

***Lygaeosoma streittoi* n. sp.**  
**from southern Iberian Peninsula**  
**(Hemiptera: Heteroptera: Lygaeidae)**

S. PAGOLA-CARTE<sup>1</sup>, J. RIBES<sup>2</sup>

<sup>1</sup>Apdo. 70 P.K.; E-20150 Villabona (Gipuzkoa); E-mail: pagolaxpc@telefonica.net

<sup>2</sup>València 123-125, ent., 3a; E-08011 Barcelona; E-mail: 4354jrr@comb.cat

### Abstract

*Lygaeosoma streittoi* n. sp. (Hemiptera: Heteroptera: Lygaeidae) is described from Sierra de Castril, Andalusia, southern Iberian Peninsula. Its external morphology, including micropterism with strong reduction of scutellum, and its high altitude habitat of Mediterranean type are similar to those of several species of the genus *Apterola*. The study of the male genitalia and pygophore not only confirms its ascription to *Lygaeosoma*, but also reveals some useful characters to separate it from other species of this genus. The singularity of the new species, as well as its likely endemism, are discussed in the context of the adaptation to high mountain habitats. The term «apterolization process» is proposed.

**Key words:** Hemiptera, Heteroptera, Lygaeidae, *Lygaeosoma streittoi* n. sp., Iberian Peninsula, endemic species, description, *Apterola*.

### Resumen

***Lygaeosoma streittoi* n. sp. del sur de la Península Ibérica (Hemiptera: Heteroptera: Lygaeidae)**

Se describe *Lygaeosoma streittoi* n. sp. (Hemiptera: Heteroptera: Lygaeidae) de la Sierra de Castril, Andalucía, sur de la Península Ibérica. Su morfología externa, incluyendo el micropterismo con fuerte reducción del escutelo, y su hábitat mediterráneo de gran altitud son similares a los de varias especies del género *Apterola*. El estudio de la genitalia masculina y el pigóforo no sólo confirma su adscripción a *Lygaeosoma*, sino que también revela algunos caracteres útiles para su separación de otras especies de este género. Se discute la singularidad de la nueva especie, así como su probable endemism, en el contexto de la adaptación a hábitats de alta montaña. Se propone el término «proceso de apterolización».

**Palabras clave:** Hemiptera, Heteroptera, Lygaeidae, *Lygaeosoma streittoi* n. sp., Península Ibérica, especie endémica, descripción, *Apterola*.

### Laburpena

***Lygaeosoma streittoi* n. sp., Iberiar Penintsularen hegoaldekoa (Hemiptera: Heteroptera: Lygaeidae)**

*Lygaeosoma streittoi* n. sp. (Hemiptera: Heteroptera: Lygaeidae) deskribatzen da, Sierra de Castril-ekoa, Andaluzia, Iberiar Penintsularen hegoaldea. Bere kanpo-morfologia, mikropterismoa gehi eskuteloaren laburtzea barne, bai eta bere altitude handiko habitat mediterranea ere, *Apterola* generoko zenbait espezieen antzekoak dira. Arren genitalia eta pigoforoaren azterketak *Lygaeosoman* sartzea berretsi ez ezik, genero honetako beste espezieetatiko bereizketarako karaktere baliagarri batzuk ere eman ditu. Espezie berriaren paregabetsuna, bai eta bere balizko endemizitatea ere, altuera handiko mendien habitatetarako moldapenaren testuinguruan eztabaidatzen dira. «Apterolizazio prozesua» terminoa proposatzen da.

**Gako-hitzak:** Hemiptera, Heteroptera, Lygaeidae, *Lygaeosoma streittoi* n. sp., Iberiar Penintsula, espezie endemikoa, deskribapena, *Apterola*.

## Introduction

Among ground-dwelling seed bugs (Lygaeidae: Lygaeinae), several genera have evolved towards micropterism in both sexes. One of the most striking cases is that of *Apterola*, a mainly Mediterranean genus of five species (*A. pallida* Slater, 1964 is known by a single female specimen from Namibia; see Deckert, 1995), within which macropterous forms are only known for the East-Mediterranean *A. lowii* (Saunders, 1876).

Previously to the Euro-Mediterranean fauna by Péricart (1999), two milestone works have dealt with the genus *Apterola*: Peláez (1942) published a thorough study on the Spanish species, describing *A. ramburi* and creating the subgenus *Parapterola* to accommodate both *A. ramburi* and *A. iberica* Horváth, 1899. Deckert (1995) revised the genus, establishing the currently accepted subspecies of *A. kuenckeli* Mulsant & Rey, 1866 (he described *obscura*, accepted *focarilei* Tamadini, 1964 and downgraded *rubicunda* (Stål, 1872) to subspecies), and providing new illustrations of morphology as well as redescriptions, a reinterpretation of the subgenera and an interesting discussion on phylogeny and relationships.

*A. (P.) ramburi* and *A. (P.) iberica* are southern Iberian lygaeids of small size<sup>(1)</sup>, the former being a typical high-altitude species endemic to Sierra Nevada, Andalusia (Peláez, 1942; Deckert, 1995; Péricart, 1999; Vázquez and Costas, 2013).

In our exploration of the Andalusian mountain ranges, a series of small<sup>(2)</sup>, dark micropterous Lygaeidae (Fig. 1) was collected at a single locality of Sierra de Castril. Not belonging to any known species and showing some characters of external morphology intermediate between both subgenera of *Apterola* (*s. str.* and *Parapterola*), the study of the male genitalia (together with some other characters) has unexpectedly placed this new taxon closer to the species of the genus *Lygaeosoma*, in which we have decided to include it.

The genus *Lygaeosoma* Spinola, 1837 has a wide distribution in the Palaearctic, Afrotropical and Oriental Regions. Nine species (and one subspecies) are hither-

to known from the Palaearctic Region (Péricart, 2001; Aukema *et al.*, 2013), five of them occurring in the Euro-Mediterranean area: *L. anaticum* Seidenstücker, 1960, *L. angulare* Reuter, 1885, *L. parvulum* Kiritshenko, 1914, *L. sardeum* Spinola, 1837 (including the subspecies *erythropterum* (Puton, 1876)) and *L. sibiricum* Seidenstücker, 1962. Similarly to *Apterola* species, they are ground-dwelling and xero-thermophilous dark bugs, with biology most probably depending on the moss-lichen layer (Péricart, 1999). For some of these species, brachypterous and/or micropterous forms are known in addition to macropterous ones.

The new species *Lygaeosoma streitoi* n. sp. is described below. Its remarkable appearance as well as its generic placement are further discussed.

All measurements are based on all known specimens (= type series = 6 males and 4 females) and are given in millimetres (mm). For most morphometric characters, after the average value, the whole range is given in parentheses. Measurements are indicated separately for males and for females only for those characters showing sexual dimorphism (commented at the end of the description).

## Description

### *Lygaeosoma streitoi* n. sp.

#### *Size and overall shape:*

Micropterous males and females (Figs. 1 and 2). Total length: males = 3.37 (3.29–3.45); females = 3.62 (3.32–3.85).

Body subovate to ovate, 3.18–3.30 × (males) and 3.08–3.17 × (females) longer than basal (posterior) width of pronotum and 2.47–2.56 × (males) and 2.17–2.23 × (females) longer than maximum width, which is usually at the level of fourth (and more rarely third) abdominal segment.

#### *Vestiture and sculpture:*

Mostly dull; pronotal transverse groove across each callus, shiny; a few median areas of abdominal tergites also shiny for the lack of pubescence.

Pubescence double: a rather evenly and densely distributed layer of very short, decumbent, yellowish-grey pubescence plus longer and more sparsely distributed, semierect setae of the same colour. The latter

<sup>(1)</sup> Respectively for *Apterola (Parapterola) ramburi* and *A. (P.) iberica*: 3.5–4.2 mm and 3.8–4.5 mm, according to Deckert (1995), or 3.9–4.25 mm and 4.25–5.0 mm, according to Péricart (1999).

<sup>(2)</sup> Even smaller than the members of *Apterola (Parapterola)*, with average length not reaching 3.5 mm.



FIGURE 1. *Lygaeosoma streittoi* n. sp.: Habitus of the holotype ♂ (left) and one paratype ♀ (right); both specimens deposited in the Museu de Ciències Naturals (Zoologia) de Barcelona, MCNB.

approximately as long as the maximum width of antennal segment II, or longer on legs and antennae.

Eyes pubescent, with minute setae in between the ommatidia.

Long trichobothria (4 visible from above) arising laterally from sternites V (1, anterior), VI (2, anterior and posterior) and VII (1, posterior).

Head finely punctate, with punctures masked by pubescence. Pronotum entirely punctate, with dense and coarse punctuation, only leaving greater spaces between punctures on the middle of posterior and, to a lesser extent, anterior margins; in some small specimens, very few and sparse (but coarse) punctures, particularly so on the posterior lobe of pronotum. Anterior half of scutellum similarly punctate.

Abdominal tergites finely wrinkled transversely.

#### *Coloration:*

General dorsal coloration ranging between black and brownish black. Head black, without pale spot on the middle of posterior margin. Antennae totally black, or brownish black in some specimens, rarely with segment II slightly paler. Eyes black or somewhat clearer posteriorly (at least in collection specimens). Ocelli dark brown, shiny. Rostrum brownish; bucculae even paler. Pronotum of the general colour, with anterior and lateral margins narrowly, and posterior margin widely paler, the brownish colour extending more or less towards the whole posterior lobe. A median paler line distinct in greater, generally female, specimens; only insinuated (from anterior and

posterior margins) or almost absent in the smaller, generally male, ones. Posterolateral angles also generally paler. Scutellum black with posterior margin narrowly paler; very rarely a median paler line visible. Hemelytra brown and usually with a central blackish area. Abdomen black, paler towards the last segments, particularly tergite VII. Connexivum bicolor: paratergites black with posterior 1/3–1/2 brown (greater specimens) to brownish black (smaller ones) or even almost totally black (rarely). General ventral or latero-ventral coloration ranging between black and brown, with some areas paler than dorsally. Thoracic pleurites distinctly paler than abdomen and with margins particularly pale. Metathoracic scent gland yellowish brown, being the palest structure of the insect. Legs brown to brownish black, showing individual variation but with femora (always) and third tarsomeres (almost always) darker; sometimes tibiae pale brown or yellowish brown.

#### *Structure and measurements:*

Head slightly shorter than high and considerably shorter than wide, about 4/5 and 3/5, respectively. Head width = 1.00 (0.92–1.09). Eyes somewhat protruding, touching or almost touching the anterior margin of pronotum. Ocular index: males = 2.60 (2.47–2.73); females = 2.75 (2.59–2.82). Ocelli very small, difficult to observe in some specimens. Antennae about half the body length. Length of antennal segments I – II – III – IV = 0.28 (0.26–0.31) – 0.51 (0.46–0.54) – 0.36 (0.33–0.41) – 0.54 (0.49–0.56). Antennal segment I surpassing clypeus by approximately 1/3 of its length. Ratio antennal segment II / interocular distance (synthlipsis): males = 0.91 (0.89–1.00); females = 0.86 (0.83–0.88). Ratio antennal segment II / diatone = 0.51 (0.49–0.56). Ratio antennal segments II/III = 1.41 (1.31–1.50). Ratio antennal segments IV/III = 1.50 (1.40–1.58). Rostrum slightly surpassing mesocoxae.

Pronotum moderately (males) to markedly (females) trapeziform. Lateral sides rather straight. Anterior margin finely carinate. Subplan, with anterior lobe only slightly convex and without distinct median keel; only in greater specimens insinuated by the interruption of punctuation and/or a paler colour. Anteriorly narrower than head width, about  $0.80 \times$  (0.75–0.85  $\times$ ). Basal width or maximum width of posterior lobe = maximum pronotal width = 1.09 (1.03–1.24). Mesal pronotal length = 0.68 (0.64–0.77). Ratio posterior width / anterior width = 1.36 (1.29–1.41). Ratio posterior width / mesal length = 1.60 (1.48–1.68).

Scutellum truncate posteriorly and distinctly trapezi-

form (inverted trapezium, similar to subgenus *Apterola* s. str.). Anterior half depressed with respect to posterior half, forming a transverse, punctate groove. Ratio scutellum / pronotum (lengths) = 0.39 (0.33–0.46).

Hemelytra strongly reduced, not surpassing the scutellum length and leaving all the abdominal tergites exposed. Lacking membrane (similar to micropterous forms in genera *Apterola*, *Psileula* or *Stenaptula*). Subtriangular and with posterior margin more or less transversely truncate (as in genus *Apterola*). No more than the origin of veins marked.

Legs. Unarmed, femora without teeth. Length of metatibia = 1.03 (0.97–1.15). Length of metatarsomeres: I the longest, almost  $1/3 \times$  metatibial length; II the shortest. Approximate proportions (not in mm): I – II – III = 14 – 4 – 7.

Abdomen, in lateral view, strongly sloping from tergite I to III down to a deep depression between tergites III–IV (a shallower depression between tergites II–III is present in all species of *Apterola*). Tergite I markedly convex. Tergites V + VI forming a moderate convexity. Tergites bordered by inner paratergites bearing the apodemes for dorso-ventral muscles. Apodemes on inner paratergites well visible as darker, usually glabrous spots. Stigmata on outer paratergites (connexivum) very hardly visible.

#### *Male genitalia and pygophore:*

Pygophore as in Fig. 3, with dorsal opening comparatively small and diaphragm with a slight median indentation. Parameres (Fig. 4) of *Lygaeosoma*-type, without sensitive lobe and without any processus. Hypophysis rather stout and curving outwards. Phallus in rest as in Figs. 5a–b, with the processus gonopori very long. See Discussion for comparative comments on all these structures.

#### **Sexual dimorphism:**

The only obvious secondary sexual characters are those concerning the size and overall shape of individuals. In general, females tend to be greater than males. Nevertheless, the longest (three out of four) females of the type series were collected at 1800 m and all (six) males were collected at 2000 m; therefore the altitude cannot be discarded as a determining factor of body length. Unlike body size, shape is usually quite distinguishing, females being more clearly ovate with the ratio total length / maximum width distinctly lower than males (2.17–2.23 and 2.47–2.56, respectively),

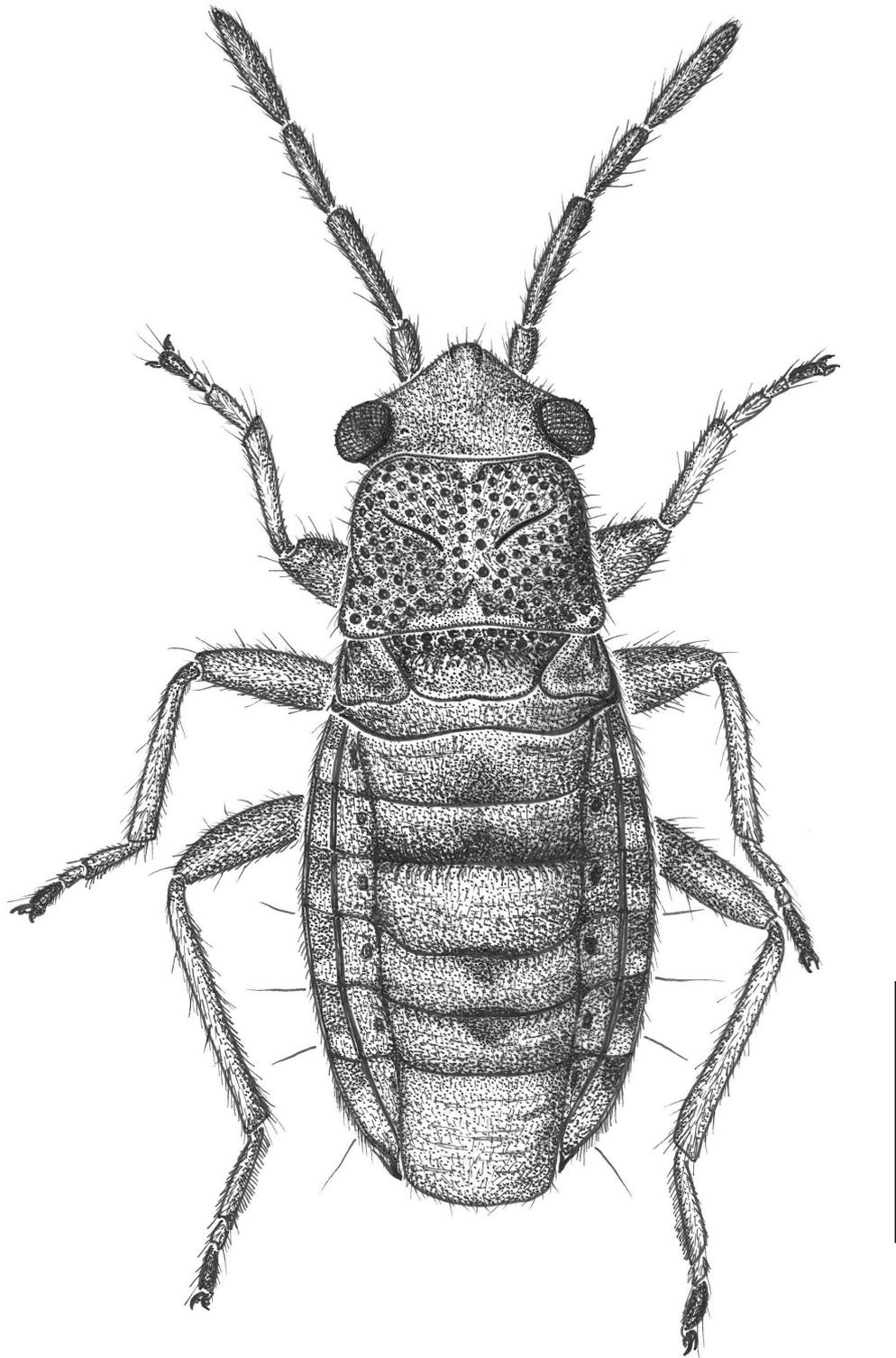


FIGURE 2. *Lygaeosoma streitoi* n. sp.: Habitus of the holotype ♂ (Scale bar = 1 mm).

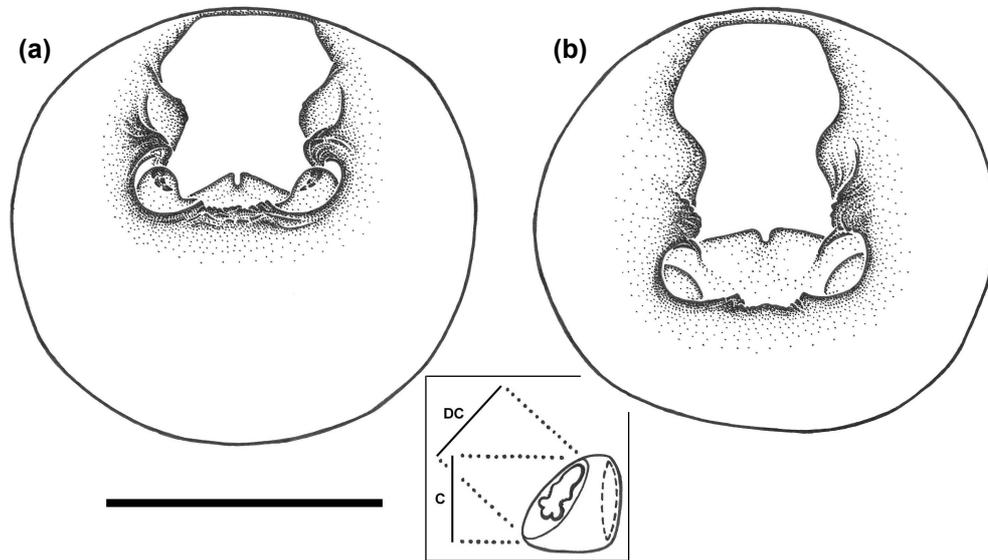


FIGURE 3. *Lygaeosoma streittoi* n. sp.: Pygophore in two views (see inset diagram): (a) Caudal (= C); (b) Dorso-caudal (= DC) (Scale bar = 0.4 mm).

as shown in Fig 1. In addition, eyes are slightly bigger in males, as reflected by their smaller ocular index, or by any ratio that includes the interocular distance (synthlipsis).

#### Type material:

HOLOTYPE: ♂, labelled «GRANADA: Castril: / S<sup>a</sup> de Castril: Cerro del Buitre: / 2000 m 30SWG1689 / Ground near *Erinacea anthyllis* / 9-05-2013 / S. Pagola Carte leg.». A red, typewritten label is now added below: «HOLOTYPE / *Lygaeosoma* / *streittoi* n. sp. / Pagola-Carte & J. Ribes, 2013».

PARATYPES: 5 ♂♂, 4 ♀♀, same data, except for 3 ♀♀ at 1800 m. A red, typewritten label is now added below: «PARATYPE / *Lygaeosoma* / *streittoi* n. sp. / Pagola-Carte & J. Ribes, 2013».

Holotype deposited in the Museu de Ciències Naturals (Zoologia) de Barcelona (MCNB). Paratypes deposited in the Museu de Ciències Naturals de Barcelona (MCNB) (1 ♀), Museo Nacional de Ciencias Naturales, Madrid (MNCN) (1 ♂, 1 ♀), Streito coll. (Montpellier) (1 ♂), Ribes coll. (Barcelona) (1 ♂), Pagola-Zabalegui coll. (Villabona) (2 ♂♂, 2 ♀♀).

The specimens are mounted on a card. The genitalic structures of the holotype and one paratype are glued on the same card. During the manipulation of several male specimens, the pygophore was accidentally withdrawn (telescoped) within the preceding abdominal segments, where it remains.

#### Type locality:

All the specimens were collected at the summit (altitude of 1800–2000 m) of Sierra de Castril mountain range (Spain: Andalusia: Granada), which belongs to the group of mountains called the Prebaetic System, that is, the northernmost area of the Baetic System.

#### Etymology:

With great pleasure we name this species after our colleague the heteropterist Jean-Claude Streito, not only for his friendship, but also in recognition of his tremendous and fine work as editor of the «*Faune de France*» book series. Particularly for his help, patience and kindness to us.

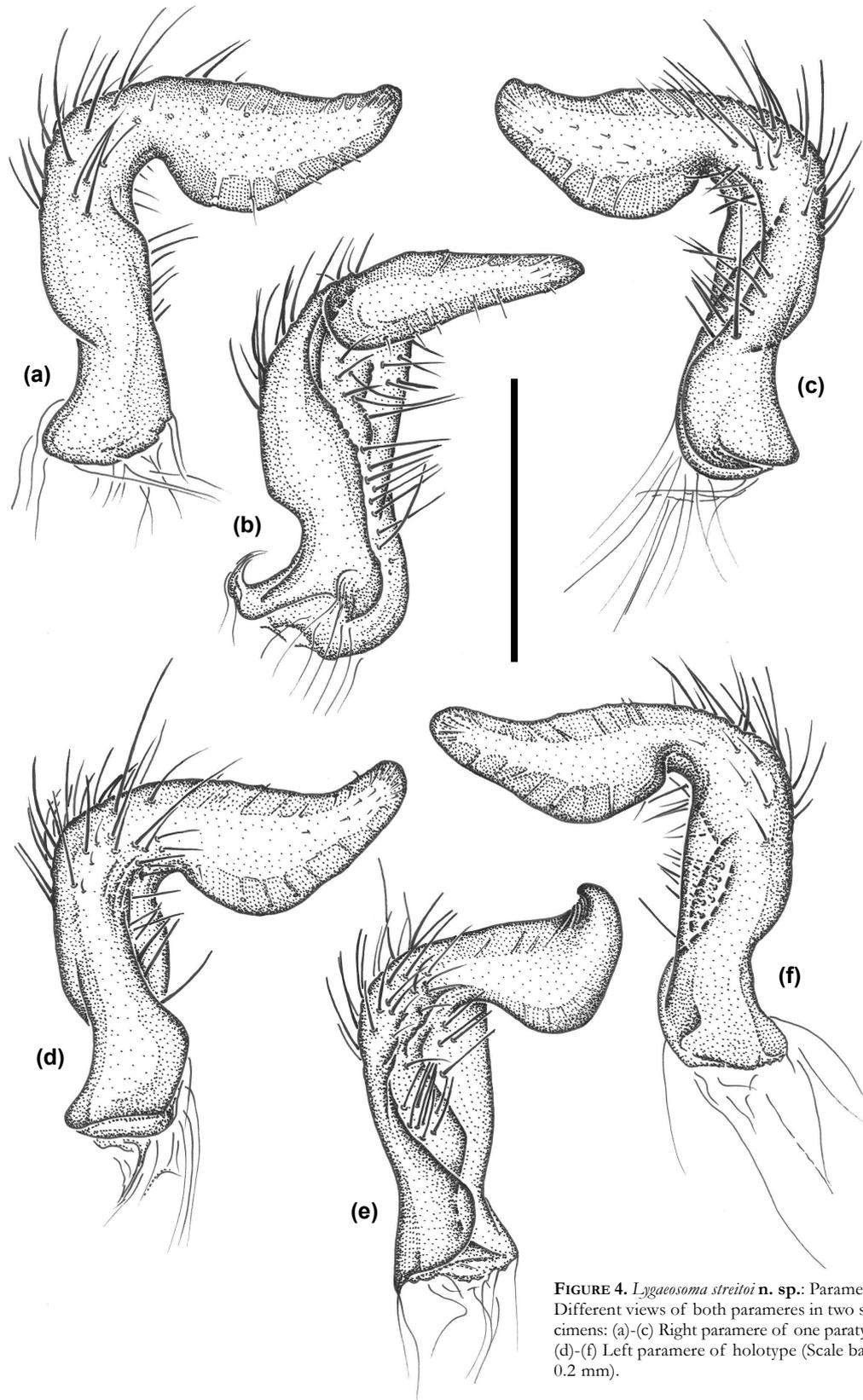


FIGURE 4. *Lygaeosoma streittoi* n. sp.: Parameres: Different views of both parameres in two specimens: (a)-(c) Right paramere of one paratype; (d)-(f) Left paramere of holotype (Scale bar = 0.2 mm).

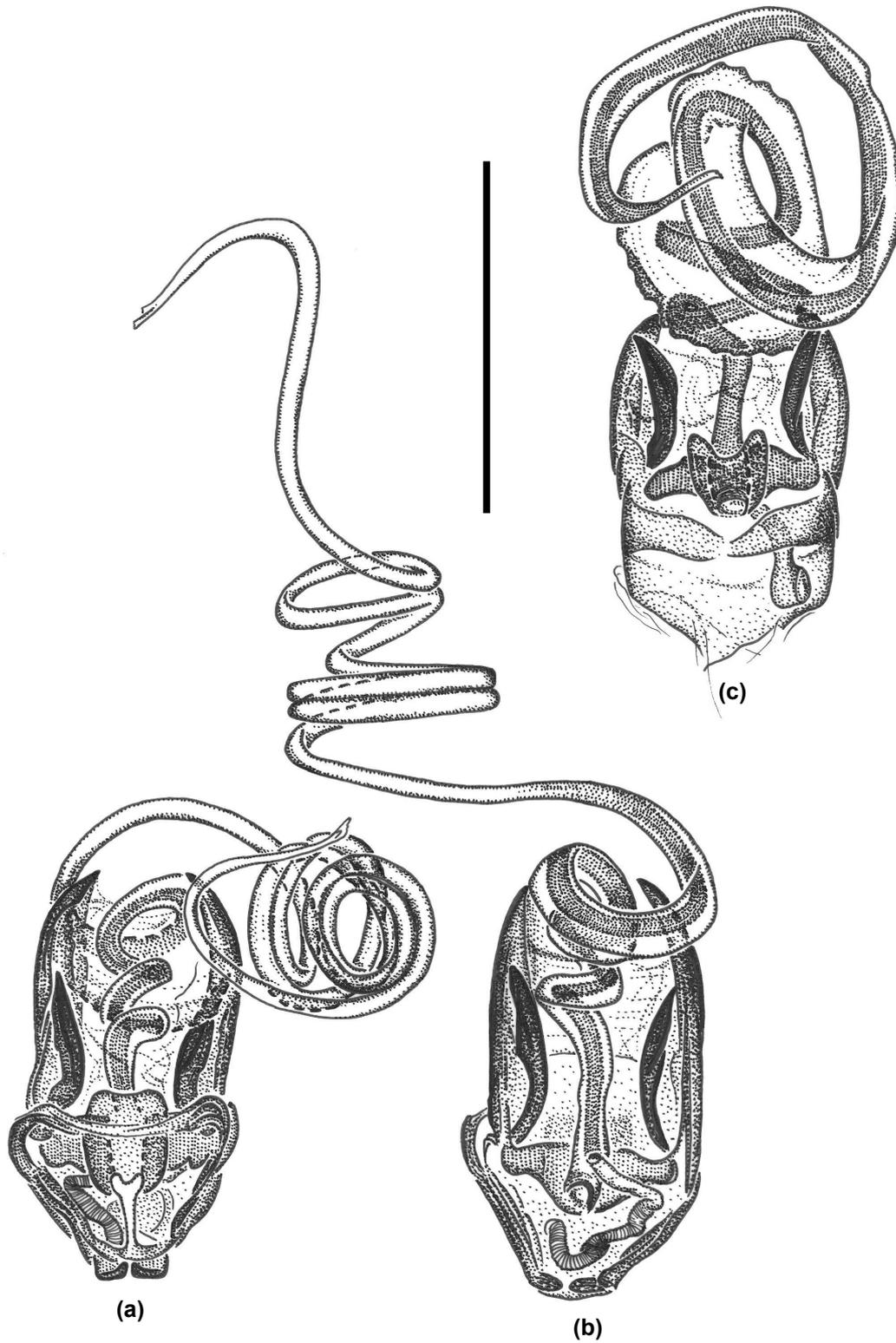


FIGURE 5. Phallus in rest of: (a)-(b) *Lygaeosoma streitoi* n. sp., two views; (c) *Lygaeosoma sardeum* Spinola, 1837, specimen from the province of León (Scale bar = 0.4 mm).



**FIGURE 6.** Habitat of *Lygaeosoma streittoi* n. sp. at 1800–2000 m in Sierra de Castril: (a) High density of *Erinacea anthyllis* bushes at 1800 m with Cerro del Buitre in the background; (b) Microhabitat (ground near *Erinacea anthyllis*) very close to the summit of this mountain, about 2000 m of altitude. A snow patch is visible behind the pines *Pinus nigra*.

#### Habitat:

All the specimens were collected at the same locality in a single collecting event. They occurred on the ground near or under *Erinacea anthyllis* bushes between 1800–2000 m (supramediterranean bioclimatic stage or belt with *Pinus nigra*) (Fig. 6). The search for additional specimens at lower altitudes was unsuccessful. Only adults were observed. Given the time of the year (beginning of May), in combination with the high altitude, they were most probably post-hibernating individuals.

The accompanying heteropterous fauna observed in the same (micro)habitat was composed of several Lygaeidae (*Apterola* (*Parapterola*) *ramburi* Peláez, 1942, *Lygaeosoma sardenum sardenum* Spinola, 1837, *Spilostethus saxatilis* (Scopoli, 1763) and *Gonianotus marginepunctatus* (Wolff, 1804)) and one Nabidae (*Prostemma* (*Prostemma*) *albimaculata* Stein, 1857); some of them being interesting faunistic records as well. *Erinacea anthyllis* bushes might constitute the main winter shelter for many of these Heteroptera, including *Lygaeosoma streittoi* n. sp., rather than their obligate trophic and/or habitat resource from Spring to Autumn. But a trophic dependence on the seeds of this Fabaceae could also be hypothesized.

#### Distribution:

Up to now, only known from the type locality.

#### Discussion

*Lygaeosoma streittoi* n. sp. is well characterized among Euro-Mediterranean *Lygaeosoma* species by its combination of small size, extreme micropterism and several characters of the male genitalia and pygophore. Micropterism in other species of *Lygaeosoma* does not affect the morphology so strongly (see, for example, Péricart, 1999: fig. 46c, *Lygaeosoma sibiricum* Seidenstücker, 1962). In fact, the overall morphological appearance of the new species resembles that of the genus *Apterola*, in which the hemelytra are very short and subtriangular and the scutellum is distinctly shortened as well. Specifically, the scutellum of *Lygaeosoma streittoi* n. sp. is very similar to that in the subgenus *Apterola* s. str. (see, for example, Deckert, 1995: fig. 1a, *Apterola* (s. str.) *kuenckeli*), i.e. posteriorly truncate and, consequently, trapezoid-like instead of triangle-like. However, at first glance, the new species could be taken for one member of the subgenus *Parapterola*, given its small size and shorter antennae (see, for example, Peláez, 1942: plate XX, drawings of the three Spanish species of *Apterola*).

Despite its unique combination of characters, our decision is rather conservative, ascribing the new species to the known genus *Lygaeosoma* on the basis of some other characters of external morphology and

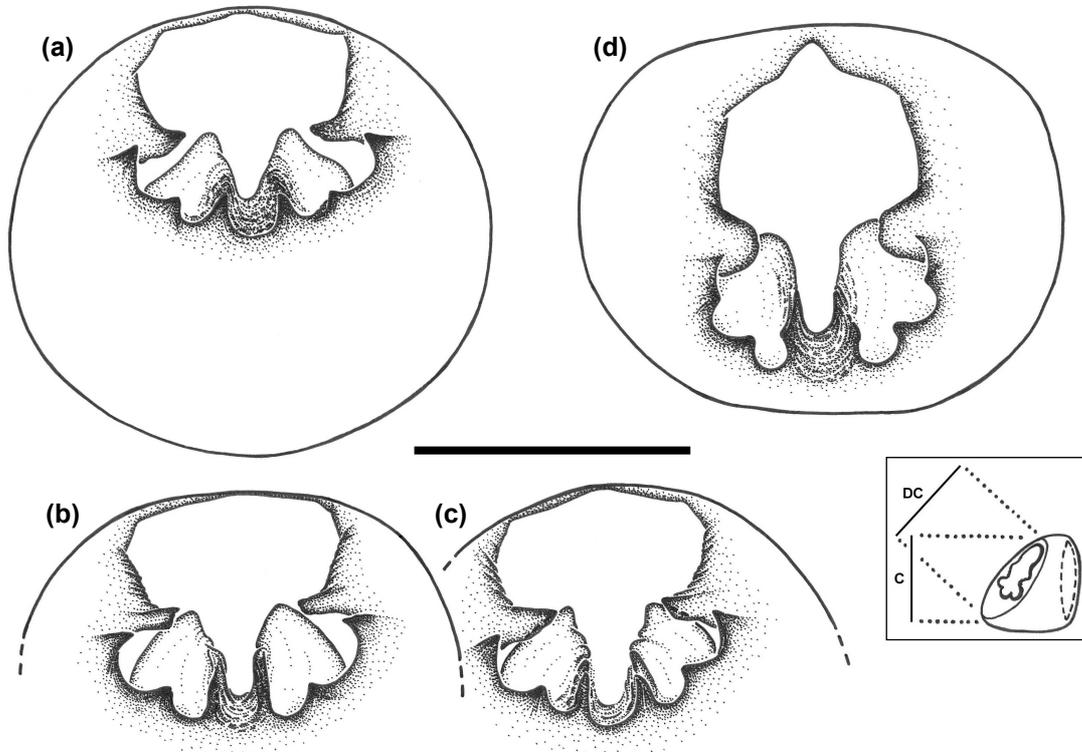


FIGURE 7. *Lygaeosoma sardeum* Spinola, 1837: Pygophore in two views (see inset diagram): (a)-(c) Caudal (= C); (d) Dorso-caudal (= DC) [Three Iberian specimens: (a), (d) Province of León; (b) Province of Cuenca; (c) Province of Araba] (Scale bar = 0.4 mm).

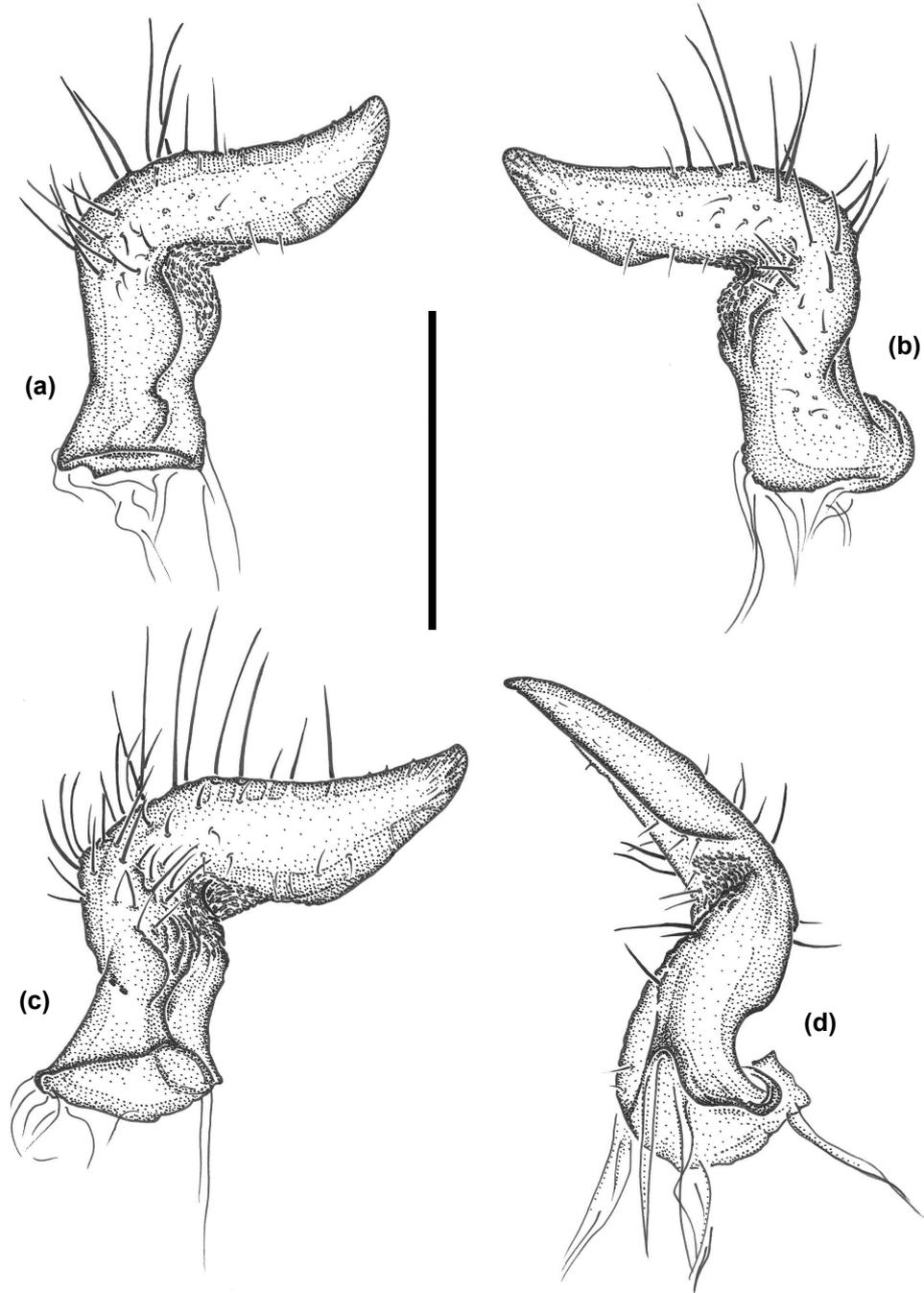
particularly after the study of parameres. Concerning the external characters, the following have to be mentioned: the type of pubescence, without the long setae typical of *Apterola*; the absence of pale spot on the middle of the posterior margin of head; the deep abdominal depression between tergites III-IV and not between tergites II-III as in *Apterola*; the presence of abdominal inner paratergites bearing the apodemes for dorso-ventral muscles (see also: Péricart, 1999: figs. 22d and 22e, for *Apterola* and *Lygaeosoma*, respectively). All those are distinguishing characters between *Lygaeosoma* and *Apterola*.

On the other hand, the parameres are quite informative. In fact, they lack both the sensitive lobe typical of most Lygaeinae genera including *Apterola* (see Deckert, 1990: figs. 1-4) and the processi present in a number of them, including some species of *Apterola* (see Peláez, 1942: figs. 10 and 12). In our opinion, the parameres of *Lygaeosoma streitoi* n. sp.

share the same basic structure with those of other *Lygaeosoma* species (see Péricart, 1999: fig. 44, for *L. anatolicum* Seidenstücker, 1960, *L. angulare*, Reuter, 1885, *L. parvulum* Kiritschenko, 1914 and *L. sardeum* Spinola, 1837).

The new species may be endemic to the Prebaetic System or even microendemic to the highest elevations of Sierra de Castril. The co-occurrence at the same locality and habitat of *Apterola* (*P.*) *ramburi*, *Lygaeosoma sardeum* and *Lygaeosoma streitoi* n. sp. is undoubtedly very interesting from an ecological perspective, and it might be so from a phylogenetic one too<sup>(3)</sup>. Notwithstanding that these matters are beyond the scope of the present description, the

<sup>(3)</sup> It is indeed very tempting to think in terms of a fertile hybridization event in the past, between *Lygaeosoma sardeum* and *Apterola* (*P.*) *ramburi*.



**FIGURE 8.** *Lygaeosoma sardeum* Spinola, 1837: Different views of both parameres in three Iberian specimens: (a)-(b) Right paramere; (c)-(d) Left paramere [(a)-(b) Province of Araba; (c) Province of León; (d) Province of Cuenca] (Scale bar = 0.2 mm).

following question arises in the context of such a co-occurrence: Could this *Apterola*-like *Lygaeosoma* be no more than a micropterous form of *L. sardeum*?

In order to answer that question, and as a way to get a deeper understanding of its generic ascription, the male genitalia and pygophore of *L. sardeum* were examined (Figs. 7, 8 and 5c) and compared to those of *Lygaeosoma streitoi* n. sp. (Figs. 3, 4 and 5a-b). To increase comparability, we chose specimens of *L. sardeum* of small size, from various Iberian localities (see Appendix 1). We conclude that they may be considered congeneric, but clearly not conspecific. Specifically:

- (a) The dorsal opening of the pygophore (compare Figs. 3 and 7)<sup>(4)</sup> is greater and differently shaped in *L. sardeum* and the diaphragm is also quite different.
- (b) The parameres of *L. sardeum* are more slender and, curiously, relatively smaller (compare Figs. 4 and 8) and they bear a shagreened area on the inner angle between the body and the hypophysis. In *Lygaeosoma streitoi* n. sp. such a shagreened area is absent, but instead abundant setae, arranged in several clusters or levels, can be observed from the paramere basis to that angle. Figs. 4e and 8d are drawn based on forced positions with the aim of enriching the bidimensional representation of the different volume proportions between both species; neither of those views can be obtained in the alternative species, respectively.
- (c) The comparison of the phalli (Figs. 5a-b and 5c, both in rest) is also clarifying, since the processus gonopori is much longer and thinner in *Lygaeosoma streitoi* n. sp. (similarly to some *Apterola* species: see Peláez, 1942: fig. 9; Deckert, 1995: fig. 4), besides other differences concerning the vesica or the phallosome, particularly the proportions of sclerotized lateral structures.

Thus, belonging to the genus *Lygaeosoma*, the new species exhibits substantial differences with respect to *L. sardeum* and to the remaining Euro-Mediterranean species, most probably as a result of the adaptation to its particular microhabitat at high altitude. This «apterolization process» concerns not only the micropterism but also the size reduction of ocelli or

<sup>(4)</sup> Much care has to be taken when comparing such sub-spherical structures. For that reason, the same two positions (caudal and dorso-caudal) have been established to make the drawings, as indicated (as «C» and «DC», respectively) in the inset of Figs. 3 and 7. For the caudal view, the pygophore is simply placed resting on the plane formed by its anterior margin or opening.

the change from a triangular-shaped pronotum to a trapezoidal-shaped one.

Flightlessness in Lygaeidae is believed to be related primarily to habitat stability, as, for example, among ground-litter living (geophilous) species (Slater, 1997). Long «evolutionary» stability could be behind the process here named «apterolization», triggering speciation within genera *Apterola* and *Lygaeosoma* and, as a consequence, promoting endemism in Andalusian mountains. Anyway, sound studies on these issues are lacking for Iberian Heteroptera... In our opinion, a thorough revision and phylogenetic analysis of Iberian Lygaeinae might reveal a somewhat different taxonomic arrangement of the *Apterola* species, maybe relating (some of) them to one or another genus of generally macropterous species, in a similar way to the outstanding *Lygaeosoma streitoi* n. sp.

## Acknowledgements

We are very grateful to Harry Brailovsky (Mexico), Miguel Costas (Madrid) and Jürgen Deckert (Berlin) for sending bibliography. We also deeply thank Ernst Heiss (Innsbruck) and Armand Matocq (Paris) for reviewing and improving the article.

## References

- AUKEMA B, RIEGER CH, RABITSCH W. 2013. *Catalogue of the Heteroptera of the Palaearctic Region, volume 6*. The Netherlands Entomological Society. Amsterdam.
- DECKERT J. 1990. Zum Bau von Parameren, Phallus und Pygophore der Lygaeinae und Bemerkungen zur Systematik der Unterfamilie (Heteroptera, Lygaeidae). *Mitteilungen aus dem Zoologischen Museum in Berlin* **66**(1): 91-119.
- DECKERT J. 1995. Die Arten der Lygaeinae-Gattung *Apterola* Mulsant & Rey (Heteroptera, Lygaeidae). *Deutsche Entomologische Zeitschrift* (N.F.) **42**: 1-16.
- PELÁEZ D. 1942. Estudio monográfico de las especies españolas del género *Apterola* Muls. et Rey (Hem. Lyg.). *Revista de la Sociedad Mexicana de Historia Natural* **3**: 113-134 + 3 pl.
- PÉRICART J. 1999. *Hémiptères Lygaeidae euro-méditerranéens, volume 1*. Faune de France, 84A. Fédération Française des Sociétés de Sciences Naturelles. Paris.

- PÉRICART J. 2001. Family Lygaeidae Schilling, 1829 – Seed-bugs. In: Aukema B, Rieger Ch (Eds.). *Catalogue of the Heteroptera of the Palaearctic Region, volume 4*. The Netherlands Entomological Society. Amsterdam.
- SLATER JS. 1977. The incidence and evolutionary significance of wing polymorphism in lygaeid bugs with particular reference to those of South Africa. *Biotropica* 9(4): 217-229.
- VÁZQUEZ MÁ, COSTAS M. 2013. Los coreidos, ligeidos, berítidos y tíngidos (Hemiptera, Heteroptera: Coreidae, Lygaeidae, Berytidae y Tingidae) (pp.: 173-201). In: Díaz Ruano F, Tierno de Figueroa JM, Tinaut Ranera JA (Eds.). *Los insectos de Sierra Nevada. 200 años de historia*. Asociación Española de Entomología.

---

**Received / Recibido / Hartua: 27/10/2013**

**Accepted / Aceptado / Onartua: 14/11/2013**

**Published / Publicado / Argitaratua: 31/12/2013**

## Appendix 1

Iberian specimens of *Lygaeosoma sardenum* Spinola, 1837 examined for comparative purposes:

- 1 ♂ total length = 3.9 mm, labelled «LEÓN: / Boca de Huérgano: / Portilla de la Reina / 1230 m / 30TUN5168 / 23-06-2009 / S. Pagola Carte leg.»
- 1 ♂ total length = 3.5 mm, labelled «CUENCA: / Huélamo / (márgenes carretera) / 1400 m / 5-08-2008 / S. Pagola Carte leg.»
- 1 ♂ total length = 3.8 mm, labelled «Lantziego (El Chital) / 500 m / Lantziego / ARABA 30TWN3911 / 25-04-2004 / S. Pagola Carte leg.»