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Suplementos del Boletín de la Asociación española de Entomología

Taxonomy and biogeography of Iberian Amarina Bonelli, 1810 (Coleoptera, Carabidae)[1]

Taxonomía y biogeografía de los Amarina Bonelli, 1810 ibéricos (Coleoptera, Carabidae)[1]

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ABSTRACT

The systematics of Iberian Amarina Bonelli, 1810 (Coleoptera, Carabidae) is revised by updating the catalogue of species and their distribution. Keys to determine the genera, subgenera and species are included. To date, 73 species and subspecies included in 13 subgenera and 2 genera are known from Iberia. It is discussed the position of *Curtonotus* Stephens, 1828 and *Amarocelia* Motschulsky, 1862 as separate taxa in the light of new evidence. The biogeography of Amarina is also discussed; species of this subtribe show a wide distribution within the Palearctic region, whereas the whole family Carabidae shows a higher proportion of endemisms and Mediterranean elements in the Iberian Peninsula. Comments on the evolutionary history of Amarina are likewise included; the group seems to have an Asiatic European origin and colonized the Mediterranean basin when the ancient Tethys Sea was closed.

Key Words: Taxonomy, biogeography, Iberian Amarina, Carabidae

RESUMEN

Se ha revisado la sistemática de los Amarina Bonelli, 1810 ibéricos (Coleoptera, Carabidae), actualizando el catálogo de especies y su distribución y se ha elaborado claves para la determinación de géneros, subgéneros y especies. Hasta la fecha se conocen en la península Ibérica 73 especies y subespecies de Amarina, que se incluyen en 13 subgéneros y 2 géneros. Se aportan argumentos recientes y clásicos para considerar a *Curtonotus* Stephens, 1828 y *Amarocelia* Motschulsky, 1862 como taxones independientes. También se discuten aspectos biogeográficos de los Amarina ibéricos; el patrón de los taxones de esta subtribu es diferente al del conjunto de la familia Carabidae en la península ibérica, ya que la mayoría de los Amarina presentan una distribución amplia en la región Paleártica, mientras que en el conjunto de los carábidos ibéricos predominan los endemismos y los elementos mediterráneos. También se incluyen consideraciones sobre la historia evolutiva de toda la subtribu Amarina, que parece ser un grupo asiático europeo cuya llegada a la cuenca mediterránea se produjo al cerrase el antiguo mar de Tethys.

Palabras clave: Taxonomía, biogeografía, Amarina ibéricos, Carabidae

1. Work dedicated to the memory of our distinguished colleague Dr. Fritz Hieke (1930-2015).Trabajo dedicado a la memoria de nuestro insigne colega el Dr. Fritz Hieke (1930-2015)

INTRODUCTION

Researchers interested on Iberian Amarina Bonelli, 1810 are much indebted to Dr. Fritz Hieke due to his valuable contributions on this ground beetle group, that have made it possible to have accurate tools for identifying the many species of the subtribe, to increase our knowledge on their distribution, and to develop better hypotheses on their evolution and phylogeny.

Amarina is a speciose subtribe distributed in the remnants of the former Laurasia, which has radiated into 562 species (LORENZ, 2005) within the Palearctic and Nearctic regions. This huge number gives an approximate idea of the effort carried out by HIEKE when aiming to get a global taxonomic knowledge on extant taxa and their geographic distribution. His catalogues of the whole genus *Amara* Bonelli, 1810 (HIEKE, 1995, 2011), and his contributions to the Palearctic Catalogue (HIEKE, 2003, 2017), nicely resume a vast scientific contribution, built up with successive monographs and detailed revisions on particular subgenera and species. His last contribution was the description of a new species from China together with new distribution data on Oriental species (HIEKE *et al*., 2012).

A number of these contributions are needed to identify Iberian Amarina, namely those dedicated to *Zezea* Csiki, 1929*, Amara, Percosia* Zimmermann, 1832*, Camptocelia,* Jeannel, 1942, *Leironotus* Ganglbauer, 1891*, Celia* Zimmermann, 1832 and *Xenocelia* Hieke, 2001 (HIEKE, 1970, 1973, 1975, 1978, 1983, 1984, 1995, 1999, 2001), together with other papers containing many details on distribution and taxonomy of species. HIEKE (1983, 1984) also described three species endemic to the Iberian Peninsula, *Amara (Camptocelia) barcelonensis* Hieke, 1983, *A. (Camptocelia) malacensis* Hieke, 1983 and *A. (Leironotus) albarracina* Hieke, 1984.

In addition to these valuable studies, Dr. Fritz HIEKE attended plenty of demands about identification of material submitted by entomologists working with Iberian Amarina. Likewise, his expertise can be found in dozens of museum specimens that he revised, thus contributing to create a valuable reference collection for future taxonomic studies. Of particular interest is the abundant material he revised from the Museo Nacional de Ciencias Naturales in Madrid.

The Iberian Peninsula is not very rich in endemic taxa of Amarina, only 14 species out of 73. In addition to Iberian taxa described by HIEKE (1983,1984), VIVES DURÁN (1971) made a valuable contribution with the description of *A. espagnoli* J. Vives, 1971, just showing that the subgenus *Leuris* Lutshnik, 1927 has radiated into three species occupying different Pyrenean massifs. This contribution has been followed by that of E. VIVES (2018) who described *A. emmanuelivivesi* Vives, 2018 fron the eastern Pyrenees. JEANNE (1985) also published the description of *A. (Xenocelia) vivesi* Jeanne, 1985 after a vivid correspondence with HIEKE (*fide* HIEKE, 2001).

With regard to the distribution and taxonomy of Iberian Amarina, it is worth mentioning the many contributions of JEANNE (1968, 1970, 1985), which were systematically assembled and completed in two catalogues by JEANNE & ZABALLOS (1986) and ZABALLOS & JEANNE (1994). Later contributions are due to RUIZ-TAPIADOR *et al.* (2002, 2009), who added valuable records of most species and summarized current knowledge on their geographic distribution. These contributions were synthesized in the catalogue of SERRANO (2013). The last important contribution to this field is due to AGUIAR & SERRANO (2013), who have much enlarged distribution data of taxa in their catalogue of Carabidae inhabiting Portugal.

MATERIAL AND METHODS

Iberian Amarina

Taxa included in this study are listed in Table I. In the catalogue of SERRANO (2013) the subtribe included 66 species plus 3 subspecies, but this number has thereafter increased to 70 species and 3 subspecies.

A large part of the studied material is deposited in the collection of Department of Zoology of the University of Murcia. We have also revised plenty of individuals deposited in the collection of the Museo Nacional de Ciencias Naturales, Madrid (henceforth abbreviated MNCN). The majority of these individuals were revised by Hieke and are thus a valuable reference for our work.

To develop keys to taxa we have first introduced a key to separate *Amara* from *Curtonotus* Stephens, 1828, as this last taxon is here treated as a distinct genus (see discussion below). It then follows the key to subgenera of *Amara*; then comes the list of species of each subgenus with the distribution of species in the Iberian Peninsula, and the key to identify them.

Taxonomic framework

The taxonomic part has been carried out following HIEKE's papers (1983,1984) together with contributions from other authors who are familiar to entomologists working with West Palearctic Amarina. We have used as core taxonomy that put forward by HIEKE (2004) in the revised version of *Die Käfer Mittleuropas*. Other works here considered are those of JEANNEL (1942), ANTOINE (1957), HŮRKA (1996) and COULON *et al.* (2011). Although the taxonomy of French Amarina is well treated in COULON *et al.* (2011), we have also considered the contributions from MARTÍNEZ (1981) and HORELLOU (2015).

Keys to taxa of the genus *Amara* follow an alphabetical order of subgenera: *Acorius*, *Amara, Amathitis, Amarocelia*, etc. The order followed in more traditional works is intended to show phylogenetic relationships (for example, keys to subgenera *Amara* and *Zezea* are usually closely placed under the assumption that they are related lineages), but to date no formal analysis of these suspected relationships have been carried out.

Distribution data and chorological types

The source of distribution data of Iberian Amarina is the catalogue of SERRANO (2013) that summarizes the contributions of many authors published in the last three centuries. This catalogue has been updated to 2020 with a thorough review of papers published in the last years. Of particular relevance are the contributions not considered in SERRANO (2013), as are those ones by RUIZ-TAPIADOR *et al.* (2002, 2009), the Catalogue of Portugal by AGUIAR & SERRANO (2013), and a number of recent papers listed in SERRANO (2016). It has been also incorporated valuable information resulting from the identification of material deposited in the Museo Nacional de Ciencias Naturales (Madrid), during a visit carried out by J. Serrano on July 2016.

The biogeographical analysis is based on the current knowledge on Amarina indicated in the Palearctic Catalogue (HIEKE 2003, 2017), together with updated information, particularly that concerning Iberian Amarina. Categorization of species as biogeographic elements (chorological types) has been done according the criteria put forward by VIGNA

TAGLIANTI *et al.* (1992), and subsequently modified by SERRANO *et al.* (2003). These criteria are indicated in the updated electronic catalogue by SERRANO (2020) downloadable in: Monografías electrónicas SEA, vol. 9. http://sea-entomologia.org/monoelec.html

RESULTS

Taxonomy of Iberian Amarina

The list of Iberian Amarina includes 73 taxa (Table I). The subtribe is here considered to include two separate genera, *Amara* and *Curtonotus*. A first key is aimed to discriminate between them.

Key to Iberian genera of subtribe Amarina Bonelli, 1810

1. Large species (11.0 mm or more) with cordiform pronotum, anterior and posterior basis punctured; posterior angle of pronotum toothed, external fovea at posterior basis deep and broad, internal elongate (Fig. 1). Parascutelar stria well developed. Prosternum process immarginate and without setae (Fig. 2a). Apex of right paramere not hooked. Dorsal coloration dark ..... ***Curtonotus* Stephens, 1828**

• Species with other character combination: body length rarely exceeding 11.0 mm; anterior basis of pronotum usually smooth, posterior basis from punctured to smooth; pronotum shape variable, only cordiform in particular species; posterior angle of pronotum moderately or not toothed; foveae from faint to strongly impressed. Parascutelar stria usually developed but absent in particular species. Apex of right paramere hooked or not. Dorsal coloration variable, with metallic tinge (green, bronze, bluish-green) or without it (from clear yellow or pale to dark brown or black) ..... ***Amara* Bonelli, 1810**

Genus *Curtonotus* Stephens, 1828

This genus is represented in the Iberian Peninsula by a single species, *Curtonotus aulicus* (Panzer, 1796). It is characterized by a cordiform pronotum that shows a fold between external fovea of posterior basis and lateral side; anterior basis with punctures, posterior basis with abundant and marked punctures, posterior angle toothed (Photo 1 and Fig. 1). Prosternum not beaded and without setae (Fig. 2a). Setae of marginal row of elytra divided into two groups. Metepisterna punctured. Apex of aedeagus shortly ogival (Fig. 3); right paramere without hook.

Photo 1. Habitus of *Curtonotus aulicus* (Panzer, 1796). See page 31

The species is found in mountains of North and Central Peninsula, to the south in the NE Betic Chains (Nerpio, Albacete). Chorotype Siberian European.

Key to subgenera of *Amara* found in the Iberian Peninsula

1. Prosternal process marginate (Fig. 2b, c), hairless or with two setae or more (*Amara equestris* Duftschmid, 1812) **2**

• Prosternum process immarginate (Fig. 2a), always hairless **12**

2. Antennae usually bicolor, antennomeres 1, 1-2 or 1-3 pale, the other darkened, sometimes all antennomeres black. Dorsal coloration metallic, black underneath..... **3**

• Antennae unicolor, reddish or yellow. Dorsal coloration not metallic, underneath coloration variable **6**

3. Terminal spur of fore tibia trifid (Fig. 4a). Mentum tooth not emarginate medially..... ***Zezea* Csiki, 1929**

• Terminal spur of fore tibia single (Fig. 4b), not trifid. Mentum tooth usually bifid, medially divided..... **4**

4. Antennomeres 1, 1-2 or 1-3 light yellow, the others darkened ..... ***Amara*** (partim)

• All antennomeres black, at most the first three slightly reddish underneath..... **5**

5. Male metatibia with an apical fringe of setae in the internal face (Fig. 5a). Apex of seventh stria with a single seta. All antennomeres black ***Amara*** (partim)

• Male metatibia without apical fringe of setae in the internal face (Fig. 5b). Apex of seventh stria with two setae. Antennomeres 1-3 sometimes with a reddish hue underneath..... ***Amarocelia* Motschulsky, 1862**

6. Prosternum process with setae (Fig. 2b) **7**

• Prosternum process hairless (Fig. 2c) **10**

7. External fovea of pronotum basis separated from lateral side by a sharp folding. Pronotum trapezoid-shaped (Fig. 6a), side not constricted backwards, and lateral bead thickened close to hind angle. First antennomere with two setae. Prosternal process with more than six setae. Meso- and metafemur with four or more setae. Dorsal coloration dark . ***Percosia* Zimmermann, 1832**

• All these characteristics not present simultaneously: the pronotum is cordiform in *Leuris* (Fig. 6b), or shows rounded sides (*Camptocelia*, Fig. 6c); if it has a trapezoid shape (*Paracelia,* Fig. 6d), then the prosternum process only has two apical setae..... **8**

8. Usually without the two pairs of supraorbital setae that characterize the genus; likewise, the pronotum side is also devoid of setae in the first third and at hind angle; pronotum cordiform, side clearly sinuate before hind angle (Fig. 6b). First antennomere short and thickened. Apterous, metepisterna short (Fig. 7a) ..... ***Leuris* Lutshnik, 1927**

• Two pairs of supraorbital and pronotum setae present, as usual. Pronotum not cordiform, side not clearly sinuate before hind angle. First antennomere slender. Winged and with long metepisterna (Fig. 7b) **9**

9. Side of pronotum regularly arcuate and constricted forwards and backwards (Fig. 6c). First antennomere with one seta. Mesofemur with two setae (Fig. 8a)..... ***Camptocelia* Jeannel, 1942**

• Pronotum with trapezoid shape (Fig. 6d), side not or slightly constricted backwards. First antennomere with two setae. Mesofemur with four setae (Fig. 8b)..... ***Paracelia* Zimmermann, 1832**

10. Side of pronotum sinuate before hind angle (Fig. 9a). Male metatibia hairy in the internal face (except for *A. crenata*; fig. 5a). Anterior margin of epistome concave and slightly thickened (Fig. 10a). Right paramere of aedeagus without terminal hook or this being minute ... ***Bradytus* Stephens, 1827**

• Side of pronotum not sinuate before hind angle. Male metatibia not hairy brushed in the internal face; at most, short and fine setae alternate with stronger spines (Fig. 5b). Anterior margin of epistome not thickened and moderately concave, leaving visible the basis of labrum (Fig. 10b). Right paramere of aedeagus usually with terminal hook well visible..... **11**

11. Dorsal coloration dark brown, even in the margin of pronotum, microsculpture at elytron disk with large isodiametric cells (Fig. 11a).

Male prosternal process with a small punctured fovea (Fig. 2c). Last male ventrite with four setae ..... ***Xenocelia*** **Hieke, 2001**

• Dorsal coloration from reddish to yellowish brown, particularly in the pronotum margin, this rarely dak. Microsulpture at elytron disk shallower due to minute and almost isodiametric cells (Fig. 11b). Male prosternal process without punctured fovea. Last male ventrite with two setae ..... ***Celia*** **Zimmermann, 1832**

12. Parascutelar stria absent or rudimentary..... ***Leironotus*** **Ganglbauer, 1891**

• Parascutelar stria normally developed **13**

13. Maximum width of pronotum at middle, side rightly narrowed towards hind angle (Fig. 12a), disk convex. Head punctured near pronotum, punctures sparse in the whole pronotum. Elytron striae almost impunctate. Meso- and metafemur with two setae in the ventral side. Dorsal coloration brown. Apex of aedeagus relatively slender (Fig. 13a)... ***Acorius*** **Zimmermann, 1831**

• Pronotum transverse, maximum width in the first third, side sinuate before hind angle, disk moderately convex (Fig. 12b). Head not punctured posteriorly. Punctures of pronotum scarce and shallow, limited to posterior basis. Elytron striae punctate. Meso and metafemur with 6-5 setae in the ventral side. Dorsal coloration testaceous. Apex of aedeagus rounded (Fig. 13b)..... ***Amathitis*** **Zimmermann, 1832**

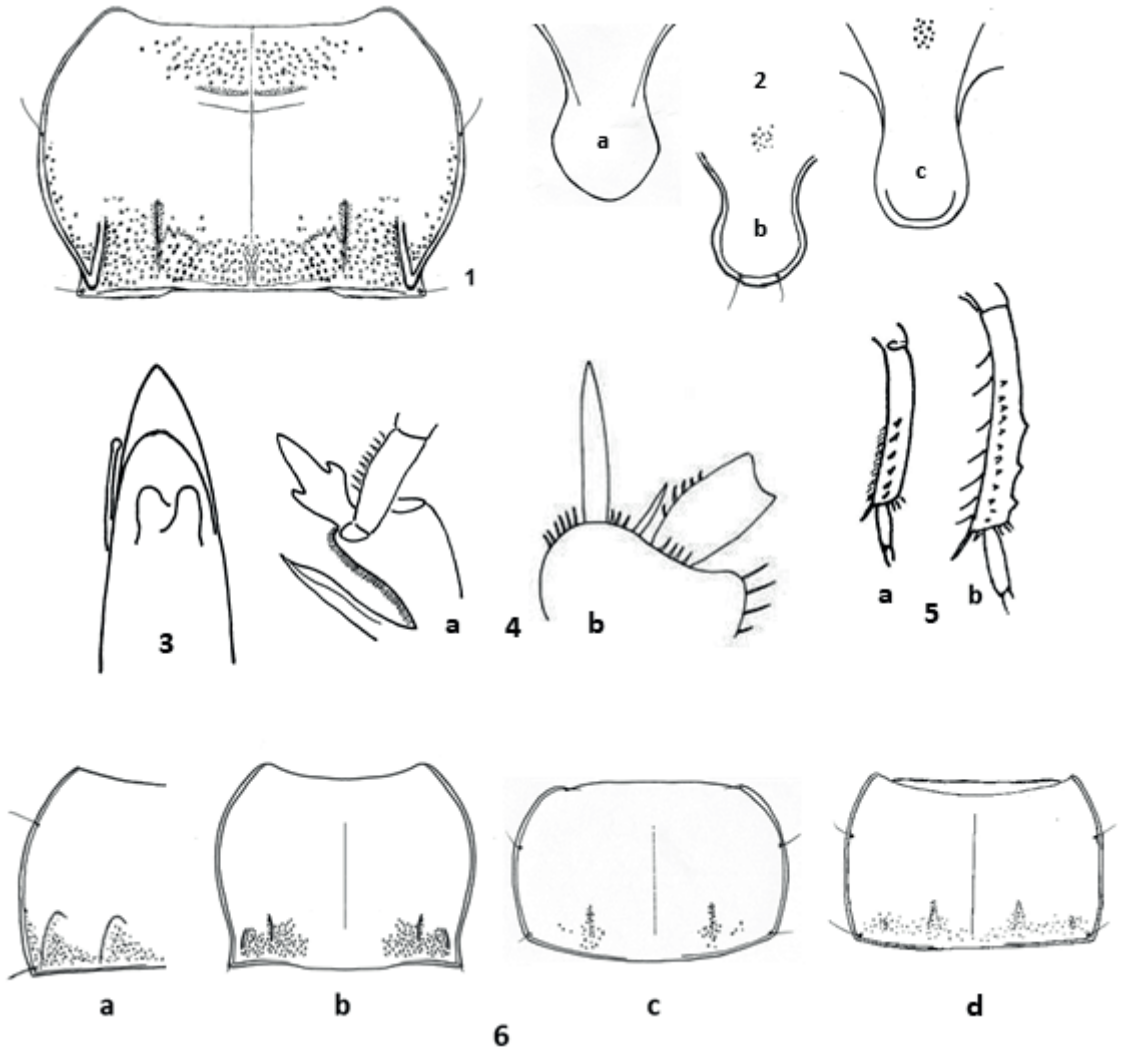

Fig. 1. Pronotum of *Curtonotus aulicus.* Fig. 2. Prosternum process of (a) *Curtonotus aulicus*; (b) *Amara (Paracelia) simplex*; (c) *A. (Xenocelia) ingenua.* Fig. 3. Median lobe of aedeagus of *Curtonotus aulicus.* Fig. 4. Apical spur of fore tibia of (a) *Amara (Zezea) plebeja*; (b) *A. (Amara) eurynota.* Fig. 5. Male metatibia of (a) *Amara (Bradytus) apricaria*; (b) *A. (Xenocelia) ingenua*. Fig. 6. Pronotum of (a) *Amara (Percosia) equestris*; (b) *A. (Leuris) pyrenaea*; (c) *A. (Camptocelia) affinis*; (d) *A. (Paracelia) simplex.*

Fig. 1. Pronoto de *Curtonotus aulicus.* Fig. 2. Saliente prosternal de (a) *Curtonotus aulicus*; (b) *Amara (Paracelia) simplex*; (c) *A. (Xenocelia) ingenua.* Fig. 3. Ápice del lóbulo medio del edeago de *Curtonotus aulicus.* Fig. 4. Espina apical de la protibia de (a) *Amara (Zezea) plebeja*; (b) *A. (Amara) eurynota.* Fig. 5. Metatibia del macho de *Amara (Bradytus) apricaria*; (b) *A. (Xenocelia) ingenua*. Fig. 6. Pronoto de (a) *Amara (Percosia) equestris*; (b) *A. (Leuris) pyrenaea*; (c) *A. (Camptocelia) affinis*; (d) *A. (Paracelia) simplex.*

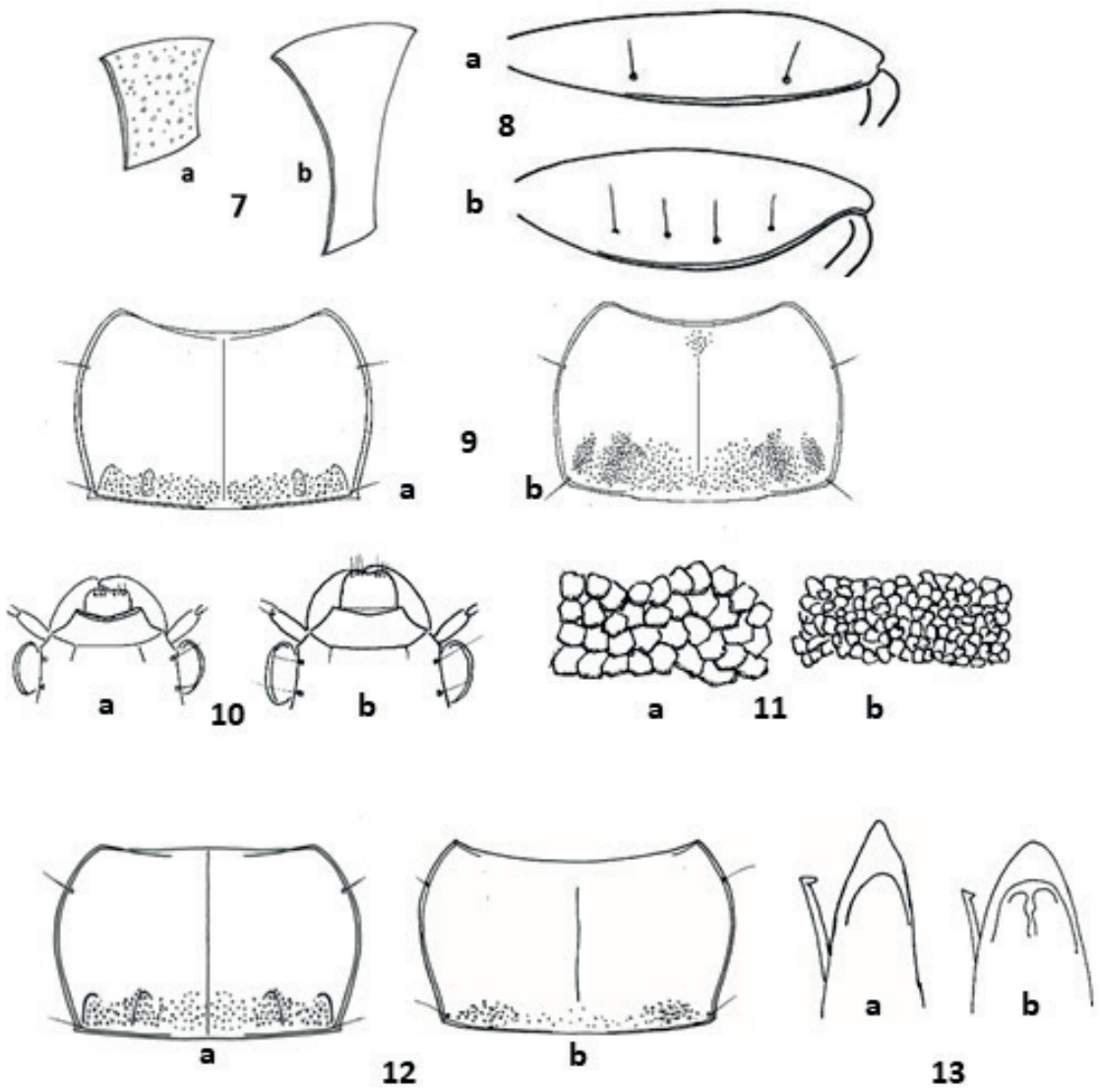

Fig. 7. Metepisterna of *Amara (Leuris) espagnoli;* (b) *A. (Paracelia) simplex*. Fig. 8. Mesofemur of (a) *Amara (Camptocelia) gravidula testudinea*; (b) *A. (Paracelia) simplex*. Fig. 9. Pronotum of (b) *Amara (Bradytus) apricaria*; (b) *A. (Celia) sollicita*. Fig. 10. Anterior border of epistome emarginate in (a) *Amara (Bradytus) apricaria*; not emarginate in (b) *Amara (Xenocelia) ingenua*. Fig. 11. Microsculpture of elytron of (a) *A. (Xenocelia) ingenua*; (b) *A. (Celia) fervida*. Fig. 12. Pronotum of (a) *Amara (Acorius) metallescens*; (b) *A. (Amathitis) rufescens shismatica*. Fig. 13. Apex of aedeagus of (a) *Amara (Acorius) metallescens*; (b) *A. (Amathitis) rufescens shismatica*.

Fig. 7. Metaepisterna of *Amara (Leuris) espagnoli;* (b) *A. (Paracelia) simplex*. Fig. 8. Mesofémur de (a) *Amara (Camptocelia) gravidula testudinea*; (b) *A. (Paracelia) simplex*. Fig. 9. Pronoto de (b) *Amara (Bradytus) apricaria*; (b) *A. (Celia) sollicita*. Fig. 10. Borde anterior del epistoma engrosado en (a) *Amara (Bradytus) apricaria*; sin engrosar en (b) *Amara (Xenocelia) ingenua*. Fig. 11. Microescultura del élitro de (a) *A. (Xenocelia) ingenua*; (b) *A. (Celia) fervida*. Fig. 12. Pronoto de (a) *Amara (Acorius) metallescens*; (b) *A. (Amathitis) rufescens shismatica*. Fig. 13. Ápice del edeago de (a) *Amara (Acorius) metallescens*; (b) *A. (Amathitis) rufescens shismatica*.

Key to identify the species

Subgenus *Acorius* Zimmermann, 1831

The subgenus includes a single species *Amara (Acorius) metallescens* (Zimmermann, 1831) (Photo 2).

Photo 2. Habitus of *Amara (Acorius) metallescens* (Zimmermann, 1831). See page 32

Body length 7-9 mm. Winged, dorsum reddish brown, shiny in males, mat in females. Frontal furrows short and well-marked, eye prominent. Pronotum slightly cordiform (Fig. 12a). Elytra long, almost parallel, humeri well-marked and with a small tooth. Foretibia with two spurs, one large and one small; prosternum process not apically bordered and without setae, male without median fovea. Apex of aedeagus ogival (Fig. 13a).

Littoral from Algarve to Valencia and salty places of ancient basins in both Submesetas and the Ebro valley; Ibiza and Majorca. Mediterranean element.

Subgenus *Amara* Bonelli, 1810

This subgenus is the most diverse in the Iberian Peninsula with 18 species. Most of them show a wide distribution within the Palearctic or the Holarctic regions. Most species show a dorsal green bronze metallic coloration that may vary to blue green, deep green or black. Body size varies between 6-13 mm. The pronotum is typically trapezoid, antennomeres 1-3 are often pale, the others are dark. Species of this subgenus resemble those of subgenus *Zezea* Csiki, 1929 but are readily distinguishable by the shape of the terminal spine in the protibia, single in *Amara*, trifid in *Zezea*.

• *Amara (Amara) aenea* (DeGeer, 1774) (*palustris* Gistel, 1857). Iberian Peninsula and Balearic Islands. Palearctic. The most common *Amara* species in Iberia.

• *Amara (Amara) anthobia* A. et J. B. Villa, 1833. Almost the entire Iberian Peninsula: recorded in the South in Barranco del Teatino (Granada), NE Betic chains; El Almendral (Huelva; López-Pérez et al., 2014); Cartagena (MNCN Madrid). European.

• *Amara (Amara) communis* (Panzer, 1797). Northern and Central Iberian Peninsula. Asiatic European.

• *Amara (Amara) convexior* Stephens, 1828. Atlantic Iberian Peninsula. Central Asiatic European.

• *Amara (Amara) curta* Dejean, 1828. Pyrenees, Cantabrian Chain and Northern Iberian System: coll of Piqueras (Soria). Siberian European.

• *Amara (Amara) eurynota* (Panzer, 1796). Northern and Central Peninsula, localized in sites of Granada and Murcia to the South. Palearctic.

• *Amara (Amara) famelica* Zimmermann, 1832. Northern Peninsula, towards SW reaches serra da Estrela (Portugal). Siberian European.

• *Amara (Amara) familiaris* (Duftschmid, 1812). Northern and Central Peninsula, also in NE Betic chains. Asiatic European.

• *Amara (Amara) lucida* (Duftschmid, 1812) (*chobauti* Puel, 1924). Cited in all Portugal (AGUIAR & A. SERRANO, 2013) and Andalusia: Igualeja (Málaga), coll of Las Palomas (Jaén). European.

• *Amara (Amara) lunicollis* Schiodte, 1837. Atlantic Peninsula and Catalonian Chain. Asiatic European.

• *Amara (Amara) montivaga* Sturm, 1825. Northern Peninsula. European.

• *Amara (Amara) nigricornis* Thomson, 1857 (*natvigi* Csiki, 1929). Eastern Pyrenees: port of Cabús, 2400 m (Andorra) and Puigmal, 2350 m (Cerdaña), Nou Creus (Gerona); Cantabrian Chain: Macizo del Sueve (Asturias). Siberian European.

• *Amara (Amara) nitida* Sturm, 1825. Atlantic Peninsula, more frequent in mountains. Siberian European.

• *Amara (Amara) ovata* (Fabricius, 1792). Mountains of northern and Central Peninsula; NE Betic chains; whole Portugal. Asiatic European.

• *Amara (Amara) proxima* Putzeys, 1866. Hieke has studied individuals from "Cuenca, Castilien", La Puebla de Don Fadrique (Granada) and Santiago de la Espada (Jaén); it seems that the species inhabits the eastern half of Mediterranean Iberia. Turanic South European.

• *Amara (Amara) similata* (Gyllenhal, 1810). Almost the entire Peninsula, less frequent in the west; Majorca. Palearctic (Photo 3).

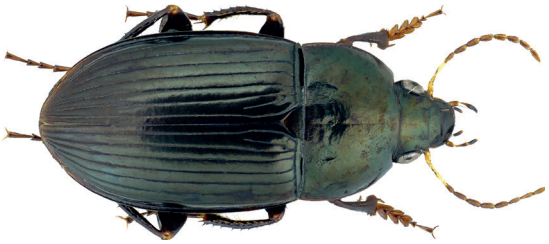

Photo 3. Habitus of *Amara* (*Amara*) *similata* (Gyllenhal 1810). See page 33

• *Amara (Amara) subconvexa* Putzeys, 1865 (*palustris* Baudi di Selve 1864, no Gistel, 1857). Mediterranean Peninsula, in the NW up to Bragança, in the NE in Sélles (Lérida). West Mediterranean.

• *Amara (Amara) tibialis* (Paykull, 1798). Central Pyrenees: lake of San Mauricio (Lérida), Bourg Madame and Osséja (Cerdaña). Asiatic European.

Key to species of the subgenus *Amara* Bonelli, 1810

1. Elytra with parascutelar pore **2**

• Elytra without parascutelar pore **8**

2. Setiferous pore near hind pronotum angle closer to pronotum basis and well separated from side (Figs. 14a, b); basis with few and sparse punctures and foveae shallow. Setae of elytron margin forming groups of 6+1+8. Striae deeper at apex. Dorsal coloration metallic, three first antennomeres pale. Body size 7.0-9.5 mm **3**

• Setiferous pore equally distant from pronotum basis and lateral side (Fig. 16), or if it is slightly closer to basis, then punctures are abundant (Fig. 21, *A. communis, A. convexior*). The other characters vary among taxa but do not show the same combination described above **4**

3. Anterior angle of pronotum acute, approaching eye (Fig. 14a), pronotum broadened posteriorly. Tibiae dark green or blue, rarely coppery. Apical shaft of aedeagus triangular and slightly rounded apically, hook of right paramere minute (Fig. 15a). 7.5-9.5 mm ..... ***montivaga***

• Anterior angle of pronotum rounded (Fig. 14b), pronotum less broadened backwards. Parascutelar stria sometimes missing. Tibiae reddish with coppery hue. Apical shaft of aedeagus longer than wider, apex largely rounded, hook of right paramere well developed (Fig. 15b). 7.0-9.0 mm ..... ***nitida***

4. Legs yellow. Marginal setae of elytron forming three groups of 6+1+8. First four antennomeres pale. Apex of aedeagus shortly ogival, as in fig. 17e. Body length 5.0-7.0 mm ..... ***anthobia***

• At least femora darkened. Marginal setae of elytron forming a single continuous group. Only the three first antennomeres pale **5**

5. Elytron striae not deepening at apex. Pronotum trapezoid, outer fovea shallow, inner fovea deep and punctate (Fig. 16a). Male mesotibia not hairy at inner side of apex. Apical shaft of aedeagus large and progressively narrowed to tip (Fig. 17a). Body size large, 9.0-13 mm ..... ***eurynota***

• Elytron striae deepening at apex. Male mesotibia with or without hairy inner side. Body size smaller than 10 mm **6**

6. Posterior basis of pronotum almost smooth (Fig. 16b); pronotum broadest before posterior basis, this wider than that of elytron. Tibiae darkened, male mesotibia with hairy inner side. Aedeagus as in fig. 17b. Body size 8.0-10 mm ..... ***ovata***

• Posterior pronotum basis with shallow but evident punctures (Fig. 16c, *A. similata*); pronotum broadest at posterior basis, this as wide as elytron basis. Tibiae reddish, paler than femora **7**

7. Foveae of pronotum basis well impressed and punctured (Fig. 16c). Male meta- and mesotibia hairy close to apex of inner side. Apical shaft of aedeagus slightly longer than wider, rounded (Fig. 17c). Dorsal coloration coppery. Larger size, 7.5-10 mm..... ***similata***

• Foveae of pronotum basis usually with shallow, fine and sparse punctures (Fig. 16d). Male mesotibia not hairy close to apex of inner side. Apical shaft of aedeagus notably narrowed to tip (Fig. 17d). Dorsal coloration brown dark. Body size smaller, 7.0-8.0 mm..... ***subconvexa***

8. Legs yellow or reddish. Striae deepening close to elytron apex; marginal setae of elytron making up three groups of 6+1+8. Male mesotibia hairless on inner side of apex. Terminal hook of right paramere minute or absent **9**

• Legs dark, at least femora are black or dark brown. Usually, terminal hook of right paramere well-visible. The other characters vary in each species **10**

9. Anterior angle of pronotum protruding (Fig. 18a). Male protarsomeres well dilated (Fig. 19a). Legs yellow. Aedeagus as in fig. 20a. Body size 5.0-7.0 mm ..... ***familiaris***

• Anterior angle of pronotum hardly protruding (Fig. 18b). Male protarsomeres moderately dilated (Fig. 19b). Legs reddish or red-yellowish. Aedeagus as in fig. 20b. Body size 4.5-6.0 mm ..... ***lucida***

10. Antennae uniformly black, only the first antennomere is dark red. Internal angle of foretibia protruding. Pronotum basis smooth, fovea shallow. Striae fine, not deepened at elytron apex; marginal setae of elytron forming a continuous row. Legs dark. Dorsum with coppery hue, particularly in elytron surface. Apex of aedeagus short and wide, tip rounded (Fig. 20c). Body size 7.0-8.5 mm ..... ***nigricornis***

• At least the first two antennomeres pale **11**

11. Striae clearly deepening towards elytron apex **12**

• Striae not deepened towards elytron apex **17**

12. Setiferous pore in the posterior angle of pronotum 2-3 times closer to basis than to lateral side (Figs. 14, 21) **13**

• Setiferous pore in the posterior angle of pronotum just situated in the angle (Fig. 24) **16**

13. External apical angle of protibia protruding. The two first antennomeres reddish, the second may be darkened towards apex. Posterior basis of pronotum with sparse and fine punctures, impressions shallow. Aedeagus as in fig. 23. Body size 6,5-8,5 mm ..... ***lunicollis***

• External apical angle of protibia not protruding. Coloration of antennae and legs variable **14**

14. Anterior angle of pronotum rounded, not protruding; posterior basis of pronotum almost smooth (Fig. 14b). Antennomeres 1-3 pale, as the beginning of the fourth ..... ***nitida***

• Anterior angle of pronotum protruding or acute; posterior basis of pronotum with punctures of varying density (Fig. 24). At most the first three antennomeres pale **15**

15. External impression of posterior basis of pronotum shallow, the inner one well-marked (Fig. 21a). Marginal setae of elytron forming groups of 6+1+8. Apical shaft of aedeagus ogive-shaped (Fig. 22a). Body size smaller, 6.0-7.5 mm ..... ***communis***

• External impression of posterior basis of pronotum rather shallow, the inner one well-marked (Fig. 21b). Marginal setae of elytron forming a continuous row of 20 setae. Apical shaft of aedeagus scarcely narrowed to apex, apex rounded (Fig. 22b). Body size larger, 7,0-8,5 mm..... ***convexior***

16. Tibiae paler than femora. Antennomeres 1-2 reddish. Pronotum side almost straight near posterior angle (Fig. 24a). Apex of aedeagus as in fig. 25a. Dorsal coloration with a brownish hue. Body size 5.5-7 mm..... ***curta***

• Tibiae and femora pale. Antennomeres 1-3 pale. Pronotum widened backwards up to posterior angle (Fig. 24b). Apex of aedeagus as in fig. 25b. Dorsal coloration with coppery hue. Body size 7-8.5 mm..... ***proxima***

17. Rather small body size, 4.0-5.0 mm. Pronotum almost straight at hind angle, both impressions of posterior basis shallow, this with few punctures (Fig. 26a). Body subparallel, dorsum convex. Parascutelar stria almost rudimentary. Three first antennomeres pale but the third darkened at apex. Tibiae pale. Apex of aedeagus in slender ogive, right paramere with minute hook (Fig. 27a) ..... ***tibialis***

• Body size larger than 6 mm. Oval habitus shape, dorsum moderately convex. Parascutelar stria well-developed. Antennomeres 1, or 1-3 pale. Tibiae darkened or black **18**

18. Three first antennomeres pale. External basal fovea of pronotum shallow and with sparse punctures, inner fovea linear and well-marked; seta of posterior angle equally distant from basis and side (Fig. 26b). Dorsum of varying coloration from black to bronze, green or blue-green, black coloration in alpine environments. Femora dark, tibiae paler. Apex of aedeagus slender, longer than wider, scarcely narrowed; hook of right paramere evident (Fig. 27b). Body size 6-8.5 mm. The most common *Amara* species in many areas of the Iberian Peninsula ..... ***aenea***

• Only the first antennomere pale. External basal fovea of pronotum shallow but visible; punctures on posterior basis of pronotum sparse; seta of posterior angle close to basis, separated from side (Fig. 26c). Tibiae black. Apex of aedeagus triangular, progressively narrowed; hook of right paramere minute (Fig. 27c). Body size 7-8.5 mm ..... ***famelica***

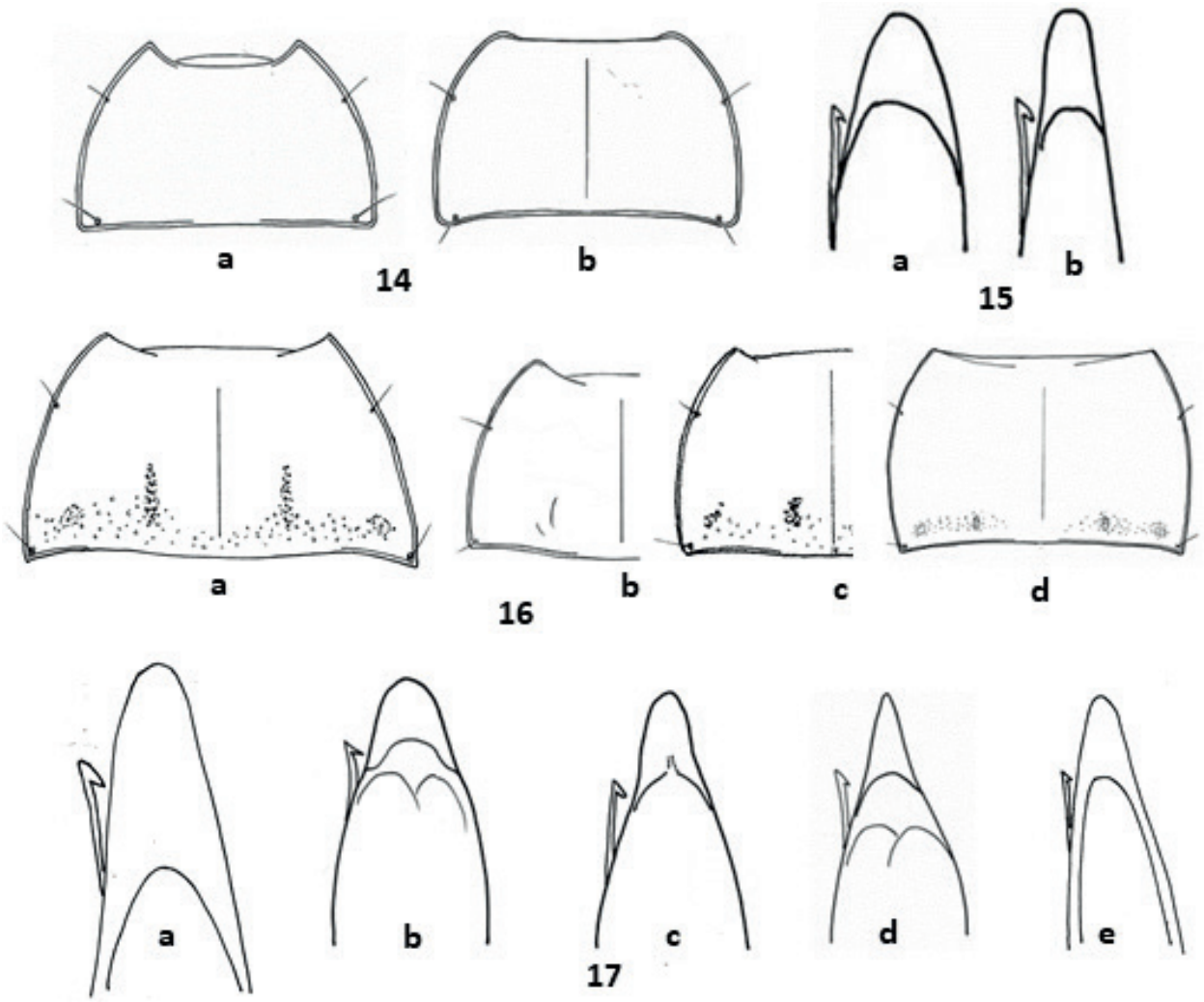

Fig. 14. Pronotum of (a) *A. (Amara) montivaga*; (b) *A. (Amara) nitida*. Fig. 15. Apex of aedeagus of (a) *A. (Amara) montivaga*; (b) *A. (Amara) nitida*. Fig. 16. Pronotum of (a) *A. (Amara) eurynota*; (b) *A. (Amara) ovata*; (c) *A. (Amara) similata*; (d) *A. (Amara) subconvexa*. Fig. 17. Apex of aedeagus of (a) *A. (Amara) eurynota*; (b) *A. (Amara) ovata*; (c) *A. (Amara) similata*; (d) *A. (Amara) subconvexa*; (e) *A. (Amara) anthobia*.

Fig. 14. Pronoto de (a) *A. (Amara) montivaga*; (b) *A. (Amara) nitida*. Fig. 15. Ápice del edeago de (a) *A. (Amara) montivaga*; (b) *A. (Amara) nitida*. Fig. 16. Pronoto de (a) *A. (Amara) eurynota*; (b) *A. (Amara) ovata*; (c) *A. (Amara) similata*; (d) *A. (Amara) subconvexa*. Fig. 17. Ápice del edeago de (a) *A. (Amara) eurynota*; (b) *A. (Amara) ovata*; (c) *A. (Amara) similata*; (d) *A. (Amara) subconvexa*; (e) *A. (Amara) anthobia*.

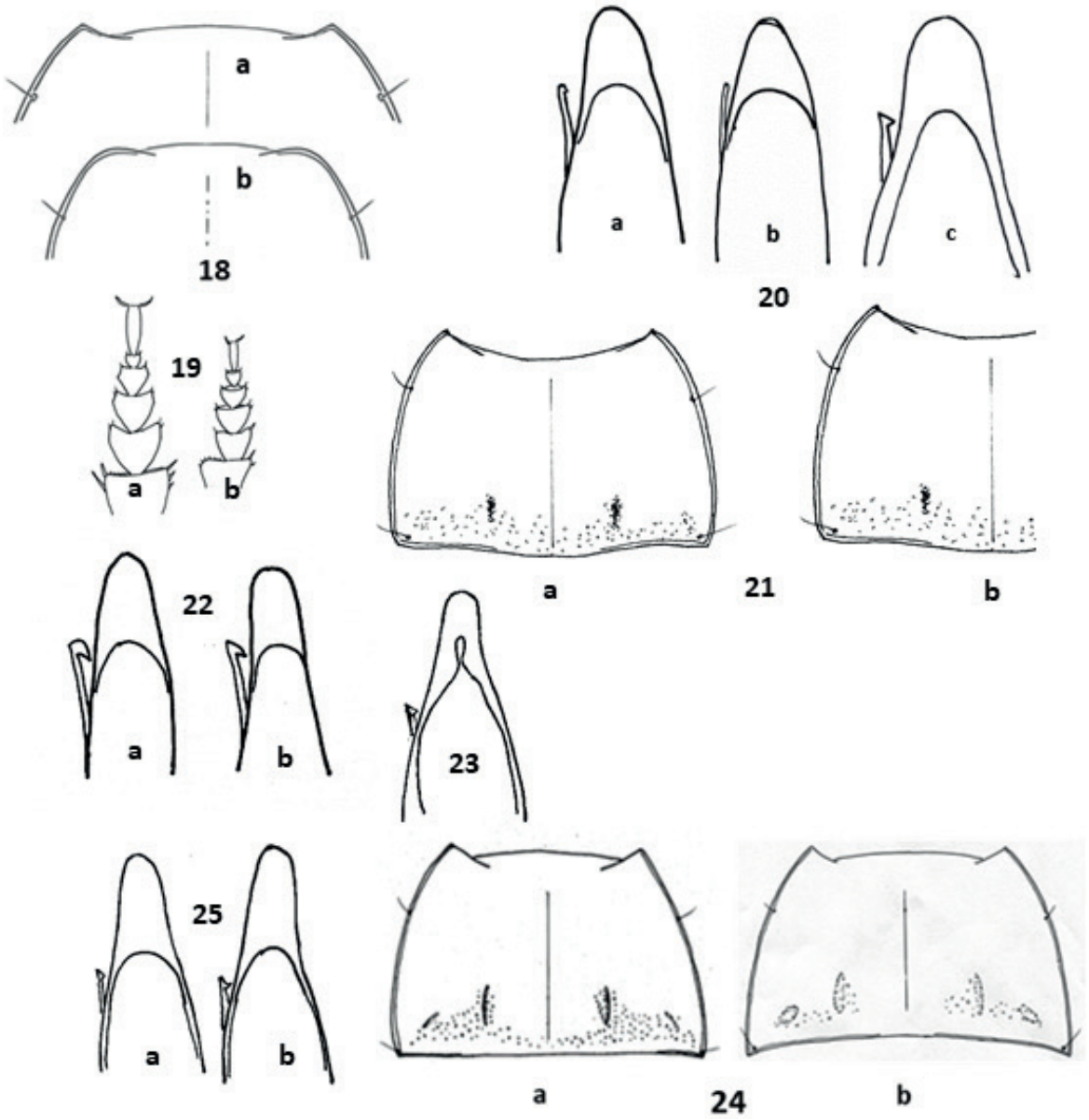

Fig. 18. Detail of anterior angle of pronotum of (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida*. Fig. 19. Male protarsomeres of (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida*. Fig. 20. Apex of aedeagus of (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida;* (c) *A. (Amara) nigricornis.* Fig. 21. Pronotum of (a) *Amara (Amara) communis*; (b) *A. (Amara) convexior*. Fig. 22. Apex of aedeagus of (a) *Amara (Amara) communis*; (b) *A. (Amara) convexior*. Fig. 23. Apex of aedeagus of *A. (Amara) lunicollis*. Fig. 24. Pronotum of (a) *Amara (Amara) curta;* (b) *A. (Amara) proxima.* Fig. 25. Apex of aedeagus of (a) *Amara (Amara) curta;* (b) *A. (Amara) proxima.*

Fig. 18. Detalle del ángulo anterior del pronoto de (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida*. Fig. 19. Protarsómeros del macho de (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida*. Fig. 20. Ápice del edeago de (a) *Amara (Amara) familiaris*; (b) *A. (Amara) lucida;* (c) *A. (Amara) nigricornis.* Fig. 21. Pronoto de (a) *Amara (Amara) communis*; (b) *A. (Amara) convexior*. Fig. 22. Ápice del edeago de (a) *Amara (Amara) communis*; (b) *A. (Amara) convexior*. Fig. 23. Ápice del edeago de *A. (Amara) lunicollis*. Fig. 24. Pronoto de (a) *Amara (Amara) curta;* (b) *A. (Amara) proxima.* Fig. 25. Ápice del edeago de (a) *Amara (Amara) curta;* (b) *A. (Amara) proxima.*

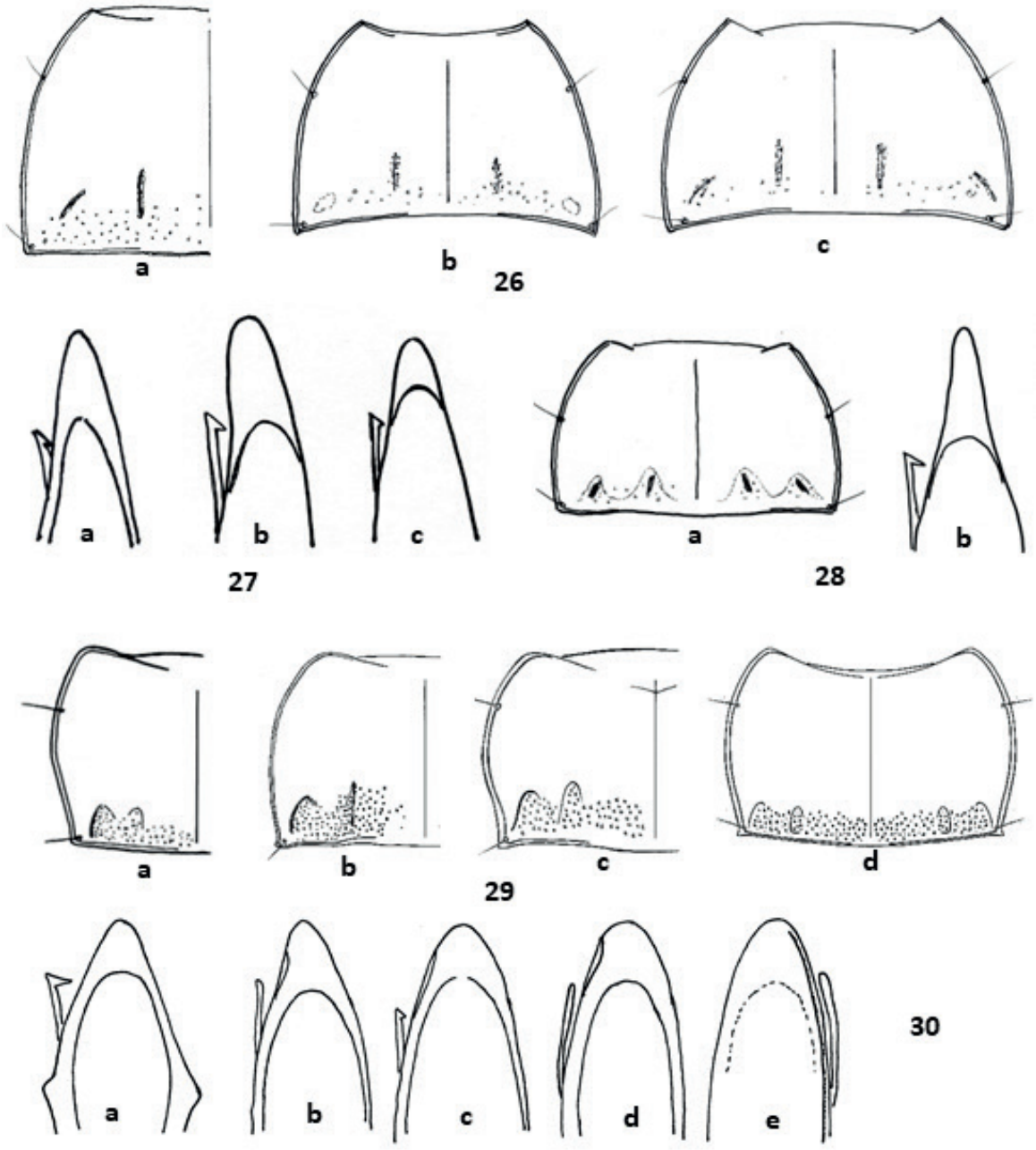

Fig. 26. Pronotum of (a) *Amara (Amara) tibialis*; (b) *A. (Amara) aenea*; (c) *A. (Amara) famelica.* Fig. 27. Apex of aedeagus of (a) *Amara (Amara) tibialis*; (b) *A. (Amara) aenea*; (c) *A. (Amara) famelica*. Fig. 28. Pronotum (a) and apex of aedeagus of *Amara (Amarocelia) erratica*. Fig. 29. Pronotum of (a) *Amara (Bradytus) crenata*; (b) *A. (Bradytus) consularis*; (c) *A. (Bradytus) fulva*; (d) *A. (Bradytus) apricaria*. Fig. 30. Apex of median lobe of aedeagus of (a) *Amara (Bradytus) crenata*; (b) *A. (Bradytus) consularis;* (c) *A. (Bradytus) fulva*; (d-e) *A. (Bradytus) apricaria* (d, dorsal view; e, ventral view).

Fig. 26. Pronoto de (a) *Amara (Amara) tibialis*; (b) *A. (Amara) aenea*; (c) *A. (Amara) famelica.* Fig. 27. Ápice del edeago de (a) *Amara (Amara) tibialis*; (b) *A. (Amara) aenea*; (c) *A. (Amara) famelica*. Fig. 28. Pronoto (a) y ápice del edeago de *Amara (Amarocelia) erratica*. Fig. 29. Pronoto de (a) *Amara (Bradytus) crenata*; (b) *A. (Bradytus) consularis*; (c) *A. (Bradytus) fulva*; (d) *A. (Bradytus) apricaria*. Fig. 30. Ápice del lóbulo medio del edeago de (a) *Amara (Bradytus) crenata*; (b) *A. (Bradytus) consularis;* (c) *A. (Bradytus) fulva*; (d-e) *A. (Bradytus) apricaria* (d, vista dorsal; e, vista ventral).

Subgenus *Amarocelia* Motschulsky, 1862

This subgenus includes in Iberia a single species. The subgenus has been often considered as synonym of *Celia*.

Amara (Amarocelia) erratica erratica (Duftschmid, 1812) has a body length of 6-8 mm. Dorsal coloration varies from metallic dark green to black; all appendices are black-colored but first antennomeres are dark reddish underneath. Eyes well-developed. Anterior angle of pronotum protruding; side narrowed anteriorly but not backwards, posterior angle almost straight; inner and outer foveae well marked, with scarce and fine punctures (Fig. 28a). Striae of elytron fine and with fine punctures; interstriae almost flat. Apex of aedeagus slender and narrowed (Fig. 28b).

Central Pyrenees, from peak Puigmal to peak Arlas. Holarctic element.

Subgenus *Amathitis* Zimmermann, 1832

The subgenus includes in the Iberian Peninsula a single taxon, *Amara (Amathitis) rufescens shismatica* Antoine, 1957.

Body length 8-10 mm (Photo 4). Dorsum pale testaceous. Head wide, eyes not prominent, frontal furrows long, all this area notably depressed. Pronotum transverse and notably sinuate before posterior angle (Fig. 12b). Elytra almost transparent, Winged. Prosternum process without posterior border, male showing a small fovea. Meso- and metafemur with a row of large setae on the ventral side. Apex of aedeagus in short and rounded ogive (Fig. 13b). This species is visually well recognizable from other Iberian *Amara* by the pale dorsal coloration.

Littoral of Algarve and from Almería to Valencia; salty places of both Submesetas and the Ebro River Valley. North African element.

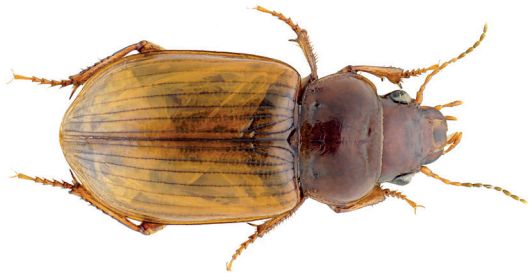

Photo 4. Habitus of *Amara (Amathitis) rufescens shismatica* Antoine, 1957). See page 34

Subgenus *Bradytus* Stephens, 1827

Species of this subgenus show a transversal pronotum with maximum width at middle and sides narrowed forward, often sinuate before hind angle; pronotum basis notably punctate. Head wide. Dorsum is brown-colored and body size is small-medium, 6.5-9 mm. Most species show an euroasiatic distribution and only a few taxa are found in the Mediterranean.

• *Amara (Bradytus) apricaria* (Paykull, 1790). Almost the entire Peninsula, Minorca. Holarctic (Photo 5).

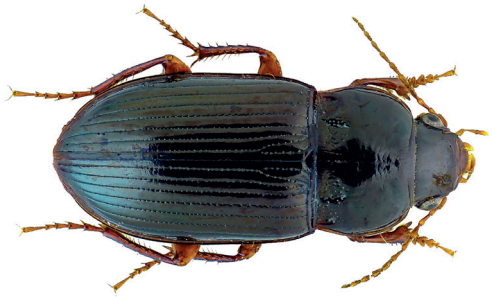

Photo 5. Habitus of *Amara (Bradytus) apricaria* (Paykull, 1790). See page 35

• *Amara (Bradytus) consularis* (Duftschmid, 1812). Atlantic Peninsula. Siberian European.

• *Amara (Bradytus) crenata* Dejean, 1828; to be confirmed from provinces of Zaragoza and Barcelona. Turanic European.

• *Amara (Bradytus) fulva* (O. F. Muller, 1776). North and Central Peninsula, to be confirmed from Portugal and Balearic Islands. Siberian European.

Key to Iberian species of subgenus *Bradytus*

1. Median tooth of mentum simple, not bifid. Anterior angle of pronotum marked; side largely sinuate before hind angle (Fig. 29a). Male metatibia not hairy in the apical part of the inner side. Sides of median lobe of aedeagus toothed (Fig. 30a). Body size 7.5-8.5 mm ..... ***crenata*.**

• Median tooth of mentum bifid. Anterior angle of pronotum and side before hind angle variable (Fig. 29b-d). Male metatibia hairy in the apical part of the inner side. Sides of median lobe of aedeagus not toothed; a long groove runs underneath right side (Fig. 30e), only appreciable in dorsal view as a more or less brief notch close to tip (Fig.30b-d)..... **2**

2. Pronotum slightly constricted close to hind angle and weakly sinuate before this angle. Pronotum basis punctured except for middle (Fig. 29b). Prosternal process rounded. Right paramere of median lobe of aedeagus hooked (Fig. 30b). Gonostyle with distal segment broad and rounded. Body size 7-9 mm ..... ***consularis*.**

• Pronotum side notably constricted backwards, clearly sinuate before hind angle (Figs. 29c-d). Right paramere of median lobe of aedeagus not hooked or hook rather small (Figs. 30c-e)..... **3**

3. Anterior angle of pronotum protruding although rounded; pronotum transverse, not cordiform (Fig. 29c). Elytron striae fine and with shallow punctures. Prosternal process slightly acute. Length of second antennomere equal to half of fourth. Apical shaft of aedeagus shorter and rounded (Fig. 30c). Distal segment of gonostyle slender and narrow, apically not rounded. Body size 7.5-9 mm..... ***fulva***

• Anterior basis of pronotum regularly arcuate, angle slightly acute; pronotum slightly cordiform (Fig. 29d). Elytron striae marked, punctures well impressed. Prosternal process rounded. Length of second antennomere equal to 2/3 of fourth. Apical shaft of aedeagus rounded (Fig. 30d). Distal segment of gonostyle slender and notched in the internal side. Body size smaller, 6.5-8 mm ..... ***apricaria***

Subgenus *Camptocelia* Jeannel, 1942

Species of this subgenus are characterized by a transversal and rounded pronotum with maximum width at middle, small body size and testaceous dorsal coloration. Punctuation of pronotum basis is variable, from dense to almost vanishing. Most species are found in the Mediterranean basin, sometimes in arid and sandy habitats.

• *Amara (Camptocelia) affinis* Dejean, 1828. Mediterranean Peninsula. Iberian Maghrebine.

• *Amara (Camptocelia) arcuata arcuata* (Putzeys, 1865). From Estepona (Málaga) to Torrevieja (Alicante).

- *Amara (Camptocelia) arcuata castiliana* Hieke, 1983. Central System, serra da Estrela, Southern Meseta, Algarve. Endemic.

• *Amara (Camptocelia) barcelonensis* Hieke, 1983. Hills surrounding Barcelona. Endemic.

• *Amara (Camptocelia) brevis* Dejean, 1828 Mediterranean Peninsula. West Mediterranean.

• *Amara (Camptocelia) corpulenta* (Putzeys, 1866). Penibetic sierras (from Málaga to Almería), NE Betic sierras, atlantic basin of the Iberian

Peninsula: Miranda do Douro (Bragança), Manteigas (Guarda), Lisboa, El Escorial (Madrid), Uclés (Cuenca). West Mediterranean.

• *Amara (Camptocelia) cottyi cottyi* Coquerel, 1859. SE half of the Peninsula, from Málaga to Gerona, sparse in the innerland: Aranjuez (Madrid), Monteagudo (Navarra). Possibly a Betic-Riffian element.

• *Amara (Camptocelia) eximia* Dejean, 1828. Almost all the Peninsula but not cited in Galicia. Catalan Provençal pattern (Photo 6).

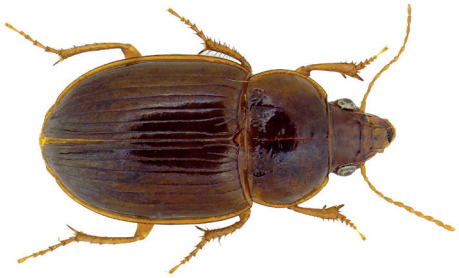

Photo 6. Habitus of *Amara (Camptocelia) eximia* Dejean, 1828. See page 36

• *Amara (Camptocelia) gravidula gravidula* Rosenhauer, 1856. Sierra de Ronda (Málaga). Endemic.

- *Amara (Camptocelia) gravidula testudinea* Putzeys, 1865. Sierra Nevada (Granada). Endemic.

• *Amara (Camptocelia) malacensis* Hieke, 1983. Sierra de Ronda (Málaga). Endemic.

• *Amara (Camptocelia) rotundata* Dejean, 1828. Rare in the western Peninsula: Béjar (Salamanca), Setúbal, Beja and Coto de Doñana (Huelva). Iberian Maghrebine.

Key to Iberian species of subgenus *Camptocelia*

1. External fovea of pronotum basis deep and small, equally distant from inner fovea and lateral side, sometimes mixed with inner fovea (Fig. 31a) **2**

• External fovea of pronotum basis closer to lateral side than to inner fovea, sometimes almost erased (Figs. 31c, d) **3**

2. Eye not convex, hardly protruding from head. Pronotum only slightly constricted backwards. Male prosternum without fovea. Apex of aedeagus briefly triangular (Fig. 32a). Dorsum brown reddish. Body length 8.0 mm. Only known from the outskirts of Barcelona..... ***barcelonensis***

• Eye convex, clearly protruding from head. Pronotum constricted backwards (Fig. 31a); foveae well impressed and punctured. Male prosternum with fovea. Aedeagus with a well-developed apical lamella (Fig. 32b). Dorsum dark or yellowish brown. Body length 6.5-8.5 mm ..... ***eximia***

3. Anterior angle of pronotum slightly protruding; posterior basis with few punctures; foveae reduced; pronotum notably constricted hindwards (Fig. 31b). Fovea of male prosternum at most shallow and with few shallow punctures. Base of elytra broader than the posterior basis of pronotum. Apical lamella of aedeagus shortly triangular (Fig. 32c). Larger size, 8.2 mm..... **4 *gravidula***

• Anterior angle of pronotum obtuse, not protruding (Fig. 31c). Fovea of male prosternum varying among species. Base of elytra as narrow as the posterior basis of pronotum. Size smaller than 8.2 mm..... **5**

4. Pronotum moderately constricted forwards, anterior angle slightly protruding. Apical shaft of aedeagus triangular, moderately broadened ..... ***gravidula gravidula***

• Pronotum notably constricted forwards and also backwards, anterior angle less protruding. Apical shaft of aedeagus triangular and broadened (Fig. 32c) ..... ***gravidula testudinea***

5. Pronotum side regularly arcuate (Fig. 31c). Body size 7.0-8.2 mm. Pronotum basis smooth. Male prosternum with evident punctured fovea. Dorsum convex. Flightless. Apex of aedeagus truncate (Fig. 32d). Dorsum reddish or dark brown ..... ***malacensis***

• Pronotum side more narrowed forwards (Figs. 31d-f), or if regularly arcuate, then body size is smaller than 7.0 mm. Inner fovea of pronotum usually punctured. Male prosternum with or without fovea. Wings present except for *A. arcuata arcuata* **6**

6. Pronotum enlarged from anterior angle to the middle or the last third, thus showing its maximum width well after the middle (Figs. 31d-f). Body size larger, 6-8.2 mm..... **7**

• Pronotum widened from anterior angle to first third, thus showing its maximum width where the lateral anterior seta arises (Figs. 31g-i). Body size smaller, 4.5-7.0 mm **10**

7. Maximum width of pronotum close to posterior angle, this almost straight; posterior basis at most with few punctures (Fig. 31d). Eyes flattened. Elytron striae shallow. Male prosternum without fovea. Dorsally with oval shape and reddish brown coloration. Apical aedeagus shaft with parallel sides, tip truncate (Fig. 32g). Body length 6.5-7.5 mm..... **8 *arcuata***

• Maximum width of pronotum at middle; posterior angle obtuse; posterior basis with punctured fovea. Eyes convex. Elytron striae punctured. Male prosternum with fovea. Dorsally with more parallel shape and brown coloration. Apical shaft of aedeagus triangular, progressively narrowed (Figs. 32e, f). Body length 6.5-7.5 mm..... **9**

8. Hind angle of pronotum rounded; external fovea faint. Elytron striae very fine. Wingless..... ***arcuata arcuata***

• Hind angle of pronotum marked; external fovea visible. Elytron striae fine. Winged..... ***arcuata castiliana.***

9. Elytron broadened from humerus backwards. Posterior basis of pronotum with some deep punctures in both foveae (Fig. 31e). Eye convex somewhat protruding. Male prosternum usually with a shallow punctured fovea. Apical shaft of aedeagus with a triangular shape (Fig. 32e). Body length 6.5-8.2 mm ..... ***brevis.***

Elytron moderately widened from humerus backwards. Foveae of posterior basis of pronotum shallow but evident, with scarce fine punctures (Fig. 31f). Eye moderately convex. Male prosternum without fovea, at most showing scarce fine punctures. Always winged. Apex of aedeagus shaft shortly triangular with sides slightly constricted (Fig. 32f). Body length 6.5-8.2 mm..... ***corpulenta***

10. Body size small, 4.5-5.4 mm. Dorsum reddish brown. Pronotum almost rectangular, basis smooth (Fig. 31g). Winged. Eyes notably convex. Elytra shortly oval, striae fine. Male prosternum with loose punctures. Aedeagus with elongate apical lamella (Fig. 32h) ..... ***rotundata***

• Body size larger, 5.0-7.0 mm. Dorsal coloration variable. Pronotum more constricted anteriorly. Elytra slender, not shortly oval. Male prosternum with punctured fovea..... **11**

11. Body more parallel. Pronotum moderately transverse, the internal fovea isolated from posterior basis (Fig. 31h). Antenna slender. Apical shaft of aedeagus triangular, endophalus with small spines (Fig. 32i). Body length 5.5–7.0 mm..... ***affinis***

• Body with oval shape, particularly in the elytron. Pronotum transverse, inner fovea reaching posterior basis (Fig. 31i). Antenna shorter, median antennomeres short. Apical shaft of aedeagus triangular, endophalus without spines (Fig. 32j). Body length 4.8-6.8 mm..... ***cottyi***

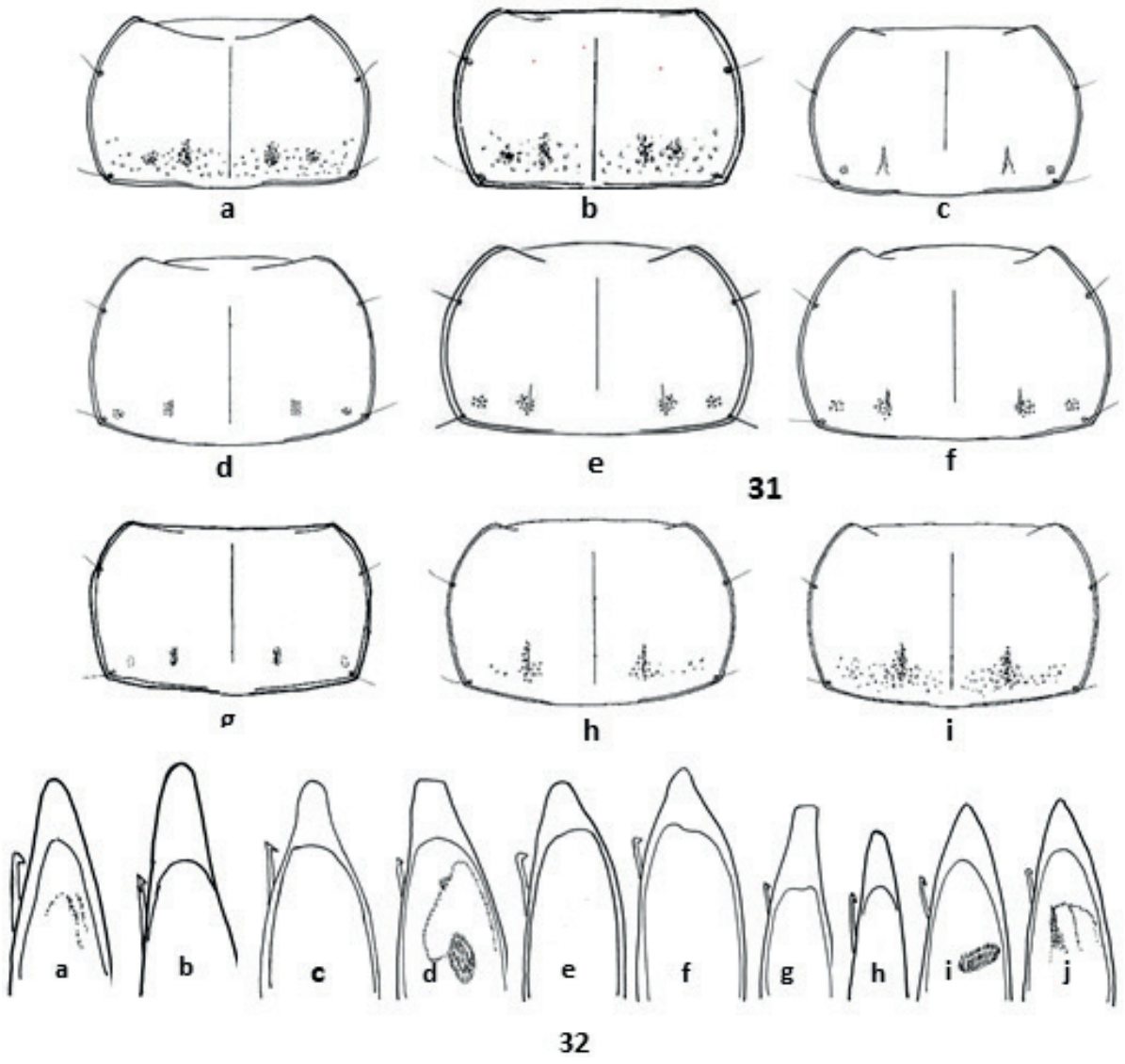

Fig. 31. Pronotum of (a) *Amara (Camptocelia) eximia*; (b) *A. (Camptocelia) gravidula;* (c) *A. (Camptocelia) malacensis;* (d) *Amara (Camptocelia) arcuata;* (e) *A. (Camptocelia) brevis*; (f) *A. (Camptocelia) corpulenta*; (g) *Amara (Camptocelia) rotundata*; (h) *A. (Camptocelia) affinis*; (i) *A. (Camptocelia) cottyi.* Fig. 32. Apex of median lobe of aedeagus of (a) *Amara (Camptocelia) barcelonensis*; (b) *A. (Camptocelia) eximia;* (c) *A. (Camptocelia) gravidula testudinea;* (d) *A. (Camptocelia) malacensis;* (e) *A. (Camptocelia) brevis;* (f) *A. (Camptocelia) corpulenta;* (g) *A. (Camptocelia) arcuata;* (h) A. *(Camptocelia) rotundata*; (i) *A. (Camptocelia) affinis*; (j) *A. (Camptocelia) cottyi*. Figs. 32a, d, e, g and j redrawn from HIEKE (1983).

Fig. 31. Pronoto de (a) *Amara (Camptocelia) eximia*; (b) *A. (Camptocelia) gravidula;* (c) *A. (Camptocelia) malacensis;* (d) *Amara (Camptocelia) arcuata;* (e) *A. (Camptocelia) brevis*; (f) *A. (Camptocelia) corpulenta*; (g) *Amara (Camptocelia) rotundata*; (h) *A. (Camptocelia) affinis*; (i) *A. (Camptocelia) cottyi.* Fig. 32. Ápice del lóbulo medio del edeago de (a) *Amara (Camptocelia) barcelonensis*; (b) *A. (Camptocelia) eximia;* (c) *A. (Camptocelia) gravidula testudinea;* (d) *A. (Camptocelia) malacensis;* (e) *A. (Camptocelia) brevis;* (f) *A. (Camptocelia) corpulenta;* (g) *A. (Camptocelia) arcuata;* (h) A. *(Camptocelia) rotundata*; (i) *A. (Camptocelia) affinis*; (j) *A. (Camptocelia) cottyi*. Figs. 32a, d, e, g y j redibujadas de HIEKE (1983).

Subgenus *Celia* Zimmermann, 1832

This subgenus was revised by Hieke (2001) who split it into *Xenocelia* and *Celia*. At first sight members of both subgenera look similar but species of *Celia* may be often distinguished by a dorsal red-brown to yellow-brown coloration never darkened as in *Xenocelia*. Likewise, males of *Celia* show only 2 pores in last ventrite, and these are 4 in *Xenocelia*. Chorotype of species varies from Holarctic to west Mediterranean and endemic, what suggests an ancient origin of the lineage.

• *Amara (Celia) arenaria* (Putzeys, 1865) (*hispanica* Csiki, 1929). Eastern Pyrenees and southern Iberian System: Tramascastilla (Teruel). Endemic.

• *Amara (Celia) bifrons* (Gyllenhal, 1810). Mountains of atlantic Peninsula, Iberian System, Central System (sierra of Guadarrama), north and central Portugal. Siberian European.

• *Amara (Celia) brunnea* (Gyllenhal, 1810). Eastern Pyrenees, Penarrubia (Lugo), la Cuiña and coll of Ancares (León). Holarctic.

• *Amara (Celia) fervida fervida* Coquerel, 1859. Mediterranean Peninsula, Majorca. West Mediterranean.

• *Amara (Celia) montana* Dejean, 1828. Mediterranean Peninsula, Galicia, Balearic Islands. Mediterranean.

• *Amara (Celia) praetermissa* (Sahlberg, 1827). Atlantic Peninsula, between Montes de León and Eastern Pyrenees, at altitudes over 1400 m. Siberian European.

• *Amara (Celia) sollicita* Pantel, 1888. Cited in many places of the Peninsula, including Galicia. Mediterranean (Photo 7).

Photo 7. Habitus of *Amara (Celia) sollicita* Pantel, 1888. See page 37

Key to Iberian species of subgenus *Celia*

1. Parascutelar stria with an umbilicate pore. Mentum tooth simple or bifid. Apical shaft of aedeagus slightly thickened at tip..... **2**

• Parascutelar stria without umbilicate pore. Mentum tooth bifid. Apical shaft of aedeagus not thickened dorsally at tip..... **4**

2. Pronotum widened up to first third, side briefly constricted backwards; anterior angle of pronotum only moderately protruding; pronotum basis with inner and outer foveae well impressed and punctured (Fig. 33a). Apex of aedeagus shortly triangular and thickened (Fig. 34a, b). Body size 5.5-8 mm..... ***fervida***

• Pronotum widened up to second third, close to posterior angle; anterior angle of pronotum protruding; pronotum basis well punctured, outer fovea variably marked (Figs. 33b, c) **3**

3. Mentum tooth bifid. Body size larger, 6.0-8.0 mm. Pronotum regularly widened backwards, posterior angle almost straight; basal foveae from moderately to well impressed (Fig. 33b). Apex of aedeagus moderately thickened (Fig. 34c), right paramere of normal length... ***praetermissa***

• Mentum tooth simple. Body size smaller, 5.5-6.0 mm. Pronotum widened up to posterior fourth; anterior angle acute and posterior angle obtuse; external fovea often loose (Fig. 33c). Apex of aedeagus notably thickened (Fig. 34d), right paramere short. Bronze with metallic lustre ..... ***brunnea***

4. Pronotum slightly constricted backwards; basal foveae deep, the external forming a fold with lateral side, posterior angle slightly obtuse (Fig. 35). Basal margin of elytron wide, sharply limited laterally by an oblique line directed towards humerus; striae moderately deepened towards apex. Epipleures and ventrites reddish. Palps, antennae and legs yellow. Body length 5.5-6.5 mm ..... ***bifrons***

• Pronotum roundly constricted backwards, posterior angle obtuse (Figs. 36a-c). Basal margin of elytron progressively narrowed towards humerus..... **5**

5. Body size larger, habitus more robust, 6.5-8.0 mm. Anterior basis of pronotum arcuate; posterior angle of pronotum briefly rounded, pronotum relatively transverse; external fovea deep and even forming a fold with side (Fig. 36a). Humeral angle slightly protruding with a tooth. Apex of aedeagus well developed, elongate and only briefly constricted apically; hook of right paramere small (Fig. 37a)..... ***sollicita***

• Body size smaller, 5.5-7 mm. Anterior basis of pronotum only moderately concave (Fig. 36b, c). Foveae of pronotum deep (*montana)* or shallow (*arenaria*) **6**

6. Body size 7.0 mm. Fovea of pronotum basis deep, the external forming a marked fold with lateral side (Fig. 36b). Elytron striae well impressed and punctured. Humeral angle forming a minute folding Dorsum reddish testaceous. Apical shaft of aedeagus well developed (Fig. 37b) ..... ***montana***

• Body size smaller, habitus slender, 5.5-6.5 mm. Anterior basis of pronotum almost straight; posterior angle better marked than in *A. montana*, pronotum moderately transverse (Fig. 36c). Humeral angle not protruding. Apex of aedeagus in elongate triangle; hook of right paramere of normal size (Fig. 37c). Dorsum brown, elytra ferruginous ..... ***arenaria***

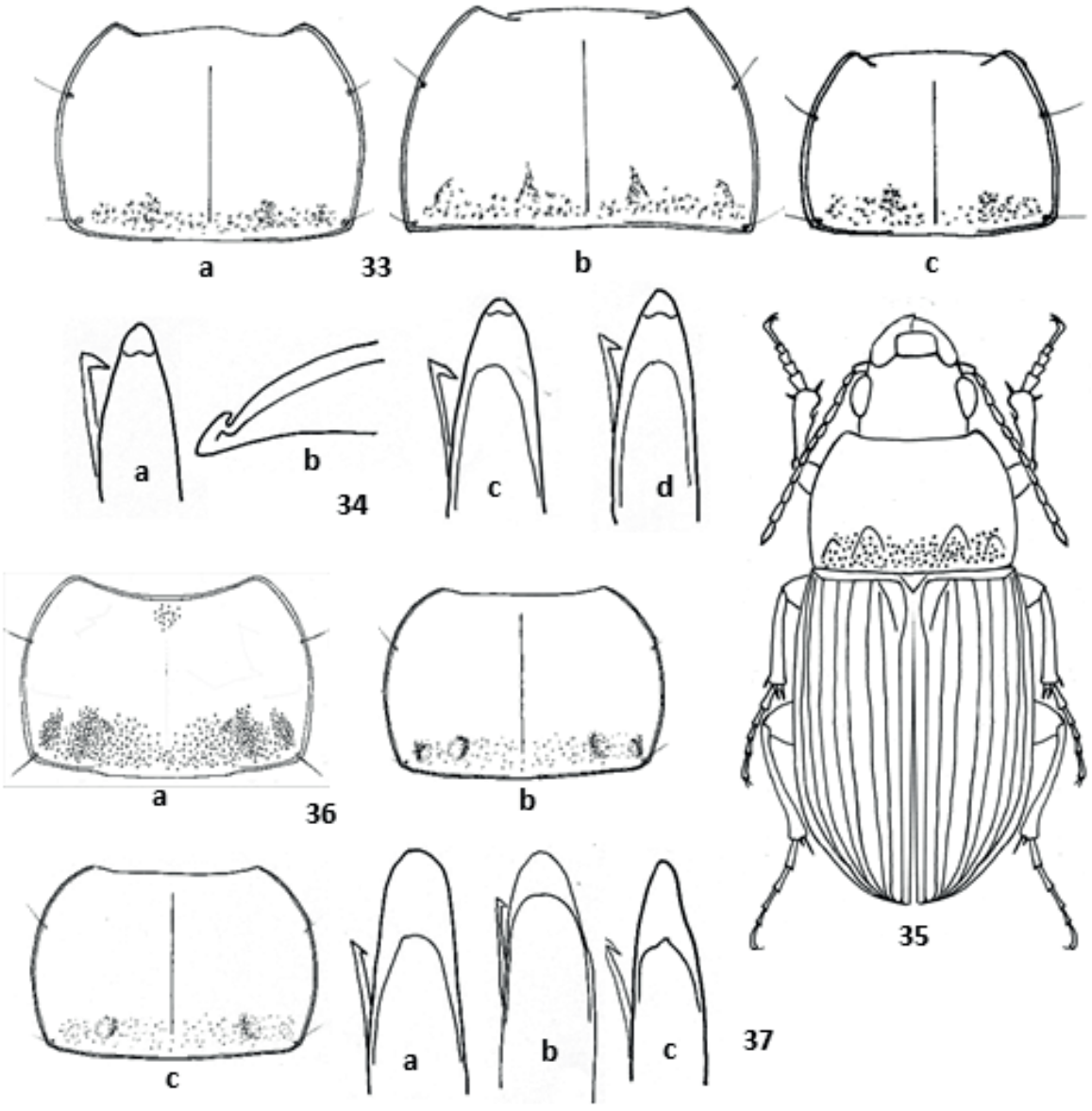

Fig. 33. Pronotum of (a) *Amara (Celia) fervida*; (b) *A. (Celia) praetermissa*; (c) *A. (Celia) brunnea*. Fig. 34. Apex of aedeagus of *Amara (Celia) fervida* (a and b; redrawn from ANTOINE, 1957); (c) *A. (Celia) praetermissa*; (d) *A. (Celia) brunnea* (c and d redrawn from HIEKE, 2004). Fig. 35. Dorsal habitus of *Amara (Celia) bifrons*. Fig. 36. Pronotum shape of (a) *Amara (Celia) sollicita*; (b) *A. (Celia) montana*; (c) *A. (Celia) arenaria* (Figs. 36b and c redrawn from COULON *et al.*, 2011). Fig. 37. Apex of aedeagus of (a) *Amara (Celia) solicita*; (b) *A. (Celia) montana*; (c) *A. (Celia) arenaria.*

Fig. 33. Pronoto de (a) *Amara (Celia) fervida*; (b) *A. (Celia) praetermissa*; (c) *A. (Celia) brunnea*. Fig. 34. Ápice del edeago de *Amara (Celia) fervida* (a y b; redibujadas de ANTOINE, 1957); (c) *A. (Celia) praetermissa*; (d) *A. (Celia) brunnea* (c y d redibujadas de HIEKE, 2004). Fig. 35. Hábito en vista dorsal de *Amara (Celia) bifrons*. Fig. 36. Contorno del pronoto de (a) *Amara (Celia) sollicita*; (b) *A. (Celia) montana*; (c) *A. (Celia) arenaria* (Figs. 36b y c redibujadas de COULON *et al.*, 2011). Fig. 37. Ápice del edeago de (a) *Amara (Celia) solicita*; (b) *A. (Celia) montana*; (c) *A. (Celia) arenaria.*

Subgenus *Leironotus* Ganglbauer, 1891

This subgenus includes seven species of which three are endemic to Iberian mountains, one inhabits France and Iberia and the other three are found in Samos (Greece) and Turkish mountains. This distribution might be the result of an ancient lineage disjunction at both sides of the Mediterranean. Body size is usually smaller than 7.5 mm and the dorsal coloration is reddish brown.

• *Amara (Leironotus) albarracina* Hieke, 1984. Southern Iberian System. Endemic.

• *Amara (Leironotus) glabrata* Dejean, 1828. Atlantic basin of the Peninsula north of Guadalquivir River; NE Betic chains; Pyrenees. West Mediterranean.

• *Amara (Leironotus) ooptera* (Putzeys, 1865). Central System: sierras of Béjar, Gredos and Guadarrama. Endemic (Photo 8).

Photo 8. Habitus of *Amara (Leironotus) ooptera* (Putzeys, 1865). See page 38

• *Amara (Leironotus) rotundicollis* (Schaufuss, 1862). Cantabrian Chain, Orense (eastern Galicia), Northern Iberian System, Central System including serra da Estrela. Endemic (Photo 9).

Photo 9. Habitus of *Amara (Leironotus) rotundicollis* (Schaufuss, 1862). See page 39

Key to Iberian species of subgenus *Leironotus*

1. Pronotum strongly constricted backwards, notably cordiform, posterior basis narrower than anterior; posterior angle aligned with the origin of 4th stria. Pronotum basis with a large depression that includes two small linear foveae (Fig. 38a). Apical shaft of aedeagus elongate and asymmetric (Fig. 39a), ventrally curved at tip, endophalus with spines (Figs. 39b, c); distal gonocoxite broad, apex not constricted (Fig. 40a). Body length 6.3-7.5 mm ..... ***rotundicollis***

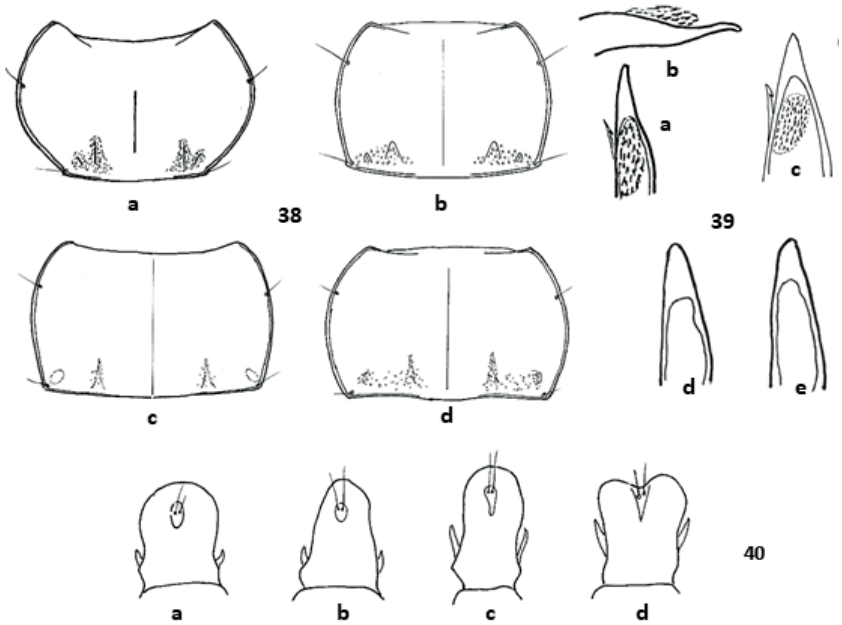

Fig. 38. Pronotum shape of (a) *Amara (Leironotus) rotundicollis*; (b) *A. (Leironotus) glabrata*; (c) *A. (Leironotus) ooptera*; (d) *A. (Leironotus) albarracina*. Figs. 38c, d redrawn from HIEKE (1984). Fig. 39. Apex of aedeagus of (a, b) *Amara (Leironotus) rotundicollis*; (c) A. *(Leironotus) glabrata*; (d) *A. (Leironotus) ooptera*; (e) *A. (Leironotus) albarracina*. Figs. 39d, e redrawn from HIEKE (1984). Fig. 40. Gonocoxite of (a) *Amara (Leironotus) rotundicollis*; (b) A. *(Leironotus) glabrata*; (c) *A. (Leironotus) ooptera*; (d) *A. (Leironotus) albarracina*. Redrawn from HIEKE (1984).

Fig. 38. Contorno del pronoto de (a) *Amara (Leironotus) rotundicollis*; (b) *A. (Leironotus) glabrata*; (c) *A. (Leironotus) ooptera*; (d) *A. (Leironotus) albarracina*. Figs. 38c, d redibujadas de HIEKE (1984). Fig. 39. Ápice del edeago de (a, b) *Amara (Leironotus) rotundicollis*; (c) A. *(Leironotus) glabrata*; (d) *A. (Leironotus) ooptera*; (e) *A. (Leironotus) albarracina*. Figs. 39d, e, redibujadas de HIEKE (1984). Fig. 40. Gonocoxito de (a) *Amara (Leironotus) rotundicollis*; (b) A. *(Leironotus) glabrata*; (c) *A. (Leironotus) ooptera*; (d) *A. (Leironotus) albarracina*. Redibujados de HIEKE (1984).

• Pronotum moderately constricted forwards, posterior basis broader than anterior; posterior angle of pronotum obtuse, aligned with the origin of 7th stria (Figs. 38 b-d). Apical shaft of aedeagus almost symmetrically narrowed to apex (Figs. 39 c-e). Body length 6.2-7.5 mm **2**

2. Pronotum side less constricted forwards, less arcuate; pronotum slender, ratio width/length 1.5; foveae well impressed (Fig. 38b). Elytron striae well impressed and punctured. Metepisterna 1.8 longer than wider. Male prosternum with punctured fovea. Disk of elytron relatively flat. Last male ventrite with two apical setae closely placed each other. Apical shaft of aedeagus making up a slender and short triangle, endophalus with a row of spines, right paramere with a stout hook (Fig. 39c); distal gonocoxite broad and apically slightly constricted (Fig. 40b). Body length 6-7 mm ..... ***glabrata***

• Pronotum more constricted forwards, notably arcuate and transverse (Figs. 38 c-d), ratio width/length 1.7; external fovea almost faint; elytron striae fine and finely punctured. Metepisterna 1.5-1.2 longer than wider. Male prosternum without punctured fovea. Last male ventrite with two or four apical setae **3**

3. Pronotum moderately constricted fore- and backwards, posterior angle moderately obtuse (Fig. 38c); pronotum basis with punctures in the internal fovea. Disk of elytron convex. Last ventrite with four setae. Apex of aedeagus making up a well-developed and rounded triangle (Fig. 39d), endophalus with a minute rows of spines, right paramere without a terminal minute hook; distal gonocoxite moderately elongate (Fig. 40c). Body length 6.4-7.0 mm ..... ***ooptera***

• Pronotum rather arcuate fore- and backwards, posterior angle notably obtuse (Fig. 38d); pronotum basis with shallow punctures. Male last ventrite with two setae, that of female with four. Apex of aedeagus (Fig. 39d) similar to that of *A. ooptera*; distal gonocoxite broad and almost rectangular (Fig. 40d). Body length 6.6-7.6 mm ..... ***albarracina***

Subgenus *Leuris* Lutshnik, 1927

This subgenus is made up by four species inhabiting the Central and Eastern Pyrenees, that are restricted to a few localities in alpine environments. They are notable by the lack of the typical setae in head and pronotum that characterize the genus *Amara*. Their aspect is robust; head wide and pronotum sinuate before posterior angle. The group was included in former catalogues within the subgenus *Leiocnemis* Zimmermann, 1832, that is found in the Caucasus and shows distinct morphology.

• *Amara (Leuris) emmanuelivivesi* E. Vives, 2018. Tosa d'Alp (Girona).

• *Amara (Leuris) espagnoli* (J. Vives, 1971). Central Pyrenees: Las Blancas, 2200 m (peak of Aspe, Huesca); Grallera Gran Cornellana (sierra of El Cadí, Lérida). Endemic (Photo 10).

Photo 10. Habitus of *Amara (Leuris) espagnoli* (J. Vives, 1971). See page 40

• *Amara (Leuris) puncticollis* Dejean, 1828. Eastern Pyrenees: peak of Puigmal, above 2000 m. Endemic.

• *Amara (Leuris) pyrenaea* Dejean, 1828. On the Spanish side close to Canigou Peak; peak of Puigmal. Endemic.

Key to Iberian species of subgenus *Leuris*

1. Posterior half of head and the entire pronotum well punctured; pronotum side strongly sinuate before hind angle; anterior angle acute and protruding; basal foveae shallow (Fig. 41a). Elytron striae deep and punctured; elytron apex divergent. Apical shaft of aedeagus narrow and slender (Fig. 42a) ..... ***puncticollis***

• Head smooth, pronotum punctures limited to posterior basis; pronotum side from clearly to moderately sinuate before hind angle, anterior angle no or slightly protruding (Figs. 41b, c). Elytron striae finer and without punctures; apex of elytra jointly rounded **2**

2. Body longer and slender, 9.0-11 mm. Pronotum slender, almost square, disc almost flat (Fig. 41b). Intermediate antennomeres slender. Apex of aedeagus forming an almost symmetrical ogive well-developed (Fig. 42b) ..... ***espagnoli***

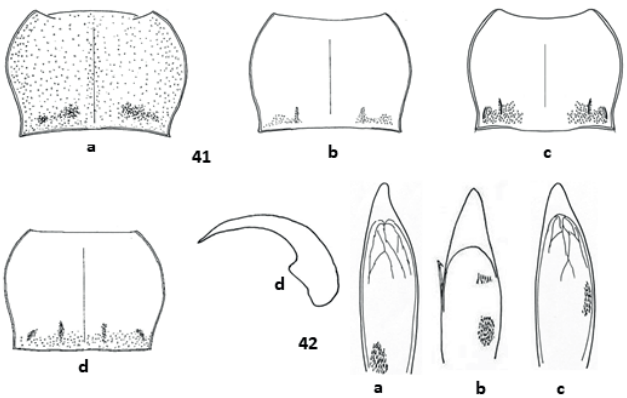

Fig. 41. Pronotum shape of (a) *Amara (Leuris) puncticollis*; (b) *A. (Leuris) espagnoli* (c) *A. (Leuris) pyrenaea*; (d) *A. (Leuris) emmanuelivivesi*. Fig. 42. Apex of aedeagus of (a) *Amara (Leuris) puncticollis* (b) *A. (Leuris) espagnoli*; (c) *Amara (Leuris) pyrenaea*; (d) aedeagus of *A. (Leuris) emmanuelivivesi* view of profile; (e) left conchoid paramere. Figs. 41a and b redrawn from COULON *et al.* (2011).

Fig. 41. Contorno del pronotum de (a) *Amara (Leuris) puncticollis*; (b) *A. (Leuris) espagnoli* (c) *A. (Leuris) pyrenaea*; (d) *A. (Leuris) emmanuelivivesi*. Fig. 42. Ápice del edeago de (a) *Amara (Leuris) puncticollis* (b) *A. (Leuris) espagnoli*; (c) *Amara (Leuris) pyrenaea*; (d) edeago de *A. (Leuris) emmanuelivivesi* visto de perfil; (e) parámero izquierdo con aspecto conchoide. Figs. 41a y b redibujadas de COULON *et al.* (2011).

• Body shorter and wider, 8.0-10 mm. Pronotum more transversal, notably narrowed anteriad, disc clearly convex (Figs. 41c-d). Intermediate antennomeres short. Apex of aedeagus less developed (Fig. 42c) **3**

3. Elytra shorter and convex (length/width 1.37). Punctures of posterior basis of pronotum almost restricted to foveae, hind angle slightly protruding outwards (Fig. 41c). Aedeagus less arcuate, apical shaft shortly triangular (Fig. 42c); left conchoid paramere with trapezoid shape and basal tooth .....***pyrenaea***

• Elytra slender (length/width 1,63). Posterior basis of pronotum densely punctured, hind angle straight, not protruding outwards (Fig. 41d). Aedeagus regularly arcuate (Fig. 42d), apical shaft triangular; left conchoid paramere square and without basal tooth ..... ***emmanuelivivesi***

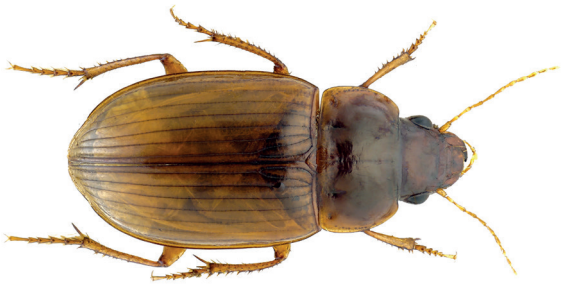

Photo 11. Habitus of *Amara (Paracelia) simplex simplex* Dejean, 1828. See page 41

Subgenus *Paracelia* Bedel, 1899

This subgenus is characterized by the combination of femora with four setae in posterior half, the beaded prosternal process with two setae, and the metatibia of males devoid of hairy apical brush in the internal side; dorsal coloration from dark brown to testaceous. Most species of the subgenus are found in Asia, and only a few reach the western Palearctic.

• *Amara (Paracelia) quenseli quenseli* (Schoenherr, 1806). Pyrenees: Panticosa (Huesca). Holarctic.

• *Amara (Paracelia) rufoaenea* Dejean, 1828. Eastern and Central Peninsula (including both Submesetas), Sierra Nevada, Balearic Islands. West Mediterranean.

• *Amara (Paracelia) simplex simplex* Dejean, 1828. Mediterranean Peninsula and Ibiza; no records from Portugal. Turanic South European (Photo 11).

Key to Iberian species of subgenus *Paracelia*

1. Pronotum posterior basis with shallow foveae, smooth or with sparse punctures; posterior angle obtuse and rounded; pronotum side arcuate but not markedly constricted backwards (Fig. 43a). Elytra testaceous. Apical shaft of aedeagus elongate and acute (Fig. 44a), ventrally bent; endophalus with sclerotized membranes. Body size 6.0-7.0 mm..... ***simplex simplex***

• Pronotum basis with deep foveae, basis well punctured; posterior angle of pronotum slightly toothed (Figs. 43b, c). Elytra coppery black or brownish. Apical shaft of aedeagus thickened..... 2

2. Anterior margin of pronotum not markedly concave, angle not protruding; side of pronotum constricted backwards, posterior angle obtuse (Fig. 43b). Apical shaft of aedeagus straight and acute; right paramere short and devoid of hook (Fig. 44b). Body length 8.5 mm..... ***rufoaenea***

• Anterior margin of pronotum concave, angle protruding; side of pronotum briefly constricted backwards, posterior angle almost straight (Fig. 43c). Apical shaft of aedeagus shorter and rounded; right paramere of normal length and hooked at tip (Fig. 44c). Body length 6.0 mm.....***quenseli quenseli***

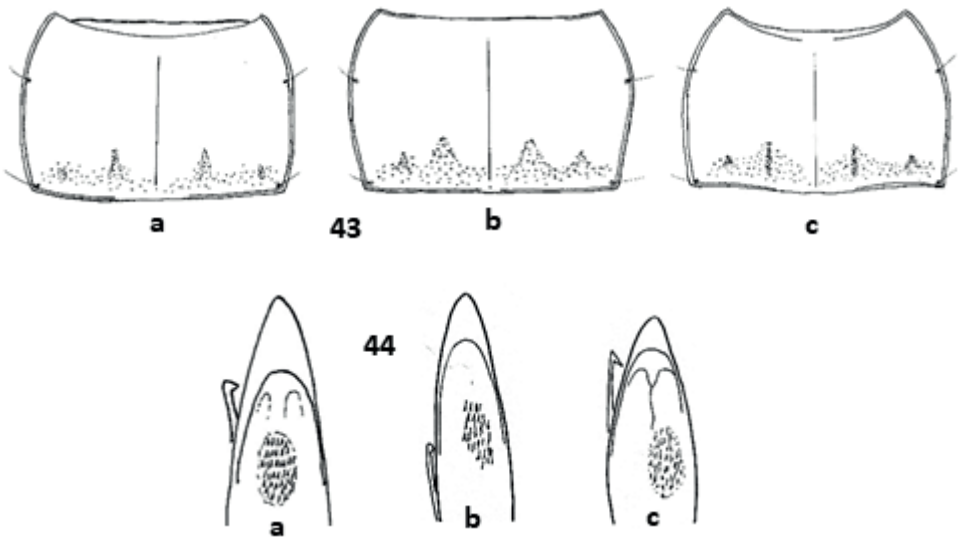

Fig. 43. Pronotum shape of (a) *Amara (Paracelia) simplex simplex*; (b) *A. (Paracelia) rufoaenea*; (c) *A. (Paracelia) quenseli quenseli*. Fig. 44. Apex of aedeagus of: *Amara (Paracelia) simplex simplex*; (b) *A. (Paracelia) rufoaenea*; (c) *A. (Paracelia) quenseli quenseli*. Fig. 44a redrawn from ANTOINE (1957).

Fig. 43. Contorno del pronoto de (a) *Amara (Paracelia) simplex simplex*; (b) *A. (Paracelia) rufoaenea*; (c) *A. (Paracelia) quenseli quenseli*. Fig. 44. Ápice del edeago de: *Amara (Paracelia) simplex simplex*; (b) *A. (Paracelia) rufoaenea*; (c) *A. (Paracelia) quenseli quenseli*. Fig. 44a redibujada de ANTOINE (1957).

Subgenus *Percosia* Zimmermann, 1832

Species of this subgenus resemble a small *Zabrus* due to the stout dorsal aspect and the hairy prosternal process. There is a single species of the subgenus in the Iberian Peninsula with two subspecies, whose distribution should be better ascertained.

• *Amara (Percosia) equestris equestris* (Duftschmid, 1812). Mountainous areas of northern and central Peninsula. Siberian European (Photo 12).

Photo 12. Habitus of *Amara (Percosia) equestris* (Duftschmid, 1812). See page 42

• *Amara (Percosia) equestris zabroides* Dejean, 1828. Southern Iberian System: "Castilien, Cuenca" and Canales (Logroño; HIEKE, com. pers.); Tragacete, Guadalaviar, Bronchales and Uña (Champion, 1902, *fide* ORTUÑO, com. pers.). West Mediterranean.

Prosternum process with 6-14 or more setae, pronotum with trapezoid shape (Fig. 45a), dark dorsal coloration. External fovea of pronotum basis separated from lateral side by a sharp folding. First antennomere with two setae. Apex of aedeagus moderately rounded (Fig. 45b). The subspecies *A. equestris zabroides* is of larger size,11.4-14.2 mm, whereas *A. equestris equestris* has a body size of 8.4-10.6 mm, and shows a broader shape and more parallel elytra.

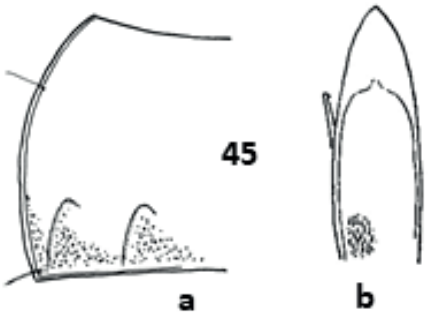

Fig. 45. Pronotum (a) and apex of aedeagus (b) of *A. (Percosia) equestris*.

Fig. 45. Pronoto (a) y ápice del edeago (b) de *A. (Percosia) equestris*.

Subgenus *Xenocelia* Hieke, 2001

This subgenus has been recently described by Hieke (2001) to include a number of taxa formerly included in the subgenus *Celia*. In spite of the close external resemblance between species of both subgenera, there are a number of characters that allow to separate them: the dorsal coloration, the setae of male last ventrite and the shape of the aedeagus shaft. Taxa of *Xenocelia* show an European Asiatic distribution, as observed for taxa of subgenus *Celia*, what suggests that both lineages experimented a parallel evolutionary radiation on geographic and morphological grounds.

• *Amara (Xenocelia) atlantis* (Antoine, 1925). HIEKE (2001: 37) guessed that this species was to be found in Andalusia. This species is known from the High and Medium Atlas. When revising material from the Sierra Nevada (province of Granada) we found a beetle that matches the characters described by HIEKE (2001) for *A. atlantis*. The locality is Fuente de Juan Manuel, road to Veleta Sky Station, Sierra Nevada (Granada), at 2150 m.a.s.l., under stones, collected by E. Ortiz, 4-X-1980. Betic-Riffian chorotype.

• *Amara (Xenocelia) bischoffi* Jedlicka, 1946. Pyrenees and Southern Iberian System: Frías de Albarracín (Teruel); Javalambre. See also distribution of *A. cursitans* and *A. municipalis*. Turanic North Mediterranean.

• *Amara (Xenocelia) cursitans* Zimmermann, 1832. Northern Peninsula. According to HIEKE (2001: 55) records of this species in the southern Peninsula (Ciudad Real; Madrid; sierra de Alcaraz, Albacete), possibly correspond to *A. bischoffi*. European.

• *Amara (Xenocelia) fusca* Dejean, 1828 (*complanata* Dejean, 1828). Almost the whole Peninsula, cited in Portugal from the sierra of San Mamede (Portalegre). Turanic Mediterranean.

• *Amara (Xenocelia) ingenua* (Duftschmid, 1812). Mediterranean Peninsula and Majorca; no records from Portugal. Siberian-European (Photo 13).

Photo 13. Habitus of *Amara (Xenocelia) ingenua* (Duftschmid, 1812). See page 43

• *Amara (Xenocelia) municipalis* (Duftschmid, 1812). Central and Eastern Pyrenees; Cantabrian Mountains: Puerto de Pajares (Asturias). Records from localities corresponding to the Mediterranean Peninsula possibly correspond to *A. bischoffi*. Siberian European.

• *Amara (Xenocelia) vivesi* (Jeanne, 1985). Calahorra (Logroño), Monteagudo (Navarra), sierra de Alcubierre (Zaragoza-Huesca), Fraga and Penalba (Huesca), Caldetas (Barcelona), Teruel, Tortosa (Tarragona); Galera and Huéscar (Granada). Iberian (Photo 14).

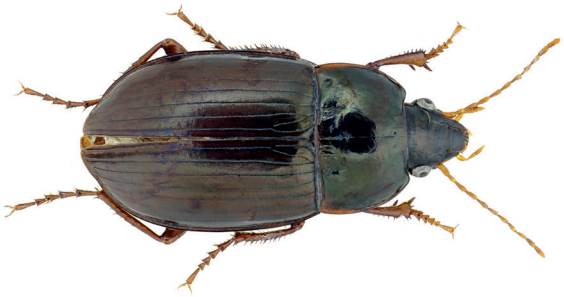

Photo 14. Habitus of *Amara (Xenocelia) vivesi* (Jeanne, 1985). See page 44

Key to Iberian species of subgenus *Xenocelia*

1. Body size large, 9-11 mm. Head dilated, wider than half pronotum. Neck notably dilated, tempora short. Pronotum flattened towards posterior angle; basal foveae strongly punctured (Fig. 46a). Elytron striae well impressed and punctured. Antennae and legs testaceous. Apex of aedeagus triangular and slightly sinuate to right (Fig. 47a).....***ingenua***

• Body size smaller than 9 mm. Width of head normal, equal or less than half of pronotum width. Neck moderately dilated, tempora developed. Pronotum only slightly flattened posteriorly **2**

2. Antennae and palps reddish. Maximum width of pronotum near or at posterior basis. Body size 7.5-9.0 mm **3**

• Antennomeres 1, 1-2 or 1-3 yellow reddish, the other darkened. Maximum width of pronotum at middle or close to posterior basis. Body size 8.5 mm or less..... **5**

3. Anterior angle of pronotum protruding; posterior basis with few punctures (Fig. 46b). Eyes large and rounded. Apical shaft of aedeagus in elongate triangle, endophalus with one group of spines (Fig. 47b), right paramere with a small hook. Body size smaller, 7.5-8.5 mm ..... ***vivesi***

• Anterior angle of pronotum not protruding, mildly rounded; anterior basis almost straight (Figs. 46c, d). Eyes large and rounded, or only moderately convex. Apical shaft of aedeagus in broader triangle, endophalus with one or two groups of spines (Figs. 47d-f), right paramere with hook of variable size. Body size variable, 6.5-9.0 mm **4**

4. Body size large, 8.0-9.0 mm. Eye large and rounded. Anterior margin of pronotum delimited by the upper border and an inferior line erased at middle (Fig. 46c). Apical shaft of aedeagus robust, endophalus with a basal group of spines (Fig. 47c), right paramere with a well-developed hook..... ***fusca***

• Body size smaller, 6.5-7.5 mm. Eye moderately convex. Anterior margin of pronotum delimited by the upper border and an inferior deep transverse line (Fig. 46d). Apical shaft of aedeagus in short triangle, right paramere ending in a small hook, endophalus with two rows of median-apical spines (Fig. 47d) ..... ***atlantis***

5. Maximum width of pronotum at first third, almost straight posteriorly (Fig. 46e); margin of anterior basis not delimited by a deep line. Antennomeres 2-3 pale, the other darkened. Eye notably protruding, almost hemispheric. Apex of aedeagus shortly triangular and rounded (Fig. 47e), endophalus with a tight semiapical pack of spines, hook of right paramere well developed. Body size 7.5-8.5 mm..... ***cursitans***

• Maximum width of pronotum at middle or in the second third (Figs. 46f, g), Margin of anterior basis well delimited by a deep transversal line. Antennomeres 1-2 pale, the other darkened. Eye moderately protruding. Apex of aedeagus elongate and shortly rounded, endophalus at most with a tiny pack of semiapical spines, hook of right paramere small..... **6**

6. Body size smaller, 6.0-7.2 mm. Maximum width of pronotum close to middle, this almost straight close to posterior angle (Fig. 46f). Striae of elytron with very fine punctures. Apex of aedeagus slender, making up an elongate triangle, tip rounded (Fig. 47f) ..... ***municipalis***

• Body size larger, 7.0-8.5 mm. Pronotum very similar to that of *A. municipalis* but posterior angle more straight (Fig. 46g). Striae of elytron well punctured. Apex of aedeagus somewhat more apically narrowed than that of *A. municipalis*, tip not rounded (Fig. 47g)..... ***bischoffi***

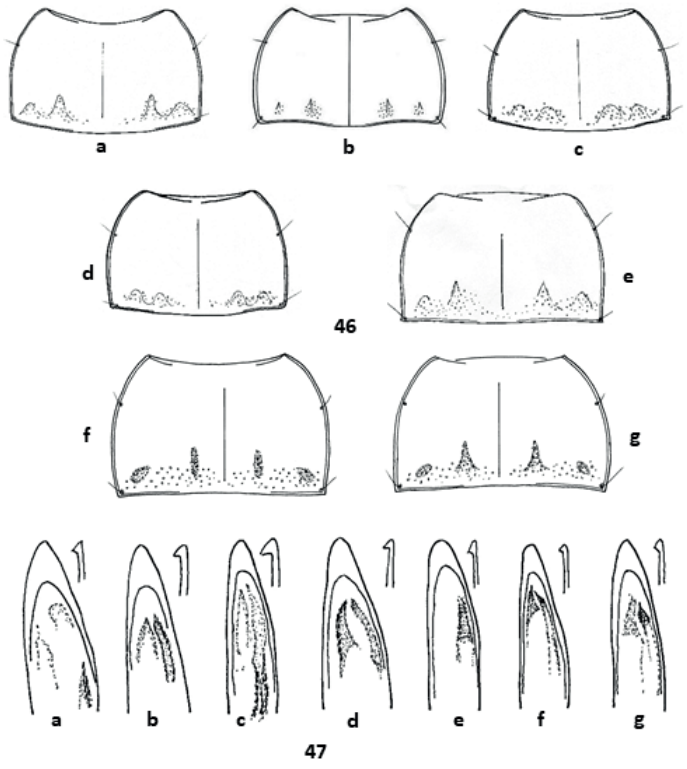

Fig. 46. Pronotum shape of (a) *Amara (Xenocelia) ingenua*; (b) *A. (Xenocelia) vivesi*; (c) *A. (Xenocelia) fusca*; (d) *A. (Xenocelia) atlantis*; (e) *Amara (Xenocelia) cursitans*; (f) *A. (Xenocelia) municipalis*; (g) *A. (Xenocelia) bischoffi*. Fig. 46b redrawn from HIEKE (2001). Fig. 47. Apex of aedeagus of (a) *Amara (Xenocelia) ingenua*; (b) *A. (Xenocelia) vivesi*; (c) *A. (Xenocelia) fusca*; (d) *A. (Xenocelia) atlantis*; (e) *A. (Xenocelia) cursitans*; (f) *A. (Xenocelia) municipalis*; (g) *A. (Xenocelia) bischoffi*. All figures redrawn from HIEKE (2001).

Fig. 46. Pronoto de (a) *Amara (Xenocelia) ingenua*; (b) *A. (Xenocelia) vivesi*; (c) *A. (Xenocelia) fusca*; (d) *A. (Xenocelia) atlantis*; (e) *Amara (Xenocelia) cursitans*; (f) *A. (Xenocelia) municipalis*; (g) *A. (Xenocelia) bischoffi*. Fig. 46b redibujada de HIEKE (2001). Fig. 47. Ápice del edeago de (a) *Amara (Xenocelia) ingenua*; (b) *A. (Xenocelia) vivesi*; (c) *A. (Xenocelia) fusca*; (d) *A. (Xenocelia) atlantis*; (e) *A. (Xenocelia) cursitans*; (f) *A. (Xenocelia) municipalis*; (g) *A. (Xenocelia) bischoffi*. Todas las figuras han sido redibujadas de HIEKE (2001).

Subgenus *Zezea* Csiki, 1929

This subgenus includes a few species distributed from China to North Africa. A number of species show a trapezoid pronotum with a wide bisinuate posterior basis. Dorsal coloration is bronze or green metallic as in species of the subgenus *Amara*. When the trifid apical spur of protibia is seen, the individual can be readily assigned to *Zezea*. Other differential characters, as the punctuation of metepisternae, need to be inspected under the stereo microscope.

• *Amara (Zezea) concinna* Zimmermann, 1832. Northern and Central Peninsula: León, Galicia, Central System. South European.

• *Amara (Zezea) floralis* Gaubil, 1844 (*gaubili,* Fassati 1949). Eastern Pyrenees. Catalano Provençal.

• *Amara (Zezea) fulvipes* (Audinet-Serville, 1821). Possibly in the entire atlantic basin of the Peninsula: Galicia, saltmarshes of Txingudi (Guipúzcoa); Reinosa (Santander); Pyrenees: Elizondo (Navarra), Lliviá (Lérida); in Portugal south down to Lisbon. South European.

• *Amara (Zezea) kulti* Fassati, 1947. Northern and Central Peninsula, serra da Estrela, NE Betic chains, Sierra Nevada. West Mediterranean.

• *Amara (Zezea) plebeja* (Gyllenhal, 1810). Atlantic Peninsula and Central System. Asiatic European.

• *Amara (Zezea) rufipes* Dejean, 1828. Northern and Central Peninsula. West Mediterranean.

• *Amara (Zezea) strenua,* Zimmermann 1832. Wet soils of the northern Meseta: Salamanca, Navadijos (sierra de Gredos, Ávila). European.

• *Amara (Zezea) tricuspidata,* Dejean 1831. Portugal: Viana do Castelo, Coimbra, Serra da Estrela, Companhia das Lezírias (Santarem) (AGUIAR & SERRANO, 2013). Central Asiatic European.

Key to Iberian species of subgenus *Zezea*

1. Trifid spur of fore tibia broad and obtuse (Fig. 48a). Anterior margin of epistome not emarginate. Pronotum shape typical of *Zezea*: broadened backwards, posterior basis medially bisinuate, inner fovea deep (Fig. 49a); anterior basis straight, angle not marked. Ventrites without punctures. Apex of aedeagus oval and relatively short, symmetrically narrowed (Fig. 50a). Dorsal coloration coppery black, femora black, tibiae paler. Length 7.0-7.5 mm ..... ***floralis***

• Trifid spur of fore tibia thorny (Fig. 48b). Epistome, ventrites and coloration variable **2**

2. Anterior angle of pronotum clearly protruding; pronotum basis notably punctured (Fig. 49b). Femora brown, tibiae yellow. Apical shaft of aedeagus moderately developed and slightly turned to left, with triangular shape (Fig. 50b). Body size small, 6-6.5 mm ..... ***plebeja***

• Anterior angle of pronotum well-marked but not advanced towards eyes; punctures of pronotum basis scarce, restricted to foveae (Fig. 49c, e). Femora and tibia with similar rufous or black colour, or tibiae paler. Body size larger than 7 mm **3**

3. Suture between frons and epistome evident. Anterior margin of epistome slightly arcuate. Inner fovea of pronotum basis well marked, outer fovea from erased to well visible (Fig. 49c). Three first antennomeres and basal half of fourth reddish, the other darkened. First ventrites with punctures. Elytron striae well visible. Aedeagus as in fig. 50c. Body size large (8.5-10 mm) ..... ***strenua***

• Suture between frons and epistome almost wanting. Anterior margin of epistome straight. Outer fovea of posterior basis of pronotum erased or shallow. Body size usually less than 9.5 mm **4**

4. Legs entirely brown reddish. Setae of elytron margin making up two groups. Posterior pronotum basis not sinuate (Fig. 49d) **5**

• Legs not entirely brown reddish, at least femora and tarsi are dark. Setae of elytron margin making up a single group. Posterior pronotum basis bisinuate (Fig. 49e-g) **6**

5. Posterior basis of pronotum basis sparsely punctured, mostly located inside the fovea; lateral border slightly thickened towards posterior angle. Apical shaft of penis short and rounded, not ventrally bent (Fig. 50d). Distal gonocoxite narrow, slender, and with rounded tip. Dark bronze or blue. 7.5-8.5 mm ..... ***concinna***

• Pronotum basis well punctured; side almost straight close to posterior angle (Fig. 49d). Apical shaft of penis slender, longer than wider, and ventrally bent (Fig. 50e). Distal gonocoxite wide at base, narrowed at tip. Metallic black. 8.5-9.5 mm ..... ***rufipes***

6. Anterior margin of epistome concave, erased at middle and leaving visible the basis of labrum. Anterior basis of pronotum almost straight (Fig. 49e). Elytron microsculpture with a subtle transverse mesh and striae less punctured. Ventrites wihout punctures but with lateral wrinkles. Aedeagus narrow, with a short and rounded apical shaft (Fig. 50f). Female palpomere with parallel sides. Body size 9.0-10 mm ..... ***kulti***

• Margin of epistome complete, at most slightly emarginate but covering the posterior basis of labrum, which is not visible. Anterior basis of pronotum concave or almost straight. Elytron microsculpture isodiametric, striae punctured **7**

7. Pronotum side widened up to posterior angle; punctures usually restricted to inner fovea; anterior basis almost straight (Fig. 49f). Legs entirely dark. Dorsal coloration black. Aedeagus robust with well-developed triangular apical shaft (Fig. 50g). Female palpomere with rounded sides. Larger, body size 9.0-10.5 mm ..... ***fulvipes***

• Pronotum widened backwards up to 4/5; punctures abundant in both foveae; anterior basis concave (Fig. 49g). Dorsal coloration blackish with green or bronze hue. Femora darkened, tibiae yellowish. Left side of median lobe of aedeagus sinuate and the same happens with the apical shaft, that is slightly deviated to right (Fig. 50h). Smaller, body size 6.5-8.0 mm ..... ***tricuspidata***

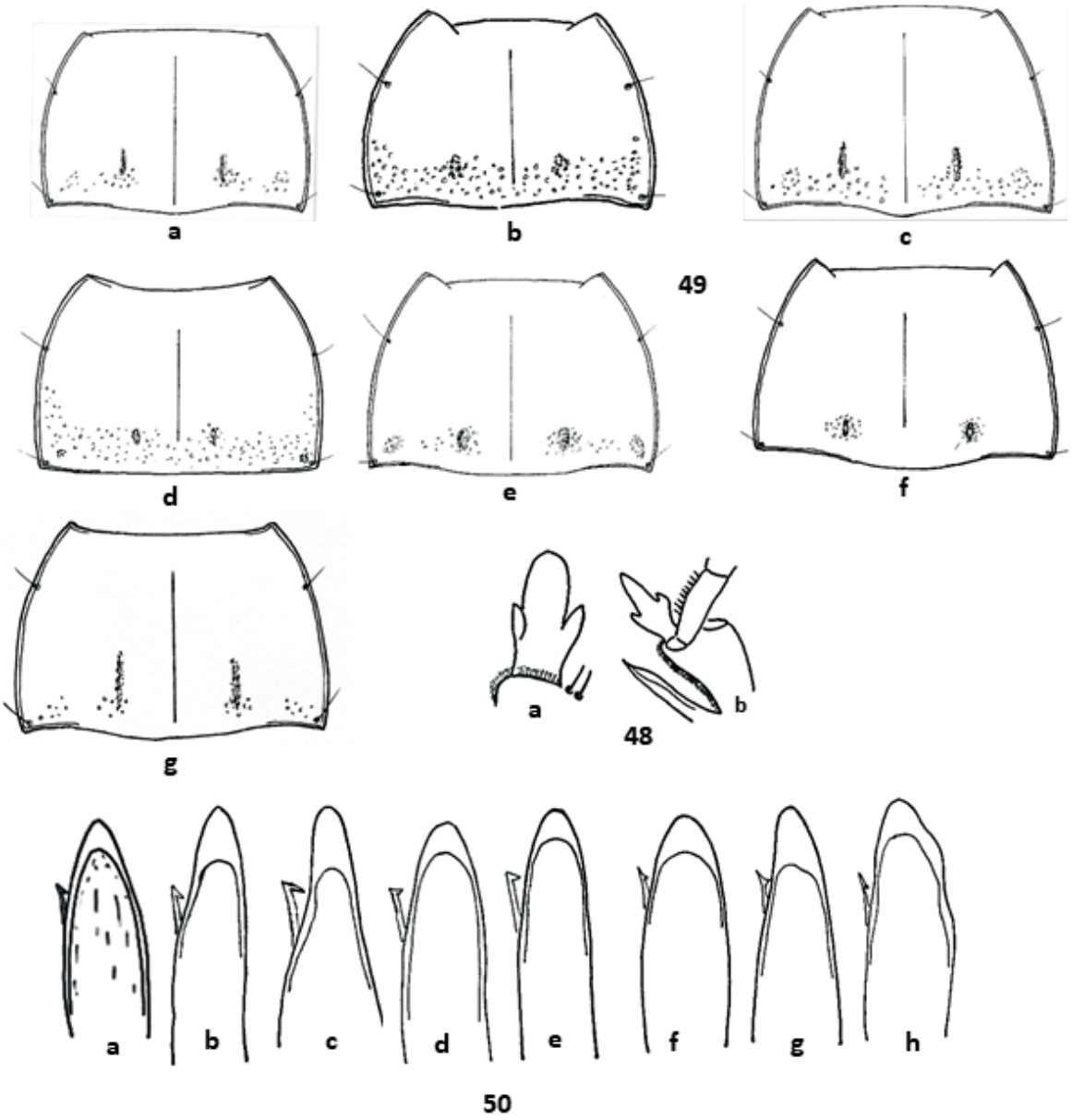

Fig. 48. Apical spur of protibia of (a) *Amara (Zezea) floralis*; (b) *A. (Zezea) plebeja*. Fig. 49. Pronotum of (a) *Amara (Zezea) floralis;* (b) *A. (Zezea) plebeja*; (c) *A. (Zezea) strenua*; (d) *A. (Zezea) rufipes;* (e) *Amara (Zezea) kulti*; (f) *A. (Zezea) fulvipes*; (g) *A. (Zezea) tricuspidata*. Figs 49b, d-g redrawn from COULON *et al.* (2011). Fig. 50. Apex of aedeagus of (a) *Amara (Zezea) floralis*; (b) *A. (Zezea) plebeja*; (c) *A. (Zezea) strenua*; (d) *A. (Zezea) concinna*; (e) *A. (Zezea) rufipes*; (f) *A. (Zezea) kulti*; (g) *A. (Zezea) fulvipes*; (h) *A. (Zezea) tricuspidata.* Figs. 50b-h redrawn from COULON *et al.* (2011).

Fig. 48. Espolón apical de la protibia de (a) *Amara (Zezea) floralis*; (b) *A. (Zezea) plebeja*. Fig. 49. Pronoto de (a) *Amara (Zezea) floralis;* (b) *A. (Zezea) plebeja*; (c) *A. (Zezea) strenua*; (d) *A. (Zezea) rufipes;* (e) *Amara (Zezea) kulti*; (f) *A. (Zezea) fulvipes*; (g) *A. (Zezea) tricuspidata*. Figs 49b, d-g redibujadas de COULON *et al.* (2011). Fig. 50. Ápice del edeago de (a) *Amara (Zezea) floralis*; (b) *A. (Zezea) plebeja*; (c) *A. (Zezea) strenua*; (d) *A. (Zezea) concinna*; (e) *A. (Zezea) rufipes*; (f) *A. (Zezea) kulti*; (g) *A. (Zezea) fulvipes*; (h) *A. (Zezea) tricuspidata.* Figs. 50b-h redibujadas de COULON *et al.* (2011).

DISCUSSION

On the taxonomic status of *Curtonotus* and *Amarocelia*

Curtonotus is currently treated as a subgenus of *Amara* by most authors except for those following the criteria of JEANNEl (1942), who rised many subgenera to genera (a practice applied also to large genera as *Carabus* Linneus, 1758*, Bembidion* Latreille, 1802*, Pterostichus* Bonelli, 1810 and others). The question of "lumping" or "splitting" these large lineages is becoming more objective, as far as their systematics and biogeography are better known, and molecular data become available. For example, lineages as *Sinechostictus* Motschulsky, 1864 and *Orthomus* Chaudoir, 1838 are now considered apart from *Bembidion* or *Pterostichus* (LÖBL and LÖBL, Palearctic Catalogue 2017) as phylogenetic evidence (*Sinechostictus*: MADDISON, 2012; *Orthomus*: own barcode unpublished data) indicates that they branched off the main genus stem in ancient epochs, and developed enough morphological and molecular differences through geological time as to deserve their recognition as separate genera. Often, peculiarities in geographic distribution and ecological preferences are also associated to this distinctness.

In the case of *Curtonotus*, HIEKE (1978) already hypothesized that this taxon was possibly the first one that became separated from the main stem of the subtribe Amarina, as observed in a tentative phylogenetic tree of Zabrini hand-elaborated according to morphological and geographical characters. In addition to the morphological features than distinguish *Curtonotus* and *Amara*, HIEKE (1978) put forward that separation between both lineages was supported by the breakup of Laurasia into Palearctic and Nearctic regions. Species of *Curtonotus* are presently more abundant in the eastern Palearctic region, an area equally separated from the western Palearctic and the Nearctic during the Eocene. It is then hypothesized that during this geological period there was an adequate geographic scenario for the origin of *Curtonotus* in the eastern Palearctic, followed by late dispersal routes to both Europe and North America, where lineages experimented secondary radiations (BRIGGS, 1987; SANMARTÍN *et al.* 2001; ARCHIBALD & MAKARKIN 2006). This hypothesis implies that *Curtonotus* was separated from *Amara* about 50 million years. The cladistic analysis carried out by ANDÚJAR & SERRANO (2001) based on morphology, and the molecular data presented by SÁNCHEZ-GEA *et al.* (2004) also support the distinctness of *Curtonotus* as a separate genus from *Amara*. Barcoding data of RAUPACH *et al.* (2018) show that *Curtonotus* taxa, together with some "atypical" *Amara* species, make up the sister group of the genus *Amara*. These data support our treatment of *Curtonotus* as a separate genus.

Amara erratica is a species either included in the monotypic subgenus *Amarocelia* Motschulsky, 1862 (HŮRKA, 1996; HIEKE, 2011, 2017), or in the subgenus *Celia* (JEANNEl, 1942; LORENZ, 2005; COULON et al., 2011; SERRANO, 2013). Barcode data provided by RAUPACH *et al.* (2018) suggest that *Amara erratica* is a member of subgenus *Amara*, close to the *A. aenea* group of taxa with flat interstriae in the apex of elytron. It is necessary to corroborate this relationship by considering also molecular data from the nuclear genome, as the close relationship between *A. erratica* and *A. interstitialis, A. spreta* and *A. famelica* based on mitochondrial sequences, could be the result of an introgression event that resulted in the entire replacement of the ancestral mitochondrial sequence of *A. erratica*. According to this uncertainty, *Amarocelia* is here treated as a distinct subgenus, that might be eventually included into the subgenus *Amara* if adequate evidence is found.

Distribution patterns of Iberian Amarina

Present distribution of Amarina (HIEKE, 2011) together with biological properties shown by most of its lineages, support the hypothesis of a Centroasiatic origin of the subtribe, and a secondary colonization of Europe and the Mediterranean Basin to the west, and the Nearctic region through Beringia to the east (Nearctic *Curtonotus*). Adults of many species are usually seed-eaters of diverse plant species (i.e., polyphagous instead of oligophagous; THIELE 1977; HONEK *et al.*, 2003; KULKARNI *et al*., 2005) and this seems also to be true for the larvae (SASKA & JAROSIK, 2001). As seen in Table I, lineages found in the Iberian peninsula include many species able to cope with both Atlantic and Mediterranean climatic conditions, namely 27 (14 taxa inhabiting north and central Peninsula, plus 13 species inhabiting the whole Peninsula). Thus, a generalist feeding preference and a wide ecophysiological tolerance may explain that many of the Iberian Amarina have a large distribution area, either Cosmopolitan or Euroasiatic; these chorologies make up 47.9% of all taxa (Table II). In comparison, the same chorological categories of the whole Iberian Carabidae are only 22.9% (SERRANO et al., 2003). It seems that these biological characteristics allow the Amarina to become eurytopic beetles, able to colonize and adapt to conditions prevailing in both temperate and Mediterranean areas of Eurasia. As noted by SERRANO *et al.* (2003), taxa showing a Centroasiatic, Siberian or European distribution are often restricted to the northern half of Iberia, or even to the humid northernmost third (i.e., the "Atlantic Peninsula"). However, other species of Iberian Amarina not only occur in atlantic areas but have been able to establish populations in the montane belt of particular Mediterranean sierras, that is, the Iberian System, Central System, Betic chains; less frequently, these taxa have also colonized the Central plains (Table I).

The second highest proportion of chorotypes shown by Iberian Amarina corresponds to the Mediterranean elements, in a wide sense (28.8%). This proportion suggests that some lineages of Amarina has radiated in the Mediterranean basin, what is particularly evident for the subgenus *Camptocelia* (see below).

The proportion of endemic taxa of Amarina, 23.1%, is low in comparison with the 58% of endemicity that is observed for the whole family Carabidae in Iberia (Table II). However, it should be noted that this high percentage of endemic taxa is mostly due to a huge number of species of the subfamily Trechitae that inhabit the hypogean milieu (ORTUÑO & GILGADO, 2010; SERRANO, 2013), an environment that has not been colonized by Amarina. Indeed, most of these endemic Trechitae taxa are only known from a single cave, or a locality of the Mesovoid Shallow Substratum (MSS).

Endemic elements are only found within a few lineages of Iberian *Amara*. Whereas species of *Leuris* and *Leironotus* seem to have radiated at high altitudes of Pyrenean and Central Iberian sierras, following the typical evolutionary pattern of orophilous lineages, species of *Camptocelia* show a distinct evolutionary pathway, as these include endemic taxa not always inhabiting high mountains (i.e., *A. arcuata, A. barcelonensis*). Furthermore, *A. corpulenta* (Betic-Riffian) and *A. rotundata* (Ibero-Maghrebian) also live in plains. Three more *Camptocelia* are west Mediterranean whereas *A. eximia* shows a south European distribution. Other species of *Camptocelia* are also restricted to the Mediterranean Basin (HIEKE, 2003). The distribution of these taxa suggests that the subgenus is possibly one of the few lineages that were originated in the Mediterranean area from ancestors that came from Central Asia.

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Table I. List of Iberian Amarina with indication of the chorological category of each taxon and its distribution on the Iberian Peninsula.

Tabla I. Lista de los Amarina ibéricos con indicación de la categoría corológica de cada taxón y su distribución en la península ibérica.

Species Subtribe Amarina Zimmermann 1831	Chorological category	North („humid") Peninsula	North & Central Peninsula	Whole Peninsula	Only Mediterranean Peninsula	Endemic & restricted distribution
Amara (Acorius) *metallescens* (Zimmermann 1831)	WMED				1	
Amara (*Amara*) *aenea* (DeGeer 1774)	PALE			1		
Amara (*Amara*) *anthobia* A. y J. B. Villa 1833	EUME			1		
Amara (*Amara*) *communis* (Panzer 1790)	ASER		1			
Amara (*Amara*) *convexior* Stephens 1828	CAER	1				
Amara (*Amara*) *curta* Dejean 1828	CAER		1			
Amara (*Amara*) *eurynota* (Panzer 1797)	PALE			1		
Amara (*Amara*) *famelica* Zimmermann 1832	PALE		1			
Amara (*Amara*) *familiaris* (Duftschmid 1812)	ASER			1		
Amara (*Amara*) *lucida* (Duftschmid 1812)	TEUM			1		
Amara (*Amara*) *lunicollis* Schiodte 1837	ASER	1				
Amara (*Amara*) *montivaga* Sturm 1825	TUER	1				
Amara (*Amara*) *nigricornis* Thomson 1857	SIER	1				
Amara (*Amara*) *nitida* Sturm 1825	SIER	1				
Amara (*Amara*) *ovata* (Fabricius 1792)	ASER		1			
Amara (*Amara*) *proxima* Putzeys 1866	TSER				1	
Amara (*Amara*) *similata* (Gyllenhal 1810)	PALE			1		
Amara (*Amara*) *subconvexa* Putzeys 1865	WMED				1	
Amara (*Amara*) *tibialis* (Paykull 1798)	ASER	1				

Species Subtribe Amarina Zimmermann 1831	Chorological category	North („humid") Peninsula	North & Central Peninsula	Whole Peninsula	Only Mediterranean Peninsula	Endemic & restricted distribution
Amara (Amarocelia) erratica (Duftschmid 1812)	ASER		1			
Amara (Amathitis) rufescens shismatica (Antoine, 1957)	NAFR				1	
Amara (Bradytus) apricaria (Paykull 1790)	HOLA			1		
Amara (Bradytus) consularis (Duftschmid 1812)	ASER	1				
Amara (Bradytus) crenata Dejean 1828	TUER			1		
Amara (Bradytus) fulva (O. F. Müller 1776)	SIER		1			
Amara (Camptocelia) affinis Dejean 1828 (*perezi* Putzeys 1867; *tingitana* Putzeys 1870)	WMED				1	
Amara (Camptocelia) arcuata arcuata (Putzeys 1866)	ENDE					1
Amara (Camptocelia) arcuata castiliana Hieke 1983	ENDE					1
Amara (Camptocelia) barcelonensis Hieke 1983	ENDE					1
Amara (Camptocelia) brevis Dejean 1828	WMED				1	
Amara (Camptocelia) corpulenta (Putzeys 1866)	BERI				1	
Amara (Camptocelia) cottyi Coquerel 1859	WMED				1	
Amara (Camptocelia) eximia Dejean 1828	SOER			1		
Amara (Camptocelia) gravidula gravidula Rosenhauer 1856	ENDE					1
Amara (Camptocelia) gravidula testudinea Putzeys 1865	ENDE					1
Amara (Camptocelia) malacensis Hieke 1983	ENDE					1
Amara (Camptocelia) rotundata Dejean 1828	IBMG				1	
Amara (Celia) arenaria (Putzeys 1865) (*hispanica* Csiki 1929)	TSER				1	
Amara (Celia) bifrons (Gyllenhal, 1810)	ASER		1			
Amara (Celia) brunnea (Gyllenhal, 1810)	HOLA	1				
Amara (Celia) fervida Coquerel, 1858	WMED				1	
Amara (Celia) montana Dejean, 1828	MEDT			1		
Amara (Celia) praetermissa (Sahlberg, 1827)	SIER	1				
Amara (Celia) sollicita Pantel, 1888	TSER				1	
Amara (Leironotus) albarracina (Hieke, 1984)	ENDE					1
Amara (Leironotus) glabrata Dejean, 1828	SOER				1	
Amara (Leironotus) ooptera (Putzeys, 1866)	ENDE					1

Species Subtribe Amarina Zimmermann 1831	Chorological category	North („humid") Peninsula	North & Central Peninsula	Whole Peninsula	Only Mediterranean Peninsula	Endemic & restricted distribution
Amara (Leironotus) rotundicollis (Schaufuss, 1862)	ENDE					1
Amara (Leuris) emmanuelivivesi (E. Vives, 2018)	ENDE					1
Amara (Leuris) espagnoli (J. Vives, 1971)	ENDE					1
Amara (Leuris) puncticollis Dejean, 1828	ENDE					1
Amara (Leuris) pyrenaeus Dejean, 1828	ENDE					1
Amara (Paracelia) quenseli (Schönherr, 1806)	HOLA	1				
Amara (Paracelia) rufoaenea Dejean, 1828	WMED				1	
Amara (Paracelia) simplex Dejean, 1828	TSER				1	
Amara (Percosia) equestris equestris (Duftschmid, 1812)	SIER		1			
Amara (Percosia) equestris zabroides Dejean, 1828	SOER				1	
Amara (Xenocelia) atlantis Antoine, 1925	IBMG				1	
Amara (Xenocelia) bischoffi Jedlicka, 1946	TSER		1			
Amara (Xenocelia) cursitans Zimmermann, 1831	EURP	1				
Amara (Xenocelia) fusca Dejean, 1828 (*complanata* Dejean, 1828)	WPAL			1		
Amara (Xenocelia) ingenua (Duftschmid, 1812)	PALE				1	
Amara (Xenocelia) municipalis (Duftschmid, 1812)	ASER	1				
Amara (Xenocelia) vivesi Jeanne, 1985	ENDE					1
Amara (Zezea) concinna Zimmermann, 1832	EURP		1			
Amara (Zezea) floralis Gaubil, 1844 (*gaubili* Fassati 1949)	SOER	1				
Amara (Zezea) fulvipes Audinet-Serville, 1821	CEUR	1				
Amara (*Zezea) kulti* Fassati, 1947	EUME		1			
Amara (Zezea) plebeja (Gyllenhal, 1810)	SIER		1			
Amara (Zezea) rufipes Dejean, 1828	WMED		1			
Amara (Zezea) strenua Zimmermann, 1832	CEUR			1		
Amara (Zezea) tricuspidata Dejean, 1831	SIER			1		
Curtonotus aulicus (Panzer, 1797)	ASER		1			
No. of taxa		14	14	13	18	13

Table II. Comparison of the proportion of the different chorological categories of the whole Iberian fauna of Carabidae, and those corresponding to Iberian Amarina. The categories are grouped (from top to bottom) in elements with a **wide-range** distribution, partially **Euroasiatic** or **European**, predominantly **Mediterranean**, and **endemic** or taxa with restricted distribution. Data were obtained from SERRANO (2020).

Tabla II. Comparación entre las proporciones de las diferentes categorías corológicas de toda la fauna ibérica de Carabidae y los taxones ibéricos de la subtribu Amarina. Se han agrupado las categorías (de arriba abajo) in elementos con una distribución muy amplia, los de patrón euroasiático o europeo, los de tipo mediterráneo y los endémicos o aquellos con distribución muy limitada. Los datos se han tomado de SERRANO (2020).

Chorological category	**Amarina**		**Iberian Carabidae**	
Cosmopolitan			3	
Holarctic	3		12	
Palearctic	5		35	
West Palearctic	1		37	
No. of taxa	**9**	12.3%	**87**	6%
Asiatic European	10		24	
Sibirian European	7		55	
Centralasiatic-European-Mediterranean	-		9	
Centralasiatic European	2		15	
Centralasiatic Mediterranean	-		3	
Turanic-European-Mediterranean	1		14	
Turanic European	2		27	
European	2		61	
Central European	2		5	
Alpine	-		14	
No. of taxa	**26**	35.6%	**245**	16.9%
Turanic Mediterranean	-		27	
European Mediterranean	2		10	
Turanic South European	5		18	
South European	4		24	
West European	-		50	
Mediterranean	1		111	
West Mediterranean	8		13	
North African	1		2	
Atlantic	-		4	
North Mediterranean	-		2	
Afrotropic-Indo-Mediterranean	-		1	
Afrotropic Mediterranean	-		11	
Indo Mediterranean	-		1	
Indian-Saharian	-		2	
No. of taxa	**21**	28.8%	**275**	18.98
Endemic to Iberia	14		752	
Iberian Maghrebine	2		67	
Betic Riffian	1		6	
Lionigurian	-		4	
Catalonian Provenzal	-		11	
No. of taxa	**17**	23.3%	**843**	58.12%
Total no. of taxa	**73**		**1450**	

Photo 1. Habitus of *Curtonotus aulicus* (Panzer, 1796).

Photo 2. Habitus of *Amara (Acorius) metallescens* (Zimmermann, 1831)

Photo 3. Habitus of *Amara* (*Amara*) *similata* (Gyllenhal 1810)

Photo 4. Habitus of *Amara (Amathitis) rufescens shismatica* Antoine, 1957)

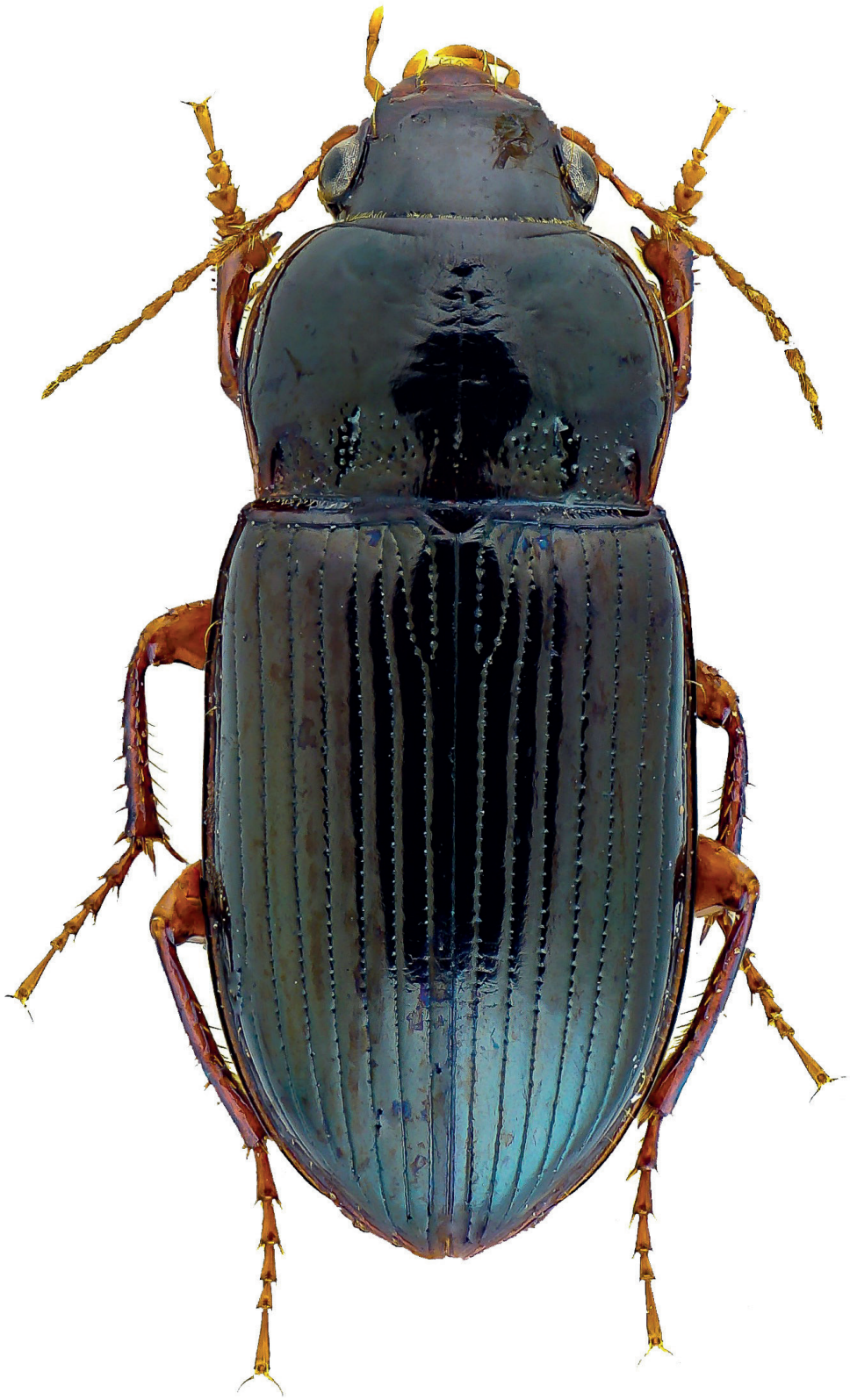

Photo 5. Habitus of *Amara (Bradytus) apricaria* (Paykull, 1790)

Photo 6. Habitus of *Amara (Camptocelia) eximia* Dejean, 1828.

Photo 7. Habitus of *Amara (Celia) sollicita* Pantel, 1888.

Photo 8. Habitus of *Amara (Leironotus) ooptera* (Putzeys, 1865).

Photo 9. Habitus of *Amara (Leironotus) rotundicollis* (Schaufuss, 1862).

Photo 10. Habitus of *Amara (Leuris) espagnoli* (J. Vives, 1971).

Photo 11. Habitus of *Amara (Paracelia) simplex simplex* Dejean, 1828.

Photo 12. Habitus of *Amara (Percosia) equestris* (Duftschmid, 1812).

Photo 13. Habitus of *Amara (Xenocelia) ingenua* (Duftschmid, 1812).

Photo 14. Habitus of *Amara (Xenocelia) vivesi* (Jeanne, 1985).

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