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Description of male of *Leucospis insularis* (Hymenoptera: Chalcidoidea: Leucospidae) with new records and check-list of Chalcidoidea of Socotra Island

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Abstract. A check-list of the Chalcidoidea of Socotra Island based on published data and newly collected material is presented. The male of the endemic species *Leucospis insularis* Kirby, 1900 (Leucospidae) is described for the first time. The following five species are recorded from the Socotra Island for the first time: *Eupelmus orientalis* (Crawford, 1913) (Eupelmidae); *Cryptoprymna atra* (Walker, 1833), *Cyrtoptyx latipes* (Rondani, 1874), *Dinarmoides spilopterus* Masi, 1924 (all Pteromalidae); and *Torymoides kiesenwetteri* (Mayr, 1874) (Torymidae). Altogether 11 species from five families are currently known from Socotra, four species of which are considered to be endemic to the island.

Key words. Hymenoptera, Chalcidoidea, Agaonidae, Eupelmidae, Leucospidae, Pteromalidae, Torymidae, *Leucospis*, description, new records, Yemen, Socotra

Introduction

Some papers concerning the fauna of Chalcidoidea of continental Yemen have been published recently. Altogether, data about seven out of 19 currently recognized Chalcidoidea families have been published, e.g. Agaonidae – Van Noort & Harten (2006), Eulophidae – Yefremova (2007), Yefremova & Yegorenkova (2009), Eurytomidae – Zerova et al. (2008), Mymaridae – Jesu & Viggiani (2007), Ormyridae – Zerova et al. (2006), Perilampidae – Heraty & Darling (2007), Pteromalidae – Van Noort & Harten (2006), Narendran & Harten (2007) and Narendran et al. (2007).

However, the fauna of Chalcidoidea of Socotra Island remains very poorly known. Mayr (1885) was the first who mentioned some chalcid wasps from Socotra Island. He described five species of fig wasps (family Agaonidae and Pteromalidae) reared from *Ficus* tree fruit collected at an unspecified locality on Socotra Island and sent to him from the collection

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of Dr. Schweinfurth (Cairo, Egypt). Later, Kirby (1900) described one new species of the family Leucospidae, collected during an expedition to Socotra Island organised partly by the Liverpool Museum in the years 1898–1899 (Forbes 1899). This was the last mention of chalcids from Socotra for the next 100 years, until Van Noort & Harten (2006) published new data on fig wasps collected by Malaise traps and by light traps.

The aim of this study is to supplement the current knowledge of the Chalcidoidea fauna of Socotra Island, based on material collected during two Czech expeditions in 2003 and 2010.

Material and methods

The dry mounted specimens were examined under Leica MZ16 stereoscopic microscope. Photographs were taken using a Canon 60D digital camera, equipped with Canon MP-E 65/2.8 MACRO lens with 5:1 optical magnification. Partially focused images of each specimen were combined using Zerene photo stacker software, version 1.04.

Terminology used in the text follows that of Gibson et al. (1997) including all abbreviations of the mophological structures:

OD lateral ocellus diameter;
OOL distance between posterior ocellus and eye;
POL distance between posterior ocelli;
$Gt_{1–n}$ gastral tergum 1–n;
$Fl_{1–7}$ flagellomeres 1–7.

The specimens included in this study are deposited in the following collections:

BMNH The Natural History Museum, London, United Kingdom;
CNCI Canadian National Collection of Insects, Ottawa, Canada;
CUPC Charles University in Prague, Czech Republic;
NMPC National Museum, Prague, Czech Republic.

Taxonomy

Leucospis insularis Kirby, 1900

(Figs. 1–5)

Leucospis insularis Kirby, 1900: 13 (original description).
Leucospis insularis: Schmid-Egger (2010): 324 (key to *Leucospis* species from Arabian Peninsula).

Type material. Holotype: ♀ (BMNH), ‘Sokotra: Jena-agahan (1200 ft, 12. I. [18]99)’ [not studied].
Material examined. Socotra Island: Hadiboh env., N 12°65′02″ E 54°02′04″, ca. 10–100 m, 21.xi.–12.xii.2003, P. Kabátek leg., Yemen – Soqotra 2003 expedition, Jan Farkač, Petr Kabátek & David Král, 1 ♂ (CUPC).

Description of male. Body length 5.9 mm. Head black, antenna including scape and pedicel, base of mandibles and maxillolabial complex rusty red; tooth on mandibles, pedicel, anellus, F3–F7 and clava partly black (Figs. 1–3). Pronotum rusty red with transverse yellow line in middle; nearly whole mesonotum, dorsellum, propleuron and mesopleuron black; tegulae, prepectus, extreme side of lateral lobe of mesoscutum, acropleuron, metapleuron, frenal area of scutellum, distal part of dorsellum and propodeum rusty red; on scutelum yellow transverse line between black and rusty red part of scutellum. All legs rusty red except yellow

Figs. 1–5. *Leucospis insularis* Kirby, 1900, male. 1 – habitus, lateral view; 2 – head, frontal view; 3 – antenna, dorsal view; 4 – forewing, dorsal view; 5 – femur, lateral view.

mesotibiae, dorsoapical part of metacoxae, basoventral part of metafemora and black teeth on metafemora (Figs. 1, 5). Abdomen almost completely rusty red, Gt3 behind its basal half with yellow transverse line interrupted in middle. Wings slightly infumate but hyaline on disc; wing venation and setae brown with hardly infumate region of disc below wing venation (Figs. 1, 4).

Head dense but finely punctured, meso- and metasoma with coarse punctuation, pubescens of body very long, thin and white. Head 1.05 times as broad as mesosoma and about 2.24 times as broad as long. Temples converging, about 0.19 times of length of head. Head 1.24

times as broad as high, mouth 3.06 times as wide as malar space, latter 0.28 times of length of eye. Eyes with distinct setae (clearly visible using 20–30x magnification), 1.67 times as long as wide. Ocelli large: POL : OOL 2.45, OOL : OD 1.57. Posterior margin of middle ocellus reaches imaginary line joining lateral ocelli. Scrobal depression deep and distinctly transversely rugose on whole surface, outer margins of scrobal depression margined by sharp carina. Interantennal process well developed, reaching 1/3 of scape. Lower margin of clypeus bilobed, median tooth small but conspicuous. Antenna as follows: pedicel plus flagellum as long as head, scapus 1.6 times as long as wide, not reaching anterior ocellus, 0.27 times as long as length of eye. Pedicel 1.29 times as long as long, not as wide as annellus in broadenest part. Scapus and pedicel more or less shiny, covered with dense setation, setae are longer than those on rest of antenna. Anellus 1.25 times as long as wide. Flagellum stout, F_3–F_7 transverse (ratio of measurements of F_1–F_7: 11/10, 12/12, 11/12, 11/13, 11/14, 11/15, 10/14), clava 1.5 times as long. Flagellum dull, covered with short dense setation.

Pronotal collar convex, sides subparallel, disc of pronotum with three distinct cuticular carina, slightly angulate in middle – discal carina just behind and not longer that yellow transverse line on collar, weak and slightly lower than submarginal one; submarginal carina (carina between discal and marginal carina) of same length as marginal carina and as yellow transverse line. Pronotum 1.60 times as wide as long, mesonotum 0.85 times as wide as long, propodeum 1.90 times as wide (measured in widenest part) as long (measured in medial carina area). Propodeum without medial carina. Fore wing 3.45 times as long as wide; relative measurements – marginal:postmarginal:stigmal vein as 15:23:88. Metafemur relatively slender, 2.18 times as long as wide with nine gradually reduced teeth on posterior side; first tooth broadly triangular, twice as long as second tooth, all teeth except first one slender triangular, third tooth 0.75 times as long as first tooth.

Metasoma nearly as long as head plus mesosoma, metasoma moderatelly clavate, 2.11 times as long as wide, first gastral segment (Gt1) as long as wide and 0.50 times as wide as Gt3.

Diagnosis. The recently collected male fits well to the female type in the key by Bouček (1974), i.e. couplet 9. The species is easily recognizable due to the unusually long and thin pubescence, slender metafemora and weak discal carina.

Bionomy. Unknown.

Distribution. Species endemic to Socotra Island, so far known from two specimens only.

New records

Eupelmidae

Eupelmus (*Eupelmus*) *orientalis* (Crawford, 1913)

Material examined. Socotra Island: Noged plain (sand dunes), Sharet Halma vill. env, 12°21.9′N, 54°05.3′E, 20 m, at light, 10.–11.xi.2010, J. Bezděk leg., G. Gibson det., 1 ♀ (CNCI); Dixam plateau, Firmihin (*Dracaena* forest); 12°28.6′N, 54°01.1′E, 490 m, sweeping, 15.–16.xi.2010, J. Bezděk leg., P. Janšta det., 1 ♀ (CUPC).

Distribution. The species was described from Bangalore (India) (Crawford 1913). According to Noyes (2012) database, it is known also from Iraq, Niger, West and South Africa. **First record from Socotra Island.**

Pteromalidae

Cryptoprymna atra (Walker, 1833)

Material examined. Socotra Island: Al Haghier Mts., Scant Mt. env., 12°34.6′N, 54°01.5′E, 1450 m, 12.–13.xi.2010; J. Bezděk leg., 1 ♀ (CUPC).

Distribution. This species is widely distributed throughout Europe (Belgium, Czech Republic, France, Germany, Greenland, Hungary, Iceland, Ireland, Netherlands, Romania, Slovakia, Sweden, United Kingdom) (Noyes 2012). **First record from Socotra Island.**
Remarks. Biology of this species is unknown, but it is probably associated with some host on coniferous trees (Graham 1969). However, there are no conifers growing on Socotra Island (Miller & Morris 2004).

Cyrtoptyx latipes (Rondani, 1874)

Material examined. Socotra Island: Dixam plateau, Firmihin (*Dracaena* forest), 12°28.6′N, 54°01.1′E, 490 m, sweeping, 15.–16.xi.2010, J. Bezděk leg., 2 ♀♀ (CUPC).

Distribution. The species is widely distributed in the Palearctic region (Azerbaijan, China, Croatia, Cyprus, Egypt, Europe, Greece, India, Italy, Kazakhstan, Lebanon, Libya, Pakistan, Spain, Syria, Turkey, former Yugoslavia); known also from India, and one record comes also from Afrotropical Eritrea (Noyes 2012). **First record from Socotra Island.**

Dinarmoides spilopterus Masi, 1924

Material examined. Socotra Island: Noged plain (sand dunes), Sharet Halma vill. env., 12°21.9′N, 54°05.3′E, 20 m, sweeping, 10.–11.xi.2010, J. Bezděk leg., 1 ♀ (CUPC); Dixam plateau, Firmihin (*Dracaena* forest), 12°28.6′N, 54°01.1′E, 490 m, sweeping, 15.–16.xi.2010, J. Bezděk leg., 3 ♀♀ 2 ♂♂ (CUPC).

Distribution. It is a species widely distributed in Europe (Croatia, Czech Republic, Italy, Romania, Slovakia, Spain, Sweden and Serbia), Canary Islands, and also reported from Turkmenistan (Noyes 2012). **First record from Socotra Island.**
Remarks. I have seen many specimens in the collection of NMPC identified by Zdeněk Bouček in 1960's and it seems that this species is very polymorphic or there is a complex of species. To validate this statement it is necessary to examine more specimens from the whole area of distribution.

Torymidae

Torymoides kiesenwetteri (Mayr, 1874)

Material examined. Socotra Island: Dixam plateau, Firmihin (*Dracaena* forest), 12°28.6′N, 54°01.1′E, 490 m, sweeping, 15.–16.xi.2010, J. Bezděk leg., 1 ♀ (CUPC).

Distribution. It is a very common species in Europe (Andorra, Bulgaria, Canary Islands, Croatia, Czech Republic, Egypt, Europe, France, Germany, Greece, Hungary, Italy, Macedonia, Madeira, Moldova, Poland, Romania, Serbia, Slovakia, Spain, Switzerland, United Kingdom, former Yugoslavia) and Turkey (Noyes 2012). Known also from Nepal and India (Noyes 2012). **First record from Socotra Island.**

Check-list of Socotran Chalcidoidea

Specimens marked with asterisk are considered to be endemic to Socotra Island.

Agaonidae
Elisabethiella socotrensis (Mayr, 1885)
Platyscapa awekei Wiebes, 1977

Eupelmidae
Eupelmus (*Eupelmus*) *orientalis* (Crawford, 1913)

Leucospidae
**Leucospis insularis* Kirby, 1900

Pteromalidae
Crossogaster triformis Mayr, 1885
Cryptoprymna atra (Walker, 1833)
Cyrtoptyx latipes (Rondani, 1874)
Dinarmoides spilopterus Masi, 1924
**Otitesella serrata* Mayr, 1885
**Sycoryctes coccothraustes* Mayr, 1885
**Sycoscapter truncatus* Mayr, 1885

Torymidae
Torymoides kiesenwetteri (Mayr, 1874)

Conclusion

Including the new faunistic records mentioned above, 11 species of Chalcidoidea wasps are currently known from Socotra Island. Four of these species are, according to the current knowledge, endemic to the island. The total number is still very low in comparison to the Chalcidoidea species recorded from continental Yemen – 153 species (Noyes 2012). We can suppose that the number of chalcids wasps known from Socotra will increase with more intensive surveying. In particular, we can expect more species occurring in the Afrotropical region, although the fauna of Socotra Island (and Yemen) is formed also by several widely distributed Palaearctic species, e.g, eulophids of continetal Yemen (Yefremova & Yegorenkova 2009), or the above mentioned pteromalids and eupelmids from Socotra. Finally, discovery of more species endemic to Socotra Island cannot be excluded.

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