



**Conker  
Tree  
Science**

## A guide to identifying species of pest controller

Note: to take part in **Conker Tree Science**, you don't need to identify the species of pest controller by using this guide. As described in the instructions for **Mission: Pest Controllers**, all you need to do is identify insects as alien moths, pest controllers and others. However, if you like a challenge, use this guide and have a go.

There are many different types of 'pest controller' (technically known as parasitoids) that prey upon the larvae of the horse-chestnut leaf miner (scientific name: *Cameraria ohridella*). These parasitoids are 'endoparasitic' on the leaf miner larva, that is, they live inside the larva. However, many of these species can also be 'secondary parasitoids' which feed upon parasitoid larvae living inside the leaf-miner larva.

Identifying the species of parasitoid is a challenging task that usually requires experience and a good microscope or hand lens. For those people who would like to try, we have provided an illustrated key to the different species of parasitoid that might be encountered from *C. ohridella* in the UK. It is not possible to identify all specimens emerging from horse-chestnut leaves by using this key, as some insects emerge from eggs or larvae that are not associated with the leaf-miners (some, but not all of these are included in the key). You may also find parasitoids on the horse-chestnut leaf miner that have not previously been recorded on that host. However, most species you find will be included here.

The key was produced by and the photographs taken by Andrew Polaszek (Natural History Museum). The key and photographs are reproduced with permission from our article in *British Wildlife*. See the full article for more information about the life history of the parasitoids.

Michael Pocock, Darren Evans, Nigel Straw & Andrew Polaszek (2011) The horse-chestnut leaf-miner and its parasitoids. *British Wildlife* Vol. 22 Number 5 June 2011 p. 305-313. <http://www.britishwildlife.com/>

To use the key, start with clause 1 and work through it carefully. Each clause requires you to make a decision. Each decision results in either the number of a clause to go to next, or a species or genus name. Once you get to a name, check the photograph to see if your identification looks correct, and look at the percentages to see how common your species or genus is in our sample.

We would welcome receiving records of identified specimens. Records can be submitted via [www.ourweboflife.org.uk](http://www.ourweboflife.org.uk) (for parasitoids reared during the Mission: pest controllers) or by email to [conker-science@bristol.ac.uk](mailto:conker-science@bristol.ac.uk) (for parasitoids reared at other times).

## A key to the parasitoids of *Cameraria ohridella*

(Values after the species name refer to their proportional abundance in our samples.)

1. Fore wing without any cells or veins.....	Platygastridae
(emerging from fly puparia, not from <i>Cameraria</i> . About 1% of the parasitoids we reared were <i>Leptacis</i> sp. from this family. <i>Leptacis</i> sp. has distinctively segmented, long antennae and swollen tips to its tibiae. In our study they were probably parasitizing Cecidomyiidae fly hosts.)	
- Fore wing at least with some veins (figs 1-16).....	2
2. Fore wing with more than 2 cells (figs 1-3).....	3
- Fore wing with no cells (figs 4-16).....	5
3. Fore wing with 2 cells adjacent to the large frontal triangular cell (arrowed in fig 1).....	
.....	<i>Colastes braconius</i> (1%)
- Fore wing with 1 cell adjacent to the large frontal triangular cell (arrowed in figs 2-3).....	4
4. Hind wing with vein (abscissa of Cu – arrowed in fig. 2) short.....	<i>Itopectis alternans</i> (0%)
- Hind wing with vein (abscissa of Cu – arrowed in fig. 3) long.....	<i>Scambus signatus</i> (1%)
5. Tarsi 5 segmented (arrowed in fig 4).....	6
- Tarsi 4 segmented (arrowed in fig 15).....	7
6. Notauli absent or very faint (fig. 4).....	<i>Pteromalus semotus</i> (0%)
Notauli (arrowed in fig 5) very clearly developed.....	<i>Eupelmus urozonus</i> (0%)
7. Submarginal vein (arrowed in figs 8, 9, 11) with 2-4 setae (hairs).....	8
- Submarginal vein (arrowed in figs 12 & 14) with more than 5 setae (hairs).....	13
8. Submarginal vein with 2 setae.....	9
- Submarginal vein with 3 or 4 setae.....	12
9. Fore wing with 3 dark bands (fig. 6).....	<i>Closterocerus trifasciatus</i> (1%)
- Fore wing without 3 dark bands (figs 7, 8).....	10
10. Propodeum with distinct ridges (arrowed in fig. 7).....	<i>Pediobius saulius</i> (0%)
- Propodeum without distinct ridges (fig. 8).....	11
11. Antennal club 3-segmented (fig. 8); postmarginal vein as long as stigmal vein. (The marginal wing vein branches distally to form the postmarginal vein, along the leading edge of the wing, and the stigmal vein that projects into the wing membrane.).....	<i>Neochrysocharis chlorogaster</i> (1%)
- Antennal club 2-segmented (fig. 9); postmarginal vein 2x as long as stigmal vein.....	<i>Chrysocharis</i> spp (4%)
12. Mesoscutum with a central longitudinal furrow (carina, fig. 10).....	<i>Baryscapus nigroviolaceus</i> (0%)
- Mesoscutum without a central longitudinal furrow (carina, fig. 11).....	<i>Minotetrastichus frontalis</i> (56%)
13. Mesoscutum with complete notaulae (arrowed in figs 12-13).....	14
- Mesoscutum without complete notaulae.....	15
14. Mesosoma (“thorax”) with contrasting pale and dark regions (e.g. fig. 12).....	<i>Cirrospilus</i> spp (7%)
- Mesosoma (“thorax”) completely dark (fig. 13).....	<i>Elachertus inunctus</i> (0%)
15. Costal cell of fore wing very narrow (arrowed in fig. 14).....	<i>Hemiptarsenus ornatus</i> (0%)
- Costal cell of fore wing wider (figs 15-16).....	16
16. Propodeum with ridges on the sides (arrowed in fig. 15).....	<i>Pnigalio</i> spp (21%)
- Propodeum without ridges on the sides (fig. 16).....	<i>Sympiesis sericeicornis</i> (10%)

### Notes

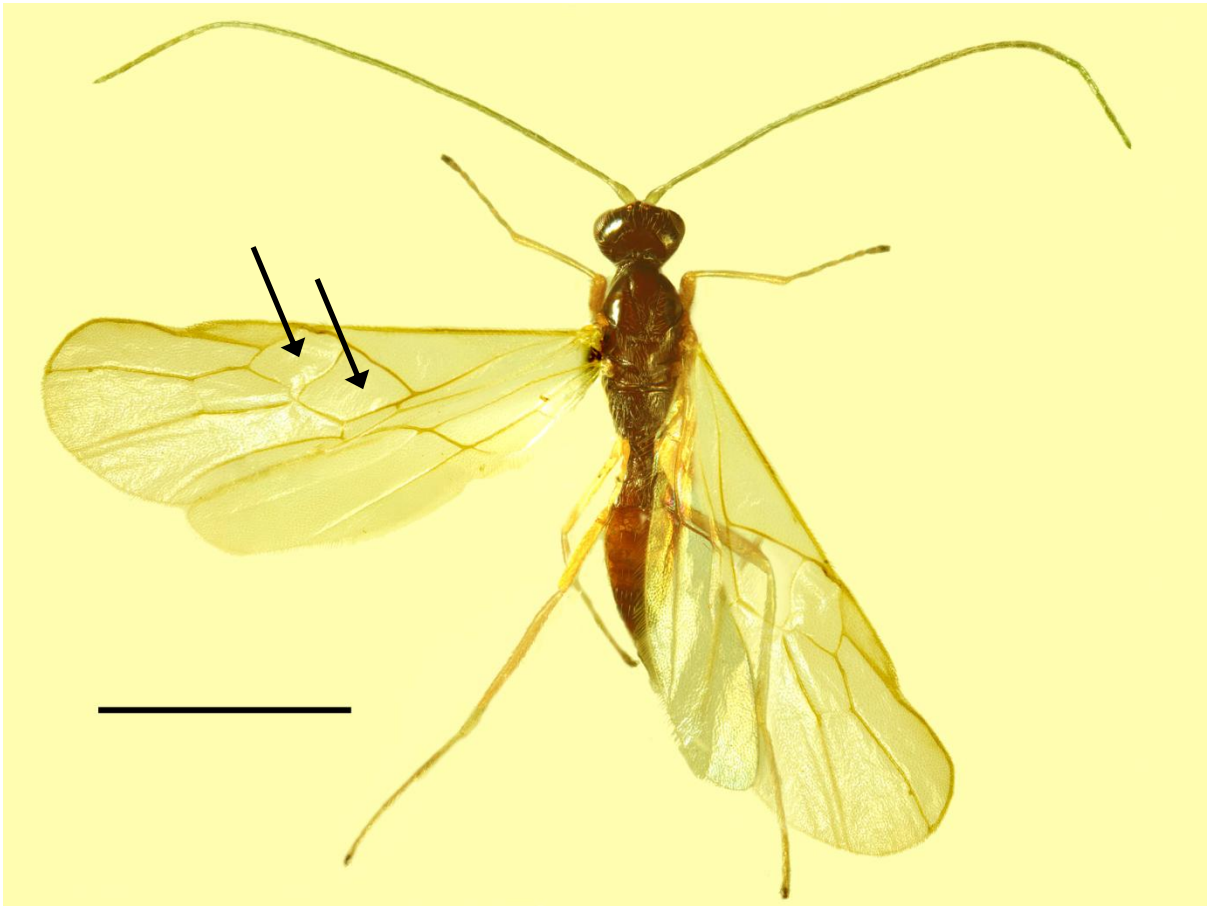
Five species of *Chrysocharis* have been recorded from *C. ohridella* but require analysis of their DNA for accurate identification.

Three species of *Cirrospilus* have been recorded from *C. ohridella* in the UK. They can be distinguished on patterns of light and dark on their mesosoma (“thorax”): *C. vittatus* (5%) has dark longitudinal stripes on its pale mesosoma. *C. diallus* (1%) has a more or less uniformly dark, metallic mesosoma with pale spots at the side. *C. pictus* (1%) has a dark, metallic mesosoma with a pale band across the middle.

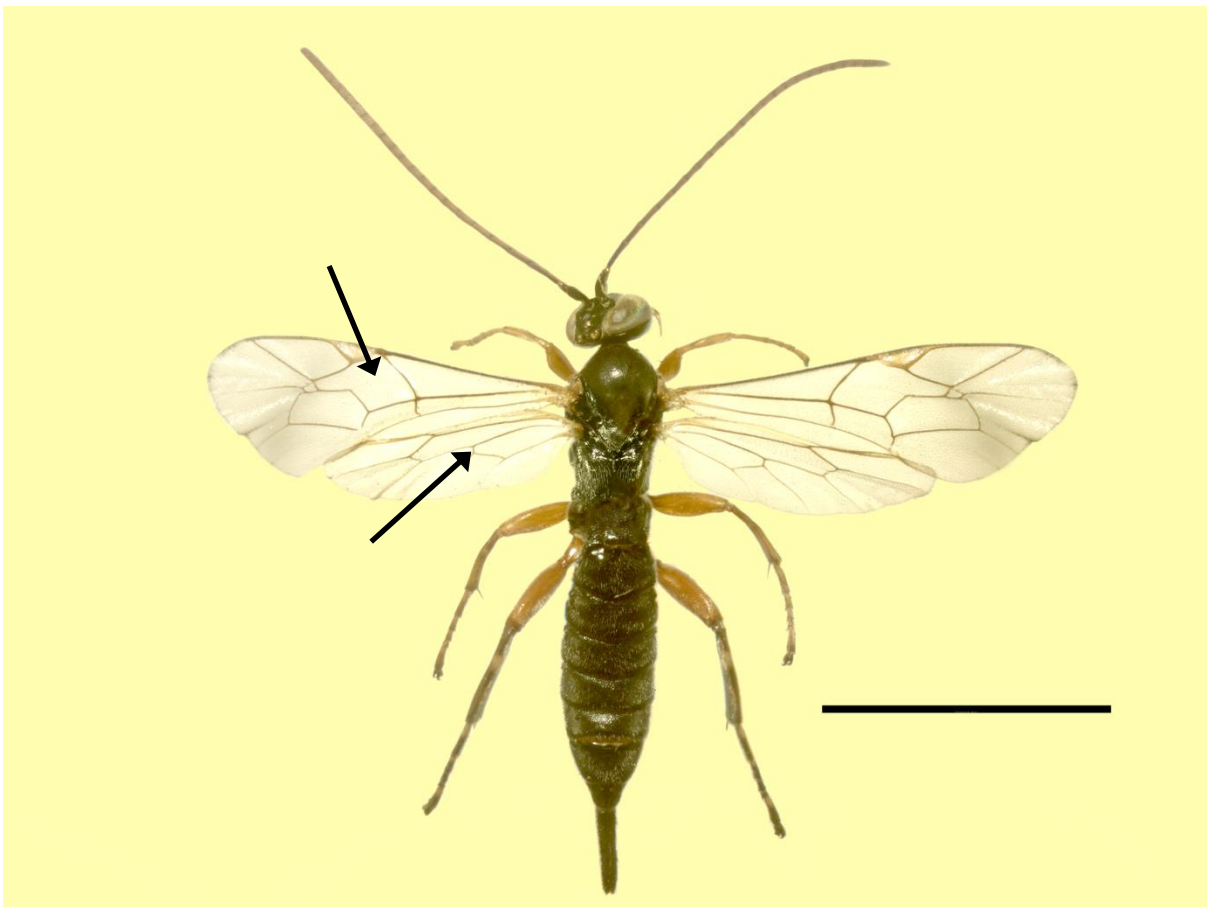
Two species of *Pnigalio* have been recorded from *C. ohridella* from the UK. *P. mediterraneus* (17%) has the three basal segments of the hind tarsi whitish, contrasting with the well-defined dark distal segments (looking like black shoes). *Pnigalio soemius* (4%) has pale brownish (never white) tarsi that gradually darken distally.

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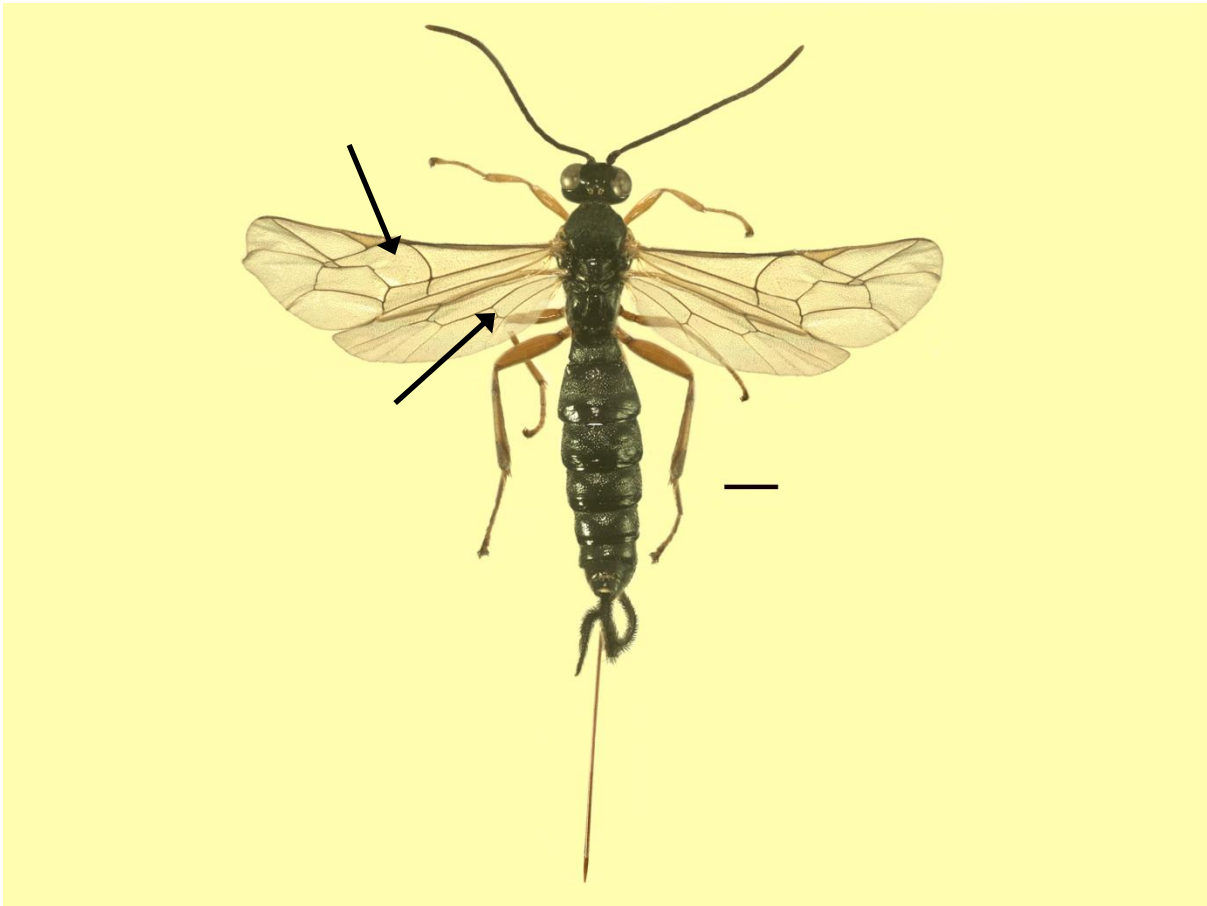
<http://www.britishwildlife.com/>



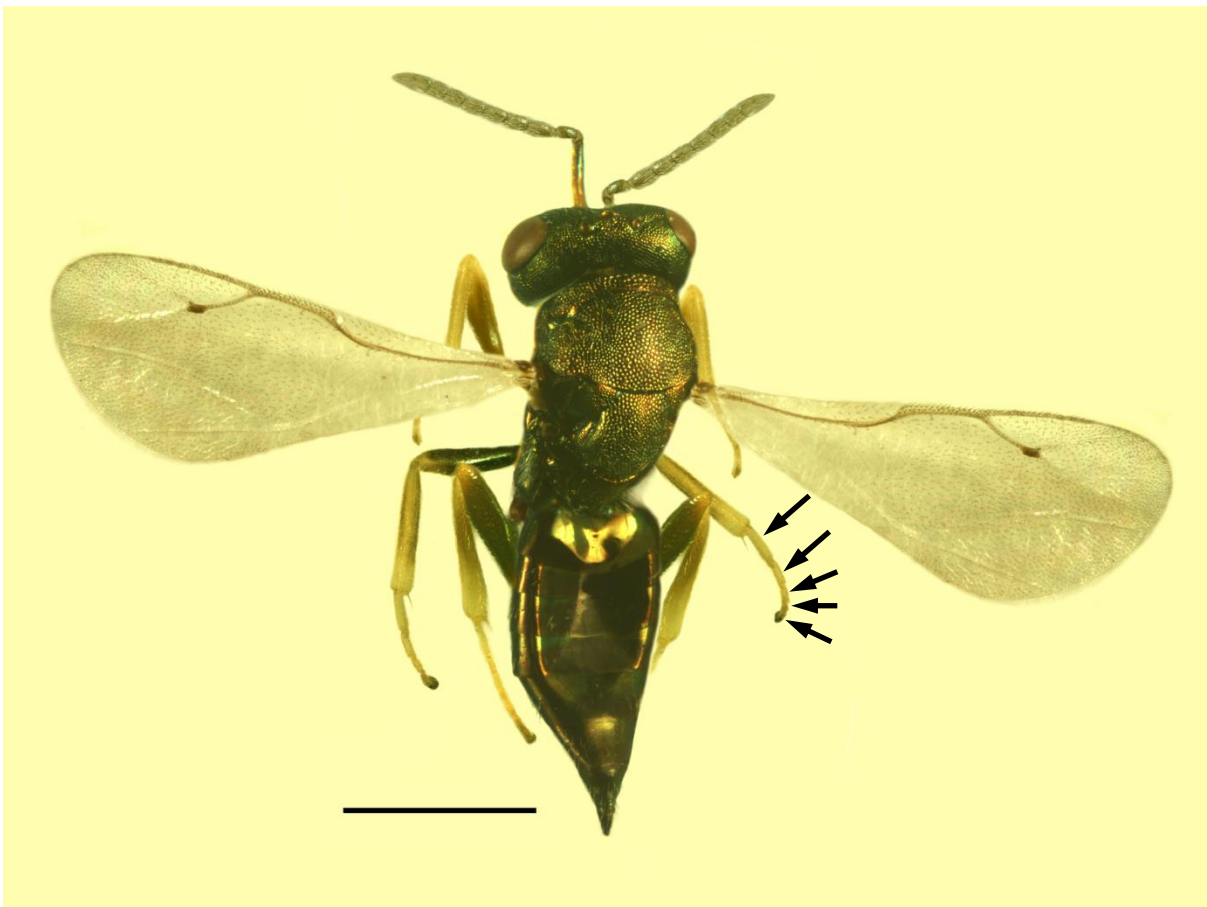
**Fig. 1.** *Colastes braconius* (scale bar = 1mm)



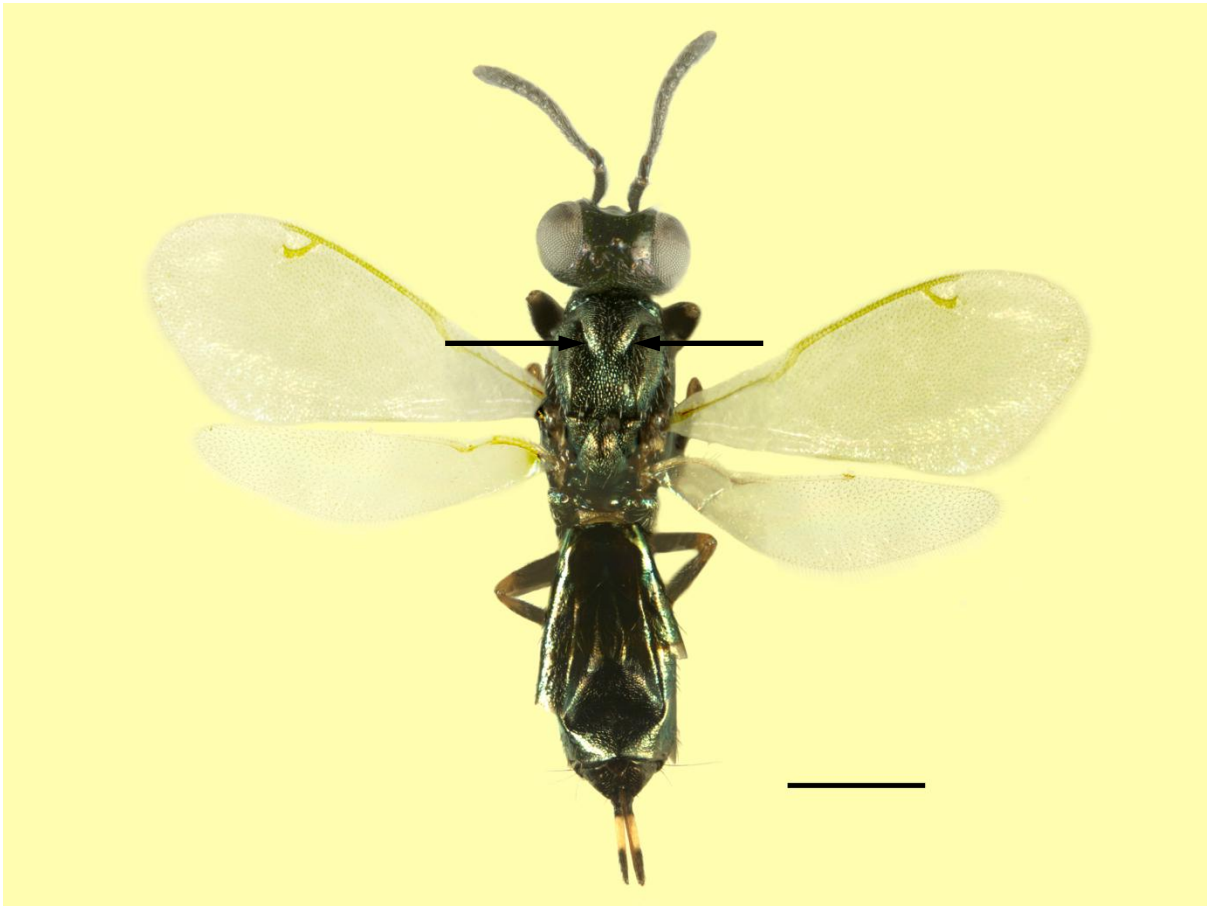
**Fig. 2.** *Itopectis alternans* (scale bar = 5mm)



**Fig. 3.** *Scambus inanis* (scale bar = 1mm)



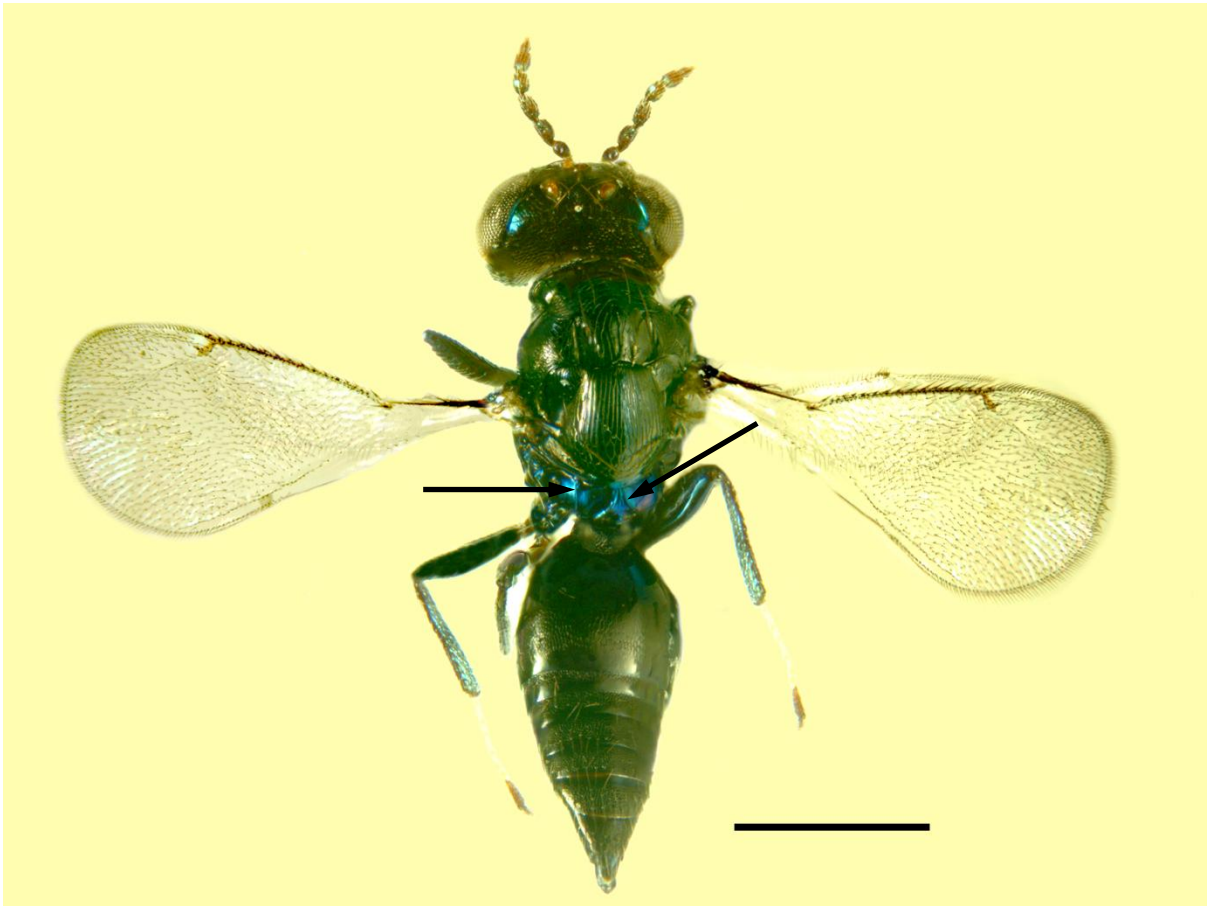
**Fig. 4.** *Pteromalus semotus* (scale bar = 1mm)



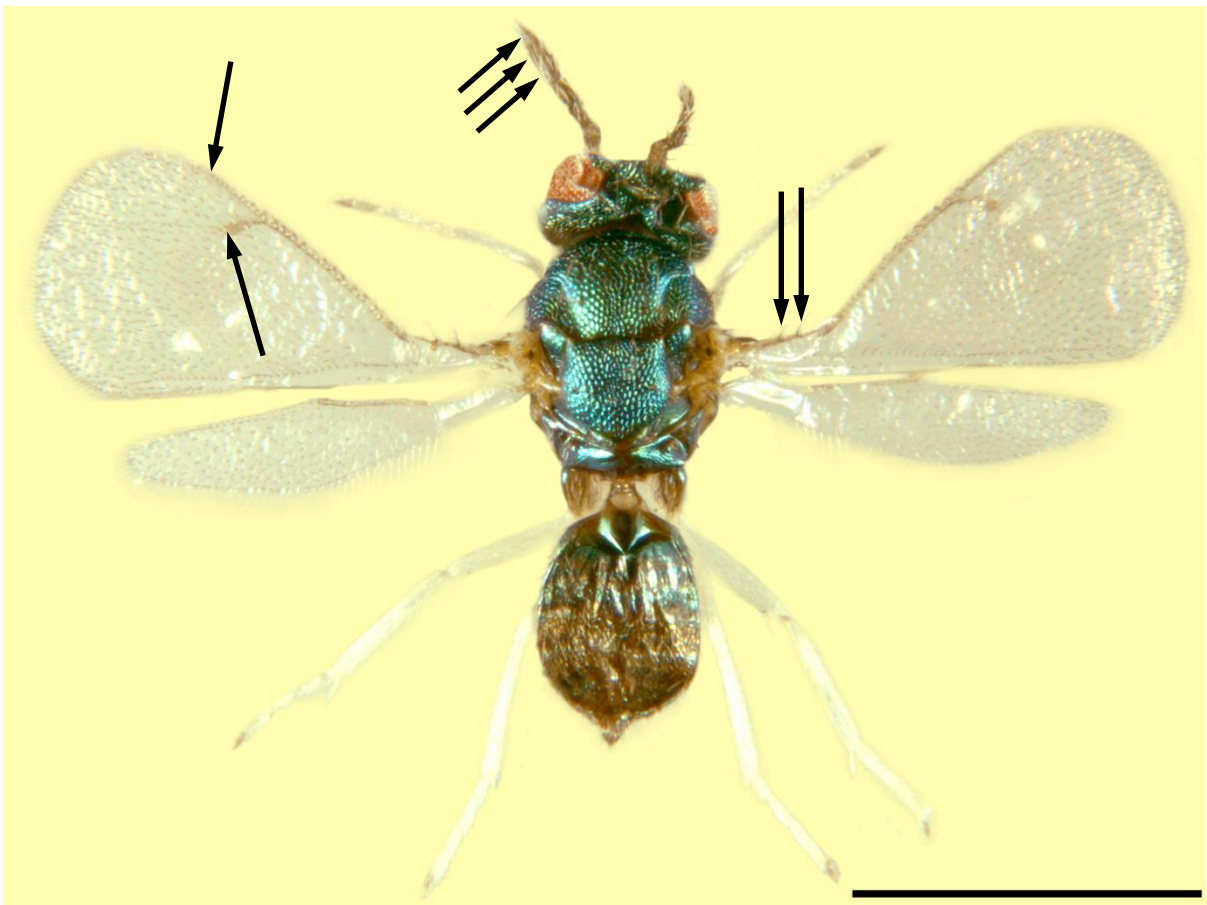
**Fig. 5.** *Eupelmus urozonus* (scale bar = 0.5mm)



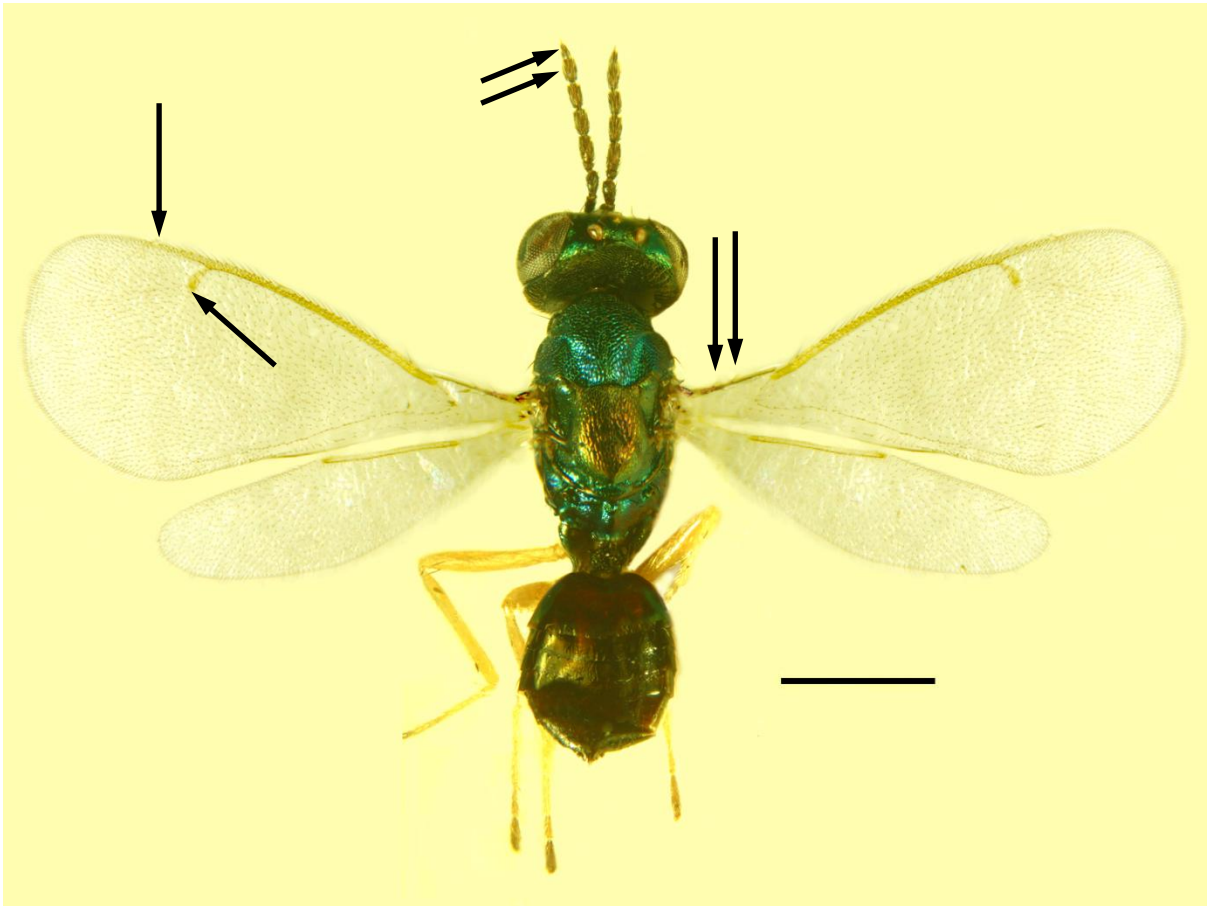
**Fig. 6.** *Closterocerus trifasciatus* (scale bar = 0.5mm)



**Fig. 7.** *Pediobius saulius* (scale bar = 0.5mm)



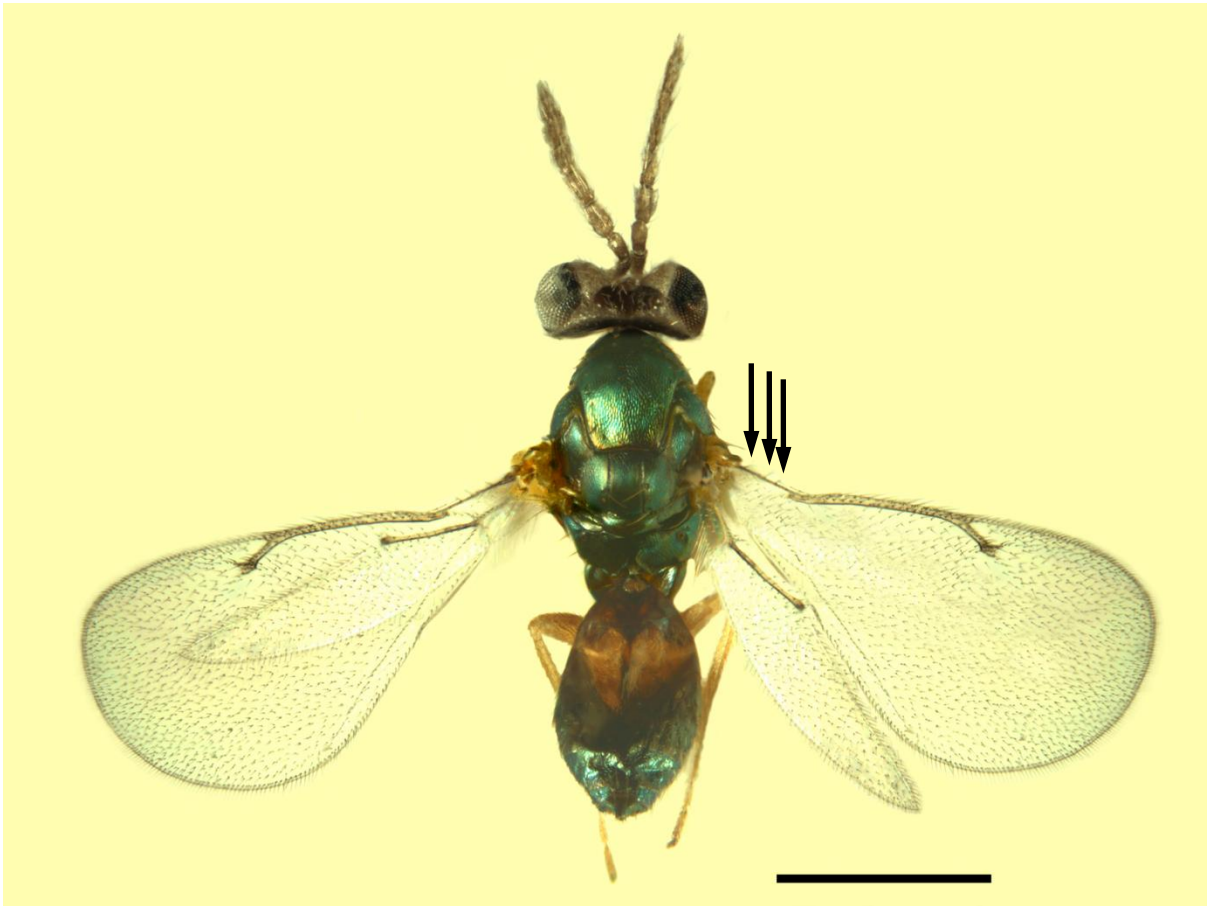
**Fig. 8.** *Neochrysocharis chlorogaster* (scale bar = 0.5mm)



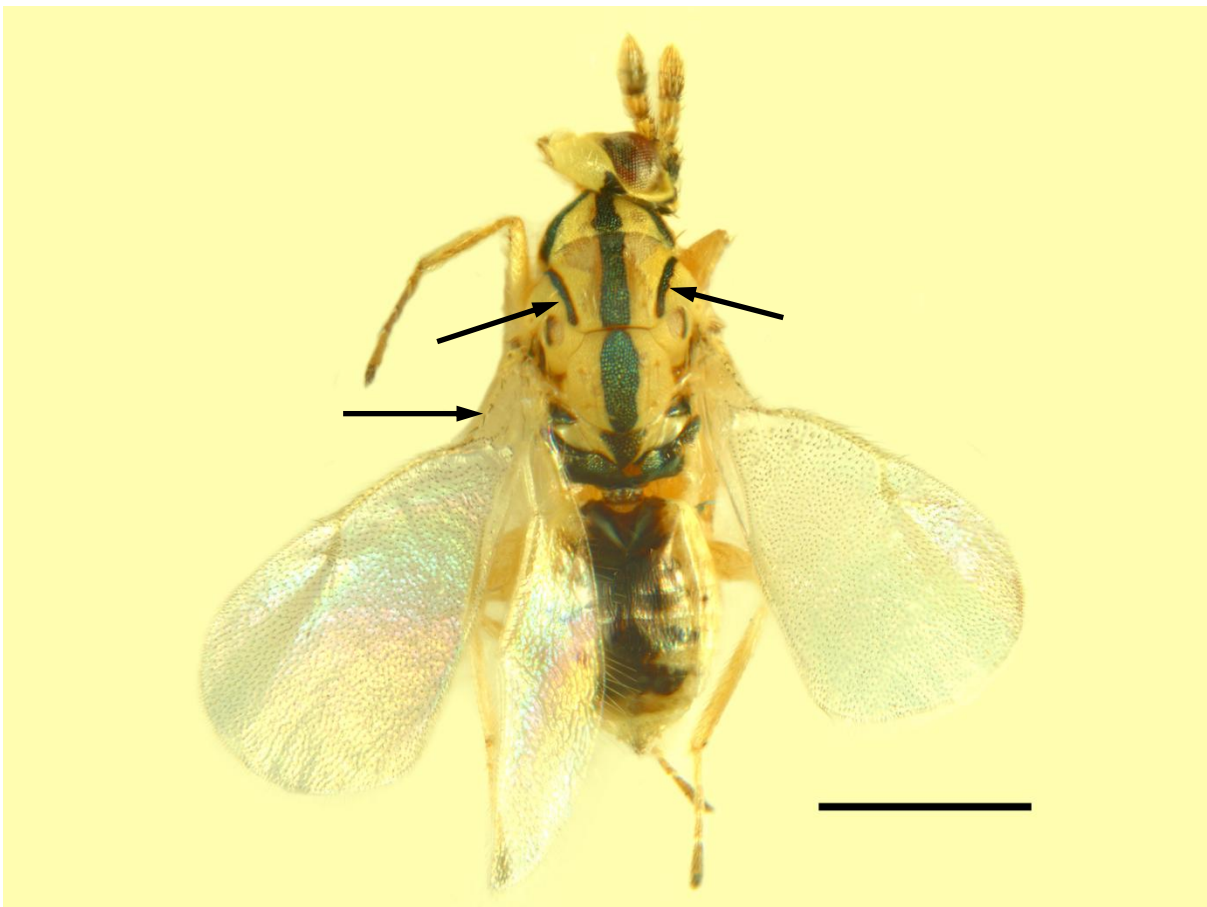
**Fig. 9.** *Chrysocharis phryne* (scale bar = 0.5mm)



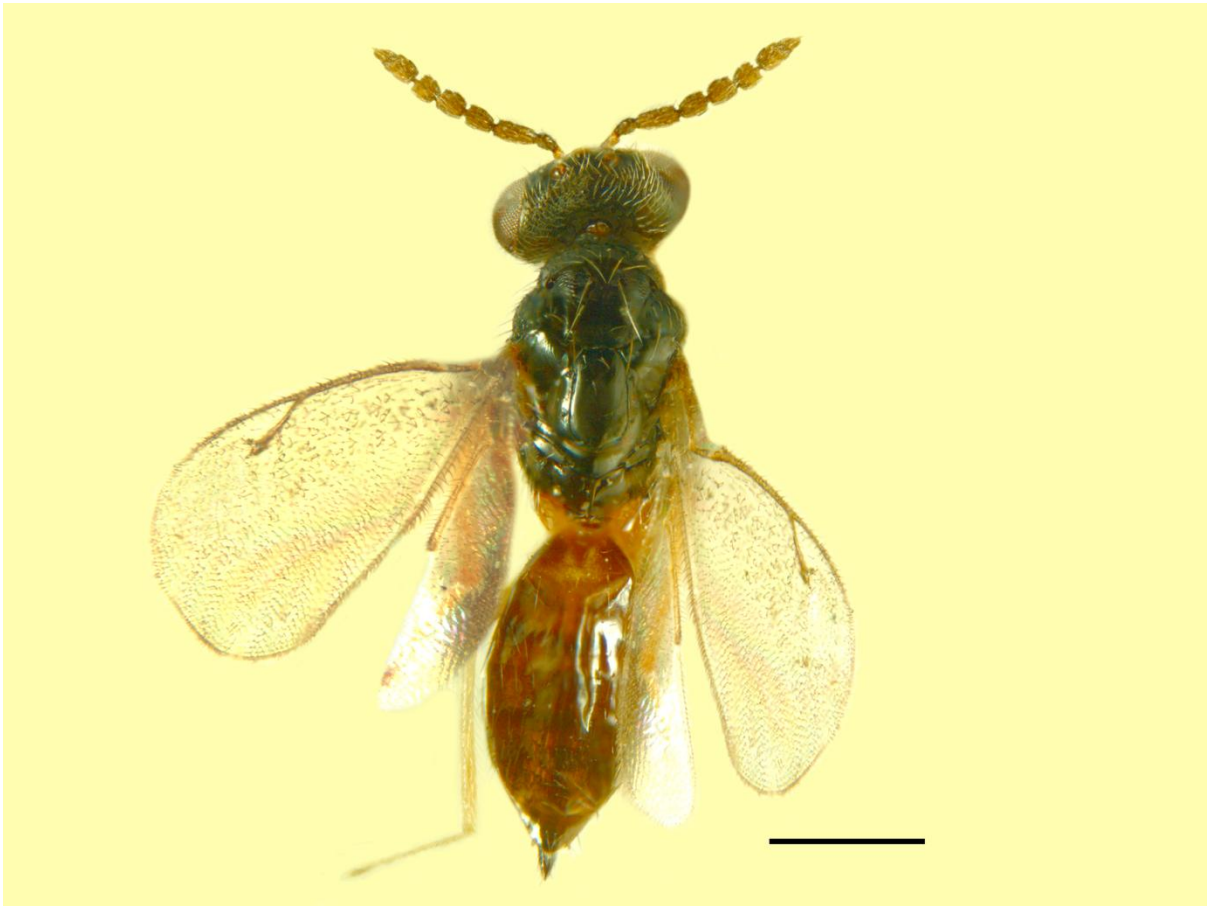
**Fig. 10.** *Baryscapus nigroviolaceus* (scale bar = 0.5mm)



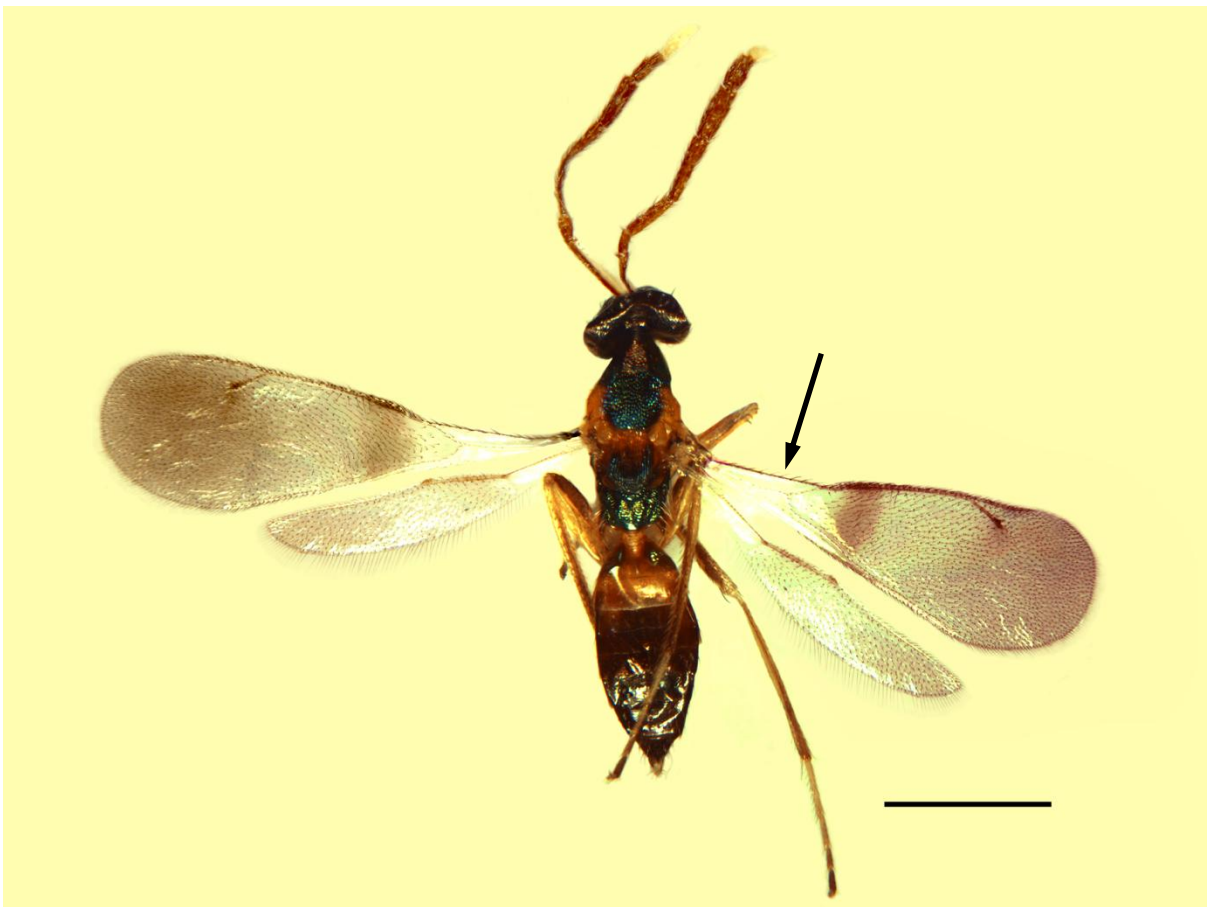
**Fig. 11.** *Minotetrastichus frontalis* (scale bar = 0.5mm)



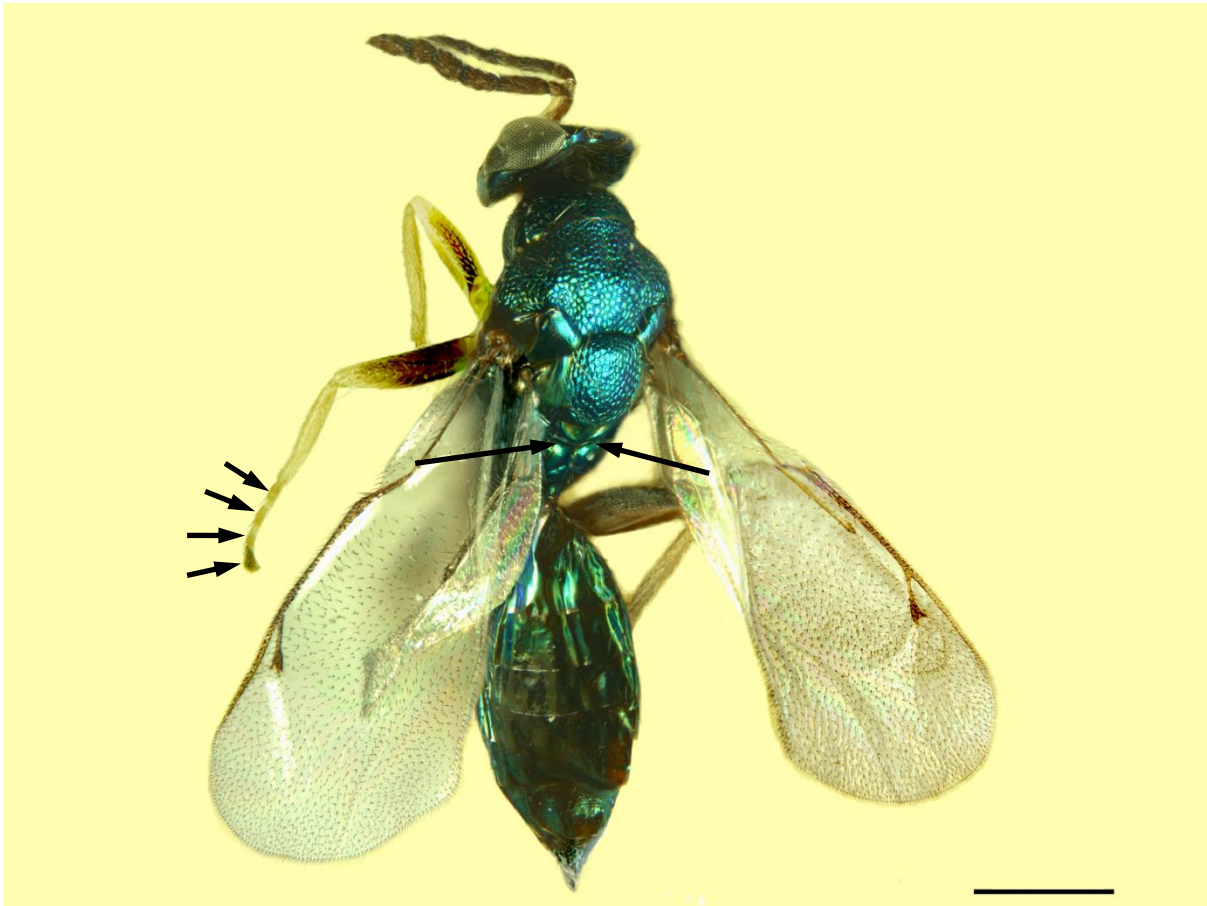
**Fig. 12.** *Cirrospilus vitattus* (scale bar = 0.5mm)



**Fig. 13.** *Elachertus inunctus* (scale bar = 0.5mm)



**Fig. 14.** *Hemiptarsenus ornatus* (scale bar = 0.5mm)



**Fig. 15.** *Phigalio mediterraneus* (scale bar = 0.5mm)



**Fig. 16.** *Sympiesis sericeicornis* (scale bar = 0.5mm)