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 Erdös is removed from synonymy under E. splendens Giraud and accorded specific rank; E. valentinus Bolivar is newly synonymized under E. testaceiventris (Motschulsky) and E. capillaris Bolivar under E. fuscipennis Förster. 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 Erdös 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 Bolivar con E. fuscipennis Förster. 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 Bolivar (1933) and one by Gijswijkstra (1993). Ceballos (1956) catalogues only seven species, but the total number of recognized Spanish spe-
cies is now increased to twenty-six. Some of this increase stems from studies of material housed in the Museo Nacional de Ciencias Naturales (Madrid), much of it collected by García Mercet and Bolívar y Pieltain in the first half of the twentieth century. Substantial contributions to our knowledge of Iberian Eupelmus have been made more recently by Nieves-Aldrey (1982) rearing from galls of Cynipidae (Hymenoptera) on Quercus in Salamanca and by Pujade (1989) rearing from a diversity of galls in Catalunya, by Gijswijt (1993) collecting on Juniperus thurifera L. in Soria, and by Javier Blasco-Zumeta collecting in Los Monegros (Zaragoza). More general collecting in mainland Spain by Z. Boucek, the authors and others, and in the Canary Islands by M. Báz, M. Koponen and others, has contributed additional information.

Two new species and one new subspecies are described here. E. matranus Erdös is recognized as a species distinct from E. splendens Giraud. A key is provided to the species found in Spain and the Canary Islands.

In the following alphabetically arranged list of Spanish Eupelmus, abbreviations are as follows: CBP = C. Bolívar y Pieltain, JBZ = J. Blasco-Zumeta, JNA = J. Nieves Aldrey, JPV = J. Pujade i Villar, MNCN = Museo Nacional de Ciencias Naturales (Madrid), RGM = R. García Mercet, RRA = R. R. Askew.

Eupelmus (Eupelmus)

**E. aloysii** Russo, 1938: 229-231


A second female specimen is in MNCN; it is without locality but evidently of Italian origin, labelled with a neatly written list (in Italian) of morphological characters, ‘agosto 1935-xiii - da Floetribo-olivo’, ‘Colección G’. Mercet’ and ‘7’.

Russo (1938) described *E. aloysii* from material reared in Italy from a branch of olive (*Olea europea* L.) infested with larvae of *Phloeotribus scarabaeoides* (Bernard) (Coleoptera, Scolytidae).

**E. annulatus** Nees, 1834: 175-176

Recorded by Nieves-Aldrey (1982) as a parasitoid in galls of Cynipidae (Hymenoptera) on *Quercus*.

Specimens in MNCN are from Almeria, Madrid and Segovia, collected by CBP, RGM and Lauffer. 1 ♀ Cercedilla (Madrid), viii.1916, leg. Bolivar has relatively well-developed wing marks. More recent records are from Zaragoza (1992, JBZ) and Lérida (1996, RRA).

**E. atropurpureus** Dalman, 1820: 381

Ruschka (1921) mentions having seen specimens of *E. atropurpureus* from peninsular Spain.

Additional material: Madrid, 1922, RGM and 1923, CBP (MNCN); Santander, 1922, RGM (MNCN); Almeria, no date or collector, ex Mercet collection (MNCN); Salamanca, no date or collector, ex Mercet collection (MNCN); Zaragoza, 1980, P. J. Chandler and 1991, JBZ; Huesca, 1997, JBZ and undated, CBP (MNCN); Zamora, Toro, 1986, ex gall *Isocolus lichtensteini* (Mayr) on *Centarea aspera* L., JNA; La Coruña, Puerto del Son, 1994, JNA.

**E. cerris** Förster, 1860: 128

Recorded from peninsular Spain by Nieves-Aldrey (1982) as a parasitoid in galls of *Synophorus politus* Hartig (Hym., Cynipidae) on *Quercus suber* L. in Salamanca. Also found in Madrid (El Pardo), two females emerging 10.vi.1999 from galls of the same host on *Q. suber*, JNA.

**E. clavicornis** Askew sp. n. (fig. 7)


*Paratypes.* 1 ♀, same data as holotype; 1 ♀, same data as holotype except gall collected 28.viii.1991.

*Female.* Head dark green, shining, with coppery reflections from lower face; antenna with scape and most of pedicel black, weakly metallic; anellus and pedicel at extreme apex pale yellowish; remaining flagellum unicolorous brown. Mesoscutum shining green, coperpy anteriorly; scutellum, axillae and sides and venter of thorax mainly coperpy. Wings hyaline; venation pale yellow; microtrichiae pale. Legs with coxae concolorous with thorax; femora pale yellow, darkened over about proximal three-quarters (the holotype has darkening only on dorsal surface); tibiae pale yellow with a varyably devel-
Figs. 1-7.— *Eupelmus* species. 1) *E. matranus* Erdös, 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* Bolivar, 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* Erdös (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* Bolivar (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.
ped subbasal brown ring; tarsi with at least basal three segments pale yellow. Gaster with first tergite green, otherwise mainly coppery; ovipositor sheaths mostly pale yellow but with basal two-fifths brown and some indefinite darkening at apex, the extreme apical margin of the sheath black. Length 1.3 (holotype) - 1.6 mm.

Head in dorsal view twice as broad as long; POL 2.2 OOL, posterior ocellus separated from orbit by about 1.2 times its diameter; vertex almost smooth. Head in front view about 1.1 times as broad as high; eyes separated by half head breadth; sculpture of face weak, frons almost smooth, weak striate-reticulate sculpture between eye and mouth; scrobal area not strongly excavated and no ridge between scrobe and eye. Antenna (fig. 7) with pedicel plus flagellum only very slightly longer than breadth of head; scape not expanded, not reaching level of anterior ocellus; pedicel 0.26 times length of flagellum, about as long as anellus plus funicle segments 1-3; anellus subquadrate; funicle broadening distally, basal four segments narrower than pedicel, F1-3 rather longer than broad, F6 subquadrate and about as broad as pedicel, F7 transverse; clava large, comprising almost 0.4 times length of flagellum, not quite twice as long as broad, more than twice as broad as pedicel.

Thorax dorsally and laterally mainly smooth and shining with sculpture indicated weakly only on scutellum, axilla and front of mesopleuron. Scutellum longer than broad. Mesotibia without apical pegs; mesosbasitartrus with small, pale pegs; metacoxa with longer than broad. Mesotibia without apical pegs; tarsal pegs.

Forewing completely pilose except for elongate-oval speculum, but hairs small, pale and difficult to see; ratios of lengths costal cell: marginal vein: stigmal vein: postmarginal vein as 22:12:11:6.

Gaster excluding ovipositor sheaths a little longer than hind tibia, and the scape 2.3 times as long as broad.

New record for peninsular Spain: Segovia, San Rafael, 1922, CBP (MNCN), 1♀; Zaragoza, Nuevalos, 1994, JNA, 1♀.

This species is allied to E. urozonus but has almost entirely pale femora and tibiae.

**Eupelmus** sp. indet.

Jaén, 1974, RRA, 1♀.

Like *E. fulvipes*, this species has pale femora and tibiae, but it differs in having pale mesosatarsal pegs.

**Eupelmus** capillaris Bolívar, 1933: 195-197 syn. n.

Zaragoza, Pina de Ebro, 1991, JBZ, 5♀♀. No material referable to *E. capillaris* Bolivar could be found in MNCN and its synonymy under *E. fuscipennis* is based solely upon Bolivar’s original description. This mentions, in particular, pale mesosatarsal pegs, ovipositor all black and twice as long as hind tibia, and the scape 2.3 times as long as broad, all characters of *E. fuscipennis*. However, at variance with *E. fuscipennis*, is Bolivar’s statement that the wings of *E. capillaris* are clear.

**Eupelmus** hartigi Förster, 1841: 33

*Eupelmus* hartigi is known from localities in central and southern Europe (Boucek, 1977) north...
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 'Portici 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 Förster specimens.

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


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 MNHN 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)

**Etimología.** From *Juniperus thurifera*.

**E. linearis** Förster, 1860: 119

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

**E. longicorpus** Girault, 1915: 6

Boucek (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.


(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], 1♀.

Boucek (1977) placed both *E. splendens* Bolívar (invalid homonym) and *E. matranus* Erdős 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
plus flagellum at least 1.1 times breadth of head; in *E. splendens* their combined length scarcely greater than breadth of head) and less strongly clavate than that of *E. splendens* with the seventh funicle segment less than twice as broad as F1 (fully twice as broad in *E. splendens*) and the clava as long as the pedicel plus first two flagellar segments (only as long as pedicel plus anellus in *E. splendens*).

A male *E. matranus*, collected with a female at St Georges Blancaeneix near Bergerac, Dordogne, France (27.v.1981, RRA) differs from reared males of *E. splendens* in having a much longer general seta. The seta is as long as the general sulcus (fig. 4) whereas in *E. splendens* the general seta is only about half the length of the sulcus (fig. 3). Also, the whole of the anterior face of the scape is yellow in *E. matranus* whereas in male *E. splendens* the scape is yellow only at the extreme base and sometimes along its anterior edge.

**E. microzonus** Förster, 1860: 125

New record for peninsular Spain where it appears to be widespread. The following material is in MNCN: Madrid, El Escorial, no date, Lauffer in Mercet collection, El Pardo, 1922 and 1923, RGM, Vaciamadrid, no date, RGM, Collado-Mediano, 1927, CBP, Torrelodones, 1906, Cabrera; Segovia, San Rafael, 1917, CBP; Almería, no date, in Mercet collection; Zaragoza, Ambel, no date, Dusmet. Further specimens have been taken in Jaén, 1974, RRA; Toledo, Dosbarrios, 1974, RRA; Granada, Puerto del Moro, 1974, RRA; Guadalajara, La Alcarria, 1996, RRA; Zaragoza, Pina de Ebro, 1991, JBZ.

Material reared from galls of the following has also been examined:

- *Myopites* sp. (Diptera, Tephritidae) on *Inula crithmoides* L., Portugal, Algarve, 1999, M. Boness
- *Aylax minor* Hartig (Hym., Cynipidae) on *Papaver* sp., Madrid, 1994, F. Ronquist; on *P. rhoeas* L., Madrid, Arganda, 1995, JNA; on *P. rhoeas*, Portugal, Serra de Arrabida, 1985, JNA.
- *Barbotinia orantiensis* (Barbotin) (Hym., Cynipidae) on *Papaver* sp., Madrid, Arganda, 1986, JNA.
- *Isocolus lichtensteini* (Mayr) (Hym., Cynipidae) on *Centaurea aspera* L., Madrid, Camporeal, 1985, JNA and Zamora, Toro, 1986, JNA.
- *Phanacis centaureae* Förster (Hym., Cynipidae) on *Centaurea* sp., Madrid, 1994, F. Ronquist and Segovia, Tabladillo, 1985, JNA; on *C. scabiosa* L., Guadalajara, Pozo de Guadalajara, 1984, JNA and Soria, Aldehuela de Calatañazor, 1989, JNA.

**E. rostratus** Ruschka, 1921: 291-293


Reared from cynipid galls on *Quercus* in central Europe.

**E. splendens** Giraud, 1871: 416 (figs. 2, 3)

Reported by Pujade (1989) as a parasitoid in galls of *Pediaspis aceris* (Gmelin) (Hym., Cynipidae) on *Acer monspessulanum* L. in Catalunya (Montserrat). Distinctions between this species and *E. splendens* Bolivar are given under *E. matranus*.

**E. stenozonus** Askew sp. n. (figs. 8, 9)

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 testaceous, 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


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 ♀, en los que se aprecia la disposición de las hileras de denticulos negros.
times as long as flagellum, only 0.75 times as long as subquadrate anellus plus first funicle segment in holotype (in smaller specimens about equal to anellus plus F1); funicle broadening and segments shortening distally; F1 about 2.5 times as long as broad and slightly narrower than pedicel, F7 subquadrate and about twice as broad as pedicel; clava comprising 0.25 times length of flagellum and 2.4 times as long as broad.

Mesoscutum with posterior median depressed area entirely reticulate, more coarsely so than scutellum and axilla; scutellum slightly longer than broad; mesopleuron entirely reticulate, finely so on anterior third, extremely finely in a transverse median band, and more coarsely on posterior two-fifths. Mesotibia with an apical row of 5 or 6 dark pegs in front of spur (fig. 9); ventral surfaces of mesotarsal segments 1-4 (fig. 9) with relatively long black pegs, on basitarsus arranged in two longitudinal rows on each side, the anterior rows each comprising 5-7 pegs and overlapping the longer posterior rows of 9-11 pegs each, on T2 in two rows of 4-5 pegs, on T3 in two rows of 2 pegs, and 2 apical pegs on T4. Metacoxa with dorsal surface pilose.

Forewing (fig. 8) with relatively long, sparse pilosity; the speculum relatively broad; ratio of lengths costal cell: marginal vein: stigmal vein: postmarginal vein as 17:14:3:3; stigma angled against stem of stigmal vein, rather large, separated postmarginal vein. It is, perhaps, closest to E. annulatus but differs in its longer ovipositor with very narrow median pale band, the genal seta of the male is shorter and less curved, and the stigma in both sexes is larger.

**E. testaceiventris** (Motschulskey, 1863: 49)  
Eupelmus valentinus Bolivar, 1933: 200, 201 syn. n.

Eupelmus valentinus was described by Bolivar from a female found at Bétera, Province of Valencia. This specimen could not be found in MNCN, but a female labelled 'Barcelona R. G. Mercet 23-8-927' agrees quite well with the description of E. valentinus except that the ovipositor sheaths are somewhat shorter, only about as long as the hind tibia and 0.4 times the length of the rest of the gaster (corresponding measurements given in the description are 1.25 and 0.5 times). This specimen is identified as E. testaceiventris, described from Ceylon but suggested to be widespread in the Mediterranean region and ‘locally common in grassy vegetation in Spain - n. rec.’ (Boucek, 1977).

In the Canary Islands E. testaceiventris is probably the most numerous species of Eupelmus and it has been found on Gran Canaria (1985, M. Báez, La Gomera (1999, M. Báez, M. Koponen, RRA), La Palma (1997 and 1998, M. Koponen), Tenerife (1973, P. J. Chandler; 1984-99, M. Báez and M. Koponen; 1999, RRA). It is a parasitoid of grass-
dwelling Cecidomyiidae (Dipt.) and is found, together with *E. moroderi*, on the grass *Hyparrhenia hirta*.

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


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)**


New record for peninsular Spain: Madrid, Vaciadamidr, 1918, CBP (MCN); El Pardo, no date, RGM (MCN); Avila, Chamartin, 1918, RGM (MCN); 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** (Nikol’skaya, 1952: 493) comb. n.

New record for peninsular Spain: Two females from Madrid, Vaciadamidr, 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) comb. n.


**E. (M.) muellneri** Ruschka, 1921: 305 comb. 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 lichtenstei-ni* (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 (MCN); Alicante, Torrevieja, 1974, Z. Boucek; Granada, Calahonda, 1988, RRA; Zaragoza, Pina de Ebro, 1992, JBZ.

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

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

Additional records: Madrid, Vaciadamidr, 1923, CBP (MCN); El Pardo, no date, RGM (MCN); Loeches, 1924, RGM (MCN); Torrelodones, 1906, Cabrera; Castellón, Benicasim, 1974, Z. Boucek; 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 Vaciadamidr
(1923, RGM (MNCN)), is questionably referable to E. seculatus.

**E. (M.) vesicularis** (Retzius, 1783: 70, no. 291)

Cited from Majorca (Askew, 1975) and as a parasitoid in several cynipid galls on Quercus in Salamanca (Nieves-Aldrey, 1982). Pujade (1989) reported its hosts in Catalunya as *Diastrophus rubi* (Bouché) (Hym., Cynipidae) on Rubus, *Myopites olivieri* Kieffer (Dipt., Tephritidae) on Dittrichia and *Mikiola fagi* Hartig (Dipt., Cecidomyiidae) on Fagus. Specimens have also been reared from galls of *Rhopalomyia* (Dipt., Cecidomyiidae) on Artemisia at Zaragoza, Pina de Ebro, 1996, JBZ, and from the following Cynipidae by JNA: *Liposthenus kernerii* (Wachtl) on Nepeta latifolia D.C., Madrid, El Ventorillo, 1989

Phanasis caulecola (Hedicke) on Picris echoides L., Guadalajara, Valdenoches, 1990

*Phanasis centareae* on *Centarea nigra* L., Guadalajara, El Cárdeno de la Sierra, 1986, and on *C. scabiosa*, Guadalajara, Tamajón, 1987

Timaspis phoenixopoda (Mayr) on Lactuca vimagea (L.), Madrid, Puerto de la Morcuera, 1985

Non-reared material in MNCN was obtained from Madrid, Cercedilla, no date, CBP; El Pardo, no date, RGM and El Escorial, 1892 & 1924, CBP; Segovia, San Rafael, no date, CBP; San Sebastián, 1918, RGM; Bilbao, no date, RGM; La Coruña, no date, RGM. Additional material has been examined from Gerona, Tossa de Mar, 1961, RRA; San Sebastián, Orio, 1964, RRA; and from Jaca (1973), Val d’Aran (1994) and Gavarnie (1977), all RRA in the Pyrenees.

**E. (M.) sp. indet. A**

1 ♀, Madrid, El Pardo, 1928, RGM (MNCN); 1 ♀, Madrid, Zarzalejo, no date, RGM (MNCN).

These two specimens are probably conspecific. They both have infuscate scapes and pale mesobasitarsal pegs, and appear to belong to the *E. schmie- deknechti* Ruschka group (Kalina, 1981). Further material is required to ascertain their identity.

**E. (M.) sp. indet. B**

4 ♀♀, ex gall Aylax papaveris (Perris) on *Papaver* sp., Malaga, Embalse del Chorro, 1987, JNA.

This material represents a species near *E. (M.) seculatus*.

**Key to Spanish species of Eupelmus Dalman (females only)**

Keys to most Palaeartic species of the subgenera *Eupelmus* and *Macroneura* will be found respectively in Kalina (1988) and Kalina (1981).

1. Macropterous, or if brachypterous (*E. atropurpureus*), then pronotum without a setose transverse crest; gaster seldom pale only at base but sometimes extensively yellowish; scape most often dark and metallic, sometimes bicoloured, rarely yellow ........... 2

• Brachypterous; pronotum with a transverse crest bearing a row of stout setae; gaster nearly always with base of first tergite contrastingly pale; scape yellow (except in unidentified species) (*Macroneura*) .......... 23

2(1) Brachypterous, forewing truncate, triangular, clear, not upturned, with venation complete, the stigmatic vein parallel with and close to apical margin; body black with purple reflections; ovipositor all black, not quite half as long as hind tibia. *E. atropurpureus* Dalman Macropterous ....................................................... 3

• Mesoscutum posteriorly reticulate, not more shiny than scutellum and axillae (in *E. clavicornis* mesoscutum almost smooth but scutellum and axillae also very weakly sculptured and shiny); forewing clear or with general infumation, rarely with a discal cloud .......... 4

• Mesoscutum posteriorly smooth and shiny, contrasting with dull, strongly sculptured scutellum and axillae; forewing with an infumate mark below parastigmata and another below stigmatic vein, the two marks often connected by weaker infumation .......... 20

Mesotibia at apex and ventral surface of mesobasitarsus with at least some black pegs (e.g. fig. 9); ovipositor very dark basally, pale-banded medially and darkened apically, rarely (*E. stenozonus*) longer than hind tibia .................................................. 5

• Mesotibia and mesobasitarsus without black pegs, pegs either absent, pale or brown; ovipositor sometimes uniformly dark, sometimes longer than hind tibia ...... 11

5(4) Forewing entirely pilose without a speculum; mesopleuron dull, relatively strongly reticulate, more finely so centrally but nowhere almost smooth .................. *E. aloysii* Russo Forewing with speculum represented by a bare, oblique linear area (linea calva) below parastigma and basal part of marginal vein; mesopleuron rather shiny, its sculpture fine and weak, parts of disc sometimes almost smooth ...................................................... 6

• Ovipositor sheath distinctly longer than hind tibia and almost 0.7 times as long as rest of gaster (fig. 8) .......... *E. stenozonus* Askew Ovipositor sheath at most about as long as hind tibia and 0.5 times as long as rest of gaster .......... 7

Ovipositor sheath about as long as hind tibia .......... 8

• Ovipositor sheath at most 0.8 times length of hind tibia .................................................. 9
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 stigmatic 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 stigmatic vein; mesobasitarsus with more than twenty dark pegs ventrally

10(9) Legs except coxae yellow, or at most with some infuscation on front femur; postmarginal vein slightly longer than stigmatic vein. **E. fulvipes** Förster

- Legs with femora and tibiae partly infuscate; postmarginal vein not longer (usually slightly shorter) than stigmatic vein. **E. urozonus** Dalman

11(4) Thorax including prepectus and tegulae metallic, gaster metallic. **E. clavicornis** Askew

- Thorax with prepectus, gaster, and sometimes lateral and posterior edges of mesosoma non-metallic reddish yellow; scape sometimes not reaching above vertex; tegulae with narrow basal dark band; hind coxa bare dorsally in basal half

12(11) Legs except coxae yellow; ovipositor sheaths hardly one-quarter length of gaster and not quite half as long as hind tibia. **E. cerris** Förster

- Legs with femora and tibiae partly infuscate; ovipositor sheaths longer. **E. hartigi** Förster

13(12) Ovipositor sheaths with broadly 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 basal half. **E. fuscipennis** Förster

- Ovipositor sheaths uniformly dark, sometimes longer than in alternate; thoracic dorsum densely reticulate; forewing usually weakly infuscate; 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. **E. fulvipes** Förster

14(13) Antenna dark with only anellus pale; marginal vein length about 2.5 times postmarginal vein and 3.7 times stigmatic vein. **E. testaceiventris** (Motschulsky)

- Antenna with flagellum pale, only basal funicle segments somewhat darkened, basal half of scape yellow; marginal vein length about 1.5 times postmarginal and 2.0 times stigmatic vein. **E. splendens** Giraud

15(11) Ovipositor sheaths at least 5.5 times as long as hind tibia, entirely dark. **E. moroderi** Bolivar

- Ovipositor sheaths at most 2 times as long as hind tibia, with a median pale band more or less indicated. **E. hartigi** Förster

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. **E. tarda** Förster

17(16) Antenna dark with only anellus pale; marginal vein length about 2.5 times postmarginal vein and 3.7 times stigmatic vein. **E. testaceiventris** (Motschulsky)

- Antenna with flagellum pale, only basal funicle segments somewhat darkened, basal half of scape yellow; marginal vein length about 1.5 times postmarginal and 2.0 times stigmatic vein. **E. fulvipes** Förster

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. pallicornis** 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. **E. moroderi** Bolivar

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 Bolivar

- 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 thurifera. **E. juniperinus** Thurifera Askew

20(21) 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 stigmatic 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. fulvipes** Förster

- 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 stigmatic vein; prepectus, tegulae and sides of pronotum metallic reddish yellow; scape sometimes not reaching above vertex; tegulae reddish with weak basal infuscations; hind coxa dorsally pilose. **E. fuscipennis** Förster

21(20) Forewing speculum absent, stigma with exceptionally long uncus 0.7 times length of stigmatic vein, marginal vein more than 3.0 times as long as stigmatic vein; mesobasitarsus ventrally without dark pegs; antenna with scape reaching above vertex and all funicle segments longer than wide. **E. rostratus** Ruschka

- Forewing speculum present, stigma normal without lengthened uncus, marginal vein 2.0 times as long as stigmatic vein; mesobasitarsus ventrally with black pegs; scape not reaching above vertex and last funicle segment slightly transverse, F6 subquadrate. **E. matranus** Erdös

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 (fig. 1) not more than 1.1 times as long as stigmatic vein; head in dorsal view 1.75-1.9 times as broad as long; larger species, length 2.2-2.8 mm. **E. matranus** Erdös

- Ovipositor sheaths (fig. 2) 0.9 times 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]

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.
Acknowledgements

We acknowledge with gratitude the following who have generously supplied one of us (RRA) with specimens, information or both: Javier Blasco-Zumeta, Martin Boness, Zdenek Boucek, Theo Gijswijt and Juli Pujade. Our thanks also to Gary Gibson whose very helpful comments initiated several improvements to this paper. This work was granted to JLNA for the research projects DGES PB97-1241, Spanish Ministry of Education and Culture and the project “Inventory and study for the research projects DGES PB97-1241, Spanish Ministry of Education and Culture”. Our thanks also to Gary Gibson whose very helpful comments initiated several improvements to this paper. This work was granted to JLNA for the research projects DGES PB97-1241, Spanish Ministry of Education and Culture and the project “Inventory and study for the research projects DGES PB97-1241, Spanish Ministry of Education and Culture”.

References


