

Review of Palearctic and Australian species of *Bootanomyia* Girault 1915 (Hymenoptera: Torymidae: Megastigminae), with descriptions of new species

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Received: 15.05.2009

Abstract: The world species of *Bootanomyia* Girault (Hymenoptera: Chalcidoidea, Torymidae) are reviewed. Nine species are transferred from *Megastigmus* to *Bootanomyia* as new combinations: *B. almusiensis* (Doğanlar, 1989), *B. dorsalis* (Fabricius 1789), *B. dunicola* (Boucek 1982), *B. habui* (Kamijo, 1962), *B. maculipennis* (Yasumatsu and Kamijo, 1979), *B. nipponicus* (Yasumatsu and Kamijo, 1979), *B. stigmatizans* (Fabricius 1789), *B. synophri* (Mayr 1874), and *B. zhaoi* (Xu & He, 2003). *Megastigmus bohemani* Ratzeburg, 1848 is reinstated as a species from synonymy under *M. dorsalis* Fabricius and transferred to *Bootanomyia* as *B. bohemani* (Ratzeburg, 1848) (comb. and status n.). Seven species are described as new species: *B. balikesirensis*, *B. emrezaferi*, *B. hepdurgunae*, *B. mehmeti*, *B. onuri*, *B. saragoldae*, and *B. shebnemae*. An identification key for the world species of *Bootanomyia* is provided. Species of *Bootanomyia* are recorded as parasitoids of insect gall inducers in several plant parts.

Key words: *Bootanomyia*, new species, world species, diagnosis, distribution, biology

Bootanomyia Girault 1915 (Hymenoptera: Torymidae: Megastigminae)'nın dünya türlerinin revizyonu ve yeni türlerin tanımlanması

Özet: Dünyadaki *Bootanomyia* (Hymenoptera: Chalcidoidea, Torymidae) türleri ele alınarak çalışılmıştır. Dokuz tür, *Megastigmus*'tan *Bootanomyia* cinsine new combination olarak aktarılmıştır. Bunlar: *B. almusiensis* (Doğanlar, 1989), *B. dorsalis* (Fabricius 1789), *B. dunicola* (Boucek 1982), *B. habui* (Kamijo, 1962), *B. maculipennis* (Yasumatsu and Kamijo, 1979), *B. nipponicus* (Yasumatsu and Kamijo, 1979), *B. stigmatizans* (Fabricius 1789), *B. synophri* (Mayr 1874) ve *B. zhaoi* (Xu & He, 2003). *Megastigmus bohemani* Ratzeburg, 1848 tür seviyesine yükseltilmiş ve *Bootanomyia* cinsine *B. bohemani* (Ratzeburg, 1848) (comb. and status n.) olarak aktarılmıştır. Yedi yeni tür isimlendirilmiş ve tanımlanmıştır (new species): *B. balikesirensis*, *B. emrezaferi*, *B. hepdurgunae*, *B. mehmeti*, *B. onuri*, *B. saragoldae* ve *B. shebnemae*. *Bootanomyia* cinsinin dünyadaki bütün türleri için teşhis anahtarı oluşturulmuştur. *Bootanomyia* türleri çoğunlukla gall oluşturan fitofag böceklerin parazitoitleri olarak belirlenmiştir.

Anahtar sözcükler: *Bootanomyia*, yeni türler, dünya türleri, teşhis, dağılış alanları, biyolojileri

Introduction

Bootanomyia (Hymenoptera: Chalcidoidea, Torymidae) was described by Girault (1915) with its type species, *B. smaragdus* Girault, 1915, as a subgenus

of *Megastigmus* Dalman 1820. Later, *Bootanomyia* was upgraded to genus level by the same author (Girault 1928a). Dahms (1984, 1986) discussed the types of 3 species of the genus from Australia.

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Bouček (1988) studied the species of the genus, and transferred 9 species of the genus to *Bootanelleus* Girault 1915, and 1 to *Malostigmus* Bouček 1988. The diagnostic characters of *Bootanomyia* were provided, and in the subfamily Megastigminae the genus was keyed out by Bouček (1988).

Bouček (1988) synonymized *Epibootania* Girault 1937 with the genus and added its type, *E. guttatipennis* Girault, to the list of the genus.

Grissell (1999) and Noyes (2008) listed 4 species of *Bootanomyia*, and gave their synonyms, distributions, and literature lists.

Kamijo (1962) described *Megastigmus habui* from Japan, and Yasumatsu and Kamijo (1979) described *maculipennis* from Japan and *nipponicus* from Japan and China as metallic-colored and parasitic species that develop within plant galls.

Roques and Skrzypczynska (2003) gave the statement of Bouček (1988) as “although belonging to *Bootanomyia* the five additional species, still considered as *Megastigmus* species are known to develop within plant galls in the West Palearctic Region: *M. almusiensis* Doğanlar, 1989, *M. dorsalis* (Fabricius 1789), *M. dumicola* Bouček 1982, *M. stigmatizans* (Fabricius 1789) and *M. synophri* Mayr 1874”.

Stojanova (2007) designated the lectotype of *M. synophri*, and redescribed it in detail, and gave an identification key to the species of *Megastigmus* associated to the cynipid galls in the west Palearctic mentioned above.

Bootanomyia already has 3 species from Australia and 1 species from the Philippines (Bouček, 1988; Grissell, 1999; Noyes, 2008). Bouček (1988) also stated that probably the 6 species from the northern hemisphere should be included in *Bootanomyia* if all the metallic-colored *Megastigmus* species belong here.

In the present work, all of the species having the diagnostic characters of the genus from all over the world were studied, some species of *Megastigmus* were transferred to *Bootanomyia* as a new combination, some new species from Turkey and Australia were described, and an identification key for all of the species of *Bootanomyia* was provided.

Materials and methods

The types of the *Bootanomyia* species in the Queensland Museum, Brisbane, Australia, and those of *Bootanomyia synophri* borrowed from the Austrian National History Museum, Vienna, Austria (NMW), are studied. Specimens of several species of the genus were borrowed from the Australian National Insect Collection, Canberra, Australia. Some reared specimens of *B. habui* Kamijo from Japan were donated by Dr. Victor Fursov, Ukraine, when the author was working there. I also reared specimens of *Bootanomyia* from the cynipid galls on *Quercus* spp. and *Rosa* spp, collected from several parts of Turkey.

Morphological terminology follows Bouček (1988) and Roques and Skrzypczynska (2003). The following new abbreviations are used: EOC: least distance between eye and occipital carina; OOC: space between hind ocellus and occipital carina; Odia: diameter of hind ocellus; TO: space between upper margin of toruli and lower margin of median ocellus; TCly: space between lower margin of toruli and tip of teeth of clypeus, Teye: space between lower margin of toruli and level of lower margin of eye; sensilla used for linear sensilla on flagellar segments; BMNH: British Museum (Natural History); ZSSM: Zoologische Staatssammlung München; ICMKU: Insect Museum of Plant Protection Department, Agriculture Faculty, Mustafa Kemal University, Antakya, Hatay, Turkey; PCMD: Private Collection of Prof. Mikdat Doğanlar.

Parts of some types and other specimens are slide-mounted in Canada balsam. Photographs of diagnostic characters of the new species were taken using a stereo-microscope with a digital camera attached to it. The examined specimens are deposited in the collection of the Insect Museum of the Plant Protection Department, Agriculture Faculty, Mustafa Kemal University, Antakya, Hatay, Turkey (ICMKU), and in the Australian National Insect Collection, Canberra, Australia (ANIC).

Results and discussion

Bootanomyia Girault, 1915 (Figures 1-18)

Bootanomyia Girault, 1915 (243): 304. (as subgenus of *Megastigmus* Dalman), Type species:

Megastigmus (*Bootanomyia*) *smaragdus* Girault, by original designation.

Epibootania Girault, 1937 (448): 1. Type species of *Epibootania guttatipennis* Girault, by original designation. (Synonymized by Bouček 1988).

Bootanomyia: Girault, 1928 a (420): 262; Bouček 1988: 120, 129; Grissell, 1999: 11-12.

Diagnosis: Body 3.0-8.0 mm in length. In the subfamily Megastigminae the genus has the following characteristics: lower clypeal margin medially excised or emarginated, i.e. bidentate; body with distinct metallic color, the thorax at least, medially and usually also the vertex; antenna inserted below center of face, pronotum (always) and mesonotum (at least in some species) with transverse striations, midlobe of mesonotum with at least 4 longitudinal rows of setae (usually 6 rows or more).

Biology: At least some species are larval parasitoids of various gall forming species of Cynipidae (Hymenoptera) on *Quercus* and *Rosa* species.

Species of *Bootanomyia*

Bootanomyia almusiensis (Doğanlar) **comb.n.** – PALEARCTIC: Turkey (Figures 1a-h)

Megastigmus almusiensis Doğanlar, 1989: 199-200. Holotype female, Almus, Tokat, Turkey. (PCMD), paratypes same data as holotype, (PCMD, BMNH, ZSSM)

Material studied: Holotype female, Turkey: Almus, Tokat, 20.ii. 1987; Paratypes: same locality as holotype, 3 females, 11.-12. iv. 1989; 2 males, 20. ii. 1987; 12 males, 3.-11. iv. 1989 (in ICMKU).

Redescription: The species was described and illustrated by Doğanlar (1989). Some new figures (Figure 1a-h) were given, and some diagnostic characters newly found will be added as follows: Body as seen Figure 1a. Head (Figures 1b, c) with length of head 1.82-1.86× the least length of vertex; eyeOC 2.93-3.17× broad of frons; distance between upper corners of eyes in dorsal view 1.54× broad of frons; temple 0.27-0.28× dorsal length of eye; OOC 0.72 POL. Mesoscutum (Figure 1d) with 18-27 transverse striae; scutellum (Figure 1e) with transverse longitudinal fine reticulation; frenum with dense striae. Propodeum (Figure 1f) with some

rugae medially. Antenna (Figure 1g) with sensilla on flagellum long, F_1 with 2 in a row; F_2 - F_3 with 1+3, F_4 - F_7 with 2+3 sensillae in 2 rows. Forewing (Figure 1h) with stigma circularly surrounded by infumation.

Comments: The species was originally described from mixed materials. By studying new characters the paratypes were divided into 2 groups, 1 of which is another new species, *Bootanomyia mehmeti*, by applying the characters given in the key.

Bootanomyia balikesirensis n.sp. – PALEARCTIC: Turkey (Figures 2a-f)

Etymology. The name is derived from the name of the place where the specimen was collected.

Material studied: Holotype female, Turkey: Balıkesir, 25. viii. 2004, (B. Hepdurgun), trapped in orchards of *Olea europea* (in ICMKU).

Description:

Female: 2.6 mm (plus upturned ovipositor 2.2 mm). Body (Figure 2a) orange yellow except vertex with metallic green maculae (Figure 2b), pronotum with macula medially, mid lobe of mesoscutum; scutellum completely, and propodeum up to level of spiracles metallic green; metasoma ovipositor sheaths black. Antennae dark brown, except ventral sides of scape and pedicel lemon yellow. Wings hyaline, veins brown, stigma with broad infumation continuing to middle of wing (Figure 2f). Pilosity of body pale.

Head (Figure 2c) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line, (Figure 2c); relative measurements: head width 42, height 32, dorsal length 35, frons width 24; eye frontal view 9; OOL 5, POL 12, OOC 5.5, Odia 4, eyeOC 10; eye 20:15, malar space 8; TO 19, TCly 8, Teye 0, flagellum with pedicel 56.

Antenna (Figure 2b) filiform, club only slightly broader than F_1 ; flagellum with pedicel 1.43× as long as width of head and 3.75× transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, 3.11× as long as broad, and slightly longer than transverse diameter of eye (18:16). Relative measurements of antenna (l:w): scape 36:10, pedicel 12:6, anellus 2:5, F_1 14:6; F_2 - F_4 12:8; F_5 - F_6 10:8; F_7 8:8, club 28:10 (C_1 12, C_2 10, C_3 6). Sensilla on flagellum

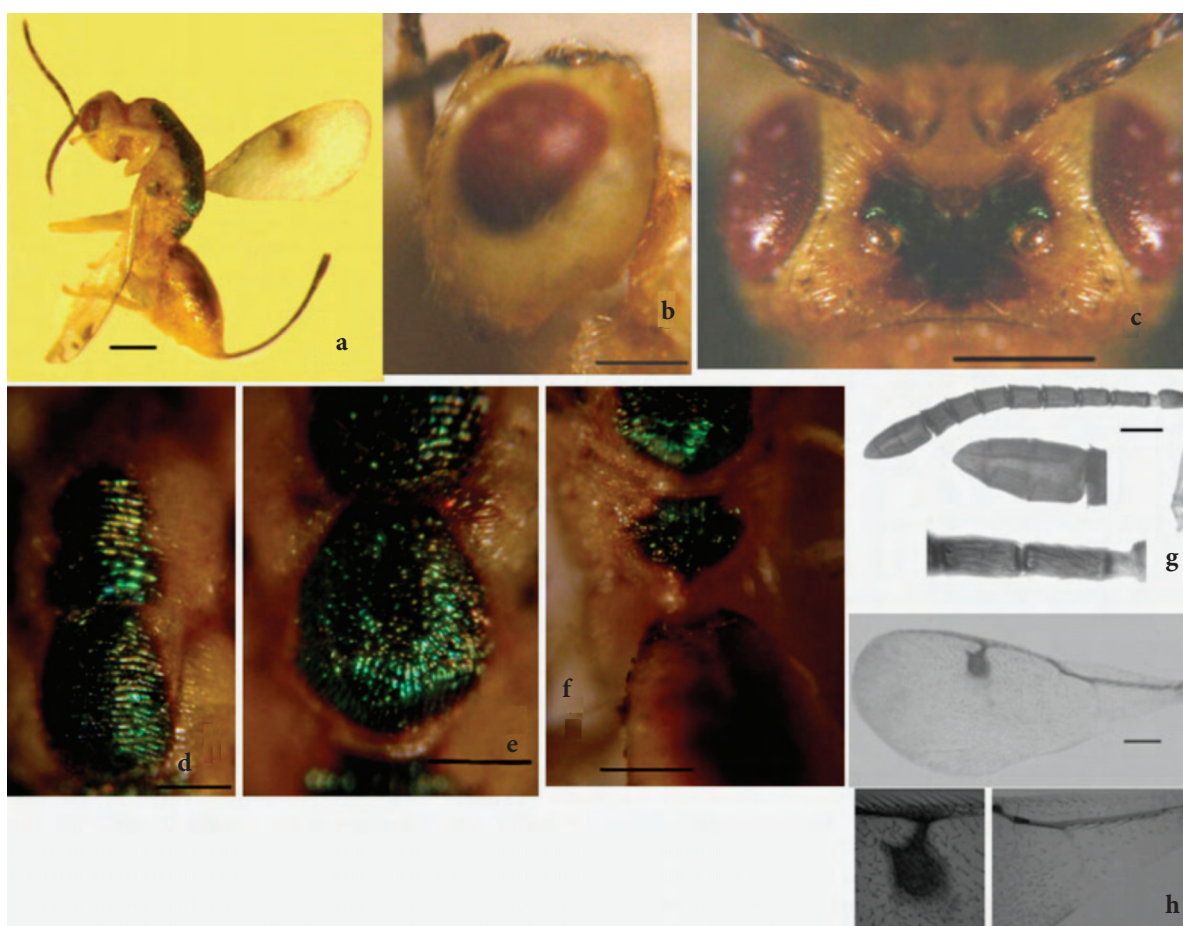


Figure 1. a-h. *Bothanomyia almusensis* Doğanlar, female: a. body, in lateral view; b-c. head, b. in lateral view, c. in dorsal view; d. mesoscutum and anterior part of scutellum; e. scutellum with frenum; f. propodeum and anterior part of metasoma; g. antennae, basal and apical segments of flagellum; h. forewing, basal part, and stigma (scale for Figure a, g, h = 0.25 mm, for the others = 0.125 mm).

long, F_1 with 2+3, F_2 - F_7 with 4+3 sensilla in 2 rows. Club as long as 3 preceding segments combined, 2.8× as long as broad.

Mesosoma (Figures 2a, d) 1.84× as long as mesoscutum broad, slightly broader than height; pronotum (Figure 2e) about 1.26× as broad as long, with 12 rows of distinct, coarse transverse striae; mesonotum about 1.65× as broad as long, with coarse, transverse long reticulation, 6 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 2d) slightly longer than broad, with fine circular reticulation in 2/3 basal part, frenum with longitudinal striae, about 0.32× length of scutellum, scutellum with 6 setae, 2 of them in frenum, on each

side. Forewing (Figure 2f) 2.44× as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 50:4; parastigma 20, marginal vein 28, postmarginal vein 28, stigmal vein 4, stigma (l:w) 8:6, uncus 3.

Hind wing 4.17× as long as broad.

Propodeum (Figure 2d) 0.5× as long as scutellum, 0.61× as long as distance between inner edges of spiracles, with deeply and regularly carinated, with arched transverse keel at basal one-third, median carina absent, finely reticulated between spiracles, the latter separated by their own length from posterior margin of metanotum.

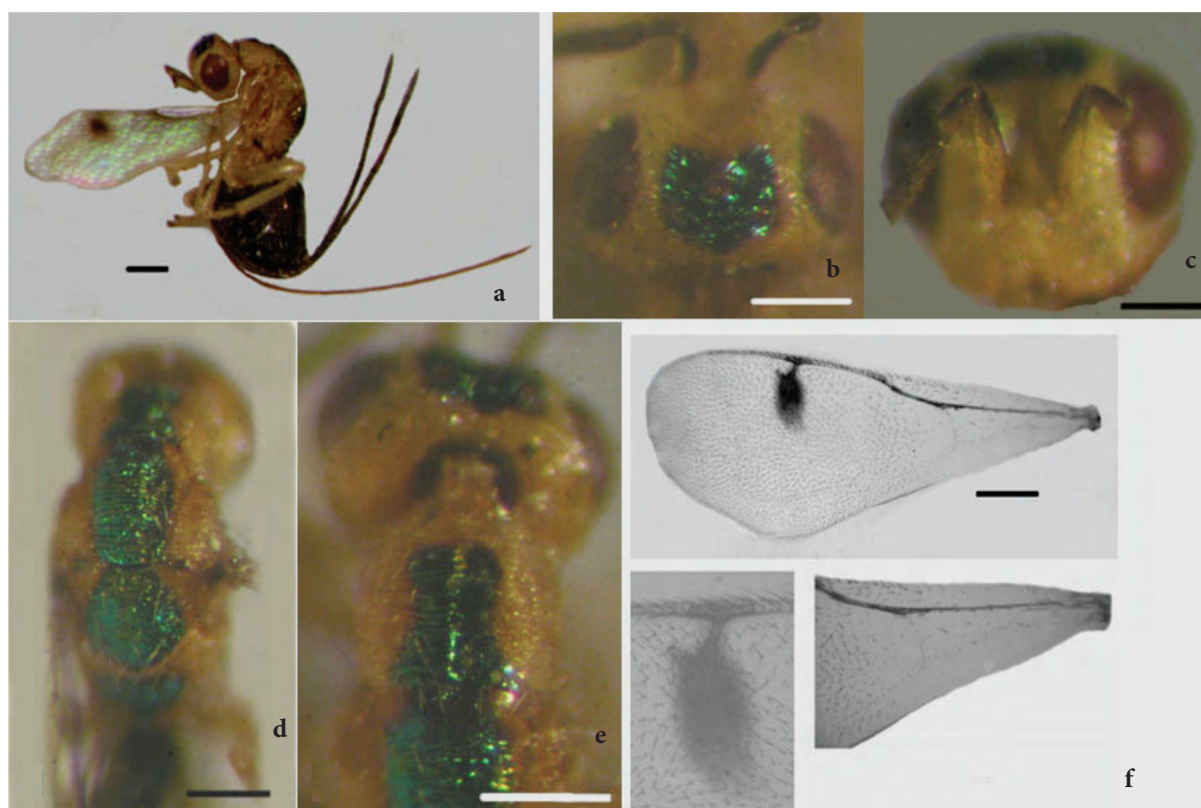


Figure 2. a-f. *Bootanomyia balikesirensis* n.sp., female: a. body, in lateral view; b-c. head, b. in dorsal view, c. in frontal view; d. mesosoma; e. rear part of head and pronotum; f. forewing, basal part and stigma (scale for Figure a = 0.5 mm, for f = 0.25 mm, for the others = 0.125 mm).

Metasoma (Figure 2a) as long as mesosoma, compressed, $2.14\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath $2.03\times$ as long as metasoma, $2.77\times$ as long as hind tibia.

Host: unknown

Comments: *Bootanomyia balikesirensis* is similar to *habui* and *nipponicus* in having ovipositor only slightly shorter than mesosoma and metasoma combined. But it differs from *habui* in having hairs on thorax pale (in *habui* hairs on thorax black); flagellum at least $1.25\times$ as long as width of head (in *habui* flagellum $1.1\times$ as long as width of head); scutellum as long as wide (in *habui* scutellum $1.2\times$ as long as wide). It also differs from *nipponicus* in having head in dorsal view $1.2\times$ as broad as long (in *nipponicus* head in dorsal view $1.6\times$ as broad as long); F_1 $1.75\times$ as long as F_7 (in *nipponicus* F_1 slightly longer than F_7); sensilla on flagellum dense, F_1 with 2+3, F_2 - F_7 with 4+3 sensilla in 2 rows (in *nipponicus*

sensilla sparse and disposed in 1 row on each funicle segment in smaller specimens, becoming 2 rows on basal segments in larger specimens); club as long as 3 preceding segments combined (in *nipponicus* club a little longer than 2 preceding segments combined); propodeum $0.5\times$ as long as scutellum (in *nipponicus* propodeum $0.66\times$ as long as scutellum). (The characters of *nipponicus* were taken from Yasumatsu and Kamijo (1979).

***Bootanomyia bohemanii* Ratzeburg, comb. and status n.-** – PALEARCTIC: Europe, Germany (Figures 3a-l).

Megastigmus bohemanii Ratzeburg, 1848: 2:182: Europe, Germany. The species was treated as a synonym of *M. dorsalis* by Grissel (1999) and Noyes (2008). I reared some specimens from Germany that are distinct from *B. dorsalis*, and appeared to be *B. bohemanii* based on the description given by Ratzeburg (1848). Its types were destroyed during

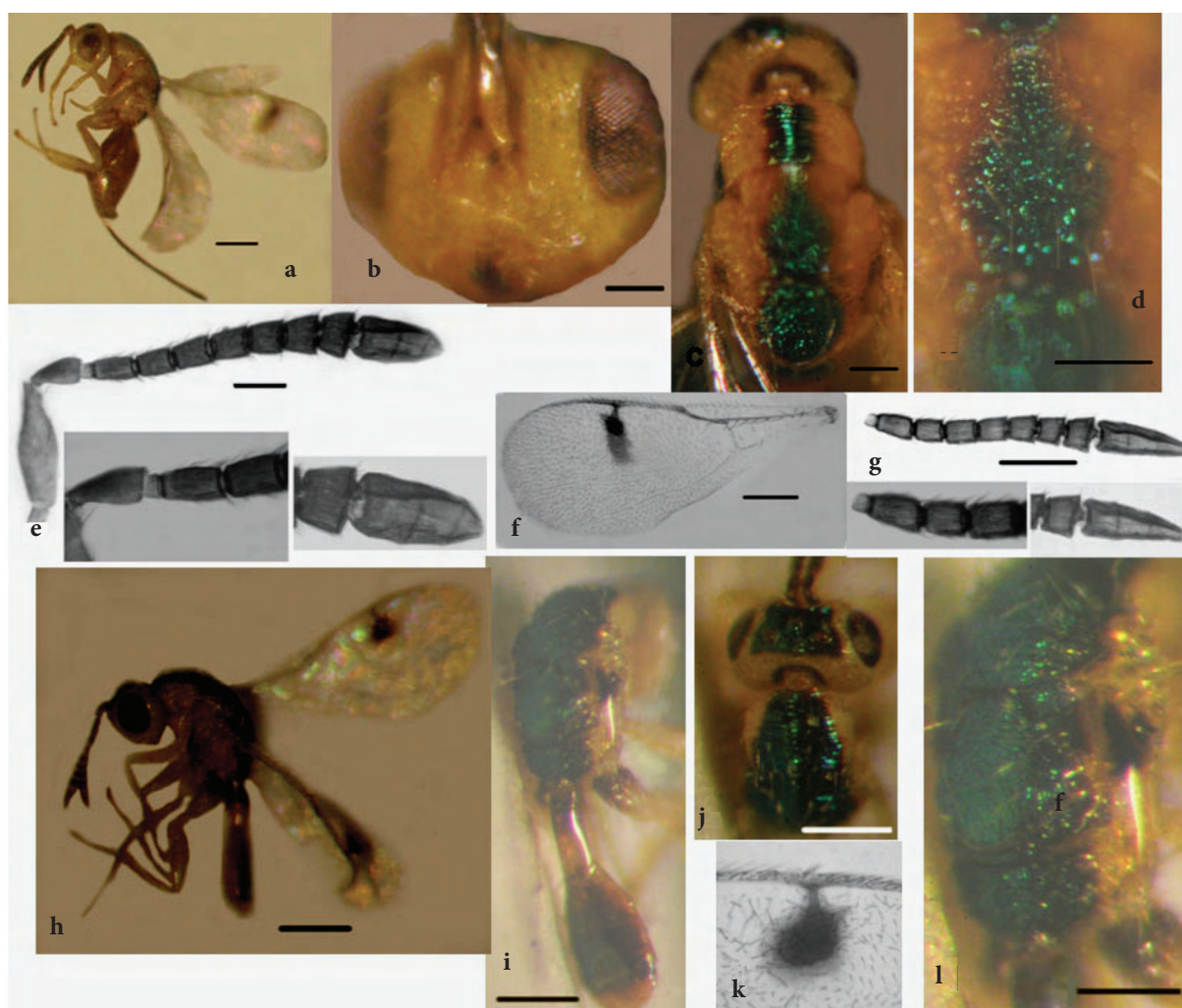


Figure 3. a-l. *Bootanomyia bohemanii* Ratzeburg: a-f. female: a. body, in lateral view; b. head, in lateral view; c. rear part of head and mesosoma; d. mesoscutum and anterior part of scutellum; e. antenna, basal and apical segments of flagellum; f. forewing, basal part and stigma; g-l. male: g. antennae (excluding scape); h. body, in lateral view; i. body, in dorsolateral view; j. head in dorsal view and pronotum; k. forewing stigma; l. scutellum and propodeum (scale for Figure a, f-g = 0.25 mm, for the others = 0.125 mm).

World War II and there are no other types of this species in any other museum in Europe. Because of this reason I designated a neotype for *B. bohemanii*.

Material studied: Neotype Female, Bad Soden-Salzmünster, Germany, 27.vii. 1983, reared from cynipid galls on *Quercus* sp. (it will be deposited in the ZSSM). Additional materials: 1 female, 1 male, same data as neotype (in ICMKU).

Description:

Female: 2.0 mm (plus upturned ovipositor 1.4 mm). Body (Figure 3a) with head and thorax

orange yellow except vertex with metallic green maculae, median part of pronotum, mid lobe of mesoscutum except anterior sides and bands close to notauli; scutellum completely and propodeum at base medially metallic green; metasoma pale brown, mesosternum mostly dark brown, ovipositor sheaths black, but at base shortly pale. Antennae brown, except ventral sides of scape and pedicelus orange yellow. Wings hyaline, veins brown, stigma with broad infumation continuing to middle of wing. Pilosity of body pale.

Head (Figure 3b) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line; temples rounded, $0.38\times$ as long as dorsal length of eye. Relative measurements: head width 68, height 52, dorsal length 40, frons width 38; eye frontal 15; OOL 8, POL 14, OOC 10, Odia 4, eyeOC 15; eye 31:25, malar space 12; TO 31, TCly 14, Teye 0, flagellum with pedicel 83.

Antenna (Figure 3e) clavate, gradually shortening and widening apically; flagellum with pedicel $1.32\times$ as long as width of head and $3.32\times$ transverse diameter of eye. Scape not reaching to the front ocellus, nearly cylindrical, $3.7\times$ as long as broad, and almost as long as transverse diameter of eye (26:25). Relative measurements of antenna (l:w): scape 26:7, pedicel 10:5, anellus 1.5:4, F_1 9:4; F_2 8:4.5; F_3 8:5, F_4 7:5, F_5 7:5.5; F_6 6:6, F_7 6:7, club 17:8 (C_1 8, C_2 5, C_3 4). Sensilla on flagellum long, F_1 - F_2 with 3 sensilla, F_3 - F_4 with 4; F_5 with 6; F_6 - F_7 with 7 sensilla in a row. Club slightly shorter than 3 preceding segments combined, $2.12\times$ as long as broad.

Mesosoma (Figure 3c) $1.6\times$ as long as mesoscutum broad, as broad as height; pronotum about $1.47\times$ as broad as long, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum (Figure 3d) about $2.4\times$ as broad as long, with coarse rugosity, 6 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 3c) slightly longer than broad (34:33), with distinct rugosity in $2/3$ basal part, frenum with longitudinal striae, about $0.35\times$ length of scutellum, scutellum with 6 setae, 2 of them in frenum, on each side. Forewing (Figure 3f) $2.5\times$ as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 87:9, parastigma 30, marginal vein 43, postmarginal vein 43, stigmal vein 6, stigma (l:w) 10:12, uncus 3.

Hind wing $4\times$ as long as broad.

Propodeum $0.68\times$ as long as scutellum, $0.74\times$ as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 3a) about $1.04\times$ as long as mesosoma, not compressed, almost $2\times$ as long as

broad, its dorsal surface smooth. Ovipositor sheath $1.35\times$ longer than metasoma, $2.25\times$ as long as hind tibia.

Male: length 2 mm, similar to female except as follows: inner half of side lobes, axillae, metallic green, metasoma dorsally dark brown. Body as seen in Figure 3h, i; temples rounded, $0.35\times$ as long as dorsal length of eye. Relative measurements: head width 30, height 23, dorsal length 19, frons width 18; eye frontal 6; OOL 4, POL 8, OOC 4, Odia 3, eye 14:11, malar space 7, flagellum with pedicel 40.

Antenna (Figure 3g) filiform, flagellum with pedicellus $1.33\times$ as long as width of head, and $3.64\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $1.1\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 12:3.5, pedicel 5:2, anellus 1:1.5, F_1 4:2.5, F_2 3.5:2.5; F_3 3.5:3; F_4 - F_5 3:3.5; F_6 2.5:3; F_7 2.5:4; club 9:4 (C_1 3; C_2 3; C_3 3). Sensilla on flagellum long, F_1 with 4 sensilla in a row, F_2 - F_5 with 5; F_6 with 6; F_7 with 7 sensilla in a row. Club with complete micropilosity, almost as long as 3 preceding segments combined, $2.25\times$ as long as broad.

Mesosoma $1.9\times$ as long as mesoscutum broad, slightly wider than height; pronotum (Figure 3j) about $0.8\times$ as long as broad, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum about $1.86\times$ as broad as long, scutellum (Figure 3l) as long as broad; frenum about $0.35\times$ length of scutellum; forewing stigma (Figure 3k) with surrounding infumation, stigmal vein 5, stigma (l:w) 12.5:12.5, uncus 3.

Propodeum (Figure 3l) $0.6\times$ as long as scutellum, $0.66\times$ as long as distance between inner edges of spiracles.

Metasoma (Figure 3h, i) as long as mesosoma, compressed, almost $2.5\times$ as long as broad; with 1st segment narrow like petiole, others gradually broadening.

Host: Cynipidae sp. ? (Hymenoptera) in gall on shoots of *Quercus* sp.

Comments: *Bootanomyia bohemanii* is similar to *dorsalis* in having frons at most $2.58\times$ as broad as width of eye in frontal view and funicular segments gradually widening, F_7 1.75 - $2.0\times$ broader than F_1 but it differs from *dorsalis* in having forewing stigma

with a narrow surrounding infumation (in *dorsalis* forewing stigma with a broad infumation continuing to middle of wing); mesosoma at most 1.67× as long as broad (in *dorsalis* mesosoma at least 1.79× as long as broad); temple 0.36× length of eye in dorsal view and length of head 1.54× least length of vertex (in *dorsalis* temple 0.43× length of eye in dorsal view; length of head 1.8× shortest length of vertex at middle); F_1 - F_2 with 3 sensilla (in *dorsalis* F_1 - F_2 with 1 sensillum).

Bootanomyia dorsalis (Fabricius) **comb.n.** - PALEARCTIC: Entire Europe; ORIENTAL: India, West Bengal

Ichneumon dorsalis Fabricius, 1798 (218-219): 231. Female, France (? MNHN, Bosc Collection). Synonyms, taxonomy, hosts, biology, and morphology were given by Grissel (1999) and Noyes (2008).

Megastigmus xanthopygus Förster, 1859: 16:110

Comments: After studying the materials obtained from several parts of Europe, it is found that *M. xanthopygus* Förster (**comb.n.**) should be transferred to *Bootanomyia*.

Material studied: 2 females, 1 male, Nikalausberg, Göttingen, Germany, 20. viii. 1983; 1 female, same locality, 4. vii. 1983, reared from cynipid gall on *Quercus* sp.; 1 female, Silwood Park, London, UK, 8. v. 1981, swept from pasture (in ICMKU).

In these materials 3 different forms are found, and described as follows:

a- *B. dorsalis* (typical form) (Figures 4a-g)

Material studied: 1 female, 1 male, Nikalausberg, Göttingen, Germany, 20. viii. 1983 (in ICMKU).

Description: Female: 1.4 mm (plus upturned ovipositor 0.9 mm). Body (Figure 4a) orange yellow except vertex with metallic green maculae, median part of pronotum, mid lobe of mesoscutum except anterior sides and bands close to notauli; scutellum completely and propodeum at base medially metallic green; metasoma pale brown, mesosternum mostly dark brown, ovipositor sheaths black, but at base shortly pale. Antennae brown, except ventral sides of scape and pedicel orange yellow. Wings hyaline, veins brown, stigma with broad infumation continuing to middle of wing. Pilosity of body pale.

Head (Figure 4c, d) with face having distinct radiating striation up to upper part of frons and

transverse striations on vertex. Antenna inserted at level of lower ocular line; temples rounded, 0.30× as long as dorsal length of eye. Relative measurements: head width 46, height 39, dorsal length 31, frons width 28; eye frontal 12; OOL 6, POL 13, OOC 6, Odia 4, eyeOC 9; eye 22:19, malar space 10; TO 25, TCly 13, Teye 2, flagellum with pedicel 64.

Antenna (Figure 4a) clavate, gradually shortening and widening apically; flagellum with pedicel 1.39× as long as width of head and 3.37× transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, 3.8× as long as broad, and as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 19:5, pedicel 8:4, anellus 1:2.5, F_1 - F_4 6:3; F_5 5:3.5; F_6 5:4.5, F_7 5:6, club 16:7 (C_1 8, C_2 5, C_3 3). Sensilla on flagellum long, F_1 and F_2 with 1 sensillum, F_3 and F_4 with 3 sensilla, F_5 - F_7 with 5 sensilla in a row. Club as long as 3 preceding segments combined, 2.28× as long as broad.

Mesosoma (Figure 4b) 1.78× as long as mesoscutum broad, as broad as height; pronotum (Figure 4e) about 1.35× as broad as long, with distinct, coarse striation, having 12 rows of transverse striae; mesonotum (Figure 4f) about 1.65× as broad as long, with long reticulation, 6 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 4f) slightly longer than broad (25:24), with transverse striae in 2/3 basal part, frenum with longitudinal striae, about 0.28× length of scutellum, scutellum with 6 setae, 2 of them in frenum, on each side. Forewing (Figure 4g) 2.44× as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 66:5, parastigma 21, marginal vein 25, postmarginal vein 32, stigmal vein 4, stigma (l:w) 12:6, uncus 2.

Hind wing 3.67× as long as broad.

Propodeum 0.64× as long as scutellum, 0.80× as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 4a) about as long as mesosoma (70:68), not compressed, almost twice as long as broad, its dorsal surface smooth. Ovipositor sheath 1.40× as long as metasoma, 2.28× as long as hind tibia.

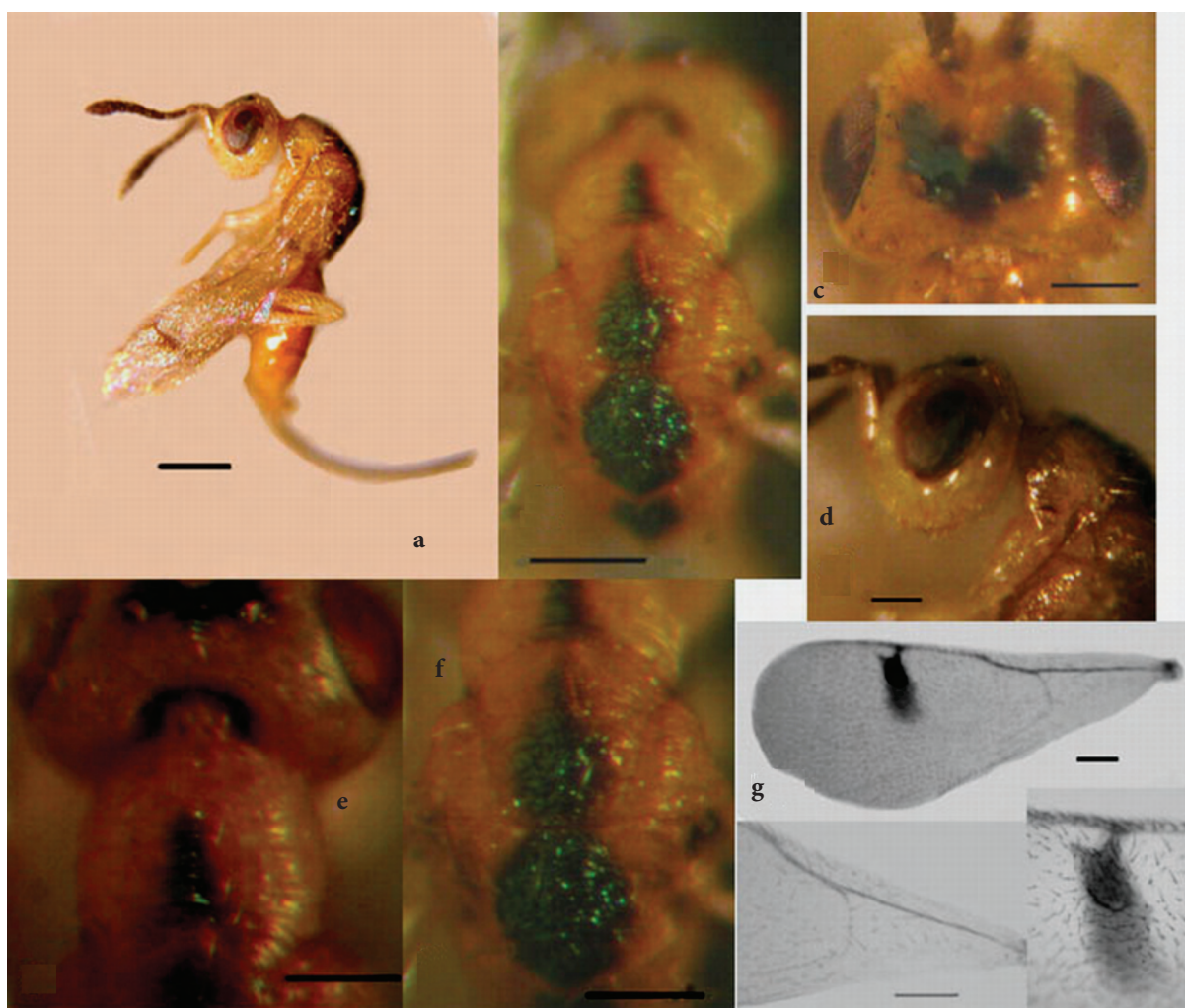


Figure 4. a-g. *Bootanomyia dorsalis* (Fabricius) (typical form), female: a. body, in lateral view; b. mesosoma; c-d. head, c. in dorsal view, d. in lateral view; e. rear part of head and pronotum; f. mesoscutum and scutellum; g. forewing, basal part and stigma (scale for Figure a = 0.25 mm, for the others = 0.125 mm).

Host: Cynipidae sp. ? (Hymenoptera) in gall on shoots of *Quercus* sp.

b-(pale form): (Figures 5a-g)

Material studied: 1 female, Nikalausberg, Göttingen, Germany, 4. vii. 1983 (in ICMKU).

Description: Similar to the typical form, except as follows:

Female: 1.5 mm (plus upturned ovipositor 1.1 mm). Similar to the dark form except as follows: Body (Figure 5a) orange yellow except vertex with pale metallic green maculae only around ocelli (Figure 5b, c), scutellum only posteriorly with pale

metallic macula and propodeum at base medially metallic green (Figure 5e).

Head (Figure 5b, c) with temples rounded, $0.43\times$ as long as dorsal length of eye. Relative measurements: head width 54, height 44, dorsal length 34, frons width 31; eye frontal 12; OOL 6, POL 13, OOC 6, Odia 4, eyeOC 11; eye 26:20, malar space 11; TO 29, TCly 15, Teye 0, flagellum with pedicel 70.

Antenna (Figure 5g) having flagellum with pedicel $1.30\times$ as long as width of head and $3.5\times$ transverse diameter of eye. Scape $4.6\times$ as long as broad, and $1.25\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 23:5, pedicel

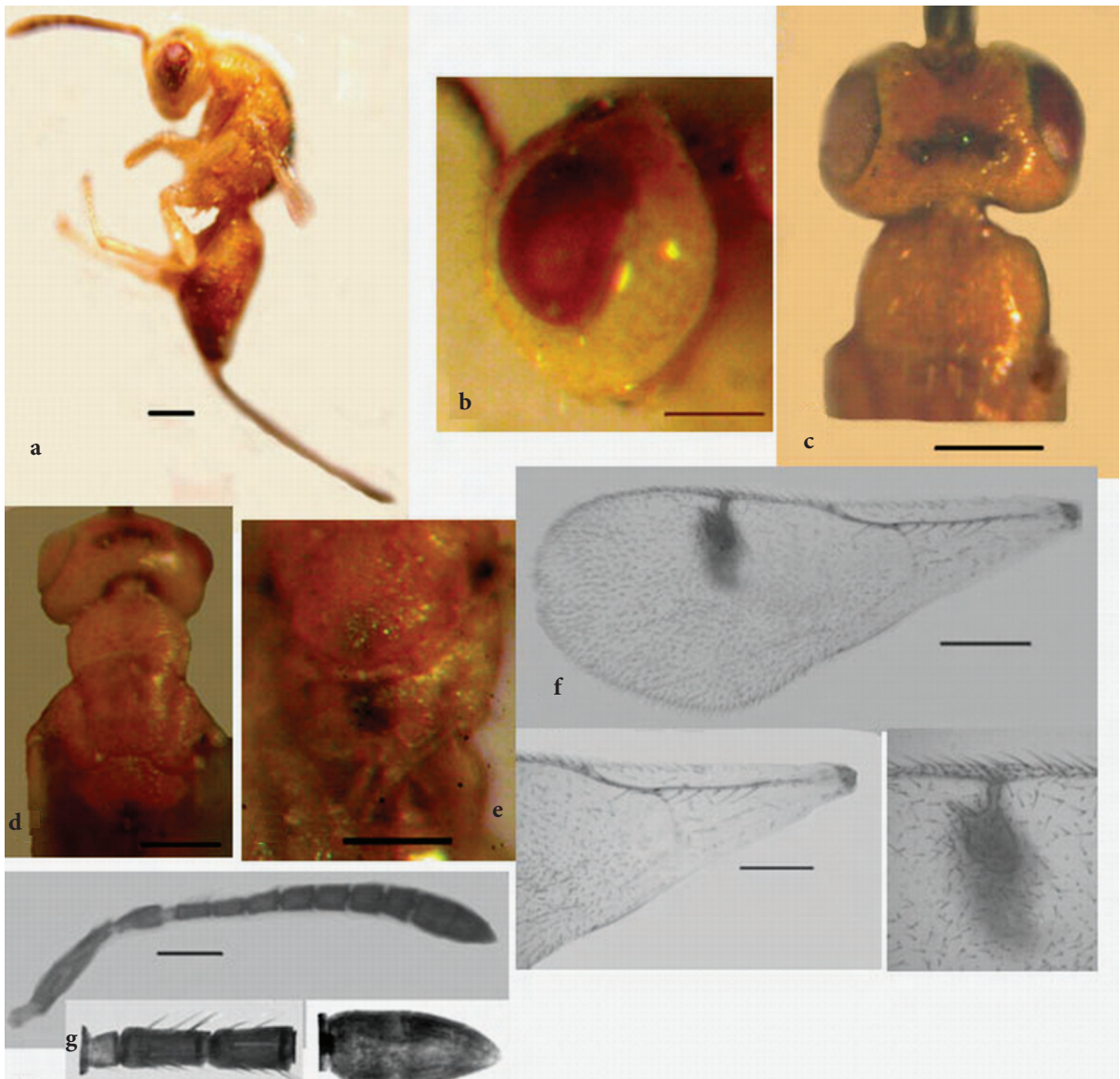


Figure 5. a-g. *Bootanomyia dorsalis* (Fabricius) (pale form), female: a. body, in lateral view; b. head, in lateral view; c. head, in dorsal view and pronotum; d. rear part of head and anterior part of mesosoma; e. scutellum and propodeum; f. forewing, basal part, and stigma; g. antenna, basal and apical segments of flagellum (scale for Figure a = 0.25 mm, for the others = 0.125 mm).

10:5, anellus 1:3, F_1 8:4; F_2 7:4; F_3 7:5, F_4 6:6, F_5 6:6; F_6 5.5:5, F_7 5:8, club 16:9 (C_1 8, C_2 4, C_3 4). Sensilla on flagellum long, F_1 and F_2 with 1 sensillum, F_3 and F_4 with 3-4 sensilla, F_5 - F_7 with 4 sensilla in a row. Club 1.78× as long as broad.

Mesosoma (Figures 5c, d) 1.67× as long as mesoscutum broad; scutellum (Figure 5e) distinctly broader than long (27:32), with distinct rugosity in 2/3 basal part, frenal area with longitudinal striae,

about 0.37× length of scutellum. Forewing (Figure 5f) 2.34× as long as broad. Relative measurements of forewing: costal cell 70:5, parastigma 22, marginal vein 38, postmarginal vein 38, stigmal vein 4, stigma (l:w) 11:9, uncus 2.

Hind wing 4× as long as broad.

Propodeum (Figure 5e) 0.52× as long as scutellum, 0.54× as long as distance between inner edges of spiracles.

Metasoma (Figure 5a) about $0.92\times$ as long as mesosoma. Ovipositor sheath $1.48\times$ longer than metasoma, $2.39\times$ as long as hind tibia.

c-(dark form) (may be *B. xanthopygus* Förster): from Silwood Park, London, UK (Figures 6a-f)

Material studied: 1 female, Silwood Park, London, UK, 8. v. 1981, swept from pasture (in ICMKU).

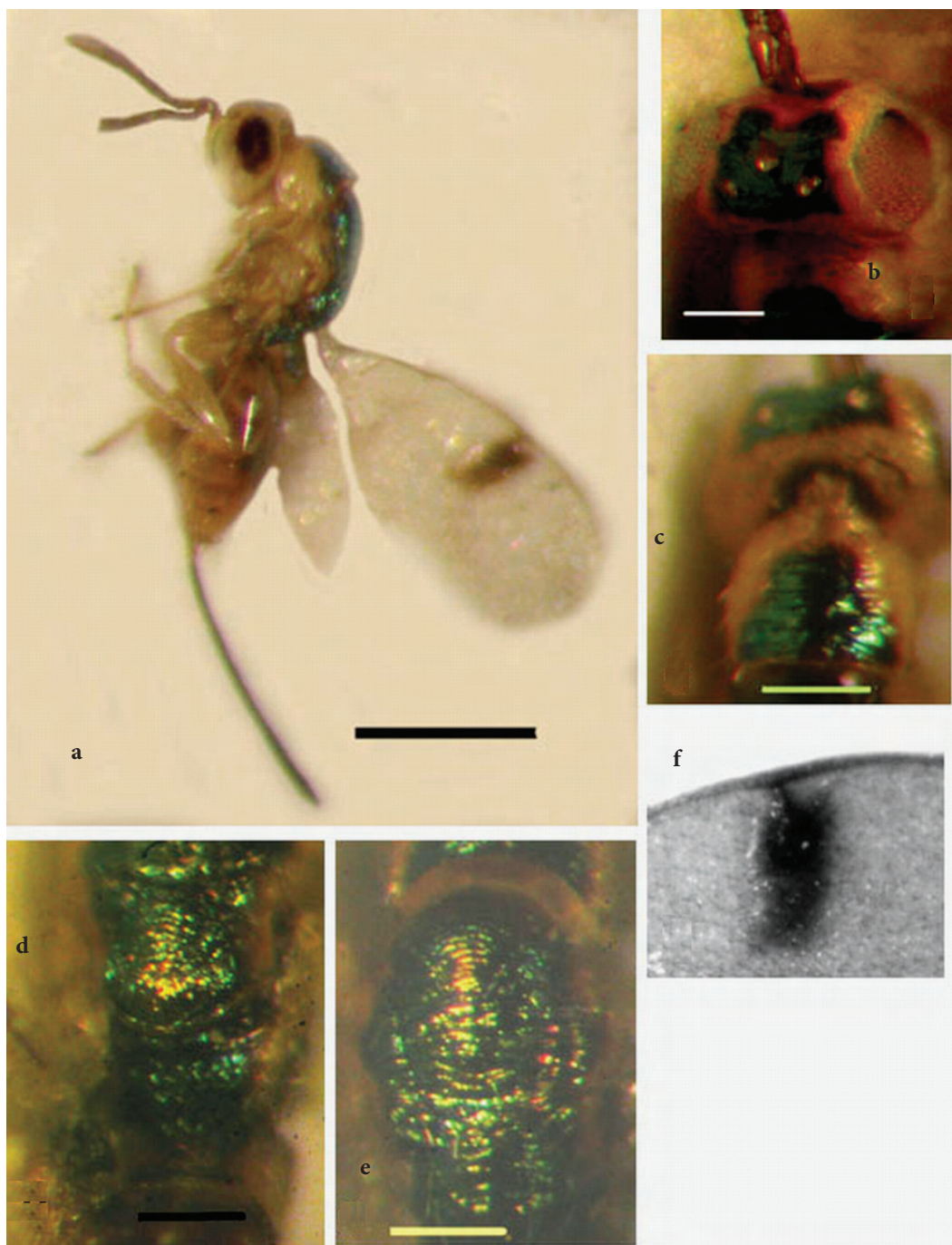


Figure 6. a-f. *Bootanomyia dorsalis* (Fabricius) (dark form), female: a. body, in lateral view; b. head, in dorsal view; c. rear part of head and pronotum; d. scutellum and propodeum; e. mesoscutum and anterior part of scutellum; f. forewing stigma (scale for Figure a = 0.25 mm, for the others = 0.125 mm).

Description: Similar to the typical form, except as follows:

Female: 1.3 mm (plus upturned ovipositor 0.9 mm). Similar to the dark form 1, except as follows: Body (Figure 6a) mid lobe of mesoscutum and inner half of side lobes metallic green.

Head (Figure 6b) Relative measurements: head width 53, height 44, dorsal length 36, frons width 32; OOL 8, POL 14, OOC 8, Odia 4, eyeOC 10; eye 27:10, malar space 11; TO 27, TCly 13, Teye -1, flagellum with pedicel 76.

Antenna (Figure 6a) flagellum with pedicel $1.43\times$ as long as width of head and $3.8\times$ transverse diameter of eye. Scape $3.3\times$ as long as broad, and slightly longer than transverse diameter of eye (23:20). Relative measurements of antenna (l:w): scape 23:7, pedicel 12:4, anellus 1:2.5, F_1 6:3.5; F_2 - F_3 6:4; F_4 6:4.5; F_5 6:5; F_6 6:6, F_7 5:7, club 17:7 (C_1 7, C_2 6, C_3 4). Club $2.43\times$ as long as broad.

Mesosoma with propodeum as seen in Figure 6c; mesonotum (Figure 6e) about $1.78\times$ as broad as long, anterior $\frac{3}{4}$ with 8 sparse transverse striae between them having coarse reticulation and posterior $\frac{1}{3}$ with fine transverse striae; scutellum (Figure 6d) with transverse long reticulation in $\frac{2}{3}$ basal part, frenal area about $0.28\times$ length of scutellum. Forewing $2.2\times$ as long as broad, with stigma (Figure 6f). Relative measurements of forewing: parastigma 23, marginal vein 35, postmarginal vein 40, stigmal vein 6, stigma (l:w) 13:12, uncus 3.

Propodeum (Figure 6d) $0.72\times$ as long as distance between inner edges of spiracles.

Metasoma (Figure 6a) slightly shorter than mesosoma (85:90), $1.85\times$ as long as broad. Ovipositor sheath $1.43\times$ as long as metasoma, $2.26\times$ as long as hind tibia.

Host: unknown

Comments: In the groups the characters stated above stay within the variations of *B. dorsalis*, color of the specimens varies from almost pale to dark metallic bluish green, and the sculpture on mesosoma varies from some rugosity to transverse striation between them with some rugae.

***Bootanomyia dumicola* (Boucek) comb.n.**
PALEARCTIC: France

Megastigmus dumicola Boucek, 1982: 183-184. Holotype female, Var, Ramatuelle, S. of St. Tropez, 14.vi.1980 (Boucek), France (MNHN); paratypes: 1 female, same data as holotype; 1 female, Pampelonne, S. of St. Tropez, 19.vi.1980 (Bouček), France (MNHN).

Description was given in detail by Bouček (1982).

***Bootanomyia emrezaferi* n.sp.** (Figures 7a-i)

Etymology. The name is derived from the name of my grandson, Mr. Emre Zafer Anlar.

Material studied: Holotype, female, Altınözü, Hatay, Turkey, $36^{\circ}00'N$; $36^{\circ}10'E$, 618 m, collected November, 1993, reared in February, 1994, from the cynipid gall collected from shoots of *Prunus* sp., M. Doğanlar, left antenna and left forewing were mounted in slides with Canada balsam, deposited (in ICMKU). Paratype 1 male, same data as holotype.

Description:

Female: 5.1 mm (plus upturned ovipositor 3.3 mm). Body (Figure 7a) with head and thorax orange yellow except vertex with metallic green maculae (Figure 7b), median part of pronotum, mid lobe of mesoscutum, inner sides of side lobes, upper half of axillae, scutellum and propodeum medially metallic green, metasoma dorsal part medially, mesosternum mostly dark brown, ovipositor sheaths black, but at base shortly pale. Wings hyaline, veins brown, stigma with broad infumation. Pilosity of body pale.

Head (Figures 7b, c) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line (Figure 7c); temples rounded, $0.37\times$ as long as dorsal length of eye. Relative measurements: head width 38, height 30, dorsal length 23, frons width 22; eye frontal 8; OOL 5, POL 8, OOC 7, Odia 3, eye 19:14, malar space 8; TO 14, TCly 8, Teye 1, flagellum with pedicel 51.

Antenna (Figure 7g) filiform, flagellum with pedicel $1.34\times$ as long as width of head and $3.64\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $1.21\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 17:4, pedicel 5.2:2.6, anellus

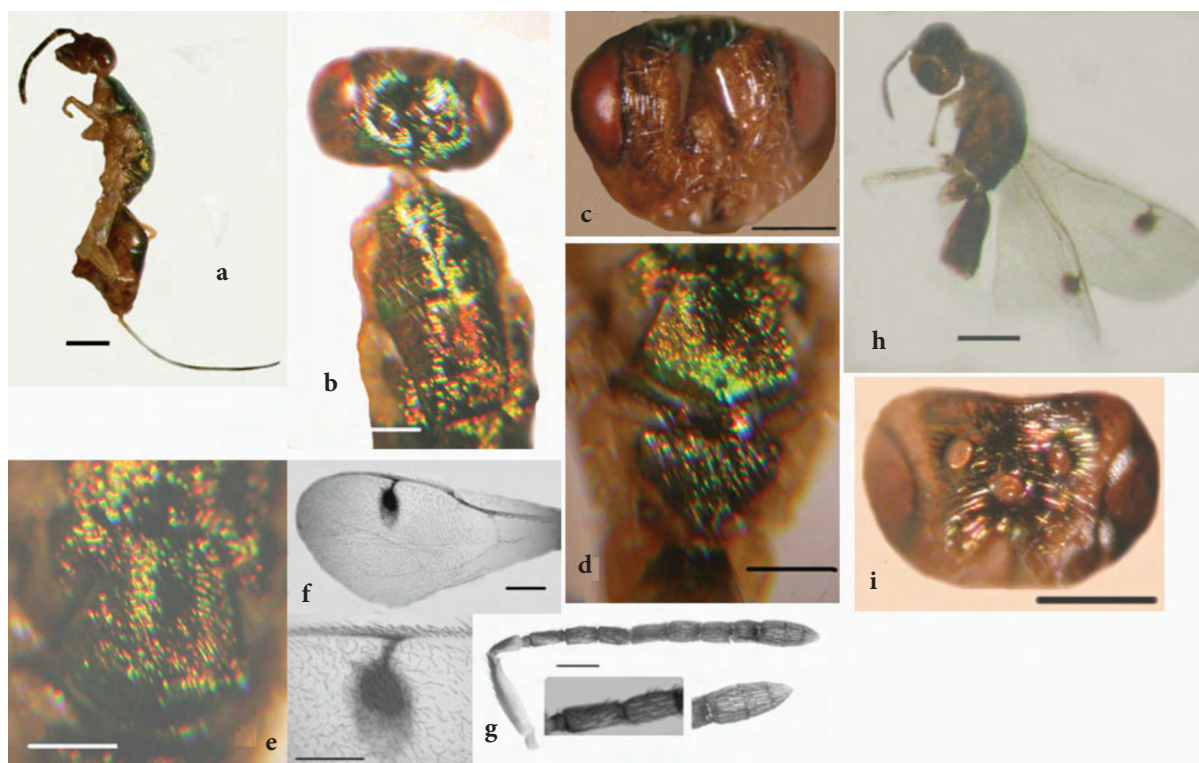


Figure 7. a-i. *Bootanomyia emrezaferi* n.sp.: a-g. female: a. body, in lateral view (excluding appendages); b. head in dorsal view and anterior part of mesosoma; c. head, in frontal view; d. anterior part of scutellum with frenum and propodeum; e. scutellum; f. forewing and stigma; g. antennae, basal and apical segments of flagellum; h-i male. h. body, in lateral view; i. head in dorsal view (scale for Figure a, f-h = 0.25 mm, for the others = 0.125 mm).

1.3:1.8, F_1 - F_3 6:3, F_4 5:3.2, F_5 - F_6 4.5:3.5, F_7 4:3.5, club 9.6:4 (C_1 4, C_2 3, C_3 2.6). Sensilla on flagellum long, F_1 with 5 sensilla in 3 rows, F_2 with 8 sensilla in 4 rows. Club as long as 2 preceding segments combined, 1.5× as long as broad.

Mesosoma 1.9× as long as mesoscutum broad, slightly broader than height (37:30); pronotum (Figure 7b) about 0.76× as long as broad, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum (Figure 7b) about 1.68× as broad as long, with sparse striation, 8 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 7e) slightly shorter than broad (24:25), with fine reticulation in 2/3 basal part, frenum with distinct longitudinal striations, about 0.33× length of scutellum, scutellum with 8 setae, 3 of them in frenum, on each side. Forewing (Figure 7f) 2.7× as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 63:7, parastigma 21, marginal vein 30, postmarginal vein 30, stigmal vein 5, stigma (l:w) 8:6.5, uncus 3.

Hind wing 3.4× as long as broad.

Propodeum (Figure 7d) 0.58× as long as scutellum, 0.67× as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, spiracles separated 1.5× by their own length from posterior margin of metanotum.

Metasoma (Figure 7a) about 0.91× as long as mesosoma, not compressed, almost 2.67× as long as broad, its dorsal surface smooth. Ovipositor sheath 1.6× longer than metasoma, 2.47× as long as hind tibia.

Male: length 2 mm, similar to female except as follows: Body (Figure 7h) with inner half of side lobes, axillae, metallic green, metasoma dorsally dark brown. Head (Figure 7i) with temples rounded, 0.44× as long as dorsal length of eye. Relative measurements: head width 22, height 16, dorsal length 14, frons width 14; eye frontal 5; OOL 2.4, POL 6, OOC 4, Oda 1.5, eye 10:8.5, malar space 4, flagellum with pedicel 35.

Antenna filiform, flagellum with pedicellus $1.6\times$ as long as width of head and $4.12\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $1.17\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 10:3.6, pedicel 3.5:2, anellus 1:1.5, F_1 - F_6 3:2, F_7 2.5:2, club 8:3 (C_1 3, C_2 2, C_3 3). Sensilla on flagellum long, F_1 with 5 sensilla in 3 rows, F_2 with 8 sensilla in 4 rows. Club with complete micropilosity, almost as long as 3 preceding segments combined, $2.67\times$ as long as broad.

Mesosoma $2.11\times$ as long as mesoscutum broad, as broad as height; pronotum about $0.86\times$ as long as broad, with distinct, coarse striation, having 16 rows of transverse striae; mesonotum about $1.8\times$ as broad as long, scutellum (Figure 2e, f) slightly longer than broad (13:12), frenal area about $0.23\times$ length of scutellum, stigmal vein 5, stigma (l:w) 8:8, uncus 3.

Propodeum $0.77\times$ as long as scutellum, $0.83\times$ as long as distance between inner edges of spiracles.

Metasoma (Figure 7h) about $0.63\times$ as long as mesosoma, not compressed, almost $1.84\times$ as long as broad.

Host: Cynipidae sp. (Hymenoptera) in gall on shoots of *Prunus* sp.

Comments: *Bootanomyia emrezaferi* n.sp. is similar to *almusiensis* and *mehmeti* n.sp. in having funicular segments almost filiform, F_7 at most $1.2\times$ broader than F_1 , but it differs from *almusiensis* in having club $2.5\times$ as long as broad, with micropilosity in a narrow area starting from apical half of C_1 (in *almusiensis* club $3\times$ as long as broad; with a broad micropilosity starting from base C_1); head in dorsal view $1.65\times$ as broad as long; temple $0.39\times$ length of eye (in *almusiensis* head in dorsal view $1.45\times$ as broad as long; temple $0.28\times$ length of eye); length of head $1.52\times$ shortest length of vertex, and OOC $1.08\times$ POL (in *almusiensis* length of head $1.82\times$ shortest length of vertex, and OOC $0.72\times$ POL); scutum with circular broad reticulation (in *almusiensis* scutum with transverse long fine reticulation); F_1 with 5 sensilla in 3 rows, F_2 with 8 sensilla in 4 rows (in *almusiensis* F_1 with 2 sensilla in a row; F_2 with 1+3 sensilla in 2 rows). It differs from *mehmeti* in having ovipositor at most $1.5\times$ as long as gaster, and $2.47\times$ as long as hind tibia (in *mehmeti* ovipositor $1.6\times$ as

long as gaster, $2.64\times$ as long as hind tibia); length of flagellum with pedicel $3.64\times$ as long as transverse diameter of eye (in *mehmeti* length of flagellum with pedicel $2.37\times$ as long as transverse diameter of eye); scape $1.21\times$ as long as transverse diameter of eye (in *mehmeti* scape $2.26\times$ as long as transverse diameter of eye); club $1.5\times$ as long as broad (in *mehmeti* club $2.2\times$ as long as broad).

Bootanomyia gemma Girault. ORIENTAL: Philippine Islands

Bootanomyia gemma Girault 1928/425:450. Holotype female, Baguio, Benguet, Luzon, Philippine Islands (Queensland Museum, not found).

Description was given by Girault (1928b) as follows:

Female. brilliant green, wings hyaline, hind coxae, center of occiput, upper half of face, all of vertex, scape, except beneath and at base more or less, pedicel except beneath and some part of thorax metallic green.

Antennae with funicular segments at least twice longer than wide; first funicular segment over thrice longer than wide, twice than pedicel, second over twice longer than wide, 7th nearly twice longer than wide; scutellum with 6 pairs of long setae. Ovipositor as long as body.

Bootanomyia guttatipennis (Girault). AUSTRALIAN: Australia (Figures 8a-g)

Epibootania guttatipennis Girault, 1937(446): 1. Lectotype female (designed by Bouček 1988: 129), Kuranda, Queensland (QMB, examined).

Material studied: Card mounted, lectotype female, minus head, left wings and part of hind leg. “*Epibootania guttatipennis* Gir., Type, Female (GH)”, the Queensland Museum register number T.5113.

Redescription: length 2.2 mm + upturned ovipositor 1.4 mm. Body (Figure 8a) orange yellow, excepts pronotum on posterior half medially, mid lobe of mesonotum and anterior corner of side lobes, scutellum, anterior corner of axillae, dorsellum and propodeum medially T-shaped macula metallic blue, metasoma dorsally pale brown, ovipositor brown. Body setae yellow.

Mesosoma $1.37\times$ as long as broad; pronotum (Figure 8b) $1.3\times$ as wide as long, with 9 rows of setae;

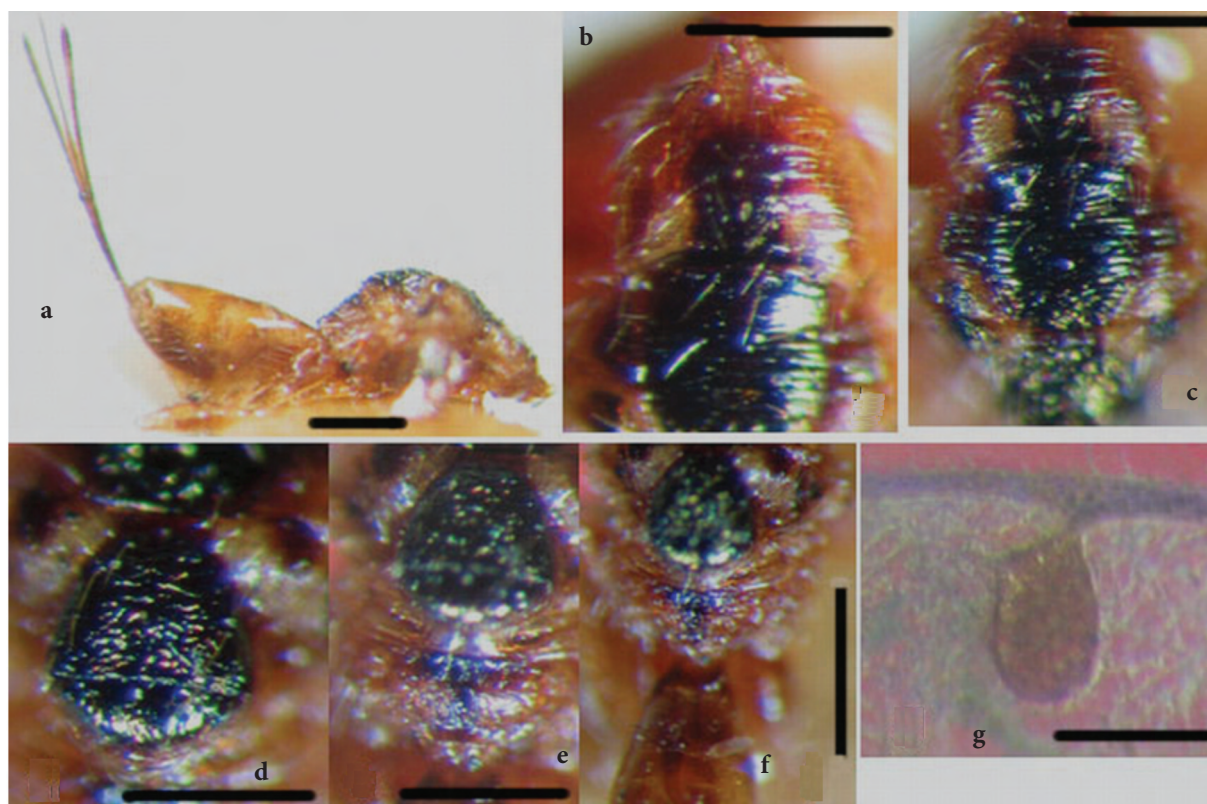


Figure 8. a-g. *Bootanomyia guttatipennis* (Girault), female: a. body, in lateral view (excluding head); b. pronotum; c. mesoscutum; d. scutellum; e. frenum and propodeum; f. propodeum and basal part of metasoma; g. forewing stigma (scale for Figure a = 0.25 mm, for the others = 0.125 mm).

mesonotum (Figure 8c) transversely striated, with 4 rows of setae; $0.6\times$ as long as wide; mesosoma with a gap between mid lobe of mesonotum and scutellum; scutellum (Figure 8d) transversely wrinkled, $1.1\times$ longer than wide, with 4 pairs of setae, frenum smooth, $0.35\times$ as long as scutellum, with 2 pairs of setae. Relative measurements (l/w): pronotum: 23/30; mesonotum: 24/40; scutellum: 23/21; frenum: 8, other part of scutellum 15; gaster: 60/27; ovipositor: 80.

Propodeum (Figure 8e, f) $0.5\times$ as long as scutellum, $0.43\times$ as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 8a, f) about $0.8\times$ as long as mesosoma, not compressed, almost $2.2\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath $1.33\times$ as long as metasoma.

Host: unknown

Comments: *Bootanomyia guttatipennis* is similar to *synophri* and *smaragtus* in having frenum smooth, but it differs from both of them in having mesosoma with a gap between mid lobe of mesonotum and scutellum (in the both species mesonotum and scutellum smoothly joining each other); ovipositor at most $1.33\times$ as long as metasoma (in the both species ovipositor at least $1.4\times$ as long as metasoma).

Bootanomyia habui (Kamijo) **comb.n.**
-PALEARCTIC: Japan (Figures 9a-k)

Megastigmus habui Kamijo, 1962: 20-22. Holotype female, Urawa, Saitama Pref., Honshu, Japan (HU); Paratypes: 9 females, 10 males, same data as holotype; 4 females, 5 males, Tokyo, Japan; 1 female, 7 males, Osaka, Japan (HU, National Institute of Agricultural Sciences).

Material studied: Materials. 1 female, 2 males, Japan Kujukuba-city, Hanare, coll. 1-10.04. 1997,

ex gall on oak, emerged 1-20. 07. 1997, V. Fursov, in ICMKU.

Redescription

Female: 4.2 mm (plus upturned ovipositor 4.0 mm). Body (Figure 9a, b) pale rufous, except vertex, median part of pronotum metallic green, midlobe of mesonotum and scutellum, except its extreme sides metallic blue; postocciput around foreman magnum, propodeum medially, metanotum dorsally, flagellum and sheaths of ovipositor brown. Wings hyaline, veins brown. Head with pale pilosity on face, but darker on genae.

Head (Figure 9c, d) with regular, low, raised reticulation on face, having fine transverse striation, but very deep coarse striation on vertex. Antenna inserted at level of lower ocular line, temples rounded, about half length of dorsal length of eye. Relative measurements: head width 40, height 31, dorsal length 24, frons width 22, OOL 6, POL 7.5, OOC 3.5, OOL 3.3, eye 17:16, malar space 10, TO 16, TCly 10, flagellum with pedicel 45.

Antenna short, filiform (Figure 9h), flagellum with pedicel $0.88\times$ as long as width of head. Scape not reaching the front ocellus, nearly cylindrical, Antenna (l:w): scape 37:9, pedicel 12:7, anellus 4:5, F_1 15:6.5, F_2 13:8, F_3 13:8, F_4 13:8, F_5 10:8, F_6 10:8, F_7 8.5:8.5, club 24:9.5 (C_1 11, C_2 8, C_3 5). Longitudinal sensilla on flagellum rather sparse; in first 3 segments sensilla in 1 row and the following ones in 2 rows. Club about as long as $2\frac{1}{2}$ preceding segments combined, with apices of C_2 and C_3 strongly oblique; micropilosity large, extending from apex of C_3 to base of the first segment.

Mesosoma (Figure 9b) $1.86\times$ as long as mesoscutum broad, almost as broad as height; pronotum (Figure 9c) about $1.35\times$ as broad as length medially (except neck), with distinct, coarse striation, having 14 rows of setae; mesonotum (Figure 9f) about 1.5 times as broad as long, with rather deep coarse cross-rugae, posteriorly with some coarse punctuation; side lobes convex with fine striation, mid lobe flat with 6 rows of erect, long hairs, notauli deep; scutellum (Figure 9e, f) with the some coarse rugosity, almost as long as broad, frenal groove distinct, frenal with longitudinal strong striation, about $\frac{1}{3}$ length of scutellum; Forewing (Figure 9g) $2.5\times$ as

long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 57:6, parastigma 18, marginal vein 20:2, postmarginal vein 37, stigmal vein 5, stigma (l:w) 5:6, uncus 3.

Hind wing $3.56\times$ as long as broad; costal cell narrow, $1.2\times$ as long as marginal vein.

Propodeum (Figure 9e) about half as long as scutellum, $0.65\times$ as long as distance between inner edges of spiracles, deeply and regularly carinated, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum. Hairs on thoracic dorsum black.

Metasoma (Figure 9a) about as long as $0.7\times$ mesosoma, not compressed, as broad as height, almost $1.6\times$ as long as broad, its dorsal surface shallow, transversally reticulated, first tergite deeply, second weakly incised apically. Ovipositor sheath a little shorter than body, $3.5\times$ as long as hind tibia.

Male: Body (Figure 9j) length 3.7-4 mm. Similar to female except as follows: Relative measurements: head width 38, height 30, dorsal length 31, eye 18:13, TO 17, TCly 9, flagellum with pedicel 50. Antenna (Figure 9k) longer than female antenna, flagellum with pedicel $1.31\times$ as long as head width. Relative measurements of antenna (l:w): scape 38:8, pedicel 13:6, anellus 3:5, F_1 13:8, F_2 12:8, F_3 11:8, F_4 10:8, F_5 8:8, F_6 8:8, F_7 6:8, club 30:9 (C_1 10, C_2 9, C_3 10). Club with distinct pilosity on whole ventral side.

Mesosoma twice as long as mesoscutum broad, slightly higher than broad; pronotum about $1.45\times$ as broad as length medially (except neck); mesonotum about $1.9\times$ as broad as long. Frenum about $0.6\times$ length of scutellum. Forewing $2.93\times$ as long as broad, having stigma (Figure 9i) without fumation. Relative measurements of forewing: costal cell 54:6, parastigma 20, marginal vein 19:1.5, postmarginal vein 26. Hind wing with costal cell $1.4\times$ as long as marginal vein. Metasoma shorter, $0.8\times$ as long as mesosoma, $2.24\times$ as long as broad.

Host: *Trichalgma serratae* (F.) (Hym. Cynipidae) (Kamijo, 1962)

Comments: *Bootanomyia habui* is similar to *nipponicus* and *balikesirensis* in having ovipositor only slightly shorter than mesosoma and metasoma

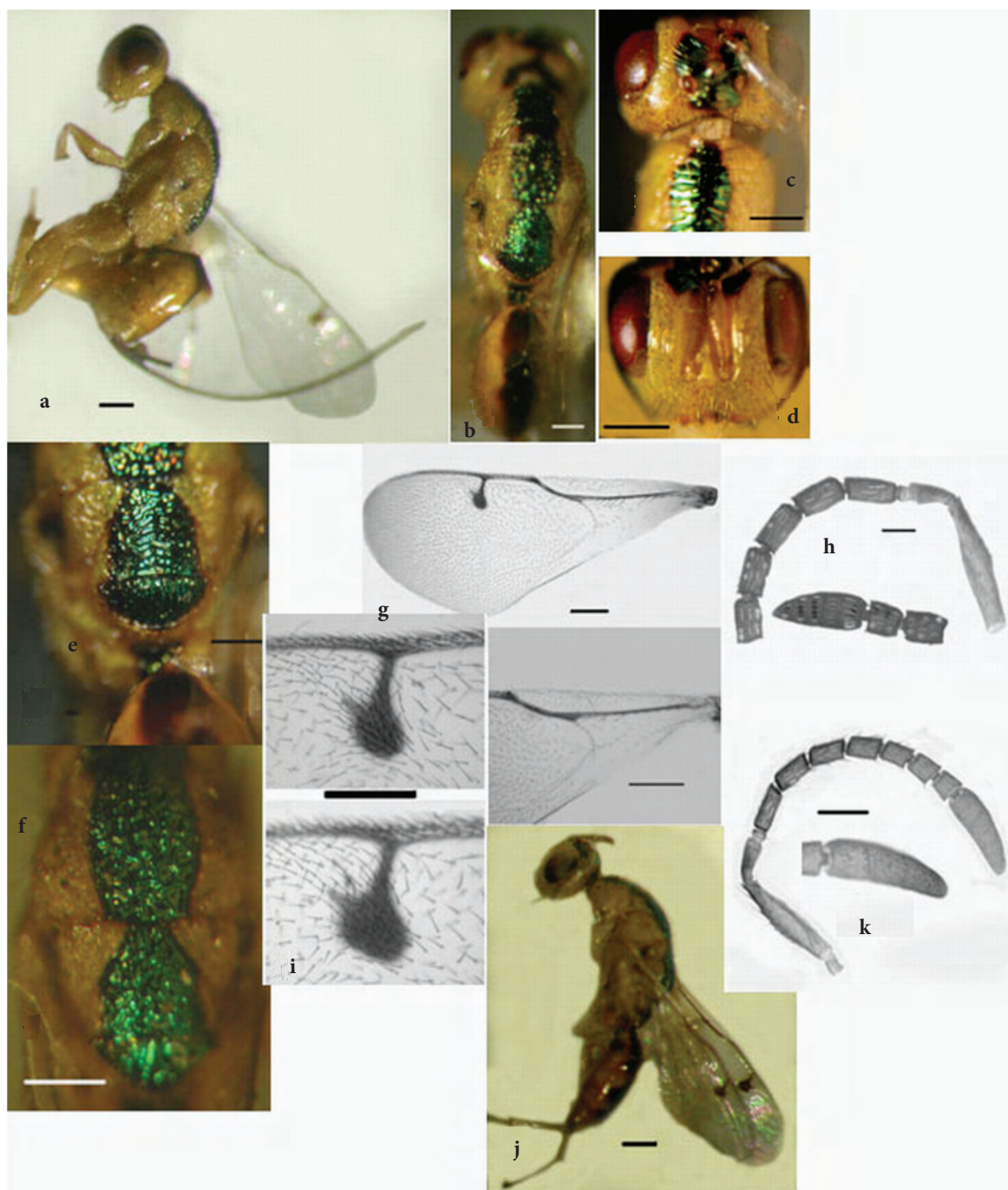


Figure 9. a-k. *Bootanomyia habui* (Kamijo): a-h. female: a. body, in lateral view; b. mesosoma and basal part of metasoma; c. pronotum; d. head in frontal view; e. scutellum with frenum, propodeum and anterior part of metasoma; f. mesoscutum and anterior part of scutellum; g. forewing, basal part and stigma; h. antennae and apical segments of flagellum; i-k. male. i. forewing stigma; j. body, in lateral view; k. antennae and club (scale for Figure a, g-k = 0.25 mm, for the others = 0.125 mm).

combined, but it differs from both of them in having hairs on thorax black, flagellum $1.1\times$ as long as width of head, F_1 $1.22\times$ as long as pedicellus, and scutellum

$1.2\times$ as long as wide (in the both species hairs on thorax pale, flagellum at least $1.25\times$ as long as width of head, and scutellum as long as wide).

***Bootanomyia hepdurgunae* n.sp. -PALEARCTIC:** Turkey (Figures 10a-e)

Etymology. The name is derived from the name of the collector, Mrs. Bahriye Hepdurgun.

Material studied: Holotype female, Balıkesir, Turkey, 05. 10. 2004, trapped in orchard of *Olea europea* (in ICMKU).

Description:

Female: 1.8 mm (plus upturned ovipositor 1.0 mm). Body (Figure 10a, b) with head lemon yellow, meso- and metasoma orange yellow, except vertex with metallic green maculae only around ocelli, mid lobe of mesoscutum median area slightly, scutellum in posterior half medially, and propodeum only medially metallic green; ovipositor sheaths dark brown. Antenna dark brown, except ventral sides of scape and pedicel lemon yellow. Wings hyaline, veins brown, stigma with broad infumation continuing to middle of wing (Figure 10e). Pilosity of body pale.

Head (Figure 10c) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line. Relative measurements: head width 52, height 44, dorsal length 34, frons width 32; eye frontal view 10; OOL 7, POL 13, OOC 8, Odia 4, eyeOC 10; eye 24:20, malar space 11; TO 22, TCly 12, Teye 2, flagellum with pedicel 74.

Antenna (Figure 10d) clavate, flagellum with pedicellus 1.42× as long as width of head and 3.7× transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, 4.2× as long as broad, and twice longer than transverse diameter of eye. Relative measurements of antenna (l:w): scape 42:10, pedicel 20:8, anellus 3:4, F₁ 12:6; F₂ 10:7; F₃ 12:8; F₄ 12:9; F₅ 12:10; F₆ 12:12; F₇ 10:14, club 30:16 (C₁ 12, C₂ 12, C₃ 6). Sensilla on flagellum long, F₁-F₃ with 1 sensillum, F₄ with 2, F₅-F₇ with 3 sensilla in a row. Club as long as 2 1/2 preceding segments combined, 1.88× as long as broad, with a narrow micropilosity starting from half of first segment.

Mesosoma (Figure 10c) 1.67× as long as mesoscutum broad, slightly broader than height (48:40); pronotum about 1.6× as broad as long, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum about 1.92× as broad as long, with coarse, transverse long reticulation, 6 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 2e, f) slightly broader

than long (26:24), with fine circular reticulation in 2/3 basal part, frenum with longitudinal striae, about 0.25× length of scutellum, scutellum with 6 setae, 2 of them in frenum, on each side. Forewing (Figure 10e) 2.39× as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing:costal cell 70:5; parastigma 22, marginal vein 32, postmarginal vein 40, stigmal vein 4, stigma (l:w) 11:10, uncus 3.

Hind wing 3.71× as long as broad.

Propodeum 0.8× as long as scutellum, 0.73× as long as distance between inner edges of spiracles, with fine reticulation, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 10a) slightly shorter than mesosoma, not compressed, 2.43× as long as broad, its dorsal surface smooth. Ovipositor sheath 1.46× as long as metasoma, 2.33× as long as hind tibia.

Host: unknown

Comments: *Bootanomyia hepdurgunae* is similar to *dorsalis* (complex) in having antenna with longitudinal sensilla sparse, on F₁ with 1, on F₂ with 2 sensilla and ovipositor 2.25-2.39× as long as hind tibia, but it differs from them in having frons at least 3× as broad as width of eye in frontal view (in *dorsalis* (complex) frons at most 2.58× as broad as width of eye in frontal view). *B. hepdurgunae* is also similar to *shebnemae* n.sp., but it differs in having ovipositor 1.46× as long as gaster, and 2.33× as long as hind tibia (in *shebnemae* ovipositor 1.25× as long as gaster, and 2.26× as long as hind tibia); in dorsal view temple 0.36× length of eye (in *shebnemae* in dorsal view temple 0.25× length of eye); postmarginal vein 1.25× marginal vein (in *shebnemae* postmarginal vein 1.08× marginal vein), and by some other characters stated in the identification key.

***Bootanomyia maculipennis* comb.n.** (Yasumatsu and Kamijo). PALEARCTIC: Japan, Korea, People's Republic of China.

Megastigmus maculipennis Yasumatsu and Kamijo, 1979: 101-102. Holotype female, Aburaya-ma, Fukuoka-shi, Kyushu, Japan (KU); Paratypes: 34 females, 19 males, central and southern Honshu, Shikoku, Kyushu, Japan.

Description was given in detail by Yasumatsu and Kamijo (1979).

***Bootanomyia mehmeti* n.sp. - PALEARCTIC:** (Figures 11a-j)

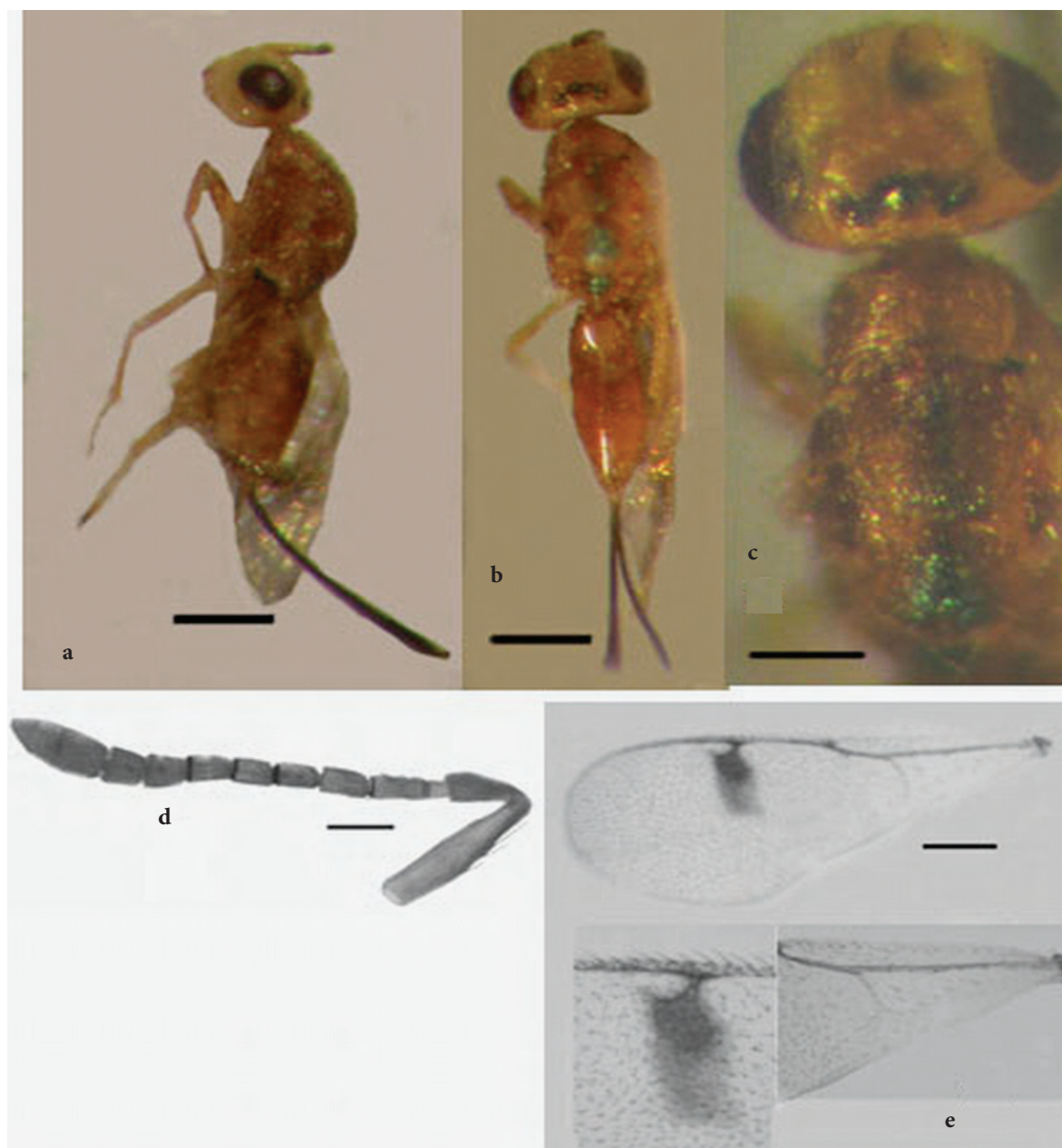


Figure 10. a-e. *Bootanomyia hepdurgunae* n.sp., female: a-b. body, a. in lateral view; b. in dorsal view; c. head in dorsal view and mesosoma; d. antenna; e. forewing, basal part and stigma (scale for Figure c = 0.125 mm, for the others = 0.25 mm).

Etymology. The name is derived from the name of my grandson, Mr. Mehmet Kazan.

Material studied: Holotype, female, Turkey, Almus, Tokat, 24. iv. 1990, reared from cynipid gall, on twigs of *Quercus* sp., in ICMKU. Paratypes: 3 females, 2 males, 8.-11. iv. 1989; 1 female, 5 males, 19.-20. iv. 1990; 1 male, 1. iv. 1991, the other data are same as holotype.

Description

Female: 2.5-2.8 mm (plus upturned ovipositor 2.2 mm). Body (Figure 11a) with head and thorax pale yellow except vertex with metallic green maculae (Figure 11b), median part of pronotum, mid lobe of mesoscutum, basal part of inner sides of side lobes, upper half of axillae, scutellum and propodeum medially metallic green, metasoma dorsal part

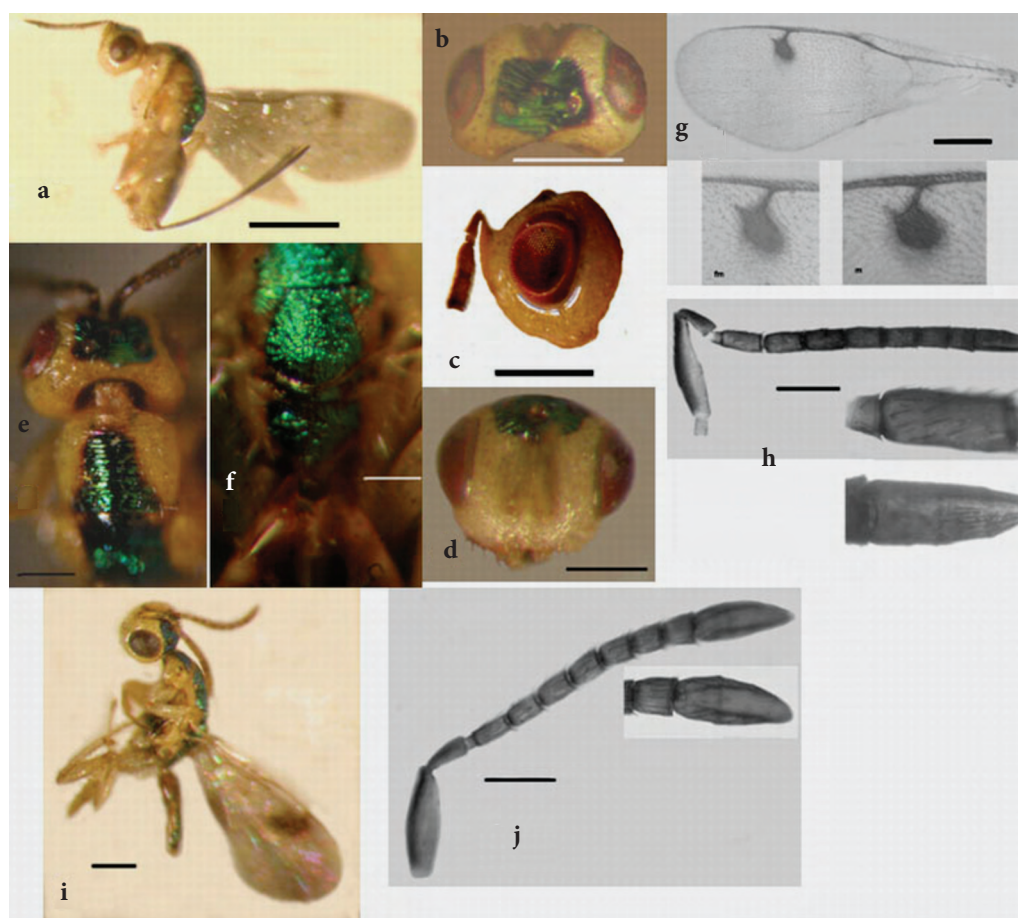


Figure 11. a-j. *Bootanomyia mehmeti* n.sp.: a-h. female: a. body, in lateral view; b-d. head, b. in dorsal view, c. in lateral view, d. in frontal view; e. rear part of head and pronotum; f. scutellum with frenum; g. forewing, basal part and stigma; h. antennae, basal and apical segments of flagellum; i-j. male. i. body, in lateral view; j. antennae and apical segments of flagellum (scale for Figure a, g-j = 0.25 mm, for the others = 0.125 mm).

medially, mesosternum mostly dark brown, ovipositor sheaths black. Antenna with scape and pedicel dorsally brown, ventrally yellow, flagellum pale brown. Wings hyaline, veins brown, stigma surrounded by infumation. Pilosity of body pale.

Head (Figures 11b, c, d) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line (Figure 11d); temples rounded, $0.29\times$ as long as dorsal length of eye. Relative measurements: head width 33, height 25, dorsal length 23, frons width 24; eye frontal 8; OOL 7, POL 12, OCC 8, Odia 4, eye 24:19, malar space 10; TO 22, Tcly 11, Teye 0, flagellum with pedicel 45.

Antenna (Figure 11h) filiform, flagellum with pedicel $1.36\times$ as long as width of head and $2.37\times$ transverse diameter of eye. Scape not reaching the front ocellus, distinctly broadened medially, $2.26\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 43:12, pedicel 14:8, anellus 3:6, F_1 16:8, F_2 - F_5 14:8, F_6 12:8, F_7 10:9, club 22:10 (C_1 9, C_2 7, C_3 6). Sensilla on flagellum long, F_1 with 4 sensilla in 2 rows, F_2 with 8 sensilla in 4 rows. Club as long as 2 preceding segments combined, $2.2\times$ as long as broad, with micropilosity.

Mesosoma $1.9\times$ as long as mesoscutum broad, slightly broader than height (32:26); pronotum (Figure 11e) about $0.75\times$ as long as broad, with distinct, coarse striation, having 12-14 rows of

transverse striae; mesonotum about $2\times$ as broad as long, apical half with 8 sparse striation and basal half coarsely rugosity, 8 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 11f) slightly shorter than broad (18:20), with fine transverse long reticulation in $2/3$ basal part, frenum with distinct longitudinal striations, about $0.25\times$ length of scutellum, scutellum with 8 setae, 3 of them in frenum, on each side. Forewing (Figure 11g) $2.5\times$ as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 44:4, parastigma 16, marginal vein 23, postmarginal vein 23, stigmal vein 3, stigma (l:w) 5:6, uncus 3.

Hind wing $3.9\times$ as long as broad.

Propodeum (Figure 11f) $0.61\times$ as long as scutellum, $0.69\times$ as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 11a) as long as mesosoma, not compressed, almost $1.5\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath $1.58\text{--}1.64\times$ longer than metasoma, $2.64\text{--}2.79\times$ as long as hind tibia.

Male: length 2.3–3.0 mm. similar to female except as follows: Body (Figure 11i) with side lobes mostly metallic green, metasoma dorsally dark brown, apically metallic dark green. Temples rounded, $0.40\times$ as long as dorsal length of eye. Relative measurements: head width 37, height 30, dorsal length 25, frons width 22; eye frontal 7; OOL 4.5, POL 9, OOC 5, Oda 3, eyeOC 9, eye 18:15, malar space 10, flagellum with pedicel 54.

Antenna (Figure 11j) filiform, flagellum with pedicellus $1.46\times$ as long as width of head and $3.6\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $1.17\times$ as long as transverse diameter of eye. Relative measurements of antenna (l:w): scape 15:4.5, pedicel 6:3, anellus 1:2, F_1 5:2.5; F_2 5:3; F_3 5:3.5; F_4 4.5:3.5; $F_5\text{--}F_6$ 4:3.5; F_7 4:4, club 12.5:5.5 (C_1 5, C_2 3.5, C_3 4). Sensilla on flagellum long, F_1 with 5 sensilla in 3 rows, F_2 with 8 sensilla in 4 rows. Club with complete micropilosity, almost as long as 3 preceding segments combined, $2.27\times$ as long as broad.

Mesosoma (Figure 11i) $2\times$ as long as mesoscutum broad, slightly broader than height (38:30); pronotum about $0.8\times$ as long as broad; mesonotum about $1.9\times$ as broad as long, scutellum (Figure 2e, f) slightly longer than broad (23:22), frenum about $0.35\times$ length of scutellum, marginal vein equal to postmarginal vein, about $6.25\times$ as long as stigmal vein, stigma (l:w) 7:10, uncus 3.

Propodeum $0.52\times$ as long as scutellum, $0.6\times$ as long as distance between inner edges of spiracles.

Metasoma (Figure 11i) about $0.66\times$ as long as mesosoma, not compressed, almost $2.5\times$ as long as broad.

Biology: reared from galls of *Neuroterus macropterus* (Hymenoptera: Cynipidae) on twigs and branches of *Quercus* sp.

Comments: *Bootanomyia mehmeti* n.sp. is similar to *almusiensis* and *emrezaferi* in having funicular segments almost filiform, F_7 at most $1.2\times$ broader than F_1 , but it differs from both of them in having ovipositor $1.6\times$ as long as gaster, $2.64\times$ as long as hind tibia (in *almusiensis* and *emrezaferi* ovipositor at most $1.5\times$ as long as gaster, and $2.47\times$ as long as hind tibia). It differs from *emrezaferi* in having the following characters: length of flagellum with pedicel $2.37\times$ as long as transverse diameter of eye (in *emrezaferi* length of flagellum with pedicel $3.64\times$ as long as transverse diameter of eye); scape $2.26\times$ as long as transverse diameter of eye (in *emrezaferi* scape $1.21\times$ as long as transverse diameter of eye); club $2.2\times$ as long as broad (in *emrezaferi* club $1.5\times$ as long as broad). It also differs from *almusiensis* in having antenna with sensilla on F_1 with 4 sensilla in 2 rows, $F_2\text{--}F_3$ with 8 sensilla in 4 rows (in *almusiensis* antenna with sensilla on F_1 with 2 in a row; $F_2\text{--}F_3$ with 1+3 sensilla in 2 rows).

***Bootanomyia nipponicus* comb.n.** (Yasumatsu and Kamijo). PALEARCTIC: Japan, Korea, People's Republic of China.

Megastigmus nipponicus Yasumatsu and Kamijo, 1979: 98–101. Holotype female, Ina, Naganoken, Japan (KU); Paratypes: 93 females, 79 males, Hokkaido, Honshu, Shikoku, Kyushu, Japan.

Description was given by Yasumatsu and Kamijo (1979).

***Bootanomyia onuri* n.sp.** -PALEARCTIC: Turkey (Figures 12a-j)

Etymology. The name is derived from the name of my grandson, Mr. Onurcan Doğanlar.

Materials studied: Holotype female, Kisecik Köyü, Antakya-Hatay, Turkey (in ICMKU). Paratypes: 1 female, 1 male, same data as holotype.

Description

Female: 3.0 mm (plus upturned ovipositor 1.4 mm). Body (Figure 12a, b) pale yellow, except vertex, between ocelli, a narrow band medially on pronotum, midlobe of mesonotum medially, and scutellum, except its extreme sides metallic green; propodeum medially, upper part of scape, dorsum of pedicel, flagellum and ovipositor sheaths black. Wings hyaline, veins brown (stigma without infumation). Pilosity of body pale.

Head (Figure 12c, d) with regular, low, raised reticulation on face, having fine transverse striation on vertex. Antenna inserted slightly above level of lower ocular line, temples rounded, about $\frac{1}{4}$ as long as dorsal length of eye. Relative measurements: head width 26, height 21, dorsal length 16, (3.2 $\times$) frons width 48/eye 15 in frontal view, OOL 10, POL 18, OOC 10, Odia 8, eye 12:10, malar space 6, TO 40, TCly 22, flagellum with pedicel 60-head 43.

Antenna slightly clavate (Figure 12i), flagellum with pedicellus 1.4 $\times$ as long as width of head and 3.6 $\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, Antenna (l:w): scape 40:8, pedicel 12:7, anellus 2: 4, F₁ 14:5, F₂ 11:6, F₃ 12:7, F₄ 10:7, F₅ 10:7, F₆ 9:8, F₇ 9:9, club 20: 9 (C₁, C₂ 7, C₃ 4). Longitudinal sensilla on flagellum sparse in first segment with 3 sensilla in one row, 2nd-4th segments

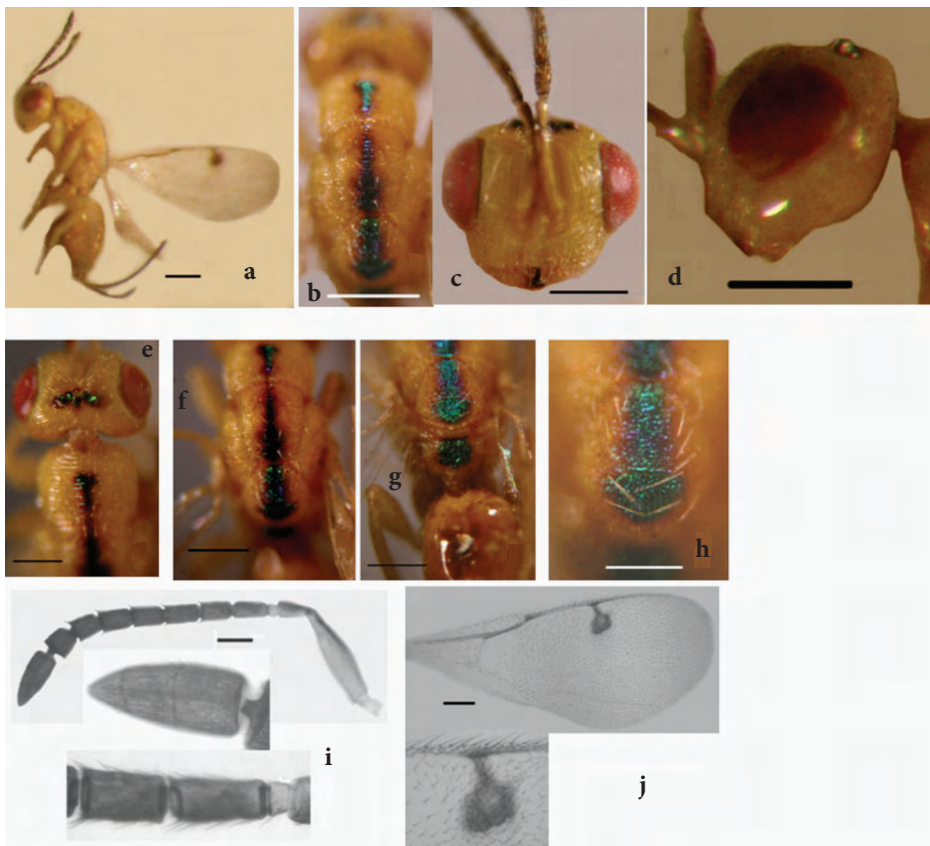


Figure 12. a-j. *Bootanomyia onuri* n.sp., female: a. body, in lateral view; b. head and mesosoma; c-d. head, c. in frontal view, d. in lateral view; e. head in dorsal view and pronotum; f. mesosoma; g. scutellum with frenum, propodeum basal part of metasoma; h. scutellum; i. antennae, basal and apical segments of flagellum; j. forewing, basal part and stigma (scale for Figure a, i, j= 0.25 mm, for the others = 0.125 mm).

with 3+4 sensilla in 2 rows and the following ones with 4+4 sensilla in 2 rows. Club slightly more than as long as 2 preceding segments combined, $2.22\times$ as long as broad, with apices of C_2 and C_3 strongly oblique; micropilosity large, extending from apex of C_3 to base of the first segment.

Mesosoma (Figure 12b) $1.96\times$ as long as mesoscutum broad, as broad as height; pronotum (Figure 12e) about $0.75\times$ as long as broad, with distinct, coarse striation, having 14 rows of setae; mesonotum (Figure 12f) about $1.4\times$ as broad as long, with fine striation, mid lobe flat with 6 rows of erect, long hairs, notauli deep; scutellum (Figure 12g, h) with the some rugosity, between rugosity with very fine reticulation, slightly broader than long, frenum distinct, frenum with some reticulations basally, apically longitudinal striation, about $0.36\times$ length of scutellum. Forewing (Figure 12j) $2.1\times$ as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 30:4, parastigma 11, marginal vein 18, postmarginal vein 22, stigmal vein 2, stigma (l:w) 4:5, uncus 1.5.

Hind wing $4\times$ as long as broad;

Propodeum (Figure 12g) $0.59\times$ as long as scutellum, $0.67\times$ as long as distance between inner edges of spiracles, deeply and regularly carinated, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 12a) about as long as $0.7\times$ mesosoma, not compressed, almost $1.75\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath a little longer than metasoma ($1.2\times$), twice as long as hind tibia.

Male: Similar to female except as follows: Mesosoma $1.87\times$ as long as mesoscutum broad, as high as broad; pronotum about $1.35\times$ as broad as length medially; frenum about $0.4\times$ length of scutellum. Stigma as long as broad.

Metasoma as long as mesosoma, compressed, almost $2.9\times$ as long as broad; with 1st segment narrow like petiole, others gradually broadening.

Host: *Neuroterus* sp. (Hym. Cynipidae) on twigs of *Quercus* sp.

Comments: *Bootanomyia onuri* is similar to *dorsalis* (complex), *hepdurgunae*, and *shebnemae* in having funicular segments gradually widening, F_7 1.75 - $2.0\times$ broader than F_1 , but it differs from them in having flagellum with longitudinal sensilla dense, on F_1 with 3 sensilla in 1 row, 2nd-4th segments with 3+4 sensilla in 2 rows, and the following ones with 4+4 sensilla in 2 rows, and ovipositor $2\times$ as long as hind tibia (in the species similar ones flagellum with longitudinal sensilla sparse, on F_1 with 1, on F_2 with 2 sensilla, and ovipositor 2.25 - $2.39\times$ as long as hind tibia).

***Bootanomyia saragoldae* n.sp.** (Figures 13a-f)

Etymology. The name is derived from the name of Mrs. Sara Gold, who helped the author when he was working in Australia.

Materials studied: Holotype female, S Ayr, Queensland, Australia, 9 September, 1950 Paratypes: 1 female, same data as holotype, 1 female, same locality as holotype, 4 September, 1950. All types are deposited in ANIC.

Description

Female: 1.6 mm (plus upturned ovipositor 1.0 mm). Body (Figure 13a) pale lemon yellow, except vertex, between ocelli, medially narrow bands on pronotum, midlobe of mesonotum, scutellum, except frenum having triangular macula, and propodeum medially triangular macula metallic green; upper part of scape apically, dorsum of pedicel pale brown, flagellum dirty yellow; ovipositor sheaths black. Wings hyaline, veins dirty yellow, stigma pale brown, without infumation. Pilosity of body pale.

Head (Figure 13b) with regular fine transverse striation on vertex. Antenna inserted at level of lower ocular line, temples narrow, about $0.23\times$ as long as dorsal length of eye. Relative measurements: head width 57, height 50, dorsal length 36, frons width 21 eye 10, OOL 7, POL 15, OOC 6, Odia 3, eye OC 10; eye 26:24, malar space 17, TO 23, TCly 14, flagellum with pedicel 58-head 57.

Antenna distinctly clavate (Figure 13e), flagellum with pedicellus almost as long as width of head and $2.23\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $4.4\times$ as long as wide. Antenna relative measurements (l:w): scape 22:5, pedicel 8:4, anellus 1.5:2.5, F_1 - F_4 4:4, F_5 3.5:4, F_6

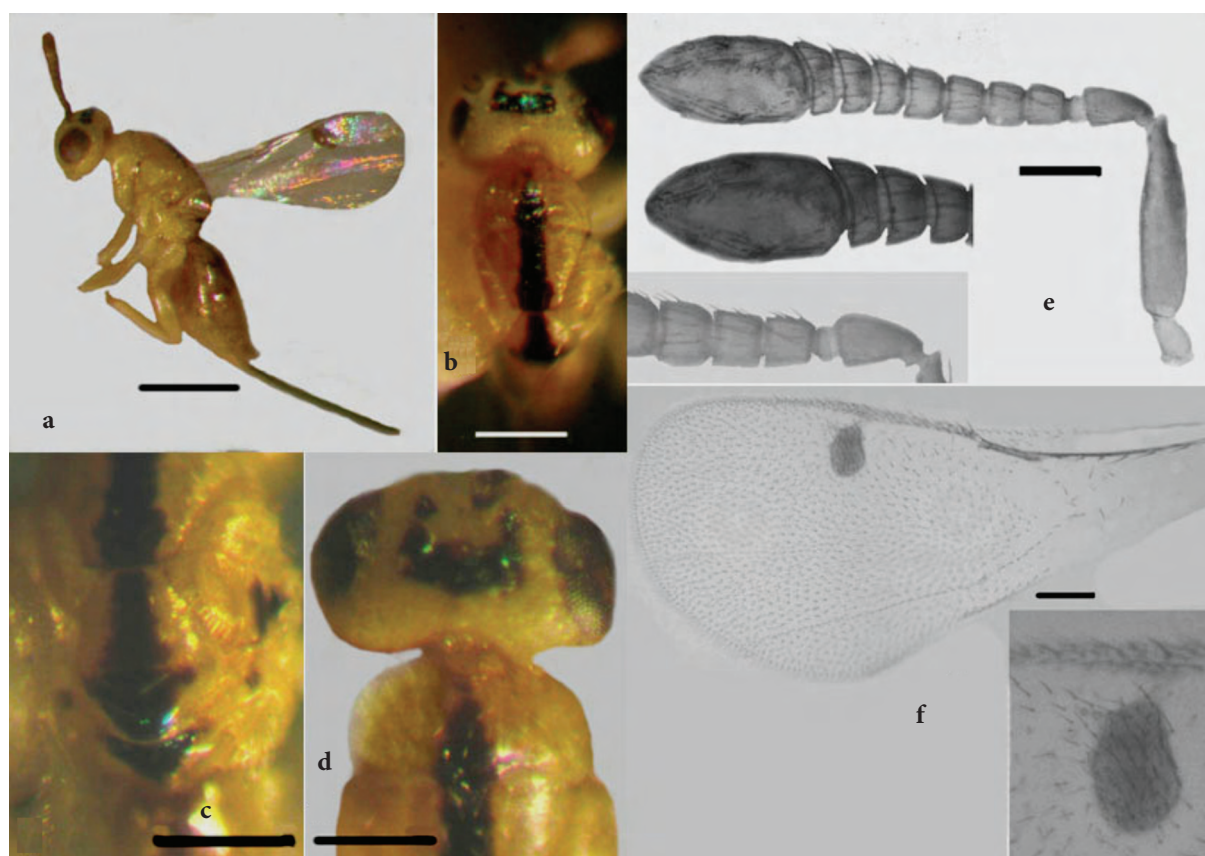


Figure 13. a-f. *Bootanomyia saragoldae* n.sp., female: a. body, in lateral view; b. head and mesosoma in dorsal view; c. scutellum and propodeum; d. head and pronotum; e. antenna, basal and apical segments of flagellum; f. forewing, and stigma (scale for Figure a, e, f = 0.25 mm, for the others = 0.125 mm).

3.5:6, F_7 3:7, club 18:10 (C_1 10, C_2 6, C_3 4). Longitudinal sensilla on flagellum rather sparse in first segment one, 2nd 3 sensilla in a row and the following ones with 4 sensilla in a row. Club as long as 5 preceding segments combined, $1.8\times$ as long as broad, with apices of C_2 and C_3 strongly oblique; micropilosity large, extending from apex of C_3 to base of the first segment.

Mesosoma (Figure 13b) with dense fine striation, $1.78\times$ as long as mesoscutum broad, slightly narrower than height (27:30); pronotum (Figure 13d) about $0.45\times$ as long as broad, having 9-11 rows of setae; mesonotum (Figure 13b) about $1.6\times$ as broad as long, with fine striation, mid lobe flat with 6 rows of fine hairs, notauli deep; scutellum (Figure 13c) with 2 pairs of setae, as broad as long, frenal groove distinct, frenum smooth, about $0.44\times$ length of scutellum. Forewing (Figure 13f) $2.24\times$ as long as broad, speculum broad, closed below, basal cell

closed with some setae. Relative measurements of forewing: costal cell 70: 4, parastigma 18, marginal vein 27; postmarginal vein 22, stigmal vein 3, stigma (l:w) 12:9, uncus 2.

Hind wing $4.56\times$ as long as broad.

Propodeum $0.38\times$ as long as scutellum, $0.75\times$ as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 13a) about as long as $0.9\times$ mesosoma, not compressed, almost $1.13\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath $1.5\times$ as long as metasoma, $2.32\times$ as long as hind tibia.

Host: unknown

Comments: *Bootanomyia saragoldae* is similar to *smaragtus* in having pronotum at most $0.55\times$ as long

as wide, thoracic pleurae pale, without metallic color, forewing hyaline below stigma and flagellum clavate, but it differs from *smaragtus* in having pronotum $0.45\times$ as long as wide (in *smaragtus* pronotum $0.55\times$ as long as wide); mesosoma medially with a narrow metallic green maculae (in *smaragtus* dorsal part of mesosoma metallic green).

***Bootanomyia shebnemae* n.sp.** (Figures 14a-i)

Etymology. The name is derived from the name of my granddaughter, Miss Şebnem Kazan.

Material studied: Holotype female, Turkey: Çamlıbel Geçidi, Tokat, 5. ii. 1993, reared from cynipid gall on *Rosa* sp., deposited in ICMKU.

Description

Female: 1.9 mm (plus upturned ovipositor 1.0 mm). Body (Figure 14a) with head lemon yellow,

other parts orange yellow except vertex with metallic green maculae (Figure 14b, c), pronotum with macula anterior half narrow and posteriorly widening, mid lobe of mesoscutum; scutellum completely, upper corners of axillae, metanotum, dorsellum and propodeum up to level of spiracles metallic green; metasoma pale brown; inner base of hind coxae dark brown, ovipositor sheaths black, but at base shortly pale. Antenna brown, except ventral sides of scape and pedicel orange yellow. Wings hyaline, veins brown, stigma with broad infumation up to middle of wing. Pilosity of body pale.

Head (Figures 14c, d) with face having distinct radiating striation up to upper part of frons and transverse striations on vertex. Antenna inserted at level of lower ocular line; Relative measurements: head width 54, height 45, dorsal length 36, frons

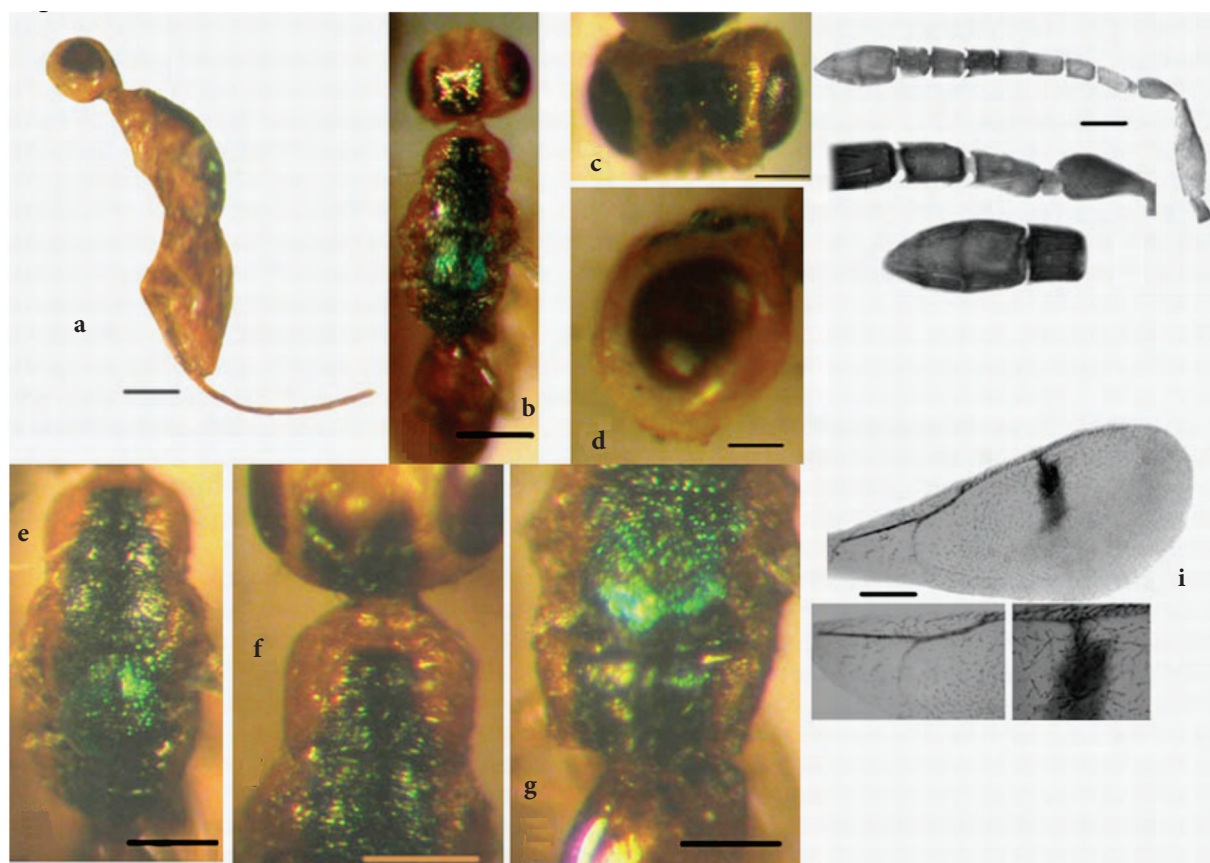


Figure 14. a-i. *Bootanomyia shebnemae* n.sp., female: a-b. body, a, in lateral view; b, in dorsal view; c-d. head, c, in frontal view, d, in lateral view; e. mesosoma in dorsal view; f. head and pronotum; g. scutellum and propodeum; h. antenna, basal and apical segments of flagellum; i. forewing, basal part and stigma (scale for Figure a, h, i = 0.25 mm, for the others = 0.125 mm).

width 33; eye frontal view 11; OOL 6, POL 14, OOC 6, Oda 4, eyeOC 11; eye 28:24, malar space 10; TO 24, TCly 16, Teye 1, flagellum with pedicel 78.

Antenna (Figure 14h) clavate, club distinctly broader than F_1 ; flagellum with pedicel $1.44\times$ as long as width of head and $3.25\times$ transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, $3.67\times$ as long as broad, and slightly shorter than transverse diameter of eye (44:48). Relative measurements of antenna (l:w): scape 44:12, pedicel 18:10, anellus 4:6, F_1 16:8; F_2 12:8; F_3 - F_4 12:10; F_5 12:11; F_6 12:13; F_7 10:14, club 32:18 (C_1 16, C_2 8, C_3 8). Sensilla on flagellum long, F_1 with 1; F_2 2, F_3 3, F_4 4, F_5 - F_7 with 5 sensilla in a row. Club almost as long as 3 preceding segments combined, $3.67\times$ as long as broad.

Mesosoma (Figure 14e) $1.88\times$ as long as mesoscutum broad, slightly broader than height; pronotum (Figure 14f) about $1.46\times$ as broad as long, with distinct, coarse striation, having 12 rows of transverse striae; mesonotum about $2.08\times$ as broad as long, with fine, transverse long reticulation, 6 longitudinal rows of erect, long hairs, notauli deep; scutellum (Figure 14g) as long as broad, with fine circular reticulation in 2/3 basal part, frenum with longitudinal reticulation, about $0.33\times$ length of scutellum, scutellum with 6 setae, 2 of them in frenum, on each side. Forewing (Figure 14i) $2.52\times$ as long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 70:7; parastigma 25, marginal vein 37, postmarginal vein 40, stigmal vein 5, stigma (l:w) 12:9, uncus 3.

Hind wing $4.75\times$ as long as broad.

Propodeum (Figure 14g) $0.63\times$ as long as scutellum, $0.79\times$ as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina distinct, finely reticulated between spiracles, the latter separated by their own length from posterior margin of metanotum.

Metasoma (Figure 14a) as long as mesosoma, not compressed, $2.25\times$ as long as broad, its dorsal surface smooth. Ovipositor sheath $1.25\times$ as long as metasoma, $2.26\times$ as long as hind tibia.

Host: reared from cynipid gall on *Rosa* sp.

Comments: *Bootanomyia shebnemae* is similar to *dorsalis* (complex) and *hepdurgunae* in having antenna with longitudinal sensilla sparse, on F_1 with 1, on F_2 with 2 sensilla and ovipositor 2.25 - $2.39\times$ as long as hind tibia, but it differs from *dorsalis* (complex) in having frons at least $3\times$ as broad as width of eye in frontal view (in *dorsalis* frons at most $2.58\times$ as broad as width of eye in frontal view). It also differs from *hepdurgunae* in having ovipositor $1.25\times$ as long as gaster (in *hepdurgunae* ovipositor $1.46\times$ as long as gaster); in dorsal view temple $0.25\times$ length of eye (in *hepdurgunae* in dorsal view temple $0.36\times$ length of eye); postmarginal vein $1.08\times$ marginal vein (in *hepdurgunae* postmarginal vein $1.25\times$ marginal vein), and some characters stated in the key.

Bootanomyia smaragdus (Girault). AUSTRALIAN: Australia, Queensland (Figures 15a-f)

Megastigmus (*Bootanomyia*) *smaragdus* Girault, 1915 (243):304. Holotype female, Roma, Queensland, October 6, 1911. Type, Hy 3341. (Queensland Museum, examined).

Material studied: Card mounted, Holotype female, minus head and right forewing. "*Bootanomyia* (= *Bootanomyia*) *smaragdus* Gir., Type Female (GH)"; Slide: 4 coverslip fragments with excess medium containing the head (1 antenna separated) and 1 forewing all from the holotype female of *Bootanomyia smaragdus*. Type, Hy/3341, A.A. Girault".

Redescription

Female: (Holotype without head, antenna and legs), length 1.8 mm + upturned ovipositor 1.2 mm. Body (Figure 15a, b) orange yellow, excepts pronotum with semicircular macula on posterior half medially, mid lobe of mesonotum, scutellum, metanotum, dorsellum medially and propodeum metallic blue, metasoma in anterior half dorsally brown, ovipositor black, basally pale. Body setae yellow.

Mesosoma (Figure 15b, d) $1.86\times$ as long as broad; pronotum (Figure 15c) $1.8\times$ as wide as long, with 6 rows of setae; mesonotum (Figure 15c, d) $0.63\times$ as long as wide, with fine dense transverse striations, with 6 rows of setae; scutellum (Figure 15e) transversely striated like mesoscutum, $1.1\times$ longer than wide, with 5 pairs of setae (3+2), with transverse dense striations, frenum smooth, $0.32\times$ as long as scutellum, without setae. Relative measurements

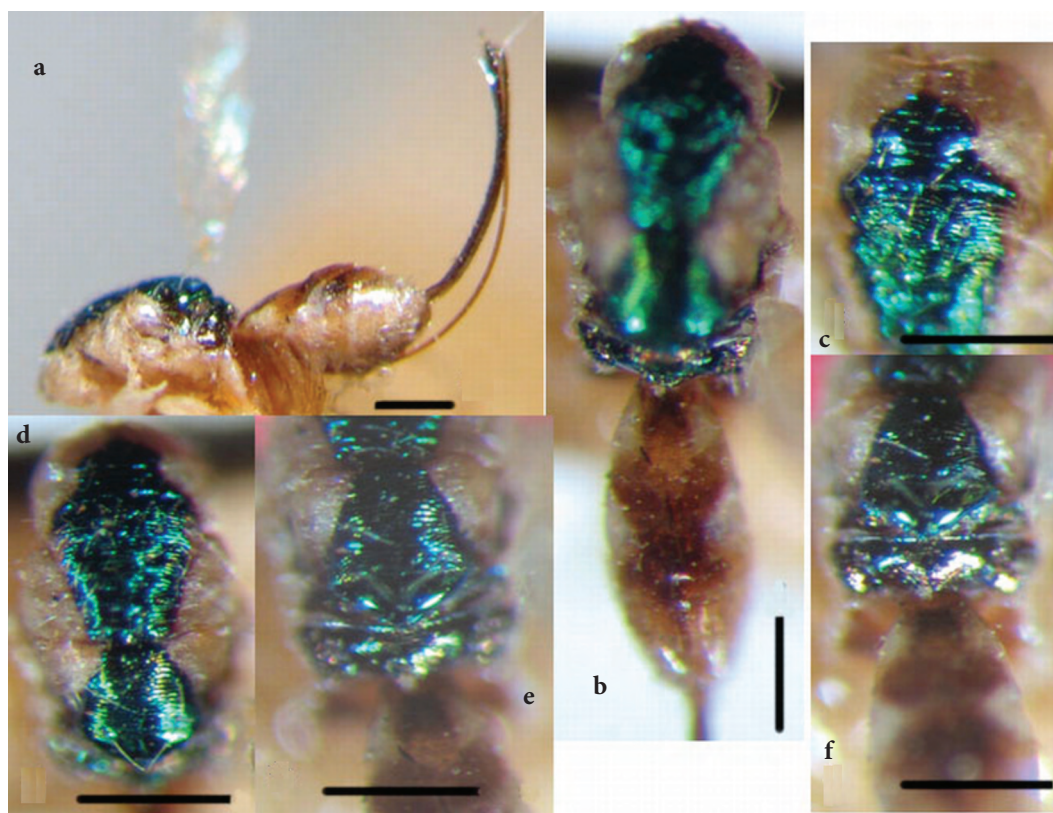


Figure 15. a-f. *Bootanomyia smaragdus* (Girault), female: a-b. body, a, in lateral view; b. in dorsal view; c. pronotum and anterior part of mesoscutum in dorsal view; d. mesoscutum and scutellum; e. scutellum and propodeum; f. frenum, propodeum and basal part of metasoma (scale for Figure a = 0.25 mm, for the others = 0.125 mm).

(l/w): pronotum: 15/27; mesonotum: 22/35; scutellum: 22/20; frenum: 7 other part of scutellum 15; gaster: 50; ovipositor: 70)

Propodeum (Figure 15f) 0.35× as long as scutellum, 2.8× as long as distance between inner edges of spiracles, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 15a, b) about 0.9× as long as mesosoma, not compressed, almost twice as long as broad, its dorsal surface smooth. Ovipositor sheath 1.4× as long as metasoma.

Host: unknown.

Comments: *Bootanomyia smaragdus* is similar to *synophry* and *saragoldae* in having frenum smooth, but it differs from *synophry* in having (in *synophry* pronotum 0.7× as long as wide); thoracic pleurae

pale, without metallic color (in *synophry* thoracic pleurae partly metallic colored); forewing hyaline below stigma and flagellum clavate (in *synophry* forewing medially with a brownish cloud below stigma and flagellum filiform). The differences between *smaragdus* and *saragoldae* were given before.

***Bootanomyia stigmatizans* (Fabricius) comb.n.**
PALEARCTIC: Europe. (Figures 16a-o)

Ichneumon stigmatizans Fabricius, 1798 (212-213): 230. Female, France (? MNHN, Bosc Collection). The data, such as synonyms, taxonomy, host, biology and morphology, were given by Grissel (1999).

Material studied: Turkey: 11 males, 6 females, Aydoğdu, Artova, Tokat, 28.i.1990, lab. reared from cynipid galls on leaves of *Quercus* sp., M. Doğanlar & H. Çam; 1 female, Bebekderesi, Artova, Tokat, 23.i. 1991, lab. reared from cynipid galls on leaves of *Quercus* sp., M. Doğanlar, deposited in ICMKU, Agriculture Faculty, Antakya-Hatay.

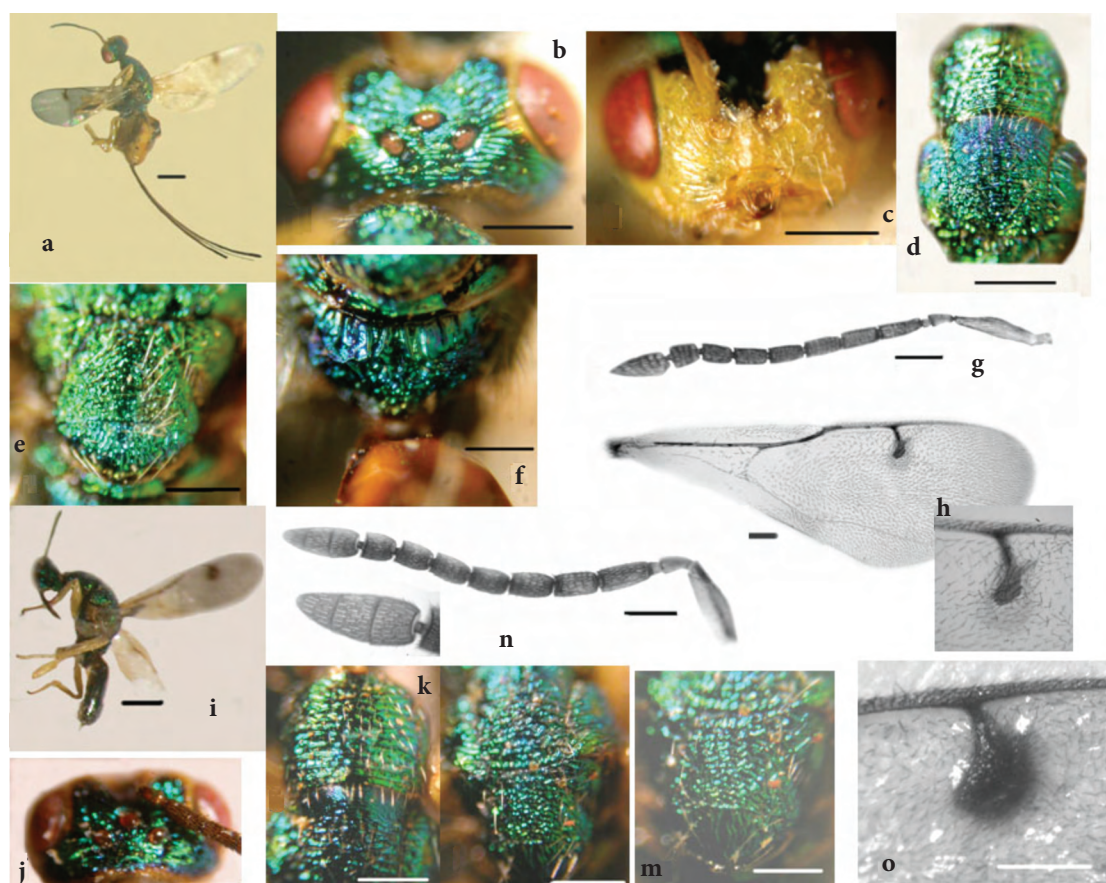


Figure 16. a-o. *Bootanomyia stigmatizans* (Fabricius): a-h. female: a. body, in lateral view; b- c. head, b. in dorsal view, c. in frontal view; d. pronotum and mesoscutum; e. scutellum with frenal line; f. propodeum and anterior part of metasoma; g. antennae; h. forewing and stigma; i-o. male: i. body, in lateral view; j. body, in dorsal view; k. pronotum; l. mesoscutum and basal half of scutellum; m. scutellum; n. antennae and club; o. forewing stigma (scale for Figure a, g-i, n = 0.25 mm, for the others = 0.125 mm).

Redescription

Female: 5.5-7.2 mm (plus upturned ovipositor 6.8 mm). Body (Figure 16a) lemon yellow, except vertex, pronotum dorsally, mid lobe and inner edges of side lobes of mesonotum, scutellum, upper edges of axillae, dorsellum medially, median part of pronotum up to callus metallic green, metasoma dorsally orange yellow except median narrow band reddish brown, ovipositor sheaths black. Wings hyaline, veins brown, stigma surrounded by infumation, antennae with scape and pedicel orange yellow, flagellum brown. Pilosity of body pale.

Head (Figure 16b, c) with lower face regular striations, having fine transverse striation on vertex. Antenna inserted at level of lower ocular line, temples

rounded, about 0.4× as long as dorsal length of eye. Relative measurements: head width 44, height 32, dorsal length 25, frons width 26 eye frontal 10; OOL 10, POL 12, OOC 10, eyeOC 16; Odia 6, eye 20:14, malar space 8, TO 15, TCly 10, flagellum with pedicel 66.

Antenna filiform (Figure 16g), flagellum with pedicellus 1.5× as long as width of head and 4.7× transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical. Relative measurements of antenna (l:w): scape 28:6, pedicel 7:4, anellus 2:3, F₁ 15:6, F₂ 13:6, F₃ 12:6, F₄-F₅ 10:6, F₆ 10:6, F₇ 8:6, club 17:6 (C₁ 7, C₂ 5, C₃ 5). Longitudinal sensilla on flagellum small, dense with 3-4 rows. Club slightly less than as long as 2 preceding segments combined, 2.8× as long as broad.

Mesosoma 1.7× as long as mesoscutum broad, as broad as height; pronotum (Figure 16d) about 0.74× as long as broad, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum (Figure 16d) about 1.8× as broad as long, with strong striations, with 10 rows of erect, long hairs, notauli deep; scutellum (Figure 16e) with rugosity in 2/3 basal part, as long as broad, with 8 pairs of setae, frenal groove distinct, frenum with longitudinal striae, about 0.35× length of scutellum. Forewing (Figure 16h) 2.8× as long as broad, speculum narrow, closed below, basal cell closed, with some setae. Relative measurements of forewing: costal cell 66:5, parastigma 18, marginal vein 20, postmarginal vein 27, stigmal vein 4, stigma (l:w) 5:3.5, uncus 2.

Hind wing 4.1× as long as broad.

Propodeum (Figure 16f) 0.6× as long as scutellum, 0.72× as long as distance between spiracles, deeply and regularly carinated, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 16a) about as long as 0.9× mesosoma, not compressed, almost 2.8× as long as broad, its dorsal surface smooth. Ovipositor sheath 2.72× longer than metasoma, almost 4.5× as long as hind tibia.

Male: length 4.2 mm. Similar to female except as follows: body (Figure 16i) with head (Figure 16j) dorsum of pronotum, mesonotum, dorsellum and metanotum metallic green, except hind coxae black with dorsal pale band; metasoma dorsally black, except base brown;

Antenna filiform (Figure 16n), flagellum with pedicellus 4× transverse diameter of eye. Relative measurements of antenna (l:w): scape 17:6, pedicel 5:3.5, anellus 1.5: 2.5, F_1 10:4.2, F_2 8:4.2, F_3 8:4.2, F_4 7:4.2; F_5 7:5, F_6 6:5, F_7 5:5, club 15:5 (C_1 5, C_2 5, C_3 5). Longitudinal sensilla on flagellum small, dense F_1 - F_5 with 6-7 rows; F_6 - F_7 with 4 rows. Club as long as 2 ½ preceding segments combined, 3× as long as broad.

Mesosoma almost twice as long as mesoscutum broad, pronotum (Figure 16k) about 0.8× as long as broad; mesoscutum (Figure 16l) with fine rugae; scutellum (Figure 16m) with transverse reticulation. Forewing 2.44× as long as broad, stigmal vein 4, stigma (Figure 16o) (l:w) 4:5.5,

Metasoma (Figure 16i) about as long as 0.8× mesosoma, almost 2.15× as long as broad.

Host: Cynipid galls on leaves of *Quercus* sp.

Comments: *Bootanomyia stigmatizans* is a distinct species in the genus in having ovipositor longer than body. The ovipositors of other species are at most as long as the body.

Bootanomyia synophry (Mayr) **comb.n.**
PALEARCTIC: Austria (17a-j).

Megastigmus synophry Mayr, 1874: 129-130. Female and male paratypes, designated by Zerova (NHMW). Lectotype designated and redescribed by Stojanova (2007).

Material studied: Paratypes: 1 female, 1 male, Vienna, Austria in NHMV.

Redescription

Female: 5.0 mm (plus upturned ovipositor 2.5 mm). Body (Figure 17a) dark bluish green, except head without vertex, pronotum without medially and lateral metallic bands, dorsellum and metanotum, tegulae, mesopleura below base of wings and antennae orange yellow, legs except hind femora yellow; metasoma brown except base and apical parts reddish brown, ovipositor sheaths black. Wings hyaline, veins brown (stigma with infumation). Pilosity of body pale.

Head (Figure 17b, c) with regular, low, raised reticulation on face, having fine transverse striation on vertex. Antenna inserted slightly above level of lower ocular line, temples rounded, about ½ as long as dorsal length of eye. Relative measurements: head width 40, height 32, dorsal length 25, frons width 25; OOL 6, POL 10, OOcc 6, Oda 3, eye 20:15, malar space 9, TO 14, TCly 17-3, flagellum with pedicel 58-head 40.

Antenna (Figure 17c) almost filiform, flagellum with pedicel 1.45× as long as width of head and 3.86× transverse diameter of eye. Scape not reaching the front ocellus, nearly cylindrical, Antenna (l:w): scape 14:3, pedicel 4:2, anellus 1:2, F_1 8:3, F_2 7:3, F_3 7:3, F_4 7:3, F_5 6:3, F_6 5:3, F_7 5:3, club 9:4 (C_1 4, C_2 3, C_3 2). Longitudinal sensilla on flagellum small, dense with 3-4 rows. Club slightly less than as long as 2 preceding segments combined, 2.25× as long as broad.

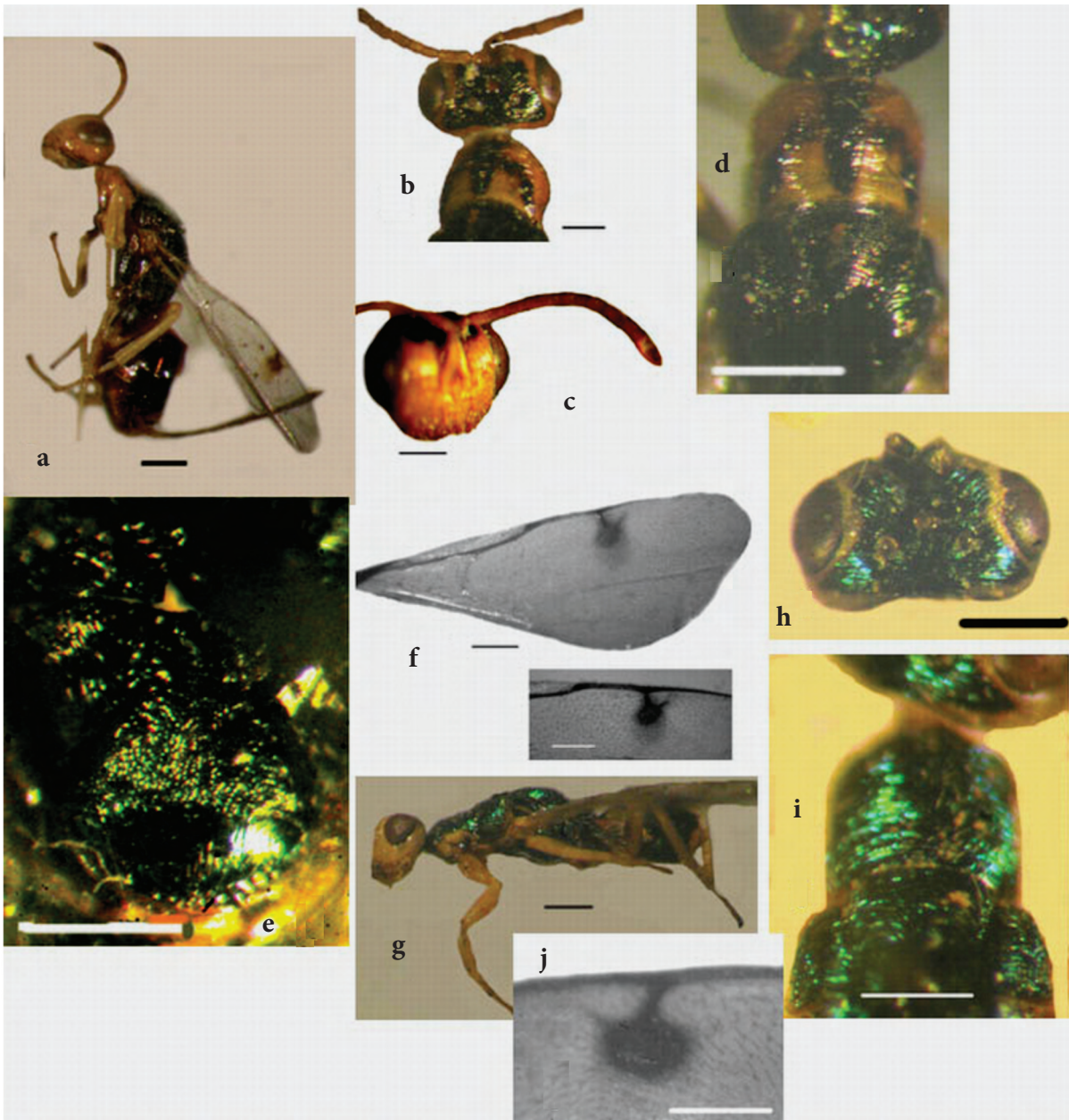


Figure 17. a-i. *Bootanomyia stigmatizans* (Fabricius): a-f. female: a. body, in lateral view; b- c. head, b. in dorsal view, c. in frontal view; d. pronotum and mesoscutum; e. scutellum with frenum; f. forewing and stigma; g-j. male, g. body, in lateral view; h. head, in dorsal view; i. pronotum; j. forewing stigma (scale for Figure a, f, g = 0.25 mm, for the others = 0.125 mm).

Mesosoma 1.9× as long as mesoscutum broad, as broad as height; pronotum (Figure 17d) about 0.7× as long as broad, with distinct, coarse striation, having 14 rows of transverse striae; mesonotum (Figure 17d) about 1.6× as broad as long, with strong striation between them with fine reticulations, mid lobe flat

with 6 rows of erect, long hairs, notauli deep; scutellum (Figure 17e) with very fine reticulation in 2/3 basal part, slightly longer than broad, frenal groove distinct, frenum almost smooth, with very fine longitudinal striation, about 0.32× length of scutellum, scutellum with 6 rows of setae; Forewing (Figure 17f) 2.46× as

long as broad, speculum narrow, closed below, basal cell closed with some setae. Relative measurements of forewing: costal cell 56:5, parastigma 18, marginal vein 20, postmarginal vein 30, stigmal vein 4, stigma (l:w) 6:7, uncus 3.

Hind wing 3.6× as long as broad. Dorsellum 2:10.

Propodeum 0.56× as long as scutellum, 0.54× as long as distance between inner edges of spiracles, deeply and regularly carinated, with arched transverse keel at basal one-third, median carina absent, spiracles separated by their own length from posterior margin of metanotum.

Metasoma (Figure 17a) about as long as 0.9× mesosoma, not compressed, almost 1.57× as long as broad, its dorsal surface smooth. Ovipositor sheath 1.4× longer than metasoma, almost twice as long as hind tibia.

Male: length 4.3 mm. Similar to female except as follows: body (Figure 17g) with head (Figure 17h) dorsally and mesosoma metallic green, except sides of pronotum (Figure 17i) and legs yellow, except coxae concolorous with body; forewing with stigma (Figure 17j) broader than long; metasoma ventrally orange yellow; flagellar segments longer than in females.

Host: *Synophrus* sp. (Hym. Cynipidae) on leaves of *Quercus* sp.

Comments: *Bootanomyia synophry* is similar to *smaragdus* and *saragoldae* in having ovipositor at least 1.4× as long as metasoma and axillae with upper part pale, but it differs from both of them in having pronotum 0.7× as long as broad (in the both species pronotum at most 0.55× as long as broad).

Bootanomyia viridiscutellum (Girault). AUSTRALIAN: Australia, Queensland (Figures 18a-f)

Megastigmus (*Bootanomyia*) *viridiscutellum* Girault, 1915(243):304. Holotype female, Gordonvale, Queensland, August 9, 1912, Hy 3343, the female on a tag, the head on a slide (QM, examined).

Material studied: Card mounted, Holotype female, minus head and metasoma "*Bootanomyia* (= *Bootanomyia*) *viridiscutellum* Gir., Type female (GH)". Slide: complete coverslip containing the holotype head in 3 pieces (1 antenna separated)." TYPE, Hy/3343, A.A. Girault", "Q. Museum. 5005".

Redescription: (Holotype without head, gaster and legs), length 1.65 mm (Girault 1915). Mesosoma 0.7 mm. Body orange yellow, excepts pronotum with a median macula posterior half of which wider than anterior part, mid lobe of mesonotum, except anterior corner, scutellum and propodeum in anterior half medially metallic blue. Gaster with 2 metallic green cross-stripes (Girault 1915). Body setae short, yellow.

Mesosoma twice as long as broad; pronotum (Figure 18a) 1.9× as wide as long, with 4 rows of setae; mesonotum (Figure 18b) with transverse, fine striations, with 4 rows of setae; 0.7× as long as wide; scutellum (Figure 18c, d) transversely finely striated, 1.1× longer than wide, with 4 pairs of setae, frenum smooth, 0.4× as long as scutellum, without setae. Forewing (Figure 18e) with basal cell closed having 6 strong long setae, stigmal vein (Figure 18f) short, stigma 1.4× as long as wide. Relative measurements (l/w): pronotum: 12/23; mesonotum: 20/29; scutellum: 18/15; frenum: 7; other part of scutellum 11; gaster: 50; ovipositor: 55.

Propodeum 0.4× as long as scutellum, 0.33× as long as distance between inner edges of spiracles, without arched transverse keel; median carina absent, propodeum medially transversely reticulated; spiracles separated by their own length from posterior margin of metanotum.

Metasoma sessile, about 0.86× as long as mesosoma, not compressed, almost 2.4× as long as broad, its dorsal surface smooth. Ovipositor sheath 1.1× as long as metasoma (Girault 1915).

Host: unknown

Comments: *Bootanomyia viridiscutellum* is similar to *dumicola* in having ovipositor shorter or at most only slightly longer than gaster (1.1×), but it differs from *dumicola* in having sessile gaster (in *dumicola* gaster distinctly petiolate).

Bootanomyia zhaoi (Xu & He) **comb.n.** PALEARCTIC: People's Republic of China, Fuji.

Megastigmus zhaoi Xu & He, 2003: 475-476, 480. Holotype female, Fuji, People's Republic of China, (ZAUC) (Noyes 2008).

Not known to me. The species was compared with *Megastigmus viridescens* Kamijo by Xu and He (2003) on page 480 (Noyes 2008).

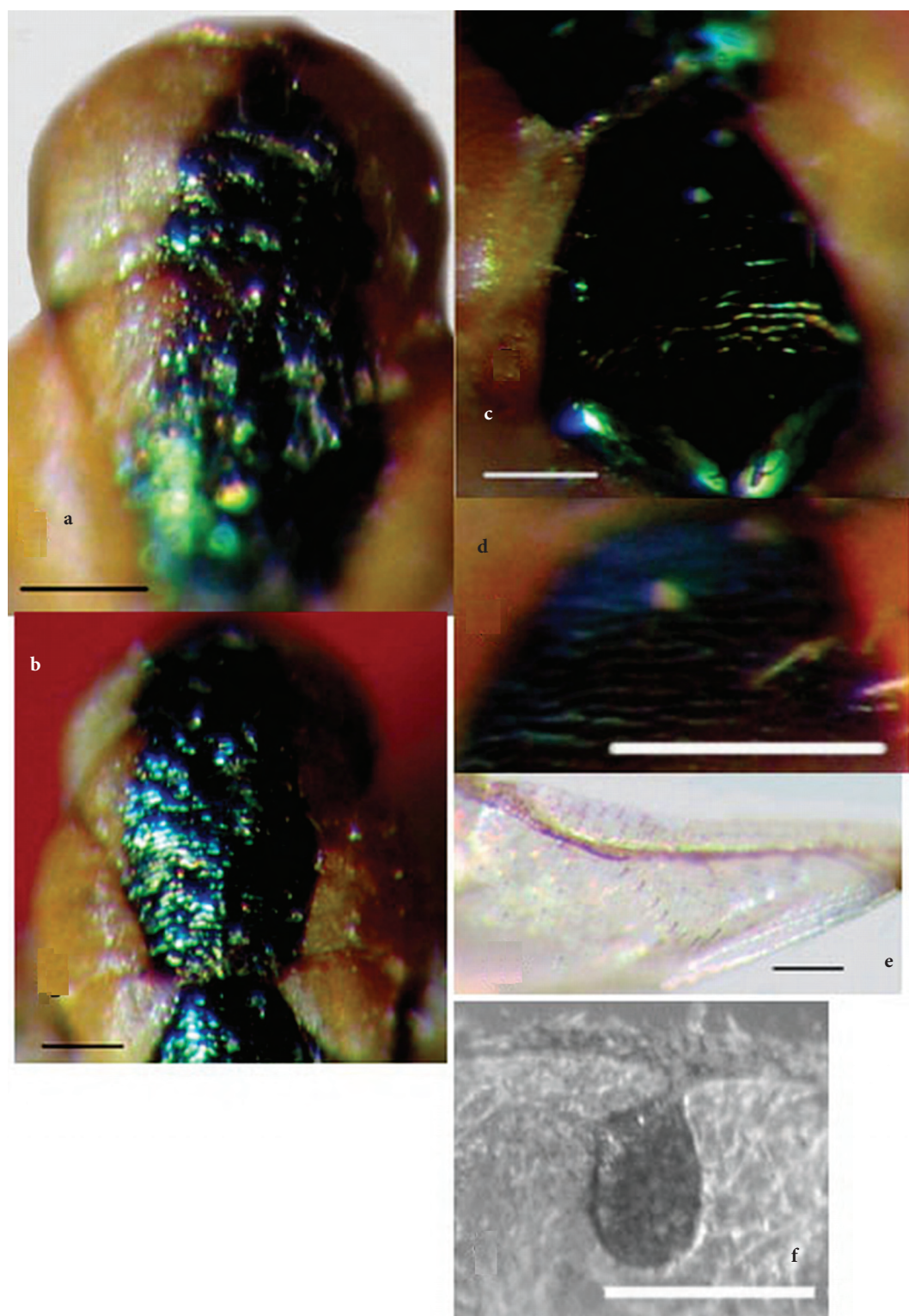


Figure 18. a-f. *Bothanomyia viridiscutellum* (Girault), female: a. pronotum and anterior of mesoscutum; b. mesoscutum, c. scutellum with frenum; d. sculpture of scutellum; e. basal part of forewing; f. forewing stigma (scale for Figure e = 0.25 mm, for the others = 0.125 mm).

KEY TO THE SPECIES OF *BOOTANOMYIA* GIRAULT 1915

- 1- Ovipositor longer than body; forewing stigma elongate at least 1.4-2× as long as wide; F_1 distinctly longer than pedicel plus anellus combined; sensilla very short, numerous, about one-sixth length of first funicle segment; mesoscutum and scutellum finely sculptured; hairs on the lower face and thoracic dorsum pale.....
.....*stigmatizans* (Fabricius 1798)
- 1'- Ovipositor at most as long as body, the other characteristics variable.....2
- 2(1')- Ovipositor as long as body; funicular segments at least twice longer than wide; 1st funicular segment over 3 times longer than wide, twice longer than pedicel, 2nd funicular segment over twice longer than wide, 7th nearly twice longer than wide.....
.....*gemma* Girault 1928.
- 2'- Ovipositor at most as long as mesosoma and metasoma together; funicular segments at most 1.5× longer than wide.....3
- 3(2')- Ovipositor shorter or at most only slightly longer than gaster (1.1×).....4
- 3'- Ovipositor distinctly longer than gaster (at least 1.2×).....5
- 4(3)- Gaster almost sessile; body lemon yellow, pronotum metallic green medially; mesoscutum medially between notauli metallic green, except anterior corners; forewing with a broad speculum.....
.....*viridiscutellum* Girault 1915
- 4'- Gaster petiolate; body red brown, pronotum pale, mesonotum with anterior half, base of scutellum and posterior half of propodeum dark green to violet gloss; forewing with speculum reduced, almost null.....
.....*dumicola* Boucek 1982
- 5(3')- Ovipositor only slightly shorter than mesosoma and metasoma combined.....6
- 5'- Ovipositor at most 1.6× as long as gaster8
- 6(5)- Hairs on thorax black; flagellum 1.1× as long as width of head; scutellum 1.2× as long as wide.....*habui* Kamijo 1962
- 6'- Hairs on thorax pale; flagellum at least 1.25× as long as width of head; scutellum as long as wide.....7
- 7(6')- Head in dorsal view 1.6× as broad as long; F_1 slightly longer than F_7 ; sensilla sparse and disposed in 1 row on each funicle segment in smaller specimens, becoming 2 rows on basal segments in larger specimens; club a little longer than 2 preceding segments combined; scutum with some rugosities; propodeum 0.66× as long as scutellum.....
.....*nipponicus* Yasumatsu and Kamijo 1979
- 7'- Head in dorsal view 1.2× as broad as long; F_1 1.75× as long as F_7 ; sensilla on flagellum long, F_1 with 2+3, F_2 - F_7 with 4+3 sensilla in 2 rows; club as long as 3 preceding segments combined; scutum with 11 striae, between them with some coarse reticulation; propodeum 0.5× as long as scutellum.....
.....*balikesirensis* n.sp.
- 8(5')- Frenum with longitudinal rugae.....9
- 8'- Frenum smooth;.....18
- 9(8)- Thoracic pleura metallic green; mesonotum and scutellum coarsely and strongly sculptured.....10
- 9'- Thoracic pleura pale yellow; mesonotum and scutellum finely sculptured.....11
- 10(9)- Scutellum as long as wide; propodeum short, about 0.75× as long as distance between inner edge of spiracles; median carina present anteriorly; sensilla sparse and disposed in 1 row on each funicle segment in smaller specimens, becoming 2 rows on basal segments in larger specimens.....
... *maculipennis* Yasumatsu and Kamijo 1979
- 10'- Scutellum 1.22× as long as wide; propodeum long, almost as long as distance between inner edge of spiracles; median carina absent; sensilla sparse and disposed in 2 rows on proximal funicla segments, showing tendency to form a single row on distal segments.....
.....*viridescens* Kamijo 1962
- 10''- near *viridescens*.....*zhaoui* Xu & He, 2003
- 11(9')- Funicular segments almost filiform, F_7 at most 1.2× broader than F_112

- 11'-- Funicular segments gradually widening, F_7 1.75-2.0× broader than F_1 14
- 12(11)-Ovipositor 1.6× as long as gaster, 2.64× as long as hind tibia; scape 3.6× as long as broad; forewing 2.5× as long as broad; frenum 0.25× as long as scutellum; Sensilla on flagellum long, F_1 with 4 sensilla in 2 rows*mehmeti* n.sp.
- 12'- Ovipositor at most 1.5× as long as gaster, and 2.47× as long as hind tibia, the other characteristics variable13
- 13(12')-Club 2.5× as long as broad, with micropilosity in a narrow area starting from apical half of C_1 ; in dorsal view head 1.65× as broad as long; temple 0.39× length of eye; length of head 1.52× shortest length of vertex; OOC 1.08× POL; scutum with circular broad reticulation; Sensilla on flagellum long, F_1 with 5 sensilla in 3 rows, F_2 with 8 sensilla in 4 rows.....*emrezaferi* n.sp.
- 13'- Club 3× as long as broad; with a broad micropilosity starting from base C_1 ; in dorsal view head 1.45× as broad as long; temple 0.28× length of eye; length of head 1.82× shortest length of vertex; OOC 0.72× POL; scutum with transverse long fine reticulation; Sensilla on flagellum long, F_1 with 2 in a row; F_2 - F_3 with 1+3, F_4 - F_7 with 2+3 sensilla in 2 rows..... *almusiensis* Doğanlar 1989
- 14(11')-Longitudinal sensilla dense, on F_1 with 3 sensillae in 1 row, 2nd-4th segments with 3+4 sensilla in 2 rows, and the following ones with 4+4 sensilla in 2 rows; ovipositor 2× as long as hind tibia..... *onuri* n.sp.
- 14'- Longitudinal sensilla sparse, on F_1 with 1, on F_2 with 2 sensilla; ovipositor 2.25-2.39× as long as hind tibia.....15
- 15(14')-Frons at least 3× as broad as width of eye in frontal view16
- 15'- Frons at most 2.58× as broad as width of eye in frontal view17
- 16(15)- Ovipositor 1.46× as long as gaster, and 2.33× as long as hind tibia; in dorsal view temple 0.36× length of eye; postmarginal vein 1.25× marginal vein; stigma almost as long as broad (11:10); frenum 0.25× as long as scutellum; Sensilla on flagellum long, F_1 - F_3 with 1 sensillum, F_4 with 2, F_5 - F_7 with 3 sensilla in a row *hepdurgunae* n.sp.
- 16'- Ovipositor 1.25× as long as gaster, and 2.26× as long as hind tibia; in dorsal view temple 0.25× length of eye; postmarginal vein 1.08× marginal vein; stigma distinctly longer than broad (12:9); frenum 0.33× as long as scutellum; Sensilla on flagellum long, F_1 with 1; F_2 2, F_3 3, F_4 4, F_5 - F_7 with 5 sensilla in a row*shebnemae* n.sp.
- 17(15')-Forewing stigma with a narrow surrounding infumation; mesosoma at most 1.67× as long as broad; OOC 0.72 POL; mesoscutum and scutellum rugose; temple 0.36× length of eye in dorsal view; length of head 1.54× least length of vertex; Sensilla on flagellum long, F_1 - F_2 with 3 sensilla, F_3 - F_4 with 4; F_5 with 6; F_6 - F_7 with 7 sensilla in a row *bohemanii* Ratzeburg, 1848
- 17'-- Forewing stigma with broad infumation continuing to middle of wing; mesosoma at least 1.79× as long as broad; OOC 0.61 POL; mesoscutum 16 striae, scutellum finely reticulate, or scutum with anteriorly 8 sparse striae between them with reticulation posteriorly with dense fine striae, scutellum transversely rugose; temple 0.43× length of eye in dorsal view; length of head 1.8× shortest length of vertex at middle; Sensilla on flagellum long, F_1 and F_2 with 1 sensillum, F_3 and F_4 with 3-4 sensilla, F_5 - F_7 with 4-5 sensilla in a row..... *dorsalis* (Fabricius, 1798)
- 18(8')- Mesosoma with a gap between mid lobe of mesonotum and scutellum; ovipositor at most 1.33× as long as metasoma; pronotum 0.76× as long as broad; axillae with upper part metallic green*guttatipennis* Girault, 1937
- 18'- Mesosoma without a gap between mid lobe of mesonotum and scutellum; ovipositor at least 1.4× as long as metasoma; pronotum at most 0.7× as long as broad; axillae with upper part pale.....19
- 19(18)- Pronotum 0.7× as long as wide; thoracic pleurae partly metallic colored; forewing medially with a brownish cloud below stigma; flagellum filiform *synophri* Mayr 1874

- 19'- Pronotum at most 0.55× as long as wide; thoracic pleurae pale, without metallic color; forewing hyaline below stigma; flagellum clavate20
- 20(19)- Pronotum 0.55× as long as wide; posterior half of pronotum, midlobe of mesoscutum, scutellum, metanotum and dorsellum, propodeum metallic green; ovipositor 1.4× as long as metasoma
.....*smaragdus* Girault 1915
- 20'- Pronotum 0.45× as long as wide; mesosoma medially with a narrow metallic green maculae; ovipositor 1.5× as long as metasoma*saragoldae* n.sp.

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