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Psallus (Psallus) anashanti n. sp. from the Basque Country, northern Iberian Peninsula (Hemiptera: Heteroptera: Miridae)

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Abstract

Psallus (Psallus) anashanti n. sp. (Hemiptera: Heteroptera: Miridae: Phylinae: Phylini) is described from the peninsular Basque Country (northern Iberian Peninsula). It belongs to the group of species of *P. (P.) haematodes* (Gmelin, 1790) and, specifically, it is the fifth known member of the subgroup of species occurring on ash trees (*Fraxinus* spp.). All the specimens have been collected on *Fraxinus angustifolia* at three (sub)Mediterranean localities of the provinces of Araba and Nafarroa. The new species is most similar to *P. (P.) lepidus* Fieber, 1858 and *P. (P.) flavellus* Stichel, 1933, from which it can be easily separated by the male genitalia (particularly vesica and left paramere). The female genitalia (particularly genital chamber with its dorsal sac and sclerotized rings) and several characters of external morphology (particularly ratio body length/width and metafemoral spots) are also useful.

Key words: *Psallus (Psallus) anashanti* n. sp., Heteroptera, Miridae, *Fraxinus angustifolia*, Basque Country, Iberian Peninsula, taxonomy.

Resumen

***Psallus (Psallus) anashanti* n. sp. del País Vasco, norte de la Península Ibérica (Hemiptera: Heteroptera: Miridae)**

Se describe *Psallus (Psallus) anashanti* n. sp. (Hemiptera: Heteroptera: Miridae: Phylinae: Phylini), del País Vasco peninsular (norte de la Península Ibérica). Pertenece al grupo de especies de *P. (P.) haematodes* (Gmelin, 1790) y, más concretamente, constituye el quinto miembro conocido del subgrupo de especies asociadas a fresnos (*Fraxinus* spp.). Todos los ejemplares se han capturado sobre *Fraxinus angustifolia* en tres localidades (sub)mediterráneas de las provincias de Araba y Nafarroa. Las especies más parecidas son *P. (P.) lepidus* Fieber, 1858 y *P. (P.) flavellus* Stichel, 1933, de las cuales puede separarse con facilidad por la genitalia masculina (especialmente vesica y parámetro izquierdo). Resultan también útiles la genitalia femenina (especialmente la cámara genital, con su saco dorsal y sus anillos esclerotizados) y varios caracteres de morfología externa (especialmente la relación longitud/anchura corporal y las máculas de los metafémures).

Palabras clave: *Psallus (Psallus) anashanti* n. sp., Heteroptera, Miridae, *Fraxinus angustifolia*, País Vasco, Península Ibérica, taxonomía.

Laburpena

***Psallus (Psallus) anashanti* n. sp., Euskal Herrikoa, Iberiar Peninsularen iparralde (Hemiptera: Heteroptera: Miridae)**

Psallus (Psallus) anashanti n. sp. (Hemiptera: Heteroptera: Miridae: Phylinae: Phylini) deskribatzen da, Euskal Herri penintsularrekoa (Iberiar Penintsularen iparralde). *P. (P.) haematodes* (Gmelin, 1790)-ren espezie-taldekoa da eta, zehazki, lizarrei (*Fraxinus* spp.) lotutako espezieen azpitaldean ezagutzen den bosgarren ordezkaria da. Ale guztiak Araba eta Nafarroa lurraldeen hiru lokalitate (sub)mediterraneotako *Fraxinus angustifolia* harrapatu dira. Antza handiena duten espezieak *P. (P.) lepidus* Fieber, 1858 eta *P. (P.) flavellus* Stichel, 1933 dira eta haietatik erraz bereizi daiteke arren genitaliarengatik (bereziki besika eta ezkerreko parameroarengatik). Emeen genitalia (bereziki ganbera genitala, bere zaku dorsala eta eraztun esklerotizatuak besteak beste) eta kanpo-morfologiaren

zenbait karaktere ere (bereziki gorputzaren luzera/zabalera erlazioa eta metafemurren orbanak) lagungarri suertatzen dira.

Gako-hitzak: *Psallus (Psallus) anashanti* n. sp., Heteroptera, Miridae, *Fraxinus angustifolia*, Euskal Herria, Iberiar Penintsula, taxonomia.

Introduction

Psallus Fieber, 1858 is one of the largest genera of Phylinae (Hemiptera: Heteroptera: Miridae) with more than 150 species described in 7 subgenera (Wagner and Weber, 1964; Wagner, 1975; Kerzhner and Josifov, 1999; Yasunaga and Vinokurov, 2000; Aukema *et al.*, 2013) mainly from the Palearctic Region. Their classification is still unsatisfactory and there is a great consensus about the non-monophyly of the group. A world revision could give generic status to some of those subgenera and provide more unequivocal diagnoses for the taxa included/excluded in one or another genera or subgenera. Among recent literature, some papers have interestingly dealt with this problem (see, for example: Wyniger, 2004; Yasunaga, 2010; Matocq and Pluot-Sigwalt, 2011, in press), being the unpublished PhD thesis by Wyniger (2004) the most thorough attempt to shed light on it on the basis of Central European fauna.

When reexamining a series of *Psallus (Psallus)* collected more than ten years ago on *Fraxinus angustifolia* (Oleaceae) in two localities and tentatively identified as *P. (P.) flavellus* Stichel, 1933, I realized that they in fact belong to a new species. Additional, recent collecting events on the same tree species in a third locality have led me to describe it now, as well as to confirm its host plant. *P. (P.) anashanti* n. sp. is morphologically close (and presumably phylogenetically related) both to *P. (P.) flavellus* and *P. (P.) lepidus* Fieber, 1858, which are also associated to *Fraxinus* spp., mainly *F. excelsior*. According to the structure of the vesica, it must be considered a further representative of the speciose group of *P. (P.) haematodes* (Gmelin, 1790). Regarding the host plant, it becomes the fifth known member of the subgroup of species occurring on *Fraxinus* spp. (see: Matocq and Pluot-Sigwalt, 2011).

Throughout the description, measurements are based on 10 ♂♂ and 10 ♀♀ of the type series 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.

Description

Psallus (Psallus) anashanti n. sp.

General habitus:

Macropterous males and females (Fig. 1). Total length: ♂♂ = 3.99 (3.75–4.13); ♀♀ = 3.91 (3.80–4.00). Body subovate, 2.89 (2.74–3.00) × (♂♂) and 2.73 (2.67–2.77) × (♀♀) longer than basal (posterior) width of pronotum and 2.40 (2.34–2.45) × (♂♂) and 2.22 (2.12–2.29) × (♀♀) longer than maximum width. Tegument shiny. General colour variable, normally as two separate forms: orange and brown, but always reddening posteriad and similarly patterned concerning the distribution of red colour. Most males of the brown form, most females of the orange form. Dorsal vestiture consisting of two types of setae: simple, semierect, dark setae and reclining, sericeous, pale setae; the former more scattered, the latter abundant, long, and forming a conspicuous, golden pubescence.

Head:

Light orange or light brown. Approximately 1.35 × wider than high in front view. Frons evenly convex. In some specimens, frons and vertex faintly mottled with brown medially. Vertex slightly margined near eyes. Eyes maron to brown. Ocular index: ♂♂ = 1.84 (1.77–1.94); ♀♀ = 2.20 (2.12–2.32). Antennae entirely pale: yellowish or very light orangish, with only segment IV very slightly darker in some specimens. Length of antennal segments I – II – III – IV = 0.23 (0.21–0.25) – 1.13 (1.05–1.23) – 0.58 (0.53–0.65) – 0.38 (0.35–0.40) for both ♂♂ and ♀♀. Segment I provided with two longer, bristle-like setae not arising from distinct black spots. Segment II thicker than III and slightly fusiform in males and slightly clubbed in females (more than 1.5 × thicker apically than basally). Ratio antennal segment II / pronotum width: ♂♂ = 0.82 (0.74–0.85); ♀♀ = 0.80 (0.74–0.86). Ratio antennal segments II / III+IV: ♂♂ = 1.13 (1.08–1.22); ♀♀ = 1.19 (1.15–1.26). Mandibular and maxillary plates and clypeus of the

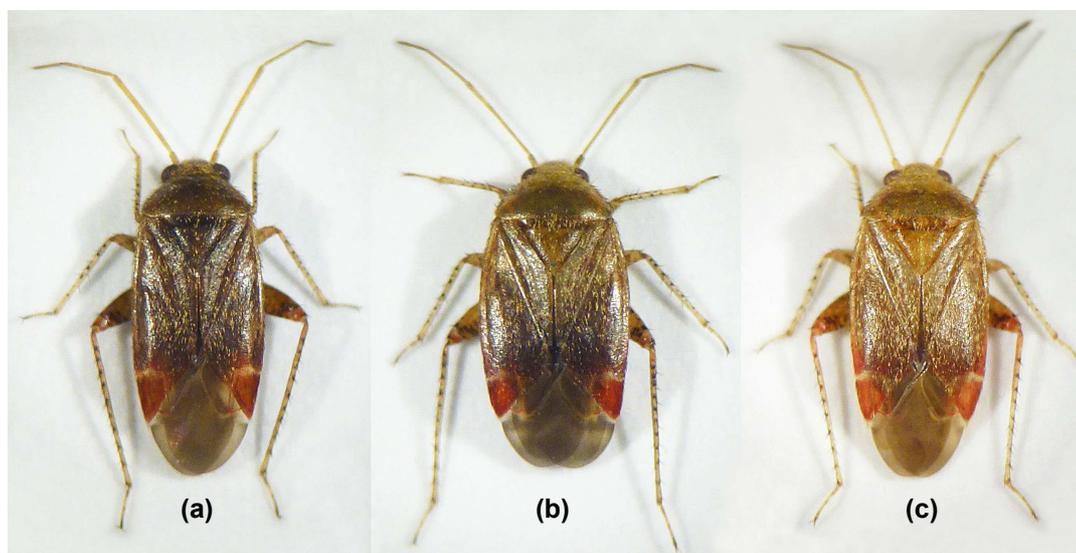


FIGURE 1. *Psallus (Psallus) anashanti* n. sp., habitus: (a) Male (holotype); (b)-(c) Females (paratypes), showing chromatic variability.

background colour, bucculae usually tinged with red. Rostrum mostly yellow, with base of first segment usually tinged with red and apex of fourth segment dark; reaching mesocoxae.

Thorax:

Pronotum and scutellum orange or brown. Scutellum sometimes more contrasted: reddish in the orange form or dark brown in the brown form. Punctuation indistinct. Pronotal calli hardly visible. Both types of setae well represented on pronotum, with semierect, dark setae more conspicuous on margins. Scutellum sometimes with a pale middle line very faintly marked. Mesoscutum sometimes conspicuously paler (orange) laterally, particularly in specimens of the brown form. Faintly spotted or mottled areas on anterior half of pronotum and mesoscutum in some specimens. Laterally, pronotum of roughly similar colour as dorsally, sometimes tinged with red and rarely with green; meso- and metapleura generally distinctly pale (the palest areas of the insect), except in darkest, male specimens, with only metathoracic scent glands pale.

Hemelytra:

Anteriorly orange or brown. Anterior third sometimes (particularly females of the orange form) paler

and showing ill-defined, reddish spots, more visible on clavus. Reddening posteriad (from orange or from brown), with cuneus always bright red, except for a (generally) broad, semilunar-shaped, pale stripe on its base. Hemelytra surpassing apex of abdomen and densely covered by reclining setae, giving the appearance of a long golden pubescence. Membrane grey, not uniformly but with two paler areas along the posterior margin: the first, small, contiguous with the minor cell and the second, greater, posteriorly to first one. Membrane veins almost always nearly concolor around major cell and tinged with red around minor cell.

Legs:

Mostly pale. Coxae yellow to brown. Trochanters pale, even in the brown form. Femora light orange, apically more or less tinged with red on both surfaces, particularly beyond the apical spots of metafemora; all femora mottled with distinct dark spots, which are variable in density and size among individuals; more abundant and uniformly distributed ventrally (longitudinally arranged) than dorsally (concentrated on the apical third); dorsal pattern of metafemoral spots as in Figs. 2a, c, e; ventral pattern of metafemoral spots as in Figs. 2b, d, f. Tibiae pale, near always tinged with red basally; tibial spines black,



FIGURE 2. *Psallus (Psallus) anashanti* n. sp., metafemora: (a)-(b) Male specimen; (c)-(d) Female specimen (darker); (e)-(f) Female specimen (paler); (a), (c), (e) Dorsal surface; (b), (d), (f) Ventral surface.

longer than tibial width, arising from well-defined, large dark spots which may fuse to form larger, irregular areas (particularly so on metatibiae). Tarsi mostly pale, third tarsomeres darkened apically. Length of metatarsomeres (approximate proportions): I – II – III = 7 – 10 – 11 (Fig. 3a). Claws as in Fig. 3b, with apex curved and pulvillus small; parempodia setiform.

Abdomen:

Laterally and ventrally, pregenital abdomen dull orange to brownish. Genital segments darker; in females, mostly reddish, brighter.

Male genitalia:

Pygophore elongate-conical, distinctly longer than wide (Figs. 4a-c), with a longitudinal keel ventrally (visible on Fig. 4c) and a protruding (ear-like), longitudinal keel subapically on left side (visible on Figs. 4a-c). Parameres and vesica proportionally big. Right paramere as in Fig. 4d, usually showing a distinctive convexity latero-basally. Left paramere as in Figs. 4e-g, with both apophysis and sensory lobe noticeably elongate; sensory lobe in lateral view without sharp angles and provided with a strong, apically-placed seta. Vesica (Fig. 5) stout, apically convoluted, between S- and J-shaped, and with secondary gonopore in subapical position; basal arc remarkably broad; apical process curved and distally twisted, provided with about 25 and 10 teeth respectively to both sides of terminal sclerotized portion, and preceded by a conspicuous enlargement of the less-sclerotized portion; lateral process spine-like, weakly curved, about 20% shorter than apical process, and converging with it.

Female genitalia:

Genital chamber subrectangular (Fig. 6a), with membranous differentiation of the dorsal wall of type I among Phylini (Pluot-Sigwalt and Matocq, 2017). Dorsal sac conspicuous and bilaterally asymmetrical; anteriorly rather constant in shape and with the lateral strands apparently fastened to the internal line of the sclerotized rings; posteriorly more variable, bilobed but with variously shaped lobes depending on individuals (compare Figs. 6a-b). Sclerotized rings teardrop-shaped, largely pointed apically and noticeably elongate in strictly dorsal view. Vestibulum as in Fig. 6c.

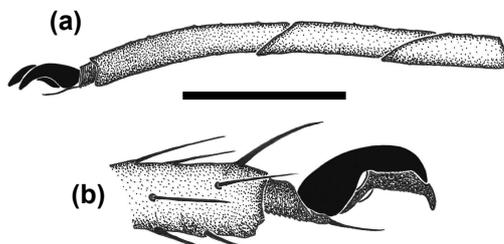


FIGURE 3. *Psallus (Psallus) anashanti* n. sp., metatarsus: (a) Schematic view (setae omitted), showing proportions of tarsomeres; (b) Detail of the claws (Scale bar: (a) = 0.2 mm; (b) = 0.1 mm).

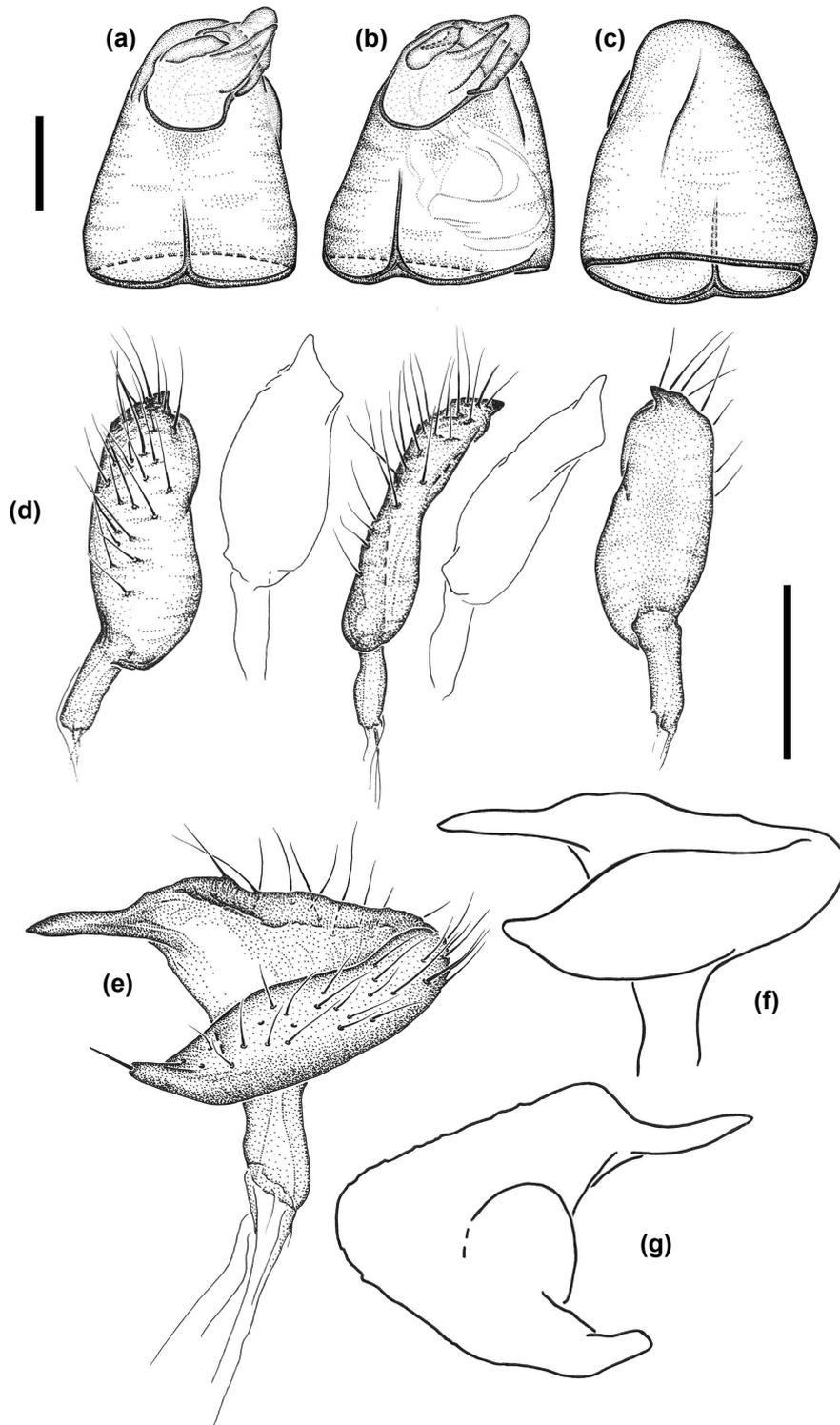


FIGURE 4. *Psallus (Psallus) anashanti* n. sp., pygophore and male genitalia: (a)-(c) Pygophore (setae omitted and only schematic view of some parts); (d) Right paramere in different views and/or specimens; (e)-(g) Left paramere in different views and/or specimens (the schematic views «(f)» and «(g)» are aimed at illustrating the «maximum-angularity-of-sensory-lobe» view and the caudal view, respectively) (Scale bars: (a)-(c) = 0.4 mm; (d)-(g) = 0.2 mm).

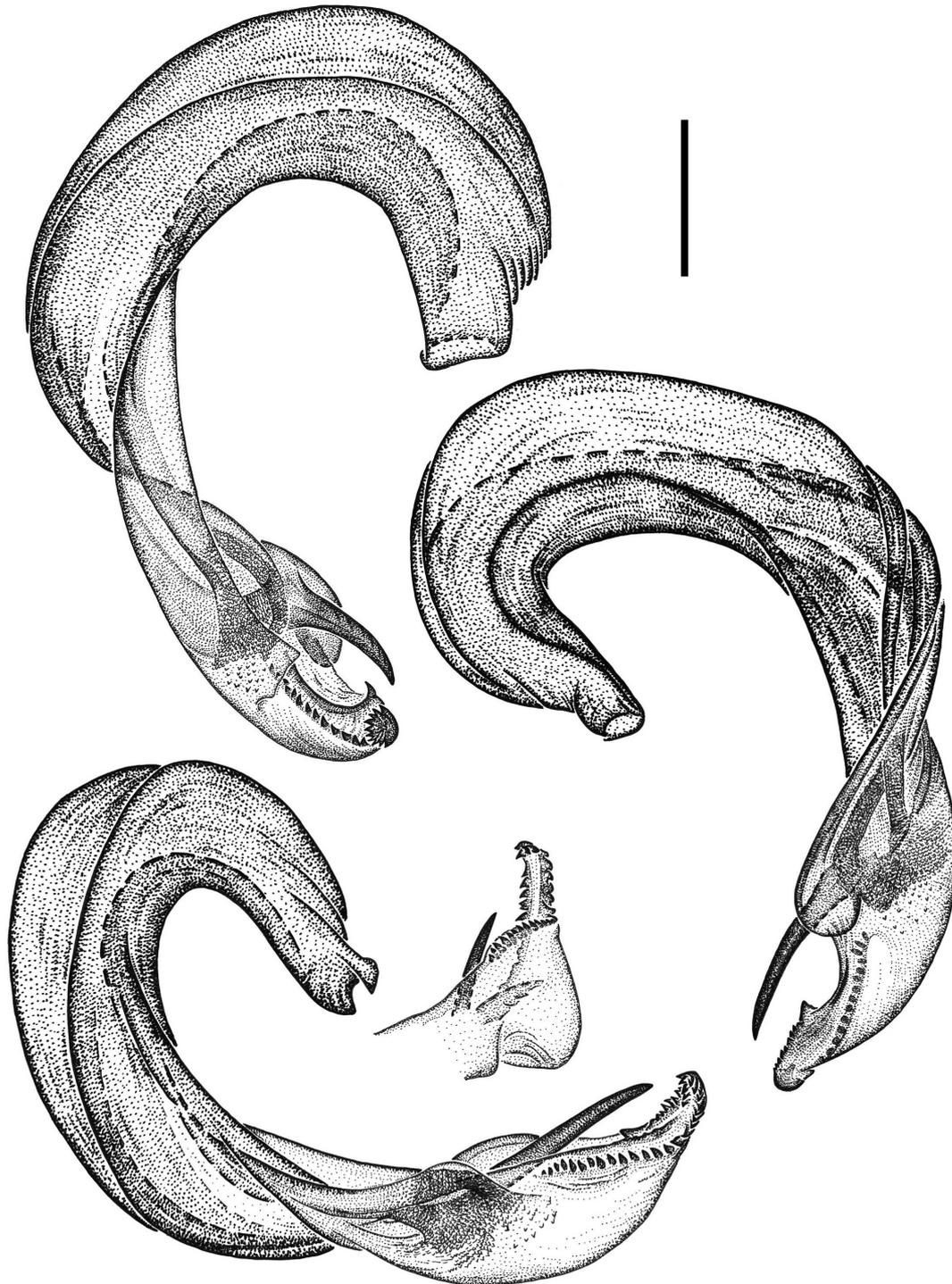


FIGURE 5. *Psallus (Psallus) anashanti* n. sp., male genitalia: Vesica in different views and/or specimens (Scale bar = 0.2 mm).

Type material:

Holotype: ♂, labelled «ARABA: Guardia / El Esperal (Lapuebla de Labarca) / 400 m 30TWN3302 / *Fraxinus angustifolia* / 25-05-2017 / S. Pagola Carte leg.». A red label is now added below: «HOLOTYPE ♂ / *Psallus (Psallus) / anashanti n. sp.* / Pagola-Carte, 2017». The specimen is mounted on a white card. Deposited in the Museum National d'Histoire Naturelle (Paris).

Paratypes: 11 ♂♂ + 26 ♀♀:

1 ♂ + 1 ♀, labelled «ARABA: Guardia / El Esperal (Lapuebla de Labarca) / 400 m 30TWN3302 / *Fraxinus angustifolia* / 16-05-2017 / S. Pagola Carte leg.».

5 ♂♂ + 14 ♀♀, labelled «ARABA: Guardia / El Esperal (Lapuebla de Labarca) / 400 m 30TWN3302 / *Fraxinus angustifolia* / 25-05-2017 / S. Pagola Carte leg.».

2 ♂♂ + 9 ♀♀, labelled «NAFARROA: Miranda-Arga / Vergalijo / 305 m 30TWN9702 / *Fraxinus angustifolia* / 31-05-2004 / S. Pagola Carte leg.».

3 ♂♂ + 2 ♀♀, labelled «NAFARROA: Arakil / Errotz / 420 m 30TWN9550 / *Fraxinus angustifolia* / 6-06-2005 / S. Pagola Carte leg.».

A red label is now added below: «PARATYPE ♀ [or ♂] / *Psallus (Psallus) / anashanti n. sp.* / Pagola-Carte, 2017». The specimens are mounted on a white card, some of them with the genitalic segments, the genitalic structures and/or the posterior right leg glued separately on the same card. Deposited in: Museum National d'Histoire Naturelle (MNHN, Paris) (1 ♂ + 1 ♀), the collections of Hannes Günther (Ingelheim) (1 ♂ + 1 ♀), Armand Matocq (Paris) (1 ♂ + 2 ♀♀) and Christian Rieger (Nürtingen) (1 ♂ + 1 ♀), and the author's collection (rest of paratypes).

Etymology:

With respect, gratitude and love, I dedicate the name of the new species to my parents Shanti Pagola and Ana Carte, who are the best university in which I have ever learned about the wonders of Nature. The specific epithet «*anashanti*» is an unvariable noun in apposition.

Type locality:

El Esperal, near Lapuebla de Labarca (municipality) but belonging to Guardia/Laguardia (municipality), in the province of Araba/Álava, in the Basque Autonomous Community, in the State of Spain.

In non-administrative terms: the gallery forest of the Ebro river in the southernmost part of «Rioja alavesa», in the Mediterranean Basque Country.

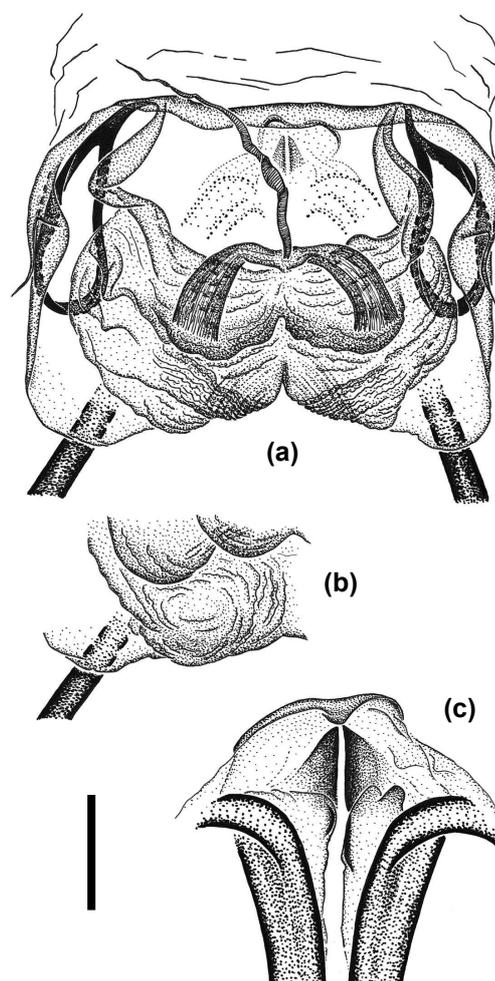


FIGURE 6. *Psallus (Psallus) anashanti n. sp.*, female genitalia: (a) Genital chamber, generalization from several specimens; (b) Detail of an individual genital chamber showing variability in the postero-dorsal regions (lobes) of dorsal sac; (c) Vestibulum (Scale bar = 0.2 mm).

Distribution and biology:

For the moment, only known from the Mediterranean and sub-Mediterranean regions of the peninsular Basque Country, in the provinces of Araba and Nafarroa (the former belonging to the Basque Autonomous Community, the latter to the Foral Community of Navarre). It might be distributed over a larger area according to the distribution of its host plant, *Fraxinus angustifolia* (Oleaceae). Alternatively, it is likely to

represent an Iberian endemic species associated to the glacial refuges provided by river depressions and their gallery forests, as could also be the case of *Orthotylus* (*Orthotylus*) *siuranus* Wagner, 1964 (Miridae: Orthotylinae) on riverbank *Salix* spp.

All the specimens were collected by beating the foliage of *Fraxinus angustifolia*, the narrow-leaved ash, abundantly growing on the banks of the Ebro river (type locality, in Araba) or some of its tributaries (the two localities in Nafarroa). Most of them were collected on the green samara at the end of May or beginning of June. In addition, a number of *Psallus* nymphs of every stage (and presumably belonging to the same species) were found by mid-May at any part of the foliage of *Fraxinus angustifolia* and never on the canopy of neighbouring trees of other species (*Salix* spp., *Populus nigra*, etc.). Simultaneously to that great amount of nymphs, a couple of non-teneral adults have been collected on May 16th, 2017, a year with early warm periods followed by frost which could have promoted a staggered development of two overlapping cohorts.

Interestingly, a noticeable ecological difference between the samplings of 2004-2005 and those of 2017 has been observed in the miridological composition of these gallery forests: *Deraeocoris* (*Deraeocoris*) *flavilinea* (A. Costa, 1862) is now present as a dense population or even «outburst» of nymphs and adults on every vegetation level: from the tree canopy to the bushes and grasses of the understorey (see its «arrival» to the Basque Country in: Pagola-Carte, 2012). A significant predation pressure on the canopy insects can be suspected⁽¹⁾.

Discussion

According to the morphology of the vesica, *Psallus* (*Psallus*) *anashanti* n. sp. must be included in the speciose group of *P. (P.) haematodes* (Gmelin, 1790), which contains many species with high host-specificity on trees other than *Quercus* (Fagaceae). They are most usually associated with one or another genus/species of the families Betulaceae, Oleaceae or Salicaceae.

⁽¹⁾ A meaningful anecdote: at the very same moment of writing this paragraph an individual of *D. (D.) flavilinea* came into my office through the window. Probably 2017 is a «great year» in the expansion of this species throughout northern Iberian Peninsula.

Occurring on the Iberian Peninsula, *P. (P.) falleni* Reuter, 1883 lives on *Betula* spp., *P. (P.) haematodes* (Gmelin, 1790) on *Salix* spp., *P. (P.) salicis* (Kirschbaum, 1856) on *Alnus* spp. and *P. (P.) vicinus* Reuter, 1899 on *Populus* spp. and they all show clear differences to the new species concerning external morphology and male genitalia (see, for example: Woodroffe, 1957; Wagner, 1975; Kerzhner, 1988; Yasunaga and Vinokurov, 2000; Wyniger, 2004; Wachmann *et al.*, 2012; Matocq, 2013; Skipper, 2013). Belonging to the same group but not to the Iberian fauna, *P. (P.) aetnicola* Wagner, 1955, from Italy, probably lives on *Betula* spp. (see: Tamanini, 1981), and both *P. (P.) nigricornis* Yasunaga & Vinokurov, 2000 and *P. (P.) oyashimanus* Yasunaga & Vinokurov, 2000 have recently been described from Japan and assumed to develop on *Alnus* spp. and *Betula emernii*, respectively. They also may be separated without difficulties⁽²⁾.

Trees of the genus *Fraxinus* (Oleaceae) host a further number of species within this group. Moreover, those species can be considered a «subgroup» of it or be treated as a «group» by itself, as for example did Matocq and Pluot-Sigwalt (2011). These authors not only described *P. (P.) inancozgeni* Matocq and Pluot-Sigwalt, 2011 in detail, but they also provided an essential introduction and a thorough discussion which constitute the best framework for the study of the *Fraxinus*-associated *Psallus*, with four taxa included: besides *P. (P.) inancozgeni*, from Turkey, *P. (P.) lepidus* Fieber, 1858 and *P. (P.) flavellus* Stichel, 1933 are widely distributed and usual on *Fraxinus excelsior*, and *P. (P.) orni* Wagner, 1968 is only known from Algeria, on *Fraxinus ornus* (about distributions: Kerzhner and Josifov, 1999; Aukema *et al.*, 2013). *P. (P.) anashanti* n. sp., living on *Fraxinus angustifolia* and sharing similar habitus and genitalic structures, is the fifth species of the subgroup. Accordingly, in the following discussion I focus on showing the distinguishing characters of the new species within this subgroup.

P. (P.) inancozgeni is a unique species due to the lack of a lateral process or spicule on the vesica. In addition, it is a somewhat smaller species with parameres (males) and genital chamber (females) different from those of *P. (P.) anashanti* n. sp. (see: Matocq and Pluot-Sigwalt, 2011).

⁽²⁾ Other recently described species of *Psallus* (*Psallus*) apparently do not belong in the group of *P. (P.) haematodes*: *P. (P.) bastatus* Carapezza, 2002, from Jordan; *P. (P.) benanensis* Li & Liu, 2007, from China; *P. (P.) sbulsangaricus* Linnavuori, 2010, from Iran; *P. (P.) cheonglaensis* Duwal, Yasunaga, Jung & Lee, 2012, from the Korean Peninsula.

P. (P.) orni has been reexamined by Matocq and Pluot-Sigwalt (2011), giving as a result the first illustration of its female genitalia and a necessary progress from previous, incorrect drawings of the male genitalia by Wagner (1968, 1975). Comparing to *P. (P.) anashanti* **n. sp.**, in the Maghrebian species the vesica is more slender and J-shaped, the left paramere has a shorter sensory lobe and the genital chamber is more transverse and with sclerotized rings more rounded.

Both *P. (P.) lepidus* and *P. (P.) flavellus* have been recorded from the peninsular Basque Country (Pagola-Carte *et al.*, 2005, 2006^③; and unpublished data), allowing the study of an abundant material from the author's collection. They are likely to be the most closely related species to *P. (P.) anashanti* **n. sp.**, which shares similarities with the former or the latter depending on the character concerned. The distinguishing combination of characters can be summarized as follows.

As typically in many Phylini, the vesica of the males is a clear-cut character. In *P. (P.) anashanti* **n. sp.** it is markedly stouter (Fig. 5) than in *P. (P.) lepidus* and *P. (P.) flavellus* (see drawings by: Woodroffe, 1957; Wagner, 1975; Kelton, 1983; Kerzhner, 1988; Wyniger, 2004). Both the basal arc and the apical process are more similar to those of *P. (P.) lepidus*. However, in the new species the basal arc is even broader and the basal membranous part of the apex is conspicuously more swollen. Moreover, in contrast to *P. (P.) lepidus*, the apical process tapers gradually and does not form a densely denticulate, club-like structure. Most denticles are arranged in a long row, similarly to *P. (P.) flavellus*, with an additional, shorter row on the opposite margin of the same process.

The pygophore (Figs. 4a-c) is as elongate as in *P. (P.) lepidus* (ratio length/width of pygophore is clearly smaller in *P. (P.) flavellus*) and, despite its great size, it seems to be too tight to accommodate the vesica and the left paramere, which is quite protruding. It must be stressed that, even though *P. (P.) anashanti* **n. sp.** is a smaller species than *P. (P.) lepidus* (and larger than *P. (P.) flavellus*), all the genitalic structures

studied in the males are noticeably bigger (Figs. 4d-g and 7-8 drawn and reproduced to the same scale!).

The right paramere of the new species, although somewhat variable among specimens, shows a greater complexity in its inner lateral margin (compare Fig. 4d to Figs. 7a, 8a), with a rather constant basal convexity. On the other hand, the left paramere is much more useful to separate these three species. Apart from its greater size, it is differently shaped and quite elongate in the new species (Figs. 4e-g) (obvious even at low magnification without extraction from the pygophore) with respect to that of *P. (P.) lepidus* (Fig. 7b-d) and *P. (P.) flavellus* (Fig. 8b-d). These two species can also be distinguished from each other according to the left paramere, particularly when comparable views are used for the examination of their sensory lobe.

Concerning the female genitalia, *P. (P.) anashanti* **n. sp.** shares the main characters of the other species of *Psallus* associated with *Fraxinus* (see for species comparison: Wyniger, 2004; Matocq and Pluot-Sigwalt, 2011; see also the simultaneous work by Pluot-Sigwalt and Matocq (in press), particularly the recognition of related species within *Psallus* *s. str.* on the basis of different elements of the dorsal wall). The new species is more similar to *P. (P.) flavellus* in the general shape of the genital chamber (subrectangular), including its dorsal sac (posteriorly bilobed), but it is closer to *P. (P.) lepidus* or even to *P. (P.) inancozgeni* according to the sclerotized rings. Nevertheless, they are distinctly larger, more teardrop-shaped and elongated anteriorly in the new species (Fig. 6a). The interindividual variability observed in the posterior lobes of dorsal sac (Figs. 6a-b) might be in accordance with Pluot-Sigwalt and Matocq's (2017, in press) hypothesis that the dorsal sac is a vaginal differentiation housing some part of the phallus during mating; in my opinion, different conformations could be the result of different copulatory histories.

Some characters of external morphology are also useful. First of all, body size and proportions (see Table 1). The average length of the three taxa is *P. (P.) lepidus* > *P. (P.) anashanti* **n. sp.** > *P. (P.) flavellus*. More interestingly, the new species is clearly distinguished by being stouter, as reflected by the ratio length/width of the insect, particularly when measured as pronotum width (a more objective measure in practice due to the tendency of hemelytra to get slightly separated in dry specimens). The males of *P. (P.) anashanti* **n. sp.** approximately have the form of the females of both other species, and the females show an even more compact or ovate shape.

^③ The specimens identified by Pagola-Carte *et al.* (2006) as *P. (P.) falleni* are in fact *P. (P.) flavellus*. The misidentification was indeed caused by the «domino effect» derived from another misidentification: the first specimens of *P. (P.) anashanti* **n. sp.** collected in 2004 and 2005 were erroneously ascribed by me to *P. (P.) flavellus* (unpublished data)... so that real *flavellus* seemed to me to be *falleni*, with a rather similar vesica.

The eyes are somewhat smaller in proportion to head in *P. (P.) anashanti* n. sp., as demonstrated by the greater ocular index of both males and females (see Table 1). Finally, concerning antennae, it is more similar to *P. (P.) flavellus* than to *P. (P.) lepidus*. Specifically, antennal segment II is thicker and shorter

with respect to pronotum width, being the ratio always < 0.90 (in some specimens < 0.80); in contrast to *P. (P.) lepidus*: ratio almost always > 0.90 (in some specimens > 1.00).

The general colour is rather variable in the new species, both in males and females. A marked tendency

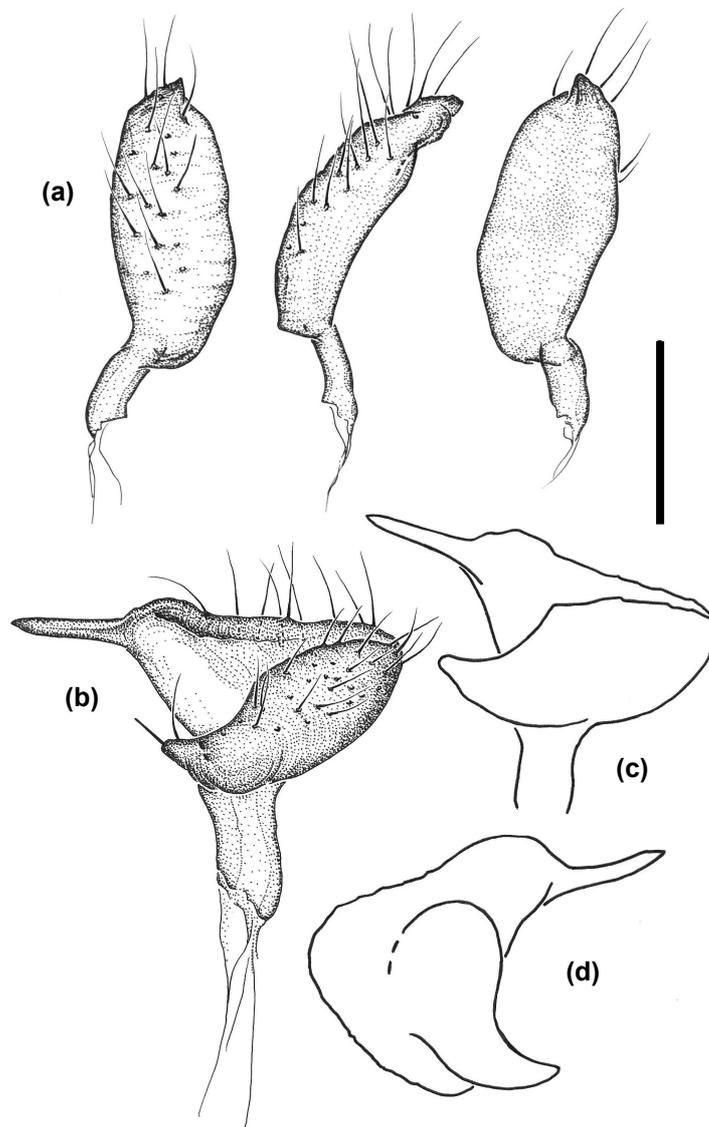


FIGURE 7. *Psallus (Psallus) lepidus* Fieber, 1858, male genitalia: (a) Right paramere in different views and/or specimens; (b)-(d) Left paramere in different views and/or specimens (the schematic views «(c)» and «(d)» are aimed at illustrating the «maximum-angularity-of-sensory-lobe» view and the caudal view, respectively) (Scale bar = 0.2 mm).

	<i>P. (P.) anashanti</i> n. sp.		<i>P. (P.) lepidus</i>		<i>P. (P.) flavellus</i>	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
Length (mm)	3.99 (3.75–4.13)	3.91 (3.80–4.00)	4.19 (3.75–4.35)	4.11 (3.75–4.35)	3.90 (3.68–4.03)	3.78 (3.65–3.88)
Length / Max. width	2.40 (2.34–2.45)	2.22 (2.12–2.29)	2.55 (2.49–2.60)	2.30 (2.25–2.34)	2.54 (2.45–2.68)	2.32 (2.25–2.42)
Length / Pron. width	2.89 (2.74–3.00)	2.73 (2.67–2.77)	3.14 (3.06–3.28)	2.99 (2.95–3.05)	3.10 (3.01–3.19)	2.89 (2.81–3.04)
Ocular index	1.84 (1.77–1.94)	2.20 (2.12–2.32)	1.53 (1.40–1.76)	1.93 (1.88–2.12)	1.62 (1.44–1.76)	1.96 (1.88–2.13)
Ant. II / Pron. width	0.82 (0.74–0.85)	0.80 (0.74–0.86)	0.95 (0.90–1.02)	0.93 (0.88–0.96)	0.84 (0.78–0.89)	0.81 (0.76–0.84)
Ant. II / Ant. III+IV	1.13 (1.08–1.22)	1.19 (1.15–1.26)	1.19 (1.13–1.23)	1.16 (1.10–1.20)	1.10 (1.02–1.19)	1.08 (1.02–1.10)

TABLE 1. Summary of selected morphometric characters for the separation of *Psallus (Psallus) anashanti* n. sp. from *P. (P.) lepidus* Fieber, 1858 and *P. (P.) flavellus* Stichel, 1933. After the average value ($n = 10$; $n = 6$; $n = 6$), the whole range is given in parentheses.

towards orange and orangish hues has to be noted in some individuals or populations (see Fig. 1c), being more similar to *P. (P.) flavellus* than to *P. (P.) lepidus*. Other individuals or populations (particularly those collected in Araba in 2017) are much darker (see Figs. 1a-b) and hence more similar to the typically red-burgundy-brown *P. (P.) lepidus*.

The ventral pattern of metafemoral spots has been used as a distinguishing character in the genus *Psallus* (see, for example: Wyniger, 2004) and it seems specifically useful in the separation between *P. (P.) lepidus* and *P. (P.) flavellus* (see also: Skipper, 2013). In spite of the variability observed in *P. (P.) anashanti* n. sp. (see Figs. 2b, d, f), a greater similarity to the former species can be seen. However, some differences concerning abundance and density of both large and small spots are also noticeable, allowing the separation of the new species.

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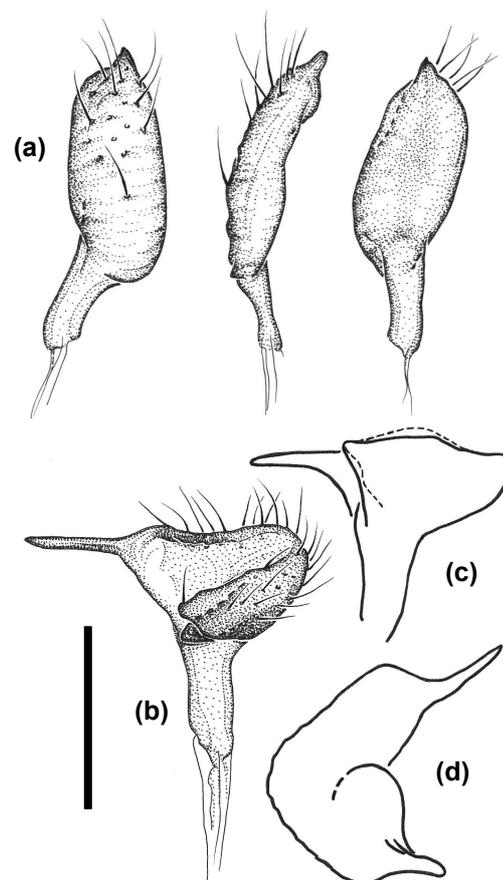


FIGURE 8. *Psallus (Psallus) flavellus* Stichel, 1933, male genitalia: (a) Right paramere in different views and/or specimens; (b)-(d) Left paramere in different views and/or specimens (the schematic views «(c)» and «(d)» are aimed at illustrating the «maximum-angularity-of-sensory-lobe» view and the caudal view, respectively) (Scale bar = 0.2 mm).

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