



A revision of European species of the genus *Tetrastichus* Haliday (Hymenoptera: Eulophidae) using integrative taxonomy

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Abstract

Background

The European species of the genus *Tetrastichus* (Insecta, Hymenoptera, Eulophidae, Tetrastichinae) are revised with 93 species, including 50 species described as new. The revision was conducted using an integrative taxonomic approach, based on DNA barcoding in combination with morphological characters. The Tetrastichinae are a biologically diverse and species-rich group of parasitoid wasps with numerous complexes of morphologically often very similar species that attack a wide range of hosts in over 100 insect families in 10 different orders. The genus *Tetrastichus* is, with almost 500 described species, the third largest genus of Tetrastichinae. Although biological information is lacking for most species, current data indicate that *Tetrastichus* species are gregarious koinobiont endoparasitoids developing on juvenile stages of mainly holometabolous insects. Due to their host specificity, several species of *Tetrastichus* are used as biological control agents.

New information

The European species of *Tetrastichus* Haliday (Hymenoptera: Eulophidae) are revised using a combination of externo-morphological and DNA barcoding data. This is the first integrative approach for any of the large genera of the Tetrastichinae. A total of 93 species are included, of which 50 are described as new: *T. agonus* sp. n., *T. antonjanssoni* sp. n., *T. argei* sp. n., *T. argutus* sp. n., *T. asilis* sp. n., *T. ballotus* sp. n., *T. bledius* sp. n., *T. broncus* sp. n., *T. calcarius* sp. n., *T. calmius* sp. n., *T. clisis* sp. n., *T. cosidis* sp. n., *T. cumulus* sp. n., *T. cyprus* sp. n., *T. delvarei* sp. n., *T. doczkali* sp. n., *T. elanus* sp. n., *T. elodius* sp. n., *T. ennis* sp. n., *T. enodis* sp. n., *T. erinus* sp. n., *T. evexus* sp. n., *T. fadus* sp. n., *T. fenrisi* sp. n., *T. flaccius* sp. n., *T. gredius* sp. n., *T. iasi* sp. n., *T. illydris* sp. n., *T. incanus* sp. n., *T. inscitus* sp. n., *T. intruitus* sp. n., *T. johnnogyesi* sp. n., *T. lacustrinus* sp. n., *T. ladrus* sp. n., *T. lanius* sp. n., *T. lazius* sp. n., *T. lixalius* sp. n., *T. lycus* sp. n., *T. marcusgrahami* sp. n., *T. minius* sp. n., *T. mixtus* sp. n., *T. nataliedaleskeyae* sp. n., *T. nymphae* sp. n., *T. pixius* sp. n., *T. scardiae* sp. n., *T. splendens* sp. n., *T. sti* sp. n., *T. suecus* sp. n., *T. tacitus* sp. n. and *T. tartus* sp. n. Two keys for the identification of species are presented, one for females and one for males. Based on DNA barcode sequences for 70 of the species, a Maximum Likelihood tree to assess phylogenetic relationships within the genus is presented. These 70 species are also characterised by a combination of CO1 and morphological data. The remaining 23 species, without a DNA barcode, are characterised by morphological data. Using a combination of data from the morphology and CO1 or morphological data only, the species are separated into three species groups (*clito-*, *hylotomarum-*, *murcia*-groups) with 41 unplaced species outside these groups. Hosts are known for 27 of the species and they are gregarious, koinobiont endoparasitoids on a wide range of immature stages of holometabolous insects and appear to be very host specific. The first host record for Lepidoptera (Tineidae) in Europe is included.

Keywords

integrative taxonomy, DNA barcoding, new species, parasitoids, Tetrastichinae, taxonomic revision, morphology, parasitoid, gregarious endoparasitoids, distribution.

Introduction

Tetrastichinae

The Tetrastichinae (Hymenoptera: Eulophidae) are one of the largest groups of parasitoid Hymenoptera. They are, with currently about 1650 species in 91 genera, the largest subfamily of the family Eulophidae, that include 297 genera and about 4500 species (Noyes 2020). Species of tetrastichines are found throughout the world and they occur in most habitats on Earth. The majority of species has been described and recorded from the temperate parts and mainly from Europe, but very little is known about this group from tropical areas. Thus, the recorded number of species is very probably a minor part of the actual number. Apart from species richness, it is also one of the biologically most diverse

groups of parasitoids and the range of tetrastichine hosts comprise over 100 insect families in 10 different orders and, in addition, spider eggs and even (through their galls) mites and nematodes are targeted (LaSalle 1994).

The subfamily is a group of particular importance, even within parasitoid wasps that are generally essential for maintaining biological diversity in terrestrial ecosystems (LaSalle and Gauld 1991, LaSalle 1994, LaSalle and Gauld 1993). It is extremely species-rich and has been used in numerous ecological, biological and behavioural studies and several species have been successfully used as biological control agents (see Graham (1987), LaSalle (1994) and references therein). Despite their importance, virtually all genera lack comprehensive taxonomic revisions and the identification of species from most geographic regions is hampered by the lack of identification tools. Furthermore, the classification of Tetrastichinae has been subject to major re-arrangements throughout the history of the subfamily since it was established by A. Förster (Förster 1856) and is treated in further detail below for the genus *Tetrastichus*.

Taxonomists have largely ignored tetrastichines because they are taxonomically extremely difficult due to a large number of species and their morphological similarity. Both factors have been a major obstacle for taxonomic revisions, based on morphological characteristics. For the present study, we chose an integrative taxonomic approach, based on DNA barcoding combined with features in the external morphology. Barcoding allows for sequencing large numbers of specimens at a reasonable cost and it provides a standardised set of molecular characters that, together and in combination with morphological data, can be used to assess species boundaries. Examination of morphology allows the inclusion of species for which DNA data could not be gathered, for example, museum specimens of rare species that are often very old and pose problems for DNA sequencing.

The genus *Tetrastichus*

The genus *Tetrastichus* has been attributed to Haliday (1844), even though it was first described by Walker in 1842, but the Walker name has been suppressed by the International Commission on Zoological Nomenclature (1965). Haliday included a single species (*Cirrospilus attalus* Walker (= *T. miser* (Nees)) which then became the type species for *Tetrastichus*. The subsequent fate of *Tetrastichus* has been quite turbulent. Burks (1943) gives a detailed account of nomenclatural and classificatory events up to his publication. The history after 1943 is equally turbulent. Graham (1961) synonymised *Tetrastichus* with *Aprostocetus* Westwood (priority made *Aprostocetus* senior to *Tetrastichus*) and recombined all European species previously in *Tetrastichus* to *Aprostocetus*. Domenichini (1966) rejected this action by Graham, resurrected *Tetrastichus* and recombined all species back to *Tetrastichus*. Bouček (1977) published a key to all genera of Tetrastichinae and maintained the wide interpretation of *Tetrastichus* by Domenichini, as did Kostjukov (1977). Graham (1987) revised the classification of European genera in Tetrastichinae and kept *Tetrastichus* as a valid genus, but now in a very restricted sense, including only species in the so-called *miser*-group (sensu Graham

(1961) Domenichini (1966)). The remainder of the species in *Tetrastichus* s.lat. were recombined to other existing, or newly created, genera. The bulk of species were transferred to *Aprostocetus*, which then became a very large genus with several hundred species on a world basis. Bouček (1988) and LaSalle (1994) followed the classification proposed by Graham. Finally, Graham (1991) revised the European species of *Tetrastichus* s.str., including 42 species, of which 20 were described as new. The species were classified into six species groups and with three unplaced species. In this publication, we follow the definition of *Tetrastichus* proposed by Graham (1987), Graham (1991).

Tetrastichus species have been found on all continents (Bouček 1988, Graham 1991, LaSalle 1994) and it is the third largest genus of the subfamily Tetrastichinae, after *Aprostocetus* and *Baryscapus* Förster (LaSalle 1994), including hundreds of species. Noyes (2020) lists 492 species names in the genus, but, due to the chaotic history of *Tetrastichus*, it is difficult to establish how many of these names actually represent species of *Tetrastichus* s.str. without examining the type specimens.

Biology

Biological information is known for about one-third of the species (29 out of 93) treated here. The available information from literature and from our own experience strongly indicate that *Tetrastichus* species are gregarious koinobiont endoparasitoids developing on juvenile stages of mainly holometabolous insects from all the four major orders: Coleoptera, Diptera, Hymenoptera and Lepidoptera (Table 1). Most species are associated with Coleoptera and mainly with phytophagous and xylophagous groups (Buprestidae, Cerambycidae, Chrysomelidae and Curculionidae). The Diptera host groups include a wide range of biologies: saprophagous (*Brachyopa* spp. *Sargus* sp.), xylophagous (*Xylomyia cabrerae*) and gall-making (*Lipara lucens*) species. In Hymenoptera, larvae and pupae of sawflies (Argidae, Tenthredinidae) are targeted. Prior to this article, no host was recorded from Lepidoptera in Europe, but here we present the first record from this order, *Scardia boletella* (Fabricius) (Tineidae), that develops in different species of shelf fungi. According to Bouček (1988), Indo-Australian species of *Tetrastichus* frequently target Lepidoptera, mainly various moths in rice fields, emerging from host pupae and sometimes also act as hyperparasitoids. The Neotropical species *T. periplanetae* Crawford targets cockroach oothecae (LaSalle 1994).

Table 1.
Tetrastichus hosts

<i>Tetrastichus</i> species	Host
<i>T. agrilocidus</i> Graham	<i>Agrius</i> sp. (Coleoptera: Buprestidae), <i>Xylotrechus pantherinus</i> Savenius (Coleoptera: Cerambycidae) (Graham 1991)
<i>T. argei</i> sp. n.	Gregarious endoparasitoid on <i>Arge ustulata</i> (L.) (Hymenoptera: Argidae)
<i>T. atratulus</i> (Nees)	<i>Plecticus tenebrifer</i> (Walker) (Diptera: Stratiomyidae) (in Japan) (Graham 1991)

<i>Tetrastichus</i> species	Host
<i>T. brachyopae</i> Graham	Gregarious koinobiont endoparasitoid on <i>Brachyopa</i> spp. (Diptera: Syrphidae), clutch size varying from 7–18 specimens, with a strong female bias (van Eck et al. 2016). Recorded from <i>Brachyopa pilosa</i> Collin (Graham 1991), <i>B. bicolor</i> (Fallén) & <i>B. insensilis</i> Collin (van Eck et al. 2016)
<i>T. clito</i> (Walker)	<i>Cassida murraea</i> L., <i>C. rubiginosa</i> Müller, <i>C. deflorata</i> Suffrian (Graham 1991), <i>C. humeralis</i> Kraatz new record . All hosts are Coleoptera: Chrysomelidae
<i>T. coeruleus</i> (Nees)	<i>Crioceris asparagi</i> (Coleoptera: Chrysomelidae), emerges from host cocoons, but oviposits already in the host eggs (Graham 1991)
<i>T. crioceridis</i> Graham	<i>Crioceris duodecimpunctata</i> L. (Coleoptera: Chrysomelidae), egg-larval parasitoid (Graham 1983)
<i>T. cyprus</i> sp. n.	Rearred from an unidentified Coleoptera and from an unidentified leaf miner on broad bean (<i>Vicia faba</i> L.)
<i>T. epilachnae</i> (Giard)	<i>Epilachna argus</i> (Geoffroy in Fourcroy), <i>E. chrysomelina</i> F., <i>Subcoccinella vigintiquattropunctata</i> L. (Coleoptera: Coccinellidae) (Graham 1991)
<i>T. halidayi</i> (Graham)	<i>Agropus ahrensi</i> Germar (Coleoptera: Chrysomelidae) (Graham 1991)
<i>T. heeringi</i> Delucchi	<i>Agrius auricalceus</i> Redtenbacher, <i>A. integrimus</i> Ratzeburg, <i>A. viridis</i> (L.) (Coleoptera: Buprestidae) (Graham 1991)
<i>T. hylotomarum</i> (Bouché)	<i>Arge ochropus</i> (Gmelin), <i>A. pagana</i> (Panzer) (Hymenoptera: Argidae), <i>Athalia cordata</i> Audinet-Serville, <i>Cladius pectinicornis</i> (Geoffroy) (Hymenoptera: Tenthredinidae), parasitising host larvae and pupae (Graham 1991)
<i>T. julis</i> (Walker)	<i>Lema</i> (<i>Oulema</i>) spp. (Coleoptera: Chrysomelidae), gregarious endoparasitoid of host larva (Graham 1991)
<i>T. legionarius</i> Giraud	Gregarious endoparasitoid of larvae and pupae of <i>Lipara lucens</i> Meigen (Diptera: Chloropidae) (Graham 1991)
<i>T. leocrates</i> (Walker)	<i>Rhynchaenus alni</i> (L.) (Graham 1991), <i>R. testaceus</i> (Müller) (new record) (Coleoptera: Curculionidae)
<i>T. lyridice</i> (Walker)	<i>Plagiodesma versicolora</i> (Laich.)? (Coleoptera: Chrysomelidae). This record is doubtful, needs checking (Graham 1991)
<i>T. macrops</i> (Graham)	Probably <i>Cis</i> spp. (Coleoptera: Cisiidae) in Polyporaceae (Graham 1991)
<i>T. melosoma</i> Graham	<i>Chrysomela vigintipunctata</i> (Scopoli) (Coleoptera: Chrysomelidae) (Graham 1991)
<i>T. miser</i> (Nees)	<i>Rhynchaenus alni</i> (L.), <i>R. fagi</i> (L.), <i>R. pilosus</i> (F.), <i>R. quercus</i> (F.), <i>R. salicis</i> (L.), <i>Ramphus oxyacantheae</i> (Marsham) (Coleoptera: Curculionidae) (Graham 1991)
<i>T. murcia</i> (Walker)	<i>Geosargus</i> sp. (Diptera: Stratiomyidae), endoparasitoid emerging from pupa (Domenichini 1966)
<i>T. nymphae</i> sp. n.	Gregarious endoparasitoid on <i>Galerucella nymphaeae</i> (L.) (Coleoptera: Chrysomelidae)
<i>T. pilemostoma</i> Graham	<i>Pilemostoma fastuosa</i> (Schaller) (Coleoptera: Chrysomelidae) (Graham 1991)
<i>T. polyporinus</i> Askew	Possibly <i>Dacne</i> sp. (Askew 2007); <i>Triplax rufipes</i> Fabricius and <i>T. russica</i> (L.) new records . All hosts are Coleoptera: Erotylidae
<i>T. scardiae</i> sp. n.	<i>Scardia boletella</i> (Fabricius) (Lepidoptera: Tineidae)

<i>Tetrastichus</i> species	Host
<i>T. setifer</i> Thomson	<i>Lilioceris liliii</i> (Scopoli) (Gold et al. 2001) and <i>L. tibialis</i> (Villa) (Kenis et al. 2002) (Coleoptera: Chrysomelidae)
<i>T. solvae</i> Graham	<i>Xylomyia cabrerae</i> (Becker) (Diptera: Xylomyiidae) in twigs of <i>Euphorbia canariensis</i> (Graham 1991)
<i>T. telon</i> (Graham)	<i>Agrius viridis</i> L. (Coleoptera: Buprestidae) (Domenichini 1966)
<i>T. temporalis</i> (Graham)	Associated with <i>Phalaris arundinacea</i> (Poaceae) (Graham 1991)
<i>T. ulmi</i> Erdös	<i>Scolytus rugulosus</i> (Müller) and <i>Leperisinus ornii</i> Fuchs (Coleoptera: Scolytidae), <i>Agrius</i> sp. and possibly <i>Anthaxia</i> sp. (Coleoptera: Buprestidae) (Graham 1991)

Van Alphen (1980) investigated the life history of *T. coeruleus* (as *T. asparagi*) and *T. crioceridis* (as an undescribed *Tetrastichus* species). Both species are parasitoids of *Crioceris* spp. (Coleoptera: Chrysomelidae) on asparagus (*Asparagus officinalis*), *T. coeruleus* on *C. asparagi* and *T. crioceridis* on *C. duodecimpunctata*. The females of both species oviposit in eggs with advanced embryos or in the larvae of their respective host. Both species are monophagous and, in spite of occurring on the same host plant, they do not overlap with each other. In another paper, Duan et al. (2011) outlined the life history of *T. planipennisi* Yang. *Tetrastichus planipennisi* is an Asiatic species targeting the emerald ash borer (*Agrius planipennis* Fairmaire) (Coleoptera: Buprestidae). The wasp female oviposits in larval stages 2–4 and it took about four weeks to complete the development from egg to adult wasp.

The sex ratio of clutches is female biased (e.g. Duan et al. 2011 and through experiences from our own rearings). In some cases, no males have been reared, suggesting thelytoky, for example, *T. coeruleus* in North America (Graham 1991).

Materials and methods

Morphology

Species of *Tetrastichus* are, like most other Tetrastichinae, taxonomically exceptional amongst Eulophidae because of their high morphological similarity, hampering a taxonomic revision, based on morphology alone. Unless collected through rearing when the host is known, species of *Tetrastichus* are very difficult from which to get a series of specimens. Sweep netting and Malaise trapping only yield one or a few specimens at best per collecting event. The rarity of many species, with only very few specimens of each species available for study, prevents the assessment of intraspecific variation and further complicates the definition of species borders. To alleviate the situation, for the present study, an integrative approach was employed, with DNA barcoding as a first step to obtain operational taxonomic units that were subsequently examined morphologically, using criteria that were traditionally used for delimiting species, i.e. morphologically diagnostic characters. In the absence of sufficient morphological differences between OTUs, a

conservative approach was followed in that the OTUs were regarded as conspecific until further evidence is available to assess their species status. In these cases, additional genetic markers are needed to disentangle complexes of closely-related species. In several species, the taxonomy has to rely on very few specimens, often with even fewer DNA barcodes and their species status will need to be evaluated as further specimens (and sequence data) become available. Furthermore, the number of species in Europe is probably much higher than currently known and there is, thus, a high probability that species of *Tetrastichus* that are not included in the present revision will be encountered in the future, in particular with material that is collected in areas other than the main study area in this article and in Graham (1991), i.e. Northern and Central Europe. For these reasons, DNA barcodes, in combination with a thorough morphological examination, will be essential for accurate species level identifications of *Tetrastichus*.

DNA sequencing

For DNA extraction, whole specimens were sent to the Canadian Centre for DNA Barcoding (CCDB) in Guelph, Canada, for DNA extraction and barcode sequencing and subsequent recovery of vouchers for preparation and morphological study. A complete list of voucher specimens included in the revision is given in Suppl. material S1. DNA extraction, PCR amplification and sequencing were conducted at CCDB, using standardised high-throughput protocols (Ivanova et al. 2006, deWaard et al. 2008). The 658 bp target region, starting from the 5' end of the mitochondrial cytochrome c oxidase I (COI) gene, includes the DNA barcode region of the animal kingdom (Hebert et al. 2003). The DNA extracts are stored at CCDB. Specimens that were successfully sequenced are listed in Suppl. material S1. All specimen data are accessible in BOLD as a single citable dataset (dx.doi.org/10.5883/DS-TTSEUR).

The data include collecting locality, geographic coordinates, elevation, collector, one or more digital images, identifier and voucher depository. Sequence data can be obtained through BOLD and include a detailed LIMS report, primer information and access to trace files. The sequences are also available on GenBank (for accession numbers, see Suppl. material S1).

Due to the expected presence of complexes of cryptic species, i.e. species that are morphologically virtually indistinguishable, all suitable specimens were subjected to DNA barcoding, even at the risk of obtaining a long series of the same species. The final BOLD dataset (DS-TTSEUR) contains 1,128 specimen records, 1,126 of which are associated with a DNA sequence. Amongst the specimens with a barcode sequence, 860 were assigned a Barcode Index Number (BIN) by the BOLD system, resulting in 73 species with one or more BINs. A total of 60 species were represented by a single BIN, 24 species with two BINs and one species (*T. sinope*) with three BINs (with a single specimen each).

The initial concerns with obtaining multiple sequences of the same species turned out to be unwarranted. A total of 22% of the species were represented by singletons, almost two thirds (63%) by 1-5 specimens and only two species with over 100 specimens each (Fig. 1). The species with the largest number of specimens in our dataset include *Tetrastichus*

atratus (178 specimens), *T. halidayi* (155 specimens), followed by *T. miser* (80 specimens), *T. temporalis* (62 specimens), *T. lyridice* (34 specimens) and *T. leocrates* (31 specimens). The remaining 67 species were represented by at most 25 specimens.

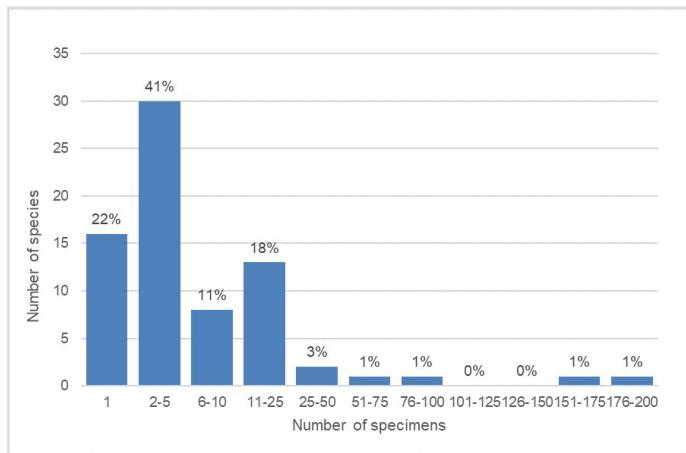


Figure 1. [doi](#)

Number of specimens of 73 *Tetrastichus* species that were analysed by DNA barcoding.

Data analysis

Sequence divergence statistics were calculated using the Kimura two parameter model of sequence evolution (Kimura 1980). Barcode Index Numbers (BINs) were assigned by the BOLD system, representing globally-unique identifiers for clusters of sequences that correspond closely to biological species (Ratnasingham and Hebert 2013). For BIN assignment, a minimum sequence length of 500 bp is required and sequences between 300 and 500 bp can join an existing BIN, but will not create or split BINs. In the present study, BINs were used to delineate Molecular Operational Taxonomic Units (MOTUs) prior to a detailed taxonomic study, based on morphological characters. Sequences were aligned using the BOLD Aligner (amino acid-based hidden Markov models). The analyses are based on sequences with a minimum length of 500 bp and less than 1% ambiguous bases. Genetic distances and summary statistics were calculated using analytical tools in BOLD and are given as mean and maximum pairwise distances for intraspecific variation and as minimum pairwise distances for interspecific variations.

For phylogenetic analyses, the COI sequences were aligned using Muscle (Edgar 2004). Maximum Likelihood (ML) trees were inferred using IQ-TREE, version 2.0.6 (Minh et al. 2020). The best-fit substitution models were inferred separately for the DNA sequence and the gap data partitions using ModelFinder (Kalyaanamoorthy et al. 2017) as implemented in IQ-TREE, prior to tree reconstruction. Branch support was estimated with ultrafast bootstrap estimation (Hoang et al. 2018) using 10,000 bootstrap replicates. The phylogenetic inferences were based on sequences with a minimum length of 500 bp, resulting in a dataset with 748 sequences.

Museum acronyms

ETHZ Swiss Federal Institute of Technology, Entomological Collection, Zürich, Switzerland; **GD** Private collection of Gérard Delvare, Montpellier, France; **HNHM** Hungarian Natural History Museum, Budapest, Hungary; **MZLU** Biological Museum, Entomology, Lund University, Sweden; **NHM** the Natural History Museum, London, United Kingdom; **NHRS** Swedish Museum of Natural History, Stockholm, Sweden; **NMW** Naturhistorisches Museum, Wien, Austria; **OUMNH** Oxford University Museum of Natural History, United Kingdom; **SMTP** Swedish Malaise Trap Project, Station Linné, Ölands Skogsby, Sweden; **UCRC** University of California, Riverside, Entomology, USA; **USNM** United States National Museum of Natural History, Washington, D.C., USA; **ZSM** SNSB-Zoologische Staatssammlung München, Munich, Germany.

Abbreviations of morphological terms and nomenclature

With some exceptions (below), the morphological terms used here are explained and illustrated (figs. 6–12) in Graham (1987). Abbreviations of morphological terms not used in Graham (1987): Gt_{1-7} gastral tergites 1–7; MG median groove on mid-lobe of mesoscutum (as median line in Graham (1987), Graham (1991)); MV marginal vein; OD diameter of lateral ocelli; ST stigmal vein; SLG sublateral groove on mesoscutellum (as sublateral line in Graham (1987), Graham (1991)); SMG submedian groove on mesoscutellum (as submedian line in Graham (1987), Graham (1991)); T1–4 tarsomeres 1–4.

To avoid the problems associated with the requirement by the International Code of Zoological Nomenclature (International Commission of Zoological Nomenclature 1999) that the gender of species names must agree with that of the genus, we follow Noyes (2004) in that all new names proposed in the present study, except indicated otherwise, must be treated as arbitrary combinations of letters or nouns in apposition. As a consequence, species names will not change if species are transferred to a genus with a different gender at any time in the future.

Imaging

The colour images of the type specimens of previously-described species were made using Canon camera equipment including an EOS 5D Mark IV body, MP E-65 macro lens and macro twin lite MT-24 EX. The camera was attached to a Cognisys stackshot macro rail system. The images of type specimens for the newly-described species were done with the same equipment, except that the macro lens was substituted with a Canon tele-zoom lens, 70–300 mm (using only 135 & 200 mm), with a 10 \times Mitutoyo microscope lens attached. The picture stacking was done with Helicon Focus version 6 software and Adobe Photoshop was used for image processing.

The SEM micrographs are from uncoated specimens and were done with a Hitachi SU 3500 scanning electron microscope, in low vacuum.

Taxon treatments

Tetrastichus Haliday, 1844

Nomenclature

Tetrastichus Haliday 1844:297–298. Type species *Cirrospilus attalus* Walker, by monotypy (=*T. miser* (Nees)). Not *Tetrastichus* Walker 1842:116, a name suppressed by the International Commission on Zoological Nomenclature (1965).

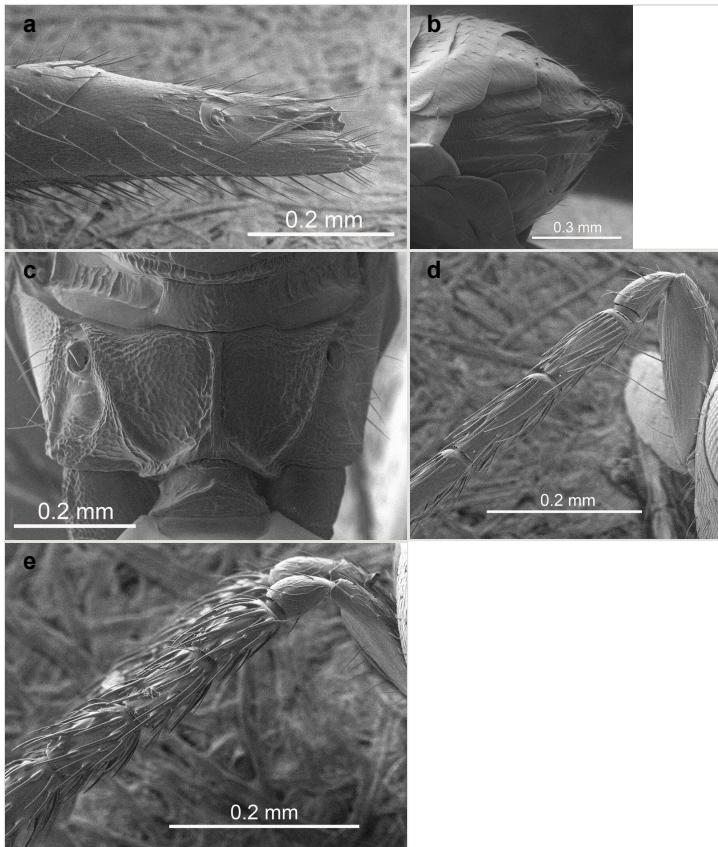


Figure 2.

Tetrastichus spp.

a: *T. legionarius* female notype, ovipositor sheaths protruding beyond Gt7, lateral view. [doi](#)

b: *T. coeruleus* female notype, ovipositor retracted, ventral view. [doi](#)

c: *T. halidayi* female notype, propodeum, dorsal view. [doi](#)

d: *T. legionarius* male notype, antennal F1-F3, lateral view. [doi](#)

e: *T. leocrates* male notype, antennal F1-F3, lateral view. [doi](#)

For a complete list of synonyms, see Graham (1991).

Diagnosis

European species of *Tetrastichus* can be diagnosed by a combination of three features: submarginal vein in fore wing with one dorsal seta, mid-lobe of mesoscutum with at least three adnotaular setae on each side and propodeum with a ± complete lateral longitudinal carina that splits into two in posterior part (like an inverted "Y", Fig. 2c). In addition, most species have a strong exoskeleton, preventing specimens from collapsing when dried. This last feature is not unique to *Tetrastichus*, but in combination with the other three features, it helps when diagnosing this group.

Identification keys

Figs 2, 3: The identification keys are based on the two keys in Graham (1991), one for females and one for males, with the new species included and with some modifications of features included and order of couplets slightly changed. The main reason for keeping the sexes apart is that differences between species are frequently based on features unique to each sex (antennal characteristics and length of female gaster). Since males are unknown for several of the species, the male key is distinctly shorter than the female key.

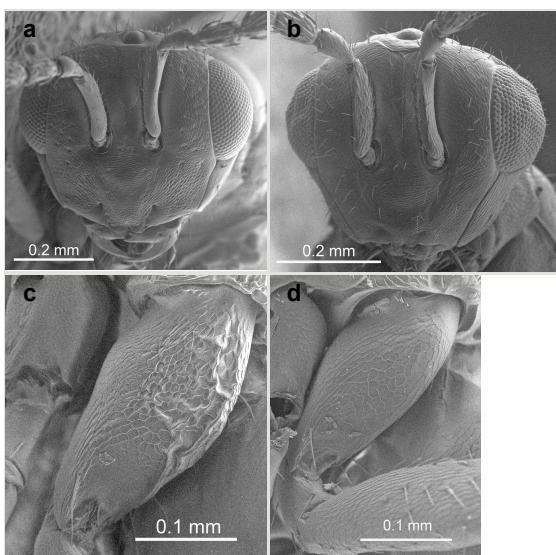


Figure 3.

Tetrastichus spp.

- a: *T. halidayi* female nontype, head, frontal view. [doi](#)
- b: *T. clito* female nontype, head, frontal view. [doi](#)
- c: *T. halidayi* female nontype, hind coxa, lateral view. [doi](#)
- d: *T. clito* female nontype, hind coxa, lateral view. [doi](#)



Figure 4.

Tetrastichus antonjanssoni sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

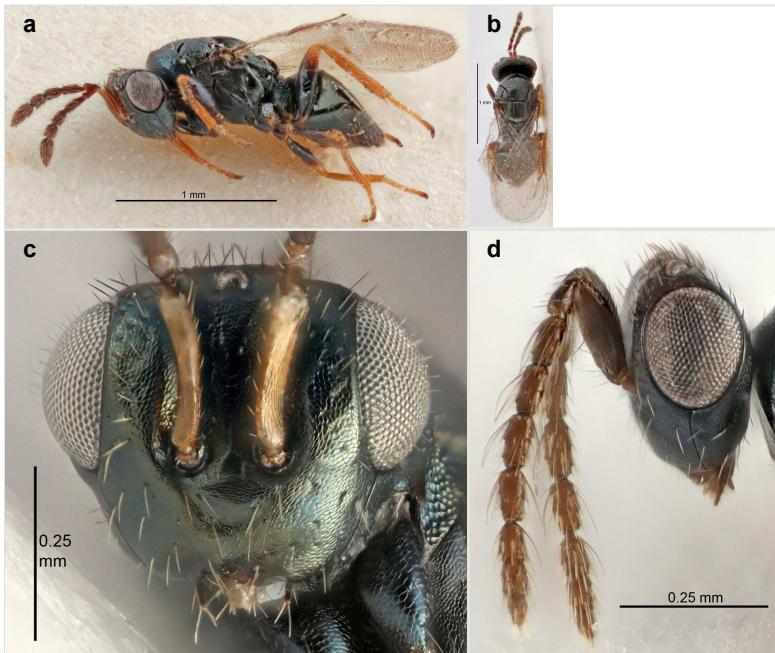


Figure 5.

Tetrastichus atratulus (Nees)

a: Neotype female, lateral. [doi](#)

b: Neotype female, dorsal. [doi](#)

c: Nontype female, head frontal. [doi](#)

d: Nontype male, head and antenna lateral. [doi](#)

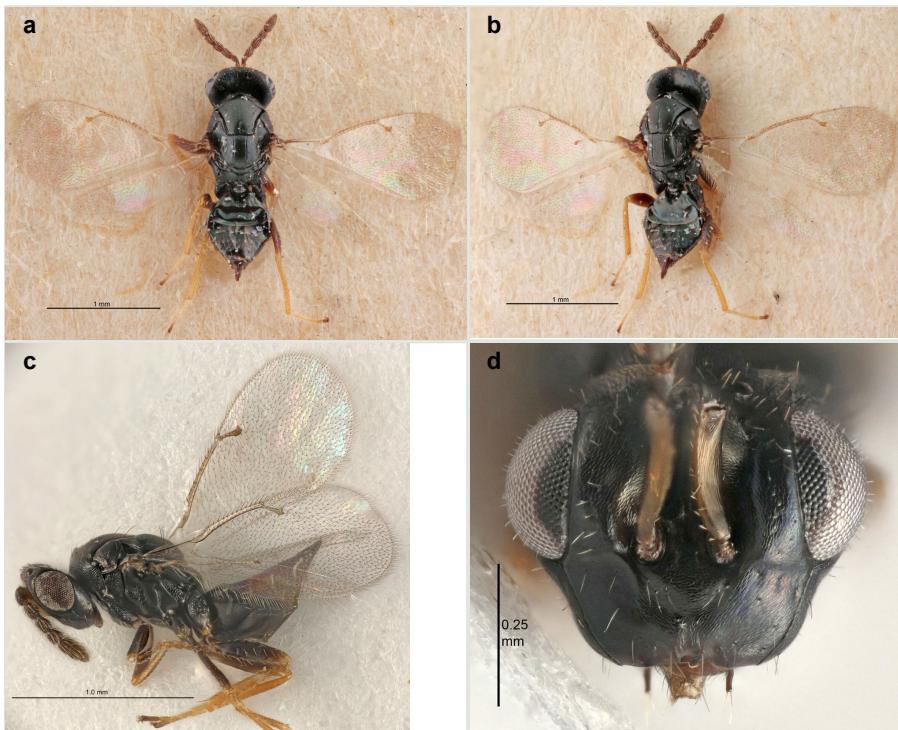


Figure 6.

Tetrastichus brachyopae Graham

- a: Holotype female, dorsal. [doi](#)
- b: Holotype female, dorso-lateral. [doi](#)
- c: Nontype female, lateral. [doi](#)
- d: Nontype female, head frontal. [doi](#)

Tetrastichus murcia group

Diagnosis

Eyes with long setae (e.g. Fig. 7d); female antenna with relatively short flagellomeres and with a distinct clava (e.g. Fig. 5a); male flagellomeres 1–4 with an externo-dorsal, sub-basal compact whorl of long setae (e.g. Fig. 5d); setae along hind margin of pronotum and adnotaular setae on mesoscutum long and erect (e.g. Fig. 7a); body black non-metallic or with weak metallic tinges; female gaster circular or short ovate.

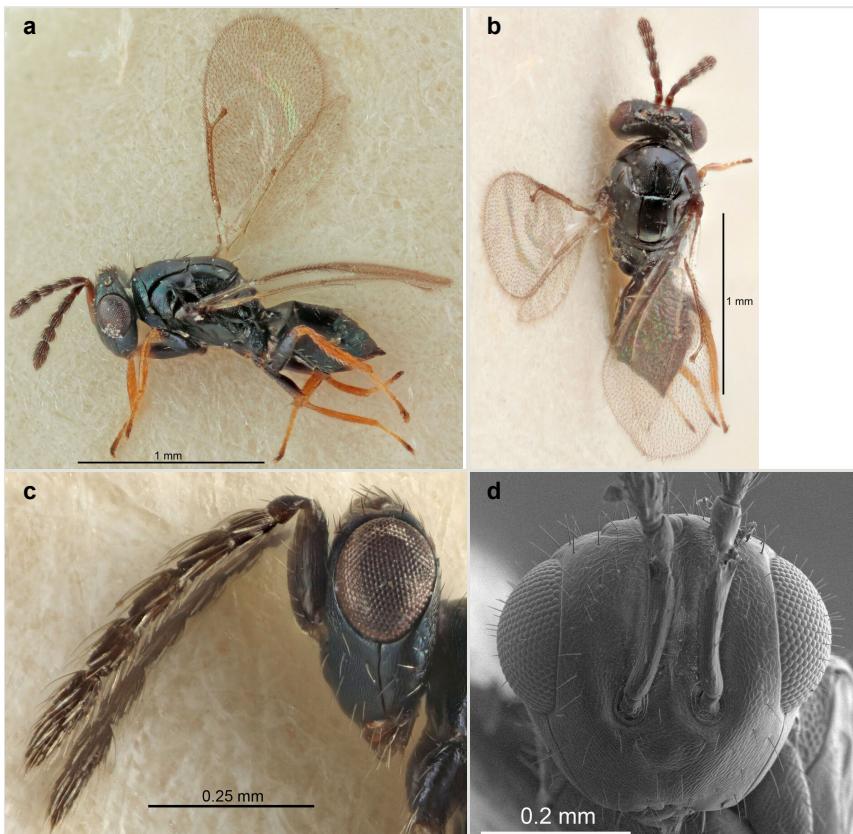


Figure 7.

Tetrastichus dasyops Grahama: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)c: Nontype male, head & antenna lateral. [doi](#)d: Nontype female, head frontal. [doi](#)***Tetrastichus antonjanssoni*, sp. n.**

- ZooBank [urn:lsid:zoobank.org:act:BD5F1E7B-17EB-4401-96CA-C18F233A1A11](http://urnlsid:zoobank.org:act:BD5F1E7B-17EB-4401-96CA-C18F233A1A11)

Material**Holotype:**

- a. scientificName: *Tetrastichus antonjanssoni*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 59.2753; decimalLongitude: 15.2134; individualID: BC-ZSM-HYM-29813-C08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-C08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-C08; recordNumber: BC-ZSM-HYM-29813-C08; recordedBy: Anton Jansson; type:

PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord:
PreservedSpecimen

Description

FEMALE holotype (Fig. 4). Body length 1.5 mm. *Head.* Width/length (dorsal view) 2.3, width/length (frontal view) 1.2, POL/OOL 2.2, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.8. *Antenna.* Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.6, 1.4, 1.1, clava length/width 2.2, lengths pedicel/F1 0.8, lengths F1/F2 1.1, F1/F3 1.2, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.4, lengths antennal spicule/C3 0.3. *Mesosoma.* Length/width 1.3, mesoscutal midlobe length/width (width measured in anterior part) 0.8, mid-lobe with median groove in posterior ½, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.1, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum (measured medially) 0.5, propodeum with strong reticulation, propodeal callus with four setae. *Fore wing.* Costal cell length/width 12.5, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster.* Subcircular to ovate, length/width 1.7, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, length longest seta of each cercus/next longest seta 1.6, longest cercal seta nearly straight, ovipositor sheaths projecting slightly beyond apex of Gt₇.

Colour. Body with weak metallic greenish-blue tinges, scape yellowish-brown with dorsal edge brown, pedicel and flagellum dark brown, tegulae dark brown, wings hyaline with veins pale yellowish-brown, coxae and femora concolorous with body, trochanters dark brown, tibiae and tarsi yellowish-brown.

MALE. Unknown.

Diagnosis

Antenna very short with F1 1.6×, F2 1.4×, F3 1.1× and clava 2.2× as long as wide; POL/OOL 2.2; distance between SMG 1.7× distance SMG to SLG; ovipositor sheaths protruding slightly beyond apex of Gt₇.

Etymology

Named after the collector of the holotype, the Swedish entomologist Anton Jansson, who collected insects mainly in the vicinities of the city Örebro (Närke Province), where he also lived and worked as a journalist.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU.

***Tetrastichus atratulus* (Nees, 1834)**

Nomenclature

Eulophus atratulus Nees von Esenbeck 1834:180. Neotype ♀ in NHM, designated by Graham 1991:264, examined (Fig. 5). Combined to *Tetrastichus* by Domenichini 1966:194.

Tetrastichus puncticoxae Kurdjumov 1913:253, 255. Holotype ♀ in Leningrad, not examined. Synonymised with *T. atratulus* by Graham 1991:264.

Description

See Graham 1991.

Diagnosis

Female antenna with length of pedicel+flagellum 1.15–1.35× width of mesoscutum, F1 2.0–2.5×, F2 1.6–2.0× and clava (incl. spicule) 2.4–3.0× as long as wide; submedian grooves of mesoscutellum nearer to sublateral grooves than to each other; apical part of ovipositor sheaths does not reach apex of Gt₇. Similar to *T. dasyops*, but with longer flagellum and shorter ovipositor sheaths. Male with relatively short hairs on eyes, about 0.3× OD.

Distribution

(Former) Czechoslovakia, France, Germany, Italy, Japan, (former) Yugoslavia, Russia, United Kingdom (Graham 1991), Sweden (Hedqvist 2003), Austria and Romania (**new records**).

Host: *Psecticus tenebrifer* (Walker) (Diptera: Stratiomyidae) (in Japan) (Graham 1991).

Material examined: Type material: neotype ♀ (NHM, type no. 5.3627). Additional material (292♀ 55♂): Austria 2♀ (MZLU, UCRC), France 51♀ 2♂ (CIRAD, NHM, ZSM), Germany 10♀ (MZLU, ZSM, UCRC), Italy 10♀ 2♂ (NHM, UCRC), Romania 132♀ 50♂ (MZLU, NHM, ZSM), Russia 3♀ (UCRC), Sweden 64♀ 1♂ (MZLU, NHM, NHRS, SMTP, ZSM), United Kingdom 20♀ (NHM).

Tetrastichus brachyopae Graham, 1991

Nomenclature

Tetrastichus brachyopae Graham 1991:265–266. Holotype ♀ in NHM, examined (Fig. 6).

Description

See Graham (1991).

Diagnosis

Submedian grooves of mesoscutellum equidistant from each other and from sublateral grooves; female gaster with ovipositor sheaths projecting beyond apex of Gt₇; female antennal funicle rather stout, its parts relatively short, F1 1.5–1.7×, F2 1.4–1.5× as long as broad; male with relatively short setae on eyes, about 0.3× OD.

Distribution

(Former) Czechoslovakia (Graham 1991), The Netherlands (van Eck et al. 2016) and Sweden (Hedqvist 2003).

Host: Gregarious koinobiont endoparasitoid on *Brachyopa* spp. (Diptera: Syrphidae), clutch size varying from 7–18 specimens, with a strong female bias (van Eck et al. 2016). Recorded from *Brachyopa pilosa* Collin (Graham 1991), *B. bicolor* (Fallén) & *B. insensilis* Collin (van Eck et al. 2016). In Sweden, collected at sap runs on *Ulmus glabra* and *Carpinus betulus* (R. Bygberg (MZLU), verbal communication).

Material examined: Type material: holotype ♀ (NHM, type no. 5.3628). Additional material (39♀ 3♂): the Netherlands 13♀ 3♂ (NHM), Sweden 26♀ (MZLU, NHM, ZSM).

Tetrastichus dasyops Graham, 1991

Nomenclature

Tetrastichus dasyops Graham 1991:263–264. Holotype ♀ in NHM, examined (Fig. 7).

Description

See Graham (1991).

Diagnosis

Female with length of pedicel+flagellum 1.0–1.05× width of mesoscutum, F1 1.7–2.0×, F2 1.2–1.6× and antennal clava (incl. spicule) 2.1–2.35× as long as wide; submedian grooves of mesoscutellum nearer to sublateral grooves than to each other; ovipositor

sheaths reach apex of Gt, or slightly beyond. Similar to *T. atratulus*, but with shorter antennal flagellum and longer ovipositor sheaths.

Distribution

United Kingdom (Graham 1991), Sweden (Hedqvist 2003), France, Italy, Romania, Russia, Spain, Switzerland (**new records**).

Host: Unknown.

Material examined

Type material: holotype ♀ (NHM, type no. 5.3626). Additional material (158♀ 14♂): France 7♀ 1♂ (GD, NHM), Italy 5♀ (NHM), Romania 3♀ (NHM), Russia 16♀ 1♂ (MZLU, UCRC), Spain 1♀ (NHM), Sweden 122♀ 12♂ (MZLU, NHM, NHRS), Switzerland 1♀ (NHM), United Kingdom 3♀ (NHM).

Tetrastichus intruitus, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:D25BBA20-4628-4516-B454-876A16F12F92>

Materials

Holotype:

- a. scientificName: *Tetrastichus intruitus*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.985; decimalLongitude: 27.585; individualID: BC-ZSM-HYM-27768-D01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D01; recordNumber: BC-ZSM-HYM-27768-D01; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-A07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-A07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-A07; recordNumber: BC-ZSM-HYM-27768-A07; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.985; decimalLongitude: 27.585; individualID: BC-ZSM-HYM-27768-C12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-C12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-C12; recordNumber: BC-ZSM-HYM-27768-C12;

- recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-C06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-C06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-C06; recordNumber: BC-ZSM-HYM-27768-C06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47; decimalLongitude: 17.27; individualID: BC-ZSM-HYM-22524-C12; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-C12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-C12; recordNumber: BC-ZSM-HYM-22524-C12; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-B03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-B03; recordNumber: BC-ZSM-HYM-27768-B03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.9853; decimalLongitude: 27.5847; individualID: BC-ZSM-HYM-27770-A10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A10; recordNumber: BC-ZSM-HYM-27760-A10; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.9853; decimalLongitude: 27.5847; individualID: BC-ZSM-HYM-27770-A08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A08; recordNumber: BC-ZSM-HYM-27760-A08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-A06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-A06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-A06; recordNumber: BC-ZSM-HYM-27768-A06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- i. scientificName: *Tetrastichus intruitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Romania; locality: Iasi Botanical Garden; decimalLatitude: 47.188; decimalLongitude: 27.549; individualID: BC-ZSM-HYM-27768-F09; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-27768-F09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-F09; recordNumber: BC-ZSM-HYM-27768-F09; recordedBy: J.S. Noyes; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-27768-F09+1445344240.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 8). Body length 1.4 mm (paratypes 1.4–1.6 mm). *Head*. Width/length (dorsal view) 2.2, width/length (frontal view) 2.0, POL/OOL 2.3, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.7. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.5, 2.5, 1.9, clava length/width 3.0, lengths pedicel/F1 0.7, lengths F1/F2 1.0, F1/F3 1.2, lengths F1, F2, F3/clava 0.6, 0.6, 0.5, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.4. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with median groove in posterior 1/3, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.1, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.2, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with strong reticulation, propodeal callus with three setae. *Fore wing*. Costal cell length/width 11.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.3. *Gaster*. Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 2.0, longest cercal seta slightly kinked in apical 1/4, ovipositor sheaths projecting slightly beyond apex of Gt₇.

Colour. Body with weak coppery tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with veins yellowish-white, coxae and femora black, trochanters dark brown, tibiae dark brown to black with apex yellowish-brown, tarsi yellowish-brown or dark brown.

Variation. Scape yellowish-brown (one specimen) or pale brown (one specimen).

MALE. Body length 1.3 mm. *Head*. Width/length (dorsal view) 2.5, width/length (frontal view) 2.1, mouth width/malar space 1.4, widths head/mesosoma 1.2. *Antenna*. F1–F4 without basal whorls of setae, scape length/eye height 0.9, scape length/width 2.5, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.6, pedicel+flagellum length/mesosoma width 2.0, length/width F1, F2, F3, F4 3.0, 2.7, 2.7, 2.7, clava length/width 6.7, lengths pedicel/F1 0.7, lengths F1/F2 1.1, F1/F3 1.1, F1/F4 1.1, lengths F1, F2, F3, F4/clava 0.5, 0.4, 0.4, 0.4.

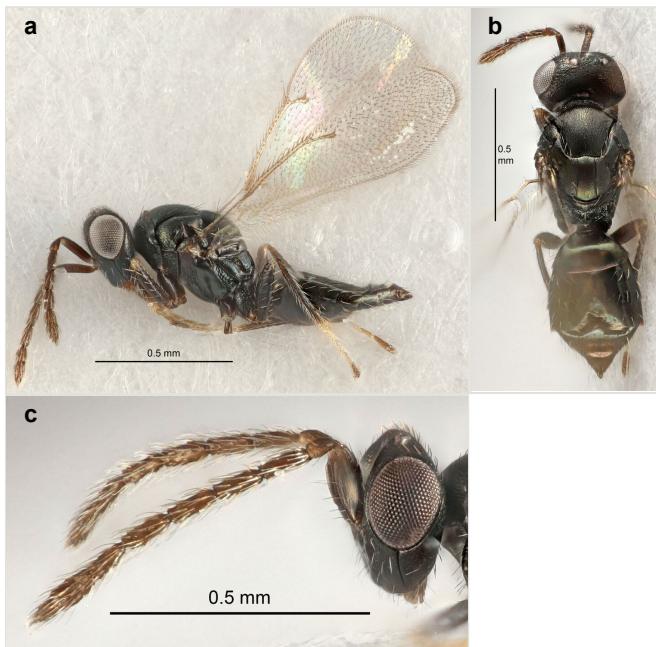


Figure 8.

Tetrastichus intruitus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. As in female.

Diagnosis

Female with antennal flagellum long, for example, F1 and F2 both 2.5× and F3 1.9× as long as wide and pedicel+flagellum 1.32× as long as width of mesoscutum; ovipositor sheaths not protruding beyond apex of Gt₇. Male with scattered setae and without externo-dorsal, sub-basal compact whorls of long dark setae on funiculars. Through the erect setae on vertex and erect adnotaular setae, similar to species in the *murcia*-group.

Distribution

Hungary, Romania.

Host: Unknown.

Notes

Holotype deposited in NHM, paratypes in MZLU, NHM.

***Tetrastichus lacustrinus*, sp. n.**

- ZooBank <urn:lsid:zoobank.org:act:9171ECE1-C208-45C1-A34F-F0C4693F428F>

Materials**Holotype:**

- a. scientificName: *Tetrastichus lacustrinus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.802; decimalLongitude: 13.747; individualID: BC-ZSM-HYM-21587-E06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-E06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-E06; recordNumber: BC-ZSM-HYM-21587-E06; recordedBy: C.Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus lacustrinus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.714; decimalLongitude: 16.763; individualID: BC-ZSM-HYM-21587-B11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-B11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-B11; recordNumber: BC-ZSM-HYM-21587-B11; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus lacustrinus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.834; decimalLongitude: 13.528; individualID: BC-ZSM-HYM-21587-E01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-E01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-E01; recordNumber: BC-ZSM-HYM-21587-E01; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus lacustrinus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.834; decimalLongitude: 13.528; individualID: BC-ZSM-HYM-21587-A09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-A09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A09; recordNumber: BC-ZSM-HYM-21587-A09; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus lacustrinus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6833; decimalLongitude: 13.4833; individualID: BC-ZSM-HYM-29813-D09; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-D09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-D09; recordNumber: BC-ZSM-HYM-29813-D09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 9). Body length 1.9 mm (paratypes 1.7–1.9 mm). *Head*. Width/length (dorsal view) 2.4, width/length (frontal view) 1.2, POL/OOL 2.0, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.0, 1.9, 1.4, clava length/width 2.8, lengths pedicel/F1 0.9, lengths F1/F2 1.1, F1/F3 1.3, lengths F1, F2, F3/clava 0.6, 0.5, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with median groove in posterior ½, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.2, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum (measured medially) 0.4, propodeum with strong reticulation, propodeal callus with five setae. *Fore wing*. Costal cell length/width 10.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster*. Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.0, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.8, longest seta almost straight, ovipositor sheaths not protruding beyond apex of Gt₇.



Figure 9.

Tetrastichus lacustrinus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body with weak coppery tinges, scape, flagellum and pedicel dark brown, tegulae dark brown, wings hyaline with veins yellowish-brown to brown, coxae black with metallic green tinges, trochanters dark brown, femora black, tibiae yellowish-brown, tarsi dark yellowish-brown to infuscate.

Variation. Paratypes with scape pale brown to yellowish-brown with dorsal edge brown, wing veins yellowish-white.

MALE. Body length 1.2 mm. *Head*. Width/length (dorsal view) 2.1, width/length (frontal view) 1.3, mouth width/malar space 1.1, eye height/malar space 1.3, widths head/mesosoma 1.1. *Antenna*. F1–F4 with basal whorls of setae, these setae reaching beyond apex of flagellomere attached to, scape length/eye height 1.0, scape length/width 2.6, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.8, length/width F1, F2, F3, F4 1.7, 1.8, 1.5, 2.0, lengths pedicel/F1 1.0, lengths F1/F2 0.9, F1/F3 1.1, F1/F4 0.8.

Diagnosis

Female with antennal clava (incl. spicule) 2.8× as long as wide; POL/OOL 2.0; distance between SMG 1.7× distance SMG to SLG; ovipositor sheaths not protruding beyond apex of Gt₇.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU.

Tetrastichus mixtus, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:664AFD68-1D68-42A0-AA27-BF1656CD49E3](http://urn.lsid.zoobank.org:act:664AFD68-1D68-42A0-AA27-BF1656CD49E3)

Materials

Holotype:

- a. scientificName: *Tetrastichus mixtus*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H02; recordNumber: BC-ZSM-HYM-27768-H02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-B01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-B01; occurrenceDetails: <http://www.boldsystems.org/index.php/>

- [API_Public/specimen?ids=BC-ZSM-HYM-27770-B01](http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B01); recordNumber: BC-ZSM-HYM-27760-B01; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H07; recordNumber: BC-ZSM-HYM-27768-H07; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H06; recordNumber: BC-ZSM-HYM-27768-H06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H05; recordNumber: BC-ZSM-HYM-27768-H05; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-A11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A11; recordNumber: BC-ZSM-HYM-27760-A11; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-C09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-C09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C09; recordNumber: BC-ZSM-HYM-27760-C09; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-C08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-C08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C08; recordNumber: BC-ZSM-

- HYM-27760-C08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
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basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
HYM-27770-C04; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-
ZSM-HYM-27760-C04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C04; recordNumber: BC-ZSM-
HYM-27760-C04; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
HYM-27770-C02; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-
ZSM-HYM-27760-C02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C02; recordNumber: BC-ZSM-
HYM-27760-C02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
HYM-27770-C01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-
ZSM-HYM-27760-C01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C01; recordNumber: BC-ZSM-
HYM-27760-C01; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
HYM-27770-B12; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-
ZSM-HYM-27760-B12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B12; recordNumber: BC-ZSM-
HYM-27760-B12; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen
- m. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order:
Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
HYM-27770-B10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-
ZSM-HYM-27760-B10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B10; recordNumber: BC-ZSM-
HYM-27760-B10; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
basisOfRecord: PreservedSpecimen

- n. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-B07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-B07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B07; recordNumber: BC-ZSM-HYM-27760-B07; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- o. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-B02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-B02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B02; recordNumber: BC-ZSM-HYM-27760-B02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- p. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-A12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A12; recordNumber: BC-ZSM-HYM-27760-A12; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- q. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H01; recordNumber: BC-ZSM-HYM-27768-H01; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- r. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G11; recordNumber: BC-ZSM-HYM-27768-G11; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- s. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G06; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G06; recordNumber: BC-ZSM-HYM-27768-G06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- t. scientificName: *Tetrastichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;

- decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G05; recordNumber: BC-ZSM-HYM-27768-G05; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- u. scientificName: *Tetrastrichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastrichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G04; recordNumber: BC-ZSM-HYM-27768-G04; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- v. scientificName: *Tetrastrichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastrichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G03; recordNumber: BC-ZSM-HYM-27768-G03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- w. scientificName: *Tetrastrichus mixtus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastrichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29751-A10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-A10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-A10; recordNumber: BC-ZSM-HYM-29751-A10; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 10). Body length 2.0 mm (paratypes 1.2–2.0 mm). **Head.** Width/length (dorsal view) 2.3, width/length (frontal view) 1.3, POL/OOL 2.4, widths head/mesosoma 1.0, mouth width/malar space 1.2, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.0, length/width F1, F2, F3 1.7, 1.8, 1.3, clava length/width 3.4, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 1.2, lengths F1, F2, F3/clava 0.4, 0.5, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.6. **Mesosoma.** Length/width 1.3, mesoscutal mid-lobe length/width (width measured in anterior part) 0.8, mid-lobe with median groove in posterior ¾, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.1, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.3, distance between SMG/distance between SMG and SLG 1.5, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with weak reticulation, propodeal callus with four setae. **Fore wing.** Costal cell length/width 11.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.0. **Gaster.** Subcircular to ovate, length/width 1.2, lengths

gaster/mesosoma 0.9, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.5, longest cercal seta almost straight, ovipositor sheaths reaching to, but not protruding beyond, apex of Gt₇.

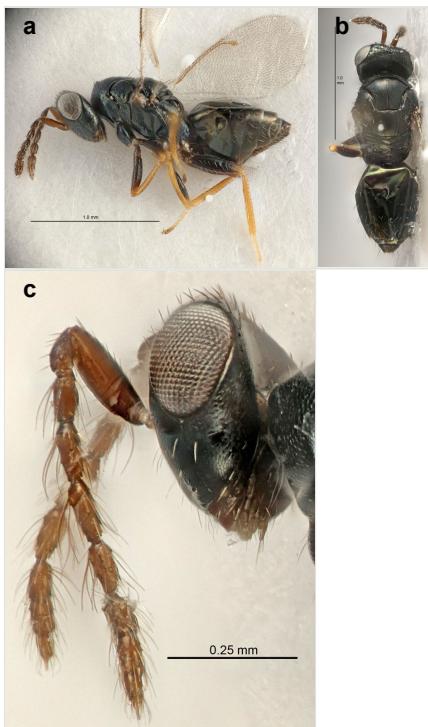


Figure 10.

Tetrastichus mixtus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body with weak metallic green and golden tinges, scape dark yellowish-brown, pedicel and flagellum dark brown, tegulae dark brown, wings hyaline with veins yellowish-white, coxae concolorous with body, trochanters dark brown, femora dark brown with very weak metallic tinges, tibiae and tarsi yellowish-brown.

MALE. Body length 1.1–1.4 mm. *Head*. Width/length (dorsal view) 2.0, width/length (frontal view) 1.2, mouth width/malar space 1.3, eye height/malar space 1.4, widths head/mesosoma 1.2. *Antenna*. F1–F4 with basal whorls of setae, these setae subequal in length to flagellomere attached to, scape length/eye height 1.1, scape length/width 3.2, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.8, length/width F1, F2, F3, F4 2.0, 2.7, 2.7, 2.3, clava length/width 5.3, lengths pedicel/F1 0.8, lengths F1/F2 0.8, F1/F3 0.8, F1/F4 0.9, lengths F1, F2, F3, F4/clava 0.4, 0.5, 0.5, 0.4.

Colour. Similar to female, but antennal scape dark brown.

Diagnosis

Female with distance between posterior ocelli relatively long, POL/OOL= 2.4; F1 1.7× as long as wide; distance between SMG 1.5× distance SMG to SLG; ovipositor sheaths reaching to, but not protruding beyond, apex of Gt₇. Male with antennal clava 5.3×, F4 2.3× and scape 3.2× as long as wide.

Distribution

Hungary, Romania, Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, ZSM.

Additional paratype (not barcoded)

1♀ “HUNGARY, Balaton-Zamárdi, 1.VIII.1961, A. Sundholm” (NHM, ex coll. Hedqvist).

Tetrastichus murcia (Walker, 1839)

Nomenclature

Cirrospilus Murcia Walker 1839c:177. Lectotype ♂ in NHM, designated by Graham 1961:39, examined (Fig. 11). Combined to *Tetrastichus* by Walker 1848:146 and to *Aprostocetus* by Graham 1961:39 and back to *Tetrastichus* by Graham 1991:261.

Tetrastichus trichops Thomson 1878:282. Lectotype ♀ in MZLU, designated by Graham 1961:39, examined. Synonymised with *T. murcia* by Graham 1991:261.

Description

See Graham (1991).

Diagnosis

Female gaster with ovipositor sheaths projecting distinctly beyond apex of Gt₇, length of projecting part about equal to length of hind basitarsus; setae on eyes very long, 0.8× OD; distance between posterior ocelli relatively short, POL/OOL= 1.5–1.6.

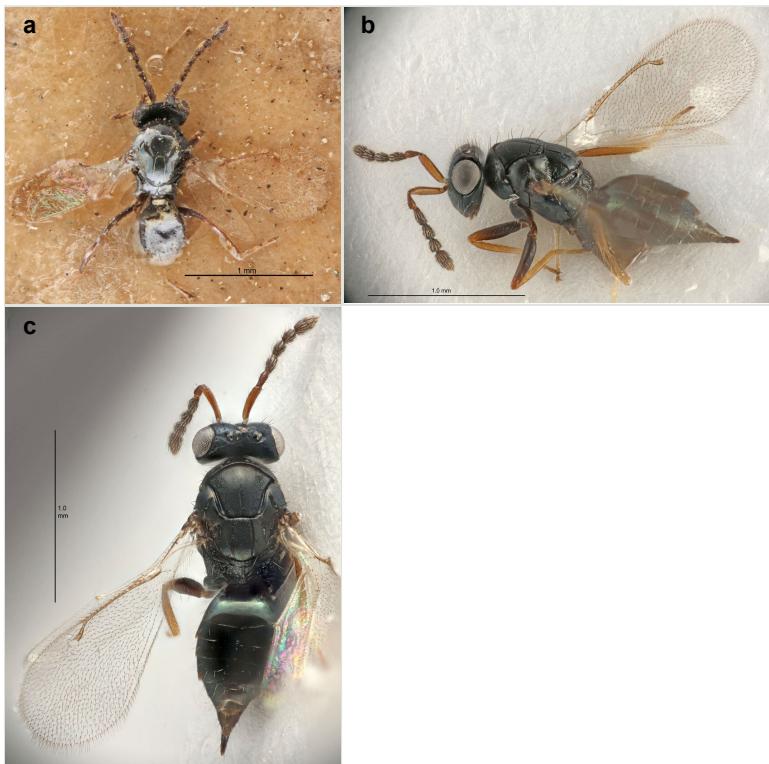


Figure 11.

Tetrastichus murcia (Walker)

a: Lectotype male, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

Distribution

France, Germany, Sweden, United Kingdom (Graham 1991), and Russia (**new record**).

Host: *Sargus (Geosargus)* sp. (Diptera: Stratiomyidae), endoparasitoid emerging from pupa (Domenichini 1966). Larvae of *Sargus* develop in decaying matter, some in ulcers of elm trees, i.e. saprophagous (Johannsen 1922).

Material examined: Type material: lectotypes ♂ of *C. murcia* (type no. 5.1944) and ♀ of *T. trichops* (type no. 4869:1). Additional material (4♀): France 2♀ (GD), Russia 1♀ (MZLU), Sweden 1♀ (SMTP).

***Tetrastichus solvae* Graham, 1991**

Nomenclature

Tetrastichus solvae Graham 1991:266. Holotype ♀ in NHM, examined (Fig. 12).

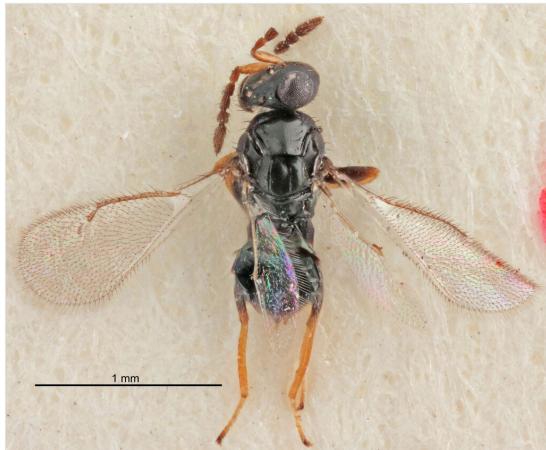


Figure 12. [doi](#)

Tetrastichus solvae Graham. Holotype female, dorsal.

Description

See Graham (1991).

Diagnosis

Female with antennal funicle stout, F1 and F2 both 1.1–1.25× as long as wide, pedicel 1.35–1.5× as long as F1; mid-lobe of mesoscutum without a median groove or with the groove indicated only near mesoscutellum.

Distribution

Spain (Canary Islands, Tenerife) (Graham 1991).

Host: *Xylomyia cabrerae* (Becker) (Diptera: Xylomyiidae) in twigs of *Euphorbia canariensis* (Graham 1991).

Material examined

Type material: holotype ♀ (NHM, type no. 5.3629).

***Tetrastichus tacitus*, sp. n.**

- ZooBank <urn:lsid:zoobank.org:act:2EAC3BB9-DC8F-4B7A-9C19-302D09F09D9D>

Materials**Holotype:**

- a. scientificName: *Tetrastichus tacitus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B10; recordNumber: BC-ZSM-HYM-22524-B10; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 46.903; decimalLongitude: 16.454; individualID: BC-ZSM-HYM-13565-F03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-F03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-F03; recordNumber: BC-ZSM-HYM-13565-F03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.594; decimalLongitude: 27.353; individualID: BC-ZSM-HYM-22523-G01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-G01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-G01; recordNumber: BC-ZSM-HYM-22523-G01; recordedBy: O.Popovici; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.381; decimalLongitude: 16.552; individualID: BC-ZSM-HYM-22524-A10; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-A10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-A10; recordNumber: BC-ZSM-HYM-22524-A10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B02; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B02; recordNumber: BC-ZSM-HYM-22524-B02; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- e. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B09; recordNumber: BC-ZSM-HYM-22524-B09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; decimalLatitude: 49.719; decimalLongitude: 10.158; individualID: BC-ZSM-HYM-22524-D03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-D03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-D03; recordNumber: BC-ZSM-HYM-22524-D03; recordedBy: J. Straka; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.9853; decimalLongitude: 27.5847; individualID: BC-ZSM-HYM-27770-A06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A06; recordNumber: BC-ZSM-HYM-27760-A06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-A11; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-A11; recordNumber: BC-ZSM-HYM-22524-A11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-A12; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-A12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-A12; recordNumber: BC-ZSM-HYM-22524-A12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B03; recordNumber: BC-ZSM-HYM-22524-B03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-

- B05; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B05; recordNumber: BC-ZSM-HYM-22524-B05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- I. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B08; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B08; recordNumber: BC-ZSM-HYM-22524-B08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- m. scientificName: *Tetrastichus tacitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B11; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-B11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-B11; recordNumber: BC-ZSM-HYM-22524-B11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 13). Body length 1.7 mm (paratypes 1.5–1.7 mm). **Head.** Width/length (dorsal view) 2.2, width/length (frontal view) 1.3, POL/OOL 2.1, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.7. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.0, 1.8, 1.2, clava length/width 2.7, lengths pedicel/F1 0.8, lengths F1/F2 1.1, F1/F3 1.3, lengths F1, F2, F3/clava 0.5, 0.5, 0.4, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.5. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with median groove in posterior ⅓, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.2, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum (measured medially) 0.5, propodeum with strong reticulation, propodeal callus with three setae. **Fore wing.** Costal cell length/width 8.7, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.1. **Gaster.** Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length longest cercal seta/next longest seta 1.8, longest cercal seta almost straight, ovipositor sheaths projecting distinctly beyond apex of Gt₇.

Colour. Body with weak metallic green tinges, scape, pedicel and flagellum dark brown, tegulae dark brown, wings hyaline with veins yellowish-brown to brown, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, fore tarsus pale brown, mid and hind tarsi yellowish-brown with T4 dark brown.

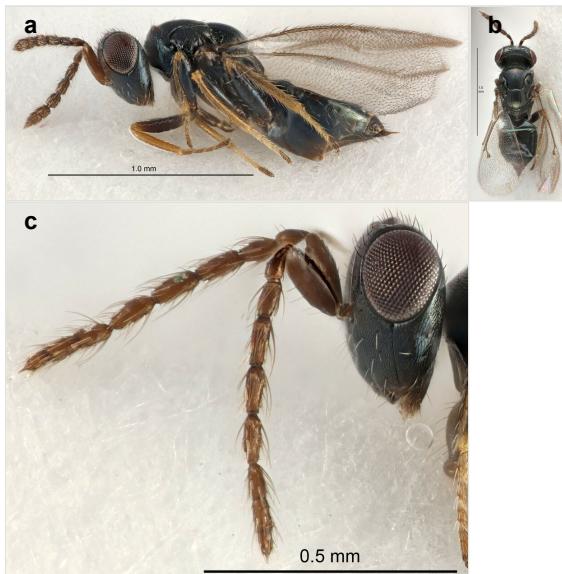


Figure 13.

Tetrastichus tacitus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Variation. Scape pale brown in some paratypes.

MALE. Body length 1.2–1.5 mm. *Head*. Width/length (dorsal view) 1.8, width/length (frontal view) 1.1, mouth width/malar space 1.1, eye height/malar space 1.4, widths head/mesosoma 0.9. *Antenna*. F1–F4 with basal whorls of setae, these setae reaching beyond apex of flagellomere attached to, scape length/eye height 0.9, scape length/width 2.9, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.6, pedicel+flagellum length/mesosoma width 1.6, length/width F1, F2, F3, F4 2.0, 2.8, 2.8, 2.7, clava length/width 6.0, lengths pedicel/F1 1.0, lengths F1/F2 0.7, F1/F3 0.7, F1/F4 0.8, lengths F1, F2, F3, F4/clava 0.3, 0.4, 0.4, 0.4.

Colour. Similar to female but scape always dark brown and tibiae brown in some specimens.

Diagnosis

Female with antennal clava (incl. spicule) 2.7× as long as wide; ovipositor sheaths protruding beyond apex of Gt₇. Male with antennal clava 6.0×, F4 2.3× and scape 2.9× as long as wide.

Distribution

Germany, Hungary, Romania.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, ZSM.

Tetrastichus tartus, sp. n.

- ZooBank urn:lsid:zoobank.org:act:998D49C4-0B49-4B9E-91ED-7C8EF3CD670E

Material

Holotype:

- a. scientificName: *Tetrastichus tartus*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-C04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-C04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-C04; recordNumber: BC-ZSM-HYM-27768-C04; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 14). Body length 1.8 mm. **Head.** Width/length (dorsal view) 2.4, width/length (frontal view) 1.2, POL/OOL 1.9, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.0, 2.3, 1.8, clava length/width 3.3, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.6, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.4. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with median groove in posterior ⅓, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.1, distance between SMG/distance between SMG and SLG 2.0, lengths dorsellum/propodeum (measured medially) 0.5, propodeum with weak reticulation, propodeal callus with four setae. **Fore wing.** Costal cell length/width 12.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.3. **Gaster.** Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.8, longest seta kinked in apical ⅓, ovipositor sheaths not reaching apex of Gt₇.



Figure 14.

Tetrastichus tartus sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic green and coppery tinges, scape yellowish-brown with dorsal edge brown, pedicel and flagellum dark brown, tegulae blackish, wings hyaline with veins yellowish-brown, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, tarsi yellowish-brown with T4 brown.

MALE. Unknown.

Diagnosis

Distance between submedian grooves 2.0× distance between submedian and sublateral grooves; antennal clava (incl. spicule) long, 3.3× as long as wide; ovipositor sheaths not protruding beyond apex of Gt₇.

Distribution

Romania.

Host: Unknown.

Notes

Holotype deposited in NHM.

Tetrastichus hylotomarum group

Diagnosis

Body bright metallic and shiny; ovipositor sheaths retracted in dry specimens and do not reach apex of Gt₇ (as in Fig. 2b); female gaster circular to short ovate; male flagellomeres 1–4 without externo-dorsal, sub-basal compact whorls of long setae (e.g. Fig. 15c); usually relatively large specimens.

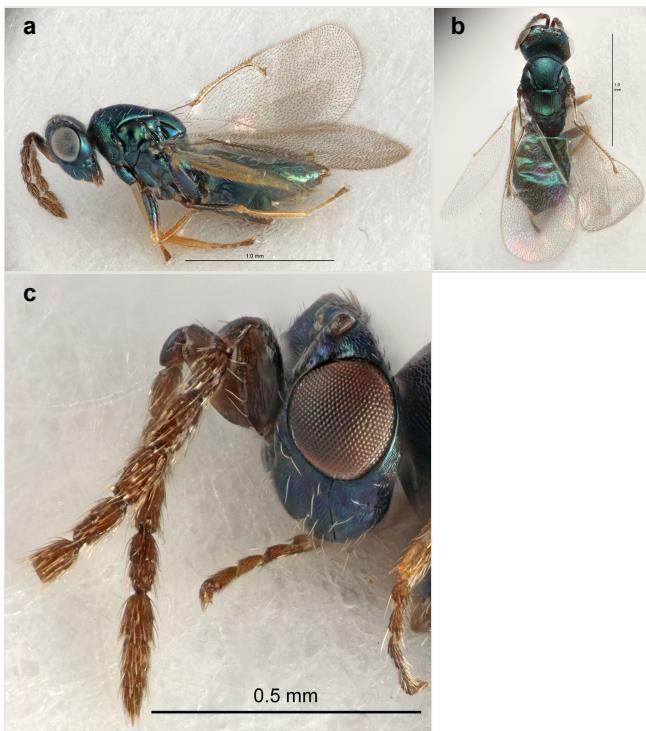


Figure 15.

Tetrastichus argei sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head+antenna, lateral. [doi](#)

Tetrastichus argei, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:DBDA353F-05C8-4374-A96E-CD5D62A0C11F](http://urn.lsid:zoobank.org:act:DBDA353F-05C8-4374-A96E-CD5D62A0C11F)

Materials

Holotype:

- a. scientificName: *Tetrastichus argei*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.683; decimalLongitude: 13.5; individualID: BC-ZSM-HYM-20721-E05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-E05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-E05; recordNumber: BC-ZSM-HYM-20721-E05; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 57.322; decimalLongitude: 18.203; individualID: BC-ZSM-HYM-22523-C07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-C07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-C07; recordNumber: BC-ZSM-HYM-22523-C07; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.633; decimalLongitude: 16.623; individualID: BC-ZSM-HYM-21587-A01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-A01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A01; recordNumber: BC-ZSM-HYM-21587-A01; recordedBy: C.Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.609; decimalLongitude: 16.508; individualID: BC-ZSM-HYM-22526-F12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22526-F12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22526-F12; recordNumber: BC-ZSM-HYM-22526-F12; recordedBy: S. Schmidt; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C06; recordNumber: BC-ZSM-HYM-25461-C06; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 64.114; decimalLongitude: 19.363; individualID: BC-ZSM-HYM-27493-G09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-G09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-G09; recordNumber: BC-ZSM-HYM-27493-G09; recordedBy: SMTP; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C07; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C07; recordNumber: BC-ZSM-HYM-25461-C07; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden;

- decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C08; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C08; recordNumber: BC-ZSM-HYM-25461-C08; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C09; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C09; recordNumber: BC-ZSM-HYM-25461-C09; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C10; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C10; recordNumber: BC-ZSM-HYM-25461-C10; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C11; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C11; recordNumber: BC-ZSM-HYM-25461-C11; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-C12; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-C12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-C12; recordNumber: BC-ZSM-HYM-25461-C12; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D01; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D01; recordNumber: BC-ZSM-HYM-25461-D01; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- m. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D02; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D02; recordNumber: BC-ZSM-HYM-25461-D02; recordedBy: P. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- n. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-

- D03; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D03; recordNumber: BC-ZSM-HYM-25461-D03; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- o. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D04; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D04; recordNumber: BC-ZSM-HYM-25461-D04; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- p. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D05; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D05; recordNumber: BC-ZSM-HYM-25461-D05; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- q. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D06; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D06; recordNumber: BC-ZSM-HYM-25461-D06; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- r. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D07; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D07; recordNumber: BC-ZSM-HYM-25461-D07; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- s. scientificName: *Tetrastichus argei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.294; decimalLongitude: 12.495; individualID: BC-ZSM-HYM-25461-D08; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-D08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-D08; recordNumber: BC-ZSM-HYM-25461-D08; recordedBy: P.
- o. Benander; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 15). Body length 1.8 mm (paratypes 1.5–1.9 mm). **Head.** Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.0, 2.0, 1.6, clava length/width 3.4, lengths pedicel/F1 0.7, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.5,

mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with median groove in posterior $\frac{3}{4}$, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.7, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum (measured medially) 0.5, propodeum with strong reticulation, propodeal callus with six setae. *Fore wing.* Costal cell length/width 12.8, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.9. *Gaster.* Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.4, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body metallic blue-green, entire antenna dark brown, tegulae black with metallic tinge, wings hyaline with veins yellowish-brown, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, fore tarsus brown, mid and hind tarsi yellowish-brown with T3–4 brown.

MALE. Body length 1.7–1.8 mm. *Head.* Width/length in dorsal view 2.3, width/length in frontal view 1.2, eye height/malar space 1.2, mouth width/malar space 1.1, widths head/mesosoma 1.0. *Antenna.* F1–F4 without basal whorls of setae, scape length/eye height 1.1, scape length/width 2.4, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3, F4 1.7, 2.0, 2.0, 2.2, clava length/width 4.4, lengths pedicel/F1 1.0, lengths F1/F2 0.8, F1/F3 0.8, F1/F4 0.7, lengths F1, F2, F3, F4/clava 0.3, 0.5, 0.5, 0.5.

Colour. As in female.

Diagnosis

Tibiae yellowish-brown; female with malar space 0.8× eye height, scape 3.5× as long as wide, antennal clava 3.4× as long as wide; mesoscutellum with ratio distance between submedian grooves to distance between submedian and sublateral grooves 1.4.

Distribution

Sweden.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, ZSM.

Host

Gregarious endoparasitoid on *Argo ustulata* (L.) (Hymenoptera: Argidae), 14♀ and 3♂ have been reared from the same host specimen. The label information does not specify which stage of the sawfly that was parasitised. Another *Tetrastichus* species, *T.*

hylotomarum, has been recorded from larvae and pupae of *Arge* spp. (Graham 1991), but not specifically *A. ustulata*.

Additional paratypes (not barcoded)

1♀ 1♂ "SWEDEN, Skåne, Kullaberg, 28.ii.1966, P. Benander, ex *Arge ustulata*".

Tetrastichus asilis, sp. n.

- ZooBank urnlsid:zoobank.org:act:14CCE9D7-3579-422B-A7A0-3951D456CA08

Material

Holotype:

- a. scientificName: *Tetrastichus asilis*; taxonRemarks: Holotype deposited in ZSM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Germany; decimalLatitude: 49.985; decimalLongitude: 9.769; individualID: BC-ZSM-HYM-25459-G12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25459-G12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25459-G12; recordNumber: BC-ZSM-HYM-25459-G12; recordedBy: D. Doczkal; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 16). Body length 1.4 mm. *Head*. Width/length in dorsal view 2.1, width/length in frontal view 1.1, POL/OOL 2.4, widths head/mesosoma 1.2, mouth width/malar space 1.0, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.2, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3 1.6, 1.9, 1.7, clava length/width 4.0, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.3, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.7, mesoscutal mid-lobe length/width 1.1 (width measured in anterior part), mid-lobe with a weak median groove in posterior 1/3, with three adnotaular setae on each side, lengths of mesoscutum/scutellum (measured medially) 1.4, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 2.5, distance between SMG/distance between SMG and SLG 2.0, lengths dorsellum/propodeum 0.6, propodeum with very weak reticulation partly smooth, propodeal callus with two setae. *Fore wing*. Costal cell length/width 13.5, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 2.4. *Gaster*. Short ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.5, longest cercal seta evenly curved, ovipositor sheaths not reaching apex of Gt₇.

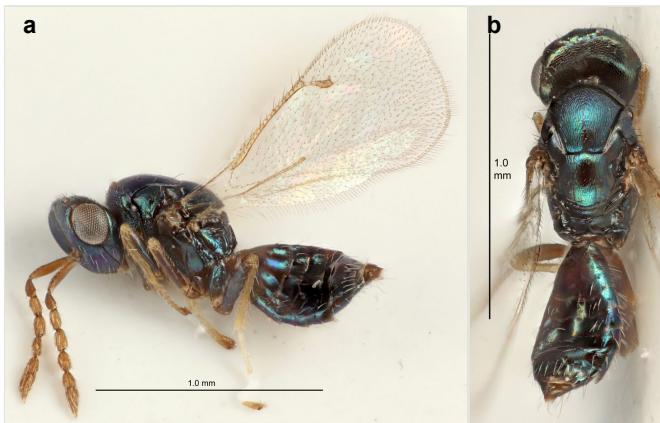


Figure 16.

Tetrastichus asilis sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body metallic bluish-green, scape yellowish-brown, pedicel and flagellum pale brown, tegulae dark brown with metallic tinges, wing venation yellowish-brown, coxae and femora concolorous with body, trochanters dark brown, tibiae and tarsi yellowish-brown, T4 pale brown.

MALE. Unknown.

Diagnosis

Tibiae yellowish-brown; female with malar space $0.9 \times$ eye height, POL/OOL 2.4, F1 $1.6 \times$, F2 $1.9 \times$, F3 $1.7 \times$ as long as wide.

Distribution

Germany.

Host: Unknown.

Notes

Holotype deposited in ZSM.

Tetrastichus brevicalcar Graham, 1991

Nomenclature

Tetrastichus brevicalcar Graham 1991:243. Holotype ♀ in NHM, examined (Fig. 17).

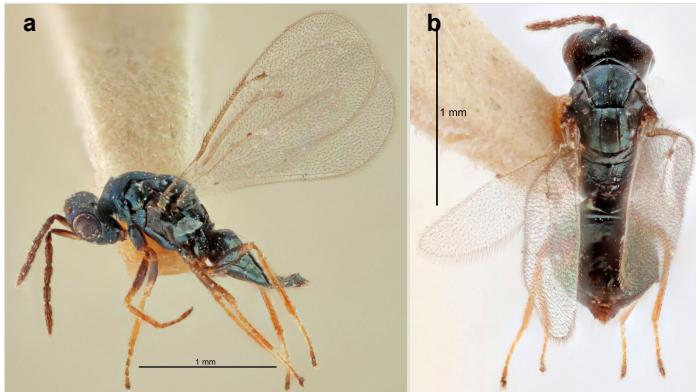


Figure 17.

Tetrastichus brevicalcar Graham.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991).

Diagnosis

Female flagellum long and slender, for example, F1 2.4–2.7×, F3 2.2–2.5× and clava 4.5–5.2× as long as wide.

Distribution

United Kingdom (Graham 1991), Sweden (Hedqvist 2003) and Czech Republic (**new record**).

Host

Unknown.

Additional material examined

24♀: Czech Republic 1♀ (NHM), Sweden 20♀ (MZLU, NHM, SMTP), United Kingdom 3♀ (NHM).

***Tetrastichus calmius*, sp. n.**

- ZooBank <urn:lsid:zoobank.org:act:A1C32083-BE37-4AC2-9C54-07E8A62C07FB>

Material**Holotype:**

- a. scientificName: *Tetrastichus calmius*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29751-B09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-B09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-B09; recordNumber: BC-ZSM-HYM-29751-B09; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 18). Body length 1.7 mm. *Head*. Width/length in dorsal view 2.0, width/length in frontal view 1.2, POL/OOL 1.9, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 2.0, 2.1, 2.1, clava length/width 3.8, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.4, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a weak median groove, with seven adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, lengths dorsellum/propodeum (measured medially) 0.7, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.7, distance between SMG/distance between SMG and SLG 1.4, propodeum with strong reticulation, propodeal callus with four setae. *Fore wing*. Costal cell length/width 10.7, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.8. *Gaster*. Ovate, length/width 1.6, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.6, lengths longest cercal seta/next longest seta 1.4, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body golden-green, scape yellowish-brown with dorsal edge dark brown, pedicel and flagellum dark brown, tegulae black with metallic tinge, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, fore tarsus brown, mid and hind tarsi with T1–3 yellowish-brown, T4 brown.

MALE. Unknown.



Figure 18.

Tetrastichus calmius sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Diagnosis

Antennal clava 3.8×, F1 1.0× and F2 2.1× as long as wide, F1 1.3× as long as pedicel; ratio POL/OOL = 1.9; length/width of enclosed space between submedian grooves 2.7.

Distribution

Sweden.

Notes

Holotype deposited in MZLU.

Host

Unknown.

Tetrastichus coelarchus Graham, 1991

Nomenclature

Tetrastichus coelarchus Graham 1991:240. Holotype ♀ in NHM, examined (Fig. 19).

Description

See Graham (1991).

Diagnosis

Antennal clava 3.4–3.6× as long as wide; malar space 0.8–0.9× height of eye; mesoscutellum with enclosed space between submedian grooves 2.7× as long as wide.



Figure 19.

Tetrastichus coelarchus Graham.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Distribution

(Former) Czechoslovakia, Ireland, Sweden, United Kingdom and (former) Yugoslavia (Graham 1991).

Notes

Holotype deposited in MZLU, paratypes in MZLU.

Host

Unknown.

Additional material examined

9♀, Sweden (NHM).

Tetrastichus coeruleus (Nees, 1834)

Nomenclature

Eulophus coeruleus Nees von Esenbeck 1834:174. Lectotype ♀ in OUMNH, designated by Graham 1961:39–40, examined (Fig. 20). Transferred to *Aprostocetus* by Graham 1961:39–40 and to *Tetrastichus* by Graham 1991:238.

Tetrastichus asparagi Crawford 1909:150. Syntypes in USNM, not examined. Synonymised by Graham 1961:39.

Description

See Graham (1991).

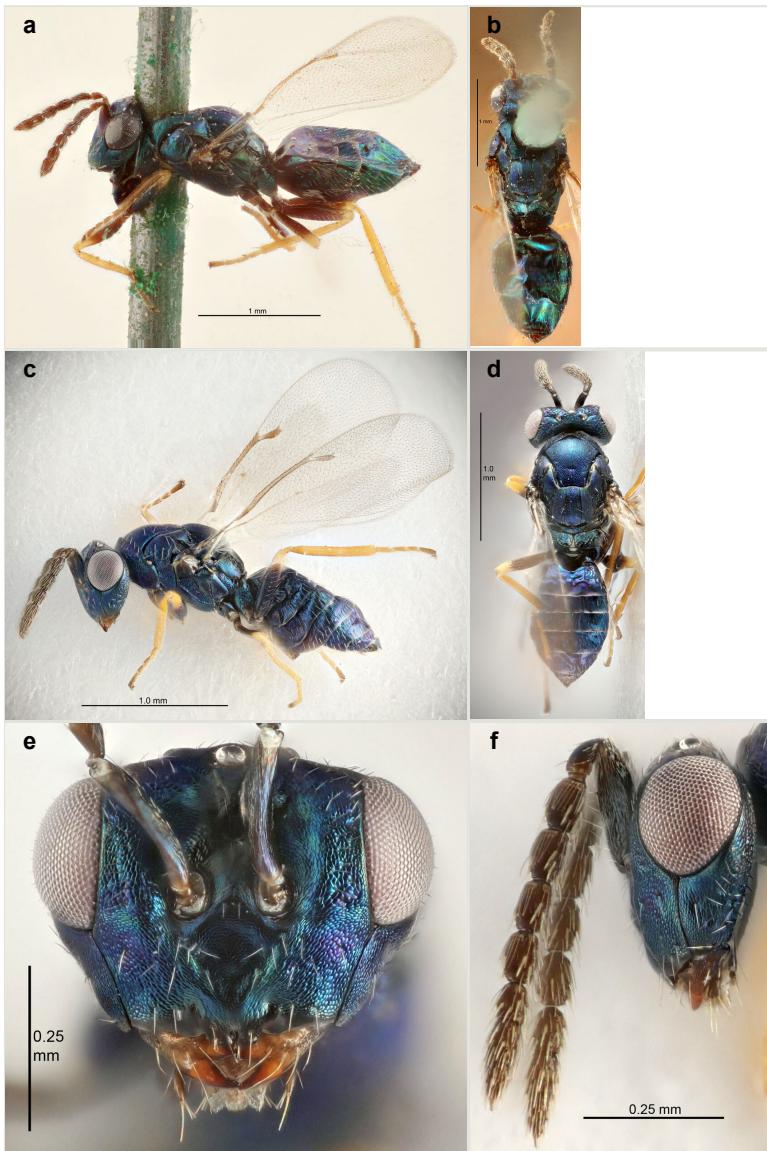


Figure 20.

Tetrastrichus coeruleus (Nees)

a: Lectotype female, lateral. [doi](#)

b: Lectotype female, dorsal. [doi](#)

c: Nontype female, lateral. [doi](#)

d: Nontype female, dorsal. [doi](#)

e: Nontype female, head frontal. [doi](#)

f: Nontype male, head and antenna lateral. [doi](#)

Diagnosis

Mouth opening very wide, 1.8–2.0 × malar space; body bright metallic blue to bluish-purple; ovipositor does not reach apex of Gt₇; male funiculars with short whorled setae, 0.5–0.7 × as long as funicular attached to.

Distribution

France, Germany, Hungary, Italy, The Netherlands, United Kingdom (Graham 1991); Norway and Sweden (**new records**).

Host: *Crioceris asparagi* (L.) (Coleoptera: Chrysomelidae), emerges from host cocoons, but oviposits in host eggs or larvae (Van Alphen 1980).

Material examined: Type material: lectotype ♀ of *E. coeruleus* (OUMNH). Additional material (72♀ 18♂): China 1♀ (UCRC), France 2♀ (GD, NHM), Norway 3♀ 1♂ (NHM), Sweden 63♀ 17♂ (MZLU, NHM, ZSM), United Kingdom 3♀ (NHM).

Tetrastichus cosidis, sp. n.

- ZooBank urnlsid:zoobank.org:act:D7F3B936-4C8D-4550-9C1E-EDDF367EE3DC

Material

Holotype:

- a. scientificName: *Tetrastichus cosidis*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.617; decimalLongitude: 16.567; individualID: BC-ZSM-HYM-20721-B06; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-B06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-B06; recordNumber: BC-ZSM-HYM-20721-B06; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 21). Body length 2.1 mm. **Head.** Width/length in dorsal view 2.1, width/length in frontal view 1.3, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 0.9, scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.0, 1.9, 2.0, clava length/width 4.2, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.0, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median groove that is weak in anterior part, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, lengths dorsellum/propodeum 0.6, mesoscutellum length/width 1.1, length/width of enclosed space between submedian grooves 2.6, distance

between SMG/distance between SMG and SLG 1.8, propodeum with weak reticulation, propodeal callus with five setae. *Fore wing*. Costa cell length/width 10.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.6. *Gaster*. Ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.6, cercal setae nm, ovipositor sheaths not reaching apex of Gt₇.

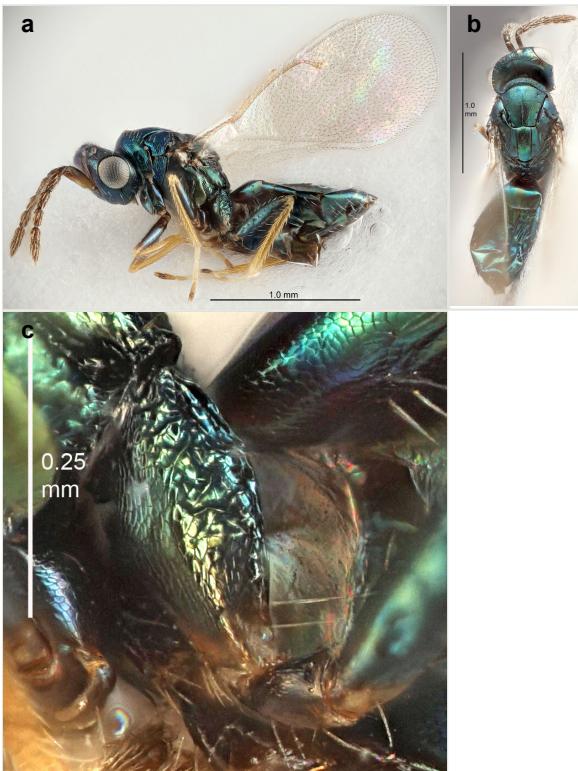


Figure 21.

Tetrastichus cosidis sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Holotype female, hind coxa, lateral. [doi](#)

Colour. Body golden-green, antenna dark brown, tegulae black with metallic tinges, wings hyaline, wing venation yellowish-white, coxae and femora concolorous with body, trochanters blackish, tibiae and tarsi yellowish-brown.

MALE. Unknown.

Diagnosis

Hind coxa with a strong, sharp and complete carina along posterior margin; malar space 0.9× eye height; antennal clava 3.9× as long as wide; mesoscutellum with ratio

distance between SMG/distance between SMG and SLG 1.4, length/width of enclosed space between submedian grooves 2.6.

Distribution

Sweden.

Notes

Holotype deposited in MZLU.

Host

Unknown.

Tetrastichus cumulus, sp. n.

- ZooBank urn:lsid:zoobank.org:act:AC5ACFA0-7AF2-403A-ABA5-31F37EF65969

Materials

Holotype:

- scientificName: *Tetrastichus cumulus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29750-C09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29750-C09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-C09; recordNumber: BC-ZSM-HYM-29750-C09; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29750-D02; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29750-D02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-D02; recordNumber: BC-ZSM-HYM-29750-D02; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29750-C05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29750-C05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-C05; recordNumber: BC-ZSM-HYM-29750-C05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- c. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7078; decimalLongitude: 13.475; individualID: BC-ZSM-HYM-29814-D08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29814-D08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29814-D08; recordNumber: BC-ZSM-HYM-29814-D08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 60.276; decimalLongitude: 17.191; individualID: BC-ZSM-HYM-27493-F01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-F01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-F01; recordNumber: BC-ZSM-HYM-27493-F01; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6967; decimalLongitude: 13.47; individualID: BC-ZSM-HYM-29751-C07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-C07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-C07; recordNumber: BC-ZSM-HYM-29751-C07; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.834; decimalLongitude: 13.528; individualID: BC-ZSM-HYM-21587-G07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-G07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-G07; recordNumber: BC-ZSM-HYM-21587-G07; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.185; decimalLongitude: 14.379; individualID: BC-ZSM-HYM-22523-D05; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-D05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-D05; recordNumber: BC-ZSM-HYM-22523-D05; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.933; decimalLongitude: 18.267; individualID: BC-ZSM-HYM-13565-A02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-A02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-A02; recordNumber: BC-ZSM-HYM-13565-A02; recordedBy: SMTP project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden;

- decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-E11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-E11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-E11; recordNumber: BC-ZSM-HYM-26563-E11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Russia; decimalLatitude: 59.567; decimalLongitude: 30.133; individualID: BC-ZSM-HYM-22524-F07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-F07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-F07; recordNumber: BC-ZSM-HYM-22524-F07; recordedBy: E. Shevtsova; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.5; individualID: BC-ZSM-HYM-20721-F12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F12; recordNumber: BC-ZSM-HYM-20721-F12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.5; individualID: BC-ZSM-HYM-20721-F09; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F09; recordNumber: BC-ZSM-HYM-20721-F09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- m. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.483; individualID: BC-ZSM-HYM-20721-G08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-G08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-G08; recordNumber: BC-ZSM-HYM-20721-G08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- n. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.667; decimalLongitude: 13.55; individualID: BC-ZSM-HYM-20721-D05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-D05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-D05; recordNumber: BC-ZSM-HYM-20721-D05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- o. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.75; decimalLongitude: 16.65; individualID: BC-ZSM-HYM-20721-B08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-B08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-B08

- [ids=BC-ZSM-HYM-20721-B08](#); recordNumber: BC-ZSM-HYM-20721-B08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- p. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.583; decimalLongitude: 13.417; individualID: BC-ZSM-HYM-20721-A03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-A03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-A03; recordNumber: BC-ZSM-HYM-20721-A03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- q. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 59.107; decimalLongitude: 18.138; individualID: BC-ZSM-HYM-27493-F10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-F10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-F10; recordNumber: BC-ZSM-HYM-27493-F10; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- r. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 57.004; decimalLongitude: 16.066; individualID: BC-ZSM-HYM-27493-H11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-H11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-H11; recordNumber: BC-ZSM-HYM-27493-H11; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- s. scientificName: *Tetrastichus cumulus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 64.183; decimalLongitude: 19.60; individualID: BC-ZSM-HYM-13565-A11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-A11; recordNumber: BC-ZSM-HYM-13565-A11; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 22). Body length 2.5 mm (paratypes 1.7–2.7 mm). **Head.** Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 2.0, widths head/mesosoma 1.0, mouth width/malar space 1.0, malar space/eye height 0.9. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.3, 2.0, 1.8, clava length/width 3.8, lengths pedicel/F1 0.6, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.2, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior 4/5, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 3.3, distance between SMG/distance between SMG and SLG 1.2, lengths dorsellum/propodeum (measured

medially) 0.7, propodeum with strong reticulation, propodeal callus with four setae. *Fore wing*. Costal cell length/width 8.8, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster*. Subcircular to ovate, length/width 1.4, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.3, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

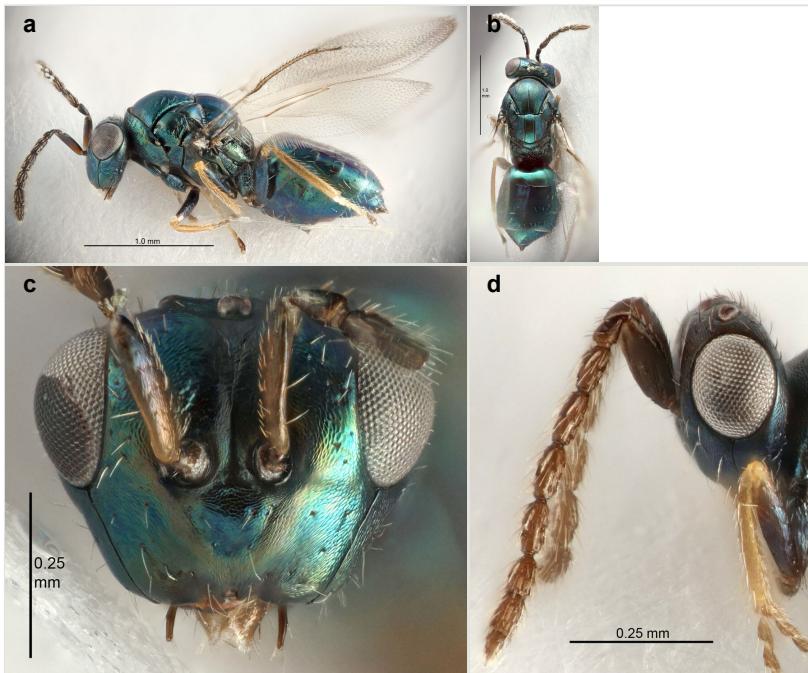


Figure 22.

Tetrastichus cumulus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype female, head frontal. [doi](#)

d: Paratype male, head and antenna lateral. [doi](#)

Colour. Body metallic blue-green, scape dark brown with base dark yellowish-brown, pedicel and flagellum dark brown, tegulae black with metallic tinge, wings hyaline with veins yellowish-brown, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, fore tarsus dark brown, mid and hind tarsi yellowish-brown with T4 brown.

Variation. Colour of scape varies from completely dark brown to yellowish-brown with apicodorsal ½ dark brown, but most specimens with colour as holotype. Paratypes with body metallic blue or blue-green.

MALE (Fig. 22). Body length 1.3–1.5 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.3, eye height/malar space 1.3, mouth width/malar space 1.1,

widths head/mesosoma 1.1. *Antenna*. F1–F4 without basal whorls of setae, scape length/eye height 1.0, scape length/width 2.2, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.8, length/width F1, F2, F3, F4 1.9, 2.1, 2.1, 2.1, clava length/width 5.0, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 0.9, F1/F4 0.9, lengths F1, F2, F3, F4/clava 0.4, 0.4, 0.4, 0.4.

Colour. As in female, but scape completely dark brown. Body metallic blue-green or purple.

Diagnosis

Mid and hind tibiae yellowish-brown; mesoscutellum with distance between submedian grooves short, distance between SMG/distance between SMG and SLG 1.2; female with malar space 0.9× height of eye, antenna with F2 2.0×, F3 1.8× and clava 3.8× as long as wide; male antenna with scape 2.2× and clava 5.0× as long as wide and scape length 1.0× height of eye.

Distribution

Russia and Sweden.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, SMTP and ZSM.

Host

Unknown.

Additional paratype (not barcoded)

1♀ "SWEDEN, Skåne, Dalby, Ö. Mölla, 21-27.viii.1998, yellow pan trap, R. Danielsson (MZLU)

Tetrastichus cyprus, sp. n.

- ZooBank [urn:lsid.zoobank.org:act:8F2ECA2A-663C-47D9-B10D-A6F6212D6F49](http://urn.lsid.zoobank.org:act:8F2ECA2A-663C-47D9-B10D-A6F6212D6F49)

Description

FEMALE holotype (Fig. 23). Body length 2.0 mm (paratypes 1.7–2.3 mm). *Head*. Width/length in dorsal view 2.4, width/length in frontal view 2.0, POL/OOL 1.5, widths head/mesosoma 1.2, mouth width/malar space 1.9, malar space/eye height 0.7. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.1, length/width F1, F2, F3 1.5, 1.4, 1.3, clava length/width 2.7, lengths pedicel/F1 0.8, lengths F1/F2 1.1, F1/F3 1.2, lengths F1, F2, F3/clava 0.5, 0.5, 0.4, widths F1/pedicel

(dorsal view) 1.5, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with median groove in posterior $\frac{1}{3}$, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.7, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum 0.5, propodeum with weak reticulation, propodeal callus with three setae. *Fore wing*. Costal cell length/width 10.6, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 3.0. *Gaster*. Subcircular to ovate, length/width 1.3, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.7, length of longest cercal seta/next longest seta 0.6, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 23.

Tetrastichus cyprus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with metallic greenish-blue, entire antenna dark brown, tegulae black, wings hyaline with veins yellowish-brown to brown, coxae concolorous with body, trochanters dark brown, fore and mid femora dark brown, hind femur concolorous with body, tibiae and tarsi yellowish-brown.

MALE. Unknown.

Diagnosis

Similar to *T. halidayi* with the wide mouth and large and oddly-shaped mandibles (as in Figs. 2a and 65d). Differs from *T. halidayi* in having female gaster short ovate, 1.3× as long as wide, ovipositor sheaths short and not visible in dorsal view, cerci on gaster placed ventrally and not visible in dorsal view, setae on vertex shorter, 0.45× OD and body strongly metallic.

Distribution

Cyprus.

Notes

The specimens in the type series are not in pristine condition, all specimens being more or less broken and dirty. The holotype is missing right wing pair and right pedicel+flagellum is broken off and glued separately to the card.

Host

Reared from an unidentified Coleoptera and from an unidentified leaf miner on broad bean (*Vicia faba* L.).

Material examined

Holotype ♀ "CYPRUS, Phlasson, 30.XII.1967, G.P. Georghiou. Parasite of Coleoptera #521" (UCRC). Paratypes (3♀): 2♀ with same label data as holotype (UCRC), 1♀ from same locality and date as holotype, but ex leaf miner on broad bean (UCRC).

Tetrastichus erinus, sp. n.

- ZooBank urnlsid:zoobank.org:act:65D13412-7863-4178-B6CB-2C3A6041F429

Materials

Holotype:

- a. scientificName: *Tetrastichus erinus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.5; individualID: BC-ZSM-HYM-20721-F10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F10; recordNumber: BC-ZSM-HYM-20721-F10; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus erinus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 67.031; decimalLongitude: 20.232; individualID: BC-ZSM-HYM-27493-H04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-H04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-H04; recordNumber: BC-ZSM-HYM-27493-H04; recordedBy: SMTP; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 24). Body length 1.9 mm (paratype 2.1 mm). **Head.** Width/length in dorsal view 2.1, width/length in frontal view 1.3, POL/OOL 2.0, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 0.8. **Antenna.**

Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.0, 2.0, 2.0, clava length/width 4.0, lengths pedicel/F1 0.7, lengths F1/F2 1.0, F1/F3 1.0, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior $\frac{2}{3}$, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.2, distance between SMG/distance between SMG and SLG 1.9, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with strong reticulation, propodeal callus with six setae. *Fore wing*. Costal cell length/width 12.8, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster*. Subcircular to ovate, length/width 1.2, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.4, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 24.

Tetrastichus erinus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with golden-green, scape yellowish-brown with apical $\frac{1}{3}$ brown, pedicel and flagellum dark brown, tegulae black with metallic tinge, wings hyaline with veins brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, fore tarsus brown, mid and hind tarsi yellowish-white with T4 brownish.

Variation. Body blue-green in paratype.

MALE. Unknown.

Diagnosis

Mesoscutellum with distance between submedian grooves long, distances between submedian grooves/submedian and sublateral grooves 1.9, ratio length/width of enclosed space between submedian grooves 2.2; tibiae yellowish-brown; female with malar space 0.8× eye height; antennal clava 4× as long as wide; POL/OOL 2.0.

Distribution

Sweden.

Notes

Holotype deposited in MZLU, paratypes in SMTP.

Host

Unknown.

Tetrastichus evexus, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:543B3F20-DFA1-44B0-B58A-DD88B270E613>

Materials

Holotype:

- a. scientificName: *Tetrastichus evexus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6847; decimalLongitude: 13.6767; individualID: BC-ZSM-HYM-25460-A01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-A01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-A01; recordNumber: BC-ZSM-HYM-25460-A01; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.605; decimalLongitude: 13.004; individualID: BC-ZSM-HYM-13565-F10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-F10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-F10; recordNumber: BC-ZSM-HYM-13565-F10; recordedBy: Bo. W. Svensson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.605; decimalLongitude: 13.004; individualID: BC-ZSM-HYM-13565-F09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-F09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-F09; recordNumber: BC-ZSM-HYM-13565-F09; recordedBy: B. W. Svensson & Co.; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6847; decimalLongitude: 13.6767; individualID: BC-ZSM-HYM-25460-A05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-

- ZSM-HYM-25460-A05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-A04; recordNumber: BC-ZSM-HYM-25460-A05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6847; decimalLongitude: 13.6767; individualID: BC-ZSM-HYM-25460-A04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-A04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-A04; recordNumber: BC-ZSM-HYM-25460-A04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - e. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6847; decimalLongitude: 13.6767; individualID: BC-ZSM-HYM-25460-A03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-A03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-A03; recordNumber: BC-ZSM-HYM-25460-A03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - f. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6847; decimalLongitude: 13.6767; individualID: BC-ZSM-HYM-25460-A02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-A02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-A02; recordNumber: BC-ZSM-HYM-25460-A02; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - g. scientificName: *Tetrastichus evexus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Romania; locality: Breazu MT rzeski; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-B11; individualCount: 1; sex: M; lifeStage: a; reproductiveCondition: S; catalogNumber: BC-ZSM-HYM-27760-B11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B11; recordNumber: BC-ZSM-HYM-27760-B11; recordedBy: J.S. Noyes; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-27760-B11+1449268734.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 25). Body length 2.3 mm (paratypes 1.9–2.0 mm). **Head.** Width/length in dorsal view 2.1, width/length in frontal view 1.3, POL/OOL 2.1, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 1.0. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.8, 2.0, 1.7, clava length/width 3.9, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 1.0, lengths F1, F2, F3/clava 0.4, 0.5, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior ¾, with four adnotaular setae on each side, lengths

mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.7, distance between submedian/distance between submedian and sublateral grooves 1.4, lengths dorsellum/propodeum (measured medially) 0.5, propodeum with strong reticulation, propodeal callus with nine setae. *Fore wing.* Costal cell length/width 8.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.6. *Gaster.* Subcircular to ovate, length/width 1.6, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.2, longest cercal setae curved, almost straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 25.

Tetrastichus evexus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body metallic blue-green, scape yellowish-brown with dorsal edge darker, pedicel and flagellum dark brown, tegulae black with metallic tinge, wings hyaline with veins yellowish-white, coxae concolorous with body, trochanters dark brown, fore and mid femora dark brown with metallic tinges and with apical $\frac{1}{3}$ yellowish-brown, hind femur concolorous with body, tibiae yellowish-brown, fore tarsus dark brown, mid and hind tarsi yellowish-brown with T4 dark brown.

MALE. Unknown.

Diagnosis

Tibiae yellowish-brown; female with malar space 1.0× eye height; scape 3.6× and antennal clava 3.9× as long as wide; mesoscutellum with ratio distance between submedian grooves to distance between submedian and sublateral grooves 1.4. Similar to *T. helviscapus*, but with longer antennal clava in female, 3.9× as long as wide.

Distribution

Sweden.

Notes

Holotype deposited in MZLU, paratypes in MZLU and NHM.

Host

Unknown.

Tetrastichus flaccius, sp. n.

- ZooBank <http://zoobank.org/NomenclaturalActs/2353186D-657E-4465-893E-5023654DE141>

Description

FEMALE holotype (Fig. 26). Body length 2.2 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.2, POL/OOL 1.9, widths head/mesosoma 1.0, mouth width/malar space nm, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.2, 2.3, 2.1, clava length/width 4.0, lengths pedicel/F1 0.6, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.6, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.6, mesoscutal mid-lobe length/width 1.1 (width measured in anterior part), mid-lobe with a weak median groove in posterior $\frac{2}{3}$, with 4+5 adnotaular setae, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 1.1, length/width of enclosed space between submedian grooves 3.1, distance between SMG/distances between SMG and SLG 1.3, lengths dorsellum/propodeum 0.6, propodeum with strong reticulation, propodeal callus with six setae. *Fore wing*. Costal cell length/width 9.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.7. *Gaster*. Ovate, length/width 1.5, lengths gaster/mesosoma 1.0, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.5, longest cercal seta curved in apical $\frac{1}{3}$, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body metallic greenish-blue, antenna dark brown, tegulae dark brown, wing venation yellowish-brown, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, fore tarsus brown, mid and hind tarsi yellowish-brown with T4 brown.

MALE. Unknown.

Diagnosis

Mesoscutellum 1.1× as long as wide with enclosed area between submedian grooves 3.1× as long as wide; length/width F1, F2, F3, clava 2.2, 2.3, 2.1, 4.0; fore wing with marginal vein 2.7× as long as stigmal vein.

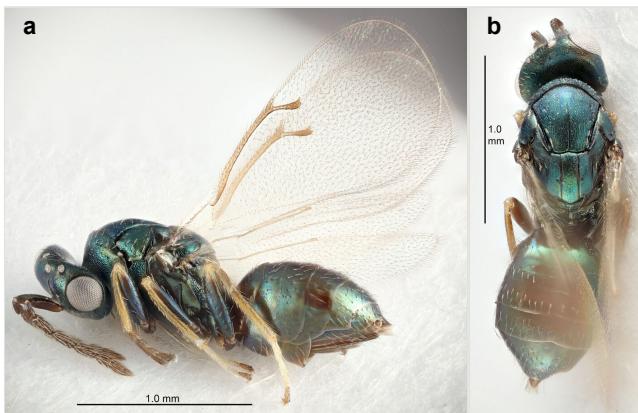


Figure 26.

Tetrastichus flaccius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Distribution

Sweden.

Notes

Holotype deposited in SMTP.

Host

Unknown.

Material examined

Holotype ♀ "SWEDEN, Hälsingland, Hudiksvalls kommun, Stensjön, 62.054°N 16.172°E, 27.vii.2005, SMTP" (SMTP).

Tetrastichus helviscapus Graham, 1991

Nomenclature

Tetrastichus helviscapus Graham 1991:242–243. Holotype ♀ in NHM (NHM type no. 5.3617), examined (Fig. 27).

Description

See Graham (1991).

Diagnosis

Tibiae yellowish-brown; female with malar space 0.7× eye height; scape 4.0× and antennal clava 3.0× as long as wide; mesoscutellum with ratio distance between submedian grooves to between submedian and sublateral grooves 1.4 and enclosed space between submedian grooves 2.7× as long as wide.

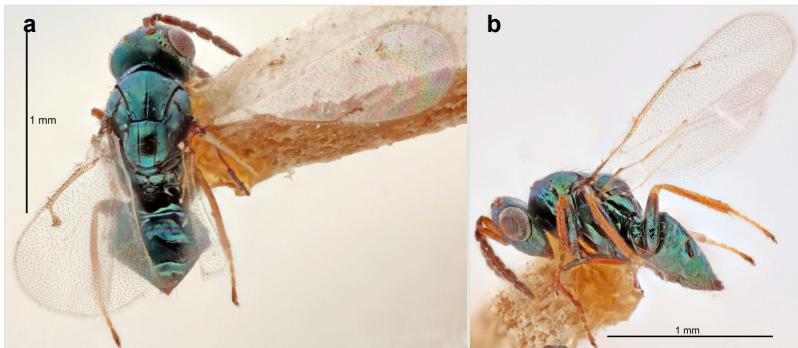


Figure 27.

Tetrastichus helviscapus Graham.

a: Holotype female, dorsal. [doi](#)

b: Holotype female, lateral. [doi](#)

Distribution

Moldova, Russia, United Kingdom, (former) Yugoslavia (Graham 1991); Sweden (Hedqvist 2003); France and Morocco (**new records**).

Host

Unknown.

Additional material examined

France, 2♀ (GD); Morocco, 2♀ (GD).

Tetrastichus hylotomarum (Bouché, 1834)

Nomenclature

Eulophus hylotomarum Bouché 1834:211. Neotype ♀, designated by Graham (1991), examined (Fig. 28). Transferred to *Tetrastichus* by Erdös 1956:390, to *Aprostocetus* by Graham 1961:40 and back to *Tetrastichus* by Domenichini 1966:88.

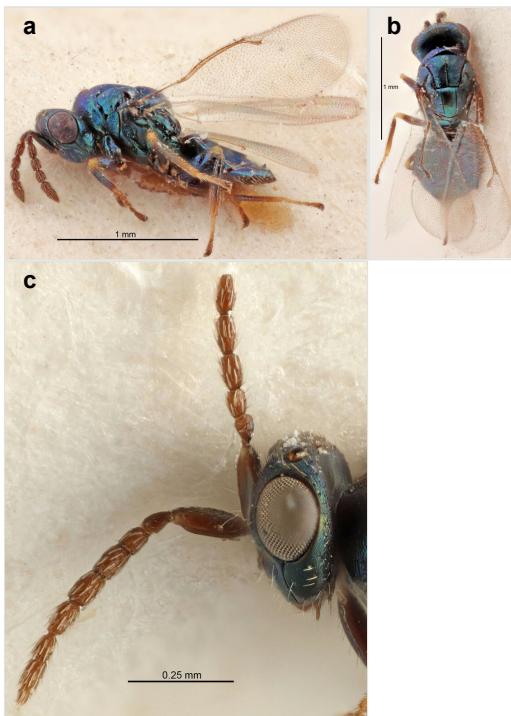


Figure 28.

Tetrastichus hylotomarum (Bouché).

a: Neotype female, lateral. [doi](#)

b: Neotype female, dorsal. [doi](#)

c: Nontype male, head and antenna lateral. [doi](#)

Description

See Graham (1991).

Diagnosis

Female antenna: F3 1.0–1.5× as long as wide, clava 2.6–3.0× as long as wide; male antenna: funiculars without an externo-dorsal, sub-basal compact whorl of long setae, F1 1.1–1.4× as long as wide and about as long as pedicel, distinctly shorter than F2; both sexes with mid and hind tibiae broadly infuscate, sometimes mainly black; body bright metallic green.

Distribution

Bulgaria, (former) Czechoslovakia, France, Germany, Hungary, The Netherlands, Russia, Sweden and United Kingdom (Graham 1991); Italy and Romania (**new records**).

Host

Reared from *Arge ochropus* (Gmelin), *A. pagana* (Panzer) (Hymenoptera: Argidae), *Athalia cordata* Audinet-Serville, *Cladius pectinicornis* (Geoffroy) (Hymenoptera: Tenthredinidae), parasitising host larvae and pupae (Graham 1991).

Additional material examined

11♀ 2♂: France 3♀ (NHM), Italy 1♀ (ZSM), Romania 1♀ (NHM), Sweden 6♀ 2♂ (MZLU, NHM, SMTP).

Tetrastichus iasi, sp. n.

- ZooBank urn:lsid:zoobank.org:act:4534B329-B4E9-4E00-9B2D-BC76C917A3F2

Materials

Holotype:

- a. scientificName: *Tetrastichus iasi*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.188; decimalLongitude: 27.549; individualID: BC-ZSM-HYM-27768-E02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-E02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-E02; recordNumber: BC-ZSM-HYM-27768-E02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus iasi*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-B02; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-B02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-B02; recordNumber: BC-ZSM-HYM-27768-B02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 29). Body length 1.9 mm. *Head*. Width/length in dorsal view 2.0, width/length in frontal view 1.3, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 0.9. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.0, 1.5, 1.3, clava length/width 3.3, lengths of pedicel/F1 0.8, lengths F1/F2 1.1, F1/F3 1.2, lengths F1, F2, F3/clava 0.5, 0.5, 0.4, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a weak median groove that is missing in anterior 1/4, with seven adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, dorsellum/propodeum length 0.5,

mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.5, distance between SMG/distance between SMG and SLG 1.5, propodeum with strong reticulation, propodeal callus with five setae. *Fore wing.* Costal cell length/width 10.7, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster.* Short ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, lengths longest cercal seta/next longest seta 1.8, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

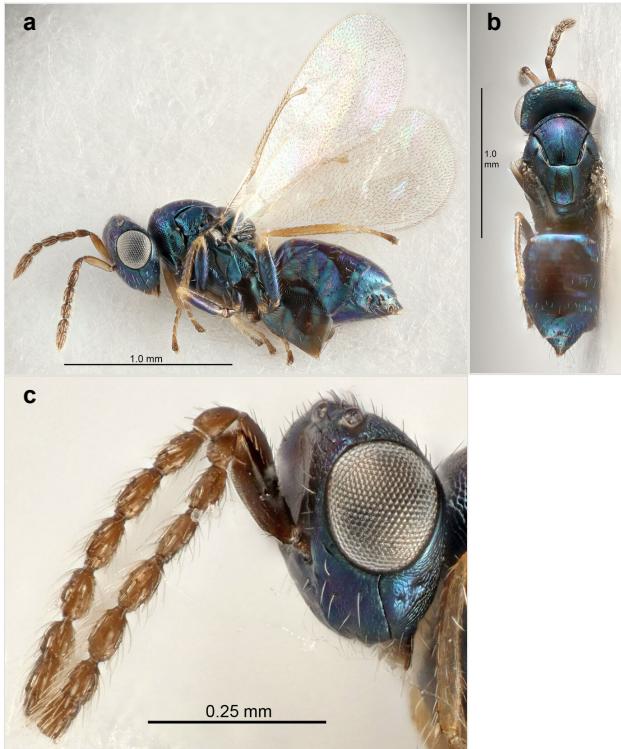


Figure 29.

Tetrastichus iasi sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body metallic bluish-green, gaster with purple tinges, scape yellowish-brown, flagellum and pedicel dark brown, tegulae black with metallic tinge, wings hyaline and venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, fore tarsus with T1–3 brown and T4 dark brown, mid and hind tarsi with T1–3 yellowish-brown and T4 dark brown.

MALE (Fig. 29). Body length 1.5 mm. *Head.* Width/length in dorsal view 2.2, width/length in frontal view 1.2, mouth width/malar space 1.0, widths head/mesosoma 1.2. *Antenna.* F1–F4 without basal whorls of setae, scape length/eye height 1.0, scape

length/width 3.2, lengths ventral plaque/scape 0.6, plaque placed in central part of scape, pedicel+flagellum length/mesosoma width 1.6, length/width F1, F2, F3, F4 1.6, 1.9, 1.9, 1.8, clava length/width 3.3, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, F1/F4 0.9, lengths F1, F2, F3, F4/clava 0.4, 0.5, 0.5, 0.5.

Colour. Scape dark brown. Otherwise similar to female.

Diagnosis

Mesoscutellum with submedian grooves diverging towards posterior part; female antenna with clava 3.3× as long as wide.

Distribution

Romania.

Notes

Holotype and paratype deposited in NHM.

Host

Unknown.

Tetrastichus illydris, sp. n.

- ZooBank urnlsidzoobank.orgact:E6AC6D4A-3CD4-484C-8A1B-751E3DB94A9B

Materials

Holotype:

- scientificName: *Tetrastichus illydris*; taxonRemarks: Holotype deposited in ZSM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Germany; decimalLatitude: 49.03; decimalLongitude: 12.157; individualID: BC-ZSM-HYM-20699-G06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20699-G06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20699-G06; recordNumber: BC-ZSM-HYM-20699-G06; recordedBy: D. Doczkal & A. Segerer; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Paratype:

- scientificName: *Tetrastichus illydris*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.05; decimalLongitude: 27.384; individualID: BC-ZSM-HYM-22523-H07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-H07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-H07; recordNumber: BC-ZSM-HYM-22523-H07; recordedBy: Popovici & Fusu; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 30). Body length 2.1 mm (paratype 1.9 mm). **Head.** Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 2.0, widths head/mesosoma 1.0, mouth width/malar space 1.0, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.1, 2.0, 1.5, clava length/width 3.3, lengths pedicel/F1 0.7, lengths F1/F2 0.9, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.6, 0.5, width F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with a weak median groove that is absent in anterior 1/4, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, lengths dorsellum/propodeum 0.8, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.3, propodeum with weak reticulation, propodeal callus with five setae. **Fore wing.** Costal cell length/width 10.0, lengths costal cell/marginal vein 1.2, lengths marginal/stigmal veins 2.9. **Gaster.** Semicircular, length/width 1.6, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.3, lengths longest cercal seta/next longest seta 1.5, ovipositor sheaths not reaching apex of Gt₇.



Figure 30.

Tetrastichus illydris sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Mesoscutum metallic blue-green and mesoscutellum golden-green, scape yellowish-brown, pedicel and flagellum dark brown, tegulae black with metallic tinges, wing venation yellowish-white, coxae concolorous with body, trochanters dark brown, fore and mid femora dark brown with apex yellowish-brown, hind femur black with metallic tinge and apex yellowish-brown, tibiae yellowish-brown, tarsi with T1–3 yellowish-brown and T4 brown.

MALE. Unknown.

Diagnosis

Mesoscutellum $0.8\times$ as long as wide, length/width of enclosed space between submedian grooves 2.6; mesoscutum bluish and mesoscutellum greenish; antennal clava $3.3\times$ as long as wide.

Distribution

Germany and Romania.

Notes

Holotype deposited in ZSM, paratype in MZLU.

Host

Unknown.

Tetrastichus inaequalis Graham, 1991

Nomenclature

Tetrastichus inaequalis Graham 1991:241–242. Holotype ♀ in NHM, examined (Fig. 31).

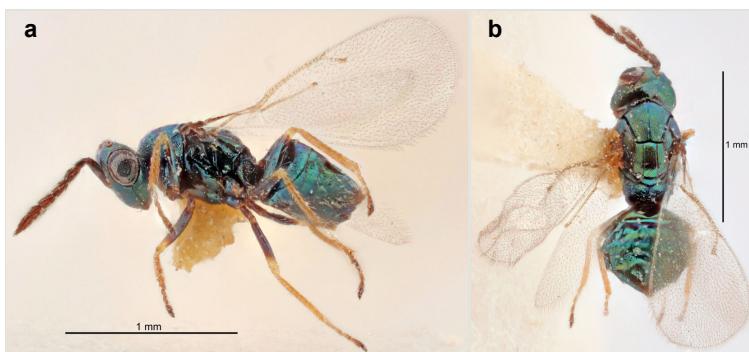


Figure 31.

Tetrastichus inaequalis Graham.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991).

Diagnosis

Antenna with F1 0.8× as long as F2 and only very slightly longer than the pedicel, F3 1.9× as long as wide; tibiae yellowish-brown; body bright metallic green.

Distribution

United Kingdom (Graham 1991), France and Sweden (**new records**).

Host

Unknown.

Additional material examined

4♀: France 2♀ (NHM), Sweden 1♀ (MZLU), United Kingdom 1♀ (NHM).

Tetrastichus incanus, sp. n.

- ZooBank urn:lsid:zoobank.org:act:A0E15318-3134-4D4F-966C-844B49CE5560

Materials

Holotype:

- scientificName: *Tetrastichus incanus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.792; decimalLongitude: 13.654; individualID: BC-ZSM-HYM-21587-G06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-G06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-G06; recordNumber: BC-ZSM-HYM-21587-G06; recordedBy: C.Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29751-B08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-B08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-B08; recordNumber: BC-ZSM-HYM-29751-B08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.943; decimalLongitude: 15.946; individualID: BC-ZSM-HYM-22523-

- D11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-D11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-D11; recordNumber: BC-ZSM-HYM-22523-D11; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.705; decimalLongitude: 13.4886; individualID: BC-ZSM-HYM-29814-B02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29814-B02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29814-B02; recordNumber: BC-ZSM-HYM-29814-B02; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-F08; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-F08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-F08; recordNumber: BC-ZSM-HYM-26563-F08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.943; decimalLongitude: 15.946; individualID: BC-ZSM-HYM-22523-D10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-D10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-D10; recordNumber: BC-ZSM-HYM-22523-D10; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 63.122; decimalLongitude: 15.07; individualID: BC-ZSM-HYM-27493-H01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-H01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-H01; recordNumber: BC-ZSM-HYM-27493-H01; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.943; decimalLongitude: 15.946; individualID: BC-ZSM-HYM-22523-E04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-E04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-E04; recordNumber: BC-ZSM-HYM-22523-E04; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Örebro; decimalLatitude: 59.2753; decimalLongitude: 15.2134; individualID: BC-ZSM-HYM-29813-G08; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-G08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/

- [specimen?ids=BC-ZSM-HYM-29813-G08](#); recordNumber: BC-ZSM-HYM-29813-G08; recordedBy: A.Jansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-G08+1516986306.jpg>; identifiedBy: Christer Hansson
- i. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Örebro; decimalLatitude: 59.2753; decimalLongitude: 15.2134; individualID: BC-ZSM-HYM-29813-H01; individualCount: 1; sex: M; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-H01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-H01; recordNumber: BC-ZSM-HYM-29813-H01; recordedBy: A.Jansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-H01+1516986310.jpg>; identifiedBy: Christer Hansson
 - j. scientificName: *Tetrastichus incanus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Bispgården; decimalLatitude: 63.0271; decimalLongitude: 16.6245; individualID: BC-ZSM-HYM-29813-A02; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-A02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-A02; recordNumber: BC-ZSM-HYM-29813-A02; recordedBy: A.Jansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-A02+1516986318.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 32). Body length 2.2 mm (paratypes 1.5–2.2 mm). **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 2.1, widths head/mesosoma 1.0, mouth width/malar space 1.1, malar space/eye height 0.9. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.2, 2.5, 2.2, clava length/width 3.8, lengths pedicel/F1 0.5, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior ¾, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.1, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.6, lengths dorsellum/propodeum (measured medially) 0.7, propodeum with strong reticulation, propodeal callus with three setae. **Fore wing.** Costal cell length/width 9.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. **Gaster.** Subcircular to ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.4, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body golden-green, scape yellowish-brown, pedicel and flagellum dark brown, tegulae black with metallic tinge, wings hyaline with veins yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, tarsi yellowish-brown, mid and hind tarsi with T4 brown.

Variation. Paratypes with body metallic blue or blue-green.

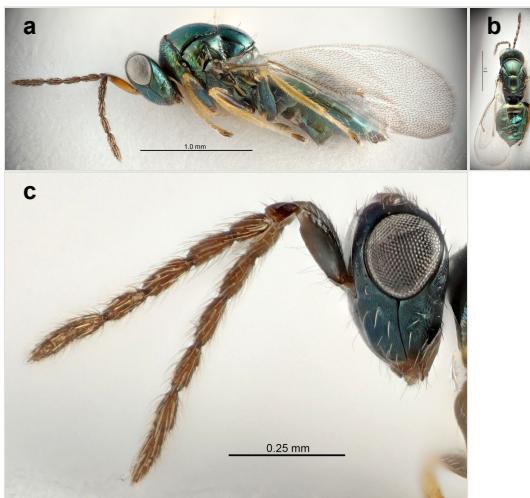


Figure 32.

Tetrastichus incanus sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)c: Paratype male, head and antenna lateral. [doi](#)

MALE (Fig. 32). Body length 1.7 mm. *Head*. Width/length in dorsal view 2.2, width/length in frontal view 1.3, eye height/malar space 1.2, mouth width/malar space 1.0, widths head/mesosoma 1.1. *Antenna*. F1–F4 without basal whorls of setae, scape length/eye height 1.0, scape length/width 2.7, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.7, length/width F1, F2, F3, F4 1.9, 2.3, 2.4, 2.4, clava length/width 4.9, lengths pedicel/F1 0.8, lengths F1/F2 0.8, F1/F3 0.8, F1/F4 0.8, lengths F1, F2, F3, F4/clava 0.3, 0.4, 0.4, 0.4.

Colour. Similar to female, but with scape dark brown. Body metallic blue-green.

Diagnosis

Mid and hind tibiae yellowish-brown; mesoscutellum with distance between submedian grooves 1.6× distance between submedian and sublateral grooves; female with malar space 0.9× height of eye, antenna with F2 2.5×, F3 2.2× and clava 3.8× as long as wide; male antenna with scape 2.7× and clava 4.9× as long as wide and scape length 1.0× height of eye.

Distribution

Sweden.

Notes

Holotype deposited in MZLU, paratypes in MZLU, SMTP.

Host

Unknown.

Tetrastichus johnnnoyesi, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:C919F453-A59B-479D-ABB0-E995120A51C5>

Materials

Holotype:

- a. scientificName: *Tetrastichus johnnnoyesi*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.298; decimalLongitude: 25.368; individualID: BC-ZSM-HYM-27768-D08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D08; recordNumber: BC-ZSM-HYM-27768-D08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus johnnnoyesi*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.298; decimalLongitude: 25.368; individualID: BC-ZSM-HYM-27768-D12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D12; recordNumber: BC-ZSM-HYM-27768-D12; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus johnnnoyesi*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.298; decimalLongitude: 25.368; individualID: BC-ZSM-HYM-27768-D10; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D10; recordNumber: BC-ZSM-HYM-27768-D10; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus johnnnoyesi*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.298; decimalLongitude: 25.368; individualID: BC-ZSM-HYM-27768-D09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D09; recordNumber: BC-ZSM-HYM-27768-D09; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 33). Body length 2.5 mm (paratypes 2.2 mm). **Head.** Width/length in dorsal view 2.1, width/length in frontal view 1.3, POL/OOL 2.1, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.1, length/width F₁, F₂, F₃ 2.0, 1.9, 1.7, clava length/width 3.2, lengths pedicel/F₁ 0.7, lengths F₁/F₂ 1.1, F₁/F₃ 1.2, lengths F₁, F₂, F₃/clava 0.6, 0.5, 0.5, widths F₁/pedicel (dorsal view) 1.0, lengths antennal spicule/C₃ 0.3. **Mesosoma.** Length/width 1.7, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with median groove, with four adnotaular setae on either side, length of mesoscutum/mesoscutellum (measured medially) 1.3, lengths dorsellum/propodeum 0.6, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 3.3, distance between SMG/distance between SMG and SLG 1.1, propodeum with strong reticulation, propodeal callus with four setae. **Fore wing.** Costal cell length/width 8.2, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.4. **Gaster.** Ovate, length/width 1.8, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.4, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.

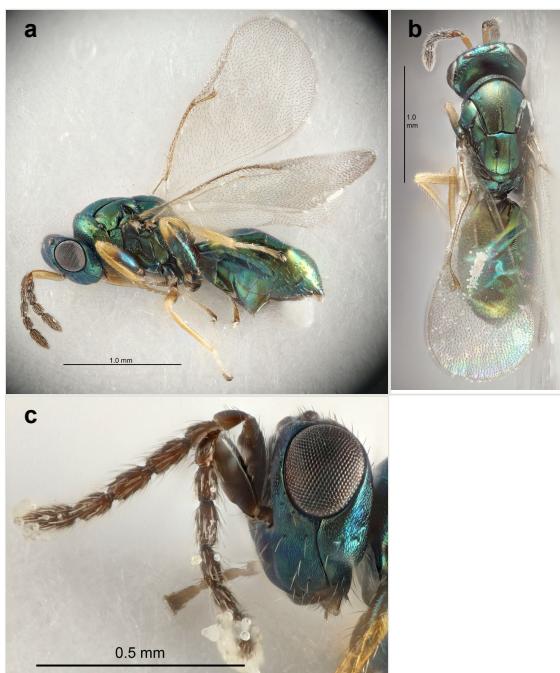


Figure 33.

Tetrastichus johnnylesi sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body golden-green, scape yellowish-brown, pedicel brownish, flagellum dark brown, tegulae black with metallic tinge, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae and tarsi yellowish-brown.

MALE (Fig. 33). Body length 2.0 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.3, mouth width/malar space 1.1, widths head/mesosoma 1.1. *Antenna*. F1–F4 without basal whorls of setae, scape length/eye height 1.1, scape length/width 3.0, ventral plaque placed in central part of scape, lengths of ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3, F4 1.2, 1.9, 1.9, 1.9, clava length/width 3.8, lengths pedicel/F1 1.1, lengths F1/F2 0.6, F1/F3 0.6, F1/F4 0.6, lengths F1, F2, F3, F4/clava 0.3, 0.5, 0.5, 0.5.

Colour. Scape black. Otherwise similar to female.

Diagnosis

Mesoscutellum with ratio length/width of enclosed space between submedian grooves 3.3; antennal clava 3.2× as long as wide.

Etymology

Named after John S. Noyes (NHM), collector of the type specimens.

Distribution

France and Romania.

Notes

Holotype and paratypes deposited NHM.

Host

Unknown.

Additional paratypes

3♀ 1♂: 2♀ 1♂ with same label data as holotype (NHM, MZLU); 1♀ "FRANCE, B. du Rhone, Fonscolombe, 7.vii.1990, M.W.R. de V. Graham" (NHM).

***Tetrastichus marcusgrahami*, sp. n.**

- ZooBank <urn:lsid:zoobank.org:act:94214DE9-0044-432B-B3BC-5BF726C647B0>

Description

FEMALE holotype (Fig. 34). Body length 2.6 mm. *Head*. Width/length in dorsal view 2.4, width/length in frontal view 1.3, POL/OOL 1.3, head/mesosoma width 1.1, mouth width/malar space 1.9, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.1, length/width F1, F2, F3 1.8, 1.4, 1.2, clava length/width 2.8, lengths pedicel/F1 0.6, lengths F1/F2 1.2, F1/F3 1.3, lengths F1, F2, F3/clava 0.5, 0.5, 0.4, width F1/pedicel (dorsal view) 1.2, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a weak median groove in median $\frac{1}{3}$, with five adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, lengths dorsellum/propodeum 0.5, mesoscutellum length/width 1.1, length/width of enclosed space between submedian grooves 2.8, distance between SMG/distances between SMG and SLG 1.5, propodeum with strong reticulation in anterior $\frac{1}{2}$, smooth in posterior $\frac{1}{2}$, propodeal callus with five setae. *Fore wing*. Costal cell length/width 9.1, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 3.0. *Gaster*. Ovate, length/width 1.4, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.6, lengths longest cercal seta/next longest seta 1.3, longest cercal seta curved, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body golden-green, scape golden-green, pedicel and flagellum dark brown, tegulae black with metallic tinges, wings hyaline, wing venation brown to fuscous, coxae and femora concolorous with body, trochanters blackish, tibiae yellowish-brown, tarsi dark brown.

MALE. Unknown.

Diagnosis

Mandibles as in *T. halidayi*, i.e. mandibles very large with outer tooth falcate and separated by a wide gap from the two small inner teeth (as in Figs. 2a and 65d); mouth opening large, 1.9× as wide as malar space. Differs from *T. halidayi* in having a shorter female gaster with ovipositor retracted and apex not reaching apical margin of gaster. Similar also to *T. cyprus*, from which it differs in antennal characters as indicated in the key.

Etymology

Named after collector of type specimen, Marcus William Robert de Vere Graham.

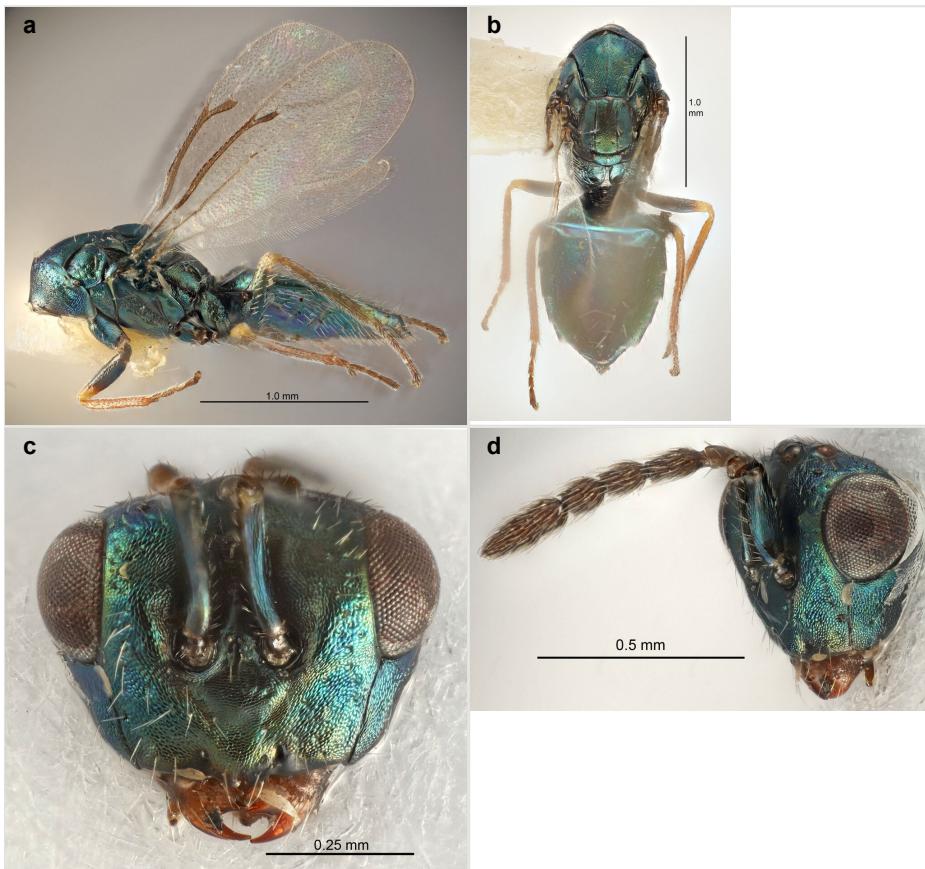


Figure 34.

Tetrastichus marcusgrahami sp. n.

a: Holotype female, lateral (excl. head). [doi](#)

b: Holotype female, dorsal (excl. head). [doi](#)

c: Holotype female, head frontal. [doi](#)

d: Holotype female, head and antenna lateral. [doi](#)

Distribution

United Kingdom.

Notes

The head of the holotype is detached and glued separately on a card and the right antennal flagellum is missing (deposited in NHM).

Host

Unknown.

Material examined

Holotype ♀ "ENGLAND: Lancashire, Freshfield (3) (Area I), 3.vi.1959", "M.W.R. de V. Graham coll., BMNH(E) 1995-489" (NHM).

Tetrastichus splendens, sp. n.

- ZooBank urn.lsid:zoobank.org:act:F8D4BA07-CC57-4062-9C4E-4E71BD04C6E4

Description

FEMALE holotype (Fig. 35). Body length 2.3 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.2, POL/OOL 2.1, widths head/mesosoma 1.0, mouth width/malar space 1.0, malar space/eye height 0.9. *Antenna*. Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.1, length/width F1, F2, F3 1.7, 1.6, 1.3, clava length/width 2.5, lengths pedicel/F1 0.7, lengths F1/F2 1.1, F1/F3 1.3, lengths F1, F2, F3/clava 0.5, 0.5, 0.4, width F1/pedicel (dorsal view) 1.2, lengths antennal spicule/C3 0.1. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with a weak median groove that is missing in anterior ¼, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 1.1, length/width of enclosed space between submedian grooves 3.5, distance between SMG/distance between SMG and SLG 1.1, lengths dorsellum/propodeum 0.5, propodeum with strong reticulation, propodeal callus with five setae. *Fore wing*. Costal cell length/width 8.8, lengths costal cell/marginal vein 1.2, lengths marginal/stigmal veins 2.2. *Gaster*. Semicircular, length/width 1.2, lengths gaster/mesosoma 1.0, Gt₇ length/width 0.5, lengths longest cercal seta/next longest seta 1.3, longest cercal seta straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 35.

Tetrastichus splendens sp. n.

- a: Holotype female, lateral. [doi](#)
b: Holotype female, dorsal. [doi](#)

Colour. Body golden-green, scape yellow, pedicel yellowish-brown, flagellum dark brown, tegulae black with metallic tinges, wings hyaline, wing venation yellowish-white, coxae concolorous with body, trochanters dark brown, femora dark brown with golden-

green tinges and with apex yellowish-brown, fore tarsus dark yellowish-brown, mid and hind tarsi yellowish-brown with T4 dark brown.

MALE. Unknown.

Diagnosis

Flagellum short and stout, length/width F1, F2, F2, clava: 1.7, 1.6, 1.3, 2.5; malar space 0.9× eye height; mesoscutellum with ratio length/width of enclosed space between submedian grooves 3.5.

Etymology

Named for the shiny appearance, from the Latin *splendens* = shiny.

Distribution

Sweden.

Host

Unknown.

Material examined

Holotype ♀ "SWEDEN, Skåne, Lund V., RN 1334/6176, 24.vi.1983, C. Hansson" (MZLU).

Tetrastichus sti, sp. n.

- ZooBank urn:lsid:zoobank.org:act:B7076D49-5606-405C-A4E4-8DC8EE3920DE

Materials

Holotype:

- a. scientificName: *Tetrastichus sti*; taxonRemarks: Holotype deposited in SMTP; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.3; decimalLongitude: 14.6171; individualID: BC-ZSM-HYM-13565-E11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-E11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-E11; recordNumber: BC-ZSM-HYM-13565-E11; recordedBy: SMTP project; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus sti*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.594; decimalLongitude: 27.353; individualID: BC-ZSM-HYM-22523-F12; individualCount: 1;

- sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-F12;
 occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-F12; recordNumber: BC-ZSM-HYM-22523-F12; recordedBy:
 O.Popovici; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus sti*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.834; decimalLongitude: 13.528; individualID: BC-ZSM-HYM-21587-G08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-G08;
 occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-G08; recordNumber: BC-ZSM-HYM-21587-G08; recordedBy:
 C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus sti*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.3; decimalLongitude: 14.617; individualID: BC-ZSM-HYM-13565-B10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-B10;
 occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-B10; recordNumber: BC-ZSM-HYM-13565-B10; recordedBy: SMTP project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus sti*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.185; decimalLongitude: 14.379; individualID: BC-ZSM-HYM-22523-A01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-A01;
 occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-A01; recordNumber: BC-ZSM-HYM-22523-A01; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus sti*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.3; decimalLongitude: 14.617; individualID: BC-ZSM-HYM-13565-E12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-E12;
 occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-E12; recordNumber: BC-ZSM-HYM-13565-E12; recordedBy: SMTP Project; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 36). Body length 2.1 mm (paratypes 1.5–2.0 mm). **Head.** Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 2.0, widths head/mesosoma 1.0, mouth width/malar space 0.9, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.4, 2.3, 2.2, clava length/width 4.4, lengths pedicel/F1 0.6, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal midlobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior ¾, with five adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.5, lengths dorsellum/propodeum (measured

medially) 0.5, propodeum with strong reticulation, propodeal callus with four setae. *Fore wing.* Costal cell length/width 10.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.3. *Gaster.* Subcircular to ovate, length/width 1.3, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.3, longest cercal seta curved in apical 1/3, ovipositor sheaths not reaching apex of Gt₇.

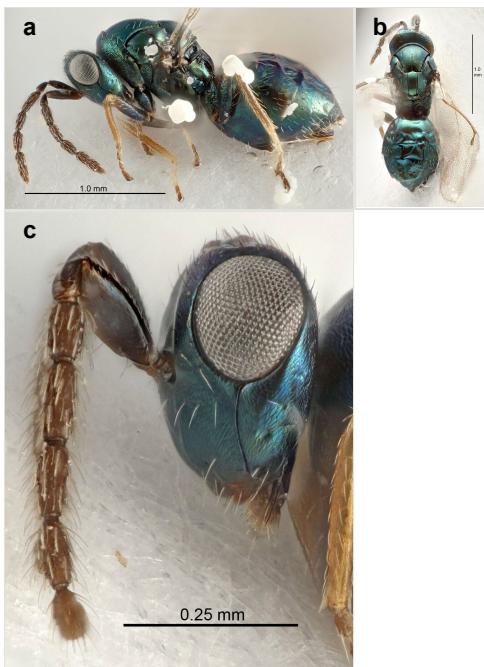


Figure 36.

Tetrastichus sti sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body golden-green, entire antenna dark brown, tegulae black with metallic tinge, wings hyaline with veins brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, tibiae yellowish-brown, fore tarsus brown, mid and hind tarsi with T1-2 yellowish-white and T3-4 brown.

Variation. Paratypes with body metallic blue, green or blue-green.

MALE. Body length 1.7 mm. *Head.* Width/length in dorsal view 2.3, width/length in frontal view 1.3, eye height/malar space 1.2, mouth width/malar space 1.0, widths head/mesosoma 1.1. *Antenna.* F1–F4 without basal whorls of setae, scape length/eye height 1.2, scape length/width 3.0, ventral plaque placed in central part of scape,

lengths ventral plaque/scape 0.7, length/width F1, F2, F3, F4 1.6, 2.4, 2.3, 2.5, lengths pedicel/F1 0.8, lengths F1/F2 0.7, F1/F3 0.8, F1/F4 0.8.

Colour. As in female. Body metallic blue-green.

Diagnosis

Mid and hind tibiae yellowish-brown; mesoscutellum with distance between submedian grooves 1.5× distance between submedian and sublateral grooves; female with malar space 0.8× height of eye, antenna with F2 2.3×, F3 2.2× and clava 4.4× as long as wide, clava with a strong constriction between C1 and C2; male antenna with scape 3.0× as long as wide and 1.0× as long as height of eye, length/width F1, F2, F3, F4 1.6, 2.4, 2.3, 2.5.

Etymology

Named after acronym STI = Swedish Taxonomy Initiative, the major funding source for this project.

Distribution

Romania, Sweden and United Kingdom.

Notes

Holotype deposited in SMTP, paratypes in MZLU, SMTP and NHM.

Host

Unknown.

Additional paratype (not barcoded)

1♀ "ENGLAND: Lincolnshire, Woodhall Spa, (2), 27.vii.1968, M.W.R.de V. Graham". Paratypes in MZLU, NHM, SMTP.

***Tetrastichus suecus*, sp. n.**

- ZooBank urnlsid:zoobank.org:act:8B6EE64C-2585-46D0-A4A4-7C74047310A5

Materials

Holotype:

- a. scientificName: *Tetrastichus suecus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.0756; decimalLongitude: 13.6778; individualID: BC-ZSM-HYM-29751-F01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-F01; occurrenceDetails: <http://>

www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-F01; recordNumber: BC-ZSM-HYM-29751-F01; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-F03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-F03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-F03; recordNumber: BC-ZSM-HYM-27769-F03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-E12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-E12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-E12; recordNumber: BC-ZSM-HYM-27769-E12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-E09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-E09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-E09; recordNumber: BC-ZSM-HYM-27769-E09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.617; decimalLongitude: 16.567; individualID: BC-ZSM-HYM-20721-B07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-B07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-B07; recordNumber: BC-ZSM-HYM-20721-B07; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.609; decimalLongitude: 16.509; individualID: BC-ZSM-HYM-27769-E04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-E04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-E04; recordNumber: BC-ZSM-HYM-27769-E04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.893; decimalLongitude: 16.768; individualID: BC-ZSM-HYM-21587-B01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-B01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/

- [specimen?ids=BC-ZSM-HYM-21587-B01](#); recordNumber: BC-ZSM-HYM-21587-B01; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.765; decimalLongitude: 16.695; individualID: BC-ZSM-HYM-21587-A08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-A08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A08; recordNumber: BC-ZSM-HYM-21587-A08; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 57.141; decimalLongitude: 17.024; individualID: BC-ZSM-HYM-21587-A05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-A05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A05; recordNumber: BC-ZSM-HYM-21587-A05; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.167; individualID: BC-ZSM-HYM-20721-C10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-C10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-C10; recordNumber: BC-ZSM-HYM-20721-C10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-H11; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-H11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-H11; recordNumber: BC-ZSM-HYM-20721-H11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.3834; decimalLongitude: 14.1197; individualID: BC-ZSM-HYM-29813-D07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-D07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-D07; recordNumber: BC-ZSM-HYM-29813-D07; recordedBy: B.Tjeder; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus suecicus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-C01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-C01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-C01; recordNumber: BC-ZSM-HYM-27769-C01; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- m. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-B10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-B10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-B10; recordNumber: BC-ZSM-HYM-27769-B10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- n. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 66.767; decimalLongitude: 20.10; individualID: BC-ZSM-HYM-13565-A01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-A01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-A01; recordNumber: BC-ZSM-HYM-13565-A01; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- o. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.433; decimalLongitude: 14.117; individualID: BC-ZSM-HYM-25461-E04; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-E04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-E04; recordNumber: BC-ZSM-HYM-25461-E04; recordedBy: D.M.S.P., J.F.P.; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- p. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.433; decimalLongitude: 14.117; individualID: BC-ZSM-HYM-25461-E05; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-E05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-E05; recordNumber: BC-ZSM-HYM-25461-E05; recordedBy: D.M.S.P., J.F.P.; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- q. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.433; decimalLongitude: 14.117; individualID: BC-ZSM-HYM-25461-E06; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-E06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-E06; recordNumber: BC-ZSM-HYM-25461-E06; recordedBy: D.M.S.P., J.F.P.; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- r. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.0756; decimalLongitude: 13.6778; individualID: BC-ZSM-HYM-29751-G07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-G07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-G07; recordNumber: BC-ZSM-HYM-29751-G07; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- s. scientificName: *Tetrastichus suecus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Örebro; decimalLatitude: 59.2753; decimalLongitude: 15.2134; individualID: BC-ZSM-HYM-29813-G09; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-G09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-G09; recordNumber: BC-ZSM-HYM-29813-G09;

recordedBy: A.Jansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-G09+1516986306.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 37). Body length 2.2 mm (paratypes 1.3–2.6 mm). *Head*. Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 1.6, widths head/mesosoma 1.0, mouth width/malar space 1.0, malar space/eye height 1.0. *Antenna*. Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.4, 2.3, 2.3, clava length/width 4.2, lengths pedicel/F1 0.6, lengths F1/F2 1.0, F1/F3 1.0, lengths F1, F2, F3/clava 0.6, 0.6, 0.6, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with complete median groove, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.7, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum 0.5, propodeum with weak reticulation, propodeal callus with four setae. *Fore wing*. Costal cell length/width 8.0, lengths costal cell/marginal vein 1.2, lengths marginal/stigmal veins 2.6. *Gaster*. Subcircular to ovate, length/width 1.6, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 2.0, longest cercal seta evenly curved, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body golden-green, scape yellowish-brown with dorsal edge and apical 1/3 dark brown, pedicel and flagellum dark brown, tegulae black with metallic tinges, wing venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, fore tarsus brownish becoming darker towards apex, mid and hind tarsi yellowish-brown with T4 brown.

Variation. Three paratypes with entire antennal scape dark brown. Colour of body blue, blue-green or green-blue and small specimens with weaker metallic tinges on body.

MALE (Fig. 37). Body length 1.9 mm. *Head*. Width/length in dorsal view 2.4, width/length in frontal view 1.3, eye height/malar space 1.1, mouth width/malar space 1.1, widths head/mesosoma 1.1. *Antenna*. F1–F4 without basal whorls of setae, scape length/eye height 1.1, scape length/width 3.0, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.6, length/width F1, F2, F3, F4 1.6, 2.0, 2.2, 2.2, clava length/width 4.4, lengths pedicel/F1 0.8, lengths F1/F2 0.8, F1/F3 0.7, F1/F4 0.7, lengths F1, F2, F3, F4/clava 0.4, 0.5, 0.5, 0.5.

Colour. Scape dark brown and body metallic blue-green. Otherwise similar to female.

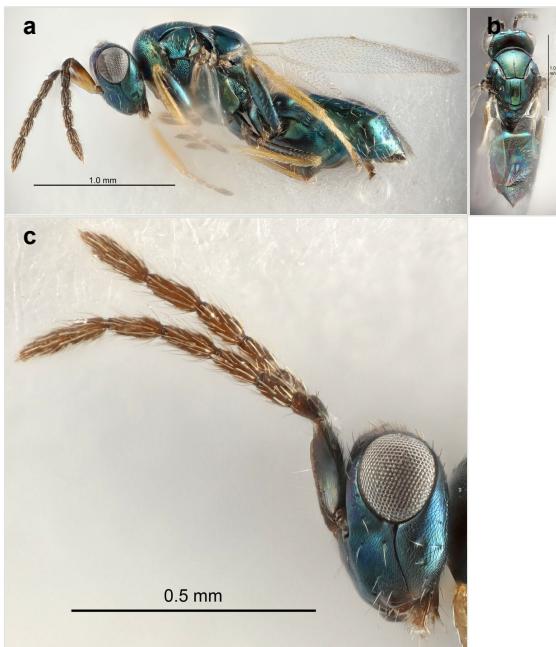


Figure 37.

Tetrastichus suecus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Diagnosis

Tibiae yellowish-brown; female with malar space $1.0 \times$ eye height, POL/OOL 1.6, F1 2.4 \times , F2 2.3 \times , F3 2.3 \times as long as wide; male with antennal scape 3.0 \times , F1 1.6 \times , F2 2.0 \times , F3 2.2 \times , F4 2.2 \times and clava 4.4 \times as long as wide.

Distribution

Sweden.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, SMTP and ZSM.

Host

Unknown.

***Tetrastichus clito* group**

Diagnosis

Frons with a more or less distinct median longitudinal carina extending from between the toruli to near the median ocellus, the sutures which define the scrobal area laterally tend to diverge ventrally, away from the median carina (Fig. 3b); hind coxae usually finely reticulate on the externo-dorsal surface (Fig. 3d).

***Tetrastichus argutus*, sp. n.**

- ZooBank [urn:lsid:zoobank.org:act:9CD75EDB-59FC-4BF2-96EC-1632D8465ABA](http://urn.lsid:zoobank.org:act:9CD75EDB-59FC-4BF2-96EC-1632D8465ABA)

Materials

Holotype:

- a. scientificName: *Tetrastichus argutus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7078; decimalLongitude: 13.4528; individualID: BC-ZSM-HYM-29751-E11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-E11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-E11; recordNumber: BC-ZSM-HYM-29751-E11; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-29750-E01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29750-E01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-E01; recordNumber: BC-ZSM-HYM-29750-E01; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-25460-H03; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-H03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-H03; recordNumber: BC-ZSM-HYM-25460-H03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6967; decimalLongitude: 13.47; individualID: BC-ZSM-HYM-29751-D04; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29751-D04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-D04; recordNumber: BC-ZSM-HYM-29751-D04;

- recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 46.522; decimalLongitude: 16.256; individualID: BC-ZSM-HYM-22524-C06; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-C06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-C06; recordNumber: BC-ZSM-HYM-22524-C06; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.788; decimalLongitude: 16.637; individualID: BC-ZSM-HYM-27769-C12; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-C12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-C12; recordNumber: BC-ZSM-HYM-27769-C12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.705; decimalLongitude: 13.4886; individualID: BC-ZSM-HYM-25460-C05; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-C05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-C05; recordNumber: BC-ZSM-HYM-25460-C05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus argutus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-E10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-E10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-E10; recordNumber: BC-ZSM-HYM-27769-E10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 38). Body length 2.0 mm (paratype 1.8 mm). *Head*. Width/length in dorsal view 2.0, width/length in frontal view 1.2, POL/OOL 2.1, widths head/mesosoma 1.1, mouth width/malar space 1.2, malar space/eye height 0.6. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.9, length/width F1, F2, F3 2.0, 2.8, 2.6, clava length/width 4.0, lengths pedicel/F1 0.4, lengths F1/F2 0.8, F1/F3 1.0, lengths F1, F2, F3/clava 0.6, 0.7, 0.6, widths F1/pedicel (dorsal view) 1.8, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width (width measured medially) 0.9, mid-lobe with complete median groove, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.1, distance between SMG/distance between SMG and SLG 1.8, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing*. Costal cell length/

width 15.0, lengths costal cell/marginal vein 0.8, lengths marginal/stigmal veins 3.2. **Gaster.** Elongate-acuminate, length/width 2.1, lengths gaster/head+mesosoma 1.0, Gt₇ length/width 0.6, length of longest cercal seta/next longest seta 1.8, longest cercal seta kinked in apical 1/4, ovipositor sheaths reaching beyond apex of Gt₇.

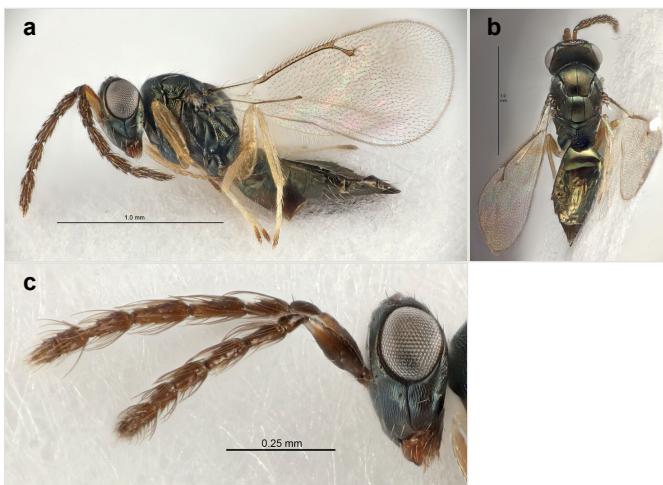


Figure 38.

Tetrastichus argutus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head & antenna lateral. [doi](#)

Colour. Body strongly metallic, coppery and golden, scape yellowish-brown, pedicel and flagellum dark brown, tegulae dark brown, wing hyaline with venation yellowish-brown, coxae concolorous with body, trochanters, femora and tibiae yellowish-brown, tarsi yellowish-brown with T4 brown.

MALE. Body length 1.4–1.6 mm. **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.2, eye height/malar space 1.5, mouth width/malar space 1.4, widths head/mesosoma 1.1. **Antenna.** F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, scape length/eye height 1.1, scape length/width 3.2, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.3, pedicel+flagellum length/mesosoma width 2.1, length/width F1, F2, F3, F4 1.9, 2.4, 2.8, 2.5, clava length/width 4.8, lengths pedicel/F1 0.7, lengths F1/F2 0.8, F1/F3 0.8, F1/F4 0.9, lengths F1, F2, F3, F4/clava 0.5, 0.6, 0.6, 0.5.

Colour. Different from female in several parts: scape, trochanters and femora dark brown, tibiae pale brown, fore tarsus brown, body less strongly metallic, blue.

Diagnosis

Female with ovipositor sheaths extending beyond apex of Gt₇; antenna with long flagellomeres: F1 2.0×, F2 2.8× and F3 2.6× as long as wide, pedicel 0.4× as long as F1, F1 1.8× as wide as width of pedicel in dorsal view, pedicel+flagellum 1.9× width of mesoscutum; male scape with short plaque, 0.3× length of scape and with apex of scape narrowed, with long flagellomeres: F1 1.9×, F2 2.4×, F3 2.8× and F4 2.5× as long as wide; female trochanters, femora and scape yellowish-brown; hind coxa with a strong and sharp carina along posterior margin.

Distribution

Hungary and Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU.

Tetrastichus bledius, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:E1A7FCA0-37D7-4E81-BAF9-D9515F7A4327>

Materials

Holotype:

- a. scientificName: *Tetrastichus bledius*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-C01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-C01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-C01; recordNumber: BC-ZSM-HYM-27768-C01; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.776; decimalLongitude: 16.624; individualID: BC-ZSM-HYM-22526-F01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22526-F01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22526-F01; recordNumber: BC-ZSM-HYM-22526-F01; recordedBy: S. Schmidt; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29751-B01; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-

- ZSM-HYM-29751-B01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29751-B01; recordNumber: BC-ZSM-HYM-29751-B01; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-H03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-H03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-H03; recordNumber: BC-ZSM-HYM-27768-H03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.1875; decimalLongitude: 27.5489; individualID: BC-ZSM-HYM-27770-D03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-D03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-D03; recordNumber: BC-ZSM-HYM-27760-D03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.5214; decimalLongitude: 13.9369; individualID: BC-ZSM-HYM-26563-D02; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-D02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-D02; recordNumber: BC-ZSM-HYM-26563-D02; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G08; recordNumber: BC-ZSM-HYM-27768-G08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-C12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-C12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C12; recordNumber: BC-ZSM-HYM-27760-C12; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-C11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-C11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C11; recordNumber: BC-ZSM-

HYM-27760-C11; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
 basisOfRecord: PreservedSpecimen

i. scientificName: *Tetrastichus bledius*; phylum: Arthropoda; class: Insecta; order:
 Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania;
 decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-
 HYM-27770-B03; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-
 ZSM-HYM-27760-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B03; recordNumber: BC-ZSM-
 HYM-27760-B03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en;
 basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 39). Body length 1.7 mm (paratypes 1.5–1.7 mm). *Head*. Width/length in dorsal view 2.4, width/length in frontal view 1.3, POL/OOL 2.3, widths head/mesosoma 1.1, mouth width/malar space 1.2, malar space/eye height 0.8. *Antenna*. Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 1.6, 1.6, 1.5, clava length/width 3.8, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.4. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median groove in posterior ½, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.2, distance between SMG/distance between SMG and SLG 1.9, lengths dorsellum/propodeum 0.8, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing*. Costal cell length/width 14.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.0. *Gaster*. Ovate, length/width 1.7, lengths gaster/head+mesosoma 1.0, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.3, longest cercal seta almost straight, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body with weak metallic blue-green tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with venation brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, fore tibia yellowish-brown, mid and hind tibiae dark brown, fore tarsus brown, mid and hind tarsi yellowish-brown with T4 dark brown.

MALE. Body length 1.4 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.3, mouth width/malar space 1.2, eye height/malar space 1.4, widths head/mesosoma 1.1. *Antenna*. F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, scape length/eye height 1.0, scape length/width 2.4, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.9, pedicel+flagellum length/mesosoma width 1.6, length/width F1, F2, F3, F4 1.0, 1.3, 1.8, 1.7, clava length/width 3.8, lengths pedicel/F1 1.2, lengths F1/F2 0.8, F1/F3 0.6, F1/F4 0.6, lengths F1, F2, F3, F4/clava 0.3, 0.4, 0.5, 0.4.

Colour similar to female, but with all tarsi brown.

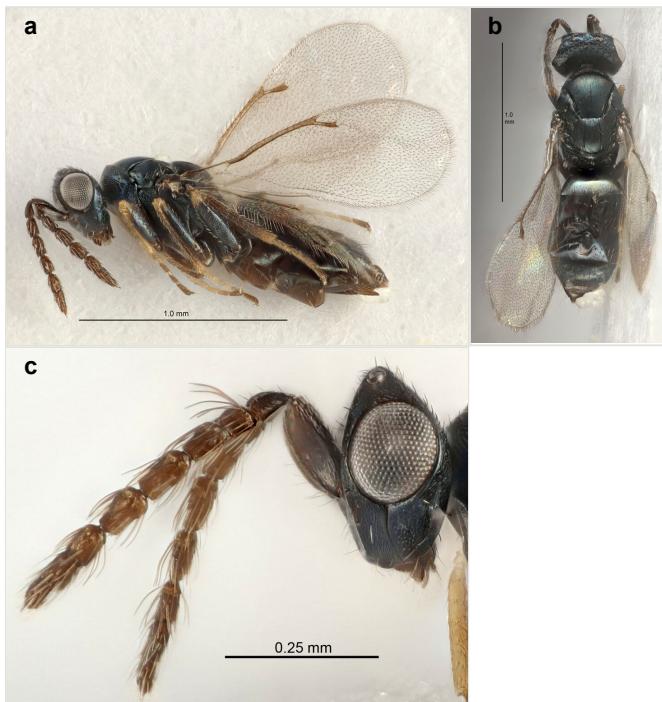


Figure 39.

Tetrastichus bledius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Diagnosis

Ratio POL/OOL 2.3; mesoscutellum with distance between SMG/distance between SMG and SLG 1.9; female gaster ovate, 1.7× as long as wide. See also key to distinguish from similar species.

Distribution

Romania and Sweden.

Host: Unknown.

Notes

Holotype deposited in NHM, paratypes in MZLU, NHM and ZSM.

Tetrastichus calcarius, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:69FF6AD2-C120-4EEC-B6F8-C52E37CEBE4E>

Materials

Holotype:

- a. scientificName: *Tetrastichus calcarius*; taxonRemarks: Holotype deposited in ZSM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.609; decimalLongitude: 16.508; individualID: BC-ZSM-HYM-22526-G03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22526-G03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22526-G03; recordNumber: BC-ZSM-HYM-22526-G03; recordedBy: S. Schmidt; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Other material:

- a. scientificName: *Tetrastichus calcarius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Kalkstad; decimalLatitude: 56.617; decimalLongitude: 16.533; individualID: BC-ZSM-HYM-20721-B05; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-20721-B05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-B05; recordNumber: BC-ZSM-HYM-20721-B05; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-20721-B05+1398631454.jpg>; identifiedBy: Christer Hansson; identificationRemarks: CH08560

Description

FEMALE holotype (Fig. 40). Body length 1.7 mm. **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 1.5, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 1.8, 1.6, 1.6, clava length/width 3.8, lengths pedicel/F1 0.8, lengths F1/F2 1.0, F1/F3 1.0, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 1.0, mid-lobe with a complete median groove, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 3.1, distance between SMG/distance between SMG and SLG 1.0, lengths dorsellum/propodeum 0.8, propodeum with strong reticulation, propodeal callus with three setae. **Fore wing.** Costal cell length/width 10.0, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 2.6. **Gaster.** Ovate, length/width 1.6, lengths gaster/head+mesosoma 0.9, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.8, longest cercal seta almost straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 40.

Tetrastichus calcarius sp. n.

a: Holotype female, lateral. [doi](#)
 b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic blue-green tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with veins yellowish-white, coxae and trochanters dark brown, femora concolorous with body, fore tibia yellowish-brown, mid and hind tibiae dark brown, tarsi brownish.

MALE. Unknown.

Diagnosis

Body weakly metallic; scape, mid and hind tibiae dark brown.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in ZSM. A second specimen of the species from the same locality is severely damaged and, therefore, excluded as a paratype.

Tetrastichus clisius, sp. n.

- ZooBank urnlsidzoobank.orgact:9C584AD8-6214-4397-A354-E1DC68BD983B

Materials

Holotype:

- a. scientificName: *Tetrastichus clisius*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G07; occurrenceDetails: <http://>

www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G07; recordNumber: BC-ZSM-HYM-27768-G07; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus clisius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-C03; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-C03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-C03; recordNumber: BC-ZSM-HYM-27760-C03; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 41). Body length 1.4 mm. **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 1.6, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 1.4, 1.6, 1.7, clava length/width 4.2, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.3, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with median groove in posterior ½, with two adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum (measured medially) 0.8, propodeum with strong reticulation, propodeal callus with two setae. **Fore wing.** Costal cell length/width 13.5, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 2.7. **Gaster.** Ovate, length/width 1.4, lengths gaster/head+mesosoma 0.7, length of longest cercal seta/next longest seta 1.8, longest cercal seta almost straight, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body black without metallic tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with venation brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, fore tibia yellowish-brown, mid and hind tibiae dark brown, tarsi brownish.

MALE. Body length 1.6 mm. **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, mouth width/malar space 1.1, height of eye/malar space 1.1, widths head/mesosoma 1.1. **Antenna.** F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, scape length/eye height 1.1, scape length/width 2.1, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.8, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3, F4 1.1, 1.4, 1.5, 1.7, clava length/width 4.6, lengths pedicel/F1 1.1, lengths F1/F2 0.8, F1/F3 0.7, F1/F4 0.7, lengths F1, F2, F3, F4/clava 0.3, 0.4, 0.4, 0.4.

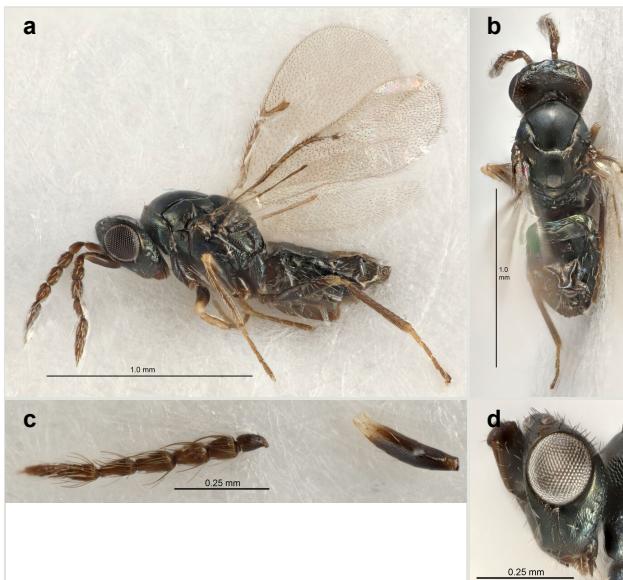


Figure 41.

Tetrastichus clisius sp. n.

- a: Holotype female, lateral. [doi](#)
- b: Holotype female, dorsal. [doi](#)
- c: Paratype male, antenna. [doi](#)
- d: Paratype male, head lateral. [doi](#)

Colour similar to female, but body with weak metallic blue tinges.

Diagnosis

Female with antennal clava long, $4.2\times$ as long as wide; gaster ovate, $1.4\times$ as long as wide; male with scape $1.1\times$ as long as eye and $2.1\times$ as long as wide. See key for separation from similar species.

Distribution

Romania.

Host: Unknown.

Notes

Holotype deposited in NHM, paratype in NHM.

Tetrastichus clito* (Walker, 1840)*Nomenclature**

Cirrospilus Clito Walker 1840:30. Lectotype ♂ in NHM, examined (Fig. 42). Transferred to *Aprostocetus* by Graham 1961:39 and to *Tetrastichus* by Peck 1963:128.

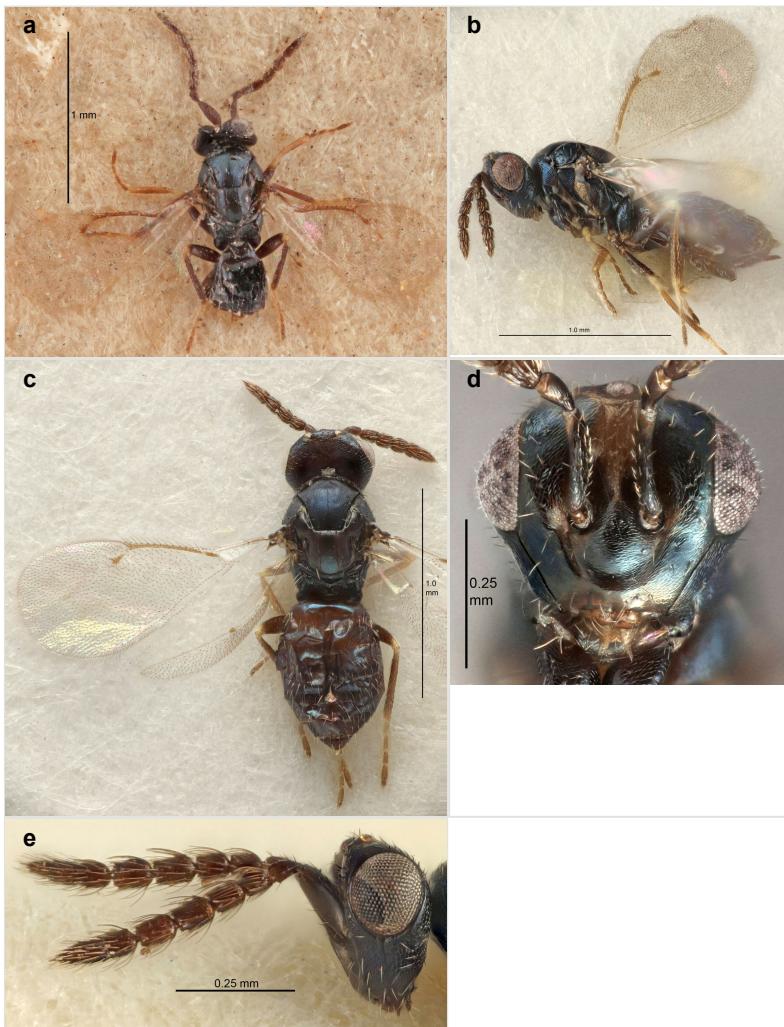


Figure 42.

Tetrastichus clito (Walker)

a: Lectotype male, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype female, head frontal. [doi](#)

e: Nontype male, head and antenna, lateral. [doi](#)

Eulophus cassidae Dufour 1846:20. Syntypes not located. Synonymised by Graham 1991:267.

Entedon Cassidarum Ratzeburg 1852:248. Type material destroyed Graham 1991:267. Synonymised by Graham 1991:267.

Description

See Graham (1991).

Diagnosis

Female antenna short, at most 1.1× as long as width of mesoscutum; mesoscutellum with distance between submedian grooves 1.5× the distance between submedian and sublateral grooves; female gaster short ovate, 1.5× as long as wide.

Distribution

(Former) Czechoslovakia, France, Germany, United Kingdom, Canada (Graham 1991) and Sweden (Hedqvist 2003).

Host: *Cassida murraea* L., *C. rubiginosa* Müller, *C. deflorata* Suffrian (Graham 1991), *C. humeralis* Kraatz (**new record**). All hosts are Coleoptera: Chrysomelidae.

Material examined

Type material: lectotype ♂ of *C. Clito* (NHM, type no. 5.1943). Additional material (28♀ 5♂): (former) Czechoslovakia 1♀ (NHM), France 14♀ 2♂ ex *Cassida humeralis* (GD), 2♀ (GD, NHM), Sweden 5♀ (NHM, SMTP), United Kingdom 6♀ 3♂ (NHM).

Tetrastichus decrescens Graham, 1991

Nomenclature

Tetrastichus decrescens Graham 1991:271–272. Holotype ♀ in NHM, examined (Fig. 43).

Description

See Graham (1991). Male is unknown.

Diagnosis

Antenna with F1 1.5× as long and 1.4× as wide as pedicel; mesoscutellum with distance between submedian grooves 1.2× the distance between submedian and sublateral grooves; female gaster elongate-acuminate, 2.0–2.2× as long as wide, ovipositor sheaths reach beyond apex of Gt₇.

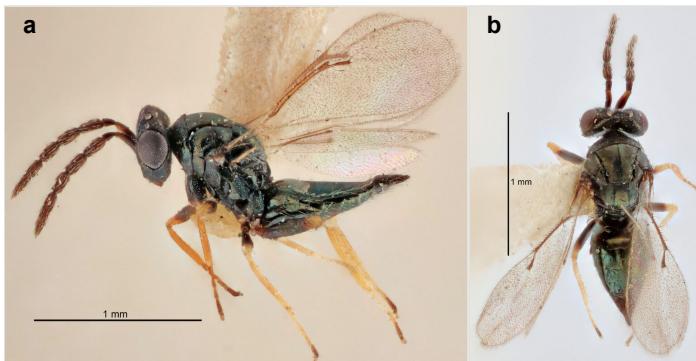


Figure 43.

Tetrastichus decrescens Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Distribution

(Former) Czechoslovakia, France, Sweden and United Kingdom (Graham 1991).

Host: Unknown.

Material examined: Type material: holotype ♀ (NHM, type no. 5.3631). Additional material (7♀): France 1♀ (GD), Sweden 6♀ (MZLU, SMTP).

Tetrastichus elanus, sp. n.

- ZooBank urnlsid:zoobank.org:act:54E6D90B-52D8-431D-804D-3127A4D79C43

Material

Holotype:

- scientificName: *Tetrastichus elanus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7078; decimalLongitude: 13.475; individualID: BC-ZSM-HYM-29814-C07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29814-C07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29814-C07; recordNumber: BC-ZSM-HYM-29814-C07; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 44). Body length 1.5 mm. **Head.** Width/length (dorsal view) 2.2, width/length (frontal view) 1.2, POL/OOL 1.6, widths head/mesosoma 1.1, mouth width/malar space 1.2, malar space/eye height 0.5. **Antenna.** Scape length/eye height 0.9,

pedicel+flagellum length/mesosoma width 1.7, length/width F1, F2, F3 1.6, 1.8, 1.7, clava length/width 3.7, lengths pedicel/F1 0.6, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.4, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.7, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 0.9, mid-lobe with a median groove in posterior $\frac{2}{3}$, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 0.7, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 1.9, distance between SMG/distance between SMG and SLG 1.6, lengths dorsellum/propodeum (measured medially) 0.9, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing*. Costal cell length/width 14.7, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 2.5. *Gaster*. Elongate, length/width 2.2, lengths gaster/mesosoma 1.6, Gt₇ length/width 0.7, length of longest cercal seta/next longest seta 1.6, longest cercal seta slightly kinked in apical $\frac{1}{4}$, ovipositor sheaths projecting slightly beyond apex of Gt₇.

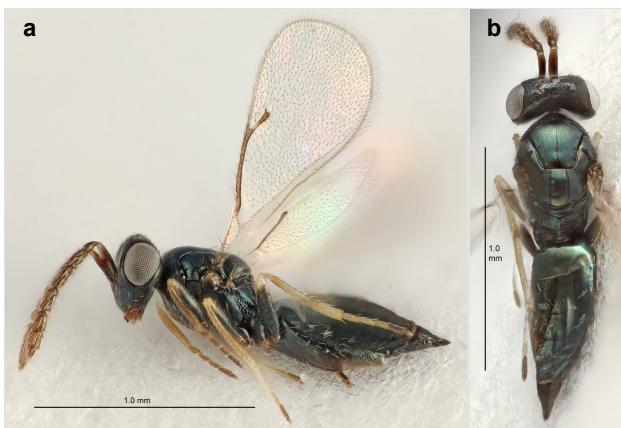


Figure 44.

Tetrastichus elanus sp. n.

- a: Holotype female, lateral. [doi](#)
 b: Holotype female, dorsal. [doi](#)

Colour. Head, mesoscutum and propodeum metallic bluish-green, mesoscutellum and gaster golden-green, entire antenna dark brown, tegulae black, wings hyaline with veins yellowish-brown, coxae and femora black with metallic tinges, trochanters dark brown, tibiae yellowish-brown, fore tarsus dark brown, mid and hind tarsi yellowish-white with T4 brown.

MALE. Unknown.

Diagnosis

Antenna with F1 1.6× as long and 1.7× as wide as pedicel; mesoscutellum with distance between submedian grooves 1.6× the distance between submedian and

sublateral grooves and with enclosed area between submedian grooves 1.9× as long as wide; female gaster elongate-acuminate, 2.2× as long as wide, ovipositor sheaths reach beyond apex of Gt₇.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU.

Tetrastichus ennis, sp. n.

- ZooBank urn:lsid:zoobank.org:act:92CF571A-6977-4FE1-B6C0-246AE0780E9E

Materials

Holotype:

- scientificName: *Tetrastichus ennis*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-B04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-B04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-B04; recordNumber: BC-ZSM-HYM-27768-B04; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- scientificName: *Tetrastichus ennis*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.9853; decimalLongitude: 27.5847; individualID: BC-ZSM-HYM-27770-A07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A07; recordNumber: BC-ZSM-HYM-27760-A07; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen
- scientificName: *Tetrastichus ennis*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Russia; decimalLatitude: 59.567; decimalLongitude: 30.133; individualID: BC-ZSM-HYM-22524-F08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-F08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-F08; recordNumber: BC-ZSM-HYM-22524-F08; recordedBy: E. Shevtsova; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- scientificName: *Tetrastichus ennis*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Romania; locality: Barnova Forest; decimalLatitude: 46.9853; decimalLongitude: 27.5847; individualID: BC-

ZSM-HYM-27770-A07; individualCount: 1; sex: F; lifeStage: a; reproductiveCondition: S; catalogNumber: BC-ZSM-HYM-27760-A07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A07; recordNumber: BC-ZSM-HYM-27760-A07; recordedBy: J.S. Noyes; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-27760-A07+1449268698.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 45). Body length 1.8 mm (paratypes 1.5–1.7 mm). **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 1.7, widths head/mesosoma 1.1, mouth width/malar space 1.2, malar space/eye height 0.7. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 1.6, 1.7, 1.7, clava length/width 3.8, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with median groove in posterior ½, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.2, distance between SMG/distance between SMG and SLG 1.8, lengths dorsellum/propodeum 0.8, propodeum with weak reticulation, propodeal callus with three setae. **Fore wing.** Costal cell length/width 10.0, lengths costal cell/marginal vein 1.2, lengths marginal/stigmal veins 2.6. **Gaster.** Ovate, length/width 1.6, lengths gaster/head+mesosoma 0.9, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.3, longest cercal seta evenly curved, ovipositor sheaths not reaching apex of Gt₇.



Figure 45.

Tetrastichus ennis sp. n.

- a: Holotype female, lateral. [doi](#)
- b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic blue tinges, entire antenna dark brown, tegulae black, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters dark brown, fore tibia yellowish-brown, mid and hind tibiae dark brown, tarsi brownish.

MALE. Unknown.

Diagnosis

Female gaster ovate, 1.6× as long as wide. See key for separation from similar species.

Distribution

Romania and Russia.

Host: Unknown.

Notes

Holotype deposited in NHM, paratype in MZLU and NHM.

Tetrastichus epilachnae (Giard, 1896)

Nomenclature

Lygellus epilachnae Giard 1896:839. Type material not located. Transferred to *Tetrastichus* by Domenichini 1966:92.

Tetrastichus Jablonowskii Szelenyi 1940:85, 86–88. Type material destroyed Graham 1991:270. Synonymised by Graham 1991:269.

Description

See Graham (1991).

Diagnosis

Very similar to *T. clito*, female differs in having a longer and more acute gaster; hosts are different (Graham 1991).

Distribution

France, Hungary, Sweden (Graham 1991).

Host: *Epilachna argus* (Geoffroy in Fourcroy), *E. chrysomelina* F., *Subcoccinella vigintiquattropunctata* L. (Coleoptera: Coccinellidae) (Graham 1991).

Material examined: No material has been examined.

Tetrastichus fenrisi, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:91B3378D-6EE4-47A4-8CDE-E4E3C94A43E2>

Material

Holotype:

- a. scientificName: *Tetrastichus fenrisi*; taxonRemarks: Holotype deposited in SMTP; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.553; decimalLongitude: 17.313; individualID: BC-ZSM-HYM-27493-G06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-G06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-G06; recordNumber: BC-ZSM-HYM-27493-G06; recordedBy: SMTP; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 46). Body length 1.7 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 1.1. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.3, 1.4, 1.4, clava length/width 3.7, lengths pedicel/F1 1.0, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.3, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width 1.1, mid-lobe with a weak median groove in posterior ½, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.6, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.8, distance between submedian groove to distance between submedian and sublateral grooves 1.0, lengths dorsellum/propodeum 0.6, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing*. Costal cell length/width 14.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.8. *Gaster*. Ovate, length/width 1.6, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.3, longest cercal seta curved, ovipositor sheaths not reaching Gt₇.

Colour. Head and mesoscutum black with weak metallic tinges, mesoscutellum dark brown, dorsellum pale brown, propodeum black, gaster dark brown with metallic tinges, antenna dark brown, tegulae dark brown, wings hyaline with venation yellowish-brown, coxae, trochanters and femora dark brown, fore tibia infuscate, mid and hind tibiae dark brown, fore tarsus dark brown, mid and hind tarsi dark brown with T1 yellowish-white.

MALE. Unknown.



Figure 46.

Tetrastichus fenrisi sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Diagnosis

Mesoscutellum with distance between submedian groove $1.0 \times$ the distance between submedian and sublateral grooves and median part with weaker reticulation and more shiny than lateral parts; mesoscutum black with weak metallic tinges, mesoscutellum dark brown, dorsellum pale brown; fore tibia infuscate, mid and hind tibiae dark brown, fore tarsus dark brown, mid and hind tarsi dark brown with T1 yellowish-white.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in SMTP.

Tetrastichus ladrus, sp. n.

- ZooBank urn.lsid:zoobank.org:act:83F01BA8-FCE6-4E2A-82B6-2A921F09AEBB

Material

Holotype:

- a. scientificName: *Tetrastichus ladrus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-F02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F02; recordNumber: BC-ZSM-HYM-20721-F02; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 47). Body length 1.6 mm. *Head*. Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 1.7, widths head/mesosoma 1.1, mouth width/malar space 1.2, malar space/eye height 0.7. *Antenna*. Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 1.4, 1.4, 1.3, clava length/width 3.7, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 1.0, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove in posterior ½, with two adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.3, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum 0.7, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing*. Costal cell length/width 13.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.1. *Gaster*. Ovate, length/width 1.4, lengths gaster/head+mesosoma 0.9, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.3, longest cercal seta almost straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 47.

Tetrastichus ladrus sp. n.

- a: Holotype female, lateral. [doi](#)
- b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic greenish-blue tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with venation brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, tibiae brownish, fore tarsus brownish, mid and hind tarsi yellowish-brown with T4 brown.

MALE. Unknown.

Diagnosis

Female gaster ovate, 1.4× as long as wide. See key for separation from similar species.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU.

Tetrastichus lazius, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:2D7C33A0-5750-4257-8DBA-5D478FDDDC15>

Material

Holotype:

- a. scientificName: *Tetrastichus lazius*; taxonRemarks: Holotype deposited in UCRC; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Italy; decimalLatitude: 41.6552; decimalLongitude: 12.9896; individualID: BC-ZSM-HYM-29813-G01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-G01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-G01; recordNumber: BC-ZSM-HYM-29813-G01; recordedBy: Munro et al; type: PhysicalObject; language: en; institutionCode: UCRC; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 48). Body length 1.9 mm. **Head.** Width/length in dorsal view 2.4, width/length in frontal view 1.3, POL/OOL 1.4, widths head/mesosoma 1.2, mouth width/malar space 1.2, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 1.4, 1.7, 1.4, clava length/width 4.2, lengths pedicel/F1 1.0, lengths F1/F2 0.9, F1/F3 1.0, lengths F1, F2, F3/clava 0.3, 0.4, 0.3, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 1.1 (width measured in anterior part), mid-lobe with median groove in posterior 4/5, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.6, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.0, lengths dorsellum/propodeum 0.6, propodeum with strong reticulation, propodeal callus with two setae. **Fore wing.** Costal cell length/width 10.4, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 2.8. **Gaster.** Ovate, length/width nm, lengths gaster/head+mesosoma nm, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 1.5, longest cercal seta curved, ovipositor sheaths not reaching apex of Gt₇.

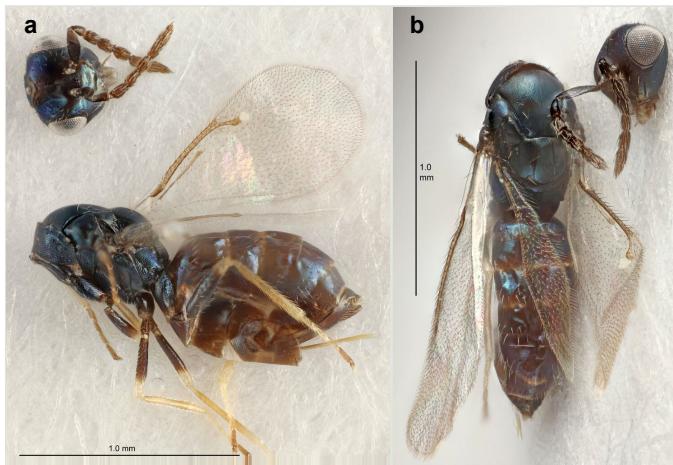


Figure 48.

Tetrastichus lazius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body metallic blue, antenna dark brown, tegulae black, wings hyaline with venation yellowish-brown, coxae and hind femur concolorous with body, trochanters and fore and mid femora dark brown, tibiae pale yellowish-brown, fore tarsus pale brown, mid and hind tarsi yellowish-white with T4 pale brown.

MALE. Unknown.

Diagnosis

Mesosoma distinctly blue metallic. See key for separation from similar species.

Distribution

Italy.

Host: Unknown.

Notes

Holotype deposited in UCRC.

Tetrastichus lixalius, sp. n.

- ZooBank urnlsid:zoobank.org:act:15D723F0-2C0F-496A-B72E-D77124F0D161

Materials

Holotype:

- a. scientificName: *Tetrastichus lixalius*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.625; decimalLongitude: 16.702; individualID: BC-ZSM-HYM-21587-A03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-A03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A03; recordNumber: BC-ZSM-HYM-21587-A03; recordedBy: C.Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus lixalius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.57; decimalLongitude: 16.531; individualID: BC-ZSM-HYM-21587-D09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-D09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-D09; recordNumber: BC-ZSM-HYM-21587-D09; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus lixalius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.57; decimalLongitude: 16.531; individualID: BC-ZSM-HYM-21587-D10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-D10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-D10; recordNumber: BC-ZSM-HYM-21587-D10; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus lixalius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.378; decimalLongitude: 16.295; individualID: BC-ZSM-HYM-13565-G10; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-G10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-G10; recordNumber: BC-ZSM-HYM-13565-G10; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus lixalius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.533; decimalLongitude: 12.917; individualID: BC-ZSM-HYM-20721-F05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F05; recordNumber: BC-ZSM-HYM-20721-F05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus lixalius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.533; decimalLongitude: 13.133; individualID: BC-ZSM-HYM-20721-C08; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-C08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-C08; recordNumber: BC-ZSM-HYM-20721-C08;

recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 49). Body length 1.9 mm (paratypes 1.7–1.9 mm). **Head.** Width/length in dorsal view 2.4, width/length in frontal view 1.3, POL/OOL 1.9, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.3, 1.3, 1.2, clava length/width 2.8, lengths pedicel/F1 0.9, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.4, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe without median groove, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.3, lengths dorsellum/propodeum 0.6, propodeum with strong reticulation, propodeal callus with two setae. **Fore wing.** Costal cell length/width 14.4, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 3.6. **Gaster.** Long ovate, length/width 1.8, lengths gaster/head+mesosoma 0.9, Gt₇ length/width 0.6, length of longest cercal seta/next longest seta 1.6, longest cercal seta evenly curved, ovipositor sheaths not reaching apex of Gt₇.

Colour. Body with weak metallic greenish-blue tinges, entire antenna dark brown, tegulae black, wing hyaline with venation brown to fuscous, coxae and femora concolorous with body, trochanters dark brown, fore tibia yellowish-brown, mid tibia brownish, hind tibia dark brown, tarsi brownish with T4 darkest.

MALE. Body length 1.6–1.7 mm. **Head.** Width/length in dorsal view 2.4, width/length in frontal view 1.3, mouth width/malar space 1.2, widths head/mesosoma 1.1, eye height/malar space 1.3. **Antenna.** F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, scape length/eye height 1.0, scape length/width 2.6, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.8, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3, F4 1.2, 1.6, 1.8, 1.7, clava length/width 3.9, lengths pedicel/F1 1.0, lengths F1/F2 0.8, F1/F3 0.7, F1/F4 0.7, lengths F1, F2, F3, F4/clava 0.3, 0.4, 0.5, 0.4.

Colour as in female.

Diagnosis

Female gaster long ovate, 1.8× as long as wide. See key for separation from similar species.

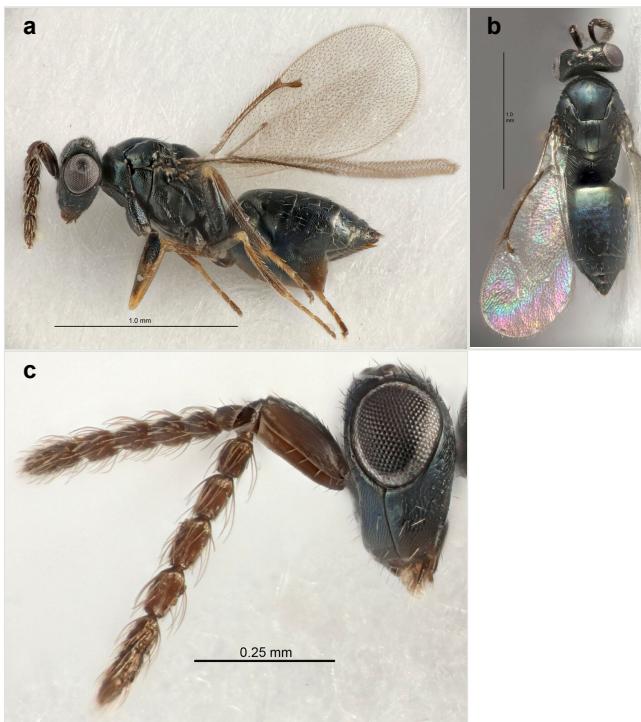


Figure 49.

Tetrastichus lixalius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU and SMTP.

Tetrastichus lycus, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:89E861D0-839F-4869-962A-3E9CF3FEA956](http://urnlsid:zoobank.org:act:89E861D0-839F-4869-962A-3E9CF3FEA956)

Materials

Holotype:

- a. scientificName: *Tetrastichus lycus*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.2442; decimalLongitude: 27.4828; individualID: BC-ZSM-HYM-27770-B05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-B05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-B05; recordNumber: BC-ZSM-HYM-27760-B05; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus lycus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.244; decimalLongitude: 27.483; individualID: BC-ZSM-HYM-27768-G09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-G09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-G09; recordNumber: BC-ZSM-HYM-27768-G09; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus lycus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Italy; decimalLatitude: 41.6552; decimalLongitude: 12.9896; individualID: BC-ZSM-HYM-29813-F08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-F08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-F08; recordNumber: BC-ZSM-HYM-29813-F08; recordedBy: Munro et al; type: PhysicalObject; language: en; institutionCode: UCRC; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus lycus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Italy; decimalLatitude: 41.6552; decimalLongitude: 12.9896; individualID: BC-ZSM-HYM-29813-F07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-F07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-F07; recordNumber: BC-ZSM-HYM-29813-F07; recordedBy: Munro et al; type: PhysicalObject; language: en; institutionCode: UCRC; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 50). Body length 1.6 mm (paratypes 1.6–1.7 mm). **Head.** Width/length in dorsal view 2.5, width/length in frontal view 1.3, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.8. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.4, 1.4, 1.8, clava length/width 3.8, lengths pedicel/F1 0.9, lengths F1/F2 1.0, F1/F3 0.9, lengths F1, F2, F3/clava 0.4, 0.4, 0.5, widths F1/pedicel (dorsal view) 1.4, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with a median groove in posterior $\frac{2}{3}$, with three adnotaular setae on each side, lengths

mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.5, distance between submedian/distance between submedian and sublateral grooves 1.3, lengths dorsellum/propodeum 0.7, propodeum with strong reticulation, propodeal callus with two setae. *Fore wing.* Costal cell length/width 10.1, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 2.9. *Gaster.* Ovate, length/width 1.5, lengths gaster/head+mesosoma 0.8, Gt₇ length/width 0.4, ovipositor sheaths not reaching apex of Gt₇.

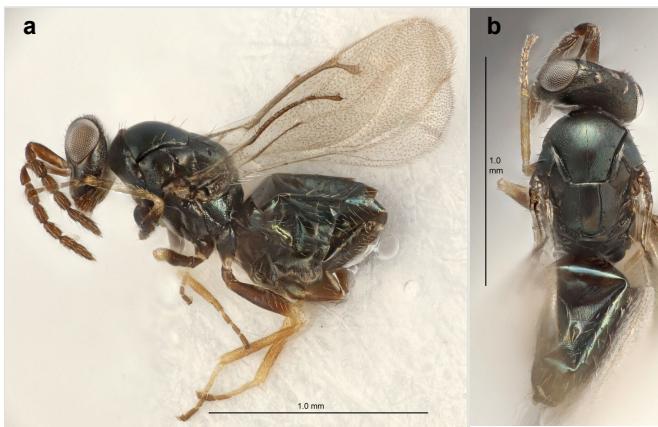


Figure 50.

Tetrastichus lycus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with weak golden-green tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with venation yellowish-brown to brown, coxae and femora concolorous with body, trochanters dark brown, tibiae pale brown, fore tarsus brown, mid and hind tarsi yellowish-brown with T4 brown.

MALE. Unknown.

Diagnosis

Female gaster ovate, 1.5× as long as wide. See key for separation from similar species.

Distribution

Italy, Romania.

Host: Unknown.

Notes

Holotype deposited in NHM, paratypes in NHM, UCRC.

Tetrastichus nymphae, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:15968C8B-DF5E-4A4C-88D2-8C843687128C>

Materials

Holotype:

- a. scientificName: *Tetrastichus nymphae*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Slovakia; decimalLatitude: 48.3689; decimalLongitude: 21.705; individualID: BC-ZSM-HYM-26562-H10; individualCount: 1; sex: female; lifeStage: adult; recordedBy: R. Gregorek & M. Suvak; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus nymphae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Slovakia; decimalLatitude: 48.3689; decimalLongitude: 21.705; individualID: BC-ZSM-HYM-26562-H11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26562-H11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26562-H11; recordNumber: BC-ZSM-HYM-26562-H11; recordedBy: R. Gregorek & M. Suvak; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus nymphae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Slovakia; decimalLatitude: 48.3689; decimalLongitude: 21.705; individualID: BC-ZSM-HYM-26562-H10; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26562-H10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26562-H10; recordNumber: BC-ZSM-HYM-26562-H10; recordedBy: R. Gregorek & M. Suvak; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 51). Body length 1.3 mm (paratypes 1.4 mm). *Head*. Width/length in dorsal view 2.5, width/length in frontal view 1.2, POL/OOL 1.8, widths head/mesosoma 0.9, mouth width/malar space 1.4, malar space/eye height 0.5. *Antenna*. Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width nm, length/width F1, F2, F3 1.3, 1.2, 1.1, clava length/width nm, lengths pedicel/F1 0.9, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava nm, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 nm. *Mesosoma*. Length/width 1.3, mesoscutal mid-lobe length/width 0.8, mid-lobe with a weak median groove that is absent in anterior 1/4, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 1.2, distance between SMG/distance between SMG and SLG 2.1,

lengths dorsellum/propodeum 0.6, propodeum with rather strong reticulation and partly smooth, propodeal callus with two setae. *Fore wing.* Costal cell length/width 11.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.5. *Gaster.* Ovate, length/width 1.5, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.6, length of longest cercal seta/next longest seta 2.0, longest cercal seta sinuate, ovipositor sheaths projecting beyond Gt₇.

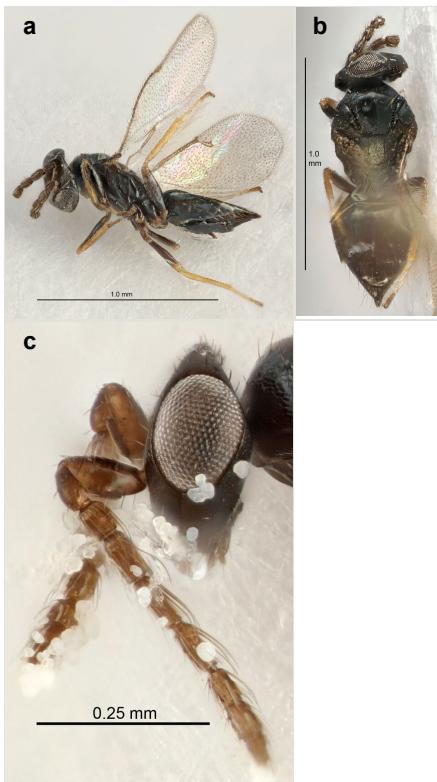


Figure 51.

Tetrastichus nymphae sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral. [doi](#)

Colour. Body dark brown to black non-metallic, antenna dark brown, tegulae black, wings hyaline with venation yellowish-brown, coxae, trochanters and femora concolorous with body, tibiae yellowish-brown, fore tarsus pale brown, mid and hind tarsi yellowish-brown with T4 brown.

MALE. Body length 1.3 mm. *Head.* Width/length in dorsal view 2.5, width/length in frontal view 1.3, eye height/malar space 1.5, mouth width/malar space 1.2, widths head/mesosoma 1.1. *Antenna.* F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, whorled setae on F1 2.0× as long as F1 length,

scape length/eye height 1.0, scape length/width 2.6, ventral plaque placed centrally, lengths ventral plaque/scape 0.4, pedicel+flagellum length/mesosoma width 1.7, length/width F1, F2, F3, F4 1.3, 1.5, 1.4, 1.3, clava length/width 4.0, lengths pedicel/F1 1.2, lengths F1/F2 0.8, F1/F3 0.7, F1/F4 0.8, lengths F1, F2, F3 F4 /clava 0.3, 0.4, 0.4, 0.4.

Colour. Similar to female.

Diagnosis

Mesoscutellum \pm flattened, distance between submedian groove $2.1 \times$ distance between submedian and sublateral grooves, female gaster ovate, $1.5 \times$ as long as wide, with ovipositor sheaths reaching beyond apex of Gt₇.

Distribution

Slovakia.

Host: Gregarious endoparasitoid on *Galerucella nymphaeae* (L.) (Coleoptera: Chrysomelidae) (Suvak et al. 2012 parasitoid identified as *Tetrastichus clito*).

Remarks: The type specimens are in poor condition, shrivelled and with parts missing: the holotype lacks antennal clava on both sides and left mid tibia and tarsus.

Additional paratype examined: 1 ♀, same data as holotype (MZLU).

Notes

Holotype deposited in MZLU, paratypes in MZLU.

Tetrastichus pilemostomae Graham 1991

Nomenclature

Tetrastichus pilemostomae Graham 1991:270–271. Holotype ♀ in OUMNH (according to Graham 1991), but could not be found there (James Hogan in mail). See Fig. 52.

Description

See Graham (1991). Male is unknown.

Diagnosis

Antenna with F1 $1.3 \times$ as long as and $1.3 \times$ as wide as pedicel; mesoscutellum with distance between submedian grooves $1.7\text{--}1.9 \times$ the distance between submedian and sublateral grooves; female gaster short ovate, $1.4 \times$ as long as wide, with ovipositor sheaths reaching beyond apex of Gt₇.

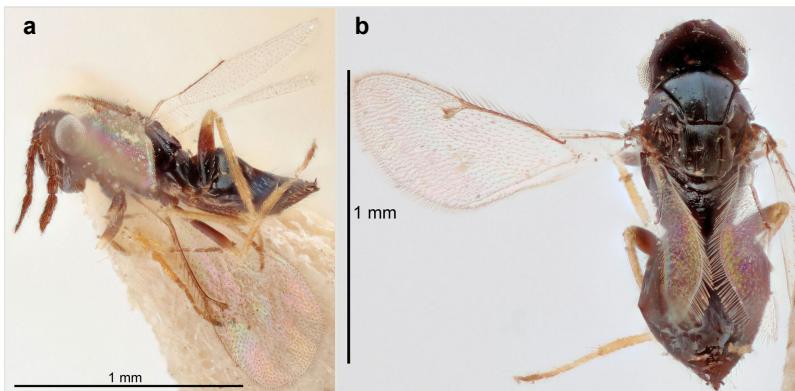


Figure 52.

Tetrastichus pilemostomae Grahama: Paratype female, lateral. [doi](#)b: Paratype female, dorsal [doi](#)

Distribution

United Kingdom (Graham 1991), Sweden (Hedqvist 2003) and Romania (**new record**).

Host: *Pilemostoma fastuosa* (Schaller) (Coleoptera: Chrysomelidae) (Graham 1991).

Material examined: Type material: 7♀ paratypes (1♀ with head missing) (NHM). Additional material: Romania 2♀ (NHM).

Tetrastichus pixius, sp. n.

- ZooBank urn:lsid:zoobank.org:act:3805D744-51AE-4BA9-A17E-431437C89D4A

Materials

Holotype:

- a. scientificName: *Tetrastichus pixius*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-A02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A02; recordNumber: BC-ZSM-HYM-26563-A02; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus pixius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-

- HYM-26563-A04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A04; recordNumber: BC-ZSM-HYM-26563-A04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus pixius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-A03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A03; recordNumber: BC-ZSM-HYM-26563-A03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus pixius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.84; decimalLongitude: 13.58; individualID: BC-ZSM-HYM-21587-C11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-C11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-C11; recordNumber: BC-ZSM-HYM-21587-C11; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus pixius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.9216; decimalLongitude: 16.1012; individualID: BC-ZSM-HYM-22523-D06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-D06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-D06; recordNumber: BC-ZSM-HYM-22523-D06; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 53). Body length 1.6 mm (paratypes 1.3–1.6 mm). **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.2, POL/OOL 1.9, widths head/mesosoma 1.1, mouth width/malar space 0.9, malar space/eye height 0.8. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 1.5, 1.6, 1.4, clava length/width 3.9, lengths pedicel/F1 1.0, lengths F1/F2 0.9, F1/F3 0.9, lengths F1, F2, F3/clava 0.3, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with median groove in posterior ½, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.7, distance between SMG/distances between SMG and SLG 1.0, lengths dorsellum/propodeum 0.7, propodeum with strong reticulation, propodeal callus with two setae. **Fore wing.** Costal cell length/width 13.5, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.3. **Gaster.** Ovate, length/width 1.3, lengths gaster/head+mesosoma 0.9, Gt₇

length/width 0.4, length of longest cercal seta/next longest seta 1.5, longest cercal seta almost straight, ovipositor sheaths not reaching apex of Gt₇.



Figure 53.

Tetrastichus pixius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic blue tinges, entire antenna dark brown, tegulae dark brown, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters dark brown, fore tibia yellowish-brown, mid and hind tibiae brownish, fore tarsus brown, mid and hind tarsi yellowish-brown with T3–4 brown.

MALE. Unknown.

Diagnosis

Female gaster ovate, 1.3× as long as wide. See key for separation from similar species.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU and SMTP.

Tetrastichus unplaced species

Taxon discussion

The following species could not be assigned to any of the existing species groups.

Tetrastichus acutiusculus Graham, 1991

Nomenclature

Tetrastichus acutiusculus Graham 1991:261. Holotype ♀ in NHM, examined (Fig. 54).

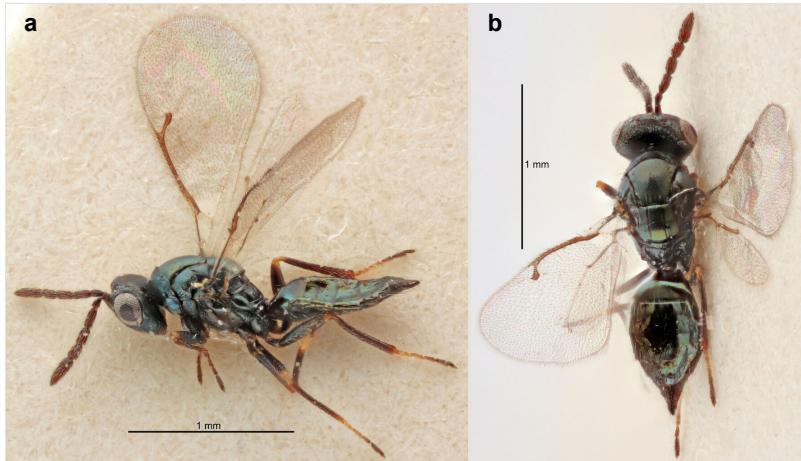


Figure 54.

Tetrastichus acutiusculus Graham

a: Female holotype, lateral. [doi](#)

b: Female holotype, dorsal. [doi](#)

Materials

- a. scientificName: *Tetrastichus acutiusculus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Klagshamn; decimalLatitude: 55.533; decimalLongitude: 12.917; individualID: BC-ZSM-HYM-20721-F07; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-20721-F07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-B10|BC-ZSM-HYM-22524-B07|BC-ZSM-HYM-20721-F07|BC-ZSM-HYM-21587-B03; recordNumber: BC-ZSM-HYM-20721-F07; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-20721-F07+1398632230.jpg>; identifiedBy: Christer Hansson; identificationRemarks: CH00225
- b. scientificName: *Tetrastichus acutiusculus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Hungary; locality: Koeszeg; decimalLatitude: 47.22; decimalLongitude: 16.313; individualID: BC-ZSM-HYM-22524-B07; individualCount: 1; sex: F; lifeStage: a; reproductiveCondition: S; catalogNumber: BC-ZSM-HYM-22524-B07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-B10|BC-ZSM-HYM-22524-B07|BC-ZSM-HYM-20721-F07|BC-ZSM-HYM-21587-B03; recordNumber: BC-ZSM-HYM-22524-B07; recordedBy: C. Hansson; identifiedBy: Christer Hansson; identificationRemarks: CH09270
- c. scientificName: *Tetrastichus acutiusculus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality:

- Bostorpshaugen; decimalLatitude: 56.776; decimalLongitude: 16.707; individualID: BC-ZSM-HYM-21587-B10; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-21587-B10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-B10|BC-ZSM-HYM-22524-B07|BC-ZSM-HYM-20721-F07|BC-ZSM-HYM-21587-B03; recordNumber: BC-ZSM-HYM-21587-B10; recordedBy: C.Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-21587-B10+1423081070.jpg>; identifiedBy: Christer Hansson
- d. scientificName: *Tetrastichus acutiusculus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Ismantorp; decimalLatitude: 56.893; decimalLongitude: 16.768; individualID: BC-ZSM-HYM-21587-B03; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-21587-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-B03; recordNumber: BC-ZSM-HYM-21587-B03; recordedBy: C.Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-21587-B03+1423081074.jpg>; identifiedBy: Christer Hansson

Description

See Graham (1991). The male is unknown.

Diagnosis

Gaster 2× as long as wide with Gt₇ 1× as long as width at base. Similar to *T. leocrates*, but with longer gaster and longer antenna, as mentioned in the key.

Distribution

United Kingdom (Graham 1991), Sweden (Hedqvist 2003), and Hungary (**new record**).

Host: Unknown.

Additional material examined: Type material: holotype ♀ (NHM, type no. 5.3625). Additional material: Hungary 1♀ (NHM), Sweden 5♀ (NHRS, MZLU, ZSM).

Tetrastichus agonus, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:73F51106-D2ED-4D87-9D18-363B1D665065>

Materials

Holotype:

- a. scientificName: *Tetrastichus agonus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-E09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-E09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-E09; recordNumber: BC-ZSM-HYM-25460-E09; recordedBy: C. Hansson; type:

PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.84; decimalLongitude: 13.58; individualID: BC-ZSM-HYM-21587-C08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-C08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-C08; recordNumber: BC-ZSM-HYM-21587-C08; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.533; decimalLongitude: 12.917; individualID: BC-ZSM-HYM-20721-F08; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F08; recordNumber: BC-ZSM-HYM-20721-F08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.517; individualID: BC-ZSM-HYM-20721-E10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-E10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-E10; recordNumber: BC-ZSM-HYM-20721-E10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6967; decimalLongitude: 13.4408; individualID: BC-ZSM-HYM-25460-G12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-G12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-G12; recordNumber: BC-ZSM-HYM-25460-G12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-F04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-F04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-F04; recordNumber: BC-ZSM-HYM-25460-F04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-E11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-E11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-E11; recordNumber: BC-ZSM-HYM-25460-E11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- g. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-E04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-E04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-E04; recordNumber: BC-ZSM-HYM-25460-E04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-D05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-D05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-D05; recordNumber: BC-ZSM-HYM-25460-D05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus agonus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Kranksjoen, Fiskeplats; decimalLatitude: 55.6983; decimalLongitude: 13.4994; individualID: BC-ZSM-HYM-25460-E06; individualCount: 1; sex: F; lifeStage: a; reproductiveCondition: S; catalogNumber: BC-ZSM-HYM-25460-E06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-E06; recordNumber: BC-ZSM-HYM-25460-E06; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-25460-E06+1449268384.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 55). Body length 2.0 mm (paratypes 1.6–2.0 mm). **Head.** Width/length in dorsal view 2.5, width/length in frontal view 1.2, POL/OOL 1.7, widths head/mesosoma 1.0, mouth width/malar space 0.9, malar space/eye height 0.9. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.3, 2.0, 2.0, clava length/width 3.3, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.6, 0.6, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median groove in posterior ½, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.5, distance between SMG/distance between SMG and SLG 1.4, lengths dorsellum/propodeum (measured medially) 0.7, propodeal callus with six setae. **Fore wing.** Costal cell length/width 7.4, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.3. **Gaster.** Elongate-acuminate, length/width 1.4, lengths gaster/mesosoma 0.9, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.6, longest cercal seta curved, ovipositor sheaths reach apex of Gt₇, but not beyond.

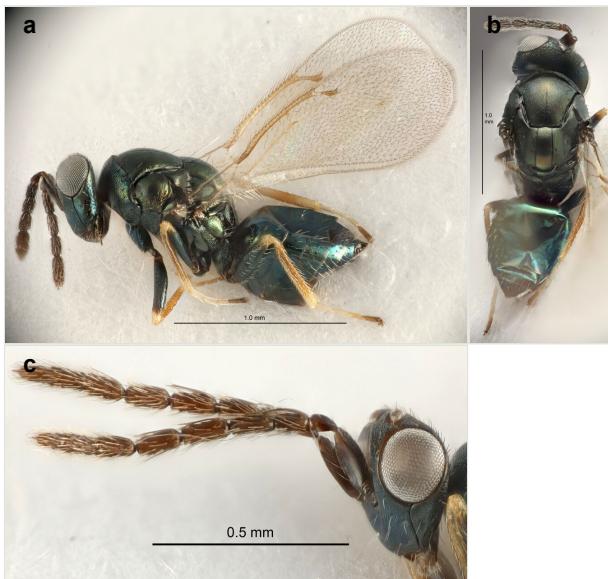


Figure 55.

Tetrastichus agonus sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)c: Paratype male, head antenna lateral. [doi](#)

Colour. Head and mesosoma with golden tinges, gaster metallic blue, entire antenna dark brown, tegulae black, wings hyaline with venation yellowish-brown, coxae and femora golden-green, trochanters black, tibiae yellowish-brown, tarsi yellowish-brown with T4 brown.

MALE. Body length 1.7 mm. *Head*. Width/length in dorsal view 2.5, width/length in frontal view 1.3, eye height/malar space 1.3, mouth width/malar space 1.0, widths head/mesosoma 1.1. *Antenna*. F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, whorled setae on F1 1.4× as long as F1 length, scape length/eye height 0.9, scape length/width 2.4, ventral plaque placed centrally, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.8, length/width F1, F2, F3, F4 1.5, 1.9, 2.0, 2.0, clava length/width 5.0, lengths pedicel/F1 2.4, lengths F1/F2 0.8, F1/F3 0.8, F1/F4 0.8, lengths F1, F2, F3 F4 /clava 0.3, 0.4, 0.4, 0.4.

Colour. Entire body with golden-green tinges, mid and hind tibiae dark brown. Otherwise as in female.

Diagnosis

Very similar to *T. miser*, but the male differs in having whorled setae of F1–F4 reaching slightly beyond the tip of funicular attached to; female tentatively separated through characters mentioned in the key.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, ZSM.

Tetrastichus agrilocidus Graham, 1991

Nomenclature

Tetrastichus agrilocidus Graham 1991:250. Holotype ♀ in NHM, examined (Fig. 56).

Description

See Graham (1991).

Diagnosis

Female antenna with clava 0.7–0.8× as long as F2+F3, F1 about as wide as pedicel; male antenna with whorled setae of funiculars reaching beyond the tips of funicular attached to, scape 2.5× as long as wide; female gaster 2.8× as long as wide.

Distribution

(Former) Czechoslovakia, Hungary, Poland (Graham 1991), Sweden (Hedqvist 2003), Finland, France and Germany (**new records**).

Host: *Agrilus* sp. (Coleoptera: Buprestidae), *Xylotrechus pantherinus* Savenius (Coleoptera: Cerambycidae) (Graham 1991).

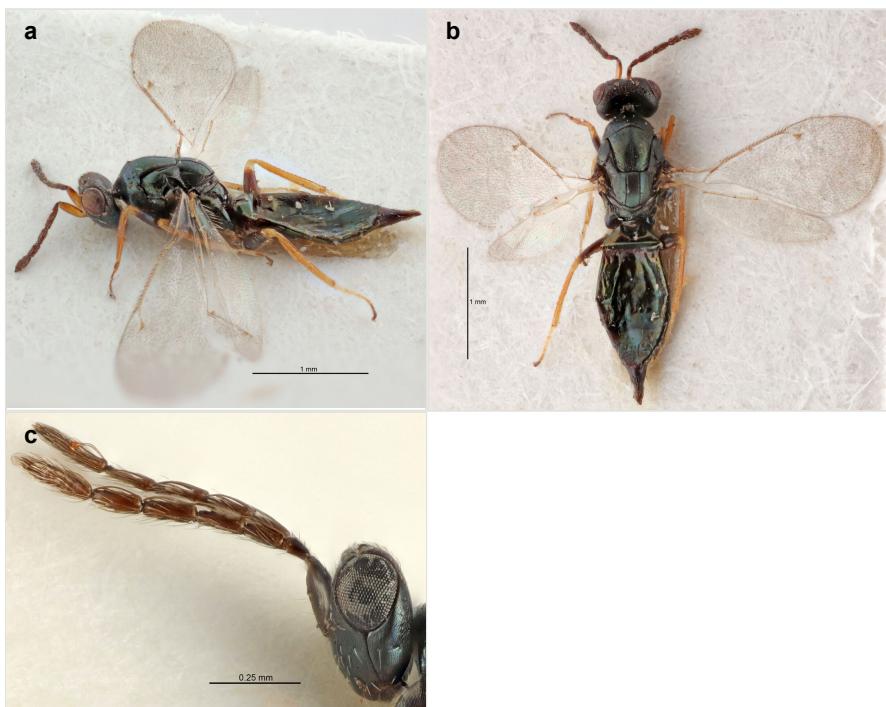


Figure 56.

Tetrastichus agrilocidus Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Nontype male, head antenna lateral. [doi](#)

Material examined

Type material: holotype ♀ of *T. agrilocidus* (NHM, type no. 5.3620). Additional material (11♀ 2♂): Czech Republic 1♀ (NHM), Finland 2♀ (NHM), France 6♀ (NHM), Germany 2♀ 1♂ (NHM, ZSM), Sweden 4♀ 1♂ (MZLU).

Tetrastichus ballotus, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:52C31218-ADD7-474A-97D7-A7B03ABCEE32](http://urnlsid:zoobank.org:act:52C31218-ADD7-474A-97D7-A7B03ABCEE32)

Materials

Holotype:

- scientificName: *Tetrastichus ballotus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6967; decimalLongitude: 13.4408; individualID: BC-ZSM-HYM-26563-A07; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A07;

recordNumber: BC-ZSM-HYM-26563-A07; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6664; decimalLongitude: 13.6242; individualID: BC-ZSM-HYM-26563-A11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A11; recordNumber: BC-ZSM-HYM-26563-A11; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.418; decimalLongitude: 16.068; individualID: BC-ZSM-HYM-13565-C04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-C04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C04; recordNumber: BC-ZSM-HYM-13565-C04; recordedBy: SMTP project; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.553; decimalLongitude: 11.273; individualID: BC-ZSM-HYM-13565-C03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-C03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C03; recordNumber: BC-ZSM-HYM-13565-C03; recordedBy: SMTP project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; decimalLatitude: 58.553; decimalLongitude: 11.273; individualID: BC-ZSM-HYM-13565-C02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-C02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C02; recordNumber: BC-ZSM-HYM-13565-C02; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; decimalLatitude: 56.418; decimalLongitude: 16.068; individualID: BC-ZSM-HYM-13565-C05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-C05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C05; recordNumber: BC-ZSM-HYM-13565-C05; recordedBy: SMTP; type: PhysicalObject; language: en; institutionCode: SMTP; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Lake Kranke, vid baeck; decimalLatitude: 55.7078; decimalLongitude: 13.475; individualID: BC-ZSM-HYM-29750-H03; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-29750-H03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-H03; recordNumber: BC-ZSM-HYM-29750-H03;

- recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29750-H03+1510087798.jpg>; identifiedBy: Christer Hansson
- g. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Tanums kn, Hamburgsund; decimalLatitude: 58.553; decimalLongitude: 11.273; individualID: BC-ZSM-HYM-13565-C01; individualCount: 1; lifeStage: a; reproductiveCondition: S; catalogNumber: BC-ZSM-HYM-13565-C01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C01; recordNumber: BC-ZSM-HYM-13565-C01; recordedBy: SMTr Project; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-13565-C01+1444992588.jpg>; identifiedBy: Christer Hansson
- h. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Lk Kranke, Ekskogen; decimalLatitude: 55.683; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-D11; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-20721-D11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-D11; recordNumber: BC-ZSM-HYM-20721-D11; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-20721-D11+1398631912.jpg>; identifiedBy: Christer Hansson; identificationRemarks: CH04246
- i. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Lake Kranke, Ekskogen; decimalLatitude: 55.6861; decimalLongitude: 13.4611; individualID: BC-ZSM-HYM-29750-F02; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-29750-F02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-F02; recordNumber: BC-ZSM-HYM-29750-F02; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29750-F02+1510087672.jpg>; identifiedBy: Christer Hansson
- j. scientificName: *Tetrastichus ballotus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Lake Kranke, baeck; decimalLatitude: 55.7078; decimalLongitude: 13.475; individualID: BC-ZSM-HYM-26563-C07; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-26563-C07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-C07; recordNumber: BC-ZSM-HYM-26563-C07; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-26563-C07+1510087182.jpg>; identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 57). Body length 1.9 mm (paratypes 1.4–2.0 mm). **Head.** Width/length in dorsal view 2.4, width/length in frontal view 1.3, POL/OOL 2.2, widths head/mesosoma 1.0, mouth width/malar space 1.0, malar space/eye height 0.8. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.2, 1.9, 1.7, clava length/width 3.6, lengths pedicel/F1 0.7, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median groove in posterior $\frac{2}{3}$, with four adnotaular setae on each side, lengths

mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.5, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum (measured medially) 0.7, propodeal callus with four setae. *Fore wing.* Costal cell length/width 9.1, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.3. *Gaster.* Ovate, length/width 1.4, lengths gaster/mesosoma 1.0, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.6, longest cercal seta curved, ovipositor sheaths projecting slightly beyond apex of Gt₇.



Figure 57.

Tetrastichus ballotus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with golden-green tinges, entire antenna dark brown, tegulae black, wings hyaline with venation dark yellowish-brown, coxae and femora concolorous with body, trochanters black, fore tibia dark yellowish-brown, mid and hind tibiae pale brown, fore tarsus dark brown, mid and hind tarsi yellowish-brown with T3-4 dark brown.

MALE. Unknown.

Diagnosis

Very similar to *T. miser*, differs morphologically in having a longer distance between lateral ocelli and eyes and in having a longer antennal clava.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, SMTP.

Tetrastichus broncus, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:18B532FE-61A6-4E1D-B5E9-E189A5042D20>

Materials

Holotype:

- a. scientificName: *Tetrastichus broncus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.822; decimalLongitude: 13.81; individualID: BC-ZSM-HYM-21587-G03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-G03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-G03; recordNumber: BC-ZSM-HYM-21587-G03; recordedBy: C.Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.016; decimalLongitude: 13.134; individualID: BC-ZSM-HYM-22523-B04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-B04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-B04; recordNumber: BC-ZSM-HYM-22523-B04; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.016; decimalLongitude: 13.134; individualID: BC-ZSM-HYM-22523-B03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-B03; recordNumber: BC-ZSM-HYM-22523-B03; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-D12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-D12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-D12; recordNumber: BC-ZSM-HYM-26563-D12; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.683; decimalLongitude: 16.641; individualID: BC-ZSM-HYM-22526-G10; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22526-G10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22526-G10; recordNumber: BC-ZSM-HYM-22526-G10; recordedBy: S. Schmidt; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- e. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.683; decimalLongitude: 13.517; individualID: BC-ZSM-HYM-21587-D04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21587-D04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-D04; recordNumber: BC-ZSM-HYM-21587-D04; recordedBy: C.Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6192; decimalLongitude: 13.5497; individualID: BC-ZSM-HYM-27770-A02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-A02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-A02; recordNumber: BC-ZSM-HYM-27760-A02; recordedBy: R. Bygebjerg; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus broncus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.0756; decimalLongitude: 13.6778; individualID: BC-ZSM-HYM-29750-B05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29750-B05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29750-B05; recordNumber: BC-ZSM-HYM-29750-B05; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 58). Body length 2.1 mm (paratypes 2.2–2.6 mm). **Head.** Width/length (dorsal view) 2.1, width/length (frontal view) 1.3, POL/OOL 1.9, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.8. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 2.0, 1.9, 1.9, clava length/width 3.5, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 1.0, mid-lobe with a median groove in posterior ½, with five adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.3, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with strong reticulation, propodeal callus with five setae. **Fore wing.** Costal cell length/width 13.6, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.8. **Gaster.** Elongate-acuminate, length/width 2.6, lengths gaster/head+mesosoma 1.1, Gt₇ length/width 1.3, length of longest cercal seta/next longest seta 1.8, longest cercal seta almost straight, ovipositor sheaths projecting beyond apex of Gt₇.

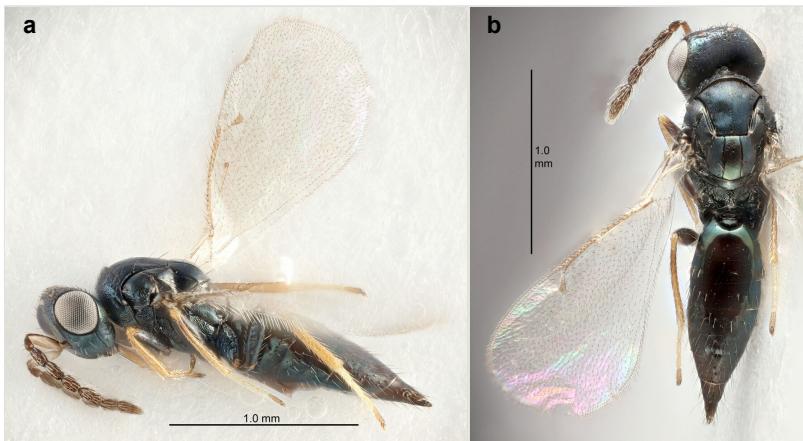


Figure 58.

Tetrastichus broncus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with weak golden-green tinges, scape yellowish-brown, pedicel and flagellum dark brown, tegulae dark brown, wings hyaline with veins yellowish-white, coxae and femora concolorous with body, trochanters dark brown, tibiae and tarsi yellowish-brown.

MALE. Unknown.

Diagnosis

Gaster elongate-acuminate, length/width 2.6, lengths gaster/head+mesosoma 1.1, Gt₇ length/width 1.3; antennal clava 1.0× as long as F2+F3 and with distinct constriction between C1 and C2.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, SMTP and ZSM.

Tetrastichus crioceridis Graham, 1983**Nomenclature**

Tetrastichus crioceridis Graham 1983:275–277. Holotype ♀ in Naturalis Biodiversity Center, Leiden, The Netherlands, not examined. Fig. 59

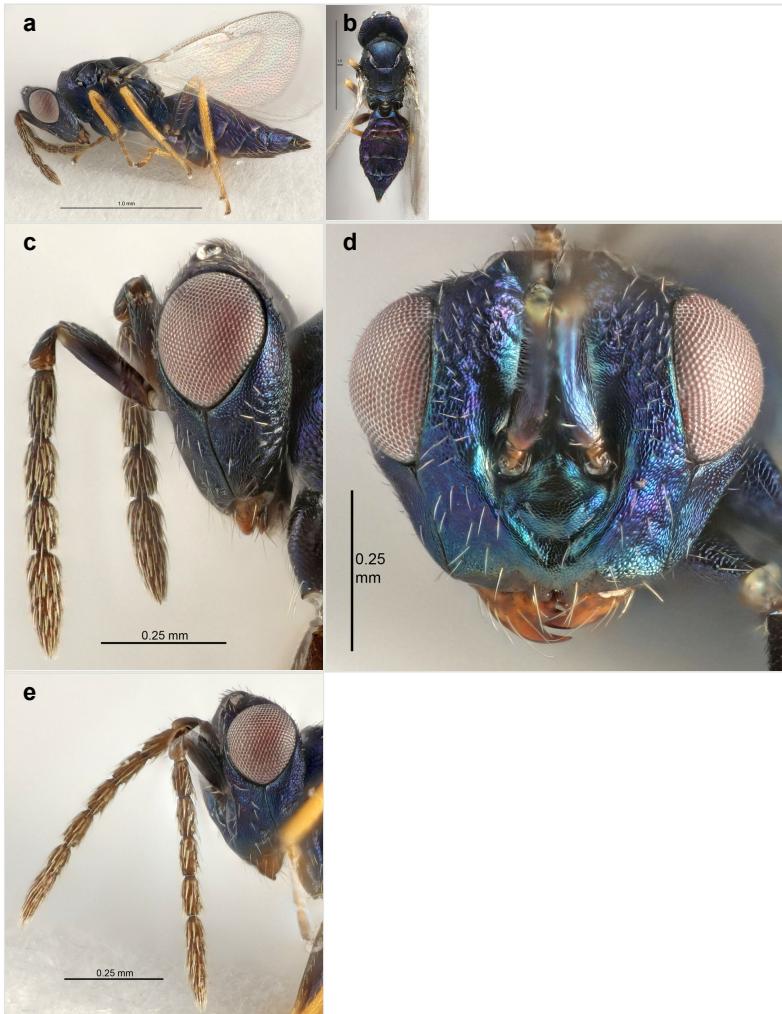


Figure 59.

Tetrastichus crioceridis Graham

a: Nontype female, lateral. [doi](#)

b: Nontype female, dorsal. [doi](#)

c: Nontype female, head and antenna lateral. [doi](#)

d: Nontype female, head frontal. [doi](#)

e: Nontype male, head and antenna lateral. [doi](#)

Description

See Graham (1983).

Diagnosis

Mouth opening 1.4–1.6× malar space in both sexes; apex of female antennal clava blunt; male funiculars 2–4 without distinct whorl of setae.

Distribution

France, The Netherlands (Graham 1983), Sweden (Hedqvist 2003) and United Kingdom (**new record**).

Host: *Crioceris duodecimpunctata* L. (Coleoptera: Chrysomelidae), gregarious egg-larval parasitoid (Van Alphen 1980).

Material examined: Type material: paratype(s) ♀ & ♂ of *T. crioceridis* (NHM). Additional material (118♀ 26♂): France 5♀ 1♂ (NHM), The Netherlands 20♀ 8♂ (NHM), Sweden 92♀ 17♂ (all ex *C. duodecimpunctata*) (MZLU, ZSM), United Kingdom 1♀ (NHM).

Tetrastichus delvarei, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:97131D3D-B98D-4079-B914-0E49A45AE920](http://urn.lsid:zoobank.org:act:97131D3D-B98D-4079-B914-0E49A45AE920)

Materials

Holotype:

- a. scientificName: *Tetrastichus delvarei*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: France; decimalLatitude: 44.124; decimalLongitude: 5.18037; individualID: BC-ZSM-HYM-29813-E02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-E02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-E02; recordNumber: BC-ZSM-HYM-29813-E02; recordedBy: G.Delvare; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus delvarei*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Germany; decimalLatitude: 50.027; decimalLongitude: 9.8; individualID: BC-ZSM-HYM-25459-G08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25459-G08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25459-G08; recordNumber: BC-ZSM-HYM-25459-G08; recordedBy: D. Doczkal; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 60). Body length 2.1 mm. *Head*. Width/length in dorsal view 2.4, width/length in frontal view 1.2, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 1.1, malar space/eye height 0.7. *Antenna*. Scape length/eye height 0.8, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.6, 2.6, 1.9, clava length/width 3.4, lengths pedicel/F1 0.5, lengths F1/F2 1.0, F1/F3 1.2, lengths F1, F2, F3/clava 0.6, 0.6, 0.5, width F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with median groove almost complete, missing in very anterior part, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, lengths dorsellum/propodeum 0.7, mesoscutellum length/width 0.9, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.6, propodeum with strong reticulation, propodeal callus with six setae. *Fore wing*. Costal cell length/width 10.3, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.2. *Gaster*. Elongate, length/width 2.3, lengths gaster/mesosoma 1.4, Gt₇ length/width 1.0, lengths longest cercal seta/next longest seta nm, ovipositor sheaths reaching beyond apex of Gt₇.



Figure 60.

Tetrastichus delvarei sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Body with weak metallic bluish-green tinges, scape pale brown with dorsal edge dark brown, pedicel and flagellum dark brown, tegulae dark brown, wing venation yellowish-white, coxae concolorous with body, trochanters dark brown, fore and mid femora dark brown with apex yellowish-brown, hind femur concolorous with body, fore tibia yellowish-brown, mid tibia pale brown with apex yellowish-brown, hind tibia dark brown with apex yellowish-brown, tarsi with T1–3 yellowish-brown and T4 brown.

MALE. Unknown.

Diagnosis

Similar to *T. agrilocidus*, but differs in having a shorter gaster, 1.4× as long as length of mesosoma and with antennal flagellomeres shorter and clava longer.

Etymology

Named after the collector of holotype, Gerard Delvare (CIRAD).

Distribution

France.

Host: Unknown.

Notes

Holotype deposited in NHM, paratype in ZSM.

Tetrastichus doczkali, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:F17802D2-E6F9-4D9E-97E7-D1513D165003>

Material

Holotype:

- a. scientificName: *Tetrastichus doczkali*; taxonRemarks: Holotype deposited in ZSM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Germany; decimalLatitude: 47.554; decimalLongitude: 7.67; individualID: BC-ZSM-HYM-21585-G01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-21585-G01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21585-G01; recordNumber: BC-ZSM-HYM-21585-G01; recordedBy: D. Doczkal; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 61). Body length 2.5 mm. **Head.** Width/length in dorsal view 2.3, width/length in frontal view 1.3, POL/OOL 2.3, widths head/mesosoma 1.0, mouth width/malar space 1.1, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 2.4, 2.1, 1.8, clava length/width 3.1, lengths pedicel/F1 0.7, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.7, 0.6, 0.6, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.3, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with complete median groove, with six adnotaular setae on each side, lengths mesoscutum/scutellum (measured medially) 1.3, mesoscutellum length/width 0.9, length/width of enclosed space between submedian lines 2.4, distance between SMG/distance between SMG and SLG 1.4,

lengths dorsellum/propodeum 0.5, propodeum with strong reticulation, propodeal callus with four setae. *Fore wing*. Costal cell length/width 8.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.5. *Gaster*. Elongate, length/width 2.6, lengths gaster/mesosoma 1.6, Gt₇ length/width 0.8, length of longest cercal seta to next longest seta 1.8, longest cercal seta evenly curved, ovipositor sheaths reaching beyond apex of Gt₇.

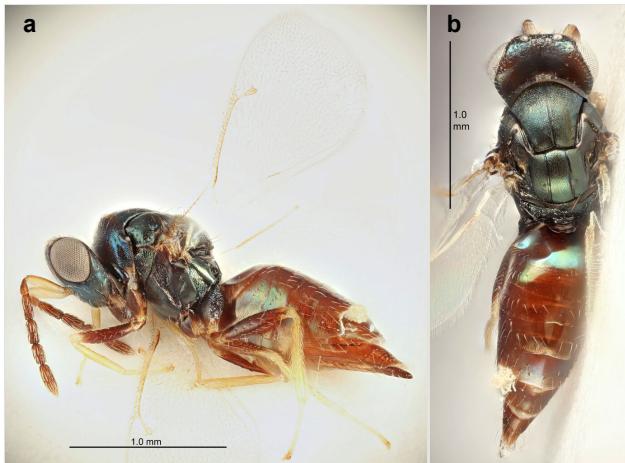


Figure 61.

Tetrastichus doczkali sp. n.

- a: Holotype female, lateral. [doi](#)
- b: Holotype female, dorsal. [doi](#)

Colour. Head and mesosoma black with golden-green tinges, gaster dark brown with metallic tinges, scape yellowish-brown with dorsal edge pale brown, pedicel brown with dorsal part dark brown, flagellum dark brown, tegulae dark brown, wing venation yellowish-white, fore and mid coxae dark brown and hind coxa concolorous with body, trochanters and femora dark brown, tibiae yellowish-brown, tibiae yellowish-white.

MALE. Unknown.

Diagnosis

Similar to *T. agrilocidus*, but differs in having a longer distance between posterior ocelli and with shorter F1 and F2.

Etymology

Named after the collector of the species, Dieter Doczkal (ZSM).

Distribution

Germany.

Host: Unknown.

Notes

Holotype deposited in ZSM.

Tetrastichus elodius, sp. n.

- ZooBank urn:lsid:zoobank.org:act:634458CE-6FDD-43BD-98B1-5381A8DF24DC

Materials

Holotype:

- a. scientificName: *Tetrastichus elodius*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Hungary; decimalLatitude: 47; decimalLongitude: 17.45; individualID: BC-ZSM-HYM-13565-F04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-F04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-F04; recordNumber: BC-ZSM-HYM-13565-F04; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus elodius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Germany; decimalLatitude: 48.518; decimalLongitude: 13.726; individualID: BC ZSM HYM AE339; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC ZSM HYM AE339; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC_ZSM_HYM_AE339; recordNumber: BC ZSM HYM AE339; recordedBy: G. Merkel-Wallner; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 62). Body length 2.0 mm (paratype 2.1 mm). **Head.** Width/length in dorsal view 2.1, width/length in frontal view 1.3, POL/OOL 2.2, widths head/mesosoma 1.2, mouth width/malar space 1.4, malar space/eye height 0.7. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 2.2, 2.2, 2.0, clava length/width 3.8, lengths pedicel/F1 0.8, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.5, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median groove in posterior ½, with five adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 0.9, length/width

of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.5, lengths dorsellum/propodeum (measured medially) 0.5, propodeal callus with five setae. *Fore wing.* Costal cell length/width 10.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 2.8. *Gaster.* Ovate, length/width 1.7, lengths gaster/mesosoma 1.2, Gt₇ length/width 0.6, length of longest cercal seta/next longest seta 2.2, longest cercal seta sinuate, ovipositor sheaths reach apex of Gt₇, but not beyond.



Figure 62.

Tetrastichus elodius sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal [doi](#)

Colour. Body metallic bluish, entire antenna dark brown, tegulae black, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae yellowish-brown, fore tarsus dark brown, mid and hind tarsi yellowish-brown with T4 brown.

MALE. Unknown.

Diagnosis

Very similar to *T. julis*, female differs morphologically in having a longer distance between lateral ocelli and eyes and in having a shorter marginal vein compared to length of stigmal vein (see key).

Distribution

Germany, Hungary.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratype ZSM.

Tetrastichus enodis, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:03EF990E-E488-4C71-A451-A6E12F0B46F1>

Material

Holotype:

- a. scientificName: *Tetrastichus enodis*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: France; decimalLatitude: 43.5912; decimalLongitude: 3.25836; individualID: BC-ZSM-HYM-29813-F03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-F03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-F03; recordNumber: BC-ZSM-HYM-29813-F03; recordedBy: G.Delvare; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 63). Body length 1.5 mm. *Head*. Width/length (dorsal view) 2.1, width/length (frontal view) 1.2, POL/OOL 1.8, widths head/mesosoma 1.2, mouth width/malar space 1.1, malar space/eye height 0.7. *Antenna*. Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3 1.8, 1.6, 1.3, clava length/width 3.0, lengths pedicel/F1 0.8, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.0, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width (width measured in anterior part) 1.0, mid-lobe with a median groove that is missing in very furthest anterior part, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.7, length/width of enclosed space between submedian grooves 2.0, distance between SMG/distance between SMG and SLG 1.8, lengths dorsellum/propodeum (measured medially) 0.9, propodeum smooth, propodeal callus with four setae. *Fore wing*. Costal cell length/width 11.8, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.1. *Gaster*. Ovate, length/width 2.4, lengths gaster/head+mesosoma 1.6, Gt₇ length/width 0.7, length of longest cercal seta/next longest seta 1.3, longest seta weakly curved almost straight, ovipositor sheaths projecting beyond apex of Gt₇.

Colour. Body dark brown to black with weak metallic tinges, antenna pale brown, tegulae dark brown, wings hyaline with veins pale yellowish-brown, coxae black with weak metallic tinges, femora and trochanters dark brown, fore tibia and tarsus infuscate, mid and hind tibiae pale yellowish-brown, mid and hind tarsi white with T4 pale brown.

MALE. Unknown.

Diagnosis

Frons with interscrobal area as a wide carina reaching almost to median ocellus; propodeum smooth and shiny.

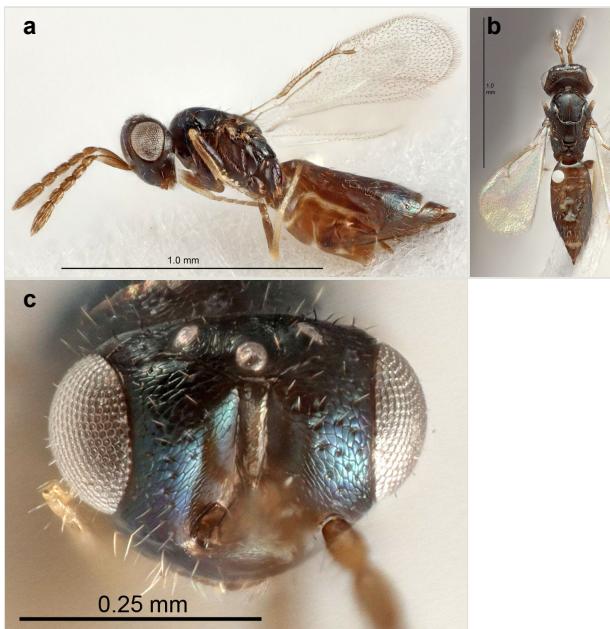


Figure 63.

Tetrastichus enodis sp. n.

- a: Holotype female, lateral. [doi](#)
b: Holotype female, dorsal. [doi](#)
c: Holotype female, head frontal. [doi](#)

Distribution

France.

Host: Unknown.

Remarks: The left femora, tibia and tarsus of mid and hind leg are detached and glued to a separate card.

Notes

Holotype deposited in NHM.

Tetrastichus fadus, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:7D70AAF5-262D-4830-8523-AF7E4713C15F>

Material

Holotype:

- a. scientificName: *Tetrastichus fadus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Russia; decimalLatitude: 60.401; decimalLongitude: 30.373; individualID: BC-ZSM-HYM-22524-H10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22524-H10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22524-H10; recordNumber: BC-ZSM-HYM-22524-H10; recordedBy: E. Shevtsova; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 64). Body length 2.6 mm. **Head.** Width/length (dorsal view) 2.2, width/length (frontal view) 1.2, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 1.3, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.8, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.1, 2.0, 2.0, clava length/width 3.1, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.6, 0.6, widths F1/pedicel (dorsal view) 1.4, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width (width measured in anterior part) 1.0, mid-lobe without median groove, with four adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.1, distance between SMG/distance between SMG and SLG 1.9, lengths dorsellum/propodeum (measured medially) 0.6, propodeum with strong reticulation, propodeal callus with five setae. **Fore wing.** Costal cell length/width 10.0, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.3. **Gaster.** Elongate-acuminate, length/width 2.4, lengths gaster/head+mesosoma 1.3, Gt₇ length/width 1.2, length of longest cercal seta/next longest seta 1.7, longest cercal seta almost straight, ovipositor sheaths projecting beyond apex of Gt₇.

Colour. Body with weak golden-green tinges, scape yellowish-brown, pedicel and flagellum dark brown, tegulae dark brown, wings hyaline with veins yellowish-brown, coxae concolorous with body, trochanters and femora dark brown, tibiae and tarsi yellowish-brown.

MALE. Unknown.



Figure 64.

Tetrastichus fadus sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Diagnosis

Gaster elongate-acuminate, length/width 2.4, lengths gaster/head+mesosoma 1.3, Gt₇ length/width 1.2; antennal clava 1.0× as long as F2+F3 and with distinct constriction between C1 and C2.

Distribution

Russia.

Host: Unknown.

Notes

Holotype deposited in MZLU.

Tetrastichus gredius, sp. n.

- ZooBank [urn:lsid:zoobank.org:act:BD8FE3EA-DB41-47AA-8FD2-FF60EF3DDF9A](http://urnlsidzoobank.orgactBD8FE3EA-DB41-47AA-8FD2-FF60EF3DDF9A)

Materials

Holotype:

- a. scientificName: *Tetrastichus gredius*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.0501; decimalLongitude: 12.915; individualID: BC-ZSM-HYM-26563-D08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-D08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-D08; recordNumber: BC-ZSM-HYM-26563-D08; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus gredius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.533; decimalLongitude: 12.917; individualID: BC-ZSM-HYM-20721-F06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F06; recordNumber: BC-ZSM-HYM-20721-F06; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 65). Body length 2.6 mm. *Head*. Width/length in dorsal view 2.2, width/length in frontal view 1.2, POL/OOL 1.8, widths head/mesosoma 1.1, mouth width/malar space 1.3, malar space/eye height 0.7. *Antenna*. Scape length/eye height 0.8, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.1, 2.0, 2.0, clava length/width 3.1, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.6, 0.6, 0.6, widths F1/pedicel (dorsal view) 1.4, lengths antennal spicule/C3 0.2. *Mesosoma*. Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a complete median groove, with five adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.5, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.1, distance between SMG/distance between SMG and SLG 1.9, lengths dorsellum/propodeum (measured medially) 0.6, propodeal callus with five setae. *Fore wing*. Costal cell length/width 8.2, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.3. *Gaster*. Elongate-acuminate, length/width 2.4, lengths gaster/head+mesosoma 1.3, Gt₇ length/width 1.2, length of longest cercal seta/next longest seta 1.7, longest cercal seta straight, ovipositor sheaths projecting beyond apex of Gt₇.



Figure 65.

Tetrastichus gredius sp. n.

- a: Holotype female, lateral. [doi](#)
b: Holotype female, dorsal. [doi](#)

Colour. Body with weak golden-green tinges, entire antenna dark brown, tegulae black, wings hyaline with venation yellowish-white, coxae and femora concolorous with body,

trochanters black, fore and hind tibia brownish, mid tibia dark brown, tarsi yellowish-brown.

MALE. Unknown.

Diagnosis

Mouth opening $1.3\times$ ($1.27\times$) malar space; scape dark brown; gaster elongate-acuminate, length/width 2.4, lengths gaster/head+mesosoma 1.3, Gt₇ length/width 1.2.

Distribution

Sweden.

Host: Unknown.

Notes

Holotype deposited in MZLU, paratype in MZLU.

Tetrastichus halidayi (Graham, 1961)

Nomenclature

Aprostocetus halidayi Graham 1961:5–8. Holotype ♀ in OUMNH, examined (Fig. 66). Transferred to *Tetrastichus* by Domenichini 1966:94.

Description

See Graham (1961).

Diagnosis

Mouth opening very wide, $2.0\text{--}2.2\times$ malar space; mandibles very large, with outer tooth falcate and separated by a wide gap from the two small inner teeth, which are subacute and closely approximated; female gaster relatively long, $1.8\times$ as long as wide with ovipositor sheaths protruding beyond apex of Gt₇.

Distribution

(Former) Czechoslovakia, Germany, Ireland, Norway, Sweden, United Kingdom (Graham 1961), Russia and Switzerland (**new records**).

Host: *Agropus ahrensi* Germar (Coleoptera: Chrysomelidae) (Graham 1991).

Material examined: Type material: holotype ♀ (OUMNH). Additional material (219♀ 57♂): Germany 2♂ (UCRC), Russia 8♀ (MZLU), Sweden 197♀ 51♂ (MZLU, NHM, NHRs, ZSM), Switzerland 1♀ (ZSM), United Kingdom 13♀ 4♂ (NHM).



Figure 66.

Tetrastichus halidayi (Graham)

a: Holotype female, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype female, head frontal. [doi](#)

e: Nontype male, head and antenna lateral. [doi](#)

Tetrastichus heeringi* Delucchi, 1954*Nomenclature**

Tetrastichus heeringi Delucchi 1954:99–101. Lectotype ♀ in ETHZ, designated by Baur 2001, not examined.

Description

See Graham (1991) and Fig. 67.



Figure 67.

Tetrastichus heeringi Delucchi

a: Nontype female, lateral. [doi](#)

b: Nontype female, dorsal. [doi](#)

c: Nontype male, head and antenna lateral. [doi](#)

Diagnosis

Diagnosis. Female antenna with F1 3.0–3.2× as long as wide and 0.7–0.8× length of clava, the latter 0.8–0.9× as long as F2+F3, F1 about as wide as width of pedicel; male antenna with whorled setae of funiculars reaching beyond the tips of funicular attached to, scape 2.4–2.6× as long as wide; female gaster 1.8–1.9× as long as wide.

Distribution

Bulgaria, (former) Czechoslovakia, France, Germany, Hungary, Italy (Graham 1991), Sweden (Hedqvist 2003) and Finland (**new record**).

Host: *Agrilus aurichalceus* Redtenbacher, *A. integerimus* Ratzeburg, *A. viridis* (L.) (Coleoptera: Buprestidae) (Graham 1991).

Material examined

Non-type material (15♀ 4♂): Finland 5♀ 2♂ (NHM), France 3♀ (GD, NHM), Sweden 7♀ 2♂ (NHM). Fig.

Tetrastichus heterus Graham, 1991

Nomenclature

Tetrastichus heterus Graham 1991:247–248. Holotype ♀ in NHM, examined (Fig. 68).



Figure 68.

Tetrastichus heterus Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991).

Diagnosis

Antennal clava 0.8× as long as F2+F3; gaster 2.3× as long as wide, as long as head+mesosoma.

Distribution

Montenegro (Graham 1991).

Host: Unknown.

Material examined

Type material: holotype ♀ (NHM, type no. 5.3619).

Tetrastichus ilithyia (Walker, 1839)

Nomenclature

Cirrospilus Ilithyia Walker 1839b:355. Lectotype ♀ in NHM, designated by Graham 1961:38, examined (Fig. 69). Transferred to *Tetrastichus* by Walker 1846:74, to *Aprostocetus* by Graham 1961:38 and back to *Tetrastichus* by Domenichini 1966:91.

Description

See Graham (1991).

Diagnosis

Female with antennal spicule 0.5× as long as C3 and scape longer than eye; mouth opening 1.14× malar space in both sexes.

Distribution

(Former) Czechoslovakia, Germany, Ireland, United Kingdom (Graham 1991), Sweden (Hedqvist 2003) and Russia (**new record**).

Host: Unknown.

Material examined: Type material: lectotype ♀ of *C. Ilithyia* (NHM type no. 5.1940). Additional material (10♀ 3♂): Russia 5♀ 3♂ (MZLU, ZSM), United Kingdom 5♀ (NHM).



Figure 69.

Tetrastichus ilithyia (Walker)

a: Lectotype female, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype female, head and antenna lateral. [doi](#)

e: Nontype male, head and antenna lateral. [doi](#)

***Tetrastichus inscitus*, sp. n.**

- ZooBank <urn:lsid:zoobank.org:act:F0E8692D-E47A-4145-99BD-31D7F2928D7C>

Materials**Holotype:**

- a. scientificName: *Tetrastichus inscitus*; taxonRemarks: Holotype deposited in MZLU; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.5; individualID: BC-ZSM-HYM-20721-F11; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F11; recordNumber: BC-ZSM-HYM-20721-F11; recordedBy: C. Hansson; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7047; decimalLongitude: 13.191; individualID: BC-ZSM-HYM-29813-B12; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-B12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-B12; recordNumber: BC-ZSM-HYM-29813-B12; recordedBy: A. Sundholm; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.378; decimalLongitude: 16.592; individualID: BC-ZSM-HYM-22523-A05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-A05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-A05; recordNumber: BC-ZSM-HYM-22523-A05; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6664; decimalLongitude: 13.6242; individualID: BC-ZSM-HYM-26563-A09; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-26563-A09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-26563-A09; recordNumber: BC-ZSM-HYM-26563-A09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 56.676; decimalLongitude: 16.558; individualID: BC-ZSM-HYM-27769-E08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27769-E08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27769-E08; recordNumber: BC-ZSM-HYM-27769-E08; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

- e. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 57.322; decimalLongitude: 18.203; individualID: BC-ZSM-HYM-22523-C09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-C09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-C09; recordNumber: BC-ZSM-HYM-22523-C09; recordedBy: Swedish Malaise Trap Project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-H09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-H09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-H09; recordNumber: BC-ZSM-HYM-20721-H09; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-F01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-F01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-F01; recordNumber: BC-ZSM-HYM-20721-F01; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 59.767; decimalLongitude: 13.467; individualID: BC-ZSM-HYM-13565-C06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-13565-C06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-13565-C06; recordNumber: BC-ZSM-HYM-13565-C06; recordedBy: SMTP project; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.15; individualID: BC-ZSM-HYM-20721-D04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-D04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-D04; recordNumber: BC-ZSM-HYM-20721-D04; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.15; individualID: BC-ZSM-HYM-20721-D03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-D03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-D03; recordNumber: BC-ZSM-HYM-20721-D03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.15; individualID: BC-ZSM-HYM-20721-D01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-D01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?

- [ids=BC-ZSM-HYM-20721-D01](#); recordNumber: BC-ZSM-HYM-20721-D01; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: United Kingdom; decimalLatitude: 51.4114; decimalLongitude: 0.0358; individualID: BC-ZSM-HYM-27770-H09; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-H09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-H09; recordNumber: BC-ZSM-HYM-27760-H09; recordedBy: A.C.Galsworthy; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - m. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.7; decimalLongitude: 13.45; individualID: BC-ZSM-HYM-20721-H10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-20721-H10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-20721-H10; recordNumber: BC-ZSM-HYM-20721-H10; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - n. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 55.6928; decimalLongitude: 13.1678; individualID: BC-ZSM-HYM-25460-B03; individualCount: 1; sex: male; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25460-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25460-B03; recordNumber: BC-ZSM-HYM-25460-B03; recordedBy: C. Hansson; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - o. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Sweden; decimalLatitude: 58.339; decimalLongitude: 11.151; individualID: BC-ZSM-HYM-27493-G01; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27493-G01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27493-G01; recordNumber: BC-ZSM-HYM-27493-G01; recordedBy: SMTP; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
 - p. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Örebro; decimalLatitude: 59.2753; decimalLongitude: 15.2134; individualID: BC-ZSM-HYM-29813-B07; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-B07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-D06|BC-ZSM-HYM-29813-B07; recordNumber: BC-ZSM-HYM-29813-B07; recordedBy: A.Jansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-B07+1516986268.jpg>; identifiedBy: Christer Hansson
 - q. scientificName: *Tetrastichus inscitus*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Roleks; decimalLatitude: 57.5391; decimalLongitude: 18.3498; individualID: BC-ZSM-HYM-29813-D06; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-29813-D06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-D06|BC-ZSM-HYM-29813-B07; recordNumber: BC-ZSM-HYM-29813-D06; recordedBy: SMTP; associatedMedia: <http://>

www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-29813-D06+1516986282.jpg;
identifiedBy: Christer Hansson

Description

FEMALE holotype (Fig. 70). Body length 2.0 mm (paratypes 1.6–2.2 mm). *Head*. Width/length in dorsal view 2.0, width/length in frontal view 1.4, POL/OOL 1.6, widths head/mesosoma 1.2, mouth width/malar space 1.6, malar space/eye height 0.7. *Antenna*. Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3 2.0, 1.7, 1.7, clava length/width 3.6, lengths pedicel/F1 0.8, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.5, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with a median groove in posterior ½, with 3+4 adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 2.5, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum (measured medially) 0.5, propodeal callus with five setae. *Fore wing*. Costal cell length/width 11.7, lengths costal cell/marginal vein 1.0, lengths marginal/stigmal veins 3.2. *Gaster*. Ovate, length/width 1.6, lengths gaster/mesosoma 1.3, Gt₇ length/width 0.6, length of longest cercal seta/next longest seta nm, longest cercal seta sinuate, ovipositor sheaths reach apex of Gt₇, but not beyond.

Colour. Body metallic bluish, entire antenna dark brown, tegulae dark brown, wings hyaline with venation dark yellowish-brown, coxae and femora concolorous with body, trochanters black, fore tibia dark yellowish-brown, mid and hind tibiae dark brown, fore tarsus dark brown, mid and hind tarsi dark yellowish-brown with T4 darkest.

MALE. Body length 1.4–1.6 mm. *Head*. Width/length in dorsal view 2.2, width/length in frontal view 1.2, eye height/malar space 1.5, mouth width/malar space 1.1, widths head/mesosoma 1.2. *Antenna*. F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, whorled setae on F1 1.2× as long as F1 length, scape length/eye height 1.2, scape length/width 2.8, ventral plaque placed centrally, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.8, length/width F1, F2, F3, F4 1.8, 1.8, 2.0, 1.8, clava length/width 4.0, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.8, F1/F4 0.9, lengths F1, F2, F3 F4 /clava 0.4, 0.5, 0.5, 0.5.

Colour. As in female.

Diagnosis

Very similar to *T. julis*, female differs morphologically as indicated in the key.

Distribution

Sweden and United Kingdom.



Figure 70.

Tetrastichus inscitus sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Paratype male, head and antenna lateral [doi](#)

Host: Unknown.

Notes

Holotype deposited in MZLU, paratypes in MZLU, NHM, SMTP and ZSM.

Tetrastichus julis (Walker, 1839)

Nomenclature

Cirrospilus Julis Walker 1839b:354. Lectotype ♂ in NHM, designated by Graham 1961:38, examined (Fig. 71). Combined to *Aprostocetus* by Graham 1961:38 and to *Tetrastichus* by Domenichini 1966:90.

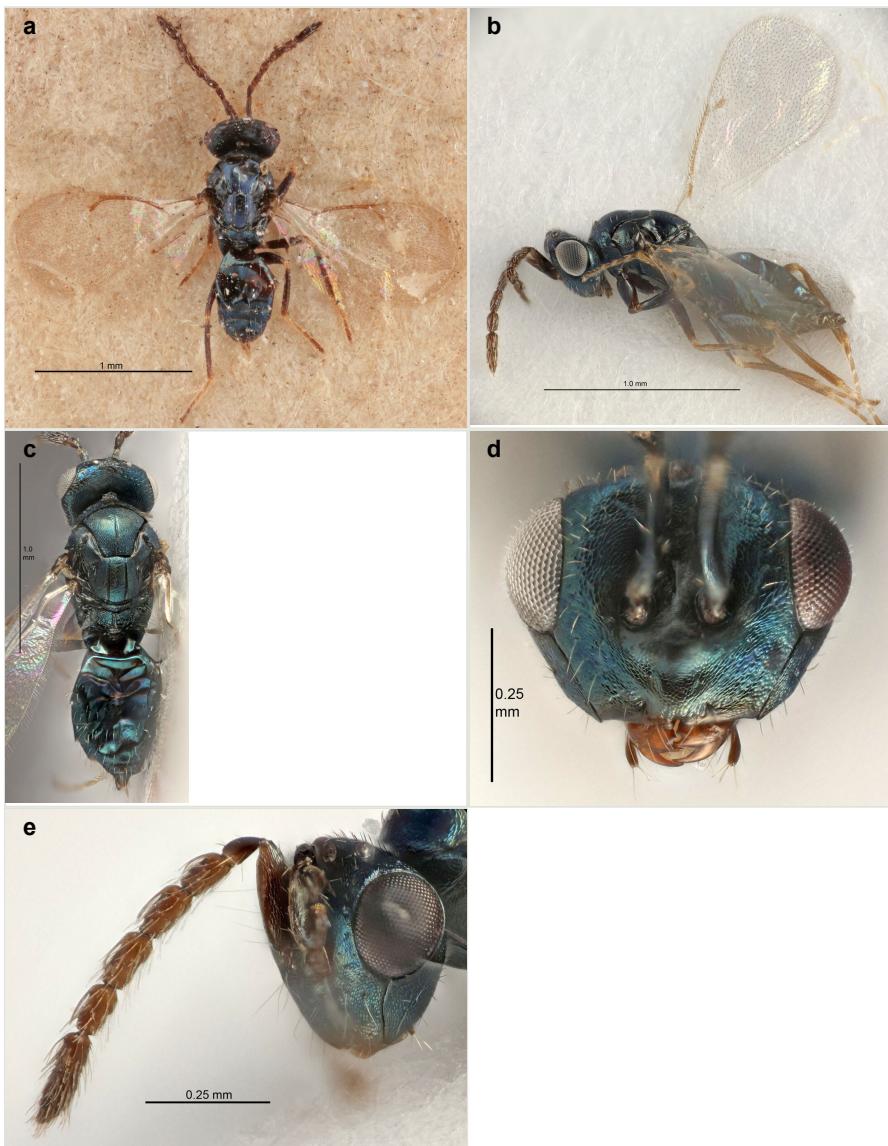


Figure 71.

Tetrastichus julis (Walker)

a: Lectotype male, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype female, head and antenna lateral. [doi](#)

e: Nontype male, head and antenna lateral. [doi](#)

Tetrastichus Maderae Walker 1872:128. Lectotype ♀ in NHM, designated by Graham 1961:40, examined. Synonymised with *T. julis* by Graham 1991:235.

Description

See Graham (1991).

Diagnosis

Mouth opening 1.4–1.6× malar space; more???

Distribution

France, Germany, Poland, Portugal (Madeira), Romania, Sweden, United Kingdom (Graham 1991), Austria and Russia (**new records**).

Host: *Lema* (*Oulema*) spp. (Coleoptera: Chrysomelidae), gregarious endoparasitoid of host larva (Graham 1991).

Material examined: Type material: lectotypes ♂ of *C. julis* (NHM, type no. 5.1941), and ♀ of *T. maderae* (NHM, type no. 5.1370). Additional material (18♀ 8♂): Austria 1♀ (UCRC), France 1♀ (G), Germany 2♀ (MZLU), Russia 1♀ (UCRC), Sweden 13♀ 8♂ (MZLU, SMTP, ZSM).

Tetrastichus lanius, sp. n.

- ZooBank urn:lsid:zoobank.org:act:C5A5DCE4-E547-4ADC-AAD4-00305DEDCCB0

Materials

Holotype:

- a. scientificName: *Tetrastichus lanius*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.985; decimalLongitude: 27.585; individualID: BC-ZSM-HYM-27768-D02; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D02; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D02; recordNumber: BC-ZSM-HYM-27768-D02; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus lanius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.045; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-22523-G05; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-22523-G05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-22523-G05; recordNumber: BC-ZSM-HYM-22523-G05; recordedBy: O.Popovici; type: PhysicalObject; language: en; institutionCode: MZLU; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus lanius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.985; decimalLongitude: 27.585; individualID: BC-ZSM-HYM-27768-

- D06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D06; recordNumber: BC-ZSM-HYM-27768-D06; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus lanius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: France; decimalLatitude: 44.4064; decimalLongitude: 1.49961; individualID: BC-ZSM-HYM-29813-E03; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-29813-E03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-29813-E03; recordNumber: BC-ZSM-HYM-29813-E03; recordedBy: H.Tussac; type: PhysicalObject; language: en; institutionCode: GD; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus lanius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-A08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-A08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-A08; recordNumber: BC-ZSM-HYM-27768-A08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 72). Body length 2.2 mm (paratypes 2.0–2.4 mm). *Head*. Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 1.9, widths head/mesosoma 1.2, mouth width/malar space 1.5, malar space/eye height 0.6. *Antenna*. Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3 2.3, 2.1, 1.8, clava length/width 3.8, lengths pedicel/F1 0.6, lengths F1/F2 1.1, F1/F3 1.2, lengths F1, F2, F3/clava 0.6, 0.5, 0.5, widths F1/pedicel (dorsal view) 1.3, lengths antennal spicule/C3 0.3. *Mesosoma*. Length/width 1.2, mesoscutal mid-lobe length/width (width measured in anterior part) 1.0, mid-lobe with complete median groove, with six adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.2, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.7, lengths dorsellum/propodeum 0.5, propodeum with strong reticulation, propodeal callus with six setae. *Fore wing*. Costal cell length/width 10.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 3.0. *Gaster*. Elongate-acuminata, length/width 1.7, lengths gaster/head+mesosoma 0.8, Gt₇ length/width 0.6, length of longest cercal seta/to next longest seta 1.8, longest cercal seta almost straight, ovipositor sheaths reach slightly beyond apex of Gt₇.

Colour. Body with weak metallic blue tinges, entire antenna dark brown, tegulae black, wings hyaline with veins yellowish-brown, coxae and femora concolorous with body, trochanters black, tibiae and tarsi yellowish-brown.

MALE. Unknown.



Figure 72.

Tetrastichus lanius sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Diagnosis

Mouth opening 1.4–1.5× malar space; scape 0.9× as long as eye. Similar to *T. crioceridis*, differs only in having F2 and antennal clava longer.

Distribution

France and Romania.

Host: Unknown.

Notes

Holotype deposited in NHM, paratypes in MZLU, NHM, GD.

Tetrastichus legionarius Giraud, 1863

Nomenclature

Tetrastichus legionarius Giraud 1863:1273. Lectotype ♀ in NMW, designated by Domenichini 1966:95, not examined. Transferred to *Aprostocetus* by Graham 1961:38-39 and back to *Tetrastichus* by Domenichini 1966:95. Fig. 73

Description

See Graham (1991).

Diagnosis

Female gaster very long, 2.6–3.3× as long as wide, with Gt₇ 1.5–1.9× as long as wide; female antenna with funiculars elongate, F1 4.1–4.3×, F2 3.2–3.9×, F3 2.8–3.1× as long as wide; male scape with ventral plaque 0.6–0.7× length of scape, whorled setae

of funiculars not reaching to the tips of funiculars attached to; eye height 1.0× malar space in both sexes; both sexes with relatively bright metallic blue colour.

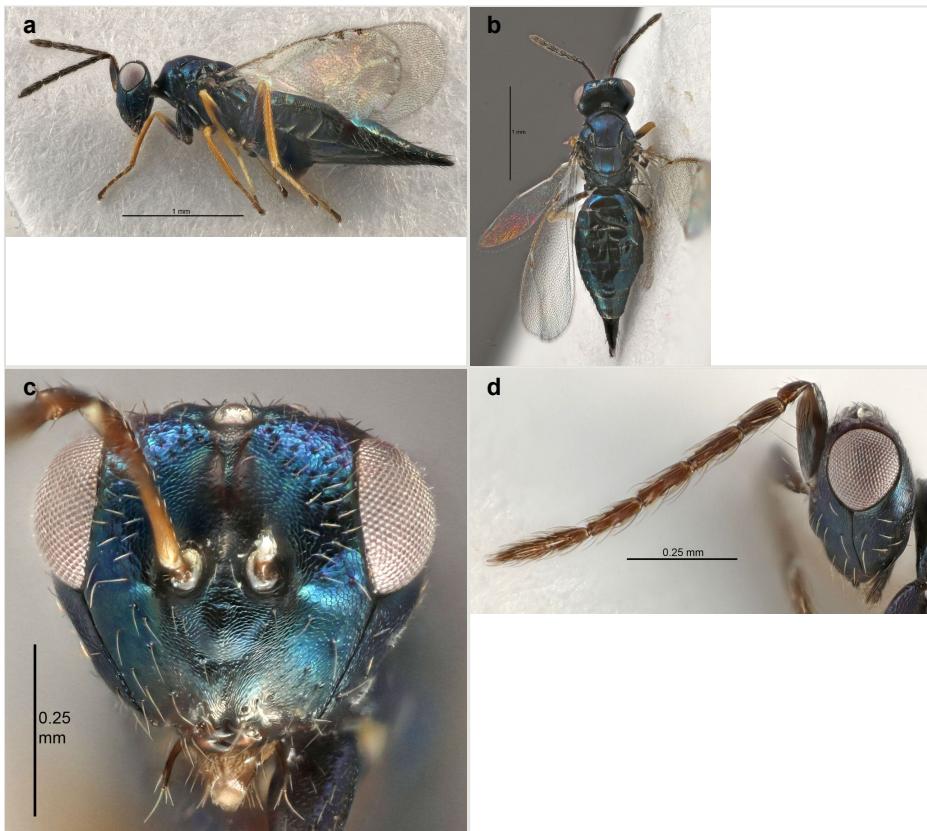


Figure 73.

Tetrastichus legionarius Giraud

a: Nontype female, lateral. [doi](#)

b: Nontype female, dorsal. [doi](#)

c: Nontype female, head frontal. [doi](#)

d: Nontype male, head and antenna lateral. [doi](#)

Distribution

Austria, (former) Czechoslovakia, France, Hungary, Italy, The Netherlands, Spain (Graham 1991), Sweden and United Kingdom (**new records**).

Host: Gregarious endoparasitoid of larvae and pupae of *Lipara lucens* Meigen (Diptera: Chloropidae) (Graham 1991).

Material examined: Non-type material (95♀ 17♂): Austria 1♀ (UCRC), France 16♀ 2♂ (GD, MZLU, NHM), Sweden 69♀ 15♂ (NHM, MZLU, ZSM), United Kingdom 9♀ (NHM).

Tetrastichus leionotus Graham, 1991

Nomenclature

Tetrastichus leionotus Graham 1991:231–232. Holotype ♀ in NHM, examined (Fig. 74).

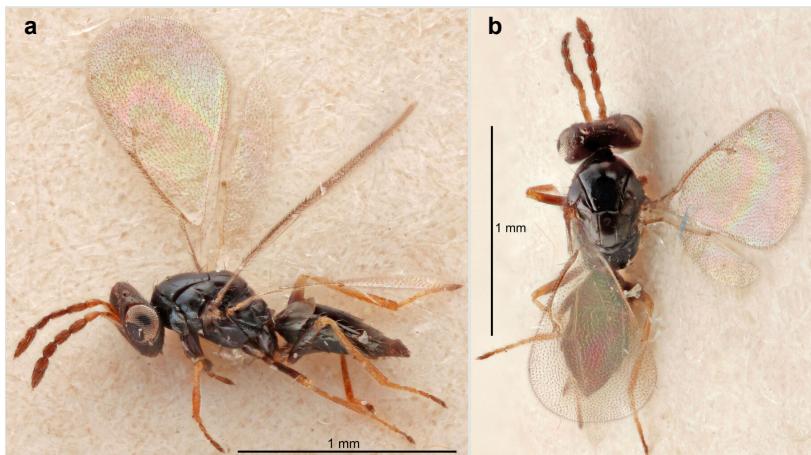


Figure 74.

Tetrastichus leionotus Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991). Male is unknown.

Diagnosis

Antenna with scape and pedicel yellowish-brown; frons with a median longitudinal carina that reaches above the middle of frons (as in Fig. 3b); thoracic dorsum strongly shiny with very weak reticulation; propodeal plicae missing in anterior half.

Distribution

France (Graham 1991).

Host: Unknown.

Material examined: Holotype ♀ (NHM, type no. 5.3612).

Tetrastichus leocrates (Walker, 1839)

Nomenclature

Cirrospilus Leocrates Walker 1839a:319. Lectotype ♂ in NHM, designated by Graham 1961:38, examined (Fig. 75). Transferred to *Tetrastichus* by Walker 1848:150, to *Aprostocetus* by Graham 1961:38 and back to *Tetrastichus* by Domenichini 1966:90.

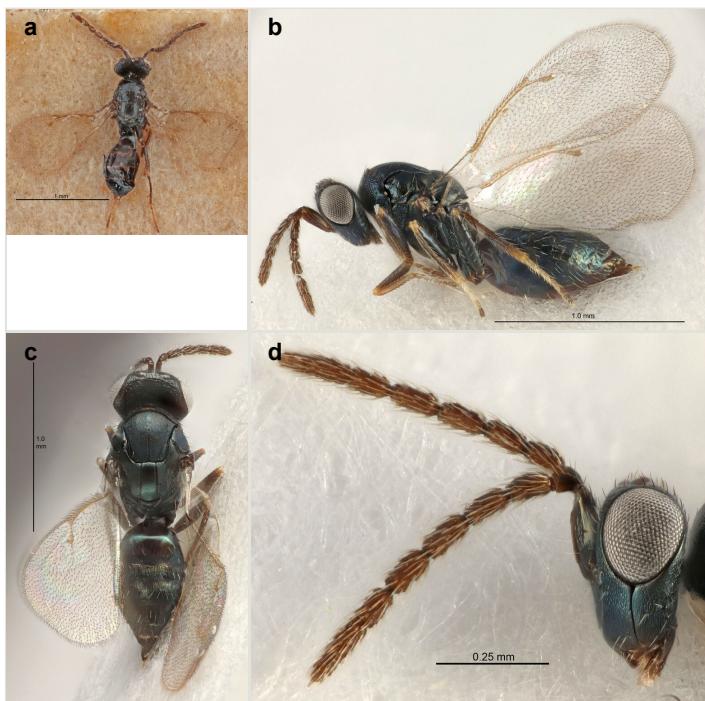


Figure 75.

Tetrastichus leocrates (Walker)

a: Lectotype male, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype male, head and antenna lateral. [doi](#)

Description

See Graham (1991).

Diagnosis

The female is similar to the female of *T. miser* and difficult to separate by morphology; male antenna is without whorls of setae on F1–F4, which separates it from males of the very similar *T. miser*, in which males have these whorls.

Distribution

Denmark, Finland, France, Italy, Spain, United Kingdom (Graham 1991) and Sweden (Hedqvist 2003).

Host: *Rhynchaenus alni* (L.) (Graham 1991), *R. testaceus* (Müller) (**new record**) (Coleoptera: Curculionidae).

Material examined: Type material: lectotype ♀ of *C. leocrates* (NHM, type no. 5.1938). Additional material: Sweden 19♀ 21♂ (NHM, MZLU, SMTP, ZSM).

Tetrastichus leptosoma Graham, 1991

Nomenclature

Tetrastichus leptosoma Graham 1991:253. Holotype ♀ in NHM, examined (Fig. 76).

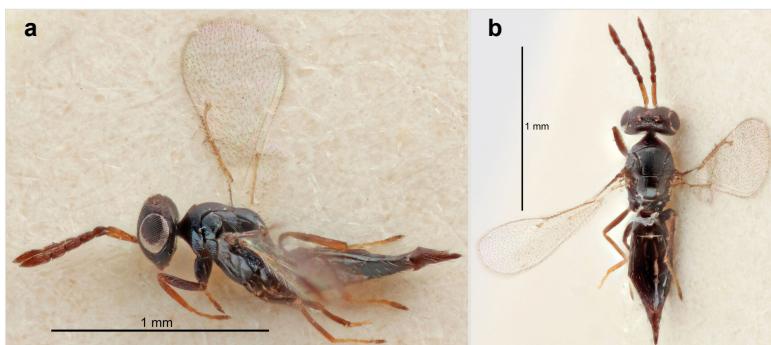


Figure 76.

Tetrastichus leptosoma Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991). Male is unknown.

Diagnosis

Female antenna with sensilla on F1–F3 sparse, in one (sometimes irregular) row on each funicular; clava without a constriction between C1 and C2.

Distribution

(Former) Czechoslovakia, France (Graham 1991).

Host: Unknown.

Material examined: Holotype ♀ of *T. leptosoma* (NHM, type no. 5.3622).

Tetrastichus lyridice (Walker, 1839)

Nomenclature

Cirrospilus Lyridice Walker 1839a:307. Lectotype ♀ in NHM, designated by Graham 1961:38, examined (Fig. 77). Transferred to *Tetrastichus* by Walker 1848:149, to *Aprostocetus* by Graham 1961:38 and back to *Tetrastichus* by Domenichini 1966:90.

Description

See Graham (1991).

Diagnosis

Female antenna with pedicel+flagellum 1.3–1.4× width of mesoscutum, setae of flagellum long and standing out at a greater angle, clava with a distinct constriction between C1 and C2 and 0.9× as long as F2+F3; male scape with short ventral plaque, 0.5× as long as length of scape.

Distribution

The Netherlands, United Kingdom (Graham 1991), Sweden (Hedqvist 2003), France and Romania (**new records**).

Host: *Plagiодera versicolora* (Laicharting) (Coleoptera: Chrysomelidae). This record is doubtful, needs checking (Graham 1991).

Material examined: Type material: lectotype ♀ of *C. lyridice* (NHM, type no. 5.1939). Additional material (45♀ 5♂): France 2♀ (NHM), Romania 2♀ (NHM), Sweden 37♀ 5♂ (NHM, MZLU, ZSM), United Kingdom 4♀ (NHM).

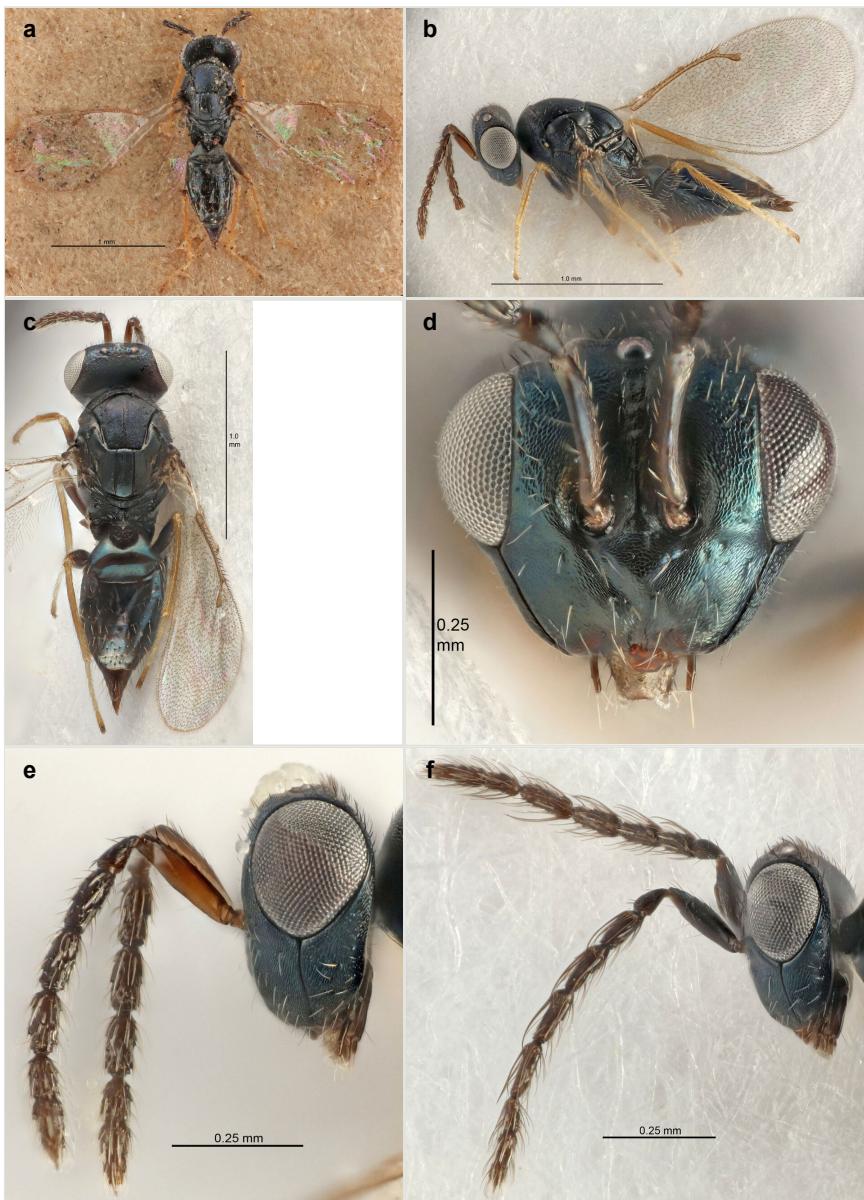


Figure 77.

Tetrastichus lyridice (Walker)

a: Lectotype female, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype female, head frontal. [doi](#)

e: Nontype female, head and antenna lateral. [doi](#)

f: Nontype male, head and antenna lateral. [doi](#)

Tetrastichus macrops (Graham, 1961)

Nomenclature

Aprostocetus macrops Graham 1961:9–10. Holotype ♀ in OUMNH, examined (Fig. 78). Transferred to *Tetrastichus* by Domenichini 1966:94.

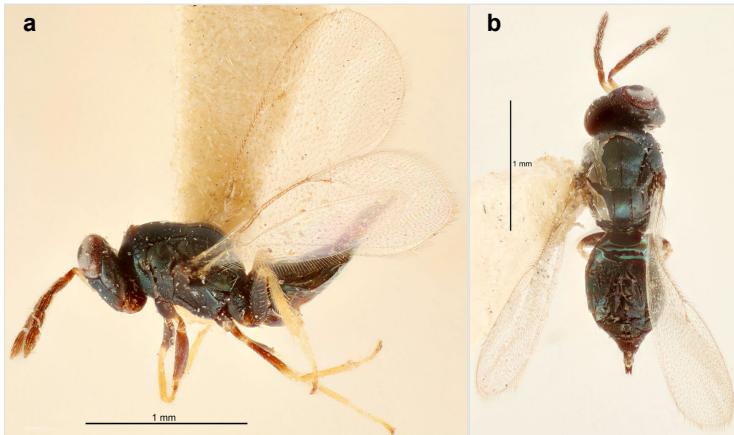


Figure 78.

Tetrastichus macrops (Graham)

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1961), Graham (1991). The male is unknown.

Diagnosis

Eyes relatively large, separated by a distance of 1.1–1.3× the length of an eye and with narrow temples; antenna with clava 0.7–0.9× as long as F2+F3.

Distribution

The Netherlands and United Kingdom (Graham 1991).

Host: Probably *Cis* spp. (Coleoptera: Cisiidae) in Polyporaceae (Graham 1991).

Material examined: Type material: holotype ♀ of *A. macrops* (OUMNH). Additional material (2♀): United Kingdom 2♀ (NHM).

Tetrastichus melasomae Graham, 1991**Nomenclature**

Tetrastichus melasomae Graham 1991:267. Holotype ♀ in NHM, examined (Fig. 79).

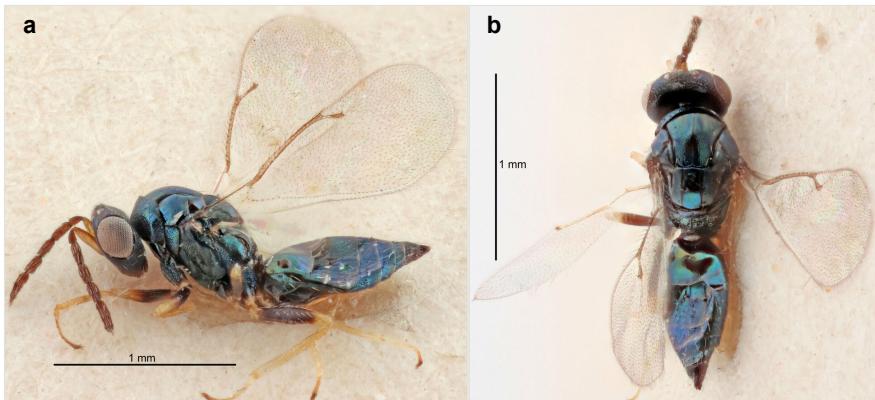


Figure 79.

Tetrastichus melasomae Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991). Male is unknown.

Diagnosis

Fore wing with costal cell very narrow, 13–17× as long as broad; antenna with claval spine about 0.5× length of C3; scape yellow; body bright green to blue.

Distribution

(Former) Czechoslovakia (Graham 1991) and Sweden (Hedqvist 2003).

Host: *Chrysomela vigintipunctata* (Scopoli) (Coleoptera: Chrysomelidae) (Graham 1991).

Material examined: Holotype ♀ of *T. melasomae* (NHM, type no. 5.3630).

Tetrastichus minius, sp. n.

- ZooBank <urn:lsid:zoobank.org:act:4EA5E6D5-D906-428F-8729-2B49B1943754>

Materials

Holotype:

- a. scientificName: *Tetrastichus minius*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-A10; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-A10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-A10; recordNumber: BC-ZSM-HYM-27768-A10; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus minius*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 47.011; decimalLongitude: 27.603; individualID: BC-ZSM-HYM-27768-B08; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-B08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-B08; recordNumber: BC-ZSM-HYM-27768-B08; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 80). Body length 1.4 mm (paratype 1.3 mm). **Head.** Width/length in dorsal view 2.2, width/length in frontal view 1.3, POL/OOL 1.7, widths head/mesosoma 1.2, mouth width/malar space 1.4, malar space/eye height 0.7. **Antenna.** Scape length/eye height 1.0, pedicel+flagellum length/mesosoma width 1.2, length/width F1, F2, F3 1.4, 1.1, 1.1, clava length/width 2.2, lengths pedicel/F1 0.9, lengths F1/F2 1.1, F1/F3 1.1, lengths F1, F2, F3/clava 0.4, 0.4, 0.4, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.3, mesoscutal mid-lobe length/width 0.9 (width measured in anterior part), mid-lobe with a weak median groove in posterior ½, with three adnotaular setae on either side, length of mesoscutum/mesoscutellum (measured medially) 1.3, lengths dorsellum/propodeum 0.4, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.3, distance between SMG/distance between SMG and SLG 1.3, propodeum with weak reticulation, propodeal callus with five setae. **Fore wing.** Costal cell length/width 12.5, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 2.9. **Gaster.** Short ovate, length/width shrivelled and difficult to measure, but appears slightly longer than wide, lengths gaster/mesosoma nm, Gt₇ length/width 0.3, length of longest cercal seta/next longest seta 1.7, longest cercal seta sinuate, ovipositor sheaths not reaching apex of Gt₇.



Figure 80.

Tetrastichus minius sp. n.a: Holotype female, lateral. [doi](#)b: Holotype female, dorsal. [doi](#)

Colour. Body dark brown to black, partly with weak metallic tinges, antenna dark brown, tegulae black with metallic tinges, wings hyaline with venation dark yellowish-brown, coxae, trochanters and femora concolorous with body, tibiae and tarsi dark yellowish-brown.

MALE. Unknown.

Diagnosis

Mouth opening 1.4× malar space; female flagellum short, for example, F3 1.1× as long as wide and clava 2.2× as long as wide; body dark brown black with metallic tinges. Similar to *T. polyporinus*, see key for characters to separate.

Distribution

Romania.

Host: Unknown.

Notes

Holotype deposited in NHM, paratype in NHM.

Tetrastichus miser (Nees, 1834)

Nomenclature

Eulophus miser Nees von Esenbeck 1834:173. Neotype ♀ in NHM, designated by Graham 1991:257, examined (Fig. 81). Transferred to *Tetrastichus* by Walker 1848:145, to *Aprostocetus* by Graham 1961:37 and back to *Tetrastichus* by Domenichini 1966:93.

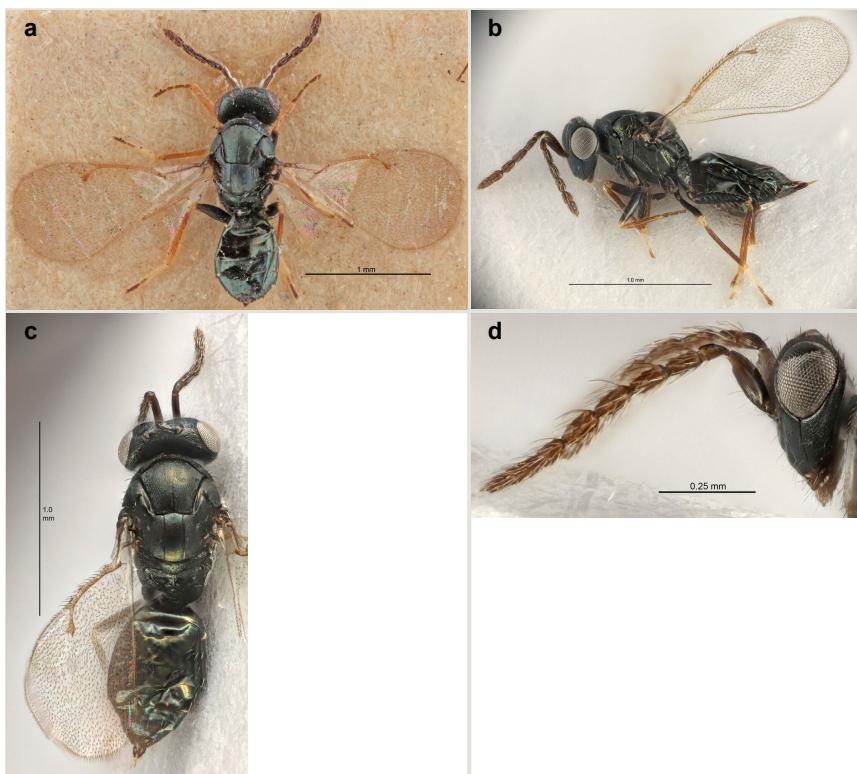


Figure 81.

Tetrastichus miser (Nees)

a: Neotype female, dorsal. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

d: Nontype male, head and antenna lateral. [doi](#)

Cirrospilus Attalus Walker 1839b:353. Lectotype ♀ in NHM, designated by Graham 1961:37, examined. Synonymised by Walker 1848:145.

Entedon medianus Ratzeburg 1848:169. Lectotype ♂ in NMW, designated by Graham 1991:257, not examined. Synonymised by Domenichini 1966:93.

Description

See Graham (1991).

Diagnosis

Female with gaster at most 1.6× as long as wide and with Gt₇ transverse; male with whorled setae on F1–F4 at most reaching to apex of funicular attached to, or slightly beyond apex. See key for delimitation from similar species.

Distribution

Austria, (former) Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Ireland, The Netherlands, Spain, Sweden, United Kingdom and (former) Yugoslavia (Graham 1991).

Host: *Rhynchaenus alni* (L.), *R. fagi* (L.), *R. pilosus* (F.), *R. quercus* (F.), *R. salicis* (L.), *Ramphus oxyacantheae* (Marsham) (Coleoptera: Curculionidae) (Graham 1991).

Material examined: Type material: neotype ♀ of *E. miser* (NHM, type no. 5.1933), lectotype of *C. Attalus* (NHM, type no. 5.1933). Additional material: Sweden 124♀ 13♂ (NHM, MZLU, ZSM), of which 12♀ 6♂ were reared from *Ramphus oxyacantheae*.

Tetrastichus nataliedaleskeyae, sp. n.

- ZooBank urn:lsid:zoobank.org:act:87DB0533-3BE8-4712-89B2-30655FB2CA03

Materials

Holotype:

- a. scientificName: *Tetrastichus nataliedaleskeyae*; taxonRemarks: Holotype deposited in NHM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Romania; decimalLatitude: 46.985; decimalLongitude: 27.585; individualID: BC-ZSM-HYM-27768-D04; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27768-D04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27768-D04; recordNumber: BC-ZSM-HYM-27768-D04; recordedBy: J.S. Noyes; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Paratype:

- a. scientificName: *Tetrastichus nataliedaleskeyae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: United Kingdom; decimalLatitude: 51.4669; decimalLongitude: 0.2358; individualID: BC-ZSM-HYM-27770-H06; individualCount: 1; sex: female; lifeStage: adult; catalogNumber: BC-ZSM-HYM-27760-H06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-27770-H06; recordNumber: BC-ZSM-HYM-27760-H06; recordedBy: N. Dale-Skey; type: PhysicalObject; language: en; institutionCode: NHM; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 82). Body length 1.7 mm (paratype 1.4–2.0 mm). **Head.** Width/length in dorsal view 2.5, width/length in frontal view 1.3, POL/OOL 2.2, widths head/mesosoma 1.1, mouth width/malar space 1.0, malar space/eye height 0.7. **Antenna.** Scape length/eye height 0.9, pedicel+flagellum length/mesosoma width 1.3, length/width F1, F2, F3 2.3, 2.0, 1.7, clava length/width 3.3, lengths pedicel/F1 0.6, lengths F1/F2 1.0, F1/F3 1.1, lengths F1, F2, F3/clava 0.5, 0.6, 0.5, widths F1/pedicel (dorsal view) 1.1, lengths antennal spicule/C3 0.2. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 1.0 (width measured in anterior part), mid-lobe with a median

groove in posterior $\frac{2}{3}$, with three adnotaular setae on each side, lengths mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 1.0, length/width of enclosed space between submedian grooves 2.4, distance between SMG/distance between SMG and SLG 1.6, lengths dorsellum/propodeum (measured medially) 0.6, propodeal callus with four setae. *Fore wing.* Costal cell length/width 9.0, lengths costal cell/marginal vein 0.9, lengths marginal/stigmal veins 2.8. *Gaster.* Ovate, length/width 1.5, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.5, length of longest cercal seta/next longest seta 1.6, longest cercal seta curved, ovipositor sheaths reach apex of Gt₇, but not beyond.



Figure 82.

Tetrastichus nataliedaleskeyae sp. n.

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Colour. Head and mesosoma with metallic bluish-green tinges, gaster golden-green, entire antenna dark brown, tegulae black, wings hyaline with venation yellowish-white, coxae and femora concolorous with body, trochanters black, tibiae dark yellowish-brown, fore tarsus dark yellowish-brown, mid and hind tarsi yellowish-white with T4 dark brown.

MALE. Unknown.

Diagnosis

Similar to *T. leocrates*, but with gaster and Gt₇ shorter; also similar to *T. sinope*, but with longer distance between submedian grooves on mesoscutellum and to *T. ballotus*, but with shorter antennal clava and shorter marginal vein in fore wing.

Etymology

Named after Natalie Dale-Skey, curator of the Hymenoptera section at the NHM, who collected one type specimen and for having been a great help with logistics at the NHM.

Distribution

Romania and United Kingdom.

Host: Unknown.

Notes

Holotype and parytype deposited in NHM.

Tetrastichus pachycerus Graham, 1991

Nomenclature

Tetrastichus pachycerus Graham 1991:252–253. Holotype ♀ in NHM, examined (Fig. 83).

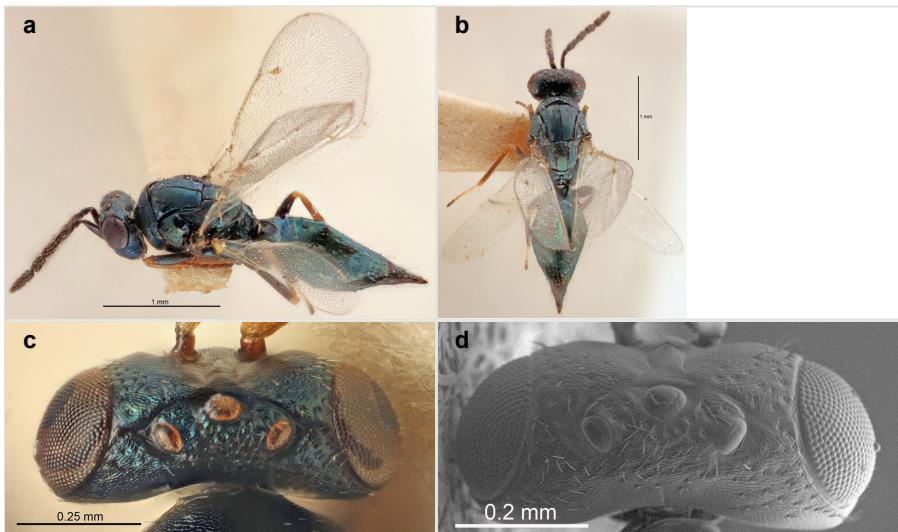


Figure 83.

Tetrastichus pachycerus Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Nontype female, vertex. [doi](#)

d: Nontype female, vertex. [doi](#)

Description

See Graham (1991).

Diagnosis

Ocellar triangle encircled by groove; vertex with numerous piliferous punctures; antennal flagellum stout, distinctly wider than width of pedicel, clava with apex blunt; F1 2.2–2.4× as long as wide; funiculars strongly hairy and with sensilla usually in three rows; large species, 2.4–3.1 mm.

Distribution

(Former) Czechoslovakia, France, United Kingdom (Graham 1991), Norway and Sweden (**new records**).

Host: Unknown.

Material examined

Type material: holotype ♀ of *T. pachycerus* (NHM, type no. 5.3621). Additional material (10♀): France 1♀ (NHM), Norway 2♀ (NHM), Sweden 5♀ (MZLU, NHM, NHRS), United Kingdom 2♀ (NHM).

Tetrastichus paululus Graham, 1991

Nomenclature

Tetrastichus paululus Graham 1991:255–256. Holotype ♀ in NHM, examined (Fig. 84).

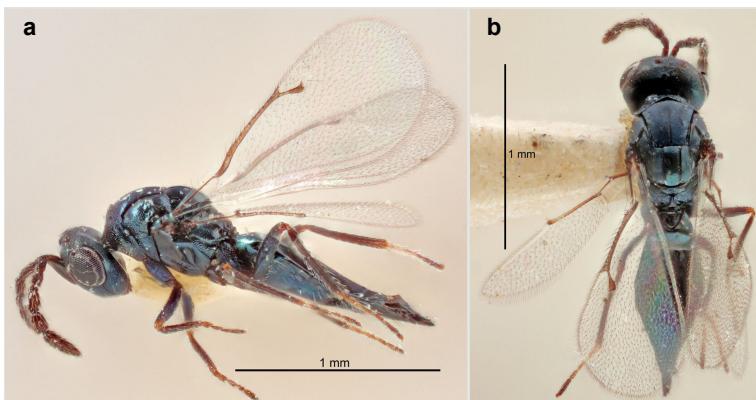


Figure 84.

Tetrastichus paululus Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991). Male is unknown.

Diagnosis

Antennal scape, tibiae and wing veins dark brown to black; gaster lanceolate 2.4–2.9× as long as wide with Gt_7 1.1–1.5× as long as wide.

Distribution

France and United Kingdom (Graham 1991).

Host: Unknown.

Material examined: Holotype ♀ of *T. paululus* (NHM, type no. 5.3623).

Tetrastichus perkinsorum Graham, 1991

Nomenclature

Tetrastichus perkinsorum Graham 1991:234. Holotype ♀ in NHM, examined (Fig. 85).



Figure 85.

Tetrastichus perkinsorum Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991).

Diagnosis

Mouth opening 1.4× malar space; antenna with scape 1.2× as long as an eye, funiculars 1.5–1.6× as long as wide.

Distribution

Sweden (Graham 1991).

Host: Unknown.

Material examined: Holotype ♀ of *T. perkinsorum* (NHM, type no. 5.3624).

Tetrastichus polyporinus Askew, 2007

Nomenclature

Tetrastichus polyporinus Askew 2007:233-234. Holotype ♀ in NHM, examined (Fig. 86).

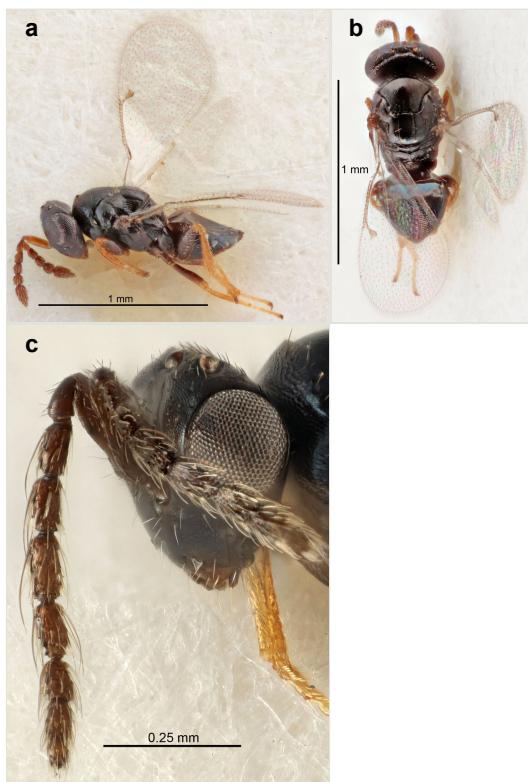


Figure 86.

Tetrastichus polyporinus Askew

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Nontype male, head and antenna lateral. [doi](#)

Description

Female, see Askew (2007).

MALE. Body length 1.7 mm. *Head*. Width/length in dorsal view 2.6, width/length in frontal view 1.4, eye height/malar space 1.5, mouth width/malar space 1.5, widths head/mesosoma 1.1. *Antenna*. F1–F4 with basal whorls of setae, reaching beyond apex of corresponding flagellomere, scape length/eye height 1.0, scape length/width 2.5, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.7, pedicel+flagellum length/mesosoma width 1.5, length/width F1, F2, F3, F4 1.7, 1.9, 2.0, 2.0, clava length/width 4.9, lengths pedicel/F1 0.8, lengths F1/F2 0.9, F1/F3 0.9, F1/F4 0.9, lengths F1, F2, F3, F4/clava 0.4, 0.4, 0.5, 0.5.

Colour. Body with weak metallic blue tinges, entire antenna dark brown, tegulae dark brown, wing venation yellowish-brown to brown, coxae concolorous with body, trochanters and femora dark brown, tibiae and tarsi yellowish-brown.

Diagnosis

Mouth opening 1.3–1.5× malar space; female antenna: flagellum short, for example, F3 at most 1.1× as long as wide, sometimes transverse and clava (incl. spicule) 2.5× as long as wide; male antenna: length of whorled setae on funiculars at least 1.4× the length of funicular attached to; F4 2.0× as long as wide; body black with very weak blue tinges.

Distribution

France, Germany (Askew 2007), Romania and Sweden (**new records**).

Host: Possibly *Dacne* sp. (Askew 2007); *Triplax rufipes* Fabricius and *T. russica* (L.) **new records**. All hosts are Coleoptera: Erotylidae.

Material examined: Type material: holotype ♀ (NHM, type no. 5.4457). Additional material (23♀ 3♂): France 11♀ 3♂ ex *Triplax russica* from *Polyporus* sp. on *Fraxinus* (G), Romania 2♀ (MZLU, NHM), Sweden 10♀ ex *Triplax rufipes* (NHM).

Tetrastichus scardiae, sp. n.

- ZooBank urnlsid:zoobank.org:act:12F1A2BE-914B-4B5B-86EE-18147639557A

Materials

Holotype:

- a. scientificName: *Tetrastichus scardiae*; taxonRemarks: Holotype deposited in ZSM; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B08; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B08; occurrenceDetails: <http://>

www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B08; recordNumber: BC-ZSM-HYM-25461-B08; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; institutionCode: ZSM; basisOfRecord: PreservedSpecimen

Paratypes:

- a. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B12; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B12; recordNumber: BC-ZSM-HYM-25461-B12; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- b. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B11; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B11; recordNumber: BC-ZSM-HYM-25461-B11; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- c. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B07; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B07; recordNumber: BC-ZSM-HYM-25461-B07; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- d. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B05; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B05; recordNumber: BC-ZSM-HYM-25461-B05; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- e. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B04; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B04; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B04; recordNumber: BC-ZSM-HYM-25461-B04; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- f. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B03; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B03; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B03; recordNumber: BC-ZSM-HYM-25461-B03; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- g. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B02; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B02;

- occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B02; recordNumber: BC-ZSM-HYM-25461-B02; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- h. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B01; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B01; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B01; recordNumber: BC-ZSM-HYM-25461-B01; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- i. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A12; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A12; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A12; recordNumber: BC-ZSM-HYM-25461-A12; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- j. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A11; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A11; recordNumber: BC-ZSM-HYM-25461-A11; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- k. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A10; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A10; recordNumber: BC-ZSM-HYM-25461-A10; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- l. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A09; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A09; recordNumber: BC-ZSM-HYM-25461-A09; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- m. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A08; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A08; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A08; recordNumber: BC-ZSM-HYM-25461-A08; recordedBy: H.
- Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- n. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A07; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A07; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A07

- [ZSM-HYM-25461-A07](#); recordNumber: BC-ZSM-HYM-25461-A07; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- o. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A05; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A05; recordNumber: BC-ZSM-HYM-25461-A05; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- p. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B10; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B10; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B10; recordNumber: BC-ZSM-HYM-25461-B10; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- q. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B09; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B09; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B09; recordNumber: BC-ZSM-HYM-25461-B09; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- r. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-B06; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-B06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-B06; recordNumber: BC-ZSM-HYM-25461-B06; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen
- s. scientificName: *Tetrastichus scardiae*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichinae*; country: Finland; decimalLatitude: 62.601; decimalLongitude: 29.759; individualID: BC-ZSM-HYM-25461-A06; individualCount: 1; lifeStage: adult; catalogNumber: BC-ZSM-HYM-25461-A06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-25461-A06; recordNumber: BC-ZSM-HYM-25461-A06; recordedBy: H. Lappalainen; type: PhysicalObject; language: en; basisOfRecord: PreservedSpecimen

Description

FEMALE holotype (Fig. 87). Body length 2.3 mm (paratypes 2.0–2.2 mm). **Head.** Width/length in dorsal view 2.0, width/length in frontal view 1.0, POL/OOL 0.9, widths head/mesosoma 0.9, mouth width/malar space 1.3, malar space/eye height 1.1. **Antenna.** Scape length/eye height 1.1, pedicel+flagellum length/mesosoma width 0.9, length/width F1, F2, F3 1.3, 1.3, 1.5, clava length/width 3.1, lengths pedicel/F1 1.4, lengths F1/F2 0.8, F1/F3 0.7, lengths F1, F2, F3/clava 0.3, 0.4, 0.4, widths F1/pedicel (dorsal view) 0.9, lengths antennal spicule/C3 0.3. **Mesosoma.** Length/width 1.4, mesoscutal mid-lobe length/width 0.8 (width measured in anterior part), mid-lobe with median groove in posterior $\frac{1}{3}$, with four adnotaular setae on each side, lengths

mesoscutum/mesoscutellum (measured medially) 1.3, mesoscutellum length/width 0.8, length/width of enclosed space between submedian grooves 2.6, distance between SMG/distance between SMG and SLG 1.1, lengths dorsellum/propodeum 0.5, propodeum with weak reticulation, propodeal callus with four setae. *Fore wing.* Costal cell length/width 8.2, lengths costal cell/marginal vein 1.1, lengths marginal/stigmal veins 2.4. *Gaster.* Ovate, length/width 1.6, lengths gaster/mesosoma 1.1, Gt₇ length/width 0.4, length of longest cercal seta/next longest seta 2.0, longest cercal seta strongly curved, ovipositor sheaths reach apex of Gt₇, but not beyond.

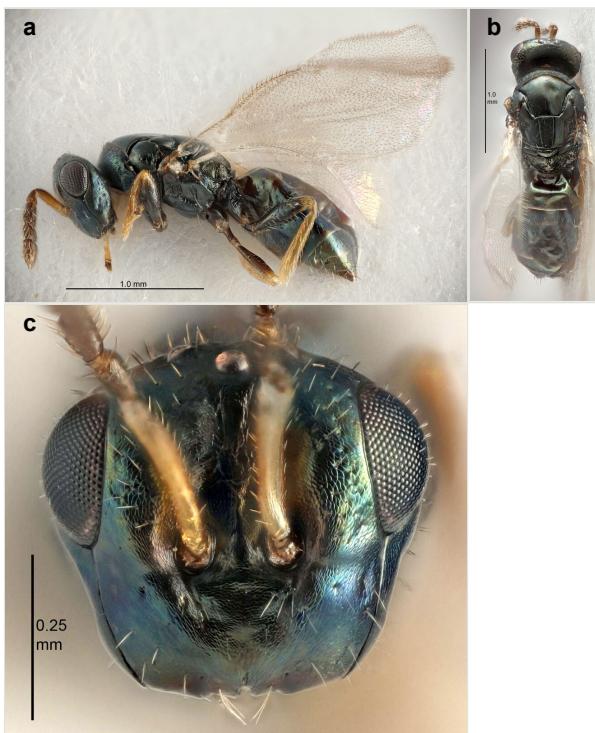


Figure 87.

Tetrastichus scardiae sp. n.

- a: Holotype female, lateral. [doi](#)
- b: Holotype female, dorsal. [doi](#)
- c: Paratype female, head frontal. [doi](#)

Colour. Body with weak metallic green tinges, scape yellowish-brown, pedicel brownish, flagellum dark brown, tegulae dark brown, wings hyaline with veins yellow-white to brown, coxae and femora concolorous with body, trochanters dark brown, tibiae and tarsi yellowish-brown.

MALE. There are four males in the type series, but all specimens are badly damaged and fragmented and all specimens lack pedicel+flagellum. The antenna holds several diagnostic characters and without them and, as the specimens are broken, it is not

possible to give a useful description. However, the male shares the same diagnostic features as the female, except characters in the antenna and it should be possible to recognise the characters through these.

Diagnosis

Posterior ocelli close, POL/OOL= 0.9; eyes small and malar space large, length of eye/malar space = 0.9 in female, 1.0 in male; female antenna short, length pedicel+flagellum/width of mesosoma = 0.9, with F1 and F2 ± merged in most specimens (incl. holotype, only two of the paratypes have these flagellomeres separated); submedian grooves on mesoscutellum distinctly converging towards posterior part; mesoscutum and mesoscutellum with weak reticulation and shiny.

Distribution

Finland.

Host: *Scardia boletella* (Fabricius) (Lepidoptera: Tineidae). There is no information if all specimens in the type series are from the same host specimen, but as the identical barcode in all specimens indicates that they are from the same clutch (including 20♀ and 4♂), this is probably the case. Thus, this species is a gregarious endoparasitoid.

Notes

Holotype deposited in ZSM, paratypes in MZLU, NHM and ZSM.

***Tetrastichus setifer* Thomson, 1878**

Nomenclature

Tetrastichus setifer Thomson 1878:283. Lectotype ♀ in MZLU, designated by Graham 1961:39, examined (Fig. 88). Transferred to *Aprostocetus* by Graham 1961:39 and back to *Tetrastichus* by Domenichini 1966:91.

Description

Female see Graham (1991).

MALE. Body length 1.9 mm. **Head.** Width/length in dorsal view 2.6, width/length in frontal view 1.3, eye height/malar space 1.2, mouth width/malar space 1.6, widths head/mesosoma 1.0. **Antenna.** F1–F4 with basal whorls of setae, reaching to but not beyond apex of corresponding flagellomere, scape length/eye height 1.1, scape length/width 3.0, ventral plaque placed in central part of scape, lengths ventral plaque/scape 0.8, pedicel+flagellum length/mesosoma width 1.4, length/width F1, F2, F3, F4 1.5, 1.7, 1.8, 1.6, clava length/width 4.5, lengths pedicel/F1 0.9, lengths F1/F2 0.9, F1/F3 0.9, F1/F4 1.0, lengths F1, F2, F3, F4/clava 0.4, 0.4, 0.4, 0.4.

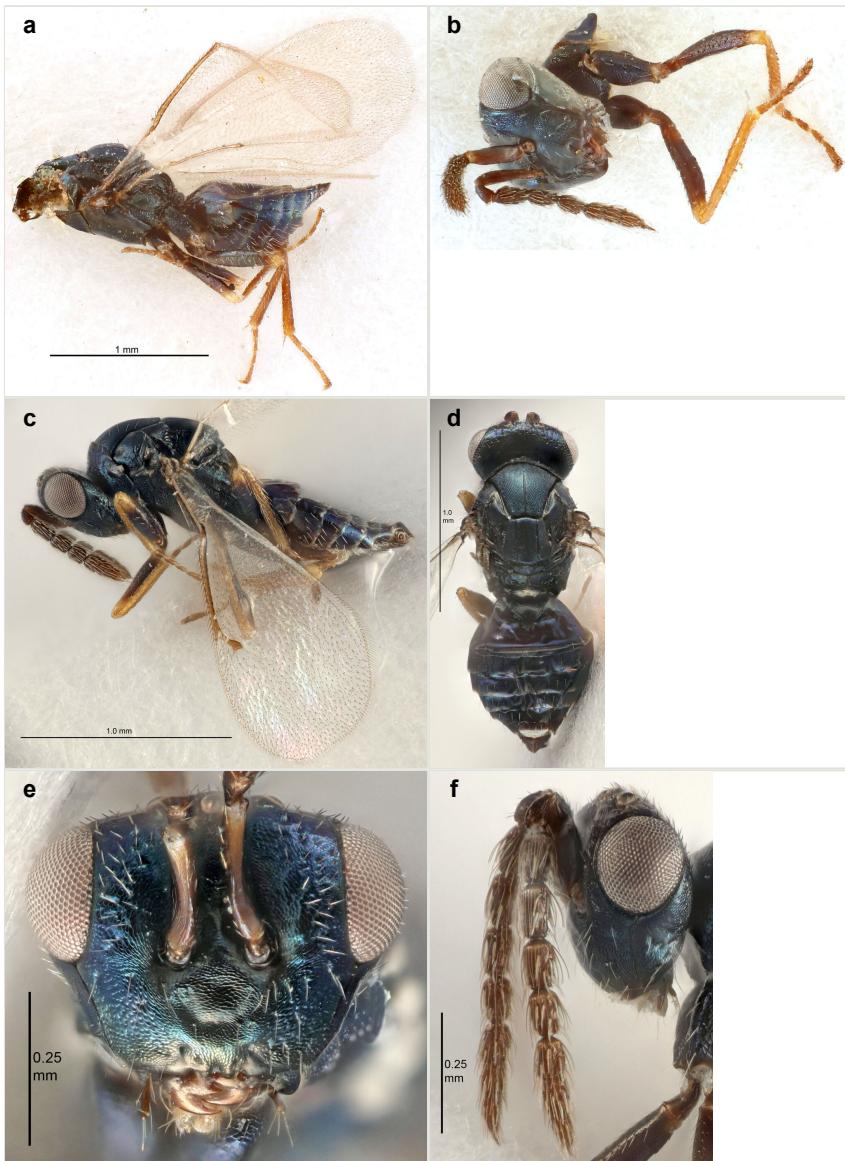


Figure 88.

Tetrastichus setifer Thomsona: Lectotype female, body excl. head and prothorax lateral. [doi](#)b: Lectotype female, head and prothorax lateral. [doi](#)c: Nontype female, lateral. [doi](#)d: Nontype female, dorsal. [doi](#)e: Nontype female, head frontal. [doi](#)f: Nontype male, head and antenna lateral. [doi](#)

Colour. Body with metallic blue tinges, entire antenna dark brown, tegulae dark brown, wing venation pale brown, coxae concolorous with body, trochanters and femora dark brown, tibiae yellowish-brown, tarsi yellowish-brown with T4 brown.

Diagnosis

Ovipositor retracted and does not reach apex of Gt₇; cerci placed laterally; colour dull compared to other species in this group; spine of antennal claval long, 0.5× C3; mouth opening 1.3–1.4× malar space.

Distribution

(Former) Czechoslovakia, France, (former) Yugoslavia (Graham 1991) and Sweden (Thomson 1878).

Host: *Lilioceris lili* (Scopoli) (Gold et al. 2001) and *L. tibialis* (Villa) (Kenis et al. 2002) (Coleoptera: Chrysomelidae).

Material examined: Type material: lectotype ♀ of *T. setifer* (MZLU, type no. 4868:1). Additional material (27♀ 5♂): France 2♀ (GD); Sweden 25♀ 5♂ ex *Lilioceris lili* (MZLU, NHM).

Tetrastichus sinope (Walker, 1839)

Nomenclature

Cirrospilus sinope Walker 1839a:295. Lectotype ♀ in NHM, designated by Graham 1961:38, examined (Fig. 89). Transferred to *Tetrastichus* by Walker 1848:148, to *Aprostocetus* by Graham 1961:37–38 and back to *Tetrastichus* by Domenichini 1966:89.

Cirrospilus hippis Walker 1839a: 304. Lectotype ♀ in NHM, designated by Graham 1961:38, examined. Synonymised by Graham 1961:38.

Cirrospilus agathocles Walker 1839b: 353. Lectotype ♀ in NHM, designated by Graham 1961:38, examined. Synonymised by Graham 1961:38.

Cirrospilus rapo Walker 1839d: 415. Lectotype ♀ in NHM, designated by Graham 1961:38, examined. Synonymised by Graham 1961:38.

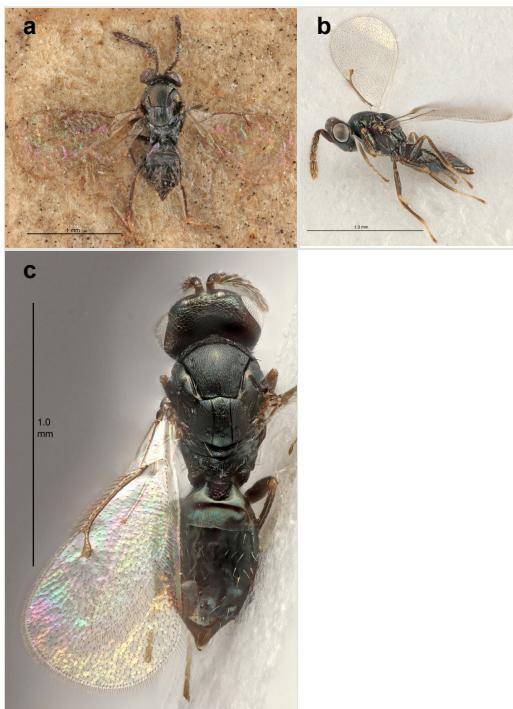


Figure 89.

Tetrastichus sinope (Walker)a: Lectotype female, dorsal. [doi](#)b: Nontype female, lateral. [doi](#)c: Nontype female, dorsal. [doi](#)

Materials

- a. scientificName: *Tetrastichus sinope*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Vombs vattenverk; decimalLatitude: 55.6619; decimalLongitude: 13.5472; individualID: BC-ZSM-HYM-26563-A05; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-26563-A05; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A11|BC-ZSM-HYM-26563-A05|BC-ZSM-HYM-20721-D06; recordNumber: BC-ZSM-HYM-26563-A05; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-26563-A05+1510087062.jpg>; identifiedBy: Christer Hansson
- b. scientificName: *Tetrastichus sinope*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Vomb; decimalLatitude: 55.667; decimalLongitude: 13.55; individualID: BC-ZSM-HYM-20721-D06; individualCount: 1; sex: F; lifeStage: Adult; catalogNumber: BC-ZSM-HYM-20721-D06; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A11|BC-ZSM-HYM-26563-A05|BC-ZSM-HYM-20721-D06; recordNumber: BC-ZSM-HYM-20721-D06; recordedBy: C. Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-20721-D06+1398631828.jpg>; identifiedBy: Christer Hansson; identificationRemarks: CH03417

- c. scientificName: *Tetrastichus sinope*; phylum: Arthropoda; class: Insecta; order: Hymenoptera; family: Eulophidae; genus: *Tetrastichus*; country: Sweden; locality: Ismantorp; decimalLatitude: 56.893; decimalLongitude: 16.768; individualID: BC-ZSM-HYM-21587-A11; individualCount: 1; sex: F; lifeStage: a; catalogNumber: BC-ZSM-HYM-21587-A11; occurrenceDetails: http://www.boldsystems.org/index.php/API_Public/specimen?ids=BC-ZSM-HYM-21587-A11|BC-ZSM-HYM-26563-A05|BC-ZSM-HYM-20721-D06; recordNumber: BC-ZSM-HYM-21587-A11; recordedBy: C.Hansson; associatedMedia: <http://www.boldsystems.org/pics/BCHYM/BC-ZSM-HYM-21587-A11+1423081076.jpg>; identifiedBy: Christer Hansson

Description

See Graham (1991).

Diagnosis

Scape, femora, mid and hind tibiae, and wing veins dark brown to black; female gaster 1.4–1.6× as long as wide and with Gt₇ transverse.

Distribution

Ireland, The Netherlands, United Kingdom (Graham 1991), Sweden (Hedqvist 2003) and France (**new record**).

Host: Unknown.

Additional material examined: Type material: lectotypes ♀ of *C. sinope* (type no. 5.1935), *C. hippis* (type no. 5.1934), *C. agathocles* (type no. 5.1936), *C. rapo* (type no. 5.1937), all in NHM. Additional material: France, 3♀ (G). Sweden, Skåne & Öland, 3♀ (MZLU).

Remarks: In the barcoded nontype material analysed, there are three groups (ACM5794, ADP1347 and ACT4395), each represented by a single female specimen. The barcode strongly indicates that these are three different species, but they are not possible to separate by their morphology. Morphologically, all three specimens agree well with the type of *T. sinope*. Since we do not have any molecular information from the types of, and under, this species, it is not possible to identify these “barcode species” better than to *T. sinope*, even though they probably represent different species. Therefore, we conclude that *T. sinope* is an aggregate of morphologically-inseparable species.

Tetrastichus sodalis Graham 1991

Nomenclature

Tetrastichus sodalis Graham 1991:256. Holotype ♀ in NHM, examined (Fig. 90).

Description

See Graham (1991). Male is unknown.

Diagnosis

Mouth 1.4× malar space; antenna with scape 0.9× as long as an eye, F3 2.0–2.4× as long as broad, clava short, 0.8× as long as F2+F3 in holotype.

Distribution

(Former) Czechoslovakia and France (Graham 1991).



Figure 90.

Tetrastichus sodalis Graham

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Host: Unknown.

Material examined: Holotype ♀ of *T. sodalis* (NHM, type no. 5.3624).

Tetrastichus tachos (Walker, 1839)

Nomenclature

Cirrospilus tachos Walker 1839b:352–353. Lectotype ♂ in NHM, designated by Graham 1961:39, examined (Fig. 91) transferred to *Tetrastichus* by Walker 1848:146, to *Aprostocetus* by Graham 1961:39 and back to *Tetrastichus* by Domenichini 1966:91.

Description

See Graham (1991).

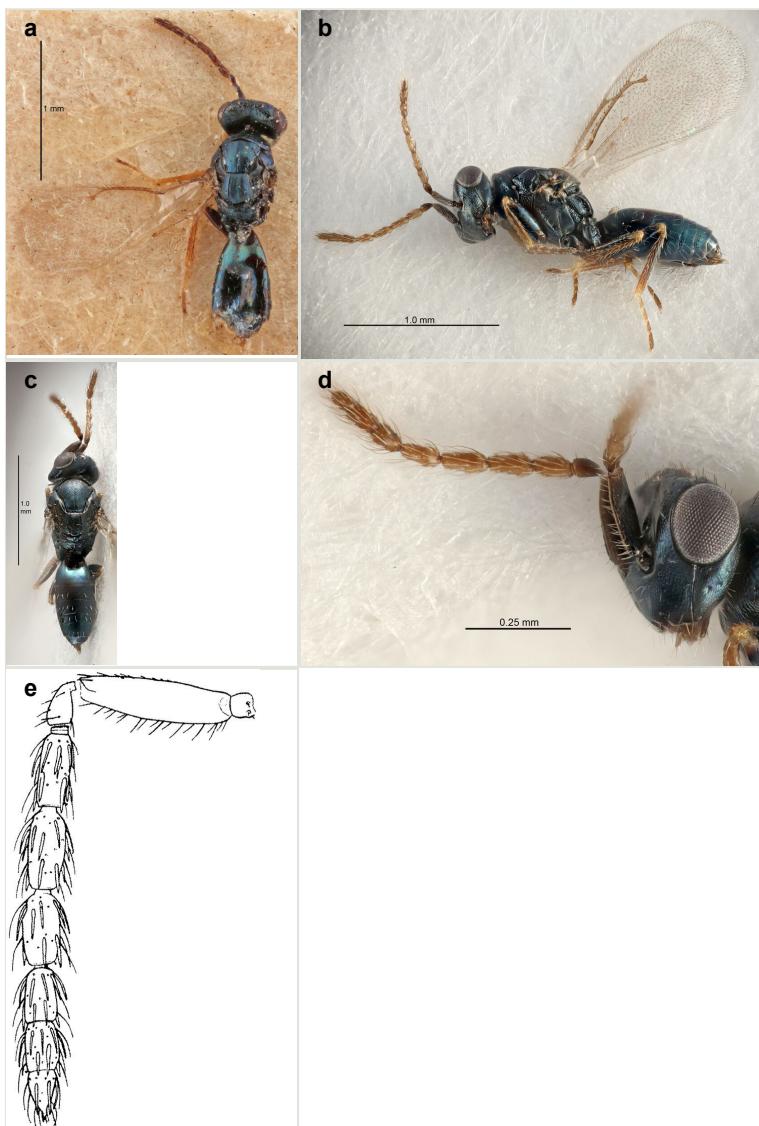


Figure 91.

Tetrastichus tachos (Walker)

a: Lectotype male, dorsal. [doi](#)

b: Nontype male, lateral. [doi](#)

c: Nontype male, dorsal. [doi](#)

d: Nontype male, head and antenna lateral. [doi](#)

e: Female, antenna lateral, from Graham (1991). [doi](#)

Diagnosis

Scape in both sexes with numerous (about ten) setae along frontal edge; female with a long antennal flagellum, pedicel+flagellum 1.6× as long as width of mesoscutum; ovipositor sheaths do not reach apex of Gt₇; male antenna with scape and pedicel dark brown almost black, flagellum pale brown.

Distribution

(Former) Czechoslovakia, United Kingdom (Graham 1991) and Sweden (Hedqvist 2003).

Host

Unknown.

Material examined: Type material: lectotype ♂ of *C. tachos* (NHM type no. 5.1942). Additional material: Sweden 1♂ (MZLU).

Tetrastichus telon (Graham, 1961)

Nomenclature

Aprostocetus telon Graham 1961:8–9. Holotype ♀ in OUMNH, examined (Fig. 92). Transferred to *Tetrastichus* by Domenichini 1966:94.

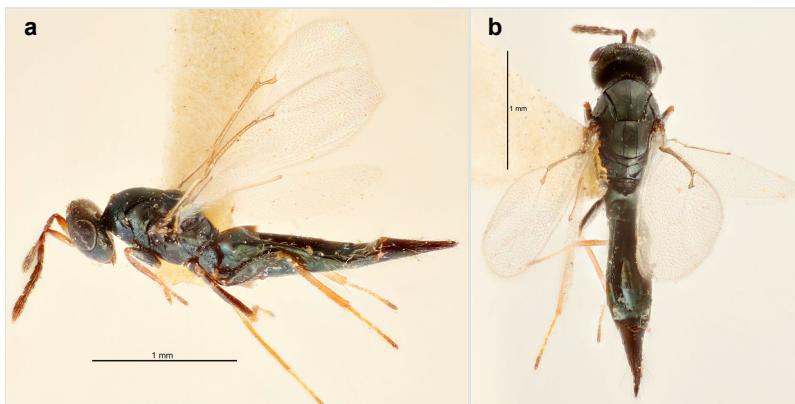


Figure 92.

Tetrastichus telon (Graham)

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

Description

See Graham (1991), Graham (1961).

Diagnosis

Female gaster very long, 2.9–5.0× as long as wide with Gt_7 1.6–2.5× as long as wide. The only other species with this long gaster is *T. legionarius*, that differs from *T. telon* in having the body bright metallic bluish-green to green, antennal scape longer than eye and a longer flagellum, about 2.8× the length of scape (about 2.6× in *T. telon*) and F1 about 4× as long as wide (about 2.8× in *T. telon*).

Distribution

(Former) Czechoslovakia, France, United Kingdom (Graham 1991), Germany, Italy (Domenichini 1966) and Sweden (Hedqvist 2003).

Host: *Agrilus viridis* L. (Coleoptera: Buprestidae) (Domenichini 1966).

Material examined

Type material: holotype ♀ of *A. telon* (OUMNH). Additional material (10♀): France 1♀ (NHM), Sweden 2♀ (MZLU, NHM), United Kingdom 7♀ (NHM).

Tetrastichus temporalis (Graham, 1961)

Nomenclature

Aprostocetus temporalis Graham 1961:10–11. Holotype ♀ in OUMNH, examined (Fig. 93). Transferred to *Tetrastichus* by Domenichini 1966:95.

Description

See Graham (1961), Graham (1991).

Diagnosis

Female gaster long, 1.9–2.3× as long as wide, with Gt_7 0.9–1.0× as long as wide; female antenna with F1 2.6–2.9×, F2 2.1–2.8×, F3 1.9–2.4× as long as wide; male scape with ventral plaque 0.6–0.7× length of scape, whorled setae of funiculars reaching the tips of funicular attached to or beyond tips; eye height 1.3× malar space in both sexes; both sexes with relatively bright metallic green (usually) or blue (more seldom) colour.

Distribution

Sweden, United Kingdom (Graham 1991) and France (**new record**).



Figure 93.

Tetrastichus temporalis (Graham)

a: Holotype female, lateral. [doi](#)

b: Holotype female, dorsal. [doi](#)

c: Nontype male, head and antenna lateral. [doi](#)

Host: Unknown, but according to Graham 1991, possibly associated with *Phalaris arundinacea* (Poaceae).

Material examined: Type material: holotype ♀ (OUMNH). Additional material (105♀ 24♂): France 6♀ (NHM), Sweden 68♀ 21♂ (MZLU, NHM, ZSM), United Kingdom 31♀ 3♂ (NHM).

Tetrastichus theoi Graham 1991

Nomenclature

Tetrastichus theoi Graham 1991:254. Holotype ♀ in Naturalis Biodiversity Center, Leiden, The Netherlands, not examined. Fig. 94

Description

See Graham (1991). Male is unknown.

Diagnosis

Head 2.1× as long as wide in dorsal view; mesoscutellum with submedian grooves 1.8–2.0× their distance from sublateral grooves; median part of propodeum, between plicae, smooth or with very weak reticulation.

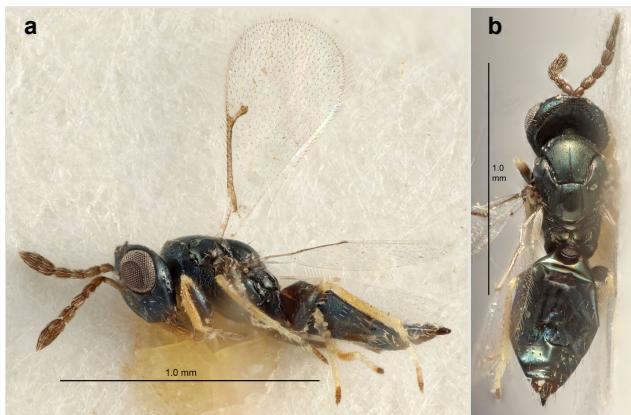


Figure 94.

Tetrastichus theoi Graham

a: Paratype female, lateral. [doi](#)

b: Paratype female, dorsal. [doi](#)

Distribution

France (Graham 1991).

Host: Unknown.

Material examined: One ♀ paratype from FRANCE, Agay, on *Inula viscosa* (NHM).

Tetrastichus ulmi Erdös, 1954

Nomenclature

Tetrastichus ulmi Erdös 1954:362. Holotype ♀ in HNHM, not examined. Transferred to *Aprostocetus* by Graham 1961:39 and back to *Tetrastichus* by Domenichini 1966:91.

Description

See Graham (1991). The male is unknown.

Diagnosis

Similar to *T. agrilicidus*, but with female antenna shorter and stouter (Fig. 95).

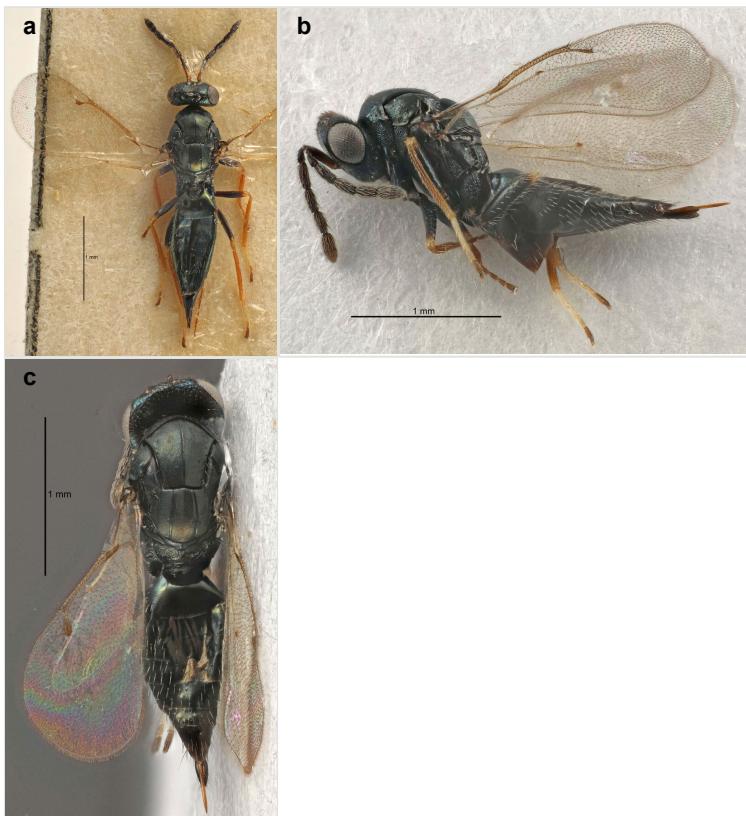


Figure 95.

Tetrastichus ulmi Erdös

a: Nontype female, dorsal. Identified by J. Erdös. [doi](#)

b: Nontype female, lateral. [doi](#)

c: Nontype female, dorsal. [doi](#)

Distribution

Bulgaria, (former) Czechoslovakia, Hungary, Italy, United Kingdom, (former) Yugoslavia (Graham 1991), France, Germany and Sweden (**new records**).

Host: *Scolytus rugulosus* (Müller) and *Leperisinus orni* Fuchs (Coleoptera: Scolytidae), *Agrilus* sp., and possibly *Anthaxia* sp. (Coleoptera: Buprestidae) (Graham 1991).

Material examined

Non-type material (21♀): France 2♀ (GD), Germany 2♀ (ZSM), Hungary 1♀ (NHM, identified as *T. ulmi* by Erdös), Sweden 16♀ (NHM, MZLU, SMTP).

Identification keys

Identification keys to females and males of European species of *Tetrastichus*

1	Females	see Table 2
–	Males	see Table 3

Table 2.

Key to females of European species of *Tetrastichus*.

1.	Frons without a narrow median longitudinal carina below the median ocellus (Fig. 3a); hind coxae strongly reticulate to rugulose on the externo-dorsal surface (Fig. 3c)	2
–	Frons with a very narrow and distinct median longitudinal carina extending from between the toruli to near the median ocellus (Fig. 3b); hind coxae usually finely reticulate on the externo-dorsal surface (Fig. 3d)	75
2.	Head with mouth opening 2.0–2.2× malar space; mandibles (Fig. 3a) very large, with outer tooth falcate and separated by a wide gap from the two small inner teeth	3
–	Mouth opening 1.8–2.0× malar space in <i>coeruleus</i> , which has mandibles less large, head and mesosoma dark to bright blue or bluish-purple; in all the other species the mouth is at most 1.5× the malar space (usually hardly wider than the malar space)	5
3.	Gaster long ovate, about 1.8× as long as wide (Fig. 66c); ovipositor visible in dorsal view (Fig. 66c); cerci on gaster placed laterally and visible in dorsal view; body colour more dull (Fig. 66a, b, c)	<i>T. halidayi</i> (Graham)
–	Gaster short ovate, 1.3–1.4× as long as wide (Figs 23b, 34b); ovipositor retracted and not visible in dorsal view (Figs 23b, 34b); cerci on gaster placed ventrally and not visible in dorsal view; body more metallic (Figs 23, 34)	4
4.	Antenna with scape 3.3× and antennal clava 2.7× as long as wide (Fig. 23a)	<i>T. cyprus</i> sp. n.
–	Antenna with scape 3.1× and antennal clava 3.0× as long as wide (Fig. 34d)	<i>T. marcusgrahami</i> sp. n.
5.	Eyes small (Fig. 87c), 0.9× as long as malar space; submedian grooves on mesoscutellum distinctly converging posteriorly (Fig. 87b); antenna in most specimens with F1 and F2 ± merged (Fig. 87a)	<i>T. scardiae</i> sp. n.
–	Eye usually as long as or longer than malar space; submedian grooves on mesoscutellum usually ± parallel; antenna with distinct constriction between F1 and F2	6

6.	Antenna (Fig. 88b): clava with a very long, slightly tapering spicule, the clava itself much longer than F2+3; flagellum stout; funiculars subequal in length or differing only slightly, all less than twice as long as broad; scape virtually as long as an eye and reaching level of vertex; mouth opening 1.4–1.5× malar space	<i>T. setifer</i> Thomson
-	Antennal clava usually with a relatively short spicule, if approaching the length seen in <i>T. setifer</i> , then clava is not or hardly longer than F2+3 and either the flagellum is less stout or the scape is longer than an eye and reaches above the vertex; width of mouth opening variable	7
7.	Width of mouth opening 1.3–2.0× malar space	8
-	Width of mouth opening equal to or only slightly wider (at most 1.14×) than malar space	18
8.	Gaster 2.4–2.5× as long as wide (Fig. 65)	<i>T. gredius</i> sp. n.
-	Gaster at most 2.1× as long as wide	9
9.	Ovipositor sheaths do not reach apex of gaster (as in Fig. 2b)	10
-	Ovipositor sheaths reach apex of gaster (as in Fig. 2a)	12
10.	Body bright metallic blue to bluish-purple (Fig. 20); antennal flagellum long (Fig. 20c), F3 1.3× as long as wide and clava (incl. spicule) 2.7–3.1× as long as wide	<i>T. coeruleus</i> (Nees)
-	Body black with very weak metallic blue tinges (Figs 80, 86); antennal flagellum short, for example, F3 1.0–1.1× as long as wide and clava (incl. spicule) 2.2–2.5× as long as wide	11
11.	Head 2.5× as long as wide in dorsal view (Fig. 86b); pedicel+flagellum 0.9× as long as width of mesosoma; antenna (Fig. 86a) with F2 1.3× and clava 2.5× as long as wide and F1 0.9× as long as F2	<i>T. polyporus</i> Askew
-	Head 2.2× as long as wide in dorsal view (Fig. 80b); pedicel+flagellum 1.1× as long as width of mesosoma; antenna (Fig. 80a) with F2 1.1× and clava 2.2× as long as wide and F1 1.1× as long as F2	<i>T. minius</i> sp. n.
12.	Antennae (e.g. Fig. 71b) with clava more acute, spicule relatively long and conspicuous; scape 1.0–1.2× length of eye, reaching to or above vertex	13
-	Antennae with clava subobtuse, spicule relatively short and inconspicuous (e.g. Fig. 59c); scape 0.9–1.0× length of eye, not reaching above vertex	16
13.	Antenna (Fig. 85a) with pedicel+flagellum about 1.2× width of mesoscutum, F1 1.6× as long as wide	<i>T. perkinsorum</i> Graham
-	Antenna with pedicel+flagellum 1.4–1.5× width of mesoscutum, F1 2.0–2.2× as long as wide	14
14.	POL 2.2× OOL; fore wing with marginal vein 2.8× stigmal vein	<i>T. elodium</i> sp. n.
-	POL 1.5–1.6× OOL; fore wing with marginal vein 3.2–3.5× stigmal vein	15

15.	Mesoscutellum with enclosed area between submedian grooves 2.7× as long as wide and distance between submedian grooves 1.5× distance between submedian grooves and sublateral grooves (Fig. 71c); fore wing with marginal vein 3.5× stigmal vein	<i>T. julis</i> (Walker)
-	Mesoscutellum with enclosed area between submedian grooves 2.5× as long as wide and distance between submedian grooves 1.7× distance between submedian grooves and sublateral grooves (Fig. 70b); fore wing with marginal vein 3.2× stigmal vein	<i>T. inscitus</i> sp. n.
16.	Antenna (Fig. 90) with F3 2.0–2.35× as long as wide; clava (incl. spicule) 0.8× as long as F2+F3	<i>T. sodalis</i> Graham
-	Antenna (Figs 59c, 72a) with F3 1.4–1.8× as long as wide; clava (incl. spicule) 1.0–1.1× as long as F2+F3	17
17.	Flagellum longer (Fig. 72a), F2 2.0–2.1× and clava (incl. spicule) 3.6–3.8× as long as wide	<i>T. lanius</i> sp. n.
-	Flagellum shorter (Fig. 59c), F2 1.5–1.8× and clava (incl. spicule) 2.8–2.9× as long as wide	<i>T. crioceridis</i> Graham
18.	Eyes usually with long, conspicuous pubescence (Figs 5c, 7d), length of the setae 0.4–0.8× OD; setae on hind margin of pronotum and adnotaular setae relatively long and suberect (e.g. Fig. 7a); gaster short ovate to subcircular (e.g. Fig. 5b); body black non-metallic or with weak metallic tinges (Figs. 4–14)	19
-	Eyes with short and inconspicuous pubescence (e.g. Fig. 3a), length of the setae 0.2–0.35× OD; setae on hind margin of pronotum and adnotaular setae usually shorter, weaker and reclinate; shape of gaster and body colour variable	29
19.	Antenna (Fig. 12) with pedicel 1.35–1.5× length of F1; funicle stout, funiculars short, F1 and F2 1.1–1.25× as long as broad; mid-lobe of mesoscutum without a median line or with line indicated only near the mesoscutellum	<i>T. solvae</i> Graham
-	Antenna with pedicel not or only slightly longer than F1; funicle stout or slender; F1 1.5–2.5×, F2 1.4–2.5×, as long as broad; mid-lobe of mesoscutum with median line distinct over at least posterior ½, sometimes complete (weak or absent in some specimens of <i>T. brachyopae</i> that differs from all other species in this group in having submedian grooves of mesoscutellum equidistant from each other and from sublateral grooves)	20
20.	Gaster (Fig. 11b, c) with ovipositor sheaths projecting distinctly beyond apex of Gt ₇ , length of projecting part about equal to length of hind basitarsus; setae on eyes very long, 0.8× OD; distance between posterior ocelli relatively short, POL 1.5–1.6× OOL	<i>T. murcia</i> (Walker)
-	Gaster with ovipositor sheaths not projecting beyond apex of Gt ₇ or projecting less than in alternate; setae on eyes shorter, 0.4–0.6× OD; POL 1.9–2.4× OOL	21

21.	Submedian grooves of mesoscutellum equidistant from each other and from sublateral grooves (Fig. 6a); gaster with ovipositor sheaths projecting beyond apex of gaster (Fig. 6a, b); antennal funicle (Fig. 6c) rather stout, its segments relatively short, F1 1.5–1.7×, F2 1.4–1.5× as long as broad	<i>T. brachyopae</i> Graham
-	Submedian grooves of mesoscutellum nearer to sublateral grooves than to each other; gaster with ovipositor sheaths not or hardly projecting beyond apex of gaster; antennal funicle less stout, funiculars on average longer, F1 1.7–2.5×, F2 1.7–2.5× as long as broad (antenna of <i>T. antonjanssoni</i> short, but with distance between submedian grooves 1.7× the distance between submedian and sublateral grooves)	22
22.	Distance between submedian grooves 2.0× the distance between submedian and sublateral grooves (Fig. 14b); antennal clava (incl. spicule) 3.3× as long as wide (Fig. 14a)	<i>T. tartus</i> sp. n.
-	Distance between submedian grooves 1.2–1.9× the distance between submedian and sublateral grooves; antennal clava (incl. spicule) 2.1–3.0× as long as wide	23
23.	Antennal flagellum longer (Fig. 8a), for example, F3 1.9× as long as wide	<i>T. intruitus</i> sp. n.
-	Antennal flagellum shorter, F3 1.1–1.4× as long as wide	24
24.	Antennal clava (incl. spicule) 2.2–2.4× as long as wide	25
-	Antennal clava (incl. spicule) 2.7–3.2× as long as wide	27
25.	Antenna short (Fig. 4a) with F1 1.6×, F2 1.4×, F3 1.1× as long as wide	<i>T. antonjanssoni</i> sp. n.
-	Antenna long with F1 2.0–2.3×, F2 1.7–1.8×, F3 1.2–1.3× as long as wide	26
26.	Antenna (Fig. 5a): pedicel+flagellum 1.15–1.35× width of mesoscutum, F1 2.0–2.5× and F2 1.6–2.0× as long as wide; apex of ovipositor sheaths does not reach apex of gaster	<i>T. atratulus</i> (Nees)
-	Antenna (Fig. 7a): pedicel+flagellum 1.0–1.05× width of mesoscutum, F1 1.7–2.0× and F2 1.2–1.6× as long as wide; apex of ovipositor sheaths reach apex of gaster or slightly beyond apex	<i>T. dasyops</i> Graham
27.	Antennal clava 3.4× as long as wide (Fig. 10a); POL/OOL = 2.4	<i>T. mixtus</i> sp. n.
-	Antennal clava 2.7–2.8× as long as wide; POL/OOL = 1.9–2.2	28
28.	Ovipositor sheaths protruding beyond apex of gaster, visible in dorsal view (Fig. 13b)	<i>T. tacitus</i> sp. n.
-	Ovipositor sheaths not protruding beyond apex of gaster, not visible in dorsal view (Fig. 9b)	<i>T. lacustrinus</i> sp. n.

29.	Ovipositor sheaths retracted and do not reach apex of gaster (as in Fig. 2b); gaster at most 1.6× as long as broad, usually subcircular sometimes short ovate; not longer, usually broader than mesosoma; eyes relatively small, usually separated by 1.6–1.8× their own length; antennal scape virtually as long as, or even slightly longer than an eye (in specimens having undistorted head the scape sometimes reaches slightly above the vertex); most species are strongly metallic (e.g. Fig. 27)	30
-	Ovipositor sheaths reach apex of gaster or even extending slightly beyond it, so that their tips are visible in dorsal view (as in Fig. 2a); gaster variable in shape, rarely subcircular, usually ovate to lanceolate; eyes usually relatively larger; antennal scape usually shorter than an eye and not reaching above the vertex; species not as strongly metallic as in alternate	50
30.	Antenna (Fig. 31a) with F1 0.8× as long as F2 and only very slightly longer than the pedicel	<i>T. inaequalis</i> Graham
-	Antennae with F1 0.9–1.2× as long as F2 and at least slightly longer than the pedicel	31
31.	Antennal flagellum very long and narrow (Fig. 91e), 1.6× as long as width of mesoscutum; ventral margin of scape with more than ten setae	<i>T. tachos</i> (Walker)
-	Antennal flagellum 1.0–1.4× as long as width of mesoscutum; ventral margin of scape with fewer setae, usually at most six	32
32.	Mid and hind tibiae predominantly to completely dark brown to black (Fig. 28a, b)	<i>T. hylotomarum</i> (Bouché)
-	Mid and hind tibiae predominantly to completely yellowish-brown to pale brown	33
33.	Mesoscutellum with enclosed space between submedian grooves 2.2× as long as wide (Fig. 24b)	<i>T. erinus</i> sp. n.
-	Mesoscutellum with enclosed space between submedian grooves 2.5–3.8× as long as wide	34
34.	Mesoscutellum with enclosed space between submedian grooves 3.3–3.8× as long as wide	35
-	Mesoscutellum with enclosed space between submedian grooves 2.5–3.0× as long as wide	38
35.	Antenna (Fig. 35a) more stout, length/width F1, F2, F2, clava: 1.7, 1.6, 1.3, 2.5; mesoscutellum with enclosed space between submedian grooves 3.8× as long as wide (Fig. 35b)	<i>T. splendens</i> sp. n.
-	Antenna more slender, length/width F1, F2, F2, clava: 2.0–2.3, 1.9–2.0, 1.7–1.8, 3.2–3.8; mesoscutellum with enclosed space between submedian grooves 3.3–3.4× as long as wide	36
36.	Antenna (Fig. 33a) shorter, F1 2.0× and clava 3.2× as long as wide	<i>T. johnnylesi</i> sp. n.
-	Antenna longer, F1 2.2–2.3× and clava 3.8–4.0× as long as wide	37

37.	Mesoscutellum 0.9× as long as wide with enclosed space between submedian grooves 3.3× as long as wide (Fig. 22b); fore wing with marginal vein 3.1× as long as stigmal vein	<i>T. cumulus</i> sp. n.
-	Mesoscutellum 1.1× as long as wide with enclosed space between submedian grooves 3.1× as long as wide (Fig. 26b); fore wing with marginal vein 2.7× as long as stigmal vein	<i>T. flaccius</i> sp. n.
38.	Malar space 1.0× height of eye	39
-	Malar space 0.7–0.9× height of eye	40
39.	POL/OOL = 1.6; F1 2.4× as long as wide (Fig. 37a)	<i>T. suecus</i> sp. n.
-	POL/OOL = 2.1; F1 1.8× as long as wide (Fig. 25a)	<i>T. evexus</i> sp. n.
40.	Antennal clava (incl. spicule) 3.0–3.4× as long as wide	41
-	Antennal clava (incl. spicule) 3.6–4.8× as long as wide	44
41.	Mesoscutellum with submedian grooves diverging towards posterior part (Fig. 29b)	<i>T. iasi</i> sp. n.
-	Mesoscutellum with submedian grooves parallel (e.g. Fig. 27a)	42
42.	Scape 3.4–3.5× as long as wide, completely to predominantly dark and metallic (Fig. 15a)	<i>T. argei</i> sp. n.
-	Scape 4.2–4.4× as long as wide, completely to predominantly yellowish-brown (Figs 27b, 30a)	43
43.	Mesoscutellum 1.1× as long as wide (Fig. 27a); mesoscutum and mesoscutellum with same colour (Fig. 27a)	<i>T. helviscapus</i> Graham
-	Mesoscutellum 0.8× as long as wide (Fig. 30b); mesoscutum bluish and mesoscutellum greenish (Fig. 30b)	<i>T. illydris</i> sp. n.
44.	Antennal clava 3.4–3.6× (3.4× in holotype, Fig. 19a) as long as wide	<i>T. coelarchus</i> Graham
-	Antennal clava at least 3.8× as long as wide	45
45.	Antennal clava 3.8–4.1× as long as wide	46
-	Antennal clava 4.4–4.8× as long as wide	49
46.	Hind coxa with a strong and complete carina along posterior margin (Fig. 21c)	<i>T. cosidis</i> sp. n.
-	Hind coxa with strong and irregular sculpture, but not a complete carina along posterior margin	47
47.	Antenna (Fig. 16a) with F2 1.9× as long as wide; ratio POL/OOL = 2.4	<i>T. asilis</i> sp. n.
-	Antenna (Figs 18a, 32a) with F2 2.1–2.5× as long as wide; ratio POL/OOL = 1.9–2.1	48
48.	Antenna (Fig. 32a): F1 1.1× as wide and 2.0× as long as pedicel, F2 2.5× as long as wide; ratio POL/OOL = 2.1	<i>T. incanus</i> sp. n.
-	Antenna (Fig. 18a): F1 1.0× as wide and 1.3× as long as pedicel, F2 2.1× as long as wide; ratio POL/OOL = 1.9	<i>T. calmius</i> sp. n.

49.	Antennal clava longer and more slender (Fig. 17a), 4.6–4.8× as long as wide, with relatively weak constriction between C1 and C2	<i>T. brevicalcar</i> Graham
-	Antennal clava shorter and more stout (Fig. 36a), 4.4× as long as wide, with a strong constriction between C1 and C2	<i>T. sti</i> sp. n.
50.	Gaster with last tergite 1.9–2.5× as long as broad; the gaster itself acuminate (Fig. 92), 2.9–5.0× as long as broad, 1.4–1.6× length of head+mesosoma, distinctly narrower than mesosoma; body bronze-black with, at most, some very weak greenish or bluish reflections (Fig. 92); antenna (Fig. 92a) with clava (incl. spicule) nearly 3× as long as broad, without constriction between C1and C2	<i>T. telon</i> (Graham)
-	Gaster with last tergite very rarely 1.9× as long as broad, usually at most as long as broad, but if long and the gaster itself is almost as elongate as in <i>telon</i> , then either the body is brighter green to blue or the antennal clava is only about twice as long as broad	51
51.	Gaster lanceolate, at least slightly longer than head+mesosoma (Figs 73b, 93b); antennae with scape as long as or longer than an eye, in specimens with undistorted head reaching at least slightly above the vertex; pedicel 2.1–2.5× as long as broad; flagellum slender, at most slightly stouter than the pedicel; F3 1.9–2.8× as long as broad; clava (incl. spicule) 3.6–4× as long as broad, usually at least slightly stouter than F2+F3; malar space 0.8–1.0× length of eye; head at most 2.2× as broad as long; temples distinct, rounded; body relatively bright metallic green to blue (Figs 73, 93)	52
-	<i>Either</i> the gaster is ovate and about as long as mesosoma, <i>or</i> the antennal scape is slightly shorter than an eye <i>or</i> does not reach vertex, the pedicel is relatively shorter and the flagellum is less slender; antennal clava (incl. spicule) usually at most 3× as long as broad; malar space usually shorter; head usually more strongly transverse and with temples very short; body colour sometimes with different colour/shine	53
52.	Gaster (Fig. 73b) 2.6–3.3× as long as broad and nearly twice the length of mesosoma, last tergite 1.5–1.9× as long as broad; antenna (Fig. 73a) with scape somewhat longer than an eye; funiculars more elongate, F1 4.1–4.3×, F2 3.2–3.9×, F3 2.8–3.1× as long as wide; head, pronotum, mesoscutum and mesoscutellum duller, their sculpture slightly stronger; body colour blue (Fig. 73b)	<i>T. legionarius</i> Giraud
-	Gaster (Fig. 93b) 1.9–2.3× as long as broad, less than twice as long as mesosoma; last tergite not or hardly longer than broad; antenna (Fig. 93a) with scape not or hardly longer than an eye, funiculars shorter, F1 2.6–2.9×, F2 2.1–2.8×, F3 1.9–2.4× as long as wide; head, pronotum, mesoscutum and mesoscutellum slightly more shiny, their sculpture slightly more delicate; body colour usually more greenish (Fig. 93)	<i>T. temporalis</i> (Graham)
53.	Antennal clava (incl. spicule) distinctly to much shorter than F2+F3, without a constriction between C1and C2, obtuse or bluntly pointed; gaster at least slightly, usually distinctly, longer than head+mesosoma	54

-	<i>Either</i> antennal clava different (not or hardly shorter than F2+F3, or with a distinct constriction between C1and C2) <i>or</i> gaster at most as long as head+mesosoma	58
54.	Eyes larger, separated by 1.1–1.25× their length; temples virtually nil (Fig. 78b); antennal scape mainly to wholly and tibiae, yellow or yellowish-testaceous (Fig. 78a). Parasite of <i>Cis</i> on fungi	<i>T. macrops</i> (Graham)
-	Eyes smaller, separated by 1.3–1.4× their length; temples 0.07–0.15× length of eyes; antennal scape and/or tibiae sometimes more or less infuscate. Parasites of Buprestidae, Scolytidae and Cerambycidae, or host unknown	55
55.	Antenna (Fig. 95b) with flagellum shorter and more stout, clava 2.0× as long as wide	<i>T. ulmi</i> Erdös
-	Antenna with flagellum longer and more slender, clava 2.7–3.4× as long as wide	56
56.	Ratio POL/OOL = 2.3; antenna (Fig. 61a) with F1 2.4× and F2 2.1× as long as wide	<i>T. doczkali</i> sp. n.
-	Ratio POL/OOL = 1.8–1.9; antenna (Figs 56a, 60b) with F1 2.6–2.9× and F2 2.6–3.0× as long as wide	57
57.	Antenna (Fig. 56a) with F1 2.9×, F2 3.0×, F3 2.3, clava 3.1× as long as wide; gaster longer (Fig. 56b), about 1.8× as long as mesosoma	<i>T. agrilocidus</i> Graham
-	Antenna (Fig. 60b) with F1 2.6×, F2 2.6×, F3 1.9, clava 3.4× as long as wide; gaster shorter (Fig. 60b), 1.4× as long as mesosoma	<i>T. delvarei</i> sp. n.
58.	Species with following combination of characters: antenna (Fig. 67a) with F1 3.0–3.2× as long as broad and 0.7–0.8× length of clava (incl. spicule), the latter 0.8–0.9× as long as F2+F3; flagellum proximally hardly stouter than the pedicel; gaster (Fig. 67b) at most twice as long as broad (temples short but distinct, about 0.15× length of eyes)	<i>T. heeringi</i> Delucchi
-	Antenna either with F1 relatively shorter <i>or</i> with clava (incl. spicule) almost as long as F2+F3 <i>or</i> with flagellum proximally distinctly stouter than the pedicel; gaster sometimes more elongate	59
59.	Gaster longer, at least 2.2× as long as broad	60
-	Gaster shorter, at most 2× as long as broad	65
60.	Antenna (Fig. 76a) with sensilla on F1–F3 sparse, in one (sometimes irregular) row on each funicular; clava without a constriction between C1and C2	<i>T. leptosoma</i> Graham
-	Antenna with sensilla of funicle less sparse, in two partly overlapping rows on at least F1 and F2; clava with a distinct constriction between C1and C2	61
61.	Flagellum more slender (Fig. 68a), for example, F3 2.8× and clava (incl. spicule) 5.0× as long as wide	<i>T. heterus</i> Graham
-	Flagellum more stout, for example, F3 1.6–2.2× and clava (incl. spicule) 2.6–4.5× as long as wide	62

62.	Ocellar triangle encircled by groove (Fig. 83c, d); vertex with numerous piliferous punctures (Fig. 83c, d); antennal clava with apex blunt (Fig. 83a); F1 2.2–2.4× as long as wide; funiculars more hairy and with more sensilla, sensilla usually in three rows (Fig. 83a) (large species, 2.4–3.1 mm)	T. pachycerus Graham
-	Ocellar triangle not encircled by groove; vertex with few piliferous punctures or none; antennal clava with apex pointed; F1 1.8–2.2× as long as wide; funiculars less hairy and with fewer sensilla, sensilla usually in two rows	63
63.	Scape (Fig. 64a) 3.3× as long as wide	T. fadus sp. n.
-	Scape 4.0–4.2× as long as wide	64
64.	Antennal scape, tibiae and wing veins black to dark brown (Fig. 84); head 2.14× as wide as long (dorsal view)	T. paululus Graham
-	Antennal scape, tibiae and wing mainly yellowish-brown and wing veins yellowish-white (Fig. 58); head 2.30× as wide as long (dorsal view)	T. broncus sp. n.
65.	Species with following combination of characters: head 2.1× as broad as long (dorsal view), with temples distinct; submedian grooves of mesoscutellum 1.8–2.0× as far apart as their distance from sublateral grooves (Fig. 94b); costal cell of fore wing narrow, 11–12.5× as long as broad; antennal scape mainly yellow; propodeum (Fig. 94b) shiny, its sculpture rather weak, sometimes partly smooth; gaster (Fig. 94b) 1.7–2.0× as long as broad	T. theoi Graham
-	Not with above combination of characters: either head more transverse with temples shorter <i>or</i> submedian grooves of mesoscutellum less far apart <i>or</i> costal cell of fore wing broader <i>or</i> antennal scape mainly to wholly black <i>or</i> propodeum distinctly reticulate	66
66.	Spicule on antennal clava 0.5× as long as C3 (Fig. 69d), scape 1.06× as long as an eye, reaching nearly to level of vertex, clava (incl. spicule) as long as F2+F3	T. illityia (Walker)
-	Spicule on antennal clava usually 0.2–0.3× as long as C3; if longer, then antennal scape shorter than an eye, not reaching vertex; clava (incl. spicule) sometimes shorter than F2+F3	67
67.	Fore wing with costal cell very narrow, 13–17× as long as broad (Fig. 79a); antenna (Fig. 79a) with claval spicule about 0.5× length of C3, scape yellow; body bright green to blue (Fig. 79)	T. melasomae Graham
-	Fore wing with costal cell broader; antenna with claval spicule relatively shorter, at most 0.4× length of C3, scape often black or partly infuscate; body sometimes dark blue or olive-greenish	68

68.	Antenna (Fig. 77e) with pedicel+flagellum 1.3–1.4× width of mesoscutum; setae of flagellum long and standing out at a greater angle; clava with a distinct constriction between C1 and C2 and 0.9× as long as F2+F3; scape more or less testaceous; gaster (Fig. 77a, c) long-ovate, 1.6–2.0× as long as broad, usually slightly longer than mesosoma; last tergite usually as long as broad, occasionally slightly transverse	<i>T. lyridice</i> (Walker)
-	Antennae with pedicel+flagellum 1.1–1.3× width of mesoscutum; setae of flagellum standing out less strongly and tending to be shorter; clava either with a very weak constriction between C1 and C2 or else at least as long as F2+F3; scape often black/dark brown; gaster subcircular to ovate, 1.2–1.9× as long as broad, shorter than to slightly longer than mesosoma; last tergite usually at least slightly broader than long	69
69.	Gaster 1.8–1.9× as long as wide, nearly or just as long as head+mesosoma, strongly acute at apex, Gt ₇ 0.8–1.0× as long as broad	70
-	Gaster not more than 1.6× as long as broad, not longer than mesosoma, except in some <i>sinope</i> which has gaster only slightly longer than mesosoma and Gt ₇ 0.4–0.6× as long as wide)	71
70.	Scape 0.9–1.0× as long as eye; flagellum longer (Fig. 54a), for example, F1 1.9–2.3× as long as wide	<i>T. acutiusculus</i> Graham
-	Scape 0.8× as long as eye; flagellum shorter (Fig. 75b), for example, F1 1.5–1.6× as long as wide	<i>T. leocrates</i> (Walker)
71.	Distance between submedian grooves 1.1–1.2× the distance between submedian and sublateral grooves (Fig. 89a, c); hind tibia and antennal scape dark brown to black (Fig. 89b)	<i>T. sinope</i> (Walker)
-	Distance between submedian grooves 1.4–1.8× the distance between submedian and sublateral grooves; hind tibia usually yellowish-brown, very seldom dark, colour of scape yellowish-brown to black	72
72.	POL 2.2× OOL	73
-	POL 1.7–1.9× OOL	74
73.	Marginal vein 3.3× as long as stigmal vein; antennal clava 3.6× as long as wide (Fig. 57a)	<i>T. ballotus</i> sp. n.
-	Marginal vein 2.8× as long as stigmal vein; antennal clava 3.3× as long as wide (Fig. 82a)	<i>T. nataliedaleskeyae</i> sp. n.
74.	Antenna (Fig. 81a, b) with F1 2.0×, F3 1.7× and clava 3.0× as long as wide; mesoscutellum with distance between submedian grooves 1.8× distance between submedian and sublateral grooves (Fig. 81a, c)	<i>T. miser</i> Walker
-	Antenna (Fig. 55a) with F1 2.3×, F3 2.0× and clava 3.3× as long as wide; mesoscutellum with distance between submedian grooves 1.4× distance between submedian and sublateral grooves (Fig. 55b)	<i>T. agonus</i> sp. n.
75.	Frons with median carina wide with sides parallel (Fig. 63c)	<i>T. enodis</i> sp. n.

-	Frons with median carina narrow with sides converging towards median ocellus	76
76.	Antenna (Fig. 74a) with pedicel yellowish-brown, same colour as scape; body (Fig. 74) black with very weak bronze and bluish tinges; mesosoma dorsally (except propodeum) strongly shiny, with very fine reticulation (Fig. 74b); median line of mesoscutum very weak or missing (Fig. 74b)	<i>T. leionotus</i> Graham
-	Antenna with pedicel brown to black, body colour variable; mesosoma dorsally with more distinct reticulation; median line of mesoscutum variable	77
77.	Ovipositor sheaths reach beyond apex of Gt ₇ and are visible in dorsal view (as in Fig. 2a)	78
-	Ovipositor sheaths do not reach apex of Gt ₇ and are not visible in dorsal view (as in Fig. 2b)	82
78.	Hind coxa with a strong and sharp carina along posterior margin (as in Fig. 21c)	<i>T. argutus</i> sp. n.
-	Hind coxa without a strong and sharp carina along posterior margin	79
79.	Mesoscutellum ± flattened (Fig. 51a, b), 1.0× as long as wide, distance between submedian grooves 2.1× the distance between submedian and sublateral grooves	<i>T. nymphae</i> sp. n.
-	Mesoscutellum more convex, 0.8× as long as wide, distance between submedian grooves 1.2–1.9× the distance between submedian and sublateral grooves	80
80.	Antenna (Fig. 52a) 1.5× as long as width of mesoscutum and clava 4.5× as long as wide; fore wing with marginal vein 3.3× as long as stigmal vein	<i>T. pilemostomae</i> Graham
-	Antenna 1.7–1.8× as long as width of mesoscutum and clava 3.7–3.8× as long as wide; fore wing with marginal vein 2.5–2.9× as long as stigmal vein	81
81.	Mesoscutellum with distance between submedian grooves 1.2× the distance between submedian and sublateral grooves and with enclosed area between submedian grooves 2.3× as long as wide (Fig. 43b)	<i>T. decrescens</i> Graham
-	Mesoscutellum with distance between submedian grooves 1.6× the distance between submedian and sublateral grooves and with enclosed area between submedian grooves 1.9× as long as wide (Fig. 44b)	<i>T. elanus</i> sp. n.
82.	Body bright metallic blue to bluish-green (Fig. 79); malar space 0.5–0.55× length of eye	<i>T. melasomae</i> Graham
-	Body dull, at most, with weak metallic tinges; malar space 0.72–0.86× length of eye	83
83.	Antenna short (Fig. 42b), at most, 1.1× as long as width of mesoscutum	84

-	Antenna at least 1.2× as long as width of mesoscutum, but usually much longer	85
84.	Gaster as long as or slightly longer than mesosoma; hosts: <i>Cassida</i> spp. (Coleoptera: Chrysomelidae)	<i>T. clito</i> (Walker)
-	Gaster as long as head+mesosoma or slightly longer; hosts: <i>Coccinellidae</i> spp. (Coleoptera)	<i>T. epilachnae</i> (Giard)
85.	Distance between submedian grooves 1.7–1.9× the distance between submedian and sublateral grooves (Figs 39b, 45b)	86
-	Distance between submedian grooves 1.0–1.4× the distance between submedian and sublateral grooves	87
86.	Ratio POL/OOL = 2.3	<i>T. bledius</i> sp. n.
-	Ratio POL/OOL = 1.7	<i>T. ennis</i> sp. n.
87.	Scape 0.9× as long as length of eye	88
-	Scape 1.0–1.1× as long as length of eye	90
88.	Antenna (Fig. 40a) with F1 1.8× as long as wide, widths F1/pedicel = 1.1; mesoscutellum with enclosed space between submedian grooves 3.1× as long as wide (Fig. 40b)	<i>T. calcarius</i> sp. n.
-	Antenna with F1 1.3–1.5× as long as wide, widths F1/pedicel = 1.3–1.4; mesoscutellum with enclosed space between submedian grooves 2.6–2.7× as long as wide	89
89.	Mouth opening 1.1× malar space	<i>T. lixalius</i> sp. n.
-	Mouth opening 0.9× malar space	<i>T. pixius</i> sp. n.
90.	Antenna with F3 1.3–1.4× as long as wide	91
-	Antenna with F3 1.7–1.8× as long as wide	93
91.	Malar space 1.1× height of eye; mesoscutellum with enclosed space between submedian grooves 2.8× as long as wide and distance between submedian grooves 1.0× the distance between submedian and sublateral grooves (Fig. 46b)	<i>T. fenrisi</i> sp. n.
-	Malar space 0.7–0.8× height of eye; mesoscutellum with enclosed space between submedian grooves 2.3–2.4× as long as wide and distance between submedian grooves 1.4× the distance between submedian and sublateral grooves	92
92.	Antenna (Fig. 48) longer, F2 1.7× and clava 4.2× as long as wide; POL 1.4× OOL	<i>T. lazius</i> sp. n.
-	Antenna (Fig. 47a) shorter, F2 1.4× and clava 3.7× as long as wide; POL 1.7× OOL	<i>T. ladrus</i> sp. n.
93.	Antenna with clava 4.2× as long as wide (Fig. 41a)	<i>T. clisius</i> sp. n.
-	Antenna with clava 3.8× as long as wide (Fig. 50a)	<i>T. lycus</i> sp. n.

Table 3.

Key to males of European species of *Tetrastichus*.

1.	Frons with a weak median longitudinal carina reaching from between the antennal toruli to not more than half way towards the median ocellus, above this, there is a flat oblong to sublinear scrobal area, defined laterally by sutures which tend to converge ventrally to join the median carina (Fig. 3a); hind coxae strongly reticulate to rugulose on the externo-dorsal surface (Fig. 3c)	2
-	Frons with a more or less distinct median longitudinal carina extending from between the toruli to near the median ocellus, the sutures which define the scrobal area laterally tend to diverge ventrally, away from the median carina (Fig. 3b); hind coxae finely reticulate on the externo-dorsal surface (Fig. 3d)	40
2.	Antennae with each funicular segment with an externo-dorsal, sub-basal compact whorl of long setae, setae attached in a single tight row (Fig. 2e)	3
-	Antennae with funiculars without compact sub-basal whorls of long setae, i.e. with scattered setae throughout (Fig. 2f)	29
3.	Mouth 2.0–2.2× malar space and mandibles large (as in Fig. 3a), with outer tooth falcate and very acute, widely separated from the two small inner teeth which are subacute	4
-	Mouth at most 1.9× malar space, if 2.0× (some specimens of <i>T. coeruleus</i> , then mandibles smaller than in alternate); mandibles relatively smaller, middle tooth usually subobtuse, inner tooth obtuse or almost truncate	5
4.	Body weakly metallic and dull (as in Fig. 66)	<i>T. halidayi</i> (Graham)
-	Body strongly metallic bluish-green (as in Figs 23, 34a, b)	<i>T. cyprus</i> & <i>T. marcusgrahami</i> spp.n. (the males of these species are unknown, this is a tentative placement)
5.	Antennal scape with 10–12 very short setae on its front edge (Fig. 91d)	<i>T. tachos</i> (Walker)
-	Antennal scape with fewer (usually 4–6) moderately long to very long setae on its front edge	6
6.	Scape with ventral plaque only 0.5–0.7× length of scape (Figs 73d, 93c), scape at least slightly longer than an eye and reaching well above the vertex; length of setae on front edge of scape about equal to width of scape; pedicel+flagellum 2x width of mesosoma; head with temples rather distinct, about 0.15× length of eye in dorsal view; head only 2.1–2.25× as broad as long in dorsal view	7

-	Antenna either with ventral plaque of scape relatively longer or, if short ($0.5 \times$ length of scape), then scape not longer than an eye or pedicel+flagellum at most $1.9 \times$ width of mesoscutum; setae on front edge of scape often shorter; head usually with temples very short or extremely short, rarely $0.15 \times$ length of eyes; the head itself usually more transverse	8
7.	Antenna (Fig. 73d) with whorled setae of funiculars not reaching the tip of the segment attached to; length of longest setae on front edge of scape tending to be slightly greater than width of scape	<i>T. legionarius</i> Giraud
-	Antenna (Fig. 93c) with whorled setae of funiculars reaching level with the tip of the segment attached to or slightly beyond tip; length of longest setae on front edge of scape equal to width of scape	<i>T. temporalis</i> (Graham)
8.	Mouth opening $1.5\text{--}2.0 \times$ malar space	9
-	Mouth opening at most $1.4 \times$ malar space, usually distinctly less than this	12
9.	Antenna (Fig. 20f) with length of whorled setae on funiculars about $0.5\text{--}0.7 \times$ the length of the segment attached to; body bright metallic blue to bluish-purple (as in Fig. 20a, b, c)	<i>T. coeruleus</i> (Nees)
-	Antenna with length of whorled setae on funiculars at least $1.2 \times$ the length of the segment attached to; body not so bright metallic	10
10.	Length of whorled setae on funiculars at least $1.4 \times$ the length of the segment attached to (Fig. 86c); F4 $2.0 \times$ as long as wide (Fig. 86c)	<i>T. polyporus</i> Askew
-	Length of whorled setae on funiculars about $1.0\text{--}1.2 \times$ the length of the segment attached to; F4 $1.6\text{--}1.8 \times$ as long as wide	11
11.	Antenna (Figs 70c, 71e) longer, $1.8\text{--}1.9 \times$ as long as width of mesoscutum and F1 $1.8\text{--}1.9 \times$ as long as wide	<i>T. julis</i> (Walker) & <i>T. inscitus</i> sp. n. (males are not possible to separate by morphology)
-	Antenna (Fig. 88f) shorter, $1.4 \times$ as long as width of mesoscutum and F1 $1.5 \times$ as long as wide	<i>T. setifer</i> Thomson
12.	Setae on vertex long (as in Fig. 5c), $0.8\text{--}1.0 \times$ OD; eyes in most species with relatively long and conspicuous pubescence (as in Fig. 7d), length of the setae $0.3\text{--}0.6 \times$ OD; body black with very weak bronze or bluish tints (Figs 4–14)	13
-	Setae on vertex short, $0.3 \times$ OD; eyes with short or very short pubescence, length of the setae at most $0.25 \times$ OD; body sometimes with brighter metallic tints	20
13.	Antenna with pedicel $1.25 \times$ as long as F1, the latter only $1.5 \times$ as long as broad	<i>T. solvae</i> Graham
-	Antennae with pedicel about as long as or shorter than F1; F1 $1.4\text{--}2.0 \times$ as long as broad	14

14.	Submedian grooves of mesoscutellum equidistant from each other and from sublateral grooves (as in Fig. 6a)	<i>T. brachyopae</i> Graham
-	Submedian grooves of mesoscutellum nearer to sublateral grooves than to each other	15
15.	Distance between submedian grooves 2.0× the distance between submedian and sublateral grooves (as in Fig. 14b)	<i>T. tartus</i> sp. n. (the male of this species is unknown, but is tentatively keyed out here)
-	Distance between submedian grooves 1.2–1.7× the distance between submedian and sublateral grooves	16
16.	Antenna (Fig. 11a) with pedicel+flagellum about 1.25× width of mesoscutum; F2–F4 each, at most, 1.6× as long as broad; eyes with very long setae, length about 0.8× OD	<i>T. murcia</i> (Walker)
-	Antenna with pedicel+flagellum 1.48–1.6× width of mesoscutum; F2–F4 each, at least, twice as long as broad; eyes with length of setae 0.30–0.55× OD	17
17.	Clava (incl.spicule) 3.3–4.5× as long as wide	18
-	Clava (incl. spicule) 5.3–6× as long as wide	19
18.	Clava (incl.spicule) 3.3× as long as wide (Fig. 7c); setae on eyes longer (as in Fig. 7d), 0.5× OD	<i>T. dasyops</i> Graham
-	Clava (incl.spicule) 4.3–4.5× as long as wide (Fig. 5d); setae on eyes shorter (as in Fig. 5c), 0.3× OD	<i>T. atratulus</i> (Nees)
19.	Antenna with F4 2.3× and scape 2.9× as long as wide (Fig. 13c)	<i>T. tacitus</i> sp. n.
-	Antenna with F4 2.7× and scape 3.2× as long as wide (Fig. 10c)	<i>T. mixtus</i> sp. n.
20.	Eyes small (as in Fig. 87c), 1.0× as long as malar space; submedian grooves on mesoscutellum converging towards posterior part (as in Fig. 87b)	<i>T. scardiae</i> sp. n.
-	Eyes longer than malar space (1.1–1.2×); submedian grooves on mesoscutellum ± parallel	21
21.	Antenna with length of longest seta on front edge of scape 1.1–1.5× width of scape; C1and C2 each at most 1.7× as long as broad	22
-	Antenna with length of longest seta on front edge of scape less than or hardly as long as width of scape; C1and C2 often relatively longer	23
22.	Mouth about 1.4× malar space; ventral plaque of antennal scape (Fig. 71e) about 0.7× length of scape	<i>T. julis</i> (Walker)
-	Mouth 1.0–1.1× malar space; ventral plaque of antennal scape (Fig. 77f) 0.50–0.55× length of scape	<i>T. lyridice</i> (Walker)
23.	Eyes small, separated by 1.6–1.85× their length; antennal scape as long as or somewhat longer than an eye, reaching above level of vertex	24

-	Eyes larger, separated by 1.35–1.5× their length; antennal scape either not quite as long as an eye or, if as long, then not reaching above level of vertex	25
24.	Antenna with scape about 1.25× length of eye; the whorled dark setae of each funicular segment reach to level of tip of the segment attached to; scape about 2.8× as long as broad; eyes separated by 1.85× their length	<i>T. perkinsorum</i> Graham
-	Antenna (Fig. 69e) with scape 1.14× length to an eye; the whorled setae of each funicular segment reach slightly beyond the tip of the segment attached to; scape 2.4–2.5× as long as broad; eyes separated by 1.6–1.65× their length	<i>T. ilithyia</i> (Walker)
25.	Antenna with whorled setae of funiculars at most just reaching the tip of funicular attached to, scape 2.7–3.2× as long as broad	26
-	Antenna with whorled setae of funiculars reaching slightly beyond the tip of funicular attached to, scape 2.4–2.8× as long as broad	27
26.	Antenna (Fig. 81d) with F1 not or hardly shorter than F2; clava with short spicule	<i>T. miser</i> (Nees)
-	Antenna with F1 distinctly shorter than F2; clava with long spicule	<i>T. sinope</i> (Walker)
27.	Flagellomeres shorter (Fig. 55c), F1 1.5×, F2 1.9×, F3 and F4 each 2.0× as long as wide	<i>T. agonus</i> sp. n.
-	Flagellomeres longer, F1 2.1–2.5×, F2 2.4–2.9×, F3 2.7–3.0×, F4 2.5–2.6× as long as wide	28
28.	Body length 1.8–2.1 mm; antenna (Fig. 56c) with length of longest seta on front edge of scape nearly equal in length to width of scape	<i>T. agrilocidus</i> Graham
-	Body length 1.2–1.8 mm; antenna (Fig. 67c) with length of longest seta on front edge of scape somewhat shorter than width of scape	<i>T. heeringi</i> Delucchi
29.	Mouth opening 1.4–1.6× malar space	<i>T. crioceridis</i> Graham
-	Mouth opening 1.0–1.2× malar space	30
30.	Scape 0.9–1.0× length of eye; scape with ventral plaque 0.6× length of scape; body dull metallic (blue, coppery or green) to non-metallic	31
-	Scape 1.0–1.2× length of eye; scape with ventral plaque 0.7–0.8× length of scape; body bright metallic green or golden-green	33
31.	Antenna (Fig. 8c) with pedicel+flagellum 2.0× as long as width of mesoscutum, F1 to F4 each 2.3–2.4× as long as wide	<i>T. intruitus</i> sp. n.
-	Antenna (Figs 29c, 75d) with pedicel+flagellum 1.6–1.7× as long as width of mesoscutum and F1 1.5–1.6×, F2 1.6–1.9×, F3 and F4 each 1.8–1.9× as long as wide	32
32.	Antenna (Fig. 75d) with scape 2.7× and clava 4.6× as long as wide; head 2.4× as wide as long in dorsal view and 1.4× in frontal view	<i>T. leocrates</i> (Walker)

-	Antenna (Fig. 29c) with scape 3.2× and clava 3.3× as long as wide; head 2.2× as wide as long in dorsal view and 1.2× in frontal view	<i>T. iasi</i> sp. n.
33.	Antennal clava (incl. spicule) 4.9–5.6× as long as wide	34
-	Antennal clava (incl. spicule) 3.3–4.4× as long as wide	36
34.	Antennal scape 2.2× as long as wide (Fig. 22d)	<i>T. cumulus</i> sp. n.
-	Antennal scape 2.7–2.8× as long as wide	35
35.	Antennal clava (incl. spicule) 5.6× and F1 2.5× as long as wide	<i>T. brevicalcar</i> Graham
-	Antennal clava (incl. spicule) 4.9× and F1 1.9× as long as wide (Fig. 32c)	<i>T. incanus</i> sp. n.
36.	Antennal scape 2.4–2.6× as long as wide	37
-	Antennal scape 3.0× as long as wide	38
37.	Antenna (Fig. 15c) with clava (incl. spicule) 4.4×, F1 1.7×, F2–F4 each 2.0–2.2×, scape 2.4× as long as wide	<i>T. argei</i> sp. n.
-	Antenna (Fig. 28c) with clava (incl. spicule) 4.0×, F1 1.4×, F2 1.6×, F3 1.7×, F4 1.8×, scape 2.6× as long as wide	<i>T. hylotomarum</i> (Bouché)
38.	Antenna (Fig. 33c) with F1 1.2× as long as wide; eye length/malar space = 1.25	<i>T. johnnnoyesi</i> sp. n.
-	Antenna with F1 1.6× as long as wide; eye length/malar space = 1.10–1.19	39
39.	Antenna (Fig. 36c) with F2 and F4 each 2.4–2.5× as long as wide	<i>T. sti</i> sp. n.
-	Antenna (Fig. 37c) with F2 2.0× and F4 2.2× as long as wide	<i>T. suecus</i> sp. n.
40.	Scape narrow at apex and with short ventral plaque (Figs 38c, 51c), 0.3–0.4× length of scape	41
-	Scape wide at apex and with long ventral plaque (e.g. Fig. 42e), 0.7–0.9× length of scape	42
41.	Antenna (Fig. 38c) with F1 1.7× as long as pedicel; hind coxa with a strong and sharp carina along posterior margin (as in Fig. 21c)	<i>T. argutus</i> sp. n.
-	Antenna (Fig. 51c) with F1 0.9× as long as pedicel; hind coxa without a strong and sharp carina along posterior margin	<i>T. nymphae</i> sp. n.
42.	Whorled setae on F1 short, 1.1× as long as length of F1	43
-	Whorled setae on F1 1.4–1.8× as long as length of F1	44
43.	Antenna (Fig. 42e): scape with ventral plaque 0.65–0.75× length of scape; pedicel 1.6–1.7× as long as broad; hosts: <i>Cassida</i> spp. (Coleoptera: Chrysomelidae)	<i>T. clito</i> (Walker)
-	Scape with ventral plaque 0.5–0.6× length of scape; pedicel 1.8–1.9× as long as broad; hosts: Coccinellidae spp. (Coleoptera)	<i>T. epilachnae</i> (Giard)
44.	Scape 1.1× as long as an eye and 2.1× as long as wide (Fig. 41c, d)	<i>T. clisius</i> sp. n.
-	Scape 1.3–1.4× as long as an eye and 2.4–2.6× as long as wide	

45.	Antenna (Fig. 49c) with pedicel 1.0× as long as length of F1, scape 2.6× as long as wide	<i>T. lixalius</i> sp. n.
-	Antenna (Fig. 39c) with pedicel 1.2× as long as length of F1, scape 2.4× as long as wide	<i>T. bledius</i> sp. n.

Analysis

Phylogenetic analysis

Of the 93 species, 70 were represented by sequences of at least 500 bp, and the sequences were used for assessing phylogenetic relationships within the genus. The Maximum Likelihood analysis resulted in trees with several distinct clades (Fig. 96), most of which were supported by bootstrap support values of 80% or higher, but only three of them can be defined unequivocally by morphological characters. These are the *Tetrastichus hylotomarum* group, the *T. murcia* group and - albeit with low bootstrap support, the *T. clito* group (Fig. 96).

Species of the *T. clito* group differ from other *Tetrastichus* species in having the frons with a more or less distinct median longitudinal carina that is extending from between the toruli to near the median ocellus, the sutures that define the scrobal area laterally tending to diverge ventrally and the hind coxa having relatively weak sculpture on the outer surface. These characters are shared with other species of the subfamily Tetrastichinae, for example, by species of *Aprostocetus*. Within the *clito* group, there are species with a protruding or a retracted ovipositor, with the latter also occurring in other *Tetrastichus* species, suggesting that it is homoplasious and that the "*T. clito* group" is non-monophyletic. Species of the *T. hylotomarum* group are regarded as monophyletic, despite the disparate placement of *T. brevicalcar* in the tree, because it came out as monophyletic in other tree reconstructions. The group is morphologically characterised by the retracted ovipositor sheaths that do not reach the apex of the gaster, gaster subcircular to short ovate and colour usually strongly metallic. Species of the *T. murcia* group can be recognised by the eyes usually with long, conspicuous pubescence, setae on hind margin of pronotum and adnotaular setae relatively long and suberect, gaster short ovate to subcircular and body black non-metallic or with weak metallic tinges.

The remaining 41, or about half of the 93 species recognised in the current study, were regarded as unplaced with respect to species groups, due to the absence of supporting morphological characters. We refrained from establishing species groups, based on molecular characters. Despite high bootstrap support values of a clade, based on mitochondrial COI providing support for its monophyly, additional markers, in particular from nuclear genes, are needed for the reliable assessment of phylogenetic relationships within the genus *Tetrastichus*.

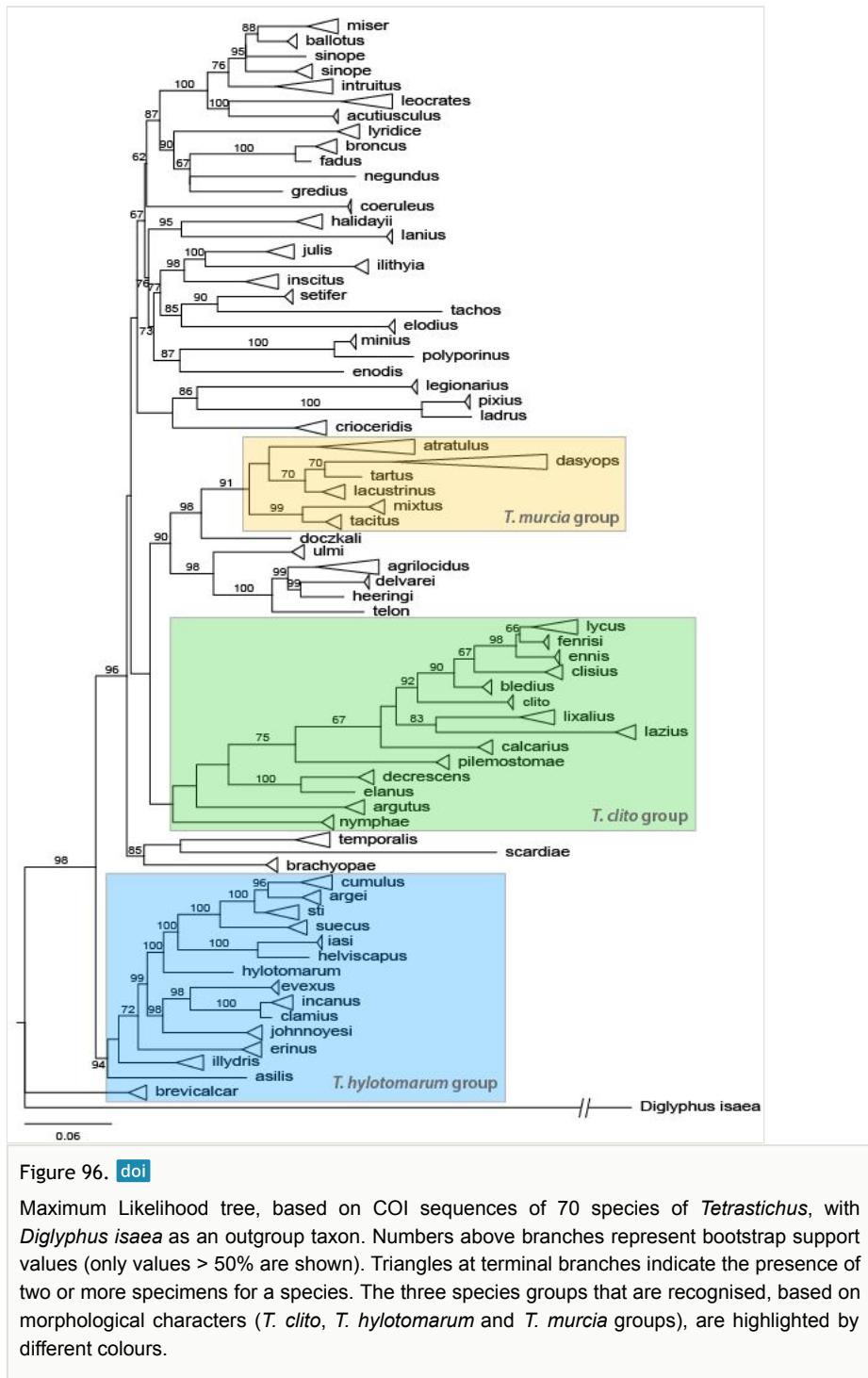


Figure 96. doi

Maximum Likelihood tree, based on COI sequences of 70 species of *Tetrastichus*, with *Diglyphus isaea* as an outgroup taxon. Numbers above branches represent bootstrap support values (only values > 50% are shown). Triangles at terminal branches indicate the presence of two or more specimens for a species. The three species groups that are recognised, based on morphological characters (*T. clito*, *T. hylotomarum* and *T. murcia* groups), are highlighted by different colours.

The present analysis includes only species of the subfamily Tetrastichinae that were traditionally regarded as species of *Tetrastichus*, based on morphological characters. This genus is morphologically much more readily definable than some other genera of Tetrastichinae, in particular compared to the genus *Aprostocetus* that has been used as a "dump" for species that did not seem to fit elsewhere. European species of *Tetrastichus* can, amongst other characters, be recognised by having a single seta on the submarginal vein and by having branched (Y-shaped) carinae laterally on the propodeum. The morphologically-close genera *Quadrastichus* and *Oomyzus* have also one seta on the submarginal vein, but they lack the Y-shaped carina on the propodeum (but may have a simple longitudinal carina laterally). Females of *Oomyzus* differ from *Quadrastichus* by their antennae, with flagellomeres being short in *Oomyzus* and comparatively long in *Quadrastichus*. In *Tetrastichus*, there are species with females having short or long flagellomeres.

Whereas 46 of the 50 (92%) species described as new are associated (and can be identified) with a DNA barcode, from one third (14) of the 43 described species, no sequences could be obtained and their identification had to rely on morphological characters.

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References

- Askew RR (2007) Two new species of Tetrastichinae (Hym., Chalcidoidea, Eulophidae) emerging from bracket fungi. *Entomologist's Monthly Magazine* 143: 233-237.
- Baur H (2001) The Hymenoptera (Chalcidoidea, Ichneumonoidea, Platygastroidea) described by Vittorio Delucchi: an annotated catalogue. *Journal of Natural History* 35 (1): 55-125. <https://doi.org/10.1080/002229301447899>

- Bouček Z (1977) Descriptions of *Tachinobia* gen. n. and three new species of Tetrastichinae (Hymenoptera: Eulophidae), with a tentative key to genera. Bulletin of Entomological Research 67: 17-30. <https://doi.org/10.1017/S0007485300010853>
- Bouček Z (1988) Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. CAB International, 832 pp. [ISBN 0-85198-607-2]
- Bouché PF (1834) Naturgeschichte der Insekten, besonders in Hinsicht ihrer ersten Zustände als Larven und Puppen. Berlin : Nicolai
- Burks BD (1943) The North American parasitic wasps of the genus *Tetrastichus* - a contribution to biological control of insect pests. Proceedings of the United States National Museum 93 (3170). <https://doi.org/10.5479/si.00963801.93-3170.505>
- Crawford JC (1909) Two new species of the genus *Tetrastichus*. Proceedings of the Entomological Society of Washington 11 (3).
- Delucchi V (1954) Neue chalcidier aus der Familie Eulophidae (mit einer Wiederbeschreibung von *Tetrastichus agrilorum* Ratz.). Mitteilungen der Schweizerischen Entomologischen Gesellschaft 27.
- deWaard J, Ivanova N, Hajibabaei M, Hebert PN (2008) Assembling DNA barcodes. Environmental Genomics 275-294. https://doi.org/10.1007/978-1-59745-548-0_15
- Domenichini G (1966) Tetrastichinae (Hymenoptera Eulophidae) palearctici ed i loro ospiti. Bollettino di Zoologia agraria e di Bachicoltura (Serie 2) 6: 61-205.
- Duan J, Oppel C, Ulyshen M, Bauer L, LeLito J (2011) Biology and life history of *Tetrastichus planipennisi* (Hymenoptera: Eulophidae), a larval endoparasitoid of the emerald ash borer (Coleoptera: Buprestidae). Florida Entomologist 94 (4): 933-940. <https://doi.org/10.1653/024.094.0430>
- Dufour L (1846) Description des galles de *Verbascum* et de *Scrophularia* et des insectes, qui l'habitent, pour servir à l'histoire du parasitisme. Annales des Sciences Naturelles (3) 5: 4-24.
- Edgar R (2004) MUSCLE: multiple sequence alignment with high accuracy and high throughput. Nucleic Acids Research 32 (5): 1792-1797. <https://doi.org/10.1093/nar/gkh340>
- Erdős J (1954) Eulophidae hungaricae indescriptae. Naturales Musei Nationalis Hungarici (Series Nova) 5: 323-366.
- Erdős J (1956) Gezogene und Gesammelte neue Zehrwespen aus Ungarn. Acta Agronomica, Academiae Scientiarum Hungaricae 6: 375-392.
- Förster A (1856) Hymenopterologische Studien. 2. Chalcidiae und Proctotrupii. Aachen
- Giard A (1896) Retard dans l'évolution déterminé par anhydrobiose chez un Hymenoptera chalcidien (*Lygellus epilachnae* n. gen. n.sp.). Comptes Rendus des Séances de la Société de Biologie, Paris (10) 3.
- Giraud J (1863) Mémoire sur les insectes qui vivent sur le roseau commun, *Phragmites communis* Trin. (*Arundo phragmites* L.) et plus spécialement sur ceux de l'orde des Hyménoptères. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien. 13: 1251-1288.
- Gold M, Casagrande R, Tewksbury L, Livingston S, Kenis M (2001) European parasitoids of *Lilioceris lilii* (Coleoptera: Chrysomelidae). The Canadian Entomologist 133 (5): 671-674. <https://doi.org/10.4039/Ent133671-5>

- Graham MWRdV (1961) The genus *Aprostocetus* Westwood sensu lato (Hym., Eulophidae) notes on the synonymy of European species. Entomologist's Monthly Magazine 97: 34-64.
- Graham MWRdV (1983) A new species of *Tetrastichus* Haliday (Hymenoptera: Eulophidae), a parasite of the asparagus beetle *Crioceris duodecimpunctata* (L.). Entomologist's Gazette 34: 275-277.
- Graham MWRdV (1987) A reclassification of the European Tetrastichinae (Hymenoptera: Eulophidae), with a revision of certain genera. Bulletin of The British Museum (Natural History) Entomology 55 (1): 1-392.
- Graham MWRdV (1991) A reclassification of the European Tetrastichinae (Hymenoptera: Eulophidae): Revision of the remaining genera. Memoirs of the American Entomological Institute 49: 1-322.
- Haliday A (1844) Contributions towards the classification of the Chalcididae. Transactions of the Entomological Society of London. Royal Entomological Society of London. 3: 295-301.
- Hebert PDN, Ratnasingham S, deWaard JR (2003) Barcoding animal life: cytochrome c oxidase subunit 1 divergences among closely related species. Proceedings of the Royal Society of London Series B Biological Sciences 270 <https://doi.org/10.1098/rsbl.2003.0025>
- Hedqvist K (2003) Katalog över svenska Chalcidoidea . Entomologisk Tidskrift 124: 73-133.
- Hoang DT, Chernomor O, von Haeseler A, Minh BQ, Vinh LS (2018) UFBoot2: Improving the Ultrafast Bootstrap Approximation. Molecular Biology and Evolution 35 (2): 518-522. <https://doi.org/10.1093/molbev/msx281>
- International Commission of Zoological Nomenclature (1999) International code of zoological nomenclature : Code international de nomenclature zoologique. 4th ed. International Trust for Zoological Nomenclature, c/o Natural History Museum, London.
- International Commission on Zoological Nomenclature (1965) *Tetrastichus* Walker, 1842 (Insecta, Hymenoptera): suppressed under the Plenary Powers. In: International Commission on Zoological Nomenclature (Ed.) The Bulletin of Zoological Nomenclature. 22. 26-27 pp.
- Ivanova N, Dewaard J, Hebert PN (2006) An inexpensive, automation-friendly protocol for recovering high-quality DNA: Tecynchnical note. Molecular Ecology Notes 6 (4): 998-1002. <https://doi.org/10.1111/j.1471-8286.2006.01428.x>
- Johannsen O (1922) Stratiomyiid larvae and puparia of the North Eastern States. Journal of the New York Entomological Society 30 (4): 141-153.
- Kalyaanamoorthy S, Minh BQ, Wong TKF, von Haeseler A, Jermiin LS (2017) ModelFinder: fast model selection for accurate phylogenetic estimates. Nature Methods 14 (6): 587-589. <https://doi.org/10.1038/nmeth.4285>
- Kenis M, Haye T, Casagrande RA, Gold MS, Tewksbury LA (2002) Selection and importation of European parasitoids for the biological control of the lily leaf beetle in North America, and prospects for control in Europe. Proceedings of the 1st International Symposium on Biological Control of Arthropods, Honolulu, Hawaii, 14-18 January 2002.
- Kimura M (1980) A simple method for estimating evolutionary rates of base substitutions through comparative studies of nucleotide sequences. Journal of Molecular Evolution 16 (2): 111-120. <https://doi.org/10.1007/BF01731581>

- Kostjukov V (1977) A comparative morphology of chalcids of the subfamily Tetrastichinae and the system of the genus *Tetrastichus* Haliday, 1844 (Hymenoptera, Eulophidae). Entomologicheskoe Obozreniye 56: 177-194.
- Kurdjumov N (1913) Notes on Tetrastichini (Hymenoptera, Chalcidoidea). Russkoe Entomologicheskoe Obozrenie 13 (2): 243-256.
- LaSalle J, Gauld ID (1991) Parasitic Hymenoptera and the biodiversity crisis. Redia 74 (3, Appendix): 315-334.
- LaSalle J, Gauld ID (Eds) (1993) Hymenoptera and Biodiversity. CABI Publishing
- LaSalle J (1994) North American genera of Tetrastichinae (Hymenoptera: Eulophidae). Journal of Natural History 28 (1): 109-236. <https://doi.org/10.1080/00222939400770091>
- Minh BQ, Schmidt HA, Chernomor O, Schrempf D, Woodhams MD, von Haeseler A, Lanfear R (2020) IQ-TREE 2: New models and efficient methods for phylogenetic inference in the genomic era. Molecular Biology and Evolution 37 (5): 1530-1534. <https://doi.org/10.1093/molbev/msaa015>
- Nees von Esenbeck CGD (1834) Hymenopterorum ichneumonibus affinium monographiae, genera Europaea et species illustrantes. Scripsit Christ. Godofr. Nees ab Esenbeck. J.G. Cottae, Stuttgartiae.
- Noyes J (2004) Encyrtidae of Costa Rica (Hymenoptera:Chalcidoidea), 2: *Metaphycus* and related genera, parasitoids of scale insects (Coccoidea) and whiteflies (Aleyrodidae). American Entomological Institute, Gainesville, Fla.
- Noyes JS (2020) Universal Chalcidoidea Database. World Wide Web electronic publication. <http://www.nhm.ac.uk/chalcidoids>. Accessed on: 2020-3-15.
- Peck O (1963) A catalogue of the Nearctic Chalcidoidea (Insecta: Hymenoptera). Memoirs of the Entomological Society of Canada 95 (S30): 5-1092. <https://doi.org/10.4039/entm9530fv>
- Ratnasingham S, Hebert PDN (2013) A DNA-based registry for all animal species: the barcode index number (BIN) system. PLOS One 8 (7): e66213. <https://doi.org/10.1371/journal.pone.0066213>
- Ratzeburg JTC (1848) Die Ichneumonen der Forstinsecten in forstlicher und entomologischer Beziehung. Nicolaische Buchhandlung, Berlin.
- Ratzeburg JTC (1852) Die Ichneumonen der Forstinsecten in forstlicher und entomologischer Beziehung. Nicolaische Buchhandlung, Berlin.
- Suvak M, Gregorek R, Pluchtova M (2012) Actual and potential role of parasitoids (Hymenoptera: Eulophidae) in control of water-lily beetle *Galerucella nymphaeae* (Coleoptera: Chrysomelidae) in conditions of Botanical Garden of P.J. Safarik University in Kosice (Slovakia). Thaiszia Journal of Botany 22 (2): 217-242.
- Szelenyi G (1940) A lucernaböde (*Subcoccinella vigintiquattropunctata* L.) és élősködője: *Tetrastichus jablonowskii* n. sp. Növényegészségügyi Évkönyv 1: 83-88. [In Hungarian].
- Thomson CG (1878) Hymenoptera Scandinaviae. Typis expressit H. Ohlsson, Lundae.
- Van Alphen JJ (1980) Aspects of the foraging behaviour of *Tetrastichus asparagi* Crawford and *Tetrastichus* spec. (Eulophidae), gregarious egg parasitoids of the Asparagus Beetles *Crioceris asparagi* L. and *C. duodecimpunctata* L. (Chrysomelidae). Netherlands Journal of Zoology 30 (2): 307-325. <https://doi.org/10.1163/002829679x00430>

- van Eck A, Heitmans W, Polaszek A (2016) *Tetrastichus brachyopae* (Hymenoptera: Eulophidae) new to the Netherlands, reared from *Brachyopa* larvae (Diptera: Syrphidae). Entomologische Berichten 76: 226-230.
- Walker F (1839a) Monographia Chalciditum. London, 333 pp.
- Walker F (1839b) Descriptions of British Chalcidites. Annals of Natural History 2: 350-355. <https://doi.org/10.1080/00222933909512398>
- Walker F (1839c) Descriptions of British Chalcidites. Annals of Natural History 3: 177-182. <https://doi.org/10.1080/03745483909443218>
- Walker F (1839d) Descriptions of British Chalcidites. Annals of Natural History 3: 415-419. <https://doi.org/10.1080/03745483909443254>
- Walker F (1840) Descriptions of British Chalcidites. Annals of Natural History 4: 29-32. <https://doi.org/10.1080/00222934009512449>
- Walker F (1842) Descriptions of Chalcidites discovered by C. Darwin near Valparaiso and Valdivia. Annals of Natural History 10: 113-117. <https://doi.org/10.1080/03745484209445206>
- Walker F (1846) List of the specimens of the hymenopterous insects in collection of the British Museum. Part 1. Printed by order of the Trustees, London.
- Walker F (1848) List of the specimens of the hymenopterous insects in collection of the British Museum. Part 2. Printed by order of the Trustees, London.
- Walker F (1872) Notes on Chalcidiae. Part VII. London