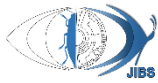


Original Article 

Primary fauna associated with galls of *Andricus synophri* (Hymenoptera: Cynipidae, Chalcidoidea) in Iran, with the description of *Synergus tavakolii* sp. nov.

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ABSTRACT. Three species of inquiline cynipids and 11 parasitoids associated with galls of the asexual form of *Andricus synophri* Pujade-Villar, Tavakoli & Melika, 2015 are cited for the first time. The inquiline species *Synergus tavakolii* Pujade-Villar **sp. nov.** (Hymenoptera: Cynipidae, Synergini) is described. *Bootanomyia onuri* Doganlar, 2011 (Hymenoptera: Chalcidoidea, Megastigmidae) is reported for the first time in Iran, and *Baryscapus anasillus* Graham, 1991 (Hymenoptera: Chalcidoidea, Eulophidae) for the first time in Asia. A key for *Synergus* Hartig, 1840 species belonging to Section II of Mayr without pronotal carina is provided. The characters to differentiate *Sycophila biguttata* (Swederus, 1795) and *S. variegata* (Curtis, 1831) are discussed.

KEYWORDS: Gall wasps, Oak forest, *Ceroptres*, Synergini, parasitoid

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INTRODUCTION

The collection and preservation of galls in insectaries reveal that the inducing species is not the only occupant present. A whole array of extraordinarily diverse fauna interacts with them to varying degrees. In fact, arthropod galls support a rich associated community of organisms that find shelter, refuge, and food within them (Pujade-Villar 2013). This is why they are considered ecological "hotspots" (Askew 1980, 1984), especially those of cynipids and gall mites, due to their greater complexity. Although various organisms can benefit from galls, we can distinguish three main groups of organisms associated with them: gall inducers, primary fauna (directly related to the gall or its inhabitants through an obligate trophic relationship), and secondary fauna (comprising organisms that use the galls without any trophic relationship or without a rigid trophic structure).

In oak galls, the primary fauna consists of inquilines (Cynipidae: tribes Synergini and Ceroptresini, and other organisms) and parasitoids (various families of Hymenoptera: Chalcidoidea). Inquilines are organisms that live off the tissues of the gall formed by the inducer. They are incapable of producing galls by themselves, although they can sometimes abort gall growth, modify its typical shape, or induce the formation of new internal tissue structures (Lobato-Vila et al. 2022). Within this group, various species of cynipids (Synergini, Ceroptresini), flies (Cecidomyiidae), butterflies (Lepidoptera), and beetles (Coleoptera) can be considered gall inquilines. The presence of an inquiline can cause the death of the gall's host organism directly (by competing for the food source) or indirectly (by collapsing the larval chamber due to the large number of larvae present). In other cases, the presence of inquilines does not harm the host organism at all, resulting in perfect coexistence. In this case, the inquiline is able

to establish itself in the peripheral tissue of the gall and create its own feeding tissue (as in the case of cynipids, for example). Parasitoids are organisms that, in their larval stage, feed directly on the inhabitants of the gall, causing their death. The adult parasitoid is free-living. Parasitoids are classified as primary when they directly attack the host organism or an inquiline, and as secondary, tertiary, etc., when they attack another parasitoid or the parasitoid of another parasitoid, etc. Complex trophic networks have been established in numerous galls, linking inducers, inquilines, parasitoids, and hyperparasitoids (Askew et al. 2013). In oak galls, all parasitoids belong to various families of chalcidoid wasps. Each gall-infested species is associated with a specific group of parasitoids (Askew et al. 2006a, 2013).

This study mentions for the first time the primary fauna (inquilines and parasitoids) that emerged from a species of cynipid associated with oaks of the *Cerris* section in Iran: *Andricus synophri* Pujade-Villar, Tavakoli & Melika, 2015. This inducer gall wasp was described in Pujade-Villar et al. (2015) when collecting galls presumably belonging to *Synophrus olivieri* Kieffer, 1898; the galls of *A. synophri* resemble those of *S. olivieri* and were thought to be galls of *Synophrus* Hartig, 1843 till adult wasps were reared. It is one of the few documented cases in the Palearctic where galls of different species (in this case, of different genera) can be confused.

MATERIAL AND METHODS

The fauna was obtained from *Andricus synophri* galls collected on *Quercus brantii* Lindl. and *Q. libani* Olivier (section *Cerris*), by Dr. Majid Tavakoli in Lorestan province (Iran) during 2011–2012. The galls were preserved in emergence boxes, and the adults that emerged were preserved in 70% ethanol for subsequent morphological study. The specimens were sent to the University of Barcelona for study. Part of the material was prepared on entomological cards for identification, and part is presented in vials in alcohol. The SEM pictures were made by the first author at Barcelona University using a FEI Quanta 200 ESEM[®] field-emission gun environmental scanning electron microscope, with low-resolution imaging without gold-coating specimens. The optical images (Figs 6 & 7) were made directly with the camera of the Android Redmi mobile phone through the eyepiece of a Nikon[®] SMZ-1 stereomicroscope. Figures 5B–D were taken with a Canon[®] EOS Rebel T7 camera adapted to a digital microscope stand; multiple image stacking was performed using EOS Utility Ver. 3.13, and subsequent image processing was achieved with Helicon Focus 8.2.16. Finally, Figure 5A was taken with a CMEX[®] PRO5 camera associated with a Zeiss[®] microscope (AXIO Sscope.A1). Inquiline wasps were identified under a Nikon SMZ-1 stereomicroscope using taxonomic keys (Pujade-Villar & Nieves-Aldrey 1993; Pujade Villar et al. 2003; Melika 2006) and descriptions of new species by Sadeghi et al. (2006). Parasitoids have been identified with an unpublished key carried out by Dr. R.R. Askew to Palearctic parasitoids associated with oak galls, the revision of Eurytominae and Decatominae by Zerova (1995), and Megastigminae by Doğanlar (2011). Also, all Iranian fauna manuscripts that cited species of the oak gall parasitoid families have been consulted for distribution. For each identified species, we provide the material examined, a brief diagnosis to aid recognition, the biology (associated galls), the distribution in Iran, and, if necessary, some additional comments.

The symbol 'ö' refers to the asexual generation and '♀♂' the sexual generation in cynipid species. The measurements and abbreviations used here include: F1–F12, referring to the first and subsequent flagellomeres; T3–T5 for the third to fifth metasomal tergite; POL (postocellar distance), the distance between the inner margins of the posterior ocelli; OOL (ocellar-ocular distance), the distance from the outer edge of a posterior ocellus to the inner margin of the compound eye; LOL (lateral-frontal ocelli distance), the distance between the lateral and frontal ocelli. The width of the radial cell of the forewing was measured from the wing margin to the Rs vein.

RESULTS

We identified a total of 14 species associated with *A. synophri* galls, three species of inquilines (Cynipidae) belonging to the tribes Ceroptresini (1) and Synergini (2), and 11 species of parasitoids

(Chalcidoidea) belonging to the families Eulophidae (1), Eurytomidae (6), Megastigmidae (1), Ormyridae (1) and Pteromalidae (2). Data for each species are presented in alphabetical order, first inquilines and second parasitoids.

Class Insecta Linnaeus, 1785

Order Hymenoptera Linnaeus, 1785

Superfamily Cynipoidea Billberg, 1820

Family Cynipidae Billberg, 1820

Subfamily Cynipinae Billberg, 1820

Tribe Ceroptresini Nieves-Aldrey, Nylander & Ronquist, 2015

Genus *Ceroptres* Hartig, 1840

***Ceroptres clavicornis* Hartig, 1840**

Material examined. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 1♀, (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 8, *Q. brantii*, (summer-2012) xi-2012: 1♀; Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 2♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 1♀.

This species is characterized by having two vertical carinae on lower face distinct prolong entire length, mesopleuron entirely smooth and shining and prominent part of ventral spine of hypopygium less than 2.0× as long as broad.

Species mentioned by Tavakoli et al. (2021) from West Azarbaijan and Kermanshah provinces associated with four *Andricus* Hartig, 1840 species belonging to the asexual generation: *A. stonei* Melika, Tavakoli & Sadeghi, 2006, *A. infectorius* (Hartig, 1843), *A. polycerus* (Giraud, 1859), and *A. tomentosus* (Trotter, 1901).

Tribe Synergini Ashmead, 1896

Genus *Synergus* Harting, 1840

***Synergus acsi* Melika & Pujade-Villar, 2006**

Material examined. Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 8, *Q. brantii*, (summer-2012) autumn-2012: 21♂♂ & 13♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 9♂♂ & 22♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) autumn-2012: 1♂ (M. Tavakoli leg.).

This species is characterized by having head trapezoid in frontal view, head and mesosoma reddish brown, vertex and between ocelli and occiput coriaceous with few indistinct punctures, OOL slightly longer than the diameter of lateral ocellus, pronotum laterally with delicate striae (especially in posterodorsal part), lateral pronotal carina absent, notauli complete, medial mesoscutal line present (reaching at least 1/3 of the scutum length), mesoscutellar foveae indistinctly delimited posteriorly, radial cell short (at most 2.4× as long as broad), metasomal tergite 2+3 with punctures posteriorly and F1 1.5–1.7 times as long as F2.

From Iran, this species was recorded for the first time along the Caspian seashore (Sadeghi et al. 2006). Later, Tavakoli et al. (2021) reported it from West Azarbaijan, Kordestan, Kermanshah, Lorestan, and Mazandaran provinces. It is associated with cynipid galls on oaks of the section *Cerris*. In Iran, it is reared from galls of *Andricus ceconii* Kieffer, 1901, *Pseudoneuroterus lanuginosus* (Giraud, 1859), and *Aphelonyx persica* Melika, Stone, Sadeghi & Pujade-Villar, 2004. *Synergus acsi* belongs to the group of *Synergus* Hartig, 1840 species lacking a posterior band of punctures on the fused tergites 2+3 (Section II Mayr). Only four species of *Synergus* belonging to Section II have no pronotal carina in the Western Palaearctic area, all of which are associated with oaks of the *Cerris* section. Three of them can be found in Iran (marked with * in the key), and they can be differentiated using the following dichotomous key:

- 1 Radial cell open on margin, punctuation upper face and frontal carinae always obsolete.
..... *S. plagiostrochi* Nieves-Aldrey & Pujade-Villar
- Radial cell closed; punctuation on upper face and frontal carina present.2
- 2 Head and mesosoma partially reddish brown (rarely metasoma black), medial mesoscutal line reaching at least 1/3 of the scutum length, mesoscutellar foveae indistinctly delimited posteriorly, radial cell short (at most 2.4× as long as broad). *S. acsi* Melika & Pujade-Villar*
- Head and mesosoma with different color, medial scutal line in a form of short triangle posteriorly or absent, mesoscutellar foveae distinctly delimited posteriorly, radial cell longer (around 3.0× as long as broad).3
- 3 Head and mesosoma light brown un both sexes, head rounded in front view; OOL equal to the diameter of lateral ocellus, POL nearly 2.0–2.2× as long as OOL, metasoma light brown; pronotum laterally with very delicate striae, notauli complete reaching pronotum (deeper and more distinct in the posterior 2/3); mesoscutellar foveae with delicate wrinkles on the bottom; metasomal fused terga 2+3 with a patch of micropunctures only posterodorsally, F1 of male 1.5–1.6× as long as F2.
..... *S. palmirae* Melika & Pujade-Villar*
- Head or mesosoma or both black to very dark brown, head transverse in front view; OOL 1.8–2.0× as long as diameter of lateral ocellus, POL 1.3–1.5× as long as OOL, metasoma usually black or very dark brown, pronotum laterally coriaceous without striae, notauli incomplete (reaching 3/4 of scutum length); mesoscutellar foveae smooth; metasomal fused terga 2+3 without micropunctures posterodorsally; F1 of male 2.5× as long as F2. *S. variabilis* Mayr*

***Synergus tavakolii* Pujade-Villar sp. nov.**

<https://zoobank.org/urn:lsid:zoobank.org:act:21646DD8-5DE0-4ADB-90D5-76B331D80F04>

[Figs 1–5]

Type material. HOLOTYPE ♀, deposited in Col. JP-V (UB) with the following labels: “Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012, (M. Tavakoli leg.)” (white label), Holotype *Synergus tavakolii* n. sp. ♀, desig. JP-V, 2026 (red label). **PARATYPES:** 20♂♂ & 19♀♀ with the same data as the holotype.

Additional material. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 3♂♂ (M. Tavakoli leg.); Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 1♂ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 1♂ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 6, *Q. brantii*, (summer-2012) autumn-2012: 1♂ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 7, *Q. brantii*, (summer-2012) autumn-2012: 1♂ & 3♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 10, *Q. brantii*, (summer-2012) autumn-2012: 1♂ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 13♂♂ & 11♀♀ (M. Tavakoli leg.).

Diagnosis (Figs 1, 3, 4). The new species belongs to section I (*sensu* Mayr) by having metasomal tergites 2+3 with a band of punctuation extending for at least 1/4 length of fused tergites and reaching ventral edge of tergite. *Synergus tavakolii* sp. nov. is closely related to *S. hayneanus* (Ratzeburg, 1833) by having the radial cell short (around 2.0× as long as broad), Rs strongly curved, F1 of males slightly curved in the middle and weakly expanded distally and apically. *Synergus tavakolii* sp. nov. differs from *S. hayneanus* by having incomplete lateral frontal carina (strongly raised and reaching lateral ocelli in *S. hayneanus*), frons coriaceous with disperse weak points (strongly punctuated and with rugae in *S. hayneanus*), short medial line of mesoscutum (extending posteriorly 2/3 or more of dorsal length of fused tergites 2+3 in *S. hayneanus*), and short apical band of micropunctures in metasoma (extending dorsally 1/3–1/2 length of fused tergites 2+3 in *S. hayneanus*).

Description. — Body length 1.6–3.1 mm (one specimen 1 mm).

Color (Fig. 5). Head black with a more or less extensive reddish area on the face that can reach the gena, antenna dirty dark brown. Mesosoma black, legs dark brown, coxae and femora brown, femur I–II and tibiae I–II yellow or partially yellow. Metasoma dark brown, darker dorsally, lighter ventrally, hypopygium always lighter. Wing veins pale.

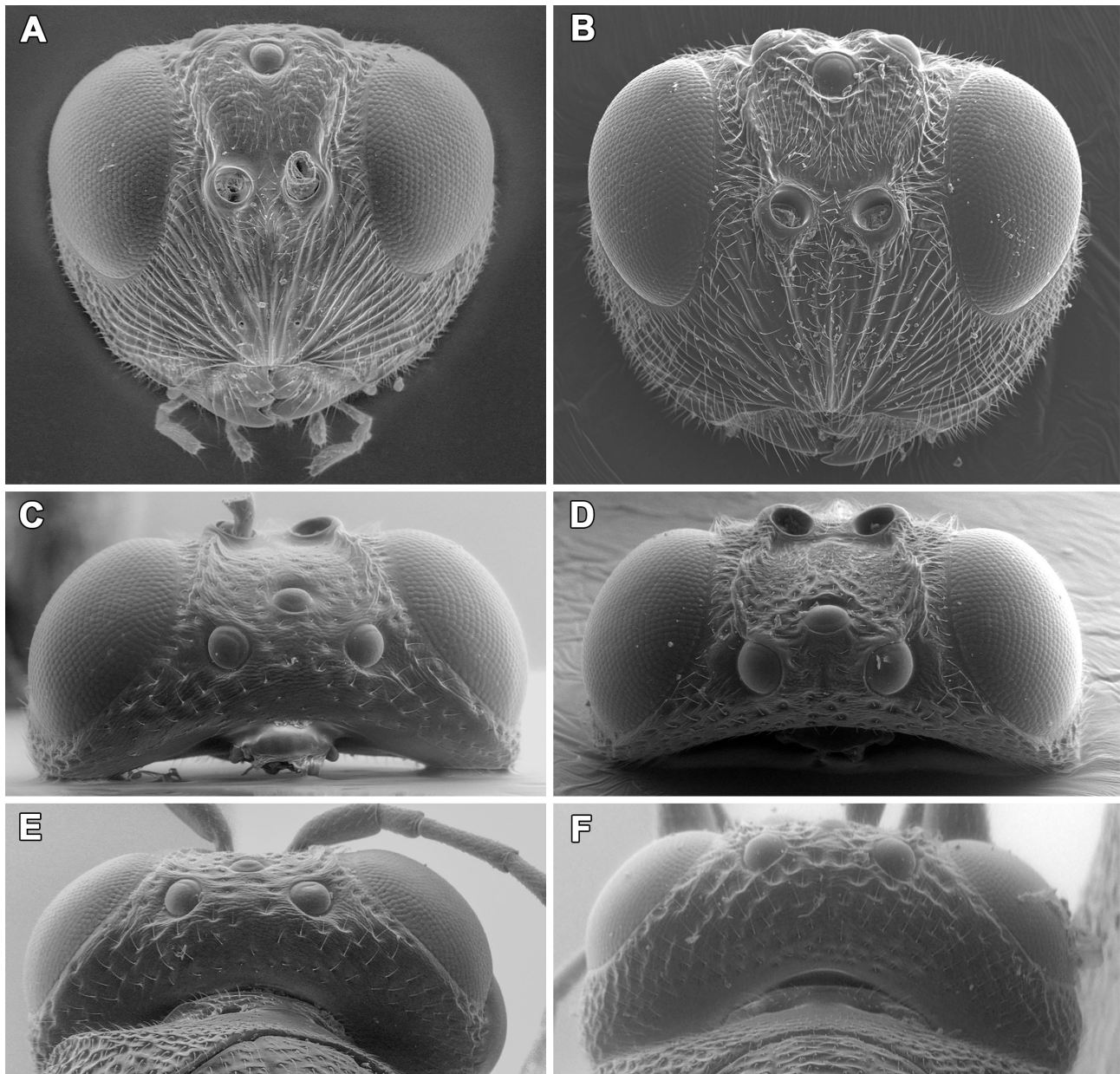


Figure 1. A, C, E. *Synergus tavakolii* sp. nov; B, D, F. *S. hayneanus*; A, B. Head, in frontal view; C, D. Head, in dorsal view; E, F. Head in posterodorsal view.

Head (Figs 1A, 1C, 1E). Slightly triangular, not transverse in front view, 1.2× as high as broad, with sparse white setae; 1.8–1.9× as broad as long from above; 2.0–2.1× as broad as long and as broad as mesosoma. Gena coriaceous with some punctures and rugae, not broadened behind eye, converging ventrally. Malar space with strong striae radiating from clypeus and reaching eye, around 0.5× as long as height of eye. POL 2.6–2.7× as long as OOL; OOL slightly shorter than diameter of lateral ocellus and shorter than LOL. Transfacial distance slightly shorter than height of eye (around 0.9×); diameter of antennal torulus 1.6× as large as distance between them and distance between torulus and eye margin. Lower face including median elevated area with striae radiating from ventral margin of clypeus and reaching eye and antennal sockets, median carina present but not raised above striae from lateral view. Clypeus hardly separable from lower face, its limits indicated by anterior tentorial pits, with epistomal sulcus and clypeopleurostomal line absent; ventrally clypeus straight. Frons coriaceous, with some scattered and superficial punctures, lateral frontal carina present, incomplete, slightly raised and not reaching lateral ocelli; vertex, interocellar area and occiput uniformly coriaceous, with some scattered and superficial punctures.

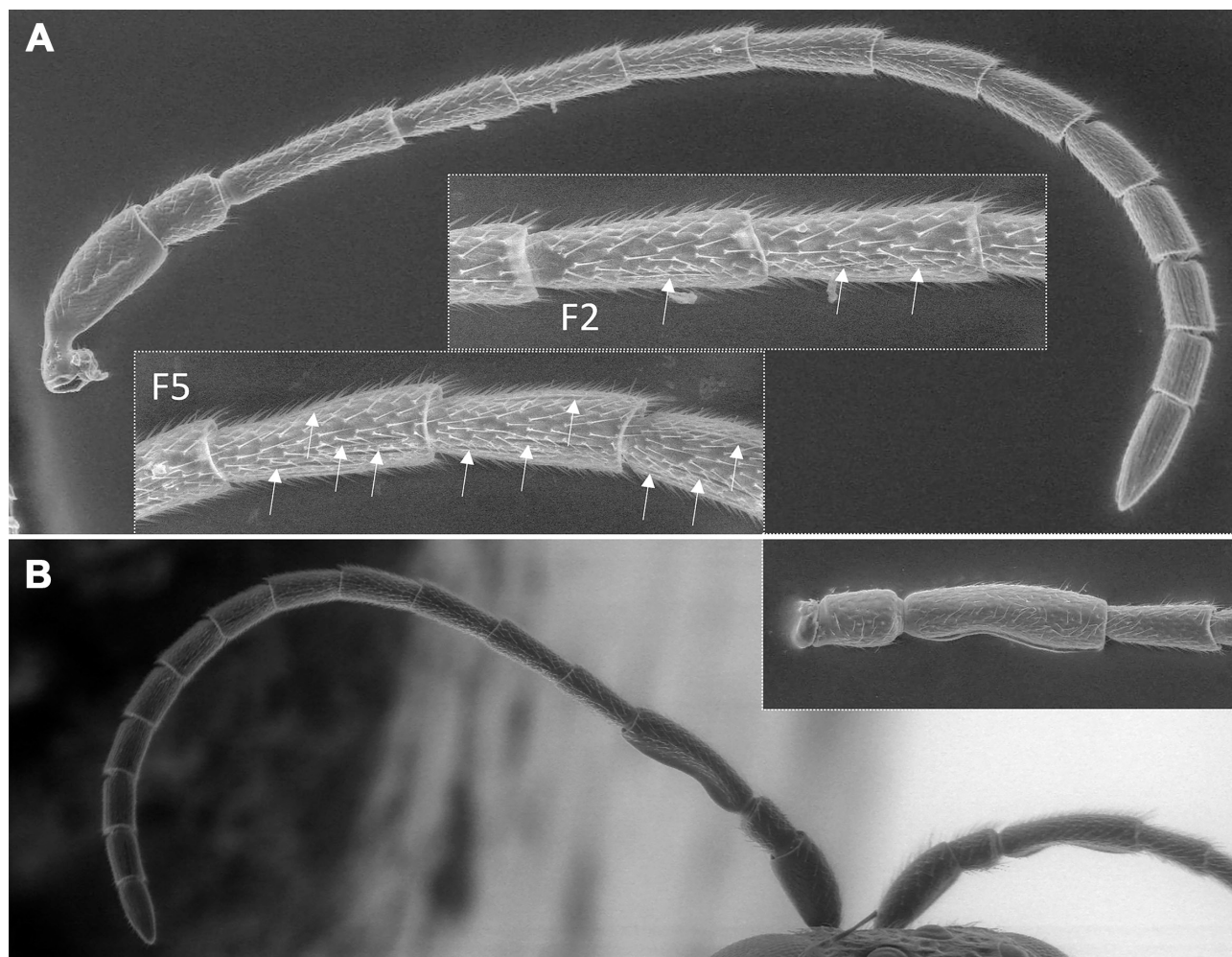


Figure 2. Antenna of *Synergus tavakolii* n. sp. **A.** Female (arrows indicate the position of the placodeal sensilla, which are barely visible); **B.** Male including a detail of the first flagellomeres.

Antennae (Fig. 2A). With 14 antennomeres, slightly longer than head+mesosoma; pedicel 1.5× as long as broad; F1 2.3× as long as pedicel and 1.5× as long as F2; F2 as long as F3; F3–F5 nearly equal in length, subsequent flagellomeres slightly shorter; F12 1.7× as long as F11; distal flagellomeres not broadened; placodeal sensilla distinctly visible on F2–F12 but inconspicuous from F2–F7.

Mesosoma (Figs 3B, 3E, 3F). Flattened dorsoventrally, longer than high in lateral view, with white setae. Pronotum coriaceous with punctures dorsally and some rugae laterally; lateral pronotal carina strong, lateral corners of pronotum strongly angled in dorsal view. Scutum with raised weak transverse carinae; interspaces broader than striae, weakly coriaceous. Notauli complete, with smooth, shining bottom; median mesoscutal line short and superficial, does not exceed 1/3 the length of the mesoscutum; parapsidal lines distinct, reaching slightly above the anterior limit of the tegula; anterior parallel lines distinct, but very superficial. Scutellum rounded, dull rugose, slightly overhanging metanotum. Mesoscutellar foveae superficial, ovate, at 2.0× as broad as high, indistinctly delimited posteriorly, with coriaceous, mat bottom, without setae; separated by a short central carina. Mesopleuron completely striate, ventrally with dense white setae; mesopleural triangle coriaceous, mat, with few setae. Metapleural sulcus reaching mesopleuron in upper 1/3 of its height; axillula coriaceous, with piliferous points; subaxillular bar smooth, shining, in the most posterior end nearly 2.0× narrower than height of metanotal trough. Dorsellum uniformly delicately coriaceous, very narrow medially; around 3.0× as short as height of ventral impressed area; ventral impressed area of dorsellum shining, with distinct irregular rugae; metanotal trough smooth, without setae. Lateral propodeal carinae nearly straight, without setae, uniformly broad and slightly converging posteriorly; central propodeal area coriaceous, with rugae, with short setae in the anterior 1/3 absent in the centre; lateral propodeal area coriaceous, with rugae and short setae.

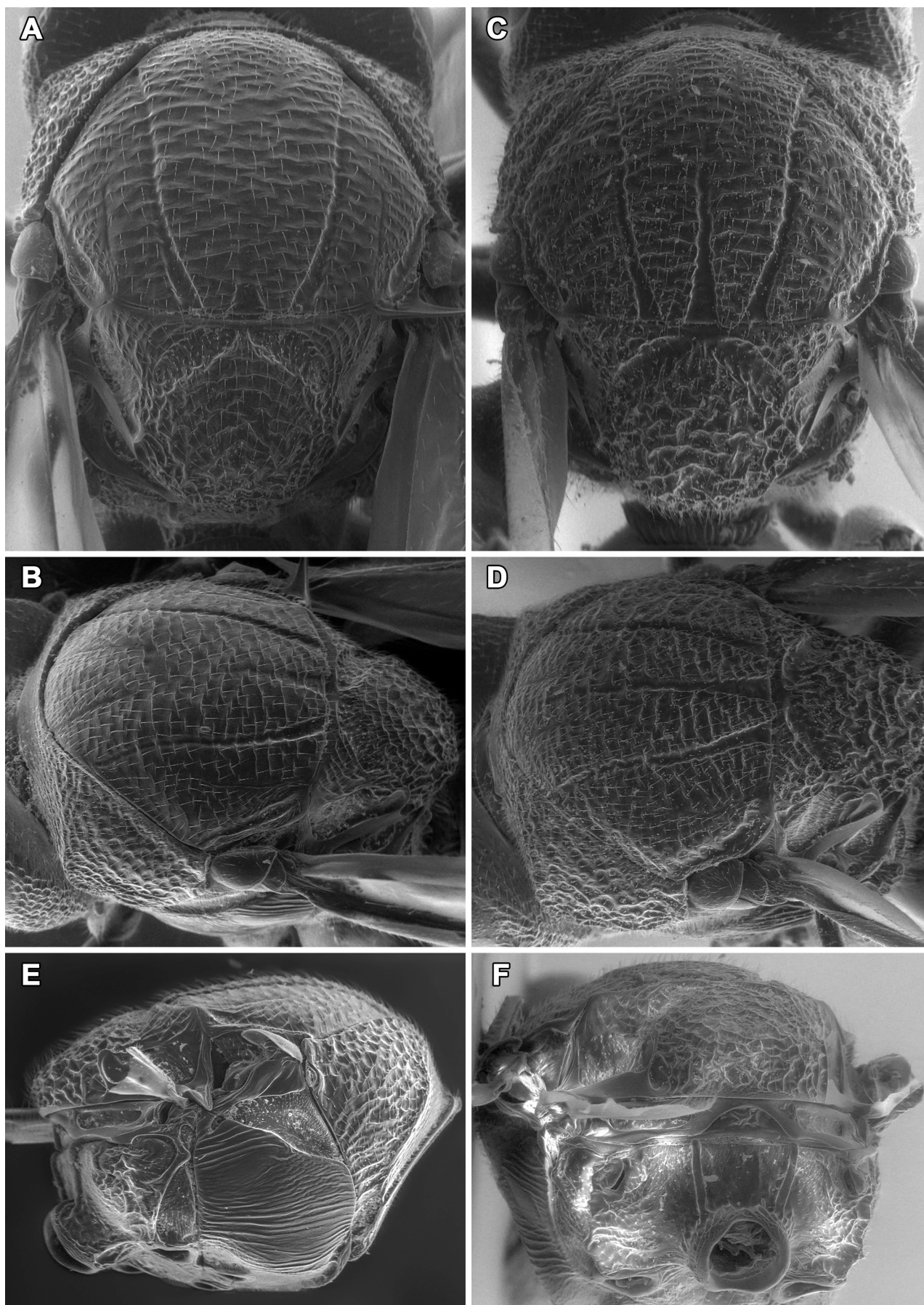


Figure 3. A, B, E, F. *Synergus tavakolii* n. sp.; C, D. *S. hayneanus*; A, C. Mesosoma, in dorsal view; B, D. Mesosoma, in dorsolateral view; E. Mesosoma, in lateral view; F. Propodeum.

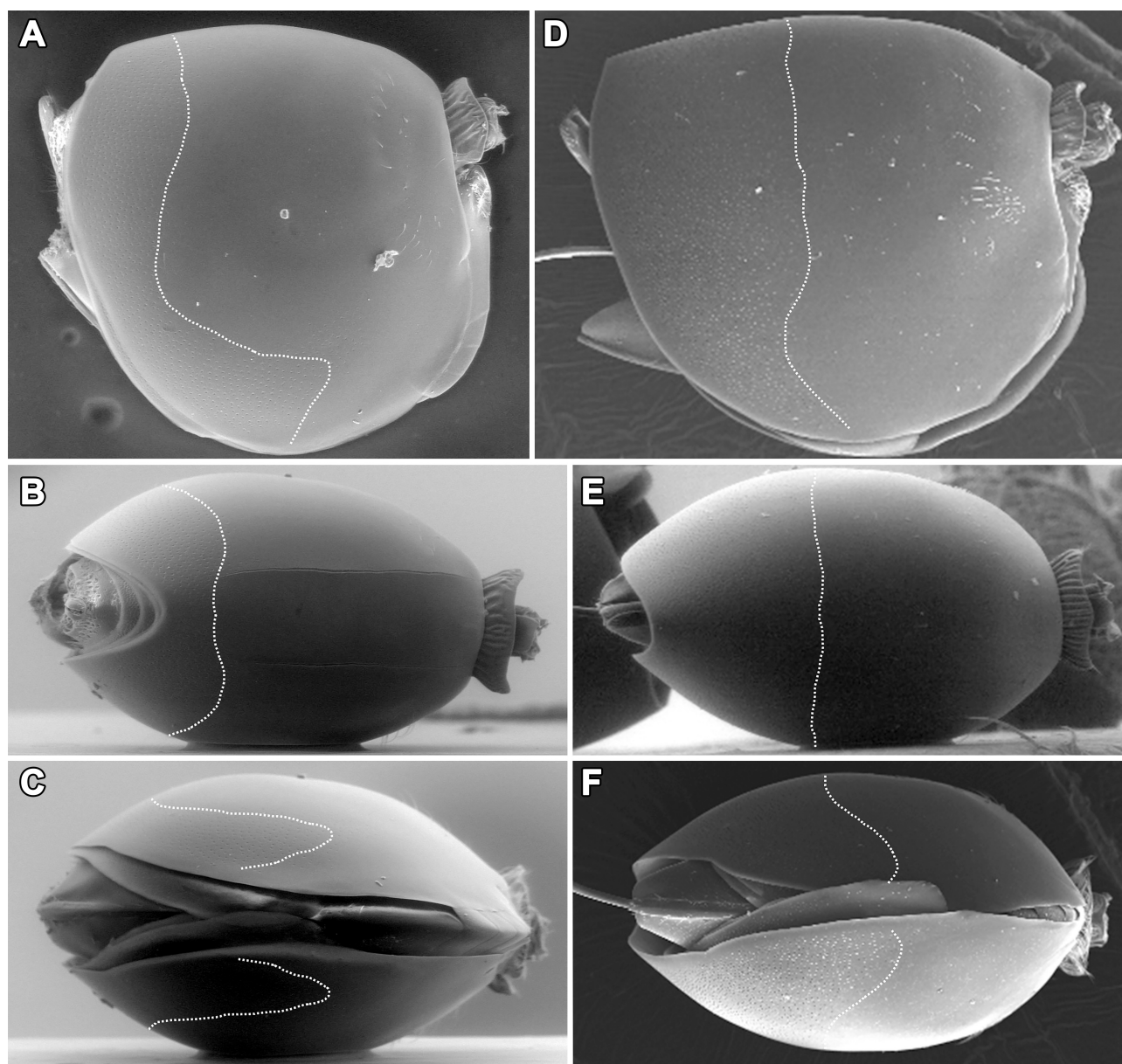


Figure 4. A, B, C. *Synergus tavakolii* n. sp.; D, E, F. *S. hayneanus*. A, D. Metasoma, in lateral view; B, E. Metasoma, in dorsal view; C, F. Metasoma, in ventral view. The dotted lines indicate the extension of the punctation.

Wings (Fig. 5A). Fore wing margin with relatively long cilia; radial cell closed and short, 2.0–2.2× as long as broad; Rs fairly strongly curved; areolet present but inconspicuous; Rs+M visible by a line of setae, projecting into middle of basalis.

Metasoma (Fig. 4A–C). slightly shorter than head+mesosoma, higher than long in lateral view; apical band of punctures short, extending posteriorly less than 1/3 of dorsal length of fused tergites 2+3 and longer below; subsequent tergites and hypopygium punctate; prominent part of ventral spine of hypopygium short, around 2.0× as long as broad.

Male. 1.3–2.6 mm. Similar to female but antenna (Fig. 2B) with 15 antennomeres, Fu, slightly expanded basally and apically and 1.9–2.0× as long as F2; placodeal sensilla on F3–F12 usually inconspicuous.

Etymology. In honour of Majid Tavakoli, from Lorestan Agricultural & Natural Resources Research Centre, the collector of all material mentioned in this study.

Distribution. Iran (Lorestan and Kordestan provinces)

Biology. Adults appear late (in November) from *Andricus synophri* galls located in *Q. libani* and *Q. brantii*.

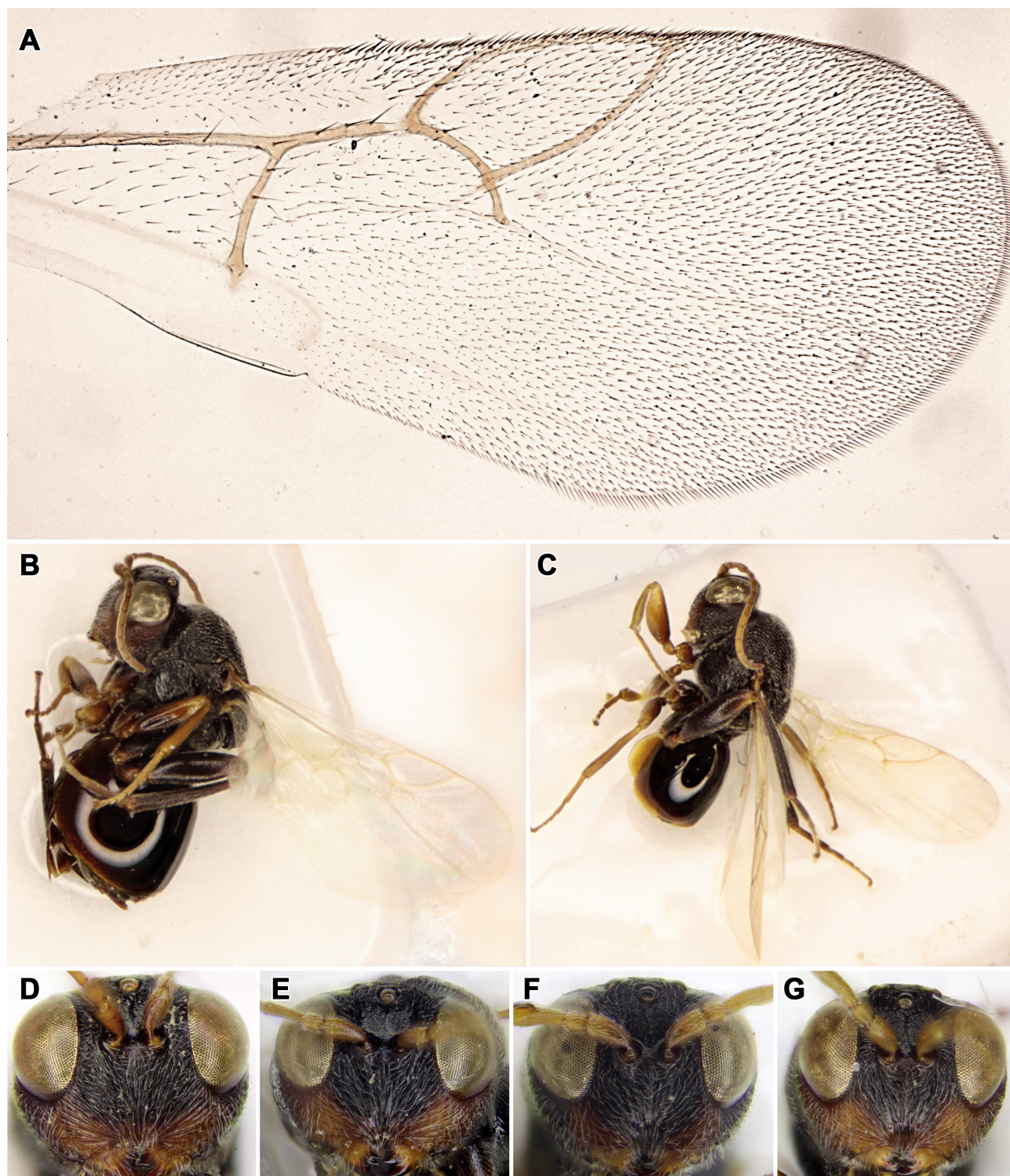


Figure 5. *Synergus tavakolii* sp. nov. A. Fore wing; B. Female habitus, lateral view; C. Male habitus, lateral view; D, E. Head of female, in frontal view; F, G. Head of male, in frontal view. Figure A, taken by E. Mateos Frías; others taken by A. Martínez-Romero.

Superfamily Chalcidoidea Latreille, 1817

Family Eulophidae Westwood, 1829

Subfamily Tetrastichinae Graham, 1987

Genus *Baryscapus* Förster, 1856

***Baryscapus anasillus* Graham, 1991**

Material examined. Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 2♀♀ (M. Tavakoli leg.).

This Tetrastichinae is characterized by having the F1 as long as broad, F2–F3 transverse, mid-lobe of mesoscutum with setae except for a bar strip down the middle, tegula black, propodeal spiracle oval, metasoma shorter (2.1–2.5× as long as broad and about 1.5× as long as mesosoma), and ovipositor sheaths projecting at most 0.15× the length of hind tibia.

According to Askew et al. (2013), very few hosts have been mentioned: *Andricus grossulariae* Giraud, 1859 ♂ and *Biorhiza pallida* (Olivier, 1791) ♂♀, and probably also *A. kollari* (Hartig, 1843) ♂, *A. lucidus* (Hartig, 1843) ♂ and *A. quercuscalicis* (Burgsdorff, 1783) ♂. This rare species is known only from France, Germany, and Hungary (UCD Community 2023). First record from Iran.

Family Eurytomidae Walker, 1832

Subfamily Eurytominae Walker, 1832

Genus *Eurytoma* Illiger, 1807

***Eurytoma adleriae* Zerova, 1995**

Material examined. Oshtoran kooh (Lorestan, Iran), Code 3, *Q. brantii*, (viii-2011) xi-2011: 2♀ (M. Tavakoli leg.); Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 3♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 5♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 1♀.

This species is characterized by having the metasoma reticulated, marginal vein similar in length to stigmal vein and postmarginal vein, and peduncle of metasoma short.

Eurytoma adleriae is mentioned as oak gall wasps from Iran in Kerman by Lotfalizadeh et al. (2012b), reared from galls of *Diplolepis fructuum* on *Rosa beggeriana* Schrenk. Usually, this species attacks oak gall wasps.

***Eurytoma brunniventris* Ratzeburg, 1852**

Material examined. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 1♀, (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 3♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 5♂♂ & 13♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 3♂♂ & 2♀♀.

This species is characterized by having metasoma smooth and shiny or with weak punctures.

Eurytoma brunniventris has been reported from oak gall wasps in Iran, occurring in Kordestan, Kermanshah, and Ilam (Nazemi-Rafie et al. 2007), West Azarbaijan (Zargarani et al. 2008), Fars, and Khuzestan (Golestaneh et al. 2008), emerging from several species of *Andricus*, *Aphelonyx*, *Chilaspis* Mayr, 1881, *Cynips*, *Dryocosmus*, *Neuroterus*, and *Pseudoneuroterus*, according to Saghaei et al. (2018).

***Eurytoma pistaciae* Rondani, 1877**

= *Eurytoma setigera* Mayr, 1878.

Material examined. Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 1♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 1♂ & 6♀♀ (M. Tavakoli leg.).

This species characterized by having last tibia with 2–3 long setae (longer than width tibiae) in the proximal part, metasoma of female longer than height, and males with convex flagellomeres.

Eurytoma pistaciae is reported from oak gall wasps in Iran by Sadeghi et al. (2009) on *Andricus galeatus* (Giraud, 1859), *A. grossulariae*, *A. lucidus*, *A. moreae* (Graeffe, 1905), *A. polycerus*, *Aphelonyx*

persica, *Dryocosmus israeli* (Sternlicht, 1968), and *Pseudoneuroterus macropterus* (Hartig, 1843) and in West Azarbaijan by Zargaran et al. (2008) on *Andricus aries* (Giraud, 1859). Also, it is collected from *Diplolepis mayri* galls on *Rosa* spp. in Tehran province by Rakhshani et al. (2003), Alborz, East Azarbaijan, and West Azarbaijan provinces by Daneshvar et al. (2009), in Lorestan by Askew et al. (2006b) and Daneshvar et al. (2009), and from Iran without mentioning the province by Askew et al. (2006a).

Genus *Sycophila* Walker, 1871

Subgenus *Tineomyza* Rondani, 1872

Sycophila biguttata (Swederus, 1795)

Material examined. Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 4♀♀ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 2♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 15, *Q. brantii*, (viii-2011) xi-2011: 1♀; Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 1♂.

According to Nieves-Aldrey (1983), *S. biguttata* is characterized by having body predominantly black, first funicular segment no longer than the pedicel, F3–F5 nearly square, marginal vein long (clearly longer than the stigmal vein which is not much longer than the postmarginal vein), submarginal wing band well developed (generally crescent-shaped), basal wing cell usually glabrous, hind tibiae with three to eight strong straight spines at most equal in size to the width of the tibia. Later, Pujade-Villar (1994) mentions also that *S. biguttata* has postmarginal vein and stigmal vein of similar length and pigmentation and, coarsely reticulate and visibly sunken propodeum in the center, rarely with well-arranged cells or these are poorly defined. In addition, Lotfalizadeh & Gharali (2007), mention that *S. biguttata* has the inverted V-shaped basal carina of propodeum distinctly pointed and submarginal infuscation large and usually reaching base of marginal vein.

Sycophila biguttata shows great variability in both coloration and the relative length of the funicle segments, and in wing hairiness (Mayr 1905; Claridge 1959; Bouček 1974; Nieves-Aldrey 1983; Pujade-Villar 1994). Although there are some exceptions, specimens obtained from galls of deciduous or marcescent oaks present an almost completely black coloration and a well-marked submarginal wing band, while specimens emerged from galls found in evergreen oaks present a greater extension of the yellow spots and a less defined wing submarginal infuscation in the distal area (Pujade-Villar 1994). The specimens studied from Iran corresponding to this species are black, sometimes with very few yellow marks if we consider that the specimens completely yellow and with a blurred infuscation in the discal area correspond to *S. variegata* (Curtis, 1831) (see below). Furthermore, all examined *S. biguttata* specimens from the northeastern Iberian Peninsula and Iran have small ocelli (Fig. 6C) compared to those of *S. variegata* (Fig. 6B). According to all of this, *S. biguttata* is not well defined (except if it is black) or it is a complex of cryptic species.

This species is mentioned from Iran in East Azarbaijan (Lotfalizadeh et al. 2006), East Azarbaijan, Ilam and Lorestan (Lotfalizadeh & Gharali 2007; Lotfalizadeh et al. 2008), Lorestan (Azizkhani et al. 2005), Kordestan and Kermanshah (Nazemi-Rafie et al. 2007), West Azarbaijan (Zargaran et al. 2008; Mohammadi et al. 2011), Mazandaran (Ghahari et al. 2010), Kerman (Lotfalizadeh et al. 2012b) emerging from several species of *Andricus*, *Biorhiza* Westwood, 1840, *Cynips* Linnaeus, 1758, *Dryocosmus* Giraud, 1859, *Neuroterus* Hartig, 1840 and *Pseudoneuroterus* Kinsey, 1923 and also from *Diplolepis fructuum* (Rubsamen, 1896) in *Rosa* spp., according to Saghaei et al. (2018).

Sycophila iracemae Nieves Aldrey, 1984

Material examined. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 2♀♀ (M. Tavakoli leg.); Oshtoran kooh (Lorestan, Iran), Code 3, *Q. brantii*, (viii-2011) xi-2011: 5♂♂ (M. Tavakoli leg.); Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 2♂♂ & 1♀ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 1♂ & 1♀ (M. Tavakoli leg.).

Sycophila iracemae is morphologically close to *S. biguttata*, from which it differs (Nieves-Aldrey 1983) by having the spines of the posterior tibiae slightly longer than width of the tibia, a marginal vein only

slightly longer than the stigmal vein, the first segment of the antennal funicle longer than the pedicel, F2–F5 longer than wide, and a basal cell of the wing hairy. This species has a black body color, but some specimens from Iran are chestnut brown. The submarginal wing band, although it is well developed, is less pigmented in the disc area.

Sycophila iracemae was previously mentioned in Iran by Sadeghi et al. (2009) from *Cynips quercusfolii* Linnaeus, 1758 and *Dryocosmus israeli* on oak gall wasps and previously by Askew et al. (2006a) in *Diplolepis mayri* (Schlechtendal, 1877) in *Rosa* galls.

Sycophila variegata (Curtis, 1831)

[Fig. 6]

Material examined. Marivan (Kordestan, Iran), Code 1, *Q. brantii*, (viii-2011) xi-2011: 2♂♂ & 2♀♀ (M. Tavakoli leg.); Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 6♂♂ & 19♀♀ (M. Tavakoli leg.); Oshtoran kooch (Lorestan, Iran), Code 3, *Q. brantii*, (viii-2011) xi-2011: 11♂♂ & 16♀♀ (M. Tavakoli leg.); Kaka-reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 7♂ & 10♀♀ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 1♂ & 1♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 18, *Q. brantii*, (summer-2012) xi-2012: 6♂♂ & 8♀♀.

According to Nieves-Aldrey (1983), *S. variegata* is characterized by having body predominantly yellow, marginal vein short (slightly longer than the stigmal vein), but clearly longer than the postmarginal vein, spines of the hind tibiae short, not equaling the width of the tibia; wing submarginal band generally narrow, reduced to a small area below the marginal vein. Later, Pujade-Villar (1994) mentioned also that *S. variegata* has postmarginal vein very little pigmented or not at all (generally shorter than the stigmal vein, which is weakly more colored) and propodeum broadly reticulate, with convergent and well-marked central ridges usually provided with transverse ridges that limit square cells. In addition, Lotfalizadeh & Gharali (2007), mentioned that *S. variegata* has an inverted V-shaped basal carina of propodeum not pointed, and submarginal infumation and usually not reaching base of marginal vein.

The variability of *S. variegata* is also high. Although Claridge (1959) mentions that the coloration of this species is predominantly black, we have not found specimens with this definition. All the specimens obtained are yellow in color with black spots, more or less widespread, to the point of being practically non-existent. Chromatic variability was already described in Nieves-Aldrey (1983) and Pujade-Villar (1994) for specimens that emerged from oak galls in the Iberian Peninsula. The extremes range from individuals almost entirely yellow in color with a very small submarginal wing band, obtained predominantly from galls of cynipid beetles associated with evergreen oaks, to others in which the black spots are much more widespread and more closely resemble the specimens from central and northern Europe often found in galls of other oaks. This variability is also manifested in the length of the wing submarginal band, which, just as happens with the specimens of *S. variegata* that emerged from the sexual form of *Callirhytis rufescens* (Mayr, 1882) from the northeast of the Iberian Peninsula (Pujade-Villar 1994), since some specimens from Iran present a slight darkening in the discal area of the first pair of wings (Fig. 6A). Nevertheless, all examined *S. variegata* specimens from north-eastern Iberian Peninsula and Iran have big ocelli (Fig. 6B) compared to those of *S. biguttata* (Fig. 6C). In Great Britain (Askew pers. com.), females of *S. variegata* can be distinguished from females of *S. biguttata* by the presence of an obvious pale mark on the side of gastral tergite 3 (present also in some Iranian specimens, Fig. 6A), but unfortunately this character does not seem to occur elsewhere. In Iran, we have found females with and without a pale spot on the metasoma (Fig. 6A). According to all of this, *S. variegata* is also not well defined, or it is a complex of cryptic species.

This species is mentioned from Iran in Lorestan (Azizkhani et al. 2005; Lotfalizadeh et al. 2008), Ilam and Lorestan (Lotfalizadeh & Gharali 2007), West Azarbaijan (Zargarani et al. 2008), Fars and Khuzestan (Golestaneh et al. 2008), emerging from *Andricus*, *Aphelonyx* Mayr, 1881, *Biorhiza*, *Chilaspis*, *Dryocosmus*, *Neuroterus* and *Pseudoneuroterus* oak galls, according to Saghaei et al. (2018). The number of galls attacked is much lower than that of *S. biguttata*, according to Saghaei et al. (2018).

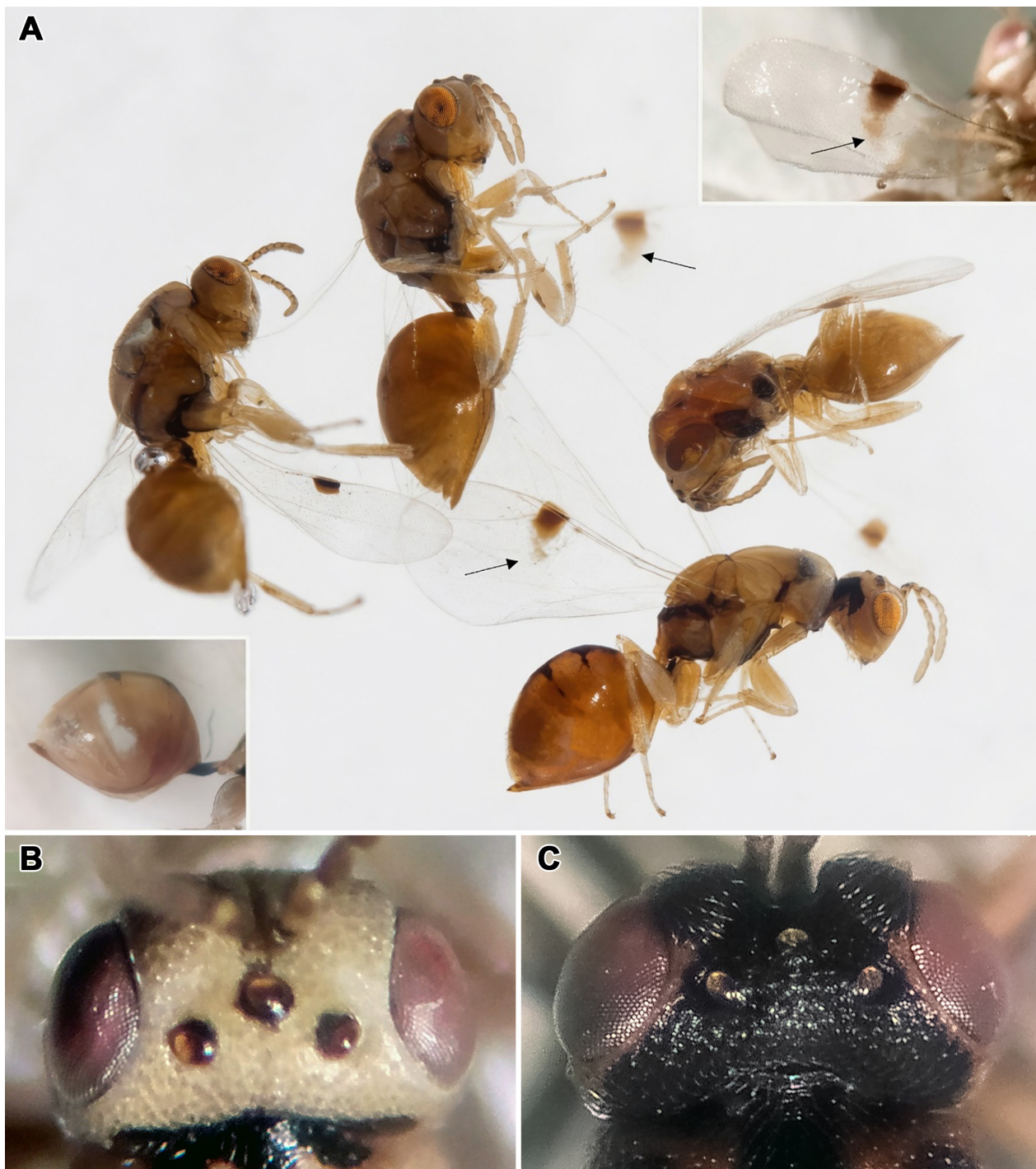


Figure 6. A. Specimens of *Sycophila variegata* (Curtis, 1831) from Iran. The arrow indicates the weak extension of the wing spot in some specimens; B. Head of *S. variegata*, in dorsal view; C. Head of *S. biguttata*, in dorsal view.

Family Megastigmidae Thomson, 1876

Genus *Bootanomyia* Girault, 1915

Bootanomyia onuri Doğanlar, 2011

Material examined. Marivan (Kordestan, Iran), Code 1, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 4♀♀, (M. Tavakoli leg.); Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 12♀♀, (M. Tavakoli leg.); Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 4♀♀ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 7♂♂ & 8♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 15, *Q. brantii*, (viii-2011) xi-2011: 6♀♀.

Bootanomyia onuri (Fig. 7) is similar to *B. dorsalis* (Fabricius, 1798) by having the funicular segments gradually widening (F7 1.75–2.0× broader than F1), pleura pale yellow, frenum sculptured, and ovipositor at most 1.6× as long as metasoma. Nevertheless according to Doğanlar (2011), *B. onuri* differs by having flagellomeres with longitudinal sensilla dense (on F1 with 3 sensilla in 1 row, 2nd–4th segments with 3+4 sensilla in 2 rows, and the following ones with 4+4 sensilla in 2 rows) and ovipositor 2.0× as long as hind tibia, while in *B. dorsalis* the flagellomeres have longitudinal sensilla sparse (F1 and F2 with 1 sensillum, F3 and F4 with 3 sensilla, F5–F7 with 5 sensilla in a row) and ovipositor longer (2.25–2.40× as long as hind tibia).

According to our specimens, the number of sensilla is variable but disposed in two rows. Also, we have some specimens with metallic marks very reduced (only with green color in propodeum), and a very few specimens are completely yellow. In addition, some specimens have forewing stigma with a weak infumation continuing to the middle of the wing, but less marked than in *B. dorsalis*.

The specimens of *B. dorsalis* mentioned in Iran from oak gall wasps need to be checked, because probably some of them correspond to *B. onuri*. The first mention of *B. dorsalis* was reported by Oilb (1971). Later, according to Fallahzadeh et al. (2009), this species has been mentioned by Nazemi-Rafie et al. (2007), Azizkhani et al. (2005), Lotfalizadeh & Gharali (2005), Zargaran et al. (2008), and Golestaneh et al. (2008). *Bootanomyia onuri* was known only from Turkey. First record from Iran.



Figure 7. Specimens of *Bootanomyia onuri* Doğanlar, 2011 from Iran.

Family Ormyridae Förster, 1856

Subfamily Ormyrinae Förster, 1856

Genus *Ormyrus* Westwood, 1832

Ormyrus nitidulus (Fabricius, 1804)

Material examined. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 2♀♀, (M. Tavakoli leg.); Oshtoran kooch (Lorestan, Iran), Code 3, *Q. brantii*, (viii-2011) xi-2011: 1♂ & 4♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 10, *Q. brantii*, (summer-2012) autumn-2012: 10♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 2♂♂ & 1♀ (M. Tavakoli leg.).

This species characterized (Zerova & Seryogina 2006) by having flagellum of females with two anelli, all funicular segments longer than broad, female metasoma with longitudinal median carina, first metasomal tergum smooth and shining anteriorly, with fine alveolate sculpture posteriorly, T3–T5 with doubled punctation meshing larger anteriorly and finer posteriorly, T6 with dense punctation and epipygium finely punctured.

Ormyrus nitidulus is mentioned in Iran by Lotfalizadeh et al. (2012a) in the provinces of West-Azərbayjan, Lorestan, Kordestan and Kermanshah on *Andricus askewi* Melika & Stone, 2001, *A. caputmedusae* (Hartig, 1843), *A. coriarius* (Hartig, 1843), *A. curtisii* (Müller, 1870) (= *mediterraneus* (Trotter, 1901)), *A. galeatus*, *A. grosulariae* (= *mayri* Wachtl, 1879), *A. lucidus*, *A. cecconi* Kieffer, 1901 (= *A. megalucidus* Melika, Stone, Sadeghi & Pujade-Villar, 2018), *A. polycerus*, *A. pseudoaries* Melika, Stone & Sadeghi, 2008, *A. quercustozae* (Bosc, 1792), *A. sternlichti* Bellido, Pujade-Villar & Melika, 2003, *A. tomentosus*, *A. truncicola* (Giraud, 1859), *Aphelonyx persica*, *Cynips divisa* Hartig, 1840, *C. quercus* (Fourcroy, 1785) and *C. quercusfolii*.

It is possible that *O. nitidulus* is a complex of cryptic species (Pujade-Villar 1989), as has been reported for other parasitoids of the oak gall wasp community (Nicholls et al. 2010).

Family Pteromalidae Dalman, 1820

Subfamily Pteromalinae Dalman, 1820

Genus *Cecidostiba* Thomson, 1878

Cecidostiba fungosa (Geoffroy, 1785)

Material examined. Dorud (Lorestan, Iran), Code 2, *Q. brantii*, (viii-2011) xi-2011: 2♀♀, (M. Tavakoli leg.); Oshtoran kooch (Lorestan, Iran), Code 3, *Q. brantii*, (viii-2011) xi-2011: 5♂♂ & 16♀♀ (M. Tavakoli leg.); Kaka-Reza (Lorestan, Iran), Code 4, *Q. brantii*, (viii-2011) xi-2011: 13♂♂ & 19♀♀ (M. Tavakoli leg.); Bane (Kordestan, Iran), code 5, *Q. libani*, (viii-2011) xi-2011: 1♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 10, *Q. brantii*, (summer-2012) autumn-2012: 9♀♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 12, *Q. brantii*, (summer-2012) xi-2012: 1♂.

This species characterized by having green color, antenna inserted clearly above of the level of the ventral edges of the eyes, face with clypeus striated only, anterior margin of clypeus with a medial incision, pronotal collar with strong anterior carina, fore wings hyaline, marginal vein less than 2.0× as long as stigmal vein, stigma more or less enlarged, basal cell bare (sometimes with very few setae unmales), hind tibia entirely yellow and female gaster about 3.0× as long as broad.

Cecidostiba fungosa has only been mentioned in Iran by Lotfalizadeh & Gharali (2008) in Lorestan province, reared from *Chilaspis israeli* Sternlicht, 1968 but present in a great number of oak gall wasps in the West Palearctic (Askew et al. 2013).

Hobbya stenonota (Ratzeburg, 1848)

Material examined. Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 11, *Q. brantii*, (summer-2012) autumn-2012: 1♀ (M. Tavakoli leg.); Kaka-Reza & Darreh Esbar, Dorud (Lorestan, Iran), code 8, *Q. brantii*, (summer-2012) xi-2012: 1♀.

This species is characterized by having green color, antenna inserted clearly above the level of the ventral edges of the eyes, striations of clypeus extending far beyond the clypeus to about a line from torulus to the lower eye margin, fore wings hyaline, and marginal vein 2.0× as long as stigmal vein.

Hobbya stenonota has been reported on *Rosa* galls from Iran in *Diplolepis mayri* by Askew et al. (2006a) without mentioning any province and on galls of *D. fructuum* from Kerman province by Lotfalizadeh et al. (2012b). Later, Lotfalizadeh & Gharali (2008) mentioned this species in association with oak gall wasps, where both the gall inductor and province are unknown. It is present in a great number of oak gall wasp species in the West Palaearctic (Askew et al. 2013).

DISCUSSION

According to Tavakoli et al. (2021) the inquilines are represented in Iran by two species of *Saphonecrus* Dalla Torre & Kieffer, 1910, 11 species of *Synergus*, and three species of *Synophrus*. Sadeghi et al. (2006) described four new *Synergus* species closely related to the European species: *S. acsi* (related to *S. variabilis*), *S. bechtoldae* Melika & Pujade-Villar, 2006 (related to *S. gallaepomiformis* (Boyer de Fonscolombe, 1832)), *S. mikoii* Melika & Pujade-Villar, 2006 (related to *S. diaphanus* Giraud, 1911), and *S. palmirae* Melika & Pujade-Villar, 2006 (related to *S. variabilis* and *S. acsi*). In our study, a new species related to another European species, *S. hayneanus*, is described: *S. tavakolii*. In Iran, *S. hayneanus* has never been reported. Regarding parasitoids of gall wasps, two studies have been published related to the Iranian fauna (Nazemi-Rafie et al. 2007; Sadeghi et al. 2009). Nevertheless, several catalogues also mention parasitoids of oak gall wasps: Saghaei et al. (2018) for Eurytomidae, Lotfalizadeh & Gharali (2008) and Abolhassanzadeh et al. (2017) for Pteromalidae, Lotfalizadeh & Gharali (2005) for Torymidae and Fallahzadeh et al. (2009) for Eurytomidae and Torymidae. Also, Lotfalizadeh & Gharali (2007) studied the *Sycophila* Walker, 1871 species that emerged from gall wasps in Iran.

In the present study, a total of 11 species of parasitoids belonging to the families Eulophidae, Eurytomidae, Megastigmidae, Ormyridae, and Pteromalidae emerged from *Andricus synophri*. *Bootanomyia onuri* (Megastigmidae) is reported for the first time in Iran, and *Baryscapus anasillus* (Eulophidae) is reported for the first time in Asia. Two species of *Sycophila* need a special mention: *S. biguttata* and *S. variegata*. Both species present great intraspecific variability, so morphological differences are scarce and weak, and there is even a concealment regarding the host species that they can attack. Claridge (1959) comments on the possibility that *S. variegata* and *S. biguttata* may correspond to 'aggregated species' which would be separated based on concepts other than those referring to the morphology of adults. The color, predominantly black in *S. biguttata* and predominantly yellow in *S. variegata*, is not always consistent. The short wing spot in *S. variegata* and longer in *S. biguttata* is not always consistent, as there are specimens of *S. variegata* with a weakly pigmented alus below the wing spot (Fig. 6A) that brings them closer to *S. biguttata*. It occurs on some Iranian specimens studied here and in some specimens of Catalonia that emerged from *Plagiotrochus* Mayr, 1881 galls. While in Great Britain there are usually no problems distinguishing them (see comments of *S. variegata*), further south things get complicated, and *S. iracemae* can be added to the problem (Askew, pers. com.). So, different authors have mentioned new characters to try to separate these species (Zerova 1978, 1995; Nieves-Aldrey 1983; Pujade-Villar 1994; Lotfalizadeh & Gharali 2007) but the results have not been satisfactory. After reviewing material from oak galls in Turkey, Askew et al. (2013) reported to us that there is considerable variation in wing venation and pigmentation, POL:OOL ratio, metatibial spines, and other characters. Here we have introduced a new character to differentiate *S. variegata* and *S. biguttata*, the size of the ocelli (Fig. 6B–C). Examination of specimens from North Africa, Iran, the Iberian Peninsula, France, and Italy shows that the aforementioned character allows us to separate these species. Nevertheless, the *Sycophila biguttata/variegata/iracemae* complex needs further study, as it probably represents a complex of cryptic species.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: The first author is responsible for the study. The second author has made some images that illustrate the study and has participated in the discussion. The third author has participated in the revision of the *Sycophila* problem and has participated in the discussion. All authors have revised the final manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in JP-V col (UB), are available from the curator upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

GENERATIVE AI STATEMENT

No generative AI tools were used in the preparation of this manuscript.

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فون اولیه مرتبط با گال‌های *Andricus synophri* (Hymenoptera: Cynipidae, Chalcidoidea) در ایران، همراه با توصیف *Synergus tavakolii* sp. nov.

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چکیده: سه گونه از زنبورهای مهمان متعلق به خانواده Cynipidae و یازده گونه پارازیتوئید مرتبط با گال‌های ایجاد شده توسط فرم بکرزای زنبور *Andricus synophri* Pujade Villar, Tavakoli & Melika, 2015 برای نخستین بار گزارش می‌شوند. گونه مهمان *Synergus tavakolii* Pujade Villar sp. nov. (Hymenoptera: Cynipidae, Synergini) توصیف شد. گونه *Bootonomyia onuri* Doganlar, 2011 (Hymenoptera: Chalcidoidea, Megastigmidae) برای اولین بار از ایران و *Baryscapus anasillus* Graham, 1991 (Hymenoptera: Chalcidoidea, Eulophidae) برای نخستین بار از آسیا گزارش می‌شود. کلید شناسایی گونه‌های جنس *Synergus* Hartig, 1840 متعلق به بخش II از تقسیم‌بندی Mayr، فاقد کاربنا در پروتوم، ارائه شد. ویژگی‌های افتراقی برای تفکیک دو گونه شامل *Sycophila biguttata* (Swederus, 1795) و *S. variegata* (Curtis, 1831) مورد بحث قرار گرفت.

ویراستار علمی
علی اصغر طالبی

دریافت: ۰۶ اردیبهشت ۱۴۰۵

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واژگان کلیدی: زنبورهای گال‌زا، جنگل بلوط، *Ceroptres*، Synergini، پارازیتوئید