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# ON THE IDENTITY OF *CALOMICRUS FALLAX* (JOANNIS, 1865) WITH DESCRIPTION OF A NEW, WIDESPREAD SPECIES OF *CALOMICRUS* FROM SPAIN AND PORTUGAL AND COMMENTS ON THE IBERIAN SPECIES (COLEOPTERA, CHRYSOMELIDAE, GALERUCINAE)

José Miguel Vela

Instituto de Investigación y Formación Agraria y Pesquera (IFAPA), Junta de Andalucía, Cortijo de la Cruz, 29140 Málaga, Spain. ORCID iD: <https://orcid.org/0000-0003-0294-0867> – [josem.vela@juntadeandalucia.es](mailto:josem.vela@juntadeandalucia.es)

## ABSTRACT

*Calomicrus fallax* (Joannis, 1865) is redescribed and its distribution is limited to Tunisia and Algeria. *Calomicrus ibericus* sp. nov. is described from Portugal and Spain. Due to the historical confusion between them, their differences are established. The Iberian species of *Calomicrus* Dillwyn, 1829 are listed. Two species, *Calomicrus espanoli* (Codina, 1963) and *Calomicrus pinicola* (Duftschmid, 1825) are transferred to *Euluperus* Weise, 1886. The Iberian species in *Calomicrus* and *Euluperus* are keyed and colour photo of habitus are provided.

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**Key words:** *Calomicrus ibericus* sp. nov.; *Euluperus*; leaf beetles; new species; Mediterranean; North Africa; Iberian Peninsula.

## RESUMEN

**Sobre la identidad de *Calomicrus fallax* (Joannis, 1865), con descripción de una nueva especie de *Calomicrus* ampliamente distribuida por España y Portugal, y notas sobre las especies ibéricas (Coleoptera, Chrysomelidae, Galerucinae)**

Se redescrive *Calomicrus fallax* (Joannis, 1865), y su distribución queda limitada a Túnez y Argelia. Se describe una nueva especie de Portugal y España, *Calomicrus ibericus* sp. nov., históricamente confundida con *C. fallax*, y se evidencian las diferencias entre ambas. Se ofrece una lista geográfica de las especies ibéricas de *Calomicrus* Dillwyn, 1829, y dos especies anteriormente combinadas en este género, *C. espanoli* (Codina, 1963) y *C. pinicola* (Duftschmid, 1825), son transferidas a *Euluperus* Weise, 1886. Se propone una clave dicotómica para separar las especies ibéricas de *Calomicrus* y *Euluperus*, y se muestran fotografía a color de los *habitus* de las mismas.

**Palabras clave:** Nueva especie; *Calomicrus ibericus* sp. nov.; *Euluperus*; crisomélido; Norte de África; Península Ibérica; España; Portugal.

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## Introduction

*Calomicrus fallax* (Joannis, 1865) has been repeatedly reported in the literature from Spain (Weise, 1886; Heyden, 1870; Kiesenwetter, 1873; Uhagón, 1887; Wagner, 1927; Codina, 1963; Daccordi & Petitpierre, 1977; Petitpierre, 1988; Vela & Bastazo, 1991; Warchałowski, 1991, 2003, 2010; García-Ocejo & Gurrea, 1995). However, Joannis (1865) described this species from Algeria, and here it is shown that it is different from a common yellow *Calomicrus* species living in Spain and Portugal, which belongs to an undescribed species. The genus *Calomicrus* is not yet sufficiently studied in the Mediterranean, and some of its species should be included in other genera. For this reason, Bezděk (2015) pointed out the morphological differences between some of the genera he called “*Luperus*-like”, including *Calomicrus* and *Euluperus*. Consequently, two Iberian species previously considered in *Calomicrus* are combined here in *Euluperus*. However, the generic assignation of other West Palaearctic species included in *Calomicrus* should be evaluated.

## Material and Methods

All measurements were made using an ocular grid mounted on MBS-10 stereomicroscope (32× magnification). The photographs of specimens were taken with Leica DFC320 attached to a Leica MZ 9.5 stereomicroscope. Images of the same specimen in different focal planes were combined using CombineZP free software.

The examined specimens are housed in the following collections:

CBe	=	Collection of Ron Beenen, Nieuwegein
CBz	=	Collection of Jan Bezděk, Brno
CBV	=	Collection of Gloria Bastazo and José Miguel Vela, Málaga
CDa	=	Collection of Mauro Daccordi, Verona
CDo	=	Collection of Serge Doguet †, Fontenay-sous-Bois
CFr	=	Collection of Frank Fritzlar, Jena
CPk	=	Collection of Jan Pelikán, Hradec Králové
CPe	=	Collection of Eduard Petitpierre, Palma de Mallorca
CSe	=	Collection of Lukáš Sekerka, Prague
MNCN	=	Museo Nacional de Ciencias Naturales, Madrid
MNHN	=	Muséum national d’Histoire naturelle, Paris (Dr. Nicole Berti †)
NMPC	=	National Museum, Prague (Lukáš Sekerka)

### Abbreviations

BL	=	body length (excluding antennae)
EL	=	length of elytra.

## Results

### *Calomicrus fallax* (Joannis, 1865)

Figs. 1, 9, 13, 14, 18, 22

*Luperus (Calomicrus) fallax* Joannis, 1865: 123 (original description).

TYPE LOCALITY. “Algérie”.

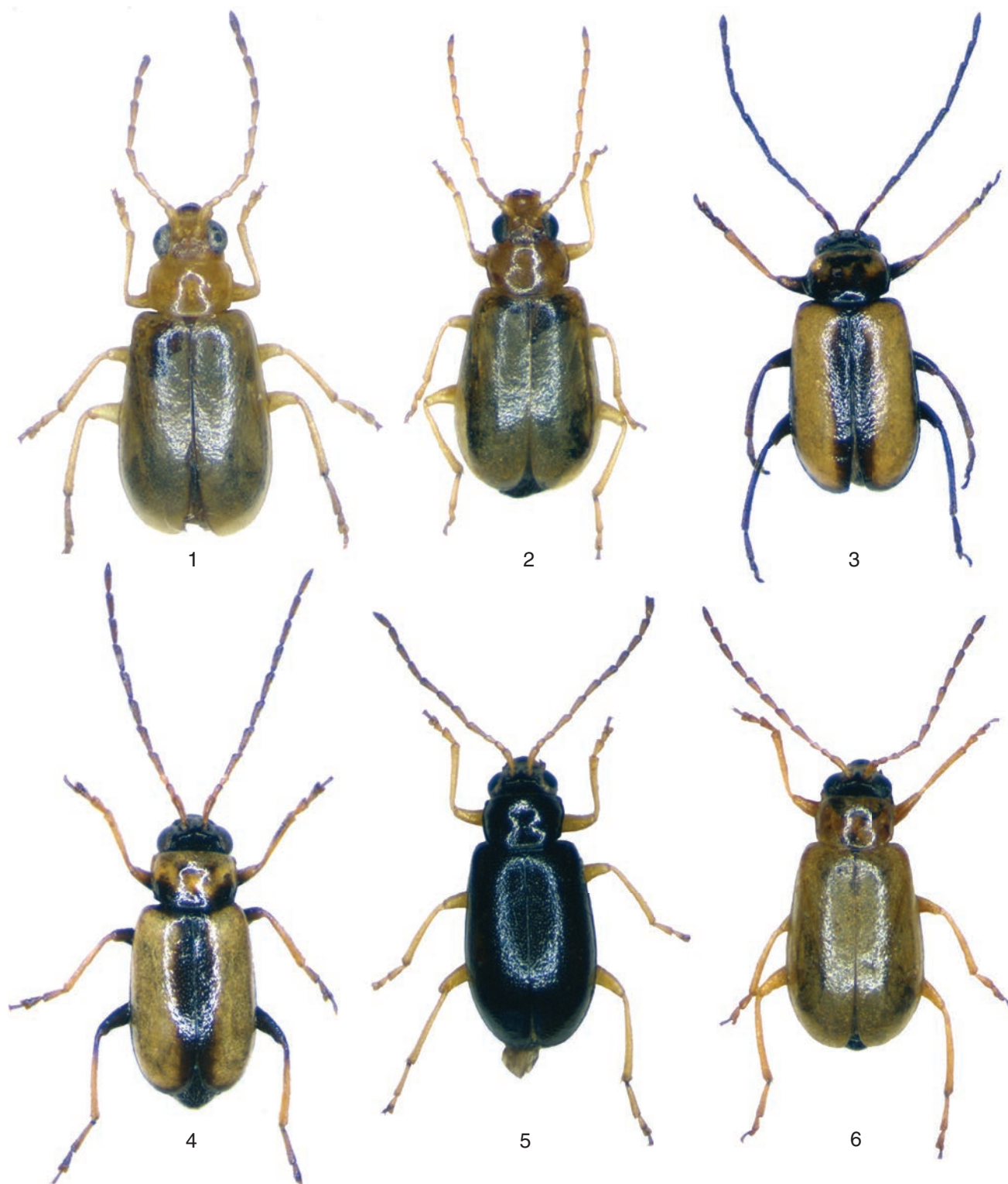
TYPE MATERIAL EXAMINED. HOLOTYPE: 1 ♀, “Bône [at present Annaba, circular] // 27 [printed] // MUSÉUM PARIS / COLL. CH. AUBÉ [printed] // *Luperus fallax* [handwritten] // HOLOTYPE [printed, red label]” (MNHN).

HOLOTYPE INFORMATION. The holotype (♀) measures: BL = 2.78 mm; EL = 2.26; smaller than the examined non-type female specimens. Antennomeres relation: 9-5-5-8-8-. The holotype lacks antennomeres VI-XI of left and IV-XI of right antenna. The late Dr. Nicole Berti (MNHN) dissected the genitalia, drew it and sent the figure of the spermatheca to the author (fig. 13); this dissection is kept in a small glycerine vial attached to the pin. Joannis (1865) explicitly stated that his description was based on a single specimen of the Aubé collection, so this is the holotype. Therefore, a specimen on the webpage of the Museum of Comparative Zoology (Harvard) cannot be considered a syntype (see [140.247.96.247/mcz/Species\\_record.php?id=25141](https://www.mcz.harvard.edu/species_record.php?id=25141)) (accessed 22/02/2018).

ADDITIONAL EXAMINED SPECIMENS. ALGERIE. Annaba, Chetaibi, 24.5.1976, Chene liége, S. Doguet leg., 5 exx. unsexed (CDo); Constantine: El Meridj, 30.5.1973, S. Doguet leg., 2 exx. unsexed (CDo), 1♂, 1♀ (CBV); Yakouren, Kabylie, L. Puel, 1♂, 1♀ (CDa). TUNISIE: Le Kef Gov., Sakiet Sidi Youssef, 8-10 km NE, str. for Touiref, 22-V-2010, leg. Angelini, 1♂ (CDa), 1♂, 1♀ (CBV); Jendouba Gov., Ain Draham 7 km SW str. for H. Bourguiba, 13-V-2009, leg. Angelini, 1♂, 2♀♀ (CDa), 1♂, 1♀ (CBV).

### REDESCRIPTION

BL: ♂♂: 2.71-3.29 mm; ♀♀: 2.92-3.46 mm. Body oblong-elongate (fig. 1); body length is 2.13-2.33 (♂♂), 1.94-2.25 (♀♀) times its maximum width. General colour pale yellow. Apex of labrum and of mandibles brownish. Elytral suture and scutellum slightly darkened. Apex of metatibia and base of metatarsomere IV with a blackish ring. Antennae gradually darker from antennomere VII. Margin of epipleura with a thin blackish line from base until 1/3 of its length. Metaventricle (♂, ♀) and abdomen (♂♂) black or brown, but the metepisternum has an outer band yellow, which widens at base and at apex. Abdomen



Figs. 1-6.— Habitus of species of the genus *Calomicrus* Dillwyn, 1829. The North African *Calomicrus fallax* (Joannis, 1885) (EL = 2.24 mm) (1), and Iberian *Calomicrus ibericus* sp. nov. (EL = 2.32 mm) (2), *Calomicrus circumfusus* (Marsham, 1802) (EL = 2.10 mm) (3), *Calomicrus suturalis* (Joannis, 1865) (EL = 2.05 mm) (4), *Calomicrus foveolatus* Rosenhauer, 1856 (EL = 2.19 mm) (5) and *Calomicrus sordidus* (Kiesenwetter, 1873) (EL = 2.32 mm) (6).

Figs. 1-6.— Habitus del género *Calomicrus* Dillwyn, 1829: la especie norte-africana *Calomicrus fallax* (Joannis, 1886) (EL = 2.24 mm) (1), y las especies ibéricas *Calomicrus ibericus* sp. nov. (EL = 2.32 mm) (2), *Calomicrus circumfusus* (Marsham, 1802) (EL = 2.10 mm) (3), *Calomicrus suturalis* (Joannis, 1865) (EL = 2.05 mm) (4), *Calomicrus foveolatus* Rosenhauer, 1856 (EL = 2.19 mm) (5) and *Calomicrus sordidus* (Kiesenwetter, 1873) (EL = 2.32 mm) (6).

with a marginal band more or less conspicuous yellow (♂♂) or yellow with the first visible ventrite somewhat darker.

**HEAD.** Slightly (♂♂) or conspicuously (♀♀) narrower than the anterior side of pronotum. Cephalic width 1.84-1.96 (♂♂), 1.64-1.70 (♀♀) times the interocular distance, due to the larger eyes in males, and 3.69-4.50 (♂♂), 3.53-3.73 (♀♀) the interantennal distance. Vertex hairless, with silk shine, somewhat convex, without punctures, with weak microwrinkles that near the eyes become stronger. No or barely perceptible coronal sulcus. Frontal suture weak or moderate, in open "V", in the middle with a depression, not reaching the posterior-inner border of the eye. Ocular sulcus absent. Frons hairless. Middle-frontal sulcus very fine. Frontal tubercles elevated, microwrinkled. Nasal keel slightly swollen. Clypeus and labrum with yellow erect setae. Fore side of labrum straight. Antennae slightly longer in males than in females; their length is 0.89-1.01 (♂♂), 0.91-0.93 (♀♀) times the length of the elytra. Antennomeres parallel. Pubescence of antennae with long, dense, semierect setae. The antennomere IV is 0.88-1.00 (♂♂), 0.84-0.89 (♀♀) times the sum of antennomeres II and III, and 1.87-2.14 (♂♂), 1.60-1.88 (♀♀) as the length of the antennomere III. Antennomere III is 0.87-1.13 (♂♂), 0.89-1.11 (♀♀) times the length of antennomere II. Antennomeres relative length: 11-5-5-10-10-10-10-9-8-8-11 (♂♂), 10-5-5-9-10-9-9-9-8-7-11 (♀♀).

**PRONOTUM.** Slightly convex, shiny, smooth or with a fine punctation. Subrectangular, with parallel sides. More transversal in the male; its maximum width is 1.49-1.60 (♂♂), 1.60-1.67 (♀♀) times its length in the middle. Its maximum width is also 1.13-1.23 (♂♂), 1.25-1.27 (♀♀) times the head width. In some specimens there is a conspicuous broad transverse depression in the disc. Anterior side not margined, with the middle part straight or slightly curved backwards. Lateral sides almost straight, with a clearly visible margin and short hairs directed outwards. Posterior side with fine but visible margin curved and sinuated in the scutellar area. Anterior angles right, with a smooth callus and a setigerous pore in subapical position. Posterior angles weakly pointed, obtuse. Scutellum small, triangular, smooth.

**ELYTRA.** Length 2.85-3.29 (♂♂), 4.15-4.45 (♀♀) times longer than pronotum. Moderately shiny, punctation shallow, not very dense, the distance between the points varies about  $\frac{3}{4}$ -1 times the diameter of a puncture. Surface irregularly punctate, finely microgranulated, with short yellowish, deciduous hairs, more visible on the sides and the apex.

**LEGS.** Protibia 1.47-1.61 (♂♂), 1.44-1.63 (♀♀) times longer than protarsus. The length of protarsus

is 2.38-2.82 (♂♂), 2.82-3.20 (♀♀) times the length of protarsomere I. This is 1.83-2.17 (♂♂), 2.00-2.20 (♀♀) longer than wide. Mesotibia slightly longer than the protibia. Metatibia 1.13-1.25 (♂♂), 1.26-1.28 (♀♀) times the length of the mesotibia. Also, metatibia is 1.17-1.29 (♂♂), 1.23-1.31 (♀♀) times the length of the metatarsus. Tibiae moderately robust gradually widened towards the middle, then parallel. Tibiae with apical deciduous spur, on its inner apical side, 0.5-1.0x the diameter of tibia at apex. Femora with sparse yellow pubescence. Metatarsus 1.67-1.73 (♂♂), 1.67-1.79 (♀♀) times the length of metatarsomere I. Metatarsomere I is 1.37-1.50 (♂♂), 1.26-1.50 (♀♀) times longer than the rest of the metatarsus and 2.36-3.00 (♂♂), 2.14-2.42 (♀♀) times longer than the metatarsomere IV. Claws appendiculate.

**VENTRAL SURFACE.** Proventrite with keel narrow, inconspicuous between the procoxae. Proacetabula open, the apophysis of protorathic hypomera reaches the middle of procoxa. Apex of metaventricle with a bifid apophysis. Abdomen with yellow semi-laying pubescence.

**GENITALIA.** ♂♂: Central lobe of last abdominal ventrite with a large impression. Penis in ventral view sub-parallel, with apex rounded; basal foramen with a long cone-shaped incision forward (fig. 9a). In side view, the penis is regularly curved, with a smooth apex (fig. 9b).

♀♀: Spermatheca (figs. 13, 14) falciform, with nodulus dilated and well-differentiated, collum very curved and cornu long; ductus descending, starting from the posterior region of the nodulus; glandula auxiliaris upwards, inserted near the beginning of the ductus; sclerified part of the ductus short. Gonocoxite (fig. 18) with basal branches deeply divided. Sternite VIII and tignum as in fig. 22.

**DISTRIBUTION.** ALGERIA: without other data (Joannis, 1865; Weise, 1886, *sub Luperus (Calomicrus)*), Biskra; Annaba: Djebel Edough (Desbrochers des Loges, 1898, *sub Luperus (Calomicrus)*)] Massif de l'Ouarsenis oriental: Teniet-EI-Haad (Guillebeau, 1891, *sub Luperus (Calomicrus)*); Sétif: Sétif, Aïn Roua; Bajara: Kherrata (Warchalowski, 1991). TUNISIA: Aïn Drahem; Camp-de-la Santé; Feriana; Le Kef (Normand, 1937, *sub Luperus*). Records from Morocco by Kocher (1958) may refer to other species, as this author says, and that by Codina (1961) refers to *Calomicrus setulosus* var. *subglabrata* (Codina, 1963), very different to *Calomicrus fallax*.

**TROPHISM.** Monophagous on *Quercus ilex* (Warchalowski, 1991) and *Q. suber* (Doguet, in litt. *sub* "Chene liège") (Fagaceae).

*Calomicrus ibericus* sp. nov.

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Figs. 2, 10, 15, 19, 23

## TYPE MATERIAL

Holotype ♂: SPAIN, Málaga, Cortes de la Frontera, 650m, Montes de Cortes, 30STF8448, 7.6.1987, *Quercus suber*, Bastazo & Vela leg.

Paratypes: SPAIN, 2 ♂♂, 2 ♀♀, Málaga, Cortes de la Frontera, 650 m, Montes de Cortes, 30STF8448, 7.6.1987, *Quercus suber*, Bastazo & Vela leg.; 1 ♂, Málaga, Cortes de la Frontera, Puerto de La Calderona, 830 m, 7.6.1987, *Quercus suber*, Bastazo & Vela leg.; 1 ♂, 2 ♀♀, Málaga, Gaucín, Sierra del Hacho, 620 m, 7.6.1987, Bastazo & Vela leg.; 3 ♂♂, 1 ♀, Málaga, Parauta, Sierra de las Nieves, 1000 m, 29.6.1983, *Quercus rotundifolia*, Bastazo & Vela leg.; 10 ♂♂, Córdoba, Priego, Las Lagunillas, subida a La Tiñosa, 18.5.1991, *Quercus faginea*, Bastazo & Vela leg.; 1 ♂, Córdoba, Luque, Sierra de la Lastra, 19.5.1991, Bastazo & Vela leg.; 1 ♀, Córdoba, Luque, El Canalizo, 29.5.1993, M. Baena leg.; 1 ♂, 1 ♀, Córdoba, Arroyo Pedroche, 11.4.1993, M. Baena leg.; 5 exx., Cádiz, Conil, 8.5.1994, P. Coello leg.; 1 ♀, Cádiz, Tarifa, Sierra de la Luna, 15.5.1993, J. de Ferrer leg.; 1 ♀, Granada, Sierra Tejada, cara N, 1200 m, 10.7.1991, Bastazo & Vela leg.; 4 exx. unsexed, Lleida, Cervera, 10.6.1991, leg. Hebauer; 2 ♂♂, Tarragona: Querol, 21.6.1977, *Quercus ilex*, E. Petitpierre leg.; 2 ♂♂, Teruel, Royuela, 15.VI.1986, S. Doguet leg.

PORTUGAL. 1 ♂, 1 ♀, Algarve, Armação de Pêra, 3 km E, küste, 50 m NN, 10.IV.2014, Fritzlar leg.; 1 ♂, 1 ♀, Algarve, Lagoa, 6 km SE, küste, 1.IV.2004, Fritzlar leg.; 8 ♂♂, 5 ♀♀, Algarve, Loulé, 10 km WNW, Monte Seco, macchia, 250 m, 3.IV.2004, Fritzlar leg.; 6 exx., ídem, Col. Beenen; 17 exx. unsexed, Algarve, Loulé, 20 km NW, Alte, 4 km W, 400 m NN, 6.IV.2004, Fritzlar leg.; 4 ♂♂, 2 ♀♀, Algarve, Portimao, 15km N, Alcalar, Obstland, 300 m NN, 7.IV.2014, Fritzlar leg.; 1 ♀, Portugal, Algarve, Alte, Santa Margarida, 9.V.1999, leg. H. Ziegler; 1 ♂, 1 ♀, Portugal, Algarve, Salar, Rocha da Pena, 17.V.1999, leg. H. Ziegler; 2 ♀♀, Algarve, Vila do Bispo, 10 km E, Budens N., Macch [ia], 150m NN, 4.IV.2004, Fritzlar leg.; 1 ♂, 1 ♀, 25 exx. unsexed, Faro distr., Arade Dam (0.5 km N of Casa Queimada) 2.V.2013, 37°14'16.7"N, 8°23'11.9"W, 87 m, *Quercus rotundifolia* and *Q. suber*, Jan Pelikán leg.; 59 exx. unsexed, ídem, 1-2.V.2013, L. Sekerka leg.; 6 exx. unsexed, Faro distr., Cerro de Cima (= Serro de Casas), 37°14'26.62"N, 8°04'45.3"W, 2.V.2013, *Quercus rotundifolia*, Jan Pelikán leg.; 1 ♂, 1 ♀, Faro, Serro da Cima (= Serro das Casas), 261 m, 37°14'26.6"N,

8°04'45.93"W, 2.V.2013, L. Sekerka leg.; 1 ♂, 1 ♀, Faro, 0.5 km S of Barranco de Velho, 37°13'52.5"N, 7°56'14.4"W, 470 m, 4-5.V.2013, L. Sekerka leg.; 1 ♂, 1 ♀, ídem, Jan Pelikán leg.

The holotype and three paratypes are deposited in the Museo Nacional de Ciencias Naturales (MNCN), Madrid, type n° 2824 of the type catalogue; the other paratypes in CBe, CBz, CDa, CFr, CPe, CPk, CSe, NMPC and CBV.

## Description

BL: ♂♂: 3.00-3.40 mm; ♀♀: 3.20-3.90 mm. Body oblong-elongate (fig. 2); the body length is 2.00-2.20 (♂♂, ♀♀) times its maximum width. General colour pale yellow. Dry specimens may be brownish. Vertex and pronotum sometimes reddish, somewhat darker than the general colouration. Apex of labrum, of mandibles, last palpomere of maxilla and apex of antennomere XI brown. In some specimens, tarsomeres III and IV somewhat darker than the others. Metatarsomere with a basal brown ring. Metaventrite (♂, ♀) and abdomen (♂♂) black or brown, but the metepisternum has a yellow outer band, which widens at the base and at the apex. Abdomen with a yellow marginal band more or less conspicuous (♂♂) or yellow with the first visible ventrite slightly darker.

HEAD. Slightly narrower than the anterior side of pronotum. Cephalic width 1.72-1.81 (♂♂), 1.37-1.68 (♀♀) times the interocular distance and 5.60 – 6.11 (♂♂), 4.00-5.70 (♀♀) the interantennal distance. Vertex hairless, with silk shine, somewhat convex, without punctures, with weak microwrinkles which near the eyes become stronger. No or barely perceptible coronal sulcus, at most as a slight punctiform impression. Frontal suture weak or moderate, short or reaching the also weak ocular sulcus. Frons hairless. Middle-frontal sulcus short, weakly marked. Frontal tubercles no or slightly swollen. Nasal keel narrow, not or slightly elevated. Clypeus and labrum with yellow erect setae. Fore side of labrum straight. Antennae slightly longer in males than in females; their length is 1.06-1.12 (♂♂), 0.91-0.96 (♀♀) times the length of the elytra. Antennomeres parallel. Pubescence of antennae is less dense in antennomeres I to III than in the others. Antennomeres III to X with some long, erect setae in their apical region. Antennomere IV is 0.95-1.05 (♂♂), 0.83-1.05 (♀♀) times the sum of antennomeres Ii and III, and 1.90-2.22 (♂♂), 1.73-2.22 (♀♀) as the length of antennomere III. Antennomere III is 0.90-1.00 (♂♂), 0.90-1.10 (♀♀) times the length of antennomere II. Antennomeres relative length: 11-5-5-10-10-10-10-10-9-11 (♂♂), 11-5-5-11-10-10-10-10-9-11 (♀♀).

**PRONOTUM.** Scarcely convex, with a large depression more or less conspicuous, shiny, with few weak punctures, and microgranulation moderate to weak. Transverse, its maximum width is 1.58-1.66 (♂♂), 1.55-1.67 (♀♀) times its length in the middle. Its maximum width is also 1.17-1.27 (♂♂), 1.26-1.58 (♀♀) times the cephalic width. Anterior side not margined, with the middle zone straight or slightly curved backwards, having a sparse row of inconspicuous silks directed forward. Lateral sides regularly curved, with well visible margin and short hairs directed outwards. Posterior side with fine but visible margin, curved but sinuated in the scutellar area. Anterior angles straight, with a smooth callus and a setigerous pore in subapical position. Posterior angles no or weakly pointed, obtuse. Scutellum small, triangular, smooth, with blunt apex.

**ELYTRA.** Length 3.72-4.12 (♂♂), 3.77-4.25 (♀♀) times longer than pronotum, with a depression in the post-scutellar area. Moderately shiny, punctation shallow, not very dense, the distance between the points varies between 1-1.5 times the diameter of a puncture. Surface irregularly punctated, finely microgranulated; sometimes it tends to form microwrinkles, with short yellowish deciduous hairs, more visible on the sides and the apex.

**LEGS.** Protibia 1.60-1.73 (♂♂), 1.49-1.70 (♀♀) times longer than the protarsus. Length of protarsus is 2.00-2.58 (♂♂), 2.50-2.92 (♀♀) times the length of protarsomere I. This is significantly broadened in ♂♂, so that is 1.71-2.00 (♂♂), 2.00-2.80 (♀♀) longer that wide. Mesotibia slightly longer than the protibia. Metatibia 1.19-1.25 (♂♂), 1.21-1.31 (♀♀) times the length of the mesotibia. Also, metatibia is 1.27-1.37 (♂♂), 1.19-1.32 (♀♀) times the length of the metatarsus. Tibiae moderately robust gradually widened towards the apex. Tibiae with apical, deciduous spur, on its inner apical side. Femora with sparse, yellow pubescence. Metatarsus 1.75-1.86 (♂♂), 1.73-1.84 (♀♀) times the length of the metatarsomere I. Metatarsomere I is 1.16-1.33 (♂♂), 1.19-1.36 (♀♀) times longer than the rest of the metatarsus and 2.23-2.90 (♂♂), 2.21-2.73 (♀♀) times longer than the metatarsomere IV. Tarsomere IV very short. Claws weakly appendiculate.

**VENTRAL SURFACE.** Proventrite with a narrow keel, inconspicuous between the procoxae. Proacetabula open. Apex of metaventricle with a bifid apophysis. Abdomen with yellow, semi-laying pubescence.

**GENITALIA.** ♂♂: Median lobe of last abdominal ventrite with a deep impression. Penis in ventral view with apex truncate and sinuated; sides convergent until the last ¼, where it is constricted and follows in parallel; basal foramen with the anterior side a bit projected forwards (fig. 10a). The everted endophallus have three type of spiculae, major ones in rear position, intermediate in fore part and a high number of

small ones in middle part (fig. 10c). In side view, the penis has the dorsal part curved until the last 1/3, from here it goes straight until a smooth point (fig. 10b).

♀♀: Spermatheca falciform (fig. 15), with nodulus dilated and well-differentiated, collum very curved and cornu long; ductus starting from the upper posterior region of the nodulus; glandula auxiliaris upwards, inserted close the starting of the ductus; sclerified part of ductus short. Gonocoxite (fig. 19) with basal branches deeply splitting. Sternite VIII and tignum as in fig. 20.

**ETYMOLOGY.** The epithet “ibericus” means “belonging or related to the Iberian Peninsula”.

**TROPHISM.** Records in the previous literature are *sub C. fallax*. Feeds on Fagaceae: *Quercus coccifera* (Uhagón, 1887); *Q. ilex* (Petitpierre, 1988); *Q. rotundifolia* (Warchałowski, 1991; present data); *Q. faginea* (García-Ocejo & Gurrea, 1995; present data); *Q. suber* (present data). Wagner (1927) recorded it from *Calycotome* (Fabaceae), but this host plant has not been confirmed.

**GENERAL DISTRIBUTION.** Spain, Portugal.

**IBERIAN DISTRIBUTION.** The previous records of *C. fallax* in Spain should refer to *C. ibericus* sp. nov.: Andalucía (Weise, 1886); Ciudad Real: Venta de Cárdenas (Heyden, 1870); Córdoba: Sierra da Córdoba (Kiesenwetter, 1873); Badajoz (Uhagón, 1887); Teruel: Valdevecar (=Valdevécar in Albarracín, Wagner, 1927); Jaén: Sierra de Cazorla (Codina, 1963; Daccordi & Petitpierre, 1977); Tarragona: Valls, Querol; Lérida: Avellanet (Petitpierre, 1988); Tarragona, Málaga (Vela & Bastazo, 1991); Málaga: Sierra de las Nieves (Warchałowski, 1991); Madrid: Monterrey (García-Ocejo & Gurrea, 1995).

**TAXONOMIC REMARKS.** The new species had been confused since Weise (1886) with *C. fallax*, which is a species known from Algeria and Tunisia. Both are very alike in coloration and general form, but can be separated by the following features:

*Calomicrus ibericus* sp. nov.: Antennae yellow with apex of antennomere XI brownish. The whole epipleura of the general color. Penis smaller, in ventral view with apex truncated and somewhat sinuated, a belt at ¾ of the length and basal foramen not pointed, short, with lateral weak constrictions and apex sinuated (fig.10a). Proximal part of spermathecal ductus separated from the nodulus, and directed down and backwards (fig. 15).

*Calomicrus fallax*: Antennae slightly and progressively infuscate from antennomere VII to apex.

Anterior margin of epipleura with a fine, dark line. Aedeagus greater, in ventral view with rounded apex (fig. 9a), without a marked belt at  $\frac{3}{4}$  of the length, and basal foramen very pointed forwards. Proximal part of spermathecal ductus close to the nodulus, and directed downwards (fig. 14).

#### Distribution of *Calomicrus* from Iberian Peninsula

In addition to *C. ibericus* sp. nov., four other species of *Calomicrus* are known from the Iberian Peninsula (Spain or Portugal):

#### *Calomicrus circumfusus* (Marsham, 1802)

Figs. 3, 26

EXAMINED SPECIMENS. SPAIN. 2 exx., Alicante: Ibi, 18.7.1981, J.M. Vela leg.; 24 exx., Asturias: Covadonga, Lago Enol, 1090 m, on *Ulex gallii* Planchon, 10.8.1992, M.A. Alonso Zarazaga leg.; 5 exx., Covadonga, Majada de Bobias, 1260 m, on *Ulex gallii* Planchon, 5.8.1992, M.A. Alonso Zarazaga leg.; 3 exx., Ávila: Burgohondo, 9.6.1990, M.A. Alonso Zarazaga leg.; 6 exx., Cantabria: Picos de Europa, Camaleño, Fuentedé, 1050 m, 14.8.1988, Bastazo & Vela leg.; 3 exx., Granada: Sierra Nevada, Bubión, Carril del Veleta, 2250 m, 10.7.1982, M.A. Alonso Zarazaga leg.; 1 ex., Sierra Arana, Alfaguara, 12.6.1981, J.M. Ávila leg.; 1 ex., Trevélez, Rio Trevélez, IX-1987, Bastazo & Vela leg.; 1 ex., Sierra de Alfacar, Cerro Higuierillas, 1450 m, 25.6.1988, Bastazo & Vela leg.; 5 exx., León: Fasgar, 1500 m, 12.8.1991, Bastazo & Vela leg.; 4 exx., Lérida: Lago de San Mauricio, 1900 m, 24.8.1980, J.A. Fernández Cortés leg.; 1 ex., Madrid: Lozoya, Reajo Capón, 1800 m, 11.7.1992, M.A. Alonso Zarazaga leg.; 2 exx., Garganta de los Montes, Arroyo del Rayo (pinar), 4.7.1992, 1350 m, M.A. Alonso Zarazaga leg.; 1 ex., Málaga: Ronda, Sierra de las Nieves, Cortijo de Quejigales, 1400 m, 29.6.1983, Bastazo & Vela leg.; 2 exx., El Burgo, Convento de las Nieves, 800 m, 30.5.1983, Bastazo & Vela leg.; 1 ex., Genalguacil, Sierra Bermeja, Los Reales, 1300 m, 22.5.1988, Bastazo & Vela leg.; 2 exx., Villanueva del Rosario, Sierra de Camarolos, 14.5.1988, M.A. Alonso Zarazaga leg.; 2 exx., Navarra: Erratzu, 13.7.1984, R. Biurun leg.; 1 ex., Tarragona: Llavería, 28.6.1979, M.A. Alonso Zarazaga leg.; 1 ej., Teruel: Albarracín, 30.6.1986, M. Baena leg.; 3 exx., Puerto de Orihuela, 5.7.1986, M. Baena leg. PORTUGAL: 3 exx., Douro Litoral: Ribeira de Riamachoso, Serra do Marao, Torno, 600 m, 6.7.1996, M. Badena leg.; 1 ex., Braga: Serra da Peneda, Alto dos Bicos, 4.6.1980, A. Serrano leg.

GENERAL DISTRIBUTION. Known of greater part of Europe (Beenen, 2010). Pic (1912) described *C. circumfusus* var. *talensis* from Tunisia: Thala, but the specific attribution should be confirmed. The record

from Morocco: Rif oriental: Ras-Fourhal by Kocher, 1958, 1969 (*sub Luperus*) is uncertain and ambiguous on an only and imperfect specimen, as this author stated.

IBERIAN DISTRIBUTION: SPAIN. Granada: Sierra Nevada (Rosenhauer, 1856); Galicia; Madrid: El Escorial (Joannis, 1865); León: Brañuelas; Orense: Cea (Heyden, 1870); Madrid: Navacerrada (Pérez Arcas, 1877); Cataluña (Martorell Peña, 1879); Barcelona: alrededores (Cuní-Martorell, 1888), Calella (Cuní-Martorell, 1897); Zaragoza: Cariñena (Górriz, 1902); Salamanca: Béjar (Champion, 1903); Logroño: Canales (Champion, 1904); Asturias-León: Puerto de Pajares (Champion & Chapman, 1905 *sub Luperus nigrofasciatus*); Pontevedra: Vigo; León: Brañuelas (Champion, 1907 *sub L. nigrofasciatus*); Granada (Pic, 1934); Granada: Puerto de la Ragua, Jubiles (Cobos, 1954); Huesca: Barbastro (Codina, 1961); Vizcaya: Galdácano, Goyeriri, Guecho (Codina, 1963); Madrid: Cercedilla; Valencia: Alcira; Castellón: Segorbe, Nules (Torres-Sala, 1962 *sub Luperus*); Jaén: Sierra de Cazorla (Daccordi & Petitpierre, 1977); Teruel: Sierra de Albarracín (Petitpierre, 1981); Barcelona: Sant Pere Màrtir, La Garriga, Collformic, Tavertet, Sant Miquel Sesperxes, Balenyà, Collbató; Tarragona: Valls, l'Albiol, Alió, La Riba, Querol, Miravet, El Molar, Sant Miquel de Brufaganya; Lleida: Seròs, Sant Guim, Cambrils, Castellbò, Vall de Tavascan; Gerona: Sant Pere Pescador, Olot, Planès, Ulldeter; Zaragoza, Soria, Almería (Petitpierre, 1988); Ávila: Sierra de Gredos (García-Ocejo & Gurrea, 1991); Albacete: Sierra de Alcaraz (Gurrea *et al.*, 1991); Granada; Málaga (Vela & Bastazo, 1991); Lérida: Valle de Arán (Petitpierre, 1994); Madrid: Sierra de Guadarrama (García-Ocejo & Gurrea, 1995); Teruel: Albarracín (Teunissen, 2002); Granada: La Sagra (Petitpierre & Daccordi, 2013); Granada: Sierra Nevada (Vela & Bastazo, 2013). PORTUGAL. Norte de Bussaco (Oliveira, 1894); Tras os Montes: Sabrosa (Barros, 1896 *sub L. nigrofasciatus*), Tras os Montes (Barros, 1928); without other data (Seabra, 1943).

#### *Calomicrus suturalis* (Joannis, 1865)

Fig. 4

EXAMINED SPECIMENS. SPAIN. 1 ex., Almería: Sierra Nevada, Morrón del Chullo, 2380 m, 24.6.1989, Bastazo & Vela leg.; 2 exx., Ávila: Burgohondo, 9.6.1990, M.A. Alonso Zarazaga leg.; 6 exx., Córdoba: Priego, Las Lagunillas, subida a La Tiñosa, 18.5.1991, Bastazo & Vela leg.; 7 exx., Sierra de Córdoba, 17.4.1993, M. Baena leg.; 4 exx., Luque, Cortijo de las Argüillas, 9.5.1993, M. Baena leg.; 8 exx., Sierra de Cabra, 1000 m, 12.6.1994, Bastazo & Vela leg.; 3 exx., Granada, Pinos Puente, 30.3.1994, M. Baena leg.; 3 exx., La Zubia, Fuente del Hervidero,

1350 m, 18.6.1989, Bastazo & Vela leg.; 4 exx., ídem, 23.6.1990; 1 ex., Madrid: Casa de Campo, 7.7.1982, J.M. Vela leg.; 2 exx., Málaga: Monte San Antón, 6.5.1989, Bastazo & Vela leg.; 3 exx., Torre de Chilches, El Cañuelo, 12.4.1981, Bastazo & Vela leg.; 6 exx., Villanueva del Rosario, Sierra de Camarolos, on *Genista florida* L., 14.5.1988, M.A. Alonso Zarazaga leg., 1 ex., Ronda, Sierra de las Nieves, Quejigales, 1400 m, 27.5.1979, M.A. Alonso Zarazaga leg.; 1 ex., ídem, 22.5.1982; 9 exx., Ronda, Puerto del Viento, 18.4.1995, J.M. Vela leg.

PORTUGAL: 1 ♂, Arade Dam (0.5 km N of Casa Queimada) 1-2.v.2013, 37°14'16.7"N, 8°23'11.9W, 87m, L. Sekerka leg.

GENERAL DISTRIBUTION. Spain, Morocco (Beenen, 2010), Portugal (present data).

IBERIAN DISTRIBUTION. SPAIN. Badajoz (Joannis, 1865, *sub Luperus*; Uhagón, 1887, *idem*); Málaga: alrededores de Cueva del Gato (Heyden, 1870, *sub Luperus*); Córdoba (Kiesenwetter, 1873, *sub Luperus*); España central y meridional (Weise, 1886; Guillebeau, 1891); Teruel: Valdovecar (sic! = Valdevécar, Albarracín) (Wagner, 1927, *sub Luperus*, Teunissen, 2002); Valencia; Castellón: Nules; Teruel: Sarrión (Torres Sala, 1962, *sub Luperus*); Málaga (Vela & Bastazo, 1991); Madrid: Torrelodones (García-Ocejo & Gurrea, 1995); Córdoba, Granada, Málaga (Doguet *et al.*, 1996); Granada: La Sagra (Petitpierre & Daccordi, 2013); Granada: Sierra Nevada (Vela & Bastazo, 2013); Málaga: Nerja, Frigiliana (Vela *et al.*, 2017).

PORTUGAL. Without further data (Laboissière, 1912). Oliveira (1894) and Seabra (1943) did not mention this species in their catalogues. However, Lukáš Sekerka (Prague) sent to me in study a specimen coming from Arade Dam (in South Portugal, Algarve, Silves), which is the first concrete record of this species in Portugal (see below).

### *Calomicrus foveolatus* Rosenhauer, 1856

Fig. 5

EXAMINED SPECIMENS. SPAIN. 1 ex., Granada: Lanteira, Arroyo de la Teja, 1650 m, 9.7.1982, M.A. Alonso Zarazaga leg.; 6 exx., Málaga: Parauta, Sierra de las Nieves, Quejigales, 1200 m, *Quercus rotundifolia*, 18.6.1984, Bastazo & Vela leg.; 3 exx., ídem, 29.6.1983; 3 exx., Estepona, Sierra Bermeja, 24.5.1980, M.A. Alonso Zarazaga leg.; 1 ex., ídem, 30.5.1992, J.M. Vela leg.; 1 ex., Jubrique, Río Genal, 16.6.1988, Bastazo & Vela leg.; 12 exx., ídem, *Q. suber*, 18.5.1996, Bastazo & Vela leg.; 10 exx., Benahavís, Sierra Palmitera, *Q. suber*, 3.5.1987, Bastazo & Vela leg.; 5 exx., Coín, Sierra Alpujata, río Pereilas, 350 m, *Q. suber*, 10.5.1987, Bastazo & Vela leg.; 12 exx., ídem, 30.5.1990; 6 exx., Ojén, El Juanar, 850 m, 16.6.1984, M.A. Alonso Zarazaga leg.; 1 ex., Ronda, Puerto del Viento, 1100 m,

25.5.1990, Bastazo & Vela leg.; 1 ex., ídem, 12.5.1992; 4 exx., Cortes de la Frontera, 21.6.1987, Bastazo & Vela leg.; 2 exx., Gaucín, Sierra del Hacho, 620 m, 7.6.1987, Bastazo & Vela leg.

GENERAL DISTRIBUTION. Spain (Beenen, 2010)

IBERIAN DISTRIBUTION. Restricted to South Spain. Granada: Sierra Nevada (Rosenhauer, 1856; Vela & Bastazo, 2013); Málaga: Ronda (Laboissière, 1912; Teunissen, 2002); Málaga: Nerja (Vela *et al.*, 2017). Oliveira (1891) based his records from Portugal in the concept of *Luperus foveolatus sensu* Joannis, 1865, which should be referred to *L. sulphuripes* Grælls. Later, Seabra (1943) repeated the Oliveira's records. So far, in agreement with Beenen (2010), this species has not been cited from Portugal.

### *Calomicrus sordidus* (Kiesenwetter, 1873)

Fig. 6

EXAMINED SPECIMENS. SPAIN. 3 exx., Málaga: Algatocín, *Q. suber*, 23.5.1992, Bastazo & Vela leg.; 20 exx., ídem, 15.5.1996; 12 exx., Benahavís, Sierra Palmitera, *Q. suber*, 3.5.1987, Bastazo & Vela leg.; 2 exx., Estepona, Sierra Bermeja, 16.4.1977, J. de Ferrer leg.; 2 exx., Coín, río Pereilas, 30.5.1990, Bastazo & Vela leg., 2 exx.

GENERAL DISTRIBUTION. Spain (Beenen, 2010).

IBERIAN DISTRIBUTION. Restricted to South Spain: Jaén (Kiesenwetter, 1873), Málaga (Vela & Bastazo, 1991; Vela *et al.*, 2017) and Cádiz: Tarifa (Teunissen, 2002).

### Species excluded of *Calomicrus* Dillwyn, 1829

#### *Euluperus espanoli* (Codina, 1963) **comb. nov.**

Figs. 7, 11, 16, 20, 24, 27

*Luperus (Calomicrus) espanoli* Codina, 1963: 368 (original description).

*Calomicrus espanoli* – Wilcox, 1973: 516 (catalogue) – Warchałowski, 2003: 352 (key) – Warchałowski, 2010: 673 (key) – Beenen, 2010: 470 (catalogue).

TYPE LOCALITY. “Hispania: Albacete: El Pardo, Sierra de Segura”.

EXAMINED MATERIAL. SPAIN. 8 exx., Teruel, Mora de Rubielos, on *Pinus sylvestris*, 24.7.1991, V. Pérez Fortea leg.

### Redescription

BL: ♂♂: 3.54-3.98 mm; ♀♀: 3.96-4.59 mm. Body oblong-elongate (fig. 7), its length is 2.21-2.41 (♂♂), 2.03-2.21 (♀♀) times its maximum width.



7



8

Figs. 7-8.— Habitus of Iberian species of the genus *Euluperus* Weise, 1886. *Euluperus espanoli* (Codina, 1963) comb. nov. (EL = 3.23 mm) (7); *Euluperus pinicola* (Duftschmid, 1825) comb. nov. (EL = 2.12 mm) (8).

Figs. 7-8.— Habitus de las especies ibéricas del género *Euluperus* Weise, 1886. *Euluperus espanoli* (Codina, 1963) comb. nov. (EL = 3.23 mm) (7); *Euluperus pinicola* (Duftschmid, 1825) comb. nov. (EL = 2.12 mm) (8).

General colour pale yellow to testaceous. Apex of labrum, apex of mandibles, maxilar palpi and abdomen brownish. Tarsi obscured. Antennomeres V-XI brown or black in males. In females all the antenna is yellow except a small darker area at the apex of antennomere IV to XI.

**HEAD.** Slightly narrower than the anterior side of pronotum. Cephalic width 1.54-1.59 (♂♂), 1.50 (♀♀) times the interocular distance, and 3.25-3.75 (♂♂), 3.43-3.75 (♀♀) times the interantennal distance. Vertex little shiny, smooth or microgranulated, with disperse points. Near the posterior margin of the eye there are some yellow, erect setae. Coronal sulcus no or barely perceptible in the confluence with the frontal suture. Frontal suture in large V or U-form, with a depression in the middle, hardly reaching the postero-inner border of the eye, not following in the ocular sulcus. Frontal tubercles in triangular form, touching

in a point with the middle-frontal suture. Nasal keel weakly swollen. Clypeus and labrum with yellow erect setae. Fore side of labrum straight or weakly concave. Antennae slightly longer in males than in females; their length is 1.03-1.08 (♂♂), 1.00-1.03 (♀♀) times the length of the elytra. Antennomeres parallel. Pubescence of antennae scarce and disperse in the antennomeres I-III, in the others is more dense with some very long setae in their apex. Antennomere IV is 0.89-0.92 (♂♂), 0.81-0.85 (♀♀) times the sum of antennomeres II and III, and 1.60-1.67 (♂♂), 1.50-1.69 (♀♀) as the length of antennomere III. Antennomere III is 1.08-1.27 (♂♂), 1.00-1.17 (♀♀) times the length of antennomere II. Antennomeres relative length: 12-6-7-10-12-12-11-11-11-11-11 (♂♂), 15-8-8-13-13-13-13-13-13-13-12 (♀♀).

**PRONOTUM.** Scarcely convex, a bit shiny, with a fine microgranulation which may be microwrinkled or

with fine, shallow and dense punctation, more visible in the posterior part. There are two lateral shallow depressions, sometimes hardly visible, and a longitudinal lineal impression at the base. Transverse, its maximum width is 1.60-1.64 (♂♂), 1.60-1.66 (♀♀) times its length in the middle. Its maximum width is also 1.21-1.25 (♂♂), 1.29-1.35 (♀♀) times the cephalic width. Anterior side not margined, with the middle zone straight or slightly sinuated. Sometimes there is a row of short hairs forwards. Lateral sides curved, with well visible margin, narrowed in the anterior and posterior part. The maximum width is in the middle and have some testaceous short hairs directed outwards. Posterior side with fine but visible margin, curved but sinuated in the scutellar area. Anterior angles straight, scarcely protruding, rather smooth, with a small callus and a setigerous pore with a long seta in subapical position. Posterior angles weakly pointed, obtuse. Scutellum small, triangular, smooth.

**ELYTRA.** Length 4.01-4.20 (♂♂), 3.82-4.05 (♀♀) times longer than pronotum. Scarcely shiny, punctation dense, shallow, not well defined, with a microwrinkled aspect. The points obliterate at the apex. The entire surface with yellow setae.

**LEGS.** Protibia 1.43-1.70 (♂♂), 1.53-1.63 (♀♀) times longer than the protarsus. Length of protarsus is 2.31-2.67 (♂♂), 2.40-2.56 (♀♀) times the length of protarsomere I. This is 1.87-2.29 (♂♂), 2.00-2.14 (♀♀) longer than wide. Mesotibia slightly longer than the protibia. Metatibia 1.19-1.24 (♂♂), 1.17-1.25 (♀♀) times the length of the mesotibia. Also, metatibia is 1.36-1.55 (♂♂), 1.41-1.51 (♀♀) times the length of the metatarsus. Tibiae robust gradually widened towards the apex, with apical, deciduous spur on its inner apical side, no longer than half the apical diameter of the tibia. Femora with sparse, yellow pubescence. Metatarsus 2.12-2.29 (♂♂), 2.22-2.58 (♀♀) times the length of the metatarsomere I. Metatarsomere I is 0.77-0.89 (♂♂), 0.63-0.82 (♀♀) times longer than the rest of the metatarsus and 1.50-1.85 (♂♂), 1.27-1.63 (♀♀) times longer than the metatarsomere IV, which is short. Claws appendiculate.

**VENTRAL SURFACE.** Proventrite with a narrow keel, inconspicuous between the procoxae. Proacetabula open.

**GENITALIA.** ♂♂: Last abdominal ventrite with three lobes (fig. 27), the lateral ones are regularly curved. Penis in ventral view parallel sided until last 1/10, where converges until a point not very acute; the base with two teeth projecting laterally and ventrally (fig. 11a). In lateral view is regular and slightly curved, narrowing at the apex to end in a point (fig. 11b).

♀♀: Spermatheca (fig. 16) with nodulus swollen, wrinkled; cornu little differentiated, regularly curved, with



Figs. 9-12.— Aedeagi of *Calomicrus fallax* (Joannis, 1865) in ventral (9a) and side view (9b); *C. ibericus* sp. nov. in ventral (10a), side view (10b), and detail of the internal sac everted (10c); *Euluperus espanoli* (Codina, 1963) in ventral (11a) and side view (11b); *E. pinicola* (Duftschmid, 1825) in ventral (12a) and side view (12b). Scale bars = 0.25 mm.

Figs. 9-12.— Edeagos de *Calomicrus fallax* (Joannis, 1865) en vistas ventral (9a) y lateral (9b); *C. ibericus* sp. nov. en vistas ventral (10a) y lateral (10b), y detalle del saco interno extroflexo (10c); *Euluperus espanoli* (Codina, 1963) en vistas ventral (11a) y lateral (11b); *E. pinicola* (Duftschmid, 1825) en vistas ventral (12a) y lateral (12b). Escala = 0.25 mm.

rounded, blunt apex; ductus sclerified in a long way, with two close curves; glandula auxiliaris inserted almost at the end of the sclerified part of the ductus. Gonocoxite without basal wings (fig. 20). Sternite VIII and tignum with rounded sclerite (fig. 24).

**TAXONOMIC REMARKS.** *Euluperus espanoli* was described from a female (Codina, 1963), and is here redescribed for both sexes and combined in *Euluperus*. After evaluation of the features set up by Bezděk (2015) to separate *Calomicrus* and *Euluperus*, *Luperus* (*Calomicrus*) *espanoli* should be included in *Euluperus*. However, this species has yellow

colouration including femora and open proacetabula, which should be added as exceptions in the list of generic characters of *Euluperus*. See taxonomic remarks under *E. pinicola*.

DISTRIBUTION. SPAIN: Logroño: Canales (Champion, 1904, *sub Luperus lividus* Joannis, “on pines”); Albacete: El Pardal, Sierra de Segura; Tarragona: Cabacés, Valls (Codina, 1963), Sierra de Prades (Alonso de Medina, 1982; Petitpierre, 1988); Teruel: Mora de Rubielos (present data).

TROPHISM. The studied specimens were collected from *Pinus sylvestris* (Víctor Pérez Fortea, com. pers.).

***Euluperus pinicola* (Duftschmid, 1825) comb. nov.**

Figs. 8, 12, 17, 21, 25

*Crioceris pinicola* Duftschmid, 1825: 234 (original description)  
*Luperus pinicola* var. *silvestris* Weise, 1886: 601 (original description) (synonymized by Beenen, 2010).  
*Luperus concolor* Apfelbeck, 1912: 259 (original description) (synonymized by Laboissière, 1925).  
*Luperus pinicola*: Hiller, 1975 (morphology, biology, ecology).  
*Luperus (Calomicrus) pinicola*: Weise, 1886: 601 (key, description), 1924: 116 (catalogue); Bedel, 1897: 161 (key); Everts, 1903: 451 (key); Laboissière, 1912: 35, 53; 1925: 51; 1934: 87, 91 (key, description); Reitter, 1913: 142 (key); Müller, 1953: 401 (key); Mohr, 1966: 201 (key).  
*Calomicrus pinicola*: Wilcox, 1973: 516 (catalogue); Gruev & Tomov, 1986: 120 (key, description); Warchalowski, 2003: 352 (key), 2010: 673 (key); Lopatin *et al.*, 2004: 139 (catalogue); Beenen, 2010: 470 (catalogue).

TYPE LOCALITY. “Linz [Austria]”.

DIAGNOSIS. The dorsum is dark brown or blackish, with the pronotum reddish more or less darkened (fig. 8), whereas the formerly known species of the genus have metallic teguments (Bezděk, 2015). For a detailed description see Hiller (1975). It is worthy to describe the sexual characters. ♂♂: Last abdominal ventrite with three lobes, the lateral ones are curved, not angulated. Penis in ventral view parallel sided until last 1/10, where it converges until a point not very acute; the base with two teeth projecting latero-ventrally (fig. 12a). In lateral view it is regular and slightly curved, ending in a fine plate with a small tooth at the apex (fig. 12b). ♀♀: Spermatheca (fig. 17) with nodulus very weakly swollen, wrinkled; cornu regularly curved, with rounded, smooth apex; ductus sclerified in a long way, with a close curve; glandula auxiliaris inserted almost at the end of the sclerified part of the ductus. Gonocoxite without basal wings (fig. 21). Sternite VIII and tignum as in fig. 25.

TAXONOMIC REMARKS. Very distinctive characters in *Euluperus*, shared by *E. espanoli* and *E. pinicola*, differently than *Calomicrus*, are: a) Vertex hairy,

b) aedeagus with two teeth situated latero-ventrally at base, a long ventral furrow, and a fine plate at apex (in lateral view); c) male last abdominal ventrite with two incisions delimitating three lobes, the lateral ones rounded and not angulated (fig. 27), contrary to *Calomicrus* type species, *C. circumfusus*, where these lobes are somewhat angulated (fig. 26); d) nodulus of the spermatheca with fine wrinkles, first part of the ductus not dilated and long, sclerified part of ductus short after the insertion of accessory gland (figs. 16, 17, contrary to *Calomicrus*, see figs. 14, 15); e) base of gonocoxite not wing-shaped (in agreement to Bezděk 2015) (see fig. 20-21) in contrast with the wing shape in *Calomicrus* (figs. 18, 19). Other species included in *Calomicrus*, especially in North Mediterranean countries and Turkey, also share many of these characters, and need a reevaluation for their correct generic combination.

DISTRIBUTION. Known of greater part of Europe (see Beenen, 2010). In Spain was only known from Gerona: Vidrà (Petitpierre & Doguet, 1981).

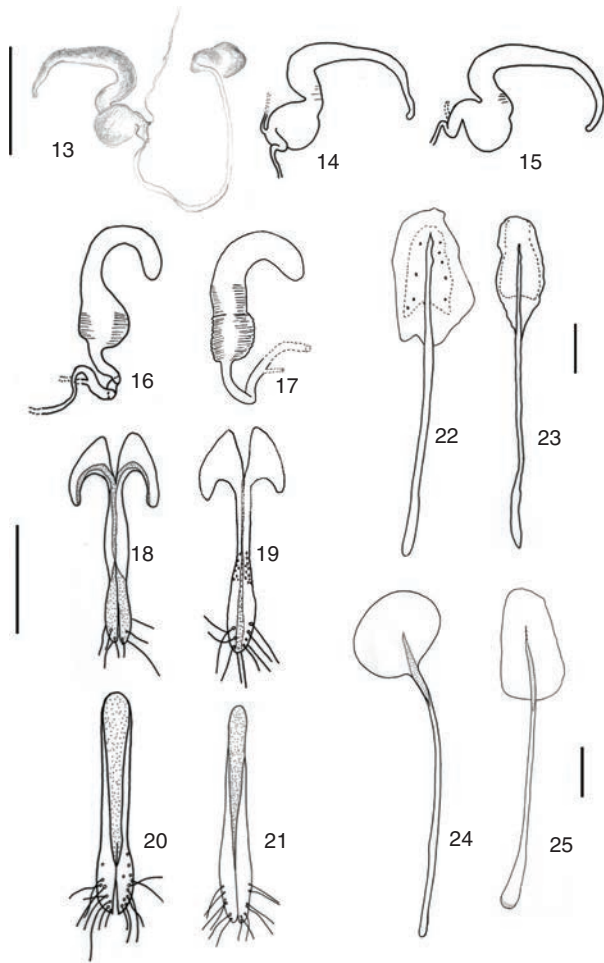
TROPHISM. *Pinus sylvestris* L., *P. nigra* Arnold (Laboissière, 1934, Müller, 1953).

COMMENTS. As indicated above, *E. espanoli* and *E. pinicola* live on *Pinus* species, suggesting an affinity of a part of the *Euluperus* species for the family *Pinaceae*.

**Practical key to the Iberian species of *Calomicrus* and *Euluperus***

Five species of *Calomicrus* live in the Iberian Peninsula, of which *C. sordidus*, *C. foveolatus* and *C. ibericus* sp. nov., are very similar in morphology and also in the outlines of aedeagus and spermatheca. However, they are easily separated by their colouration. Other species previously included in *Calomicrus* as *C. espanoli* or *C. pinicola*, belong to *Euluperus*, but are also keyed.

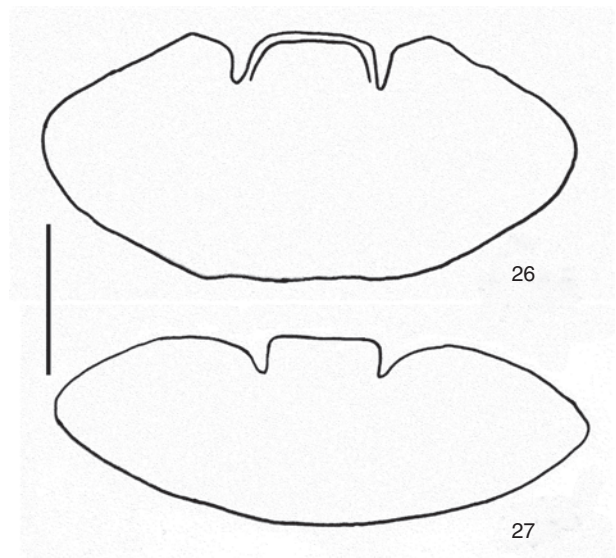
- 1 Metatarsomere I is shorter than the other three metatarsomeres, but equals the sum of metatarsomeres II and III. Generally, antennomere IV is about 1,5 times the length of the antennomere III. Vertex with some yellowish long hairs. Supraantennal tubercles triangular and touching in a point, a bit separated of the nasal keel (*Euluperus* Weise, 1886) .....2
- 1' Metatarsomere I equals the other three metatarsomeres. Antennomere IV is generally twice as long as the antennomere III. Vertex glabrous. Supraantennal tubercles not triangular, touching a longer extension, and joining to the nasal keel (*Calomicrus* Dillwyn, 1829) .....3
- 2 Teguments, including legs, yellow or testaceous .....*E. espanoli* (Codina, 1963) (fig. 7)
- 2' Elytra blackish, pronotum and head dark or reddish. Greater part of femora dark .....*E. pinicola* (Duftschmid, 1825) (fig. 8)



Figs. 13-25.— Spermathecae of holotype of *Calomicrus fallax* (Joannis, 1865) drawn by N. Berti, Paris (13); *C. fallax* (Joannis, 1865) (14); *C. ibericus* sp. nov. (15); *Euluperus espanoli* (Codina, 1963) (16) and *E. pinicola* (Duftschmid, 1825) (17). — Gonocoxite of: *C. fallax* (18); *C. ibericus* sp. nov. (19); *Euluperus espanoli* (20) and *E. pinicola* (21). — Sclerite VIII and tignum of: *C. fallax* (22); *C. ibericus* sp. nov. (23); *Euluperus espanoli* (24) and *E. pinicola* (25). Scale bars = 0.25 mm.

Figs. 13-25.— Espermatecas de *Calomicrus fallax* (Joannis, 1865) holotipo, dibujado por N. Berti, Paris (13); *C. fallax* (Joannis, 1865) (14); *C. ibericus* sp. nov. (15); *Euluperus espanoli* (Codina, 1963) (16) y *E. pinicola* (Duftschmid, 1825) (17). — Gonocoxitos de: *C. fallax* (18); *C. ibericus* sp. nov. (19); *Euluperus espanoli* (20) y *E. pinicola* (21). — Esclerito VIII y tignum de: *C. fallax* (22); *C. ibericus* sp. nov. (23); *Euluperus espanoli* (24) y *E. pinicola* (25). Escala = 0.25 mm.

- 3 Pronotum and elytra yellow with spots or stripes black or brown ..... 4
- 3' Pronotum and elytra unicolor, yellow or black ..... 5
- 4 Antennomeres IV-XI, metatibiae and a lateral stripe in the elytra which joints to sutural stripe, blackish ..... *C. circumfusus* (Marsham, 1802) (fig. 3)
- 4' Antennae yellow, somewhat darker at apex. Metatibiae in its greater part and the lateral part of elytra yellow ..... *C. suturalis* (Joannis, 1865) (fig. 4)



Figs. 26-27.— Last abdominal ventrites of *Calomicrus circumfusus* (Marsham, 1802) (26) and *Euluperus espanoli* (Codina, 1963) (27). Scale= 0.25 mm

Figs. 26-27.— Último ventrito abdominal de *Calomicrus circumfusus* (Marsham, 1802) (26) y *Euluperus espanoli* (Codina, 1963) (27). Escala = 0.25 mm.

- 5 Pronotum and elytra completely black ..... *C. foveolatus* Rosenhauer, 1856 (fig. 5)
- 5' Pronotum and elytra yellow ..... 6
- 6 Head yellow ..... *C. ibericus* sp. nov. (fig. 2)
- 6' Head with vertex and upper part of the frons black ..... *C. sordidus* (Kiesenwetter, 1873) (fig. 6)

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**References**

Alonso de Medina, E., 1982. Notas sobre la entomofauna de la Sierra de Prades (Tarragona), Crisomélidos, I. *Publicaciones del departamento de Zoología de la Universidad de Barcelona*, 7: 77-79.

- Apfelbeck, V., 1912. Komponente balkanske faune iz roda Chrysomelidae. Zoogeografski prinos fauni balkanskog Poluoostrova. *Glasnik Zemaljskog Muzeja u Bosni i Hercegovini*, 24: 235–263.
- Barros, J. M. C., 1896. Subsídios para o estudo da fauna entomológica transmontana. Coleopteros do concelho de Sabrosa. *Annaes Sciencias Naturaes*, 3: 39–44, 186–194.
- Barros, J. M. C., 1928. Coleópteros da Mata de Leiria. *Memórias e Estudos do Museu Zoológico da Universidade de Coimbra*, 14: 5–14.
- Bedel, L. E. M., 1897. Faune des coléoptères du Bassin de la Seine. Vol V. Phytophaga (fasc. 4). Pp. 161–180. Société Entomologique de France, Paris, 423 pp.
- Beenen, R., 2010. Chrysomelidae: Galerucinae. In: I. Löbl & A. Smetana (eds.). *Catalogue of Palaearctic Coleoptera, Volume 6. Chrysomeloidea*. Apollo Books. Stenstrup: 443–491.
- Bezděk, J., 2015. A review of Palaearctic *Scelolypurus* (Coleoptera: Chrysomelidae: Galerucinae), with description of *S. perreus* sp. nov. from Turkey. *Annales Zoologici*, 65: 21–39.
- Champion, G. C., 1903. An entomological excursion to Bejar, Central Spain. *Transactions of the Entomological Society of London*, 1903(2): 165–182. <https://doi.org/10.1111/j.1365-2311.1903.tb01133.x>
- Champion, G. C., 1904. An entomological excursion to Moncayo, N. Spain. *Transactions of the Entomological Society of London*, 1904(1): 81–98. <https://doi.org/10.1111/j.1365-2311.1904.tb02739.x>
- Champion, G. C. & Chapman, T. A., 1905. Another entomological excursion to Spain. *Transactions of the Entomological Society of London*, 1905(1): 37–52. <https://doi.org/10.1111/j.1365-2311.1905.tb01154.x>
- Champion, G. C., 1907. Coleoptera and Hemiptera. In: Chapman, T. A. & Champion, G. C. VII. Entomology in N.W. Spain (Galicia and Leon). *Transactions of the Entomological Society of London*, 1907 (1): 147–171. <https://doi.org/10.1111/j.1365-2311.1907.tb03068.x>
- Cobos, A., 1954. Coleópteros de Sierra Nevada (familias Cerambycidae y Chrysomelidae). *Archivos del Instituto de Aclimatación de Almería*, 2: 139–156.
- Codina, F., 1961. Nota sobre los *Luperus* marroquíes del subgénero *Calomicrus* Stephens. *Graellsia*, 19: 69–79.
- Codina, F., 1963. Nuevas formas de *Luperus* ibéricos y norteafricanos (Col. Chrys.). *Eos*, 34: 367–378.
- Cuní-Martorell, M., 1888. Insectos observados en los alrededores de Barcelona. *Anales de la Real Sociedad Española de Historia Natural*, 17: 133–191.
- Cuní-Martorell, M., 1897. Fauna entomológica de la Villa de Calella (Cataluña, provincia de Barcelona). *Anales de la Real Sociedad Española de Historia Natural*, 26: 281–239.
- Daccordi, M. & Petitpierre, E., 1977. Coleópteros Crisomélidos de la Sierra de Cazorla (Jaén) y descripción de una nueva especie de *Clytra* Laich. *Miscelánea Entomológica*, 4(1): 125–136.
- Desbrochers des Loges, J., 1898. Quelques materiaux pour le faune des Coléoptères de Barbarie. *Frelon*, 7: 1–51.
- Doguet, S., Bastazo, G., Bergeal, M. & Vela, J. M., 1996. Contribution à l'étude des Chrysomelidae d'Andalousie (Coleoptera). *Nouvelle Revue d'Entomologie*, 13(4): 315–323.
- Dufschmid, C. E., 1825. *Fauna Austriae, oder Beschreibung der österreichischen Insecten, für angehende Freunde der Entomologie*. Dritter Theil. Verlag der k.k. priv. Akademischen Kunst- Musik- und Buchhandlung. Linz und Leipzig. 289 pp.
- Everts, J. E., 1903. *Coleoptera Neerlandica. De schildvleugelige Insecten van Nederland en het aangrenzend gebied. Tweede Deel*. Martinus Nijhoff. s'Gravenhage: 401–796.
- García-Ocejo, A. & Gurrea, P., 1991. Relación entre los hábitos tróficos y la distribución por pisos bioclimáticos de la Sierra de Gredos de Chrysomelidae (Coleoptera) asociados a Genísteas. *Miscelanea Zoológica*, 15: 137–145.
- García-Ocejo, A. & Gurrea, P., 1995. Los crisomélidos (Coleoptera Chrysomelidae) de la sierra de Guadarrama (España central). Análisis biogeográfico. *Boletín de la Asociación Española de Entomología*, 19(3–4): 51–68.
- Górriz, R. J., 1902. Coleópteros de la cuenca del Ebro existentes en la colección de D. Ricardo J. Górriz. *Boletín de la Sociedad Aragonesa de Ciencias Naturales*, 1(8): 180–186.
- Gruiev, B. & Tomov, V., 1986. *Fauna Bulgarica 13: Coleoptera, Chrysomelidae II: Chrysomelinae, Galerucinae, Alticinae, Hispinae, Cassidinae*. Academie Scientiarum Bulgaricae. Sofia. 220 pp.
- Guillebeau, F., 1891. Revision du genre *Luperus* Geoffroy d'après Weise. Traduité et completée par Fr. Guillebeau. *Revue d'Entomologie (Caen)*, 10: 290–305.
- Gurrea, P., Sanz, M. J. & García-Ocejo, A., 1991. Contribución al conocimiento de los crisomélidos (Coleoptera) de la Sierra de Alcaraz (Albacete). *Actas I Jornadas sobre el Medio Natural Albacetense*, 14: 171–174.
- Heyden, L. von, 1870. *Entomologische Reise nach dem südlichen Spanien, der Sierra Guadarrama und Sierra Morena, Portugal und den Cantabrischen Gebirge*. Nicolaische Verlagbuchhandlung. Berlin. 218 pp.
- Hiller, E., 1975. Zur kenntnis des Schwarbraunen kiefernblattkäfers, *Luperus pinicola* (Dftsch.) (Col., Chrysomelidae). *Zeitschrift für Angewandte Entomologie*, 79: 398–421
- Joannis, L. de, 1865. Monographie des Galérucides d'Europe, du Nord de l'Afrique et de l'Asie. Tribu des Galérucides proprement dites o isopodes. *L'Abeille*, [1866], 3: 1–168.
- Kiesenwetter, E. A. H. von, 1873. Bemerkungen zur Bearbeitung der *Luperus*-Arten in der Monographie des Galérucides von Joannis in Marseul's Abeille T. III. Ao. 1866. P. 1 flg. *Berliner Entomologische Zeitschrift*, 17: 23–31.
- Kocher, L., 1958. Catalogue commenté des coléoptères du Maroc. Fascicule VIII Phytophages. *Travaux de*

- l'Institut Scientifique Chérifien (série zoologie)*, 19: 1–172.
- Kocher, L., 1969. Catalogue commenté des coléoptères du Maroc. Feuilles rectificatifs. *Travaux de l'Institut Scientifique Chérifien (série zoologie)*, 34: 1–5, 103–107.
- Laboissière, V. 1912. Revision des Galerucini d'Europe et pays limitrophes (suite). *Annales de l'Association des Naturalistes de Levallois-Perret*, 18: 13–55.
- Laboissière, V., 1925. Supplément au Catalogus Coleopterorum, pars 78 (Galerucinae), de J. Weise, précédée de remarques sur la classification des Galerucini. *Encyclopedie Entomologique, Séries B (Mémoires et Notes)*, 1: 33–62.
- Laboissière, V., 1934. Galerucinae de la faune française. *Annales de la Société Entomologique de France*, 103: 1–108.
- Lopatin, I. K., Aleksandrovich, O. R. & Konstantinov, A. S., 2004. *Checklist of leaf-beetles (Coleoptera, Chrysomelidae) of the Eastern Europe and Northern Asia*. Wydawnictwo Mantis. Olsztyn. 343 pp.
- Martorell-Peña, M., 1879. *Catálogo sinonímico de los insectos encontrados en Cataluña, aumentado con los recientemente hallados por el autor en los diversos órdenes de los Coleópteros, Hemípteros, Hymenópteros, Ortópteros, Lepidópteros, Dípteros y Neurópteros*. Tipografía Sucesores N. Ramírez. Barcelona. 200 pp.
- Mohr, K.-H., 1966. Familie Chrysomelidae. In: Freude, H., Harde, K.W. & Lohse, G.A. (eds.). *Die Käfer Mitteleuropas. Band 9. Cerambycidae, Chrysomelidae*. Goecke & Evers. Krefeld: 95–280.
- Müller, G., 1953. Pp. 269–480. In: *I coleotteri della Venezia Giulia. Catalogo regionato con tabelle dicotomiche per la classificazione delle specie della regione adriatica orientale, del Veneto e della pianura padana. Volume II: Coleoptera Phytophaga (Cerambycidae, Chrysomelidae, Bruchidae)*. Centro Sperimentale Agrario e Forestale (pubblicazione n. 4). Trieste. 685 pp.
- Normand, H., 1937. Contribution au catalogue des coléoptères de la Tunisie (11<sup>ème</sup> fascicule). *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord*, 28: 116–143, 232–269.
- Oliveira, M. P., 1891. Catalogue des insectes du Portugal. Coléoptères. *Revista da Sociedade de Instrução do Porto*, 38: 918–927.
- Oliveira, M. P., 1894. Chrysomelidae. In: *Catalogue des Insectes du Portugal*. Imprenta da Universidade. Coimbra: 345–393.
- Pérez Arcas, L., 1877. Una excursión entomológica a Navacerrada. *Anales de la Sociedad Española de Historia Natural*, 6: 54.
- Petitpierre, E., 1981. Chrysomelidae (Col.) de la Sierra de Albarracín. *Boletín de la Asociación española de Entomología*, 4: 7–18.
- Petitpierre, E., 1988. Catàleg dels coleòpters crisomèlids de Catalunya. III. Chrysomelinae i Galerucinae. *Butlletí de la Institució Catalana d'Història Natural*, 55: 79–100.
- Petitpierre, E. 1994. Estudi faunístic i ecològic dels Coleòpters Crisomèlids de la Vall d'Aran. *Butlletí de la Institució Catalana d'Història Natural*, 62: 77–108.
- Petitpierre, E. & Daccordi, M., 2013. Chrysomelidae (Coleoptera) de las sierras del Altiplano de Granada (Granada, Andalucía). *Zoologica Baetica*, 24: 53–78.
- Petitpierre, E. & Doguet, S., 1981. Citas nuevas o interesantes de Chrysomelidae para la Península Ibérica. *Boletín de la Asociación Española de Entomología*, 22(3–4): 246–248.
- Pic, M., 1912. Description ou diagnoses et notes diverses. *L'Échange*, 28(2–3): 33–34, 42–43, 73–74, 75, 90, 114.
- Pic, M., 1934. Notes diverses, nouveautés. *L'Échange*, 50: 21–22, 26–27.
- Reitter, E. 1913. *Fauna Germanica. Die Käfer des Deutsche Reiches. IV Band* [1912]. K. G. Lutz?. Stuttgart. 236 pp., pl. 129–152.
- Rosenhauer, W. G., 1856. *Die Thiere Andalusians nach dem Resultate einer Reise zusammengesllt*. Theodor Blaesing. Erlangen. viii + 429 pp., 3 pls.
- Seabra, A. F., 1943. Contribuições para o inventário da fauna lusitânica. Insecta Coleoptera. *Memórias e Estudos do Museu Zoológico da Universidade de Coimbra*, 142: 1–153.
- Teunissen, A. P. J., 2002. Coleópteros de la Península Ibérica de la colección A. Teunissen (Holanda): 4. Familia Chrysomelidae. *Boletín de la Sociedad Entomológica Aragonesa*, 30: 193–196.
- Torres-Sala, J., 1962. *Catálogo de la colección entomológica "Torres Sala" de Coleópteros y Lepidópteros de todo el mundo. Vol. 1*. Institución Alfonso el Magnánimo. Valencia. 487 pp.
- Uhagón, S., 1887. Coleópteros de Badajoz, 3<sup>a</sup> parte. *Anales de la Real Sociedad Española de Historia Natural*, 16: 373–404.
- Vela, J. M. & Bastazo, G., 1991. Morphological and genital patterns distinguishing *Luperus* Geoffroy, 1762 and *Calomicrus* Dillwyn, 1829 (Coleoptera Chrysomelidae). *Eos*, [1990], 66(2): 187–200.
- Vela, J. M. y Bastazo, G. 2013. Los Crisomélidos (Coleoptera: Chrysomelidae). In: F. Ruano, J. M. Tierno de Figueroa y J. A. Tíntaut (eds.). *Los Insectos de Sierra Nevada, 200 años de historia*, vol. 2. Asociación Española de Entomología. Granada: 119–145.
- Vela, J. M., Bastazo, G. & Fritzlär, F., 2017. Inventario comentado de los crisomélidos (Coleoptera, Chrysomelidae) de las Sierras Tejeda y Almijara y los Acentillados de Maro (Sur de España, Málaga-Granada). *Boletín de la Asociación Española de Entomología*, 41(1–2): 29–73.
- Wagner, H., 1927. Eine sammelreise nach Zentral Spanien. *Coleopterologische Centralblatt*, 2(2): 101–112, 2(3/4): 234–235.
- Warchałowski, A., 1991. Kurze Übersicht der oberseits hellen *Calomicrus* Steph Arten (Col.: Chrysomelidae Galerucinae). *Genus*, 2(1): 41–55.
- Warchałowski, 2003. *Chrysomelidae. The leaf-beetles of Europe and the Mediterranean area*. Natura Optima Dux Foundation. Warszawa. 600 pp., 66 pl.

- Warchałowski, A., 2010. *The Palaearctic Chrysomelidae. Identification keys. 2 vols.* Natura Optima Dux Foundation. Warszawa. 1212 pp., 102 pl.
- Weise, J., 1886. Galerucinae. Lieferung 4. Pp. 569–768. In: *Naturgeschichte der insekten Deutschlands. Erste Abteilung Coleoptera. Sechster Band* [1893]. Nicolaische Verlags-Buchhandlung, xiv + 1161 pp., 1 pl.
- Weise, J. 1924. Pars 78. Chrysomelidae: 13. Galerucinae. In: Schenkling, S. (ed.): *Coleopterorum Catalogus*. W. Junk, Berlin, 225 pp.
- Wilcox, J. A., 1973. Chrysomelidae: Galerucinae. Luperini: Luperina. *Coleopterorum Catalogus Supplementa*. Pars 78, Fasc. 3 (Editio Secunda). Uitgeverij Dr. W. Junk. 's-Gravenhage: 433–664.