

## THE GENUS *EUPELMUS* DALMAN, 1820 (HYMENOPTERA, CHALCIDOIDEA, EUPELMIDAE) IN PENINSULAR SPAIN AND THE CANARY ISLANDS, WITH TAXONOMIC NOTES AND DESCRIPTIONS OF NEW SPECIES

R. R. Askew (\*) and J. L. Nieves-Aldrey (\*\*)

### ABSTRACT

The occurrence of twenty-six species of *Eupelmus* Dalman in peninsular Spain and the Canary Islands is reported. Eleven species are newly recorded for Spain. Taxonomic, distributional and biological data are given. Two new species and one new subspecies are described. *Eupelmus matranus* Erdos is removed from synonymy under *E. splendens* Giraud and accorded specific rank; *E. valentinus* Bolívar is newly synonymized under *E. testaceiventris* (Motschulsky) and *E. capillaris* Bolívar under *E. fuscipennis* Forster. A key to females is provided.

**Key words:** Hymenoptera, Chalcidoidea, Eupelmidae, *Eupelmus*, *Macroneura*, Spain, Canary Islands, new species, key.

### RESUMEN

**El género *Eupelmus* Dalman, 1820 (Hymenoptera, Chalcidoidea, Eupelmidae) en España peninsular e islas Canarias, con notas taxonómicas y descripción de especies nuevas**

Se citan 26 especies de *Eupelmus* Dalman de España peninsular e Islas Canarias, 11 de las cuales se citan por primera vez en España. Se describen dos especies y una subespecie nuevas para la ciencia y se aportan nuevos datos taxonómicos, de biología y de distribución de todas las especies listadas. *Eupelmus matranus* Erdos se rehabilita de sinonimia con *E. splendens* Giraud, otorgándole rango específico válido. *Eupelmus valentinus* se sinonimiza de nuevo con *E. testaceiventris* (Motschulsky) y *E. capillaris* Bolívar con *E. fuscipennis* Forster. Se incluye una clave de identificación de las especies basada en las hembras.

**Palabras clave:** Hymenoptera, Chalcidoidea, Eupelmidae, *Eupelmus*, *Macroneura*, España, Islas Canarias, especies nuevas, clave de identificación.

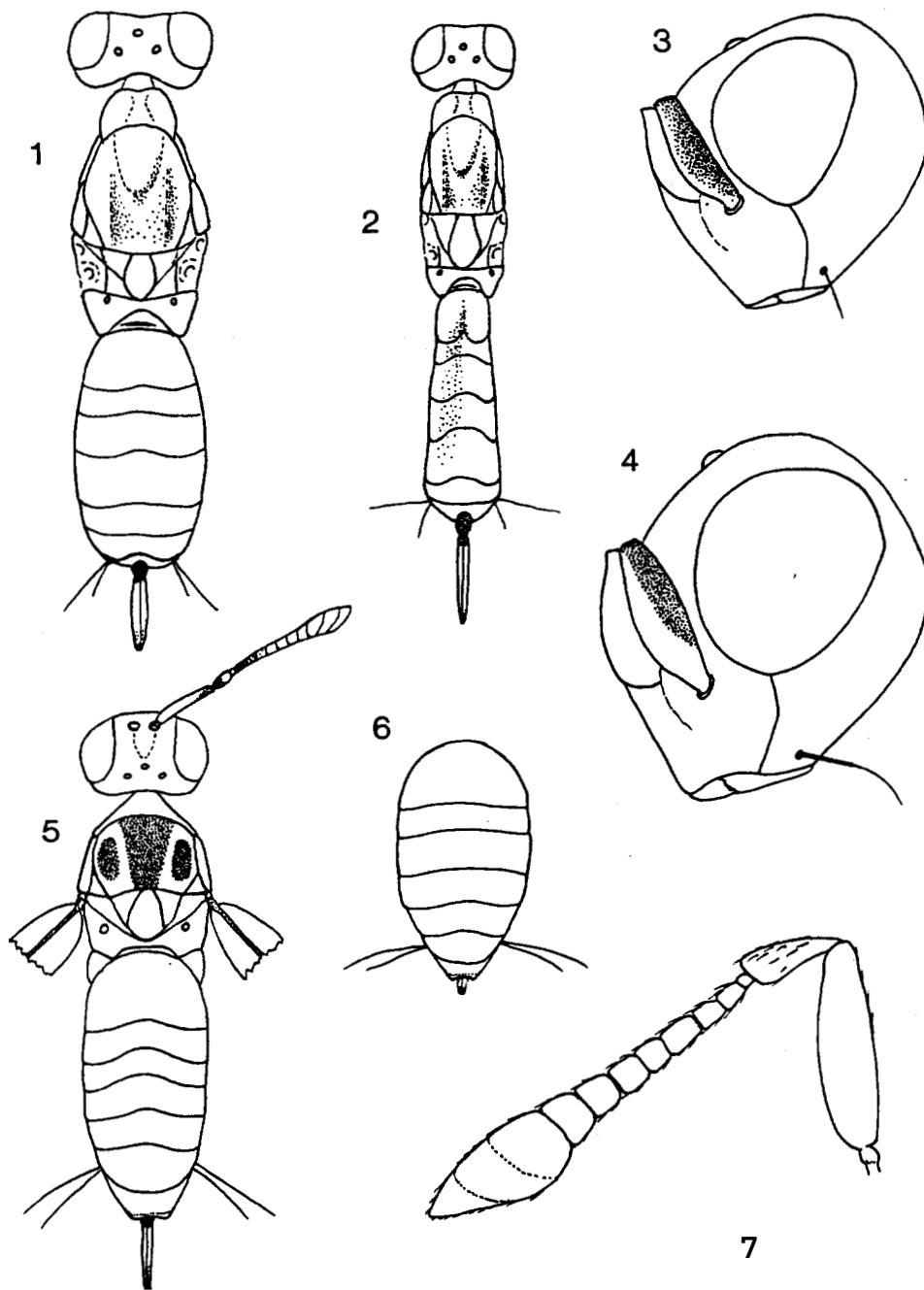
### Introduction

*Eupelmus* Dalman, 1820 is here considered, following Ruschka (1921) and Gibson (1995), to include species sometimes placed in the genus *Macroneura* Walker, 1837 (= *Eupelmella* Masi,

1919). *Macroneura* and *Eupelmus* are treated as subgenera. *Eupelmus* is well-represented in the Iberian Peninsula and new species have been described from Spain, five by Bolívar (1933) and one by Gijswijt (1993). Ceballos (1956) catalogues only seven species, but the total number of recognized Spanish spe-

\* RRA: 5, Beeston Hall Mews, Beeston, Tarporley, Cheshire CW6 9TZ, England

\*\* JLNA: Museo Nacional de Ciencias Naturales, Departamento de Biodiversidad y Biología Evolutiva, José Gutierrez Abascal 2, 28006 Madrid, España. E-mail: aldrey@mncn.csic.es



Figs. 1-7.—*Eupelmus* species. 1) *E. matranus* Erdos, body of ♀ leg. Mercet; 2) *E. splendens* Giraud, ♀ body (reared ex *Pediaspis* gall, France); 3) *E. splendens*, ♂ head; 4) *E. matranus*, ♂ head showing long genal seta; 5) *E. juniperinus* Bolívar, body of ♀ paratype (dark areas of mesoscutum and antenna are stippled); 6) *E. juniperinus thuriferae* subsp. nov., ♀ gaster; 7) *E. clavicornis* sp. nov., ♀ antenna.

Figs. 1-7.—Especies de *Eupelmus*. 1) Cuerpo de la ♀ de *E. matranus* Erdos (leg. Mercet); 2) cuerpo de la ♀ de *E. splendens* Giraud (obtenida de agallas de *Pediaspis* en Francia); 3) cabeza del ♂ de *E. splendens*; 4) cabeza del ♂ de *E. matranus* en la que se ve la larga seta genal; 5) cuerpo del paratipo ♀ de *E. juniperinus* Bolívar (las áreas oscuras de antena y mesoscutum son punteadas); 6) gáster de la ♀ de *E. juniperinus thuriferae* n. subsp.; 7) antena de la ♀ de *E. clavicornis* sp. nov.

to Britain (Graham, 1969) but it has not yet been found inhabiting Spain.

A specimen in the Museo Nacional de Ciencias Naturales in Madrid is believed to be of Italian provenance, probably sent to Mercet together with the specimen of *E. aloysii* mentioned above. Data are: 1 ♀ ex Mercet collection (MNCN) labelled 'Portico do Fleotribo. Eupelmus ... [3 illegible words] ... 1935' and '2'. It agrees reasonably well with the redescription and figure of *E. hartigi* in Ruschka (1921), based upon two Forster specimens.

*E. hungaricus* Erdos, 1959: 327-330

New record for peninsular Spain: Zaragoza, Pina de Ebro, Retuerta de Pina, Malaise trap, 20.vi.1991, JBZ, 1 ♀.

The type of *E. hungaricus* could not be found when looked for in the Hungarian National Museum (Budapest) in 1996, but the Spanish specimen agrees closely with the original description and figure.

*E. juniperinus* Bolívar, 1933: 204,205 (fig. 5)

Described from peninsular Spain (Madrid, Zarzalejo near El Escorial) from specimens collected on *Juniperus oxycedrus* L. The holotype is believed to be lost, but two females located in MNCN are clearly from the type series and have been labelled as paratypes. Each bears a similar handwritten label 'Zarzalejo G. Mercet' and a printed label 'Colección G. Mercet'; neither date nor association with *J. oxycedrus* are stated.

A *Eupelmus* similar to nominotypical *E. juniperinus* was found on *Juniperus thurifera* at Soria by Gijswijt (1993) and at Zaragoza by JBZ. Specimens associated with *J. thurifera*, however, have a much shorter ovipositor than those found on *J. oxycedrus*, and it is thought appropriate to recognize them as a new subspecies:

*Eupelmus juniperinus thuriferae* Askew subsp. n. (fig. 6)

MATERIAL: Holotype ♀. Zaragoza, Pina de Ebro, Retuerta de Pina, swept from *Juniperus thurifera*, 22.v.1992, J. Blasco-Zumeta. Deposited in MNCN.

Paratypes. Same locality as holotype, 1 ♀, Moericke trap, 11.vii.1990, JBZ; 1 ♀, colour water trap, 2.viii.1990, JBZ; 1 ♀, Malaise trap, 23.ix.1991, JBZ; 2 ♀, reared from male cones of *J. thurifera* collected 22.ii.1992 and 10.iv.1992, JBZ; 1 ♂,

swept from *J. thurifera*, 8.viii.1992, JBZ. Soria. El Burgo de Osma, 2 ♀ on *J. thurifera*, 15 and 19.vi.1994, M. J. Gijswijt.

Additional material. Males trapped by JBZ in the Retuerta de Pina, probably conspecific with the above females, were collected as follows: 1 ♂, Moericke trap, 28.v.1990; 4 ♂, Malaise trap, 18.ix.1990; 1 ♂, Malaise trap, 10.ix.1991.

FEMALE. Form and colour as in *E. juniperinus* Bolívar except for ovipositor sheaths (fig. 6) which are very short, only 0.34 times length of hind tibia and 0.13 times length of rest of gaster (0.63 and 0.33 times respectively in nominotypical form (fig. 5).

ETIMOLOGY. From *Juniperus thurifera*.

*E. finearis* Forster, 1860: 119

New record for peninsular Spain: Madrid, Galapagar, without date, RGM (MNCN), 1 ♀.

*E. longicorpus* Girault, 1915: 6

Bouček (1988: 561) mentions having seen material of this primarily Australian species from Spain (also India and Zimbabwe). We are unable to provide further information on its Spanish status, and the species is not included in the key below.

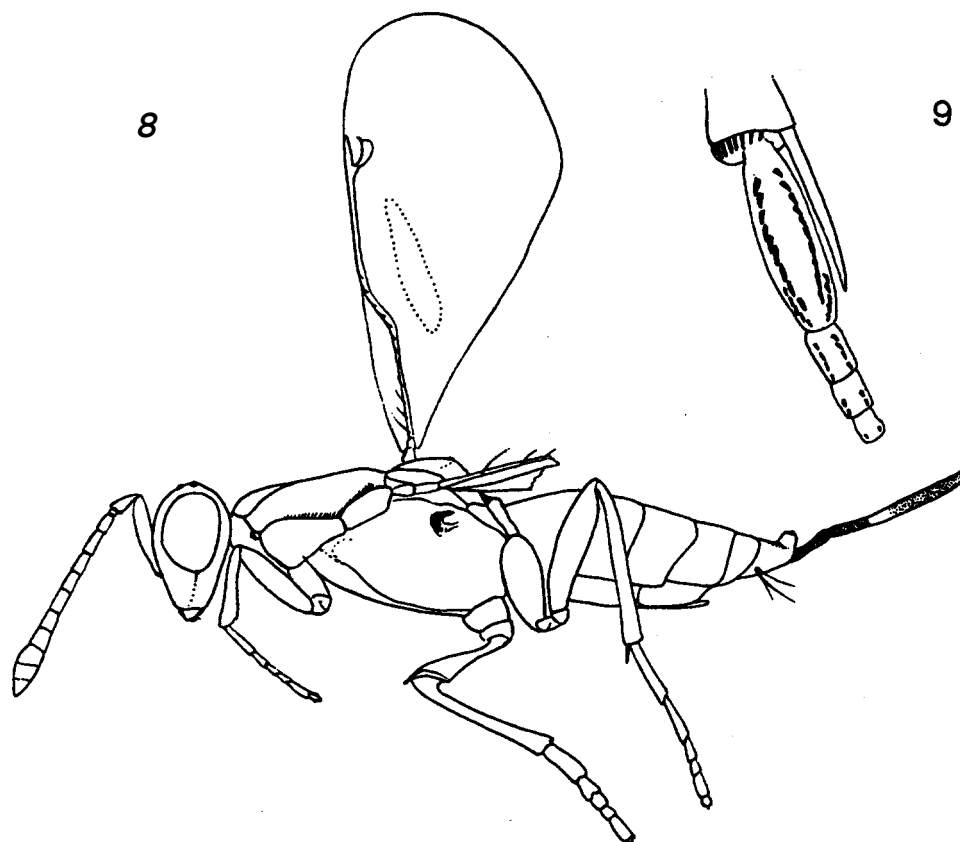
*E. matranus* Erdos, 1947: 68-70 stat. rev. (figs. 1, 4)

*Eupelmus splendens* Bolívar, 1933: 201-203 nec Giraud, 1871

Bolívar's type of his *E. splendens*, collected at Loeches (Madrid) on 5.v.1924, has not been traced, but a specimen in the Mercet collection (MNCN) agrees with the description: Gerona, Palamós, 5.ix.1927 [written as 5-9-927 in Mercet's style], 19.

Bouček (1977) placed both *E. splendens* Bolívar (invalid homonym) and *E. matranus* Erdos in synonymy with *Eupelmus splendens* Giraud, 1871, but *E. splendens* Giraud, a parasitoid in galls of *Pediaspis* (Hym., Cynipidae), is distinct from *E. matranus* (type in Budapest seen). This confirms Pujade's (1989) doubts about the correctness of the synonymy of the Giraud and Bolívar species, based upon the absence of *Pediaspis* from the type locality of *E. splendens* Bolívar.

Females of *E. matranus* (fig. 1) differ from those of *E. splendens* Giraud (fig. 2) in being larger and relatively broader with longer ovipositors, as indicated in the key to species. Additionally, the antenna of *E. matranus* is relatively longer (pedicel



Figs. 8-9. — *Eupelmus stenozonus* sp. nov. 8) ♀ holotype body and right forewing (speculum indicated by broken line); 9) ♀ apex of mesotibia and four basal tarsal segments, in ventral view, showing arrangement of black pegs.

Figs. 8-9. — *Eupelmus stenozonus* sp. nov. 8) Cuerpo y ala anterior derecha del holotipo ♀ (speculum indicado por una línea de puntos); 9) vista ventral de la mesotibia y de los cuatro segmentos basales del tarso de la P, en los que se aprecia la disposición de las hileras de denticulos negros.

Additional material. La Gomera, Antoncojo, 26.iii.1999, 2P ♀ (damaged), RRA. Tenerife, Malpais Golmar, 16.iv.1986, 1♀, M. Báez.

**FEMALE.** Body dark green with extensive coppery reflections, especially from mesoscutum; prepectus and tegula metallic. Ovipositor sheath mainly dark, black at base and heavily infuscate apically, but with a narrow yellowish median annulation which occupies at most one-fifth (one-eighth in holotype) of the sheath and is shorter than the proximal black area (fig. 8). Antenna entirely dark with metallic reflections. Wings clear; venation testaceous. Front leg almost entirely black with metallic reflections; middle leg dark from coxa to about two-thirds length of femur, tibia testaceous with basal infuscate annulation, tarsal segments 1-3 tes-

taceous, rest of tarsus infuscate; hind leg dark except apex of femur, extreme base and apical one-fifth of tibia and tarsal segments 1-2(3). Length (including ovipositor) 2.7-3.7 mm (holotype 3.7 mm).

Head in dorsal view 2.15 times as broad as long, slightly broader than mesoscutum; temples short, 0.1 times length of eye; POL about 2.2 times OOL, posterior ocellus separated from orbit by about 1.2 times its diameter. Head in front view 1.25 times as broad as high; eyes separated by 0.42 times head breadth; reticulate sculpture coarse between scrobe and eye, fine between mouth and eye. Antenna with pedicel plus flagellum 1.2 times as long as breadth of head; scape 4.2 times as long as broad with a ventral carina on distal two-thirds; pedicel 0.09

dwelling Cecidomyiidae (Dipt.) and is found, together with *E. rnoroderi*, on the grass *Hyparrhenia hirta*.

*E. urozonus* Dalman, 1820: 378 (aggregate)

Reported by Ruschka (1921) from *Olea* near Barcelona, by Nieves-Aldrey (1982) as a parasitoid in a variety of galls of Cynipidae (Hym.) on *Quercus* in Salamanca, and by Pujade (1989) from galls of Cynipidae on *Quercus* and *Rosa*, from *Myopites olivieri* Kieffer (Dipt., Tephritidae) on *Inula* and *Mikiola fagi* Hartig (Dipt., Cecidomyiidae) on *Fagus* in Catalunya. Gijswijt (1993) records *E. urozonus* from galls of a cecidomyiid (*Etsuhua thuriferae*) on *Juniperus thurifera* in Soria, and Askew & Blasco-Zumeta (1997, 1998) report its rearing from *Blascoa ephedrae* Askew (Hym., Pteromalidae) and *Eurytoma galleggedrae* Askew (Hym., Eurytomidae) on *Ephedra nebrodensis* Tineo in Los Monegros. Unpublished rearing records are from *Diplolepis rosae* (L.) (Hym., Cynipidae) (Jaca, 1992, RRA), *D. mayri* (Schlechtendal) (Logroño, Ezcaray, 1994, RRA), *Myopites* galls on *Inula* (Gerona, Tossa de Mar, 1961, RRA; Majorca, 1982, M. Boness) and fruits of *Juniperus phoenicea* L. (Canary Islands, La Gomera, 1999, RRA).

The broad host range, together with some very small morphological differences, suggest that *E. urozonus* as currently understood comprises an aggregate of forms which are poorly-differentiated morphologically but distinct biologically.

In MNCN there are specimens of *E. urozonus* agg. from Almería (Mercet collection), Madrid (RGM), Santander (RGM) and Segovia (CBP). Additional localities include San Sebastián (1964, RRA), Jaén (1974, RRA) and Andorra (1992, JPV) and, in the Canary Islands, La Palma (1997 and 1998, M. Koponen) and Tenerife (1989, M. Koponen and 1996, M. Báez).

*Eupelmus (Macroneura)*

*E. (M.) aseculatus* Kalina, 1981: 96-99 comb. n.

New record for peninsular Spain: Madrid, Vaciamadrid, 1918, CBP (MNCN), El Escorial, 1910, RGM and 1919, CBP (MNCN); Avila, Chamartín, 1918, RGM (MNCN); Jaén, 1974, RRA.

Specimens reared from galls of *Callirhytis glandium* (Giraud) and *C. rufescens* (Mayr) (agamic

generations) (Hym., Cynipidae) on *Quercus suber* from Toledo (1989, JNA) have also been examined.

*E. (M.) falcatus* (Nicol'skaya, 1952: 493) comb. n.

New record for peninsular Spain: Two females from Madrid, Vaciamadrid, 1918, CBP and Montarco, 1907, Cabrera are in MNCN.

A third female in MNCN is probably *E. falcatus* but is unusual in having an infuscate scape; it is from Madrid, El Pardo, no date, RGM.

*E. (M.) maculatus* (Ferrière, 1954: 9) cornb. n.

New record for peninsular Spain: 1 ♀, Barcelona, 1974, Z. Bouček in RRA collection.

*E. (M.) muellneri* Ruschka, 1921: 305 cornb. rev.

Not previously recorded from mainland Spain, but listed from the Canary Islands (La Gomera, Tenerife) by Gijswijt (1990).

Reared from *Myopites* (Dipt. Tephritidae) galls on *Inula*, Gerona, Tossa de Mar, 1961, RRA and Majorca, 1982, M. Boness and *Isocolus lichtensteini* (Mayr) (= *tavaresi* Nieves-Aldrey) (Hym., Cynipidae) galls on *Centaurea nicaeensis* All., Formentera, 1987, M. Boness. Also reared from *Stephaniella atriplicis* (Kieffer) (Dipt., Cecidomyiidae) on *Atriplex halimus* L. and from stems of *Eryngium maritimum* L., Portugal, Algarve, Albufeira, 1995, M. Boness. Additional material from Valencia, no date, RGM (MNCN); Alicante, Torreveja, 1974, Z. Bouček; Granada, Calahonda, 1988, RRA; Zaragoza, Pina de Ebro, 1992, JBZ.

*E. (M.) seculatus* (Ferrière, 1954: 5-7) cornb. n.

Pujade (1989) reared this species from cecidomyiid (?) galls on *Ononis* in Catalunya, and described the male.

Additional records: Madrid, Vaciamadrid, 1923, CBP (MNCN); El Pardo, no date, RGM (MNCN); Loeches, 1924, RGM (MNCN); Torrelodones, 1906, Cabrera; Castellón, Benicasim, 1974, Z. Bouček; Zaragoza, Pina de Ebro, ex galls *Rhopalomyia* (Dipt., Cecidomyiidae) on *Artemisia herba-alba* Asso, 1996, JBZ. A female with scape darkened and weakly metallic, from Vaciamadrid

- 8(7) Scape mostly yellowish, testaceous or reddish ..... *E. ceris* Förster  
 • Scape dark with metallic reflections ..... *E. annulatus* Nees
- 9(7) Marginal vein relatively short, a little more than twice as long as postmarginal vein which is about 1.2 times as long as stigmal vein; mesobasitarsus with fewer than ten dark pegs ventrally ..*E. microzonus* Förster  
 • Marginal vein about 4 times length of postmarginal vein which is sometimes not longer than stigmal vein; mesobasitarsus with more than twenty dark pegs ventrally ..... 10
- 10(9) Legs except coxae yellow, or at most with some infuscation on front femur; postmarginal vein slightly longer than stigmal vein ..... *E. fulvipes* Förster  
 • Legs with femora and tibiae partly infuscate; postmarginal vein not longer (usually slightly shorter) than stigmal vein ..... *E. urozonus* Dalman
- 11(4) Thorax including prepectus and tegulae metallic, gaster metallic ..... 12  
 • Thorax with prepectus and tegulae yellow, gaster usually partly yellowish ..... 15
- 12(11) Legs except coxae yellow; ovipositor sheaths hardly one-quarter length of gaster and not quite half as long as hind tibia ..... sp. indet.  
 Legs with femora and tibiae partly infuscate; ovipositor sheaths longer ..... 13
- 13(12) Ovipositor sheaths broadly pale with only bases and apices darkened (half length of gaster, 0.7 times length of hind tibia); thoracic dorsum exceedingly weakly sculptured, partly smooth, shiny; forewing clear; antenna (fig. 7) strongly clavate, clava broader than scape which is about 4 times as long as broad, anellus paler than rest of flagellum; hind coxa with dorsal surface bare in basai half .....*E. clavicornis* Askew  
 • Ovipositor sheaths uniformly dark, sometimes longer than in alternate; thoracic dorsum densely reticulate; forewing usually weakly infumate; antenna weakly clavate, clava narrower than scape which is less than 3 times as long as broad, anellus and rest of flagellum concolorous; hind coxa dorsally pilose ..... 14
- 14(13) Ovipositor sheaths 0.55 - 0.75 times length of gaster, 1.6 - 2.0 times length of hind tibia; mesotibia broadly infuscate medially .....*E. fuscipennis* Förster  
 Ovipositor sheaths 0.4 times length of gaster, 0.85 times length of hind tibia; mesotibia with a subbasal infuscate band occupying about one-third the length ..... [*E. hartigi* Förster]
- 15(11) Ovipositor sheaths at least 5.5 times as long as hind tibia, entirely dark ..... *E. moroderi* Bolívar  
 Ovipositor sheaths at most 2 times as long as hind tibia, with a median pale band more or less indicated ..... 16
- 16(15) Forewing with linear speculum: ovipositor sheaths 2 times as long as hind tibia ..... *E. linearis* Förster  
 Forewing without speculum; ovipositor sheaths at most only slightly longer than hind tibia ..... 17
- 17(16) Antenna dark with only anellus pale; marginal vein length about 2.5 times postmarginal vein and 3.7 times stigmal vein ..*E. testaceiventris* (Hlutschulsky)  
 • Antenna with flagellum pale, only basal finicic segments somewhat darkened, basal half of scape yellow; marginal vein length about 1.5 times postmarginal and 2.0 times stigmal vein ..... 18
- 18(17) Thoracic dorsum metallic with only prepectus, tegulae and sometimes lateral and posterior edges of mesoscutum, yellow; ovipositor sheaths at least 0.5 times as long as rest of gaster .....*E. pullicornis* Gijswijt  
 • Thorax dorsally bicoloured (fig. 5). mesoscutum yellow with a broad, median, metallic green stripe and an oval, green spot on each side; ovipositor sheaths at most 0.3 times as long as rest of gaster ..... 19
- 19(18) Ovipositor sheaths about 0.3 times as long as rest of gaster (fig. 5) and 0.6 times as long as hind tibia, Associated with *Juniperus oxycedrus* .....  
 ..... *E. juniperinus juniperinus* Bolívar  
 Ovipositor sheaths very short, only 0.13 times as long as rest of gaster (fig. 6) and 0.3 times as long as hind tibia. Associated with *Juniperus thurijera* .....  
 ..... *E. juniperinus thuriferae* Askew
- 20(2) Antenna with funicle segments 2-5 white; ovipositor sheaths entirely dark, slightly longer than hind tibia, mesobasitarsus without black pegs; forewing narrow with marginal vein length 4.0 times postmarginal vein and more than 7.0 times stigmal vein; thorax metallic; scape reaching above vertex; metatibia darkened over apical one-third, mesotibia with a broad basal dark band; hind coxa bare dorsally in basal half .....  
 ..... *E. hungaricus* Erdős  
 Antenna with funicle unicolorous dark; ovipositor sheaths with pale median band, shorter than hind tibia; mesobasitarsus sometimes with black pegs; forewing not narrow with marginal vein length only slightly more than 2.0 times postmarginal vein and at most 3.3 times stigmal vein; prepectus, tegua and sides of pronotum non-metallic reddish yellow; scape sometimes not reaching above vertex; tibiae reddish with weak basai infuscations; hind coxa dorsally pilose ..... 21
- 21(20) Forewing speculum absent, stigma with exceptionally long uncus 0.7 times length of stigmal vein, marginal vein more than 3.0 times as long as stigmal vein; mesobasitarsus ventrally without dark pegs; antenna with scape reaching above vertex and all finicic segments longer than wide ..... *E. rostratus* Ruschka  
 Forewing spectilum present, stigma normal without lengthened uncus, marginal vein 2.0 times as long as stigmal vein; mesobasitarsus ventrally with black pegs; scape not reaching above vertex and last finicic segment slightly transverse, F6 stibquadrate ..... 22
- 22(21) Ovipositor sheaths (fig. 1) relatively short, 0.6-0.7 times length of hind tibia and 0.31-0.36 times as long as rest of gaster; gaster (fig. 1) not more than 1.1 times as long as mesosoma; head in dorsal view 1.75-1.9 times as broad as long; larger species, length 2.2-2.8 mm ..... *E. matranus* Erdos  
 Ovipositor sheaths (fig. 2) 0.9 times to almost as long as hind tibia and 0.42-0.50 times as long as rest of gaster; gaster at least 1.2 times as long as mesosoma; head in dorsal view about 1.6 times as broad as long; smaller, more slender species, length 1.7-2.0 mm .....  
 ..... *E. splendens* Giraud  
 [Males of *E. matranus* and *E. splendens* differ as described in the text]
- 23(1) Reduced forewing divided into a basal, apically truncate section and an apical part which is bent upwards (the apical part may be broken off); hindwing present; mesopleuron finely striate ..... 24

- GRAHAM, M. W. R. DE V., 1969. Some Eupelmidae (Hymenoptera: Chalcidoidea) new to Britain, with notes on new synonymy in this family. *Proceedings of the Royal Entomological Society of London (B)*, 38: 89-94.
- KALMA, V., 1981. The Palearctic species of the genus *Macroneura* Walker, 1837 (Hymenoptera, Chalcidoidea, Eupelmidae), with descriptions of new species. *Sborník Vědeckého Lesnického ústavu Vysoké školy zemědělské v Praze*, 24: 83-111.
- KALINA, V., 1988. Descriptions of new Palearctic species of the genus *Eupelmus* Dalman with a key to species (Hymenoptera, Chalcidoidea, Eupelmidae). *Silvaecultura Tropica et Subtropica*, 12: 3-33.
- MOTSCHULSKY, V. DE, 1863. Essai d'un catalogue des insectes de l'île Ceylan. *Bulletin de la Société Impériale des Naturalistes de Moscou*, 36: 1-153.
- NEES AB ESENBECK, C. G., 1834. *Hymenopterorum Ichneumonibiis affinium monographiae, genera Europaea et species illustrantes*, 2. Stuttgart & Tubingen. 448 pp.
- NIEVES-ALDREY, J. L., 1982. Eupélmidos (Hym. Eupelmidae) que parasitan a los pobladores de las agallas de cinípidos producidas en especies del género *Quercus* en la provincia de Salamanca. *Boletín de la Asociación española de Entomología*, 5(1981): 143-150.
- NIKOL'SKAYA, M. N., 1952. *Chalcidii Fauni SSSR (Chalcidoidea)*. Moscow & Leningrad. 575 pp.
- PUJADE I VILLAR, J., 1989. Primeros datos sobre los eupélmidos asociados a agallas en Cataluña (Hym., Chalcidoidea, Eupelmidae) con la descripción del macho de *Macroneura seculata* (Ferrière, 1954). *Orsis*, 4: 151-160.
- RETZIUS, A. J., 1783. *Caroli de Geer genera et species insectorum*. Lipsiae. 226 pp.
- RUSCHKA, F., 1921. Chalcididenstudien. 1. Teil. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien*, 70: 234-315.
- RUSO, G., 1938. VI. Contributo alla conoscenza dei Coleotteri Scolitidi Fleotribo: *Phloeotribus scarabaeoides* (Bem.) Fauv. Parte seconda Biografia, simbiotici, danni e lotta. *Bollettino del R. Laboratorio di Entomologia Agraria di Portici*, 2: 3-420.

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