; sex: 6 females; recordedBy: Varga; occurrenceID: 4213BDF9-831A-57B6-AC83-CF6BBF0F8056

- h. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 4 June 2011; sex: female; recordedBy: Varga; occurrenceID: 7414B68E-0261-59A1-91B5-E5574C8E4660
- i. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mochary; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 10 June 2012; sex: 5 females; recordedBy: Varga; occurrenceID: B9A2957B-3B2F-57C0-95B9-A8AD75EC7A09
- j. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Mocharyorodchany, 5 May 2012; verbatimLocality: 5 km NE of Bogorodchany; verbatimElevation: 300-350 m; verbatimLatitude: 48° 50' 51.17" N; verbatimLongitude: 24° 35' 26.91" E; eventDate: 25 June 2012; sex: female; recordedBy: Varga; occurrenceID: 3C401FCA-0254-5A7C-B001-062B92491B2F
- k. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimLocality: 7-8 km SW of Bogorodchany; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 23 May 2012; sex: 2 males, 1 female; recordedBy: Varga; occurrenceID: 4E0938E6-D3FA-5DAA-BFC9-73B5FA43FDB3
- l. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimLocality: 7-8 km SW of Bogorodchany; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 26 May 2012; sex: male; recordedBy: Varga; occurrenceID: D0F55C47-257C-56E4-A374-067BC749A0DE
- m. country: Ukraine; stateProvince: Zhbyr; verbatimLocality: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 24 June 2012; sex: female; recordedBy: Varga; occurrenceID: 0257B2AF-6EBA-551E-B8A1-8C0FE8C5FA6A
- n. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Dibrova.28"E, 310 m, oak forest, 5 km SW of Bogorodchany, 14 June 2012; verbatimLocality: 5 km SW of Bogorodchany; verbatimElevation: 310 m; verbatimLatitude: 48° 46' 10.35" N; verbatimLongitude: 24° 30' 20.28" E; eventDate: 14 June 2012; sex: 2 females; recordedBy: Varga; occurrenceID: D521A1DC-D985-5D3B-B0FC-90107BAC4B0C
- o. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Gorgany; verbatimLocality: 5 km SW of Stara Guta; verbatimElevation: 1200 m; verbatimLatitude: 48° 36' 42.77" N; verbatimLongitude: 24° 09' 10.69" E; eventDate: 8-9 June 2012; sex: 2 males, 2 females; recordedBy: Varga; occurrenceID: 8A4E9946-49AF-527C-9BE4-D6065EFD2B51
- p. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Gorgany; verbatimLocality: 5 km SW of Stara Guta; verbatimElevation: 1200 m; verbatimLatitude: 48° 36' 42.77" N; verbatimLongitude: 24° 09' 10.69" E; eventDate: 14 June 2011; sex: 2 males; recordedBy: Varga; occurrenceID: E2BF9824-5C61-545E-AF0B-04027E91B6DC
- q. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Nadvirna District, Gorgany, Elmy; verbatimLocality: 15 km SW of Yaremche; verbatimElevation: 800-900 m; verbatimLatitude: 48° 24' 39.50" N; eventDate: 9 July 2005; sex: female; recordedBy: Sirenko; occurrenceID: CF6E1F97-3A49-5B49-958C-2B718F4A6DA1

- r. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Nadvirna District, Gorgany, Elmy; verbatimLocality: 15 km SW of Yaremche; verbatimElevation: 800-900 m; verbatimLatitude: 48° 24' 39.50" N; verbatimLongitude: 24° 24' 50.28" E; eventDate: 17 July 2009; sex: female; recordedBy: Sirenko; occurrenceID: BB0AB964-C424-55F2-94A7-FAFA532825B2
- s. sex: female; institutionCode: ZIN; occurrenceID: 19E5648B-CC33-52B8-A629-16621665BAE3

General features: Fore wing 18-20 mm long (in female) and 13-14 mm long (in male), areolet present. Nervellus broken at upper 0.25. Mandible with equal teeth or lower tooth slightly longer than upper tooth. Flagellum with 39-40 segments (in female) and 40-44 segments (in male). Head polished, sparsely punctate. In dorsal view temples slightly narrowed to slightly widened behind eyes. Mesopleuron densely rugulo-punctate (in female) or with unclear punctation (in male). Propodeum with weak longitudinal carinae over about 0.6-0.7 of its length (in male) or only with weak traces of dorsal longitudinal carinae (in female). Metasoma polished, without well defined punctation. OTI 2.6–2.8.

Female. Head, mesosoma and metasoma black. Face black with two yellow spots. Clypeus basally black, apically sometimes dark-brownish. Mandibles black. Flagellum black. Scape and pedicel reddish dorsally. Pterostigma yellow. Tegula yellow. Legs: hind coxa black, fore and mid coxae black with red apex, all trochanters and trochantelli yellowish-red, all femora, fore and mid tibiae and tarsi red, hind tibia fuscous, tarsomere 1 of hind tarsus partly, tarsomeres 2-5 entirely white. Metasoma black with narrow apical white bands on tergites.

Male. Head and mesosoma black. Face yellow with black central vertical stripe. Clypeus basally black, apically brown. Mandibles black. Flagellum dark-brownish. Scape and pedicel yellow dorsally. Pterostigma yellow. Tegula yellow. Legs: hind coxa black, sometimes reddish in apical 0.2, fore and mid coxae yellowish-red with black base, fore and mid femora, hind trochanter and trochantellus yellowish-red, hind femur and tibia red, fore and mid trochanters and trochantelli, tibiae and fore tarsus, tarsomere 1 of hind tarsus partly, tarsomeres 2-5 entirely white. Metasoma black basally and apically, red medially.

Distribution

Trans-Palaearctic species: Belarus (Tereshkin 1987), Belgium (Wesmael 1849), Bulgaria (Kolarov 1997), China (Hong and Sheng 1997), Croatia (Kolarov 2008), Czech Republic (Zeman and Mocek 2006), Finland, France, Netherlands, Poland, Hungary, Sweden, Switzerland (Aubert 1969), Germany (Horstmann 2001), Italy (Scaramozzino 1986), Lithuania (Constantineanu and Jonaitis 1979), Norway (Riedel et al. 2000), Romania (Constantineanu and Pisica 1977), Russia (Astrakhan Reg., Moscow Reg., Omsk Reg., Primor'ye Terr., Sakhalin Reg., Sankt Petersburg, Yaroslavl Reg.) (Meyer 1934, Kasparyan 1981, Kasparyan and Khalaim 2007), Spain (Habermehl 1927), United Kingdom (Shaw 1986), Yugoslavia (Glavendekic and

Kolarov 1994), Ukraine (Kasparyan 1981), widespread and common species in Ukrainian Carpathians.

Hosts: *Acalolepta luxuriosus* (Bates, 1873), *Ergates faber* (Linnaeus, 1761), *Monochamus grandis* (Waterhaus, 1881) (Cerambycidae) (Aubert 1969, Constantineanu and Pisica 1977).

Notes

The female of *C. croceicornis* (Gravenhorst, 1829) is similar to this species, but has yellow flagellum with black base and entirely reddish hind legs. The male of *C. excitator* (Poda, 1761) is similar to the male of *C. soleatus* (Gravenhorst, 1829), but the last one has red with black coloration hind trochanters and trochantelli, entirely yellow face and only tarsomeres 3-5 of hind tarsus entirely white.

***Coleocentrus heteropus* Thomson, 1894**

Materials

Holotype:

- a. sex: female; institutionCode: ZMLU; occurrenceID: 100DED54-F876-56BD-BA3A-E0D17CF8133E

Other materials:

- a. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimLocality: 7-8 km SW of Bogorodchany; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 23 May 2012; sex: 2 males, 2 females; recordedBy: Varga; occurrenceID: 1401A81C-8918-5735-A297-6CC3E2C02B4F
- b. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimLocality: 7-8 km SW of Bogorodchany; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 26 May 2012; sex: male; recordedBy: Varga; occurrenceID: F9CF63E9-8A80-5532-8250-168AC3460F45
- c. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Zhbyr; verbatimLocality: 7-8 km SW of Bogorodchany; verbatimElevation: 400 m; verbatimLatitude: 48° 47' 4.92" N; verbatimLongitude: 24° 28' 46.45" E; eventDate: 24 June 2012; sex: female; recordedBy: Varga; occurrenceID: 85CA768C-A43A-52E9-9826-32BC31C56496
- d. sex: female; institutionCode: ZIN; occurrenceID: E062532F-FF30-595B-BAE0-20DEF26CA887

General features: Fore wing 14-15 mm long (in female) and 9-13 mm long (in male), areolet present. Nervellus broken at upper 0.25. Mandible with equal teeth. Flagellum with 33 segments (in female) to 38 segments (in male). Head polished, without well defined punctation. In dorsal view temples parallel to slightly widened behind eyes. Mesopleuron densely rugulo-punctate. Propodeum only with weak traces of area apicalis or without carinae. Metasoma matt, without well defined punctation. OTI 2.5.

Female. Head, mesosoma and metasoma black. Face black with two small yellow spots or almost black. Clypeus from reddish to dark-brownish. Mandible black. Flagellum almost black. Pterostigma brownish with fuscous margins. Tegula red-yellowish. Legs generally red, all coxae from at least black basally (holotype). to black with only red apex, hind tibia and tarsus fuscous.

Male. Head, mesosoma and metasoma black. Face almost yellow. Clypeus red-brownish. Mandibles black. Flagellum black. Scape yellow dorsally. Pterostigma brownish with fuscous margins. Tegula yellow. Legs: all coxae black basally, apically yellowish-red, fore and mid legs except coxae, hind trochanter and trochantellus yellowish-red, hind femur red, hind tibia and tarsus fuscous.

Distribution

Finland (Hellén 1937), Hungary (Kiss von Zilah 1926), Romania (Constantineanu and Pisica 1977), Sweden (Aubert 1969), new for Ukraine.

Hosts: Unknown.

Notes

The female of *C. caligatus* Gravenhorst, 1829 is similar to this species, but has entirely red hind coxae and more developed carinae of the propodeum. Male of *C. heteropus* Thomson, 1894 is similar to *C. croceicornis* (Gravenhorst, 1829), but the last one has reddish pterostigma and yellow flagellum (with dark base).

***Coleocentrus soleatus* (Gravenhorst, 1829)**

Materials

- a. country: Ukraine; stateProvince: Ivano-Frankivsk Region, Bogorodchany District, Dibrova; verbatimLocality: 5 km SW of Bogorodchany; verbatimElevation: 310 m; verbatimLatitude: 48° 46' 10.35" N; verbatimLongitude: 24° 30' 20.28" E; eventDate: 14 May 2011; sex: male; recordedBy: Varga; occurrenceID: 66A464DA-0E53-5ADD-9776-D09406209C81
- b. country: Ukraine; stateProvince: Transcarpathian Region, Rakhiv District, Lazeschyna; verbatimElevation: 900-950 m; verbatimLatitude: 48° 14' 52.47" N; verbatimLongitude: 24° 24' 29.35" E; eventDate: June 2010; sex: female; recordedBy: Varga; occurrenceID: 09CDDA64-F0DD-5891-813B-69E222927713
- c. sex: male; institutionCode: ZIN; occurrenceID: B57E0207-3E26-5E2B-91F3-5E3402A35F1F

General features: Fore wing 11 mm long (in female) and 12 mm long (in male), areolet present. Nervellus broken at upper 0.25. Mandible with equal teeth. Flagellum with 31 segments (in female) and 33 segments (in male). Head polished, without well defined punctation. In dorsal view temples narrowed behind eyes. Mesopleuron weakly (in female) or densely (in male) rugulo-punctate. Propodeum with very weak longitudinal carinae over its entire length (in male) or only with weak traces of dorsal

longitudinal carinae (in female). Metasoma mat (in female) or polished (in male), without well defined punctation. OTI 1.8.

Female. Head, mesosoma and metasoma generally black. Face almost black. Clypeus black basally, reddish apically. Mandibles reddish basally. Flagellum almost black. Pterostigma brownish with fuscous margins. Tegula reddish-brown. Legs: mid coxae almost black, fore and hind coxae generally red, fore coxa basally, hind coxa apically (0.2) black, all femora, fore and mid tibiae and tarsi red, hind tibia apically and tarsus entirely fuscous, all trochanters and trochantelli red with black coloration. Lateral parts of apical margins of tergites 2-6 red.

Male. Head and mesosoma black. Face almost yellow. Clypeus basally black, apically reddish. Mandibles black. Flagellum reddish-brown. Scape yellowish dorsally. Pterostigma yellowish. Tegula reddish-brown. Legs: hind coxa red with only apical 0.2 black, fore and mid coxae, fore trochanter and trochantellus and all femora red, mid and hind trochanters and trochantelli red with black coloration, fore tibia and tarsus, tarsomere 2 of hind tarsus partly, tarsomeres 3-5 entirely white, mid tibia and tarsus yellowish-red, hind tibia red with fuscous apex. Metasoma black basally and apically, red medially.

Distribution

Bulgaria (Kolarov 1997), China (Jilin, Liaoning) (Sheng and Zhang 1999), Germany (Townes et al. 1965), Hungary (Kiss von Zilah 1926), Korea (Uchida 1955), Poland (Hedwig 1937), Romania (Constantineanu and Pisica 1977), Russia (Caucasus), Ukraine (Kasparyan 1981).

Hosts: Unknown.

Notes

Constantineanu and Pisica (1977) recorded *C. borcei* Constantineanu, 1929 from Romania, which is very similar to the female of *C. soleatus* (Gravenhorst, 1829), but has a fuscous pterostigma (except base), entirely black trochanters, black clypeus and red lateral parts of apical margins of tergites 3-6.

***Phaenolobus* Förster, 1869**

Type species

Ichneumon arator

Diagnosis

This genus is characterized by the combination of the following characters: clypeus transverse and basally flat, apex with median tubercle, supra-antennal area with crest

between antennal sockets, notauli strong, hing femora very thick claws of fore and mid tarsi with appressed acute tooth near apex, fore wing with areolet absent, intercubitus basal to vein 2m-cu.

***Phaenolobus fulvicornis* (Gravenhorst, 1829)**

Material

- a. country: Ukraine; stateProvince: Ivano-Frankivsk; verbatimElevation: 250–300 m; verbatimLatitude: 48° 55' 24.48" N; verbatimLongitude: 24° 42' 40.02" E; eventDate: May–June 2001; sex: female; recordedBy: Sirenko A.; occurrenceID: 701316F9-6DE0-5546-92CE-9BEFF33A8812

General features: *Female*. Fore wing 8 mm long. Nervellus broken at upper third. Mandible with upper tooth a little longer than lower tooth. Flagellum with 23 segments. Head strongly rugulo-punctate. In dorsal view temples narrowed behind eyes. Malar space with subocular groove. Mesopleuron polished, densely and clearly punctate. Head and mesosoma black. Clypeus and mandibles black. Flagellum red-brown, scape and pedicel black. Pterostigma fuscous. Legs: all coxae black, trochanters red and trochantelli, hind femur and basal half of first tergite black, hind tibia and tarsus fuscous, fore and mid femora, tibiae, tarsi and metasoma red.

Distribution

Albania (Kolarov and Andoni 1995), Algeria, Morocco, Israel, Italy, Portugal, Yugoslavia (Aubert 1969), Belarus (Sawoniewicz 2001), Bulgaria, Croatia, Serbia & Montenegro, Turkey (Kolarov 1995, Kolarov 1997, Kolarov 2008), Georgia (Djanelidze 1966), Germany (Horstmann 2001), Hungary (Kiss von Zilah 1926), Iran (Masnadi-Yazdinejad et al. 2010), Russia (Caucasus, Ryazan Reg.) (Kasparyan 1981), Latvia (Ozols 1958), Lithuania (Constantineanu and Jonaitis 1979), Netherlands (Zwakhals 1989), Poland (Hedwig 1937), Romania (Constantineanu and Pisica 1977), Spain (Mazon et al. 2011), Switzerland (Bauer 2002), Ukraine (Kasparyan 1981).

Hosts: *Phytoecia cephalotes* Küster, 1846, *Ph. coeruleascens* (Scopoli, 1763) (Cerambycidae) (Scaramozzino 1986).

Notes

There are another three species of this genus recorded so far from Ukraine, including *Ph. terebrator* (Scopoli, 1763) with black metasoma and red hind femora, *Ph. nigripennis* (Gravenhorst, 1829) with only tergites 2-4 partly red, *Ph. saltans* (Gravenhorst, 1829) which has prepectal carina long, almost reaching subtegular ridge. Constantineanu and Pisica (1977) additionally recorded another 3 new species, described from Romania, *Ph. areolator* (Constantineanu & Constantineanu, 1968) having the entirely black flagellum and ovipositor longer than hind tibia, *Ph.*

atrator (Constantineanu and Pisica, 1977), having the black metasoma and *Ph. mucronatus* (Constantineanu & Constantineanu, 1968) having only tergites 2-4 partly red. But the last two species have also the second metasomal tergite with 2 oblique grooves on each side and that scaracter distinguishes these species from similar *Ph. terebrator* (Scopoli, 1763) and *Ph. nigripennis* (Gravenhorst, 1829) with the same coloration of metasoma respectively (Kolarov and Gürbüz 2010).

Identification keys

Key to species of <i>Coleocentrus</i> in Carpathians		
1	Areolet absent. Hind coxa red. Face of both sexes entirely black (Fig. 2a)	<i>C. exareolatus</i> Kriechbaumer, 1894
–	Areolet present. Hind coxa red to black. At least face of males partly yellow	2
2	Females	3
–	Males	8
3	Hind trochanter and trochantellus red or yellowish-red	4
–	Hind trochanter and trochantellus red with black coloration (Fig. 2b)	7
4	Apical tarsomeres of hind tarsus white. Hind coxa black. Hind trochanter and trochantellus yellowish-red (Fig. 2d)	<i>C. excitator</i> (Poda, 1761)
–	Hind tarsus reddish to fuscous. Hind coxa red to partly black. Hind trochanter and trochantellus red	5
5	Hind tarsus reddish. Hind coxa red. Flagellum yellowish with black base	<i>C. croceicornis</i> (Gravenhorst, 1829)
–	Hind tarsus at least apically fuscous. Hind coxa red to partly black. Flagellum black	6
6	Hind tarsus fuscous apically. Hind coxa red. Propodeum with well defined longitudinal carinae and apical transverse carina	<i>C. caligatus</i> Gravenhorst, 1829
–	Hind tarsus entirely fuscous. Hind coxa at least black basally (Fig. 2f)	<i>C. heteropus</i> Thomson, 1894
7	All trochanters black. Pterostigma fuscous (except base). Clypeus black. Lateral parts of apical margins of tergites 3-6 red	<i>C. borcei</i> Constantineanu, 1929

–	At least fore trochanter partly red. Pterostigma reddish centrally. Clypeus apically red. Lateral parts of apical margins of tergites 2-6 red	<i>C. soleatus</i> (Gravenhorst, 1829)
8	Face black, with only inner margins of eyes yellow. Pterostigma reddish. Flagellum yellowish	<i>C. croceicornis</i> (Gravenhorst, 1829)
–	Face yellow, at most with narrow central vertical black stripe. Pterostigma yellowish or fuscous. Flagellum reddish-brown to black	9
9	Hind tarsus fuscous at least apically. Metasoma entirely black	10
–	Apical tarsomeres of hind tarsus white. Metasoma red centrally	11
10	Hind coxa black basally. Hind tibia and tarsus entirely fuscous	<i>C. heteropus</i> Thomson, 1894
–	Hind coxa black apically. Hind tibia and tarsus red, fuscous apically	<i>C. caligatus</i> Gravenhorst, 1829
11	Hind trochanter and trochantellus yellowish-red. Hind coxa black at least in basal 0.8. Face yellow with black central vertical stripe (Fig. 2c)	<i>C. excitator</i> (Poda, 1761)
–	Hind trochanter and trochantellus red with black coloration. Hind coxa black at most in apical 0.2. Face entirely yellow (Fig. 2e)	<i>C. soleatus</i> (Gravenhorst, 1829)

Acknowledgements

The author would like to express his sincere thanks to D. R. Kasparyan (ZIN) for providing comparative material, Christer Hansson (ZMLU) and Zoltán Vas (HNHM) for sending high-quality photos of the holotypes of *C. heteropus* Thomson, 1894 and *A. annulicornis* Kriechbaumer, 1894 respectively, to Alex Gumovsky (Schmalhausen Institut of zoology NASU) for the discussion of an earlier version of the manuscript, Alexey Reshchikov (Swedish Museum of Natural History), Rikio Matsumoto (Osaka Museum of Natural History), Francisco Hita Garcia (Zoological Research Museum Koenig) for reviewing of the manuscript and Gavin Broad (Natural History Museum, London) for his helpful suggestions and correction of the English text.

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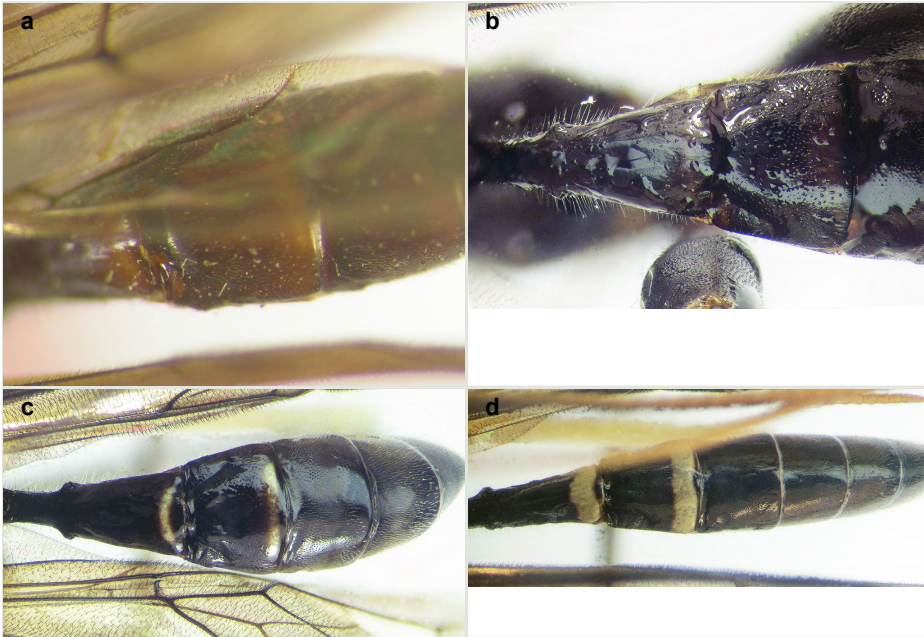


Figure 1.

***Arotes albicinctus* Gravenhorst, 1829.** First and second tergite of metasoma (dorsal view).

a: *Arotes annulicornis* Kriechbaumer, 1894, female (holotype).

b: Female 1, collected in Carpathians.

c: Female 2, collected in Carpathians.

d: Male, collected in Carpathians.



Figure 2.

Coleocentrus. Face of male (frontal view) and hind coxa, trochanter and trochantellus of female (lateral view).

- a: *C. exareolatus* Kriechbaumer, 1894, male, face.
- b: *C. soleatus* (Gravenhorst, 1829), female, hind coxa, trochanter and trochantellus.
- c: *C. excitator* (Poda, 1761), male, face.
- d: *C. excitator* (Poda, 1761), female, hind coxa, trochanter and trochantellus.
- e: *C. soleatus* (Gravenhorst, 1829), male, face.
- f: *C. heteropus* Thomson, 1894, female, hind coxa, trochanter and trochantellus (holotype).