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A NEW SPECIES OF THE GENUS *PLECTOPTERA* SAUSSURE AND REDESCRIPTION OF *EUSHELFORDIA PICA* WALKER (DICTYOPTERA: BLATTELLIDAE) FROM PERU

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ABSTRACT

A new species of the genus *Plectoptera*, *P. vladimiri* sp. nov. is described from Peru. The male of the type species of the genus *Eushelfordia, E. pica*, is redescribed and the male genitalia are examined for the first time. The taxonomic position of the genus *Eushelfordia* is discussed.

Key words: Blattellidae, Blattodea, cockroaches, Dictyoptera, *Eushelfordia*, Peru, *Plectoptera*, South America

НОВЫЙ ВИД РОДА *PLECTOPTERA* SAUSSURE И ПЕРЕОПИСАНИЕ *EUSHELFORDIA PICA* WALKER (DICTYOPTERA: BLATTELLIDAE) ИЗ ПЕРУ

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РЕЗЮМЕ

Новый вид рода *Plectoptera, P. vladimiri* sp. nov., описан из Перу. Переописан самец типового вида рода *Eushelfordia*, *E. pica* и впервые изучены гениталии самца этого вида и уточнено систематическое положение рода *Eushelfordia*.

Ключевые слова: Blattellidae, Blattodea, тараканы, Dictyoptera, *Eushelfordia*, Перу, *Plectoptera*, Южная Америка

INTRODUCTION

The Peruvian fauna of Blattellidae is poorly known. Many new records were made during recent field trip to Peru (2008). In the present paper I report about records belonging to the genera *Plectoptera* Saussure, 1864 and *Eushelfordia* Hebard, 1924.

The present paper is the first result of an examination of the cockroaches collected during 2008 in Peru.

These genera are characterized by different types of the male genitalia: normal oriented in the case of *Eushelfordia* and side reversed in the case of *Plectoptera*.

The genus *Plectoptera* includes small cockroaches of peculiar beetle-like appearance: tegmina are strongly sclerotized, slightly longer then the abdomen; wings are about twice length of tegmina and folded. It numbers 24 species (including the new species described below), which are distributed in

the New World (Princis 1965, 1971; Roth 2003). The genus *Plectoptera* is the type genus for the subfamily Plectopterinae Saussure et Zehntner, 1893. Unfortunately, the male genitalia of *Plectoptera* spp. are insufficiently known to clarify the phylogeny of the genus.

The genus *Eushelfordia* was described as a monotypical with a species *E. pica* (Walker, 1868) from Brazil (Princis 1967). Later, one additional species, *E. amazonensis* (Rocha e Silva-Albuquerque, 1957), was transferred from the genus *Paratropes* Serville, 1839. The male genitalia of *E. pica*, however, were undescribed.

MATERIAL AND METHODS

All material studied was collected and preserved in 70% ethanol. In order to study the structures of the male genital complex (anal plate, hypandrium and the male genitalia) the apex of the abdomen of specimens was removed and treated with *ca.* 10% KOH. The structures of the genital complex were stored in microvials with 70% ethanol.

The terminology of the male genitalia follows Klass (1997). The terminology used by Grandcolas (1996) is given in square brackets.

All material studied (including type material) is deposited at the Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia).

SYSTEMATICS

Family Blattellidae Karny, 1908

Genus *Plectoptera* Saussure, 1864

Plectoptera vladimiri sp. nov.

(Figs. 1A–F, 2A–F, 3A–C)

Etymology. This species is named in honour of Dr. Vladimir Izersky, entomologist and investigator of Peruvian entomofauna.

Type material. Holotype – male. PERU: Departament Junin, Satipo Prov., ~25 km SE of Satipo town, near Rio Venado village, ~1200 m, forest, 20-23 October 2008, at light, coll. L. Anisyutkin.

Description. Male (holotype). Comparatively small, beetle-like cockroach. General colour yellowish-brown (Fig. 3A, B); eyes, distal segments of maxillary and labial palps and tibiae at outer margin blackish; head brown, with indistinct light transverse band over antennal sockets (Fig. 1B); antennae brown, darker toward apices; pronotum brown in central part, nearly translucent along the edges (Figs. 1A, 3A, B); tegmina brown, each tegmen with large dark brown spot along caudal margin and two weak and indistinct light spots, larger one in central part of tegmina, smaller one at humeral angle (Figs. 1C, 3A); other parts of body and legs yellowish. Surfaces smooth and polished; puncturation visible only in costal field of tegmina. Head transverse (Fig. 1B); with distance between eyes about equal to length of eye (dorsoventral extension in Fig. 1B); distance between eyes slightly less than that between antennal sockets; distance between antennal sockets about 2.5 length of scapus; length ratio of 3rd, 4th and 5th (last) segments of maxillary palps approximately 1 : 0.6 : 0.9. Pronotum transverse (Fig. 1A), nearly straight along anterior margin, rounded along lateral and posterior margins. Scutellum distinct, triangular (Fig. 1A). Antero-ventral margin of front femur with single apical spine. Hind metatarsus (basal segment) slightly longer than following segments combined; segments 1–3 with about four (partially irregular) rows of spines along ventral margin; pulvilli of segments 1–3 indiscernible, that of 4th segment present. Tarsal claws asymmetrical (anterior smaller) and serrate; arolia comparatively large, more than half of claw length. Tegmina strongly sclerotized, more or less lanceolate in shape (Figs. 1C, 3A, B), with venation subobsolete; Sc strong, extend to middle of tegmen length; R more weak, sinuate, reaching apex of tegmen, with anterior rami partly branched; M+CuA weakly visible, with some rami; CuP reduced. Wings with distal part shaped as a large appendiculate field (Fig. 3A, C, a.f.). Abdomen with only 7th tergite specialized (Fig. 1D): medially membranous, with brush of setae; laterally with pair of oval spots. Anal plate (X, ultimate tergite) subtriangular in shape, with caudal margin distinctly emarginated (Fig. 1D). Paraprocts asymmetrical, without armament (Fig. 1F). Cerci comparatively short and broad (Fig. 1D). Hypandrium asymmetrical (Figs. 1E, 2A–C), with prominent latero-caudal angles; styles strongly asymmetrical, apically pointed; right one larger than left one; interstylar protrusion with 2 apical teeth.

Male genitalia side-reversed (Fig. 2A, D–F). Sclerite L2 [L1 – here and below in parentheses terms of Grandcolas (1996) are given] not separated in apical (external) and basal (internal) parts (Fig. 2A, D), rod-like, slightly curved at apex, with thin elongated accessory sclerite at apex (Fig. 2D, a.s.), apex densely

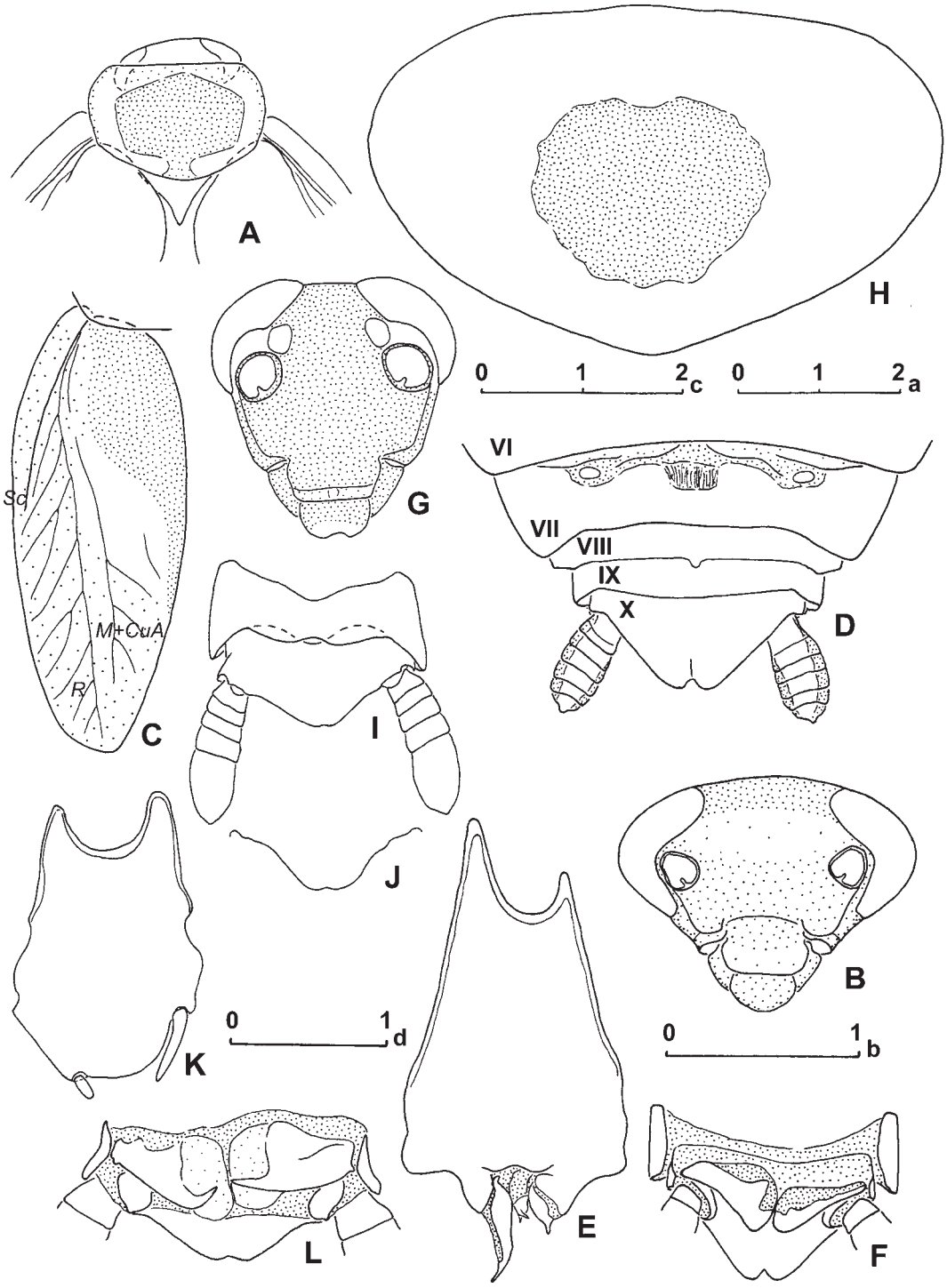

Fig. 1. External morphology: *Plectoptera vladimiri* sp. nov. (A–F) and *Eushelfordia pica* Walker (G–L). Anterior part of body from above (A); head in frontal view (B, G); left tegmen from above (C); abdominal apex from above (D, I); hypandrium from below (E, K); abdominal apex from below, hypandrium and genitalia removed (F, L); anal plate (X, ultimate tergite) outline from posterodorsal (J). Dotted area shows dark colour (A–C, G, H) or membranous parts (D–F, L). VI, VII, VIII, IX, X – numbers of abdominal tergites; M+CuA, R, Sc – veins. Scale bar (mm): **a** = A, C, H; **b** = B, D, E, F; **c** = G–K; **d** = L.

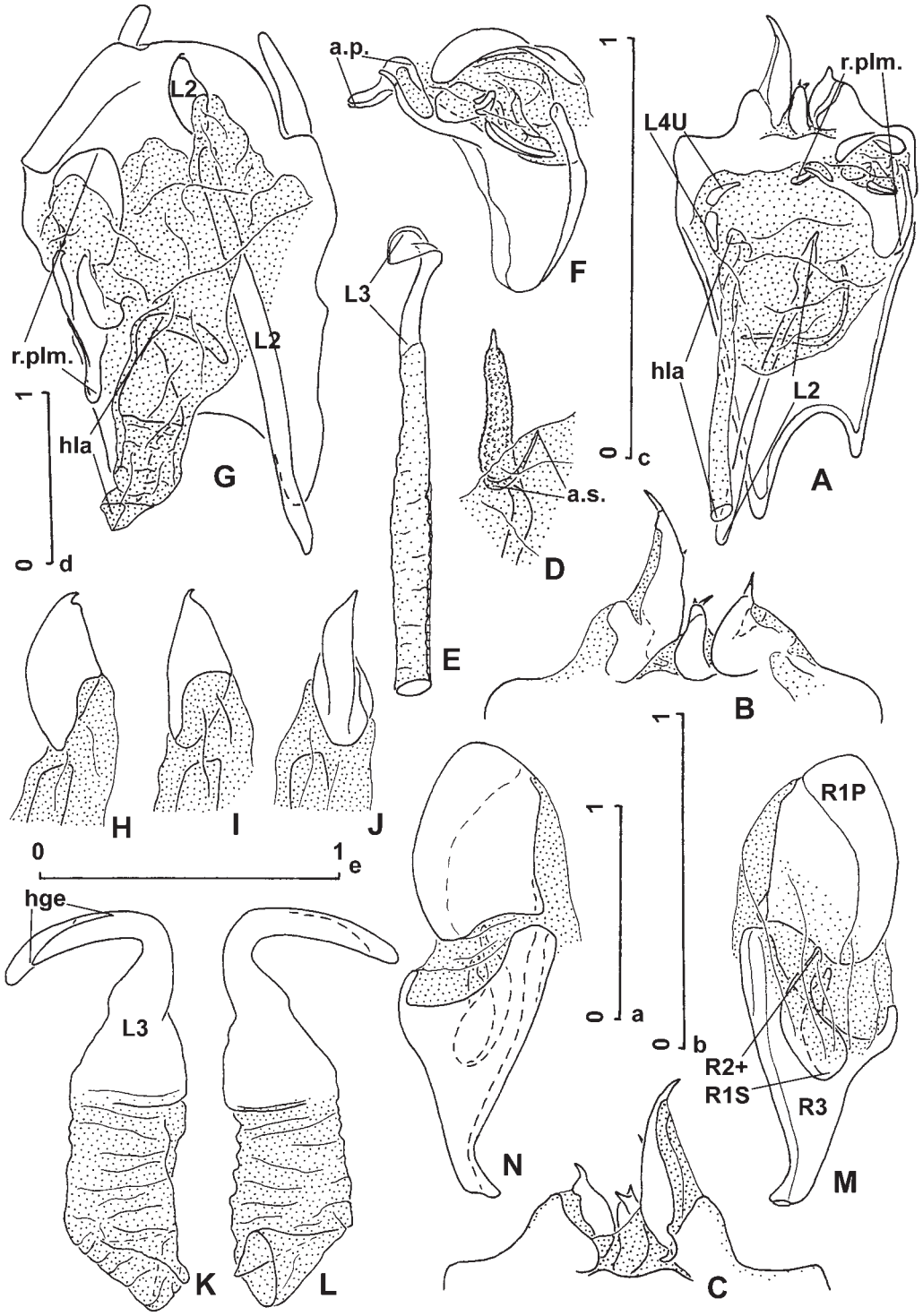

Fig. 2. Structures of male genitalia and hypandrium: *Plectoptera vladimiri* sp. nov. (A–F) and *Eushelfordia pica* Walker (G–N). Hypandrium and genitalia from above (A, G); caudal margin of hypandrium from above (B) and from below (C); apex of sclerite L2 (D, H–J); hook **hla** with membranous base and distal sclerite L3 (E, K, L); right phallomere from above (F, M) and below (N). Dotted area shows membranous parts. a.p., a.s., hge, hla, L2, L3, r.plm., R3, R1P, R2+R1S – structures of the male genitalia, see text. Scale bar (mm): **a** = A; **b** = B, C, E; **c** = D, F; **d** = G; **e** = H–N.

covered with small denticles (Fig. 2D). Sclerite L3 [L2d] long and slender, with hook **hla** comparatively high, without groove **hge** (subapical incision *sensu* Roth (1970)), apex of hook **hla** simple (Fig. 2A, E). Two small sclerites in the far right wall of the phallomere probably remnants of L4U [L3d] (Fig. 2A). Right phallomere [complex of sclerites R and N] as in Fig. 2A, F, with anterior protrusion (Fig. 2F, a.p.).

Female unknown.

Measurements (mm). Length: head 1.2; pronotum 2.7; tegmen 5.5; apical field of wing 4.1. Width: head 1.5; pronotum 4.3.

Comparison. The new species is assigned to the genus *Plectoptera* based on peculiar structure of tegmina, wings and hypandrium. *P. vladimiri* sp. nov. readily differs from *P. huascaray* Caudell, 1913, only known representative of the genus from Peru, by the lighter colour and distinctly emarginated anal plate. *P. vladimiri* sp. nov. differs from all other representatives of the genus by the peculiar structure of hypandrium and styles.

Remarks. It should be noted, that the shape and venation of tegmen of this new species are significantly different from those illustrated by Rehn (1951: pl. VI, fig. 72) for *P. porcellana* (Saussure, 1862).

A peculiar feature of the new species is the presence of a distinct antrerior protrusion of sclerite N of the right phallomere (Fig. 2F, a.p.). Such structure was earlier described for representatives of the genus *Macrophyllodromia* Saussure et Zehntner, 1893 (Anisyutkin 2007).

Subfamily Nyctiborinae Brunner von Wattenwyl, 1893

Genus *Eushelfordia* Hebard, 1925

Eushelfordia pica (Walker, 1868)

(Figs. 1G–L, 2G–N, 3D)

Material examined. 1 male. PERU: Departament Ucayali, Atalaya Prov., ~35 km NWW of Atalaya town on Ucayali river, near Sapani village, ~300 m, forest, 26-31 October 2008, leg. D.Q. Rivera.

The following description is based on the abovementioned specimen and literature data (Hebard 1925; Shelford 1908; Walker 1868).

Description. Male. Brightly and contrastingly coloured species (Fig. 3D); pronotum yellowish, with large medial black macula (Fig. 1H); tegmina black, with pairs of yellowish (anterolateral part) and whitish (anteroposterior ribbon at midlength) maculae; body from below, head, antennae and legs blackish. Surfaces more or less polished, densely covered with small setae; facial part of head slightly uneven, tegmina, especially in proximal part, not strongly punctured. Head slightly elongate (Fig. 1G); with distance between eyes about twice shorter than length of eye (dorsoventral extension in Fig. 1G); distance between eyes about twice shorter than that between antennal sockets; interval between antennal sockets about 1.6 length of scapus; length ratio of 3rd, 4th and 5th (last) segments of maxillary palps approximately 1 : 0.5 : 1. Antennae incrassated and plumose in middle part (Fig. 3D). Pronotum transverse (Fig. 1H), suboval, with posterior margin protruded. Antero-ventral margin of front femur with two apical spines. All tarsal segments densely covered with long hairs. Hind metatarsus (basal segment) shorter than other tarsal segments combined; 1–3 segments without rows of spines along ventral margin; pulvilli of 1–4 segments large. Tarsal claws simple and asymmetrical (anterior smaller); arolia comparatively large, more than one half of claw length. Tegmina semicoriaceous with dense venation (Fig. 3D). Abdomen without visible glandular specializations. Anal plate (X, ultimate tergite) transverse, with caudal margin widely protruded and medially weakly emarginated (Fig. 1I, J). Paraprocts asymmetrical, with pair of spines (Fig. 1L). Cerci comparatively short and robust, with apical segments largest (Fig. 1I). Hypandrium asymmetrical, with caudal margin widely rounded; styles strongly asymmetrical, right one much shorter (Fig. 1K).

Male genitalia of normal orientation (Fig. 2G–M). Sclerite L2 [L1] separated in short apical and long basal part (Fig. 2G–J): apical part incrassated, with short curved spine at apex; basal part simple, rod-like. Sclerite L3 [L2d] comparatively short and robust (Fig. 2G, K, L), with groove **hge (**subapical incision *sensu* Roth 1970) along anterior surface of hook **hla.** Sclerite L4U [L3d] absent. Right phallomere [complex of sclerites R and N] as in Fig. 2M, N, with elongate sclerite R1P [R2], comparatively wide sclerite R3 [R3v] and compact sclerites R2 and R1S.

Measurements (mm). Length: head 2.5; pronotum 4.2; tegmen 22. Width: head 2.4; pronotum 6.9.

Remarks. The studied specimen conforms in general to previous descriptions (Hebard 1925; Shelford 1908; Walker 1868) except for the following: the colouration of above described specimen slightly differs from *E. pica* illustrated in paper by Shelford (1908) (compare Fig. 3D and Fig. 10).

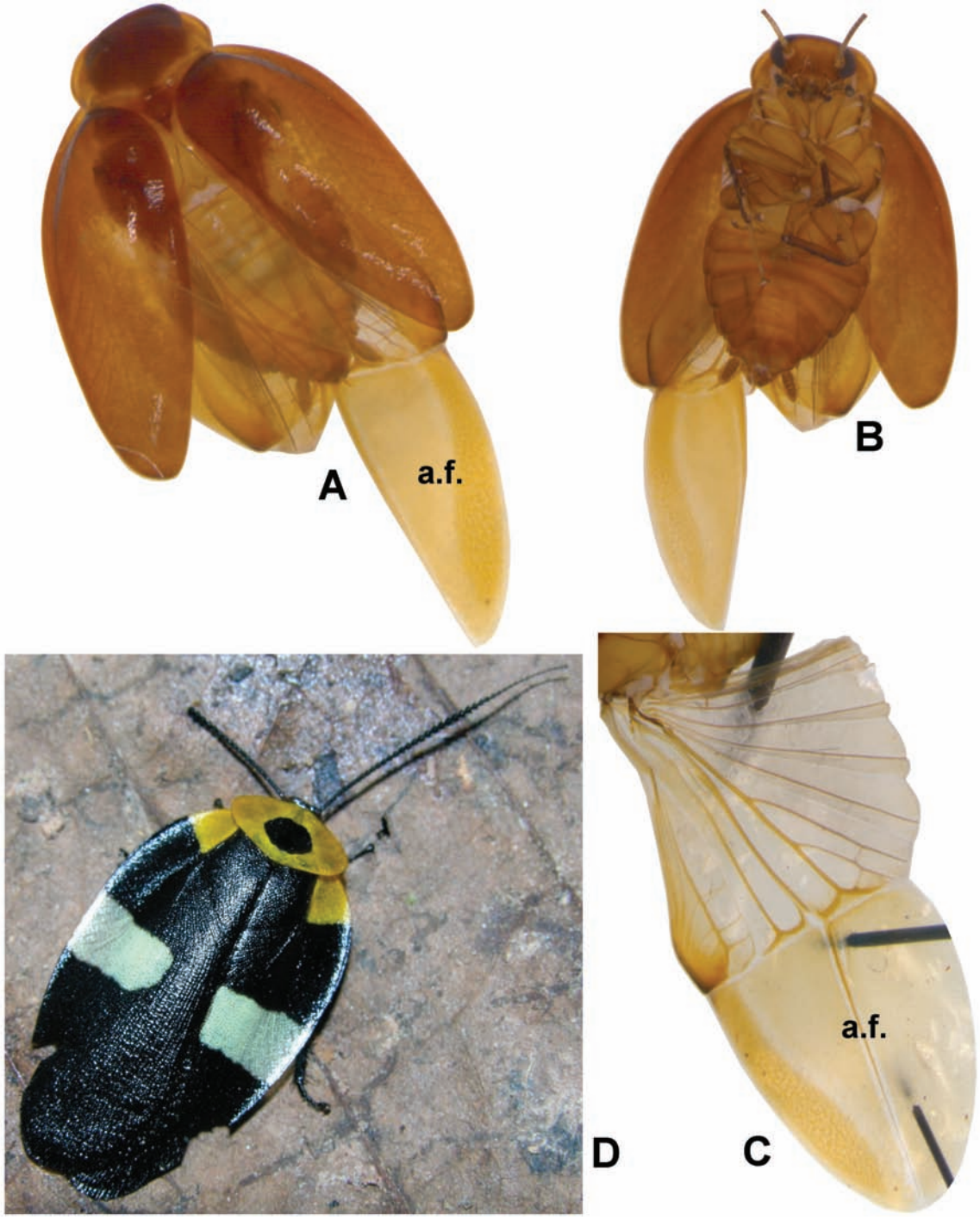

Fig. 3. *Plectoptera vladimiri* sp. nov. (A–C) and *Eushelfordia pica* Walker (D). General view from above (A, D), below (B) and wing from above (C). In Figs. A, B antennae not shown completely. Photograph D – courtesy of M. Berezin.

The genus *Eushelfordia* was described by Hebard (1925) for *Paratropes pica* Walker, 1868 and was then monotypical. This species was described from environs of city Ega (modern Tefé, state Amazonas, Brazil). Later, the second species, *Paratropes amazonensis* Rocha e Silva-Albuquerque, 1957 was transferred into *Eushelfordia* by Lopes and Oliveira (2007). The male genitalia structures of *E. pica* are typical for the subfamily Nyctiborinae (Roth 1973; Grandcolas 1993, 1996; Deans and Roth 2003) and there are no doubts that the genus *Eushelfordia* should be placed in this subfamily. The male genitalia of *E. amazonensis* are not examined yet.

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