

Preliminary Cladistics and Review of *Hemiptarsenus* Westwood and *Sympiesis* Förster (Hymenoptera, Eulophidae) in Hungary

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Chao-Dong Zhu and Da-Wei Huang (2003) Preliminary cladistics and review of *Hemiptarsenus* Westwood and *Sympiesis* Förster (Hymenoptera, Eulophidae) in Hungary. *Zoological Studies* 42(2): 307-335. A cladistic analysis of known species of both *Hemiptarsenus* Westwood and *Sympiesis* Förster (Hymenoptera: Eulophidae) in Hungary was carried out based on 176 morphological characters from adults. Three most-parsimonious trees (MPTs) were produced, strictly consensused, and rerooted. Monophyly of *Sympiesis* was supported by all 3 MPTs. A review of the genera *Hemiptarsenus* Westwood and *Sympiesis* Förster was made based on the results of the cladistic analysis. *Sympiesis petiolata* was transferred into *Hemiptarsenus*. Several other species in both *Hemiptarsenus* and *Sympiesis* were removed from the synonymy lists of different species and reinstated. <http://www.sinica.edu.tw/zool/zoolstud/42.2/307.pdf>

Key words: Taxonomy, Cladistics, *Hemiptarsenus*, *Sympiesis*, Hungary.

Working on Chinese fauna of the Chalcidoidea (Zhu et al. 1999 2000a, Zhu and Huang 2000a b c 2001a b 2002a b c, Xiao and Huang 2001a b c d e), we have found many taxa which occur in North China that have been also reported from Europe. So, it is very important to compare domestic materials to European ones. It seems particularly necessary for us to better understand some large genera such as the *Elachertus* before we can begin studying Chinese species.

Sympiesis is a large genus in the Eulophidae. There are more than 119 species worldwide (Noyes 1998). Species of *Sympiesis* are mainly ectoparasitoids, hyperparasitoids, or larval and pupal parasitoids of various species of Lepidoptera, Coleoptera, and Diptera. Eleven Afrotropical, 21 Australian/Pacific, 7 Oriental, 22 Nearctic, 2 Neotropical, and 61 Palearctic species have been described and validated (Noyes 1998). Among Palearctic species, 25 have been described from Hungary by Erdös or by Szelényi (1941 1976 1977 1981). Their original descriptions are in Hungarian, are very brief, and are

deposited at the Hungarian Natural History Museum (HNHM); careful re-examination of their materials is needed to update knowledge of this group. In May 2001, the senior author was supported by the National Scientific Fund of China (NSFC) to join a symposium in Kőszeg, Hungary. With kind help from Dr. Csaba Thuroczy, Dr. George Melika, and their colleagues, he was allowed access to nearly all of the materials of the Hungarian Eulophinae studied by Erdös and by Szelényi which are deposited at the HNHM. Special attention was paid to *Hemiptarsenus* and *Sympiesis*. We tried to compare all materials to better understand the species and the relationships among them. With all available 7 species of *Hemiptarsenus* used as outgroups, we carried out a preliminary cladistic analysis of *Sympiesis*. All studied species of both *Hemiptarsenus* and *Sympiesis* are reviewed and are keyed out based on the results of the analysis.

MATERIALS AND METHODS

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Materials examined consisted of 7 species of *Hemiptarsenus* and 25 of *Sympiesis* (see text under "Classification"), which are maintained at the Hungarian Natural History Museum (HNHM), Budapest and were temporarily being kept by Dr. Csaba Thuroczy in Köszeg. They were mainly collected from all over Hungary. We also included *S. santelinae*, which was described by Dr. Szelényi from Italy in this analysis and for further review.

Morphological terminology follows that of Gibson (1997). One abbreviation is used: F = funicular segment.

Type materials and determined materials by Erdős and by Szelényi deposited at HNHM were carefully reexamined. Morphological characters were observed under a Leica M10 light microscope. One hundred and seventy-six characters were abstracted from each holotype or other named series. Some character states were quoted from Bouček (1959) and Graham (1959). Others were abstracted from the comparative morphological study of the holotypes and confirmed by available paratypes or other named series. All characters were checked again and confirmed by further observations of the many named species loaned from the British Natural History Museum (BNHM), London. These data were entered into the software, Description Language of Taxonomy (DELTA) system (Dallwitz et al. 1999 onwards). Using the DELTA system, we generated a data matrix for the software Hennig86 (vers. 1.5). All 7 available species of *Hemiptarsenus* were chosen to be outgroup taxa, because we considered this genus to be most closely related to *Sympiesis* (see discussion in the section on outgroups). The analysis was carried out in Hennig86 to produce the most-parsimonious trees (MPTs). All resulting trees were forwarded to Winclada (Nixon 1999) to display, reroot, and map the characters, and produce rooted trees. All studied species were diagnosed mainly by their autapomorphies. However, the synapomorphies of a clade or autapomorphies of a terminal taxon were also observed from the sister species, which helped differentiate the latter species from these taxa.

CLADISTICS ANALYSIS

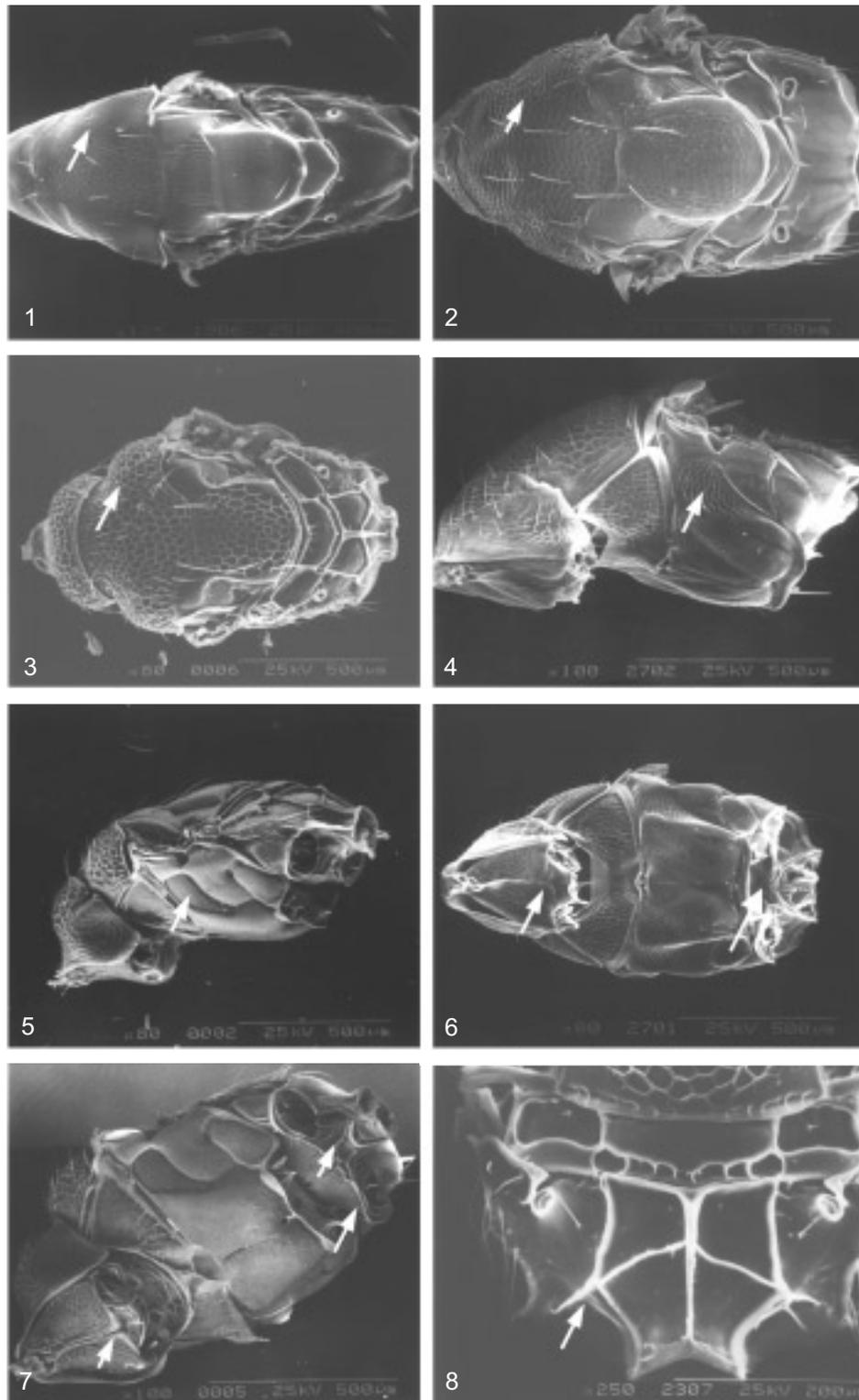
In order to analyze the relationships within *Sympiesis*, we studied all type materials and available named series by Erdős or Szelényi, which were deposited at the HNHM. In *Hemiptarsenus* and *Sympiesis*, we carefully re-examined 176 mor-

phological characters (Table 2). Most of the characters used are self-explanatory. All the data that generated the matrix were converted into the Hennig86 format (Table 3) by DELTA.

The cladistic philosophy follows that promoted by Hennig (1966) and later by other workers (e.g., Farris 1983). Following Kluge (1989), the relative informativeness of the characters was not prejudged by excluding characters that appeared to be uninformative. Thus we included all the available 176 characters in the analysis. In addition, we followed Yeates and Irwin (1996) and Gaimari and Irwin (2000) and included characters with a perceived level of homoplasy, because some of these "homoplasious" characters might possibly be evidence for relationships. We also followed Yeates (1992) and Gaimari and Irwin (2000) in including autapomorphic characters in the analysis, for these characters may be found to be more widespread which would support undiscovered clades or terminal taxa.

Outgroups

At first, seven species of *Hemiptarsenus*, which were deposited at the HNHM were chosen as outgroups to reroot the MPTs or SCT (Farris 1982, Nixon and Carpenter 1993). To search for genera closely related to *Sympiesis*, we examined all available type materials and named specimens in the genera besides *Hemiptarsenus* and *Sympiesis* in Eulophinae, using all 175 morphological characters. Except for the toruli location on the face and the ratio between the length and width of the forewing costal cell, *Hemiptarsenus* is morphologically more closely related to *Sympiesis* than to other eulophid genera. Both genera share the following characters: A) notauli in most cases not reaching the scutoscuteellar suture posteriorly (Figs. 1-3); B) funicle mostly 4-segmented; C) no distinct transepisternal sulcus; D) femoral depression present (Fig. 4); E) propleura not united into 1 straight line posteriorly (Fig. 6); and F) no carinae present on ventral parts of propodeum (Fig. 6). Characters A and B are also shared by *Prigalio*. Characters A, and C-F are also shared by some other genera in the Eulophinae, for example, *Eulophus* and *Necremnus*. But most species in those genera have a 3-segmented funicle. Males of many species of both *Prigalio* and *Sympiesis* have branched funicular segments. But *Prigalio* greatly differs from both genera in having A) propleura posteriorly united into 1 straight line in a ventral view of the pronotum (Fig. 7); B) transepis-



Dorsal view of mesosoma, showing incomplete or indistinct notauli: **Fig. 1.** *Hemiptarsenus* sp.; **Fig. 2.** *Sympiesis* sp.; **Fig. 3.** *Pnigalio* sp. Lateral view of mesosoma, showing presence of distinct transepisternal sulcus or femoral depression; **Fig. 4.** *Sympiesis* sp. with distinct femoral depression; **Fig. 5.** *Pnigalio* sp., with distinct transepisternal sulcus. Ventral view of mesosoma, showing straight propleura and carinae on metepisternum; **Fig. 6.** *Sympiesis* sp., with propleura straight posteriorly, without carinae on metepisternum; **Fig. 7.** *Pnigalio* sp., with propleura straight at posterior margin and distinct carinae on metepisternum. **Fig. 8.** Dorsal view of propodeum, showing costulae and plicae.

ternal sulcus distinct and femoral depression absent from the mesopleuron (Fig. 5); C) transverse and longitudinal carinae present on ventral parts of the propodeum (Fig. 7); and D) plicae and transverse costulae present on dorsal parts of the propodeum (Fig. 8).

Farris (1972) considered the outgroup method as 1 way of rooting a tree. Nixon and Carpenter (1993) pointed out that it is not essential to have a sister-group as the outgroup, and that outgroups do not have to be more "basal" than ingroups. As this study did not include all valid species of *Hemiptarsenus* or *Sympiesis*, we did not intend to consider the problem of "origin". Thus we do not need to consider the character polarity. In this way, we discovered that *Hemiptarsenus* and *Sympiesis* could be mutual outgroups for each other. This philosophy would not change the relationships between species, clades of both genera, or the topology of whole MPTs or the SCT.

When re-examining types of *Hemiptarsenus* and *Sympiesis*, we doubted that *Sympiesis petiolatus* belongs to *Hemiptarsenus*. Thus this is another reason we chose several species of *Hemiptarsenus* as outgroup taxa. If *S. petiolatus* falls among the ingroup of *Sympiesis*, it should belong in *Sympiesis*. Contrarily, if *S. petiolatus* falls in the outgroup of *Hemiptarsenus*, it would confirm our morphological findings and should belong to *Hemiptarsenus*.

Analysis

We studied the relationships of the species of *Sympiesis* with parsimony analysis using the computer software Hennig86 version 1.5 (Farris 1988). All results obtained from our matrix were based on cladograms calculated with the order "mhennig*+bb*" to find the MPTs. All characters were unordered. As multiple MPTs were obtained from the above order in Hennig86, we introduced the trees into Winclada to construct a strict consensus tree (SCT), to reroot it between outgroups and ingroups, and to map the characters into the tree for further analysis.

RESULTS

In the primary analysis using the order "mhennig*+bb*" of Hennig86, seven species of *Hemiptarsenus* were used as the outgroup taxa. Using "mhennig*", we obtained 4 equal MPTs with a length (L) of 426, a consistency index (CI) of

34, and a retention index (RI) of 47. Then calculating using "bb*", three equal MPTs (Fig. 9a-c), with L of 423, CI of 35, and RI of 48, were obtained. In order to choose between them or use the SCT for further analysis, an SCT (Fig. 10) based on them was constructed in Winclada and was compared to them. The SCT had an L of 427, CI of 34, and RI of 47. In the SCT, only 2 nodes were collapsed, and the topology was nearly identical to the original 3 MPTs. It is clear that the SCT was the preferred result based on the current matrix. In Winclada, we rerooted the consensus tree with the assigned outgroup and obtained 1 rooted SCT (Fig. 11), with an L of 427, CI of 37, and RI of 48. It had 31 unique nodes.

All 3 MPTs indicated the monophyly of the *Sympiesis* clade. Based on the SCT, we obtained the following synapomorphies which support this finding: A) toruli at the lower eye margin; B) setae on the mid lobe of the mesoscutum and a dark scutellum (except in *S. grahami*, *S. aureolus*, *S. pusztacola*, *S. dolichogaster*, *S. maculata*, *S. kelebiana*, *S. gyoerfii*, *S. angustipennis*, *S. biroi*, *S. notata*, *S. albiscapus*, *S. acalle*, *S. viridula*, *S. xanthostoma*, and *S. gordius*); C) hind coxae at least partially dark (except for *S. aureolus* and *S. albiscapus*); and D) metasoma completely dark (except in *S. aureolus*, *S. flavopicta*, *S. kelebiana*, and *S. notata*). Only the 1st character is stable in all species of *Sympiesis*. However, this character is shared also by *Hemiptarsenus palustris* and the other genera. In the rooted SCT (Fig. 9C), examined species of *Sympiesis* were divided into 2 groups. Five species were grouped with *S. viridula* by 2 synapomorphies: A) reticulations engraved on the face (except in *S. aureolus* and *S. flavopicta*) and B) scape dark dorsally along the entire scape. Seventeen species were grouped with *S. albiscapus* by 2 synapomorphies: A) propodeal plicae at most reaching halfway between posterior and anterior margins of the propodeum and B) setae on lower surface of costal cell with at least 1 line starting at base of forewing. In the latter clade, 13 species were grouped with *S. angustipennis* by 1 synapomorphy: hind coxae completely dark. But most synapomorphies listed have exceptions and are not stable in a clade. Thus the clades listed are weakly supported by the current data. The possible reason for these results is that the study was based only on morphological characters on the front and dorsal parts of the head, and those on the dorsal parts of the mesosoma and metasoma. Further attention should be paid to the posterior parts of the head, as well as to the lateral and

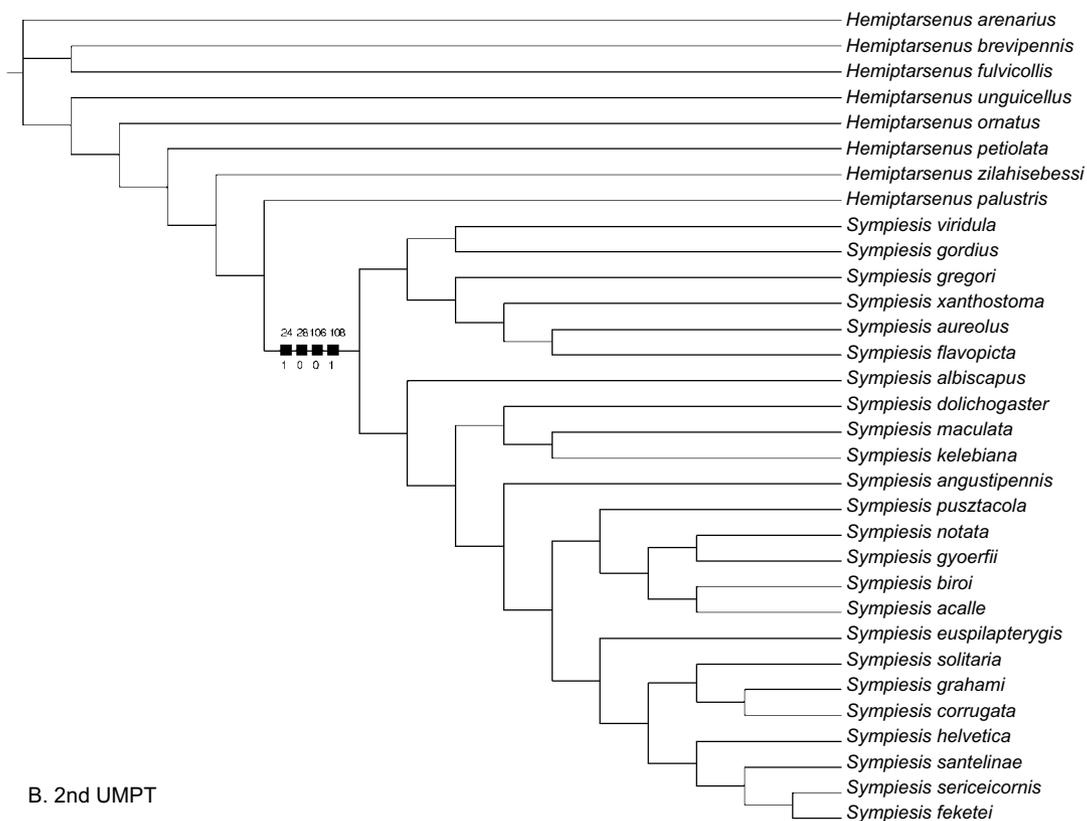
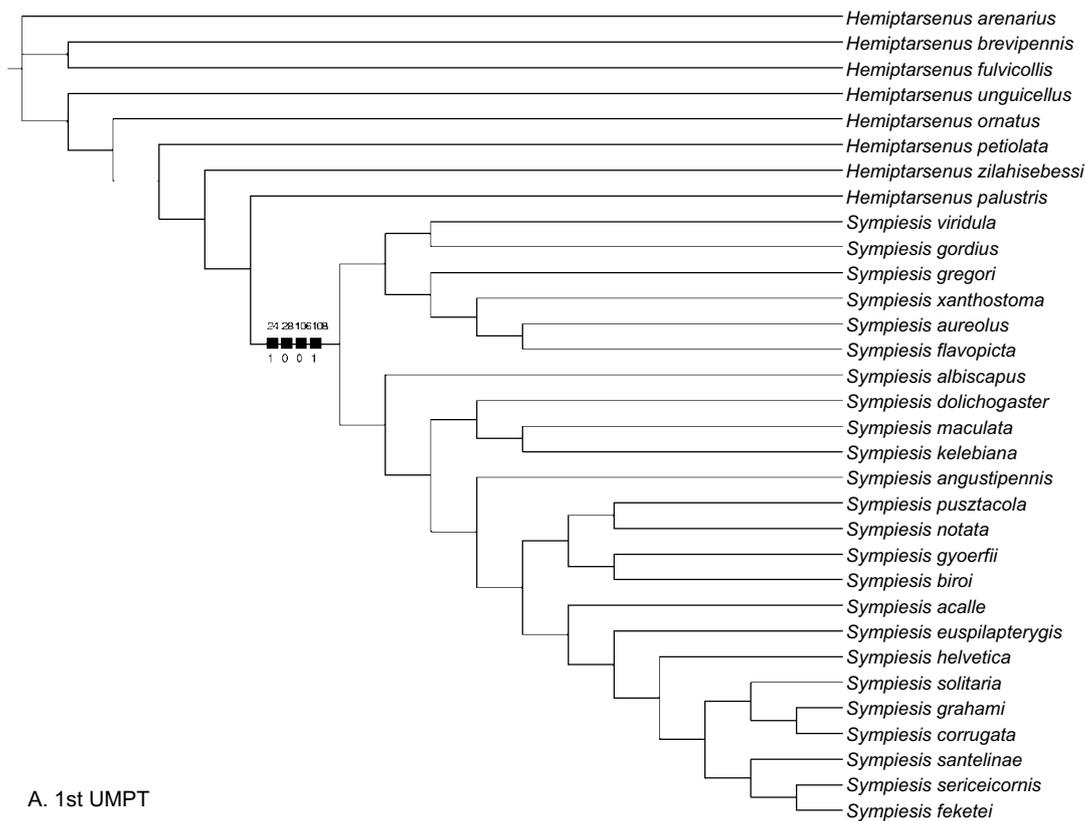


Fig. 9A-B. Two of the unrooted MPTs produced by “mhennig*+bb*” (L=423, CI=35, RI=48).

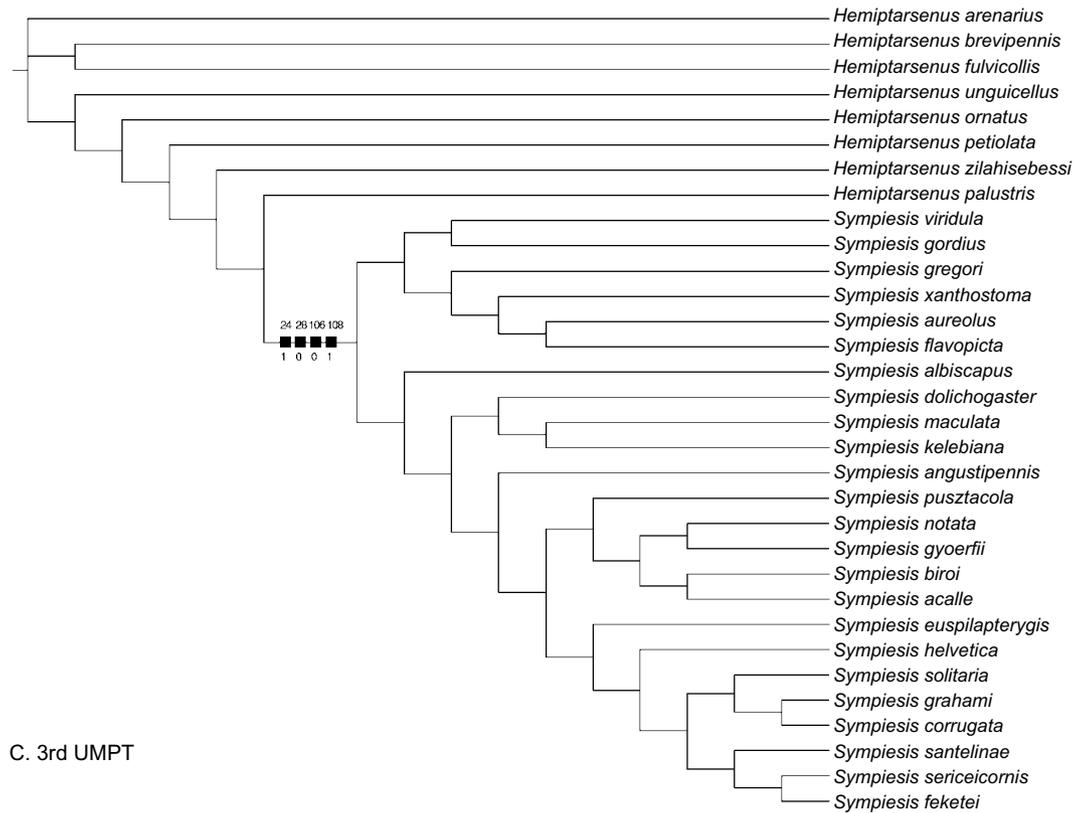


Fig. 9C. The 3rd unrooted MPT produced by "mhennig*+bb*" (L=423, CI=35, RI=48).

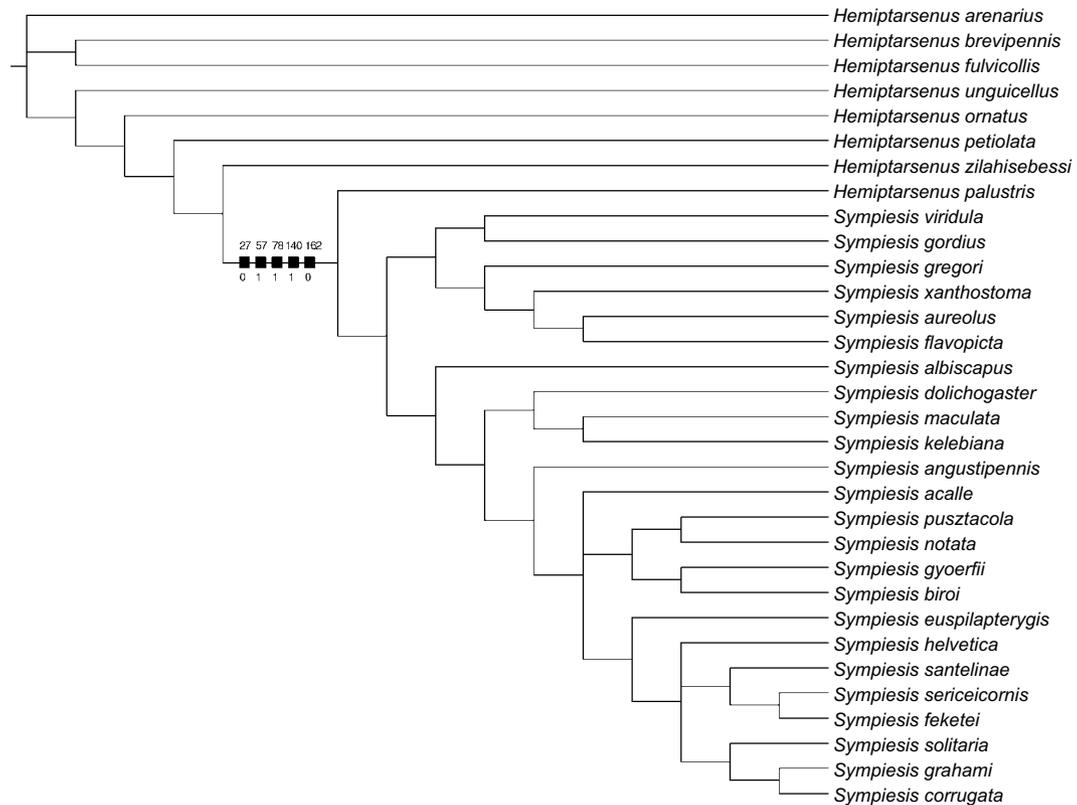


Fig. 10. Unrooted SCT (L=427, CI=34, RI=47) basing on above three unrooted trees produced by "mhennig*+bb*", showing synapomorphies supporting the clade of *Sympiesis*.

ventral parts of the mesosoma and metasoma to discover more-reliable characters.

The analysis also suggested several other results. A) *Sympiesis petiolata* should actually

belong to *Hemiptarsenus*, thus it is to be transferred from *Sympiesis* to *Hemiptarsenus*. B) *Hemiptarsenus anementus brevipennis* differs from *H. fulvicollis*, and it is validated as *H. bre-*

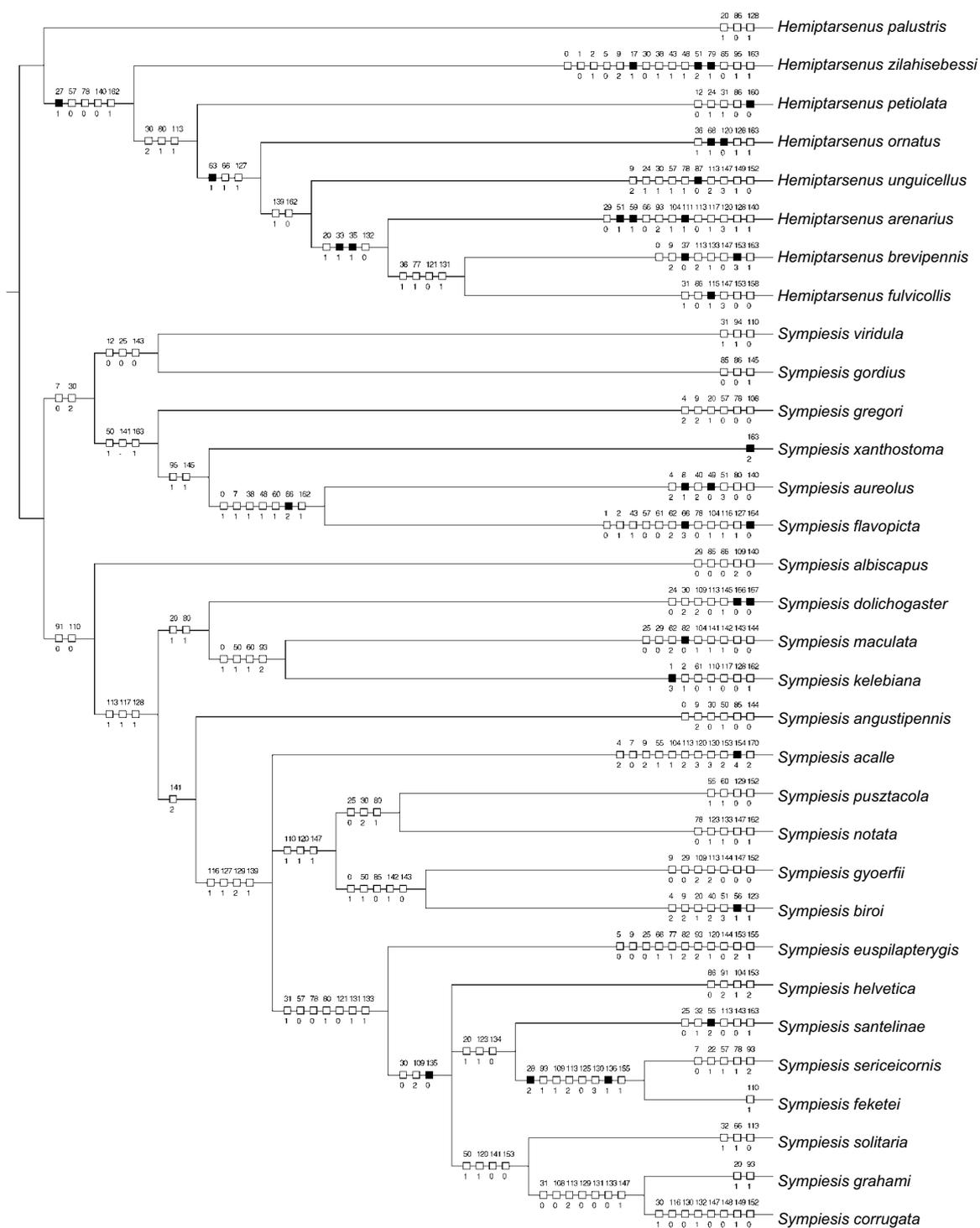


Fig. 11. Rooted SCT (L = 427, CI 34, RI 47) basing on above three unrooted trees produced by “mhennig*+bb*”, with all characters and states mapped.

vipennis. C) Although its scape extends well beyond the vertex, *H. palustris* is unique in having toruli at the lower eye margins, and it is removed from the synonymy list of *H. unguicellus*. D) *Sympiesis albiscapus* and *S. feketei* are respectively removed from the synonymy lists of *S. gordius* and *S. sericeicornis*. E) *Moroceras biroi* is confirmed to be a *Sympiesis*. Tentative keys to species of both *Hemiptarsenus* and *Sympiesis* are presented to show relationships among species shown in the rooted SCT. G) The diagnosis for each species is given based mainly on the autapomorphies shown in the rooted SCT.

CLASSIFICATION

Hemiptarsenus Westwood

Hemiptarsenus Westwood, 1833: 122. Type species: *H. fulvicollis* Westwood, 1839: 123.

Eriglyptoideus Girault, 1913: 154. Type species: *Eriglyptoideus varicornis* Girault, 1913b. Synonymized by Bouček 1988: 626.

Hemiptarsenoideus Girault, 1916: 220. Type species: *Hemiptarsenoideus semialbiclava* Girault, 1916, designated by Gahan and Fagan 1923. Synonymized by Girault 1924: 4.

Neodimmockia Dodd, 1917: 361. Type species: *Neodimmockia agromyzae* Dodd, 1917: 361. Synonymized by Girault 1924: 4.

Notanisomorpha Ashmead, 1904a: 356. Type species: *Notanisomorpha collaris* Ashmead, 1904a: 356. Synonymized by Schauff and LaSalle 1993: 494.

Comparative diagnosis: Toruli located well above lower margin of eyes (except in *H. palustris*); scape reaching well beyond vertex; forewing costal cell narrow, at least 10 times as long as wide.

Key to species of *Hemiptarsenus* at HHNM (♀)

1. Toruli at lower eye margin.....*Hemiptarsenus palustris* stat. rev.
- Toruli well above lower eye margin.....2
2. Yellow parts on head covering only parts laterad to ocelli, inner margins of eyes on vertex, part of upper occiput, and lower face; face smooth; upper face brown with metallic shine; antennal scrobe differently colored from adjacent parts; scape completely dark; body with pronotum, propleuron, and mid lobe of mesoscutum at least partly yellow; setae on scutellum with anterior pair quite shorter than posterior ones; dorsellum and propodeum smooth.....*Hemiptarsenus zilahisebessi*
- Head completely dark (except in *H. anementus brevipennis*); face sculptured; antennal scrobe concolorous with adjacent parts; body completely dark; setae on scutellum with anterior pair as strong as or as long as posterior ones; dorsellum and propodeum sculptured.....3

3. Reticulations on vertex engraved; frontal groove present; axillae distinctly advanced, not in a line with anterior margin of scutellum; scutellum green; propodeum with distinct plicae.....*Hemiptarsenus petiolatus* comb. nov.
- Reticulations on vertex raised; frontal groove absent (except in *H. unguicellus*); axillae not or only slightly advanced, in a line with anterior margin of scutellum; scutellum violet (except in *H. waterhousii*); propodeum without distinct plicae (except in *H. fulvicollis*)4
4. Scutellum longitudinally striate; hind leg completely yellow; metasoma with paler parts.....*Hemiptarsenus ornatus*
- Scutellum reticulate; hind leg at least partly dark; metasoma completely dark.....5
5. Antennal scrobe smooth; frontal groove present; funicle about equal width towards clava; clava same width as funicle at its broadest point; setae on mid lobe of mesoscutum and scutellum yellow; propodeum rugose; dark parts on mid femora covering middle 1/2; hind tibiae completely yellow.....*Hemiptarsenus unguicellus*
- Antennal scrobe sculptured; frontal groove absent; funicle broadened toward clava; clava distinctly clavate; setae on mid lobe of mesoscutum and scutellum dark; propodeum reticulate; dark parts on mid femora covering basal 3/4; hind tibiae at least partly dark.....6
6. Scape completely yellow; clava concolorous with funicles; mid lobe of mesoscutum violet; reticulations on mid lobe of mesoscutum elongate, at least 1.5 times as long as wide; scutellum green; reticulations on propodeum raised, but much weaker than those on scutellum; forewing with at least some dark markings; cubital vein bare/open below basal cell; all coxae at least partly dark; fore and mid femora completely non-metallic dark.....*Hemiptarsenus waterhousii*
- Scape at least partly dark; clava at least partly differently colored from funicles; mid lobe of mesoscutum green; reticulations on mid lobe of mesoscutum round or isodiametric; scutellum violet; reticulations on propodeum raised, as strong as those on scutellum; forewing hyaline; cubital vein complete below basal cell; all coxae completely yellow; fore and mid femora only dark metallic dorsally on mid part, yellow on other parts.....7
7. Head at least partly paler; upper face brown with metallic shine; dark parts of scape non-metallic; clava with distal 1/2 of 2nd and 3rd segments yellow; propodeum without distinct plicae; subcubital vein starting halfway between base of forewing and intersection of basal vein and cubital vein; postmarginal vein at least 1.5 times length of stigmal vein; mid tibiae at least partly dark; hind femora dark only on dorsal margin; hind tibiae mostly yellow, but middle part with metallic shine; petiole present; dark parts of metasoma non-metallic.....*Hemiptarsenus brevipennis* stat. rev.
- Head completely dark; upper face metallic green; dark parts of scape metallic; clava completely yellow; propodeum with distinct plicae; subcubital vein starting at base of forewing. Postmarginal vein shorter than or at most equal to stigmal vein; mid tibiae completely yellow; hind femora dark only dorsally near apex; hind tibiae yellow basally, gradually dark toward apex; petiole absent; dark parts of metasoma completely metallic green.....*Hemiptarsenus fulvicollis*

Hemiptarsenus brevipennis (Erdős)

Hemiptarsenus anementus brevipennis Erdős, 1951: 193.
Synonymized as *H. fulvicollis* by Bouček 1959: 142.
Stat. rev.

Diagnosis: Head at least partly paler; upper face brown with metallic shine; clava with distal 1/2 of 2nd and 3rd segments yellow; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid tibiae at least partly dark; hind femora dark only on dorsal margin; hind tibiae mostly yellow, but middle part with metallic shine; dark parts of metasoma non-metallic.

In the rooted SCT, its closest sister species is *H. fulvicollis*. They share the following synapomorphies: clava at least partly differently colored from funicles; reticulations on scutellum oblong, at least 1.2 times as long as wide; dark parts on fore and mid femora metallic. However, besides the autapomorphic characters shown in the diagnosis, it also differs from *H. fulvicollis* in dark parts of scape non-metallic; propodeum without distinct plicae; postmarginal vein at least 1.5 times length of stigmal vein; hind femora dark only on dorsal margin; hind tibiae mostly yellow, but middle part with metallic shine; and dark parts of metasoma non-metallic.

Material examined: Types: 1 ♀, Hungary: Budapest, 19 July 1916 (Biro).

***Hemiptarsenus fulvicollis* Westwood**

Hemiptarsenus fulvicollis Westwood, 1833: 123.
Transferred into *Eulophus* by Walker 1839: 190.

Hemiptarsenus albicoxa Thomson, 1878: 210. Lectotype designated by Hansson 1991: 32. Synonymized by Bouček 1959: 142.

Eulophus anementus Walker, 1839: 191. Transferred into *Hemiptarsenus* by Dalla Torre 1898: 51. Synonymized by Bouček 1959: 142.

Eulophus catreus Walker, 1839: 148. Synonymized by Bouček and Askew 1968: 50.

Eulophus dercynus Walker, 1839: 139. Synonymized by Bouček and Askew 1968: 50.

Eulophus faula Walker, 1839: 148.

Elachertus pulcherrimus Förster 1841: 40. Synonymized by Bouček and Askew 1968: 50.

Eulophus tarandus Förster, 1841: 44. Synonymized by Bouček and Askew 1968: 50.

Diagnosis: Dark parts of scape metallic; propodeum with distinct plicae; postmarginal vein shorter than or at most equal to stigmal vein; hind femora dark only dorsally near apex; hind tibiae yellow basally, gradually dark toward apex; petiole absent.

Material examined: 1 ♀, Hungary: Szigetneut-

miklos, 23 July 1964 (Szocs), ex. *Lithocolletis quiquegutellis* in *Salix rosmrinifolia* L., det. by Erdős as *H. fulvicollis*.

Comments: The reticulations on the mid lobe of the mesoscutum and scutellum are so regularly arranged that they appear to be striate.

***Hemiptarsenus ornatus* (Nees)**

Encyrtus ornatus Nees, 1834: 219. Transferred into *Hemiptarsenus* by Graham 1993: 229.

Eulophus dropion Walker, 1839: 150. Transferred into *Hemiptarsenus* by Graham 1959: 185. Synonymized by Graham 1993: 229.

Entedon gratus Goureau, 1851: 143. Synonymized as *Hemiptarsenus dropion* by Graham 1963: 190. Synonymized by Graham 1993: 229.

Entedon lepidus Goureau, 1851: 141. Synonymized as *Hemiptarsenus dropion* by Graham 1963: 190. Synonymized by Graham 1993: 229.

Diagnosis: Clava at least partly differently colored from funicles; scutellum longitudinally striate; fore femora dark dorsally, yellow on other parts; mid coxae at least partly dark; dark parts of metasoma non-metallic (cf. Zhu et al. 2000c: figs. 1-3).

The studied material is unique in having a striated scutellum. In a recent review of Chinese species of *Hemiptarsenus*, Zhu et al. (2000c) described 1 species, *H. strigiscuta* from Hunan, South China. That species is strongly striated on the scutellum. However, it could be distinguished from *H. ornatus* by a different color pattern on the head, clava, and thorax. Also it has a distinct median carina and lateral plicae (ref. Zhu et al. 2000c: figs. 1-3, 13-15).

Material examined: 1 ♀, Hungary: Farnos, 10 Aug. 1979 (Zombori), ex. larva of *Heterarthrus ochropoda* on 25 July 1979, det. by Szelényi as *H. dropion*.

***Hemiptarsenus palustris* Erdős**

Hemiptarsenus palustris Erdős, 1954a: 334. Lectotype designated by Thuroczy 1992: 164. Synonymized as *Hemiptarsenus unguicellus* by Bouček 1959: 140. Stat. rev.

Diagnosis: Antennal scrobe sculptured; propodeum with distinct plicae.

Although it has only 2 autapomorphies to define itself, it differs from *H. unguicellus* and others in having toruli at lower eye margin; yellow setae on the mid lobe of the mesoscutum and scutellum; hind coxae at least partly dark; and metasoma completely dark. Thus it was removed from the synonymy list under *H. unguicellus* and

validated.

Materials examined: Lectotype: 1 ♀, Hungary: S. Vadkert 14 Aug. 1945 (Erdős), Varosito, lectotype designated by Graham (Hym. typ. no. 5822, Mus. Budapest). Paratype: 1 ♀, same data as for holotype (Hym. typ. no. 5823, Mus. Budapest).

Variations: The lectotype has a transverse petiole, while the paratype studied has a quadrate petiole.

***Hemiptarsenus petiolata* (Szelényi)**

Sympiesis petiolata Szelényi, 1981: 295. Comb. nov.

Diagnosis: Reticulations on vertex engraved; frontal groove present; dark parts of scape metallic; propodeum with distinct plicae.

In all MPTs, this species occurs among species of *Hemiptarsenus*. The toruli is well above the lower margin of the eyes; and the costal cell is narrow, more than 10 times as long as wide. Thus it should be in *Hemiptarsenus*.

When comparing this species to *H. unguicellus*, we doubted that it was only 1 form of *H. unguicellus*. Besides the autapomorphic characters described in the diagnosis, it also differs from the latter species in having the axillae distinctly advanced, not in a line with the anterior margin of the scutellum; scutellum green; and the mid leg completely yellow.

Material examined: Holotype: ♀, Hungary: Hortobagy, Ohat, vedett erdo, erdei aljnovenyzet fuhalozva, 24-26 June 1974 (Mahunka and Vasarhelyi) (Hym. typ. no. 6817).

***Hemiptarsenus unguicellus* (Zetterstedt)**

Entedon unguicellus Zetterstedt, 1838: 427. Transferred into *Hemiptarsenus* by Thomson 1878: 210.

Eulophus alce Walker, 1840: 234. Synonymized by Bouček and Askew 1968: 51.

Eulophus alcicornis Förster, 1841: 43. Synonymized by Bouček and Askew 1968: 51.

Eulophus antilope Förster, 1841: 43. Synonymized by Bouček and Askew 1968: 51.

Eulophus cinctipes Stephens, 1846: 9. Synonymized by Bouček and Askew 1968: 51.

Eulophus divisus Walker, 1872: 125. Lectotype designated by Graham 1979: 280. Synonymized by Bouček and Askew 1968: 51; Graham 1979: 280.

Eulophus drusilla Walker, 1839: 156. Synonymized by Bouček and Askew 1968: 51.

Eulophus gonippus Walker, 1839: 132. Synonymized by Bouček and Askew 1968: 50.

Eulophus harmocerus Förster, 1841: 44. Synonymized by Bouček and Askew 1968: 51.

Eulophus hedila Walker, 1839: 134. Synonymized Bouček 1959: 140.

Eulophus hegemon Walker, 1839: 149. Synonymized by Bouček and Askew 1968: 50.

Eulophus ianthea Walker, 1839: 135. Synonymized by Bouček and Askew 1968: 50.

Eulophus janthea Dalla Torre, 1898: 62. Emendation for *Eulophus ianthea*.

Eulophus laogonus Walker, 1839: 151. Synonymized by Bouček and Askew 1968: 50.

Eulophus myodes Walker, 1839: 136. Synonymized by Bouček and Askew 1968: 50.

Eulophus nonus Walker, 1839: 142. Synonymized by Bouček and Askew 1968: 50.

Eulophus nycteus Walker, 1839: 128. Synonymized by Bouček and Askew 1968: 50.

Eulophus opicornis Förster, 1841: 44. Synonymized by Bouček 1959: 140.

Elachertus pellucens Förster, 1841: 39. Synonymized by Bouček and Askew 1968: 51.

Eulophus piscus Walker, 1839: 155. Synonymized by Bouček and Askew 1968: 51.

Eulophus sexradiatus Förster, 1841: 44. Synonymized by Bouček and Askew 1968: 51.

Eulophus villius Walker, 1839: 154. Synonymized by Bouček and Askew 1968: 51.

Diagnosis: Upper face brown with metallic shine; frontal groove present; scape dark only dorsally on apical 1/2; setae on mid lobe of mesoscutum and scutellum yellow; propodeum rugose or reticulate; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; hind femora dark only dorsally near apex; hind tibiae completely yellow.

It differs from *H. waterhousii*, *H. brevipennis*, and *H. fulvicollis* in having a smooth antennal scrobe; funicle about equal width towards the clava; clava with same width as funicle at its broadest point; and dark parts on mid femora covering middle 1/2.

Materials examined: 2 plates with 3 ♀♀, Hungary: Szeged, 15 July 1952 (Erdős), det. by Szelényi as *H. unguicellus*.

Comments: One female positioned to show both ventral and lateral views confirms this species for the senior author, or this genus is much similar to *Sympiesis*, for all specimens examined in both genera show that the 1) ventral parts of the propleura overlap a bit on each other and 2) lateral parts of the mesosoma are almost the same except for the sculptured types on different parts.

***Hemiptarsenus waterhousii* Westwood**

Hemiptarsenus waterhousii Westwood, 1833: 123. Transferred into *Eulophus* by Walker 1846: 71.

Hemiptarsenus arenarius Erdős, 1951: 192. Lectotype

designated by Thuroczy 1992: 152. Synonymized by Bouček 1959: 143.

Diagnosis: Scape completely yellow; mid lobe of mesoscutum violet; reticulations on mid lobe of mesoscutum elongate, at least 1.5 times as long as wide; scutellum green; reticulations on propodeum raised, but much weaker than those on scutellum; forewing with at least some dark markings; cubital vein bare/open below basal cell; sub-cubital vein starting beyond intersection of basal and cubital veins; fore and hind coxae at least partly dark; fore femora completely dark.

This species shares the following synapomorphies with *H. brevipennis* and *H. fulvicollis*: antennal scrobe sculptured; funicle broadened towards the clava; clava distinctly clavate; and dark parts on mid femora covering basal 3/4. But it can be distinguished from the latter 2 species by having the clava concolorous with funicles; reticulations on scutellum rounded or isodiametric; and dark parts on fore and mid femora non-metallic.

Materials examined: Lectotype: 1 ♀, Hungary: SzSztMiklos, Biro, July 1910 (Hym. typ. no. 6031, Mus. Budapest). Paratype: 1 ♀, Hungary: Kelebia, 19 May 1950 (Erdös), Dvas erdo fuvein (Hym. typ. no. 6033, Mus. Budapest). Para-lectotype: 1 ♀, Hungary: SzSztMiklos, Biro, July 1911 (Hym. typ. no. 6032, Mus. Budapest).

Variations: The paratype studied has very short wings, in which case the forewing is shorter than the pronotum plus the mesoscutum. Also the dark patches on the forewing are relatively larger and form one which extends from the parastigma to the apex of the wing.

***Hemiptarsenus zilahisebessi* Erdös**

Hemiptarsenus zilahisebessi Erdös, 1951: 190. Lectotype designated by Thuroczy 1992: 171.

Diagnosis: Yellow parts on head covering only parts laterad to ocelli, inner margins of eyes on vertex, part of upper occiput, and lower face; face smooth; upper face brown with metallic shine; antennal scrobe differently colored from adjacent parts; scape completely dark; mesosoma at least partly yellow on propleuron and mid lobe of mesoscutum; anterior pair of setae on scutellum much shorter than posterior ones; propodeum smooth; propodeal median carina distinctly complete; dark parts of metasoma non-metallic.

Materials examined: Lectotype: 1 ♀, Hungary: Kalocsa, 8 July 1947 (Erdös) (Hym. typ.

no. 5825, Mus. Budapest). Paratypes: 1 ♀, Hungary: Duka, Csoroghegy, Biro, 14 Sept. 1925 (Hym. typ. no. 5836, Mus. Budapest); 1 ♀, Hungary: Tompa, 28 June 1950 (Erdös) (Hym. typ. no. 5828, Mus. Budapest); 1 ♀, Hungary: same data as previous one except dated 26 June 1950 (Hym. typ. no. 5829, Mus. Budapest); 1 ♀, Hungary: Bakos, Biro (Hym. typ. no. 5830, Mus. Budapest); 1 ♀, Hungary: SzSztMiklos, July 1912 (Biro) (Hym. typ. no. 5832, Mus. Budapest); 1 ♀, Hungary: Tompa, 25 July 1949 (Erdös) (Hym. typ. no. 5827, Mus. Budapest); 1 ♀, Hungary: Rakos, 22 June 1908 (Biro) (Hym. typ. no. 5831, Mus. Budapest); 1 ♀, Szod, 5 July 1918 (Biro) (Hym. typ. no. 5834, Mus. Budapest); 1 ♀, Hungary: SzSztMiklos, 25 July 1912 (Biro) (Hym. typ. no. 5833, Mus. Budapest); 1 ♀, Hungary: Kalocsa, 13 July 1948 (Erdös) (Hym. typ. no. 5826, Mus. Budapest); 1 ♀, Hungary: Vacz-szod, 26 June 1923 (Biro) (Hym. typ. no. 5825, Mus. Budapest); 1 ♂, Hungary: Kelebia, 20 June 1950 (Erdös) (Hym. typ. no. 5837, Mus. Budapest).

Variations: The color pattern of the head and pronotum greatly varies, but the transverse yellow stripe on the mesoscutum is stable.

***Sympiesis* Förster**

Sympiesis Förster, 1856: 74. Type species: *Eulophus sericeicornis* Nees, 1834.

Asympiesiella Girault, 1913a: 78. Type species: *Sympiesis nelsonensis* Girault, 1914: 11. Synonymized by Bouček, 1988: 620.

Cladosympiesis Graham, 1959: 182. Type species: *Eulophus gordius* Walker, 1839: 129.

Dialomella Girault, 1913b: 289. Type species: *Dialomella australiensis* Girault, 1913b: 289. Synonymized by Bouček 1988: 620.

Dialomorphella Girault, 1915: 294. Type species: *Dialomorphella cyaneipurpurea* Girault, 1915: 295. Synonymized by Bouček 1988: 620.

Moroceras Erdös, 1954a: 323. Type species: *Moroceras biroi* Erdös, 1954a: 323. Synonymized by Bouček and Askew 1968: 40.

Necremnomyia Girault, 1913b: 292. Type species: *Necremnomyia saintpierrei* Girault, 1913b: 292. Synonymized by Bouček 1988: 620.

Opheliminus Girault, 1913c: 458. Type species: *Opheliminus grotii* Girault, 1913c: 458. Synonymized by Bouček 1988: 620.

Pardialomella Girault, 1915: 295. Type species: *Pardialomella consona* Girault, 1915: 295. Synonymized by Bouček 1988: 620.

Pardialomyia Girault, 1915: 294. Type species: *Pardialomyia spadiceipes* Girault, 1915: 294. Synonymized by Bouček 1988: 620.

Pronecremnus Girault and Dodd, 1915: 298. Type species: *Pronecremnus speciosa* Girault and Dodd, 1915: 298.

Synonymized by Bouček 1988: 620.

Pseudophelminus Girault, 1913b: 286. Type species: *Pseudophelminus longiventris* Girault, 1913b: 286. Synonymized by Bouček 1988: 620.

Sympiesonecremnus Girault, 1913b: 292. Type species: *Sympiesonecremnus boasi* Girault, 1913b: 292. Synonymized by Bouček 1988: 620.

Sympiezus Thomson, 1878: 217. Emendation for *Sympiesis* by Thomson 1878.

Teleogmus Förster, 1856: 72. Type species: *Teleogmus orbitalis* Förster, 1856: 74. Synonymized by Bouček 1958: 137.

Comparative diagnosis: Toruli not well above lower margin of eyes; scape never reaching above the vertex; forewing costal cell less than 7 times as long as wide.

Key to species of *Sympiesis* at the HHNM (♀)

1. Reticulations on face engraved (except in *S. flavopicta*); scape dark dorsally along all of scape (unknown from *S. xanthostoma*).....2
- Reticulations on face raised; scape dark only dorsally on apical 1/2, or dark dorsally along all of scape, or completely dark.....7
2. Reticulations on vertex engraved; frontal groove straight; setae on mid lobe of mesoscutum scattered at least on anterior 1/2; hind coxae mostly dark brown; completely yellow; dark parts of metasoma metallic green.....3
- Reticulations on vertex raised; frontal groove angulated, V-shaped; mid lobe of mesoscutum with paired setae only; hind coxae completely dark brown, metallic green, or mostly yellow; dark parts on metasoma completely non-metallic or brown with metallic shine.....4
3. Dark parts of scape metallic; propodeum sculptured; without distinct plicae; propodeal median carina absent; setae on lower surface of costal cell with at least 1 line starting at base of forewing; reticulations on hind coxae raised.....*Sympiesis viridula*
- Dark parts of scape non-metallic; propodeum smooth; with distinct plicae; propodeal median carina present; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein; reticulations on hind coxae engraved.....*Sympiesis gordius*
4. Dark parts on head brown; upper face brown with metallic shine; antennal scrobe sculptured; setae on mid lobe of mesoscutum and scutellum dark; costal cell with 1 line of setae on lower surface; reticulations on hind coxae raised.....*Sympiesis gregori*
- Dark parts on head green (except in *S. aureolus*); upper face metallic green; antennal scrobe smooth; setae on mid lobe of mesoscutum and scutellum yellow (except in *S. flavopicta*); costal cell with 1 line of setae on lower surface; reticulations on hind coxae raised (unknown from *S. aureolus*).....5
5. Head completely dark; reticulations on face engraved; body completely dark; mesosoma completely dark; notauli incomplete; scutellum green; metasoma completely dark brown with metallic shine.....*Sympiesis xanthostoma*
- Head at least partly paler; reticulations on face raised; body at least partly yellow; mesosoma with at least propleuron yellow; notauli complete; scutellum metallic green, or brown with metallic shine between paired setae, yellow laterally; metasoma with non-metallic dark parts and paler parts.....6
6. Head mostly pale; dark parts on head brown; upper face with different color or shine from other parts of head; dark parts of body brown with vague metallic shine; pronotum completely dark; paler parts of mesosoma covering most parts, with brown parts only covering mid parts of mesosoma; mid lobe of mesoscutum brown with metallic shine; setae on mid lobe of mesoscutum and scutellum yellow; notauli reaching anterior angle of axillae, sub-parallel posteriorly; scutellum brown with metallic shine between paired setae, but yellow on lateral sides; dorsellum smooth; forewing hyaline; fore and mid legs completely yellow; hind coxae completely yellow; metasoma appearing completely pale brown.....*Sympiesis aureolus*
- Paler parts on head covering only parts laterad to ocelli, inner margins of eyes on vertex, part of upper occiput, and lower face yellow; dark parts on head green; upper face concolorous with other parts of head; dark parts of body metallic green; pronotum at least partly yellow; paler parts of mesosoma covering all lateral parts only; mid lobe of mesoscutum green; setae on mid lobe of mesoscutum and scutellum dark; notauli reaching anterior margin of axillae, curving outwards posteriorly; scutellum metallic green between paired setae, yellow laterally; dorsellum sculptured; forewing with at least some dark markings; fore and mid legs at least partly dark; hind coxae at least partly dark; metasoma with sub-basal paler transverse stripe.....*Sympiesis flavopicta*
7. Scape completely yellow; propodeum smooth, with distinct plicae; setae on lower surface of costal cell in more than 2 lines at least near apex; all coxae completely yellow.....*Sympiesis albiscapus* stat. rev.
- Scape at least partly dark (except in *S. gyoerfii*, *S. maculata*, and some *S. corrugata*); propodeum sculptured with distinct plicae or smooth without distinct plicae (except in *S. gyoerfii*, *S. solitaria*, and *S. helvetica*); setae on lower surface of costal cell in 2 lines (except in *S. gyoerfii*, *S. santelinae*, and *S. nowickii*); all coxae at least partly dark (except in *S. kelebiana*).....8
8. Antennal scrobe sculptured; dorsellum sculptured; hind coxae at least partly pale.....9
- Antennal scrobe smooth or sculptured; dorsellum smooth or sculptured; hind coxae completely dark.....11
9. Head completely dark; frontal groove absent; scape dark dorsally along entire scape; mid lobe of mesoscutum setae scattered at least on anterior 1/2; notauli incomplete; reticulations on propodeum raised, as strong as those on scutellum, or engraved; setae on lower surface of costal cell in more than 2 lines at least near apex; subcubital vein starting beyond intersection of basal and cubital veins; reticulations on hind coxae engraved; metasoma elongate, at least 1.5 times as long as head plus mesosoma; last tergite of metasoma at least 3 times as long as broad.....*Sympiesis dolichogaster*
- Head at least partly paler; frontal groove present; scape dark only dorsally on apical 1/2 (unknown from *S. maculata*); mid lobe of mesoscutum with paired setae only; notauli complete to scutoscuteellar suture; reticulations on propodeum raised, but much weaker than those on scutellum; setae on lower surface of costal cell in 2 lines; subcubital vein starting at base of forewing; metasoma less elongate, at most 1.2 times as long as head plus mesosoma; last tergite of metasoma at most 1.5 times as long as broad.....10

10. Paler parts on head brown, covering only lower face; frontal groove straight; scape completely yellow; notauli reaching anterior angle of axillae, curving outwards posteriorly; reticulations on dorsellum engraved, weaker than those on scutellum; forewing with at least some dark markings; setae on lower surface of costal cell with at least 1 line starting at base of forewing; fore and mid coxae at least partly dark; hind coxae mostly yellow, smooth.....*Sympiesis maculata*
- Paler parts on head yellow, covering lower face just below toruli, and with another transverse narrow stripe just before median ocellus reaching inner margin of eyes; frontal groove angulate, V-shaped; scape at least partly dark; notauli reaching anterior margin of axillae, sub-parallel posteriorly; reticulations on dorsellum raised, but much weaker than those on scutellum; forewing hyaline; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein; fore and mid coxae completely yellow; hind coxae mostly dark metallic green, sculptured; metasoma appearing completely pale brown.....*Sympiesis kelebiana*
11. Head at least partly paler; upper face brown with metallic shine; scape completely dark; mid lobe of mesoscutum with paired setae only; propodeum smooth; all legs completely yellow except for some coxae.....*Sympiesis angustipennis*
- Head completely dark (except in *Sympiesis biroi*); upper face violet or metallic green (except in *Sympiesis biroi*, *S. solitaria*, and *S. grahami*); scape dark at least pale dorsally on basal 1/2 (except in *Sympiesis biroi*, *S. solitaria*, *S. corrugata*, and *S. grahami*); propodeum sculptured (except in *Sympiesis biroi*); legs at least partly dark.....12
12. Dark parts on head brown; reticulations on face engraved; upper face brown with metallic shine; setae on mid lobe of mesoscutum scattered all over dorsum; forewing with at least some dark markings; setae on lower surface of costal cell with at least 1 line starting at base of forewing; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; all femora completely dark; hind tibiae bichromatic, with dark parts on hind tibiae covering apical 1/5-1/4; scape of males brown with metallic shine.....*Sympiesis acalle*
- Dark parts on head green; reticulations on face raised; upper face metallic green or violet; setae on mid lobe of mesoscutum scattered only anteriorly; forewing hyaline; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein; subcubital vein starting at base of forewing; all femora at least partly pale (except in *S. sericeicornis*); hind tibiae almost completely dark, or if bichromatic, dark parts covering apical 1/3; scape of males brown and non-metallic.....13
13. Dark parts of scape non-metallic; setae on mid lobe of mesoscutum and scutellum yellow; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein; fore and hind femora mostly non-metallic dark; mid tibiae completely yellow.....14
- Dark parts of scape metallic; setae on mid lobe of mesoscutum and scutellum dark (except in *S. sericeicornis*); setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein; fore and hind femora at least partly metallic dark; mid tibiae at least partly dark..17
14. Head completely dark; frontal groove straight; scape dark dorsally along all of scape; setae on mid lobe of mesoscutum scattered at least on anterior 1/2; dorsellum and propodeum sculptured; hind coxae metallic green.....15
- Head at least partly paler; frontal groove angulate, V-shaped; scape completely dark (unknown from *S. gyoerffii*); mid lobe of mesoscutum with paired setae only; dorsellum and propodeum smooth; hind coxae non-metallic brown.....16
15. Setae on mid lobe of mesoscutum scattered all over dorsum; notauli complete to scutoscutellar suture; setae on scutellum yellow; fore, mid, and hind tibiae completely yellow; mid coxae and hind femora mostly dark; metasoma completely dark.....*Sympiesis puszticola*
- Setae on mid lobe of mesoscutum scattered only anteriorly; notauli incomplete, not reaching scutoscutellar suture; setae on scutellum dark; fore, mid, and hind tibiae at least partly dark; mid coxae completely dark; hind femora dark only on dorsal margin; metasoma with pale parts.....*Sympiesis notata*
16. Dark parts on head green; upper face violet; antennal scrobe smooth; scape completely yellow; dark parts of body metallic green; mid lobe of mesoscutum green, with more than 3 pairs of setae; setae on lower surface of costal cell in more than 2 lines at least near apex; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; fore and hind tibiae completely yellow; hind coxae smooth; hind femora dark only on dorsal margin.....*Sympiesis gyoerffii*
- Dark parts on head brown; upper face brown with metallic shine; antennal scrobe sculptured; scape at least partly dark; dark parts of body brown with vague metallic shine; mid lobe of mesoscutum brown with metallic shine, with 3 pairs of setae; setae on lower surface of costal cell in 2 lines; subcubital vein starting at base of forewing; fore and hind tibiae at least partly dark; hind coxae sculptured; hind femora mostly dark.....*Sympiesis biroi*
17. Face smooth; upper face violet; frontal groove straight; scape dark only dorsally on apical 1/2; scutellum violet; reticulations on scutellum oblong, at least 1.2 times as long as wide; reticulations on dorsellum and propodeum, but much weaker than those on scutellum; fore femora mostly dark, with only apex paler (yellow); mid and hind tibiae bichromatic, with darker parts metallic; hind coxae smooth.....*Sympiesis euspilapterygis*
- Face sculptured; upper face metallic green; frontal groove angulate, V-shaped; scape completely dark; scutellum green; reticulations on scutellum rounded or isodiametric; reticulations on dorsellum raised, as coarse as those on scutellum; reticulations on propodeum engraved, or as strong as those on scutellum (except in *S. sericeicornis*); fore femora completely dark; mid and hind tibiae almost completely metallic dark, or gradually darkened towards apex (except in *S. helvetica*); hind coxae sculptured.....18
18. Antennal scrobe smooth; propodeum with distinct plicae at most reaching posterior margin of propodeal spiracle; forewing with at least some dark markings.....*Sympiesis helvetica*
- Antennal scrobe sculptured (except in *S. corrugata*); propodeum with distinct plicae at most reaching halfway between posterior and anterior margins of propodeum, or without distinct plicae; forewing hyaline.....19
19. Antennal scrobe sculptured; mid lobe of mesoscutum setae scattered at least on anterior 1/2; fore femora, mid tibiae, and hind coxae completely dark; fore tibiae at least partly dark; hind tibiae almost completely dark.....20

- Antennal scrobe smooth (except in *S. grahami*); mid lobe of mesoscutum with paired setae only; fore femora mostly dark, with only apex paler (yellow); fore tibiae completely yellow, or partly dark; mid tibiae at least partly yellow; hind coxae mostly dark, or completely dark; hind tibiae yellow basally, gradually dark towards apex.....22
- 20. Frontal groove straight; scape not reaching median ocellus; funicle 3-segmented; setae on mid lobe of mesoscutum scattered only laterally; reticulations on propodeum raised, as strong as those on scutellum; setae on lower surface of costal cell in more than 2 lines at least near apex; subcubital vein starting beyond intersection of basal and cubital veins; mid femora mostly dark, at most with apex paler; dark part on mid and hind tibiae non-metallic; hind coxae brown; metasoma with non-metallic dark parts*Sympiesis santelinae*
- Frontal groove angulate, V-shaped; scape reaching median ocellus; funicle 4-segmented; setae on mid lobe of mesoscutum scattered only anteriorly; reticulations on propodeum raised, but much weaker than those on scutellum; setae on lower surface of costal cell in 2 lines; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid femora completely dark; dark part on mid and hind tibiae metallic; hind coxae green; metasoma with metallic green parts..21
- 21. Reticulations on face engraved; reticulations on antennal scrobe raised; setae on mid lobe of mesoscutum yellow; setae on scutellum yellow; reticulations on propodeum raised, but much weaker than those on scutellum; setae on lower surface of costal cell with at least 1 line starting at base of forewing.....*Sympiesis sericeicornis*
- Reticulations on face raised; reticulations in antennal scrobe engraved; setae on mid lobe of mesoscutum dark; setae on scutellum dark; reticulations on propodeum engraved; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein.....
-*Sympiesis feketei*
- 22. Dark parts of scape metallic; funicle 3-segmented; scutellum violet; costal cell with 2 or more lines of setae on lower surface; subcubital vein starting beyond intersection of basal and cubital veins; mid coxae completely dark; dark parts on mid femora metallic; mid tibiae at least partly dark; hind femora completely dark.....*Sympiesis solitaria*
- Dark parts of scape non-metallic; funicle 4-segmented; scutellum green; costal cell with 1 line of setae on lower surface; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid coxae mostly dark; dark parts on mid femora non-metallic; mid tibiae completely yellow; hind femora dark only on dorsal margin.....23
- 23. Antennal scrobe sculptured; scape completely dark; reticulations on propodeum engraved; fore leg at least partly dark; mid femora mostly dark, with dark parts covering basal 3/4; hind femora mostly metallic dark, with dark parts covering basal 3/4; hind tibiae at least partly dark.....
-*Sympiesis grahami*
- Antennal scrobe smooth; scape dark only dorsally on apical 1/2; reticulations on propodeum raised, as strong as those on scutellum; fore leg completely yellow; mid femora yellow at base and apex, brown on middle part, with brown part on mid femora covering middle 1/2; hind femora non-metallic dark only on dorsal margin, with dark part covering middle 1/2; hind tibiae completely yellow.....
-*Sympiesis corrugata*

***Sympiesis acalle* (Walker)**

Eulophus acalle Walker, 1848: 234. Transferred into *Sympiesis* by Graham 1959: 182.

Eulophus bifasciatus Thomson, 1878: 230. Synonymized as *Eulophus acalle* Walker by Bouček 1959: 128. Lectotype designated by Hansson 1991: 33.

Entedon nubeculatus Ratzeburg, 1848: 158. Synonymized by Bouček 1959: 128.

Diagnosis: Dark parts on head brown; reticulations on face engraved; upper face brown with metallic shine; setae on mid lobe mesoscutum scattered all over dorsum; forewing with at least some dark markings; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid femora completely dark; dark parts on hind tibiae covering apical 1/5-1/4.

Materials examined: (det. by Erdős as *Eulophus bifasciatus*). 1 ♀, Hungary: A.-Orbo (Dr. Szilady); 1 ♀, Hungary: Budapest, 16 July 1907 (Biro); 1 ♂, Hungary: Vacz, 26 May 1914 (Biro); 1 ♀, Hungary: Vacz, Tudosdomb, 31 May 1930 (Biro); 1 ♂, Hungary: O. Sebeshely, 16 July 1913 (Biro); 1 ♂, Hungary: O. Sebeshely, 9 July 1913 (Biro); 1 ♂, Hungary: O. Sebeshely, 17 July 1913 (Biro); 2 ♂♂, Hungary: N. Enyed, 3 July 1917 (Biro); 1 ♂, Hungary: Vien, 26 July 1908 (Biro); 1 ♂, Hungary: Budapest, 26 May 1908 (Biro); 1 ♂, Hungary: Szod, 26 Aug. 1922 (Biro); 1 ♂, Hungary: Budapest, 31 May 1928; 1 ♂, Hungary: Huvosvolgy, 17 June 1908 (Biro).

Comments: Males have a hyaline forewing, but the coloration patterns of the legs are almost the same as those of females.

***Sympiesis albiscapus* (Erdős)**

Eulophus albiscapus Erdős, 1954a: 332. Lectotype designated by Thuroczy 1992: 151. Synonymized as *Eulophus gordius* by Bouček 1959: 135. Stat. rev.

Diagnosis: Scape completely yellow; propodeum smooth, with distinct plicae; setae on lower surface of costal cell in more than 2 lines at least near apex.

In the rooted SCT, this species is in a different clade from that of *S. gordius*. It differs from members of that clade in having raised reticulations on face and setae on lower surface of costal cell with at least 1 line starting at base of forewing.

Material examined: Holotype: ♀, Hungary: Radnai h. 24 July 1973 (Hym. typ. no. 6540, Mus. Budapest).

***Sympiesis angustipennis* (Erdős)**

Eulophus angustipennis Erdős, 1954a: 332. Lectotype designated by Thuroczy 1992: 151. Transferred into *Sympiesis* by Bouček 1959: 136.

Diagnosis: Head at least partly paler; upper face brown with metallic shine; scape completely dark; mid lobe of mesoscutum with paired setae only; propodeum smooth.

This species also differs from members of the 2 clades grouped respectively with *S. pusztacola* and *S. acalle* in having completely yellow legs.

Materials examined: Lectotype of *Eulophus angustipennis* Erdős, 1954, 1 ♀, Hungary: Berhida, 8 July 1953 (Erdős) (Hym. typ. no. 6536, Mus. Budapest). Paratypes of *Eulophus angustipennis* Erdős, 1954, 1 ♀, 1 ♂, Hungary: Budai h 2 July 1952 (Erdős) (Hym. typ. no. 6538, 6539, Mus. Budapest); 1 ♀, Hungary: Sopron, 6 July 1953 (Erdős) (Hym. typ. no. 6537).

***Sympiesis aureolus* Szelényi**

Sympiesis aureolus Szelényi, 1976: 275.

Diagnosis: Dark parts on head brown; upper face with different color or shine from other parts of head; dark parts of body brown with vague metallic shine; paler parts covering most of mesosoma, brown parts only covering mid portions of mesosoma; dorsellum smooth; hind coxae completely yellow.

This species shares the following synapomorphies with and is closest to *S. flavopicta*: head at least partly paler; reticulations on face raised; body at least partly yellow; mesosoma with at least propleuron yellow; notauli complete; scutellum brown with metallic shine between paired setae, but yellow on lateral sides; and metasoma with pale parts.

Material examined: Holotype: ♀, Hungary: Kerecsend (Erdős), assoc. *Acer* sp. (Hym. typ. no. 4540, Mus. Budapest).

***Sympiesis biroi* (Erdős)**

Moroceras biroi Erdős, 1954a: 324. Transferred into *Sympiesis* by Bouček 1959: 128.

Diagnosis: Dark parts on head brown; upper face brown with metallic shine; antennal scrobe sculptured; mid lobe of mesoscutum brown with metallic shine; three pairs of setae on mid lobe of mesoscutum; fore tibiae at least partly dark.

This species shares the following synapomorphies with *S. gyoerfii*: head at least partly paler; mid lobe of mesoscutum with paired setae only; propodeum smooth; and hind coxae non-metallic brown.

Material examined: Holotype: ♂, Hungary: Budapest, Biro, 1918 (Hym. typ. no. 6034, Mus. Budapest).

***Sympiesis corrugata* Szelényi**

Sympiesis corrugata Szelényi, 1977: 243.

Diagnosis: Scape dark only dorsally on apical 1/2; fore legs and hind tibiae completely yellow; mid femora yellow at base and apex, brown on middle 1/2; hind femora dark only on dorsal margin in middle 1/2.

This species is closest to *S. grahami*, for they share the following synapomorphies: scape with non-metallic dark parts; costal cell with 1 line of setae on lower surface; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid coxae and hind femora mostly dark; dark parts on mid femora non-metallic; mid tibiae completely yellow.

Materials examined: Holotype: ♀, Hungary: Mdteszalka, 27 May 1974 (Somogyi), ex. *Pandemis ribeana* Hbn. (Hym. typ. no. 5957, Mus. Budapest). Paratypes, 2 ♀♀, same data as for holotype except dated 24 May 1974 (Hym. typ. no. 5960); 3 ♀♀, same data as for holotype (Hym. typ. nos. 5958, 5959, 5962, Mus. Budapest).

***Sympiesis dolichogaster* Ashmead**

Sympiesis dolichogaster Ashmead, 1888.

Sympiesis gracilis Girault, 1915: 296.

Asympiesiella india Girault, 1916: 341. Synonymized by Bouček 1988: 621.

Sympiesis mikado Ashmead, 1904b: 164. Lectotype designated and synonymized by Kamijo 1976: 485.

Sympiesis nelsonensis Girault, 1914: 11. Transferred into *Asympiesiella* by Girault 1913a: 78. Synonymized by Bouček 1988: 621.

Sympiesis nowickii Szelényi 1941: 27. Synonymized by Bouček 1959: 130.

Diagnosis: Frontal groove absent; dark dorsally along entire scape; setae on lower surface of costal cell in more than 2 lines at least near apex; reticulations on hind coxae engraved; metasoma elongate, at least 1.5 times as long as head plus mesosoma; last tergite of metasoma at least 3 times as long as broad.

This species differs from both *S. maculata*

and *S. kelebiana* in having head completely dark; mid lobe of mesoscutum setae scattered at least on anterior 1/2; notauli incomplete; and reticulations on propodeum raised or engraved, if raised, as strong as those on scutellum.

Materials examined: Holotype of *Sympiesis nowickii* ♀, Hungary: Sopron, Györfi, Mar. 1937 (Hym. typ. no. 501, Mus. Budapest). Paratype of *Sympiesis nowickii*, Hungary: Budapest, 12 Apr. 1939 (Vasvari) (Hym. typ. no. 8883, Mus. Budapest).

***Sympiesis euspilapterygis* (Erdős)**

Eulophus euspilapterygis Erdős, 1958: 209. Transferred into *Sympiesis* by Bouček 1959: 135.

Diagnosis: Face smooth; upper face violet; frontal groove straight; scutellum violet; reticulations on scutellum oblong, at least 1.2 times as long as wide; reticulations on dorsellum and propodeum raised, but much weaker than those on scutellum; fore femora mostly dark, with only apex yellow; hind coxae smooth; dark parts of hind tibiae metallic.

This species shares the following synapomorphies with the clade of *S. helvetica*: dark parts of scape metallic; setae on mid lobe of mesoscutum and scutellum dark; dorsellum sculptured; dark parts on fore and mid femora metallic; mid tibiae at least partly dark.

Materials examined: Holotype: ♂, Hungary, Bekasmegeyes, 4 Oct. 1954 (Szocs), ex. *Euspilapteryx phasienipenneha* in *Polygona lapathifolio* L. (Hym. typ. no. 5732, Mus. Budapest). Paratypes of *Eulophus euspilapterygis*, 1 ♂, same data as for holotype (Hym. typ. no. 5733, Mus. Budapest); 1 ♀, Hungary: Velencei-h, Nada, 10 May 1951 (Hym. typ. no. 5735, Mus. Budapest); 1 ♂, Hungary: Ocsa, 21 Oct. 1954 (Szocs), ex. *Lithocolletis quinqueguttella* in *Salice rosmarinifolia* (Hym. typ. no. 5734, Mus. Budapest).

Comments: The holotype (♂) of this species is not so distinct from other species. We recorded all information from the female paratype, which was collected from another locality in Hungary. We wonder if it is proper to select such a female specimen as the paratype.

***Sympiesis feketei* Györfi**

Sympiezus feketei Györfi, 1939: 100. Type designated by Thuroczy 1992: 158.

Diagnosis: Only 1 autapomorphy was found:

setae on the lower surface of the costal cell with 1 line of setae starting at the midpoint of the costal vein.

It is closest to *S. sericeicornis*, both species share the following synapomorphies: scape reaching median ocellus; setae on lower surface of costal cell in 2 lines; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; mid femora completely dark; and dark parts on mid and hind tibiae metallic. But it differs in having different types of reticulations: reticulations on face raised; reticulations on antennal scrobe engraved; reticulations on propodeum engraved. Also setae on mid lobe of mesoscutum and scutellum dark.

Materials examined: Lectotype: 2 ♀♀ on 1 plate, Hungary: Sapon, Dec. 1937 (Györfi) (Hym. typ. no. 8882, Mus. Budapest).

Comments: There are 2 specimens on the same card; one is positioned to show the dorsum, while the other shows the lateral and ventral parts. Based on the dorsum of the mesosoma, this species is quite distinct in having dense, small, engraved reticulations on the propodeum. Also the propodeal median carina is very strong, appearing to be a combination of 2 separate carinae. The propodeal plicae reach only halfway between the posterior and anterior margins of the propodeum, but they are a little angulate before the anterior ends. In addition, the plicae have some lateral transverse small carinae at the angle. These characters show that this species is not a form of *Sympiesis*, but one of *Pnigalio*, also it has no transverse costulae on the propodeum.

***Sympiesis flavopicta* Bouček**

Sympiesis flavopicta Bouček, 1959: 132.

Diagnosis: Yellow parts on head covering only parts laterad to ocelli, inner margins of eyes on vertex, part of upper occiput, and lower face; pronotum at least partly yellow; setae on mid lobe of mesoscutum and scutellum dark; notauli reaching anterior margin of axillae, curving outwards posteriorly; scutellum metallic green between paired setae, yellow laterally; forewing with at least some dark markings; fore and mid leg at least partly dark; metasoma with sub-basal paler transverse stripe.

Materials examined: Paratype: 1 ♀, Czech Republic, Moravia, Brno, Paleček, A. Hoffer, sesmykan v podrostu luznsho haje, 1939 (Erdős). 1 ♀, Hungary: Kungas, 9 Aug. 1958, Erdolyi, ex.

Medicago sativa, det. by Erdős as *Eulophus sandanis* Walker, by Szelényi as *S. flavopicta*.

Other specimens examined: 47 ♀♀, 3 ♂♂, collected from various localities in Bulgaria and Hungary, det. by Erdős as *Eulophus atmopterus* Ratz.; 9 ♂♂ collected from Hungary, det. by Erdős as *Teleognomus xanthostomus* Thomson.

Variations: Females always have dark markings under the stigma, and yellow parts visible dorsally; but in males, the forewing is always hyaline, and the yellow parts are not visible dorsally, but visible laterally.

***Sympiesis gordius* (Walker)**

Eulophus gordius Walker, 1839: 129. Transferred into *Sympiesis* by Graham 1959: 182.

Eulophus alaparus Walker, 1839: 163. Synonymized by Bouček 1959: 135.

Eulophus bulmerincii Ratzeburg, 1848: 155. Synonymized by Bouček and Askew 1968: 43.

Eulophus cervicornis Förster, 1841: 43. Synonymized by Bouček 1959: 135.

Eulophus laevisimus Ratzeburg, 1848: 157. Synonymized by Bouček 1959: 135.

Eulophus padellae Ratzeburg, 1844: 166. Transferred into *Entedon* by Ratzeburg, 1848: 163. Synonymized by Bouček 1959: 135.

Eulophus pisenor Walker, 1839: 153. Synonymized by Bouček and Askew 1968: 43.

Eulophus stramineipes Thomson, 1878: 232. Lectotype designated by Hansson 1991: 33. Synonymized by Graham 1959: 183.

Diagnosis: Dark parts of scape non-metallic; propodeal median carina present; setae on lower surface of costal cell with 1 line of setae starting at midpoint of costal vein.

This species shares the following synapomorphies with *S. viridula*: engraved reticulations on vertex; straight frontal groove; and brown hind coxae. But it differs from the latter species in having a smooth propodeum, with distinct plicae and engraved reticulations on hind coxae.

Materials examined: (det. by Erdős as *Eulophus stramineipes* Thoms.), 27 ♂♂, 17 ♀♀, collected from various localities in Hungary.

Variations: All females have a completely metallic green metasoma, while the males always have a basal transverse yellow patch on the metasoma. Most females have an elongate metasoma, more than 3 times as long as wide, but males have a much less elongate metasoma.

***Sympiesis grahami* Erdős**

Sympiesis grahami Erdős, 1966: 402.

Diagnosis: Antennal scrobe sculptured; reticulations on propodeum engraved.

It differs from *S. corrugata* as the latter species has a smooth antennal scrobe and raised reticulations on the propodeum, which are as strong as those on the scutellum.

Materials examined: Holotype: ♀, Hungary: Ocsa, 17 Nov. 1955 (Scocs), ex. *Lithocolletis comparella* on *Populus alba* (Hym. typ. no. 5745, Mus. Budapest). Paratypes: 1 ♀, same data as for holotype except dated 15 Oct. 1954 (Hym. typ. no. 5747, Mus. Budapest); 1 ♀, same data as for holotype except dated 19 Feb. 1955 (Hym. typ. no. 5750, Mus. Budapest); 1 ♀, same date as for holotype except dated 16 Feb. 1955 (Hym. typ. no. 5751, Mus. Budapest); 1 ♂, same data as for holotype except dated 14 Feb. 1955 (Hym. typ. no. 5746, Mus. Budapest); 1 ♂, same data as for holotype except dated 12 Feb. 1955 (Hym. typ. no. 5752, Mus. Budapest); 1 ♀, Hungary: Agasesyhiza, 17 Feb. 1955 (Szocs), ex. *Lithocolletis comparella* on *Populus alba* L. (Hym. typ. no. 5753, Mus. Budapest); 2 ♀♀, Hungary: SzSztMiklos Biro, July 1911 (Hym. typ. nos. 5754-5755, Mus. Budapest); 1 ♀, Hungary: SzSztMiklos Biro, Apr. 1912 (Hym. typ. no. 5746, Mus. Budapest); 1 ♀, Hungary: Szigetiz Miklos, 4 July 1955 (Szocs), ex. *Lithocolletis comparella* on *Populus alba* L. (Hym. typ. no. 5758, Mus. Budapest); 1 ♀, Hungary: T. Berczel Horv. 1921 (Hym. typ. no. 5759, Mus. Budapest); 1 ♀, Hungary: Kalocsa, 14 Aug. 1942 (Erdős) (Hym. typ. no. 5761, Mus. Budapest); 1 ♀, Hungary: Fokto, 25 Oct. 1942 (Erdős) (Hym. typ. no. 5762, Mus. Budapest); 1 ♀, Hungary: Miske, 13 Aug. 1939 (Erdős) (Hym. typ. no. 5763, Mus. Budapest); 3 ♀♀, Hungary: Fajsz, 4 Aug. 1943 (Erdős) (Hym. typ. nos. 5764, 5765, 5766, Mus. Budapest); 1 ♀, Hungary: Dunzugh. Ketbukfzug. 7 Apr. 1959 (Szocs), ex. *Lithocolletis dubitella* on *Salix* spp. (Hym. typ. no. 5768, Mus. Budapest); 1 ♀, Hungary: Vacz, Biro, 5 July 1923 (Hym. typ. no. 5769, Mus. Budapest); 1 ♀, Hungary: Matra, 23 June 1952 (Erdős) on *Alnus glutinosa* (Hym. typ. no. 5772, Mus. Budapest); 1 ♀, (Hym. typ. no. 5773, Mus. Budapest); 1 ♀, Hungary: Boduaraho, 6 Oct. 1943 (Erdős) (Hym. typ. no. 5774, Mus. Budapest); 1 ♀, Hungary: Köszegi h 22 May 1944 (Erdős) (Hym. typ. no. 5775, Mus. Budapest); 1 ♂, Hungary: K. Vaszar, 25 Apr. 1952 (Erdős), ex. *Lithocolletis* sp. on *Alne slugtinesa* (Hym. typ. no. 8107, Mus. Budapest); 1 ♀, Hungary: Szod, Biro, Aug. 1922 (Hym. typ. no. 5760, Mus. Budapest); 1 ♀, Hungary: Vacz, Biro, 5 Aug. 1923 (Hym. typ.

no. 5770, Mus. Budapest); 1 ♀, Hungary: Luczfalva Horvath (Hym. typ. no. 5771, Mus. Budapest); 1 ♀, Hungary: Ocsa, 14 Mar. 1955 (Szocs), ex. *Lithocolletis comparella* on *Populi alpza* (Hym. typ. no. 5749, Mus. Budapest); 1 ♀, Hungary: Ocsa, 18 Feb. 1955 (Szocs), ex. *Lithocolletis comparella* on *Populi alpza* (Hym. typ. no. 5748, Mus. Budapest); 1 ♂, Hungary: Tompa, 4 Apr. 1949 (Erdős), (Hym. typ. no. 5767, Mus. Budapest); 1 ♂, Hungary: SzSztMiklos Biro, Apr. 1912 (Hym. typ. no. 5757, Mus. Budapest); 1 ♂, Hungary: Vaszar, 25 Apr. 1952, ex. *Lithocolletis* sp. on *Alno glutinoosa* L. (Erdős) (Hym. typ. no. 5776, Mus. Budapest).

Variations: The color of the hind tibiae varied much even among those reared out of the same host. The dark patch ranges between 1/5 to nearly 2/3 of the apical 1/2 of the hind tibiae. Some paratypes have completely dark brown tibiae. Males have no branches at the funicular segments, but all funicular segments are dark dorsally, yellow ventrally (this may have resulted from the glue, because several females also had yellowish parts of the funicles). In larger ones, the propodeal plicae exist, but there were no plicae in holotypes and most of the paratypes examined.

***Sympiesis gregori* Bouček**

Sympiesis gregori Bouček, 1959: 131.

Sympiesis linifoliellae Delucchi, 1962: 60. Synonymized by Bouček and Askew 1968: 44.

Diagnosis: Dark parts on head brown; upper face brown with metallic shine; antennal scrobe sculptured; setae on mid lobe of mesoscutum and scutellum dark; costal cell with 1 line of setae on lower surface.

It also differs from *S. xanthostoma*, *S. aureolus*, and *S. flavopicta* in having an indistinct propodeal median carina (if present, it is incomplete), and raised reticulations on the hind coxae.

Materials examined: (determined by Erdős as *Eulophus atmopterus* Ratz.), 1 ♀, Hungary: O. Sebeshely, 12 July 1913 (Biro); 1 ♀, Hungary: Szepliget; 1 ♀, Hungary: Vacz, Tudosdomb, 12 July 1930 (Biro); 1 ♀, Hungary: SzSztMiklos, 10 Sept. 1911 (Biro); 1 ♀, Hungary: Wien, 26 July 1908 (Biro).

Variations: Some specimens (with underlining) have a hyaline forewing; others have 1 transverse dark patch under the stigma. Specimens with markings under the stigma also have a different color pattern of the legs: fore and mid coxae

and legs completely yellow, but the hind coxae yellow, hind femora mostly yellow, with dark patch dorsally on apical 1/2, hind tibiae bichromatic. This is probably not *Sympiesis gregori* Bouček.

***Sympiesis gyoerfii* Erdős**

Sympiesis gyoerfii Erdős, 1954a: 324.

Diagnosis: Upper face violet; scape completely yellow; setae on lower surface of costal cell in more than 2 lines at least near apex; subcubital vein starting halfway between base of forewing and intersection of basal and cubital veins; hind coxae smooth; hind femora dark only on dorsal margin; hind tibiae completely yellow.

It also differs from *S. biroi* in having green dark parts on head; violet upper face; smooth antennal scrobe; dark parts of body metallic green; green mid lobe of mesoscutum; more than 3 pairs of setae on mid lobe of mesoscutum; and completely yellow fore tibiae.

Material examined: Holotype: ♀, Hungary: Tompa, 4 Sept. 1951 (Erdős) (Hym. typ. no. 5744, Mus. Budapest).

***Sympiesis helvetica* Szelényi**

Sympiesis helvetica Szelényi, 1977: 243.

Diagnosis: Propodeum with distinct plicae, at most reaching posterior margin of propodeal spiracle; forewing with some dark markings.

In rooted SCT, this species is in the same clade of *S. solitaria* and *S. sericeicornis*, for they have the following synapomorphies: scape completely dark; setae on lower surface of costal cell in more than 2 lines at least near apex; and mid tibiae gradually darkened towards apex. But it is distinguishable in having bichromatic hind tibiae, and monochromatic funicular segments of males, with branches.

Materials examined: Holotype: ♀, Hungary: Engadin, Val Rosea, 16 Aug. 1964 (Erdős) (Hym. typ. no. 5945, Mus. Budapest). Paratypes: 1 ♀, Hungary: Engadin, Pantresina, 23 Aug. 1964 (Erdős) (Hym. typ. nos. 5947, 5949, Mus. Budapest); 2 ♀♀, same data as for previous one, except dated 27 Aug. 1964 (Erdős) (Hym. typ. nos. 5950-5951, Mus. Budapest); same data as for previous one except dated 28 Aug. 1964 (Hym. typ. no. 5948); 2 ♀♀, same data as for holotype (Hym. typ. nos. 5953, 5954, 5956, Mus. Budapest); 1 ♀, same data as for holotype except

dated 29 Aug. 1964 (Hym. typ. no. 5952, Mus. Budapest). Allotype, 1 ♂, Hungary: Engadin, Val Morteratia, 17 Aug. 1964 (Erdős) (Hym. typ. no. 5946, Mus. Budapest).

***Sympiesis kelebiana* Erdős**

Sympiesis kelebiana Erdős, 1966: 404.

Diagnosis: Yellow parts on head covering lower face just below toruli, and with another transverse narrow stripe just before median ocellus reaching inner margin of eyes; notauli reaching anterior margin of axillae; setae on lower surface of costal cell with 1 line of setae starting at mid-point of costal vein; fore and mid coxae completely yellow; metasoma with pale parts.

This species shares the following synapomorphies with *S. maculata*: head at least partly paler; mid lobe of mesoscutum with paired setae only; notauli complete and reaching scutoscutellar suture; and raised reticulations on propodeum, but much weaker than those on scutellum.

Materials examined: Holotype: ♀, Hungary: Kelebia, 26 June 1956 (Erdős), Fordi erdo fuvgin (Hym. typ. no. 5777, Mus. Budapest). Paratypes: 1 ♀, Hungary: Kelebia, 8 May 1964 (Erdős) (Hym. typ. no. 5779, Mus. Budapest); 1 ♀, Hungary: Kelebia, 30 May 1949 (Erdős), De Graminibus (Hym. typ. no. 5778, Mus. Budapest).

***Sympiesis maculata* Erdős**

Sympiesis maculata Erdős, 1966: 405.

Diagnosis: Frontal groove straight; scape completely yellow; notauli curving outwards posteriorly; reticulations on dorsellum engraved, weaker than those on scutellum; forewing with at least some dark markings; hind coxae mostly yellow.

It differs from *S. kelebiana* in having brown parts on head covering only lower face; notauli reaching anterior angle of axillae; setae on lower surface of costal cell with at least 1 line starting at base of forewing; fore and coxae partly dark; and completely dark metasoma.

Material examined: Holotype: ♀, Hungary: Hegyalja, 17 July 1954 (Erdős), assoc. *Picea excelsa* (Hym. typ. no. 4809, Mus. Budapest).

***Sympiesis notata* (Zetterstedt)**

Pteromalus notata Zetterstedt, 1838: 422. Lectotype designated and transferred into *Sympiesis* by Bouček and

Graham 1978: 234.

Entedon atmopterus Ratzeburg, 1852: 205. Transferred into *Eulophus* by Thomson 1878: 233. Synonymized as *Sympiesis sandanis* by Bouček 1959: 130. Synonymized by Bouček and Graham 1978: 234.

Eulophus damicornis Förster, 1841: 42. Synonymized as *Sympiesis sandanis* by Bouček 1959: 130. Synonymized by Bouček and Graham 1978: 234.

Eulophus laodochus Walker, 1839: 164. Synonymized as *Sympiesis sandanis* by Bouček and Askew 1968: 45. Synonymized by Bouček and Graham 1978: 234.

Eulophus pronoe Walker, 1839: 140. Synonymized as *Sympiesis sandanis* by Bouček and Askew 1968: 45. Synonymized by Bouček and Graham 1978: 234.

Eulophus sandanis Walker, 1839: 130. Transferred into *Sympiesis* by Graham 1959: 183.

Eulophus superior Förster, 1841: 42. Synonymized by Bouček and Graham 1978: 234.

Diagnosis: Setae on scutellum dark; fore and mid tibiae at least partly dark; hind femora dark only on dorsal margin; metasoma with pale parts.

This species and *S. pusztacola* share the following synapomorphies: straight frontal groove; dark scape dorsally; and sculptured dorsellum. But it differs from the latter species in the setae on mid lobe mesoscutum scattered only anteriorly; incomplete notauli, not reaching scutoscutellar suture; completely dark mid coxae; and hind tibiae at least partly dark.

Materials examined: 1 ♀, Hungary: Bukk hgs., 1973, Milyinka (Szelényi), det. by Szelényi as *Sympiesis sandanis*. Other materials determined by Erdős as *Eulophus atmopterus*, 1 ♀, Hungary: Csetate Boli, Hervath, 14 July 1916; 1 ♀, Hungary: Taonad, 31 Aug. 1914; 2 ♀♀, Hungary: Rev, 28 May 1912 (Biro); 1 ♀, Hungary: Rev, 5 June 1912 (Biro); 1 ♂, Hungary: Vacz. Tudosdomb, 24 June 1930 (Biro); 1 ♂, Hungary: Vacz, Tudosdomb, 3 Aug. 1930 (Biro); 1 ♂, Hungary: Budapest, Sashegy, 9 June 1917 (Biro); 1 ♀, Hungary: Duk, Csoroghegy, 17 Sept. 1928 (Biro); 1 ♂, Hungary: Hamor, Borsed, 26 Aug. 1915 (Szabo); 1 ♂, 2 ♀♀, Hungary: Holics, 14 July 1918 (Biro); 1 ♀, Hungary: Pecsetszeg, 8 Aug. 1911 (Biro); 1 ♂, Hungary: Budapest, Huvoivolgy, 21 June 1926 (Biro); 5 ♀♀, Hungary: Duka, Csoroghegy, 3 Oct. 1925 (Biro); 3 ♀♀, same data as for previous one except dated 14 Sept. 1925; 1 ♀, Hungary: Vacz, Tudosdomb, 4 Aug. 1929 (Biro); 1 ♀, Hungary: Vacz-szod, 30 Aug. 1925 (Biro); 1 ♂, Hungary: Vacz, Szokolya, 2 Sept. 1926; 1 ♀, Hungary: Budapest, Hiivos, 8 Aug. 1926 (Biro); 1 ♀, Hungary: Budapest, Kakuk h. 12 Oct. 1915 (Gyorffy); 1 ♀, Hungary: P. Maroth, Szepliget; 1 ♂, Hungary: Vacz, 24 June 1912 (Biro); 1 ♂, Hungary: Vacz, 26 May 1914

(Biro); 1 ♀, Hungary: Budapest, 22 July 1919 (Biro); 1 ♀, Hungary: Budapest, 30 Aug. 1916 (Biro); 1 ♀, Hungary: Budapest, 22 May 1915 (Biro); 1 ♀, 1 ♂, Hungary: Huvosvolgy, 17 June 1908 (Biro); 1 ♀, Hungary: Budapest, Huvosvolgy, 24 Aug. 1916 (Biro); 1 ♀, Hungary: SzSztMiklos, 24 July 1912 (Biro); 1 ♀, Hungary: Ocsa turjani erdo 24 Apr. 1952 (Kaszab); 1 ♂, Hungary: B. Szeplak, Torekilap, 13 June 1953 (Moczar Mt.); 1 ♀, 1 ♂, Hungary: Budapest, Saszegy, 18 Aug. 1927 (Biro); 1 ♂, Hungary: Budapest, V. Megyer, 16 May 1916 (Biro); 1 ♀, Hungary: SzSzt. Miklos, 27 July 1909 (Biro); 1 ♀, Hungary: SzSztMiklos, 7 June 1914 (Biro); 1 ♂, Hungary: SzSztMiklos, 30 July 1910 (Biro); 1 ♂, Hungary: SzSztMiklos, 13 Sept. 1911 (Biro); 1 ♀, Hungary: SzSztMiklos, 18 Apr. 1912 (Biro); 1 ♀, Hungary: SzSztMiklos, 24 July 1912 (Biro); 1 ♂, Hungary: Fehervarcsurgo, 18 Sept. 1928 (Biro); 1 ♀, Hungary: Wien, 26 July 1908 (Biro); 2 ♂ ♂, Hungary: Semering, Aug. 1908 (Biro); 1 ♀, Hungary: Bulgaria, Mts. Osogovo, 15 Aug. 1928 (Biro), 1650 m; 1 ♀, Hungary: Bakos, 20 June 1908 (Biro); 1 ♂, Hungary: Budapest, 16 May 1916 (Biro).

Sympiesis pusztacola Szelényi

Sympiesis pusztacola Szelényi, 1976: 275.

Diagnosis: Setae on mid lobe of mesoscutum scattered over entire dorsum; notauli complete to scutoscutellar suture; mid coxae mostly dark; hind tibiae completely yellow.

It differs from *S. notata* in having yellow setae on scutellum; completely yellow fore and mid tibiae; mostly dark hind femora; and completely dark metasoma.

Material examined: 1 ♀, Hungary, Agasegyhaza, 5 Sept. 1958, ex. larvae of *Oxycestae geographicae* (Szelényi).

Sympiesis santelinae Szelényi

Sympiesis santelinae Szelényi, 1977: 242.

Diagnosis: Frontal groove straight; funicle 3-segmented; setae on mid lobe mesoscutum scattered only laterally; subcubital vein starting beyond intersection of basal and cubital veins; hind coxae brown; dark parts of metasoma non-metallic.

It differs from members of the clade of *S. sericeicornis* and *S. feketei* by the scape not reaching the median ocellus; raised reticulations on the propodeum, as strong as those on the scutellum;

setae on lower surface of costal cell in more than 2 lines at least near apex; subcubital vein starting beyond intersection of basal and cubital veins; dark part on all tibiae non-metallic; and mostly dark mid femora, at most with paler apex.

Materials examined: Holotype: ♀, Italy: Sardinia Center, Aritzo, 1600 m (F. Hartig) (Hym. typ. no. 5964, Mus. Budapest). Paratype: 1 ♀, same data as for holotype except the elevation 1100 m, 1975 (Hym. typ. no. 5965, Mus. Budapest).

Sympiesis sericeicornis Nees

Eulophus sericeicornis Nees, 1834: 168. Transferred into *Sympiesis* by Förster 1856: 168.

Coccophagus compressicornis Provancher, 1887: 206. Transferred into *Sympiesis* by Peck 1951: 426. Synonymized as *Sympiesis conicus* by Miller 1970: 36. Synonymized by Doganlar 1980: 126.

Metacolus conicus Provancher, 1887: 200. Transferred into *Sympiesis* by Peck 1951: 426.

Eulophus docilis Walker, 1839: 159. Lectotype designated and synonymized by Graham 1963: 187.

Eulophus eneugamus Walker, 1839: 160. Synonymized by Bouček and Askew 1968: 45.

Sympiesis fulvipes Györfi, 1941: 131. Synonymized by Bouček 1959: 126.

Entedon laticornis Ratzeburg, 1848: 162. Synonymized by Bouček and Askew 1968: 45.

Sympiesis lithocolletidis Thompson, 1955: 298. Synonymized by Doganlar 1980: 126.

Sympiesis punctipleura Thomson, 1878: 218. Synonymized by Bouček 1959: 126.

Eulophus sithon Walker, 1839: 181. Synonymized by Graham 1963: 187.

Eulophus upupaenellae Bouché, 1834: 172. Synonymized by Bouček 1959: 126.

Sympiesis massasoit Crawford, 1913: 258. Synonymized as *Sympiesis conicus* by Miller 1970: 36. Synonymized by Doganlar 1980: 126.

Sympiesis nigrifemora Ashmead, 1888. Synonymized as *Sympiesis conicus* by Burks 1963: 1259. Synonymized by Doganlar 1980: 126.

Sympiesis nigripes Ashmead, 1888. Synonymized as *Sympiesis compressicornis* by Burks 1963: 1257. Synonymized as *Sympiesis conicus* by Miller 1970: 36. Synonymized by Doganlar 1980: 126.

Diagnosis: Reticulations on face engraved; reticulations in antennal scrobe raised; setae on mid lobe of mesoscutum and scutellum yellow; reticulations on propodeum raised, but much weaker than those on scutellum.

Materials examined: (det. by Erdős). 1 ♀, Hungary: Dr. Hensch Ruma, Slav; 1 ♀, Hungary: Kalocsa, 23 Oct. 1943 (Erdős), on *Cornus sanguinea* L.; 1 ♀, Hungary: Fokto, 14 May 1943 (Erdős); 1 ♂, Hungary: Budapest, 14 Oct. 1913 (Biro); 1 ♀, Hungary: Budapest, 22 Sept. 1915 (Biro); 2 ♀ ♀, Hungary: Budapest, Vatosmajon, 20

Table 1. Characters List

#0. Head/ 0. completely dark/ 1. at least partly paler/	#23. Transverse carina/ 0. absent from between median ocellus and toruli/ 1. present halfway between median ocellus and toruli/
#1. Paler parts on head <coverage>/ 0. covering only parts laterad to ocelli, inner margins of eyes on vertex, part of upper occiput, and lower face/ 1. all over/ 2. covering only lower face/ 3. covering lower face just below toruli, and with another transverse narrow stripe just before median ocellus reaching inner margin of eyes/	#24. Frontal groove <presence>/ 0. absent/ 1. present/
#2. Paler parts on head/ 0. brown/ 1. yellow/ 2. black/	#25. Frontal groove <direction>/ 0. straight/ 1. angulate, V-shaped/
#3. Paler parts on head <coverage>/ 0. including supra-clypeal area only/ 1. including supra-clypeal area and at least part of gena/	#26. Clypeus <straight or bilobed>/ 0. straight/ 1. bilobed/
#4. Dark parts on head/ 0. green/ 1. black/ 2. brown/	#27. Toruli <location relative to lower eye margin>/ 0. at lower eye margin/ 1. well above lower eye margin/
#5. Face/ 0. smooth/ 1. sculptured/	#28. Scape <extension>/ 0. not reaching median ocellus/ 1. reaching well above median ocellus/ 2. reaching median ocellus/
#6. Face <sculpture type>/ 0. reticulate/ 1. rugose/	#29. Scape/ 0. completely yellow/ 1. at least partly dark/
#7. Reticulations on face/ 0. engraved/ 1. raised/	#30. Scape/ 0. completely dark/ 1. dark only dorsally on apical half/ 2. dark dorsally along entire scape/ 3. dark on apical 1/2/
#8. Upper face/ 0. concolorous with other parts of head/ 1. with a different color or shine from other parts of head/	#31. Scape/ 0. with non-metallic dark parts/ 1. with metallic dark parts/
#9. Upper face/ 0. violet/ 1. metallic green/ 2. brown with metallic shine/ 3. yellow/ 4. black/	#32. Funicle <no. of segments>/ 0. 2-segmented/ 1. 3-segmented/ 2. 4-segmented/
#10. Vertex/ 0. smooth/ 1. sculptured/	#33. Funicle <broadened or not>/ 0. about equal width towards clava/ 1. broadened towards clava/
#11. Vertex <sculpture type>/ 0. reticulate/ 1. rugose/	#34. Funicle/ 0. brown/ 1. yellow/
#12. Reticulations on vertex/ 0. engraved/ 1. raised/	#35. Clava <comparison to funicles>/ 0. with same width as funicles at its broadest point/ 1. distinctly clavate/
#13. Occiput/ 0. rounded off behind posterior ocelli/ 1. distinctly margined behind posterior ocelli/	#36. Clava/ 0. concolorous with funicles/ 1. at least partly with a different color from funicles/
#14. Occipital carina <presence>/ 0. absent from behind posterior ocelli/ 1. present behind posterior ocelli/	#37. Clava/ 0. with distal 1/2 of 2nd and 3rd segments yellow/ 1. completely yellow/ 2. completely brown/
#15. Occipital carina <presence in postgenal area>/ 0. absent from postgenal area/ 1. present in postgenal area/	#38. Body/ 0. completely dark/ 1. at least partly yellow/
#16. Post-occipital carina <presence>/ 0. absent/ 1. present/	#39. Body/ 0. partly yellow/ 1. completely yellow/
#17. Antennal scrobe/ 0. concolorous with adjacent parts/ 1. with a different color from adjacent parts/	#40. Body <coloration of dark parts>/ 0. with metallic-green dark parts/ 1. with blue dark parts/ 2. with brown dark parts with vague metallic shine/ 3. with black dark parts/
#18. Antennal scrobe/ 0. black/ 1. green/ 2. brown/	#41. Pronotum <length to mesoscutum>/ 0. at most 2/5 length of mid lobe of mesoscutum/ 1. at least as long as mid lobe of mesoscutum/
#19. Antennal scrobe <carinate or not>/ 0. not carinate laterally, smoothly continuous with upper face/ 1. carinate laterally/	#42. Pronotum <length to mesoscutum>/ 0. at most 1.5 times length of mesoscutum/ 1. around 3 times length of mesoscutum/
#20. Antennal scrobe <smooth or sculptured>/ 0. smooth/ 1. sculptured/	#43. Pronotum/ 0. completely dark/ 1. at least partly yellow/
#21. Antennal scrobe <sculpture type>/ 0. reticulate/ 1. transversely striate/	#44. Pronotum <shape>/ 0. transverse, at most as long as broad/ 1. elongate conical, at least 1.5 times as long as broad/
#22. Reticulations in antennal scrobe <raised or engraved>/ 0. engraved/ 1. raised/	#45. Pronotum <paler parts>/ 0. yellow only on lateral parts of pronotum/ 1. nearly completely yellow, except narrow stripe along posterior margin dark/ 2. completely yellow/ 3. mostly yellow, with only median stripe black or brown/
	#46. Pronotum/ 0. rounded off to neck/ 1. with distinct transverse carina anteriorly/
	#47. Parts after the transverse carina on pronotum/

Table 1. (Cont.)

0. smooth/ 1. sculptured/	4. brown/ 5. black/ 6. yellow/ 7. mostly yellow, with only 1 small green patch anteriorly/ 8. mostly yellow, with only median stripe brown or black/
#48. Mesosoma/ 0. completely dark/ 1. with at least propleuron yellow/	#67. Scutellum <smooth or sculptured>/ 0. sculptured/ 1. smooth/ #68. Scutellum <striated or not>/ 0. reticulate/ 1. longitudinally striate/ 2. reticulate medially, longitudinally striate laterally/ 3. rugose/
#49. Paler parts of mesosoma <coverage>/ 0. covering most parts, with brown parts only covering mid parts of mesosoma/ 1. covering all lateral parts only/ 2. forming 1 broad, transverse stripe/ 3. covering lateral parts and mesoscutum/ 4. completely yellow/ 5. covering posterior 1/3 of mesoscutum, scutellum and dorsellum/ 6. covering posterior 2/3 of mesoscutum, posterior 4/5 of scutellum, and lateral parts/	#69. Scutellum/ 0. without longitudinal median groove/ 1. with longitudinal median groove/ #70. Submedian grooves on scutellum <presence>/ 0. absent/ 1. present/ #71. Sublateral grooves on scutellum <presence>/ 0. absent/ 1. present/ #72. Sublateral grooves on scutellum/ 0. reaching inner margin of axillae/ 1. reaching inner angle of axillae/ 2. reaching anterior margin of scutellum/ #73. Sublateral grooves on scutellum <united or not>/ 0. straight/ 1. incurved posteriorly and meeting each other/ 2. incurved posteriorly and nearly meeting each, at a distance equaling the grooves' breadth between each other/
#50. Mid lobe of mesoscutum/ 0. setae scattered at least in anterior 1/2/ 1. with paired setae only/	#74. Sublateral grooves on scutellum/ 0. smooth on bottom/ 1. sculptured on bottom/ #75. Distance between posterior ends of sublateral grooves/ 0. less than breadth of each groove/ 1. 2 times breadth of each groove/ #76. Reticulations on scutellum <engraved or raised>/ 0. engraved/ 1. raised/ #77. Reticulations on scutellum/ 0. rounded or isodiametric/ 1. oblong, at least 1.2 times as long as wide/ #78. Setae on scutellum/ 0. dark/ 1. yellow/ #79. Setae on scutellum/ 0. with anterior pair as strong as or as long as posterior ones/ 1. with anterior pair quite shorter than posterior ones/
#51. Mid lobe of mesoscutum/ 0. green/ 1. violet/ 2. yellow/ 3. brown with metallic shine/ 4. black/ 5. dark on anterior part, yellow posteriorly/	#80. Dorsellum/ 0. smooth/ 1. sculptured/ #81. Dorsellum <sculpture types>/ 0. reticulate/ 1. rugose/ 2. longitudinally carinate/ #82. Reticulations on dorsellum/ 0. engraved, weaker than those on scutellum/ 1. raised, as coarse as those on scutellum/ 2. raised, but much weaker than those on scutellum/ #83. Propodeum/ 0. concolorous with most other parts of mesosoma/ 1. at least partly with a different color from other parts of mesosoma/
#52. Mid lobe of mesoscutum/ 0. sculptured/ 1. smooth/	#84. Propodeum/ 0. with yellow patches laterad/ 1. black/ #85. Propodeum <smooth or sculptured>/ 0. smooth/ 1. sculptured/ #86. Propodeum <presence of plicae>/ 0. with distinct plicae/ 1. without distinct plicae/ #87. Propodeum <sculpture types>/ 0. rugose/ 1. reticulate/ 2. longitudinally striate/ #88. Propodeum <presence of costulae>/ 0. without costulae/ 1. with transverse costulae/
#53. Mid lobe of mesoscutum/ 0. without longitudinal median carina/ 1. with longitudinal median carina/	
#54. Mesoscutal longitudinal median carina/ 0. complete to posterior margin of pronotum/ 1. incomplete, not reaching posterior margin of pronotum/	
#55. Setae on mid lobe mesoscutum <distribution>/ 0. scattered only anteriorly/ 1. scattered all over dorsum/ 2. scattered only laterally/	
#56. Setae on mid lobe of mesoscutum <no. of pairs>/ 0. 2 pairs/ 1. 3 pairs/ 2. more than 3 pairs/	
#57. Setae on mid lobe of mesoscutum/ 0. dark/ 1. yellow/	
#58. Reticulations on mid lobe of mesoscutum/ 0. raised/ 1. engraved/	
#59. Reticulations on mid lobe of mesoscutum/ 0. round or isodiametric/ 1. elongate, at least 1.5 times as long as wide/ 2. at least partly transverse and irregular/	
#60. Notauli <completeness>/ 0. incomplete/ 1. complete/	
#61. Notauli <reach>/ 0. reaching anterior margin of axillae/ 1. reaching anterior margin of scutellum/ 2. reaching anterior angle of axillae/ 3. reaching inner angle of axillae/	
#62. Notauli <convergence>/ 0. converging posteriorly/ 1. sub-parallel posteriorly/ 2. curving outwards posteriorly/	
#63. Axillae/ 0. distinctly advanced, not in a line with anterior margin of scutellum/ 1. not or only slightly advanced, in a line with anterior margin of scutellum/	
#64. Axillae <shape anteriorly>/ 0. rounded anteriorly/ 1. angulate anteriorly/	
#65. Axillae <setose or not>/ 0. bare/ 1. with distinct pilosity/	
#66. Scutellum/ 0. green/ 1. violet/ 2. brown with metallic shine between paired setae, but yellow on lateral sides/ 3. metallic green between paired setae, yellow laterally/	

Table 1. (Cont.)

#89. Propodeum/ 0. without submedian carinae/ 1. with submedian carinae/	1. with 1 line of setae starting at midpoint of costal vein/ 2. with all lines of setae starting at base of forewing/
#90. Propodeum/ 0. with posterolateral margin not expanded/ 1. with posterolateral margin expanded into broad translucent flange over metacoxae/	#111. Cubital vein/ 0. complete below basal cell/ 1. bare/open below basal cell/
#91. Propodeal plicae <reach>/ 0. at most reaching halfway between posterior and anterior margins of propodeum/ 1. reaching anterior margin of propodeum/ 2. at most reaching posterior margin of propodeal spiracle/	#112. Cubital vein <straight or strongly curved>/ 0. straight/ 1. strongly curved/
#92. Propodeal plicae <angulate or not>/ 0. straight or rounded/ 1. angulate in middle/	#113. Subcubital vein <origin>/ 0. starting beyond intersection of basal and cubital veins/ 1. starting at base of forewing/ 2. starting halfway between base of forewing and intersection of basal and cubital veins/
#93. Reticulations on propodeum/ 0. raised, as strong as those on scutellum/ 1. engraved/ 2. raised, but much weaker than those on scutellum/	#114. Veins for forewing <normal or thick>/ 0. normal/ 1. thick/
#94. Propodeal median carina <presence>/ 0. present/ 1. absent/	#115. Postmarginal vein <length to stigmal vein>/ 0. at least 1.5 times length of stigmal vein/ 1. shorter than or at most equal to stigmal vein/
#95. Propodeal median carina/ 0. indistinct, if present, then incomplete/ 1. distinctly complete/	#116. Fore leg/ 0. completely yellow/ 1. at least partly dark/
#96. Propodeal median carina <in a furrow or not>/ 0. not in a furrow/ 1. in a furrow/	#117. Fore coxae/ 0. completely yellow/ 1. at least partly dark/
#97. Propodeal median carina <split or not>/ 0. single, not split into several carinae/ 1. split into several major carinae/ 2. appearing to merge by 2 adjacent carinae/	#118. Fore coxae/ 0. completely dark/ 1. mostly yellow/
#98. Propodeal median carina <raised basally or not>/ 0. not raised basally into a tooth/ 1. raised basally into a tooth/	#119. Fore femora/ 0. at least partly dark/ 1. completely yellow/
#99. Propodeal median carina/ 0. tooth forming an elongate tongue-like projection/ 1. tooth acutely angulate/	#120. Fore femora/ 0. dark dorsally, yellow at other parts/ 1. mostly dark, with only apex paler (yellow)/ 2. only dark dorsally on mid part, yellow at other parts/ 3. completely dark/
#100. Propodeal median carina/ 0. not raised into a cup basally/ 1. raised into a cup basally/	#121. Dark parts on fore femora <metallic or not>/ 0. metallic/ 1. non-metallic/
#101. Propodeal median carina/ 0. rounded into its lateral parts/ 1. laterally edged with distinct carinae/	#122. Dark parts on fore femora <coverage>/ 0. covering basal 3/4/ 1. covering middle 1/2/
#102. Propodeal costulae <meeting points>/ 0. meeting each other at anterior end (1/5-1/4 anterior part of) of median carina/ 1. meeting with each other at anterior 1/2-1/3 of median carina/ 2. meeting with each other at midpoint of median carina/ 3. meeting with anterior margin of propodeum, halfway between median carina and plicae/	#123. Fore tibiae/ 0. completely yellow/ 1. at least partly dark/
#103. Forewing <short or normal>/ 0. normal, at least extending to apex of gaster/ 1. short-winged, with forewing extending less than length of gaster/	#124. Fore tibiae/ 0. completely dark/ 1. partly dark/ 2. mostly dark, at most with small yellow patch at base/ 3. mostly yellow, at most with small dark patch sub-basally, covering 1/5-1/4 entire length of tibiae/
#104. Forewing <hyaline or with markings>/ 0. hyaline/ 1. with at least some dark markings/	#125. Dark part on fore tibiae/ 0. metallic/ 1. non-metallic/
#105. Forewing/ 0. with 2 transverse infuscate patches around parastigma and stigma/ 1. with a distinct streak on stigma/ 2. with 1 large, broad dark patch extending from parastigma to near stigma as well as another smaller one around stigma/	#126. Basitarsomere of foreleg <length to the 2nd>/ 0. longer than 2nd one/ 1. shorter than 2nd one/ 2. as long as 2nd one/
#106. Costal cell <narrow or broad>/ 0. normal, with its length at most 7 times breadth/ 1. narrow, with its length at least 10 times breadth/	#127. Mid leg/ 0. completely yellow/ 1. at least partly dark/
#107. Costal cell <pilosity>/ 0. bare/ 1. with at least some setae near apex of parastigma/	#128. Mid coxae/ 0. completely yellow/ 1. at least partly dark/
#108. Costal cell <no. of lines of setae on lower surface>/ 0. with 1 line of setae on lower surface/ 1. with 2 or more lines of setae on lower surface/	#129. Mid coxae/ 0. mostly dark/ 1. mostly yellow/ 2. completely dark/
#109. Setae on lower surface of costal cell/ 0. scattered/ 1. in 2 lines/ 2. in more than 2 lines at least near apex/	#130. Mid femora/ 0. yellow at base and apex, brown in middle part/ 1. mostly dark, at most with apex paler/ 2. mostly yellow but dark dorsally/ 3. completely dark/ 4. mostly yellow, with a small dark patch dorsomedially/
#110. Setae on lower surface of costal cell <origin>/ 0. with at least 1 line starting at base of forewing/	#131. Dark parts on mid femora/ 0. non-metallic/ 1. metallic/
	#132. Dark parts on mid femora <coverage>/ 0. covering basal 3/4/ 1. covering middle 1/2/

Table 1. (Cont.)

#133. Mid tibiae/ 0. completely yellow/ 1. at least partly dark/	3. mostly yellow, but middle part with metallic shine/ 4. mostly yellow, with basal 1/3 dark/ 5. mostly dark, with small yellow patch basally/ 6. mostly dark, with only small paler patch at apex/
#134. Mid tibiae/ 0. completely dark/ 1. at least partly yellow/	#154. Dark parts on hind tibiae <coverage>/ 0. covering apical 1/3/ 1. covering most/ 2. covering basal 1/3/ 3. covering basal 1/8-1/7/ 4. covering apical 1/5-1/4/
#135. Mid tibiae/ 0. gradually darkening towards apex/ 1. bichromatic/ 2. mostly yellow, with vague metallic shine on middle part/ 3. mostly yellow, dark only on basal 1/3/ 4. mostly dark, with only small patch yellow basally/ 5. mostly dark, at most with small dark patch sub-basally, covering 1/5-1/4 entire length of tibiae/ 6. gradually darkening towards base/ 7. mostly dark, with only small paler patch at apex/	#155. Dark parts of hind tibiae/ 0. non-metallic/ 1. metallic/
#136. Dark part on mid tibiae/ 0. non-metallic/ 1. metallic/	#156. Hind tarsi/ 0. with at least basal 1-3 segments whitish/ 1. with all segments testaceous to fuscous/
#137. Dark part on mid tibiae <coverage>/ 0. covering apical 1/3/ 1. covering apical 1/2/ 2. covering more than 3/4/ 3. covering basal 1/3/ 4. covering basal 8/1-1/7/ 5. covering sub-basal 1/5-1/4/ 6. covering basal 3/4/	#157. Basitarsomere of hind legs/ 0. longer than 2nd/ 1. as long as 2nd/ 2. shorter than 2nd/
#138. Basitarsomere <length to 2nd>/ 0. longer than 2nd/ 1. shorter than 2nd/ 2. as long as 2nd/	#158. Petiole/ 0. absent/ 1. present/
#139. Hind leg/ 0. completely yellow/ 1. at least partly dark/	#159. Petiole/ 0. at least as long as broad/ 1. transverse, at most 0.5 length of breadth/
#140. Hind coxae/ 0. completely yellow/ 1. at least partly dark/	#160. Petiole <smooth or sculptured>/ 0. smooth/ 1. sculptured/
#141. Hind coxae/ 0. mostly dark/ 1. mostly yellow/ 2. completely dark/	#161. Petiole <sculpture types>/ 0. reticulate/ 1. longitudinally carinate/
#142. Hind coxae/ 0. metallic/ 1. non-metallic/	#162. Metasoma/ 0. completely dark/ 1. with parts paler than other parts/
#143. Hind coxae/ 0. brown/ 1. green/	#163. Metasoma <dark parts metallic or not>/ 0. with completely metallic-green dark parts/ 1. with non-metallic dark parts/ 2. with brown dark parts with metallic shine/
#144. Hind coxae <sculptured or not>/ 0. smooth/ 1. sculptured/	#164. Metasoma/ 0. with sub-basal paler transverse stripe/ 1. with 1 broad, transverse basal paler patch, as well as 2 pairs of rounded ones in middle, and another transverse before end/ 2. appearing completely pale brown/ 3. dark medially, only narrowly yellow laterally/
#145. Reticulations on hind coxae/ 0. raised/ 1. engraved/	#165. Metasoma <shape>/ 0. longer than wide/ 1. rounded/
#146. Hind femora/ 0. at least partly dark/ 1. completely yellow/	#166. Metasoma/ 0. elongate, at least 1.5 times long as head plus mesosoma/ 1. less elongate, at most 1.2 times as long as head plus mesosoma/
#147. Hind femora/ 0. dark only on dorsal margin/ 1. mostly dark/ 2. completely dark/ 3. dark only dorsally near apex/ 4. dark on basal 2/3/ 5. dark only on basal 1/3/	#167. Last tergite of metasoma/ 0. at least 3 times as long as broad/ 1. at most 1.5 times as long as broad/
#148. Dark parts on hind femora/ 0. non-metallic/ 1. metallic/	#168. Scape of males <enlarged or not>/ 0. normal, at least 6 times as long wide/ 1. enlarged, at most 3 times as long as wide/
#149. Dark parts on hind femora <coverage>/ 0. covering basal 3/4/ 1. covering middle 1/2/	#169. Scape of males/ 0. completely yellow/ 1. at least partly dark/
#150. Hind tibiae <spur>/ 0. with all spurs shorter than 1st tarsomere/ 1. with at least 1 spur longer than 1st tarsomere/	#170. Scape of males/ 0. metallic green/ 1. brown and non-metallic/ 2. brown with metallic shine/
#151. Hind tibiae <no. of longer spurs>/ 0. with 2 elongate spurs/ 1. with only 1 elongate spur/	#171. Scape of males <smooth or reticulate>/ 0. smooth/ 1. sculptured/
#152. Hind tibiae/ 0. completely yellow/ 1. at least partly dark/	#172. Scape of males <reticulations>/ 0. with engraved reticulations/ 1. with raised reticulations/
#153. Hind tibiae/ 0. yellow basally, gradually dark towards apex/ 1. almost completely dark/ 2. bichromatic/	#173. Funicular segments of males/ 0. dark dorsally, yellow ventrally/ 1. monochromatic/
	#174. Funicular segments of males/ 0. with branches/ 1. without branches/
	#175. Male funicular segment branches/ 0. stout and not segmented/ 1. elongate and segmented/

Table 2. Data Matrix (Hennig86 Format)

xread

176 32

Hemiptarsenus_arenarius
 0????101011010?000?010100?0110??21010?0?00?00?0?0?0100?0?0010??1?0000000????10001010?111000??21
 ???????01210??110000110031?0??01121000????0110100?020?0?11?100101100?011????????

Hemiptarsenus_palustris
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 0000?00?00?110?10020000??????0010?0??????00100110?0??0??00111?00?011????????

Hemiptarsenus_zilahisebessi
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 1000?00?00?110?10020000??????0000????????0000????????0?0??0000??1130110110?101

Hemiptarsenus_brevipennis
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 ???????00?10??0020010?02000?010?21011201010?????00100?130100101101?011????????

Hemiptarsenus_fulvicollis
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Hemiptarsenus_unguicellus
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Hemiptarsenus_ornatus
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Sympiesis_sericeicornis
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Sympiesis_grahami
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 1000?00?00?010?00020011001000??01101000????011001?101100?101?000??00?0110101101?

Sympiesis_corrugata
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Sympiesis_aureolus
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Sympiesis_flavopicta
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Sympiesis_pusztacola
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 ???????00?011110010011001?00?01101000????0112011001000?0??000??00?0110110?101

Sympiesis_dolichogaster
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 0000?00?00?0112000000011??????0010?0??????00100111????0????0000??00?0000????????

Sympiesis_santeliniae
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 1000?00?00?0112000000110030?101011211010?0?01120010021?0?11?0000??01?011????????

Hemiptarsenus_petiolata
 0???0101011000?000?00??01101112120000?0?00?00?0?0?0000?0?0000??00?000000000????10001010?1010001001
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Sympiesis_maculata
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Sympiesis_kelebiana
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Sympiesis_helvetic
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Sympiesis_solitaria
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Sympiesis_gyoerfii
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Sympiesis_angustipennis
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Table 2. (Cont.)

Sympiesis_euspilapterygis
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Sympiesis_feketei
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Sympiesis_biroi
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Sympiesis_notata
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Sympiesis_albiscapus
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Sympiesis_acalle
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Sympiesis_viridula
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Sympiesis_xanthostoma
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Sympiesis_gregori
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Sympiesis_gordius
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Sept. 1950 (Dr. Gozmani); 1 ♀, Hungary: Vaczszod, 26 May 1926 (Biro); 1 ♀, Hungary: Vacz, 5 Aug. 1923 (Biro); 1 ♀, Hungary: Dobsina, July 1907; 1 ♀, Hungary: Bartfa, Kertesz; 1 ♂, 1 ♀, Hungary: Budapest, 17 Oct. 1913 (Biro); 1 ♂, Hungary: Budapest, 10 Oct. 1927 (Biro); 1 ♀, Hungary: Budapest, 12 Oct. 1927 (Biro); 1 ♀, Hungary: Budapest, 14 Oct. 1913 (Biro); 1 ♀, Hungary: SzSztMiklos, 16 July 1911 (Biro); 1 ♂, Hungary: Budapest, 16 Sept. 1911 (Biro); 1 ♀, Hungary: SzSztMiklos, 15 May 1912 (Vago); 1 ♀, Hungary: Halap, 13 May 1926 (Szlady); 1 ♀, Hungary: Budapest, Svabhegy, 15 Mar. 1911; 1 ♀, Hungary: Hilvoavolgy, 17 June 1908 (Biro); 1 ♀, Hungary: Budapest, 17 Oct. 1913 (Biro); 2 ♀♀, Hungary: Graecia, Altiki, Apr. 1931 (Fodor); 1 ♀, Hungary: Creta (Biro); 2 ♀♀, Hungary: SzSztMiklos, 28 Sept. 1911 (Biro); 1 ♀, Hungary: SzSztMiklos, 6 July 1911 (Biro); 1 ♀, Hungary: SzSztMiklos, 15 July 1910 (Biro); 1 ♀, Hungary: Nizza, Gallia, 13 May 1934 (Fodor); 1 ♀, Bulgaria: Kustendil, 24 Aug. 1928 (Biro).

Variations: Male specimens are completely brown with a vague metallic shine. The legs are mostly brown. Female specimens vary much in size: the largest one examined was almost 1.5

times longer than the smallest one. The cubital vein may be absent from under the speculum or present. The propodeum may range from being smooth to vaguely reticulate. In addition, the plicae may be absent from the propodeum.

Sympiesis solitaria Szélenyi

Sympiesis solitaria Szélenyi, 1977: 245.

Diagnosis: Funicle 3-segmented; scutellum violet; subcubital vein starting beyond intersection of basal and cubital veins.

This species forms 1 clade with *S. grahami* and *S. corrugata*, for all 3 species share the following synapomorphies: mid lobe of mesoscutum with paired setae only; fore femora mostly dark, with only apex paler (yellow); mostly dark or completely dark hind coxae; and hind tibiae yellow basally, gradually darkening toward apex. However, it differs from the latter 2 species in the metallic dark parts of the scape; costal cell with 2 or more setal lines on lower surface; subcubital vein starting beyond intersection of basal and cubital veins; completely dark mid coxae and hind femora; metallic dark parts on mid femora; and mid tibiae

at least partly dark.

Materials examined: Holotype: ♀, Hungary: Engadin, Val Fain, 25 Aug. 1964 (Erdős) (Hym. typ. no. 5966, Mus. Budapest). Paratype: 1 ♀, same data as for holotype (Hym. typ. no. 5967, Mus. Budapest).

***Sympiesis viridula* Thomson**

Eulophus viridulus Thomson, 1878: 233. Lectotype designated by Hansson 1991: 33. Transferred into *Sympiesis* by Peck 1951: 427.

Diagnosis: Propodeum sculptured, without distinct plicae; reticulations on hind coxae raised.

It differs from *S. gordius* in metallic dark parts of scape; propodeal median carina absent; and setae on lower surface of costal cell with at least 1 line starting at base of forewing.

Materials examined: 1 ♀, Hungary: R-Szombat, 27 June 1907 (Szabo); 1 ♀, Hungary: Csepel, 14 May 1908 (Biro); 1 ♀, Hungary: Papa, Wachsmann; 1 ♂, Hungary: Budapest, Huvoivolgy, Sept. 1907 (Biro); 1 ♂, Hungary: MagyarBago, Szilady, 27 July 1917.

Variations: The males examined all had non-metallic brown femora, and the metasoma sometimes had a paler basal patch.

***Sympiesis xanthostoma* (Nees)**

Eulophus xanthostomus Nees, 1834: 169. Transferred into *Teleogmus* by Thomson 1878: 213; into *Sympiesis* by Bouček 1959: 137.

Eulophus leodamas Walker, 1839: 130. Synonymized by Graham 1959: 182.

Teleogmus orbitalis Förster, 1856: 74. Synonymized by Bouček 1959: 137.

Sympiesis szelenyii Györfi, 1941: 122. Synonymized by Bouček 1959: 137.

Diagnosis: The only autapomorphic character is the brown metasoma with a metallic shine.

It has engraved complete propodeal plicae and reticulations on the hind coxae, characters which are also shared with *S. aureolus* and *S. flavopicta*. However, it differs from both species in having a completely dark head; engraved reticulations on the face; a completely dark body; a completely dark mesosoma; an incomplete notauli, not reaching the scuto-scutellar suture; a green scutellum; and a completely dark metasoma.

Materials examined: (det. by Erdős as *S. szelenyii* Gyfi.), 1 ♀, Hungary: SzSztMiklos, 30 July 1910 (Biro); 1 ♀, Hungary: Vacz-Szod, 21 July

1925 (Biro); 1 ♀, Hungary: Budapest, Huvosv, 1 Oct. 1929 (Biro); 1 ♀, Hungary: Budapest, Sashegy, 29 Aug. 1916 (Biro).

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