

Research Article

A new species of *Zelurus* Hahn, 1826 (Hemiptera: Heteroptera: Reduviidae: Reduviinae), with taxonomical notes on three other related species of the genus

Una nueva especie de *Zelurus* Hahn, 1826 (Hemiptera: Heteroptera: Reduviidae: Reduviinae), con notas taxonómicas sobre otras tres especies del género relacionadas

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Abstract. *Zelurus galvaoui* **sp. nov.** (Hemiptera: Heteroptera: Reduviidae: Reduviinae) is described from Peru, based on a male and a female specimens. Photographs of type specimens and short notes on the characteristics of *Zelurus montivagus* Lent & Wygodzinsky, 1955, *Zelurus abalosi* Lent & Wygodzinsky, 1951 and *Zelurus singularis* Lent & Wygodzinsky, 1947, related to the new species, are presented. *Zelurus abalosi* is recorded from Bolivia for the first time.

Keywords: Bolivia; group *fulvomaculatus*; *Spiniger*.

Resumen. Basado en un macho y una hembra se describe a *Zelurus galvaoui* **sp. nov.** (Hemiptera: Heteroptera: Reduviidae: Reduviinae) de Perú. Se presentan fotografías de especímenes tipo y notas breves sobre las características de *Zelurus montivagus* Lent y Wygodzinsky, 1955, *Zelurus abalosi* Lent y Wygodzinsky, 1951 y *Zelurus singularis* Lent y Wygodzinsky, 1947, relacionadas con la nueva especie. Se reporta por primera vez la presencia de *Zelurus abalosi* en Bolivia.

Palabras clave: Bolivia; grupo *fulvomaculatus*; *Spiniger*.

Introduction

Reduviinae (Hemiptera: Heteroptera) currently includes 14 Neotropical genera, among which *Zelurus* Hahn, 1826 is the largest genus, with approximately 130 species and some subspecies (Gil-Santana *et al.* 2015; Ferreira *et al.* 2016), almost all distributed in the Neotropics (Maldonado 1990). The revision of *Zelurus* by Costa Lima (1940) (as *Spiniger* Burmeister, 1835) is outdated because of numerous subsequent taxonomic changes, including the description of many new species in 19 subsequent papers. The latter were exhaustively listed by Ferreira *et al.* (2016), who also described two more species (Oliveira *et al.* 2021).

The taxonomy of *Zelurus* species has been based on morphological external characters of coloration and structure, mostly based on the criteria previously stated by Stål (1859, 1869, 1872), followed by further authors (*e.g.*, Walker 1873; Costa Lima 1940; Lent and Wygodzinsky 1945, 1947, 1951, 1954, 1955, 1957, 1968). While Stål (1859, 1872) separated the species of *Zelurus*

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in “divisions”, some set of species were considered as forming groups in the genus, such as “group *femoralis*” (Costa Lima and Costa Leite 1950; Lent and Wygodzinsky 1954), “group *fulvomaculatus*” (Lent and Wygodzinsky 1951) and “group *formosus*” (Lent and Wygodzinsky 1968). Among them, some species with morphological similarities in relation to the new species described here, *Zelurus abalosi* Lent & Wygodzinsky, 1951 and *Z. montivagus* Lent & Wygodzinsky, 1955 were included in the “group *fulvomaculatus*” (Lent and Wygodzinsky 1951, 1955).

Zelurus galvaoi sp. nov. is described from Peru, based on a male and a female specimens. Photographs of type specimens and short notes on the characteristics of *Zelurus montivagus*, *Z. abalosi* and *Z. singularis* Lent & Wygodzinsky, 1947, species related to the new species, are presented.

Material and Methods

All specimens examined here are deposited in the “Coleção de Triatomíneos do Instituto Oswaldo Cruz” (CTIOC) of the “Laboratório Nacional e Internacional de Referência em Taxonomia de Triatomíneos” (LNIRTT) in Oswaldo Cruz Institute, Rio de Janeiro, Brazil.

Photographs of the type specimens of *Zelurus abalosi* (Figs. 1-4), *Z. montivagus* (Figs. 37-44) and *Zelurus singularis* (Figs. 45-48) were taken by the second author (JPSOC) with a Leica DMC 2900 camera attached to a Leica M205C stereomicroscope. Several images were stacked using the LAs software version 4.9. All remaining figures (Figs. 5-36) were produced by the first author (HRG-S). The photographs were obtained using digital cameras (Nikon D5600 with a Nikon Macro Lens 105 mm, Sony DSC-W570 and DSC-W830). Drawings were made using a camera lucida; for clarity, the general vestiture (setation) was omitted in the ink drawings showing several structures (Figs. 9-10, 14-18, 33-34), in order to make the shape and/or structure of these portions better visible. Dissections of the male terminalia of *Zelurus galvaoi* sp. nov. (Figs. 14-29) were made by removing the eighth segment and pygophore from the abdomen with a pair of forceps and then clearing them in NaOH solution for 24 hours. The dissected structures were studied and photographed in glycerol. Images were edited using Adobe Photoshop CS6. General morphological terminology mainly follows general current works on Reduviidae (e.g., Schuh and Weirauch 2020) and *Zelurus* (e.g., Ferreira *et al.* 2016; Oliveira *et al.* 2021). In relation to the genitalia terms, in general, Lent and Wygodzinsky (1979) is followed. However, the “vesica”, as recognized by Lent and Wygodzinsky (1979), has been considered to be absent in reduviids. The assumed equivalent structure in reduviids is a somewhat sclerotized appendage of the phallosoma or the endosoma (Forero and Weirauch 2012), but not the homologous vesica that occurs in other heteropterans such as Pentatomomorpha (Rédei and Tsai 2011). Thus, this term is not used here for the median process of endosoma, which is named as such. When citing the text on the labels of a pinned specimen, a slash (/) separates the lines and a double slash (//) different labels.

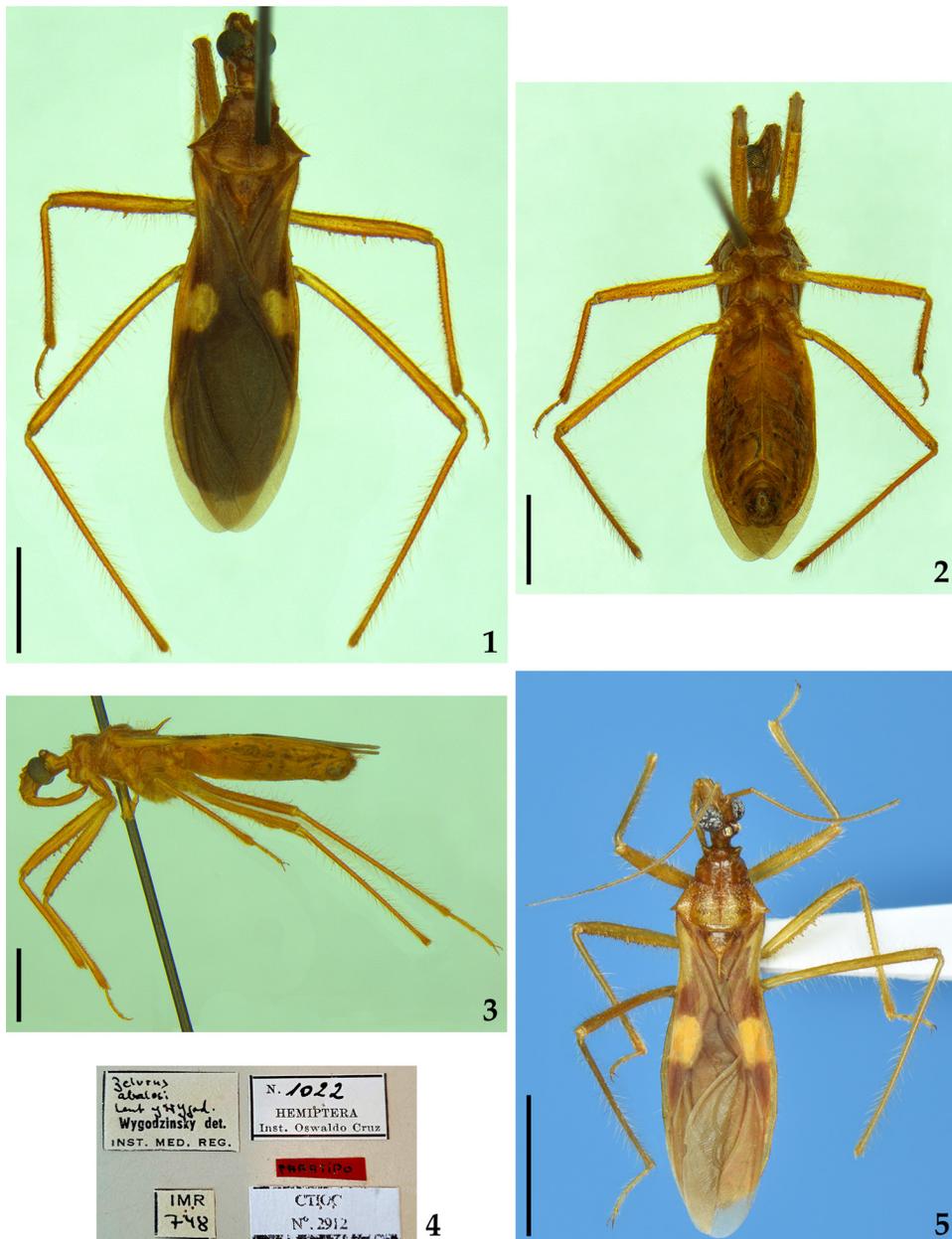
The following abbreviations for structures of male genitalia are used: ba: basal plate arm; bb: basal plate bridge; br: transverse bridge of pygophore; dp: dorsal phallosomal plate; lp: lateral process of endosoma; me: median process of endosoma; mp: median process of pygophore; pa: paramere; pd: pedicel; pt: proctiger; py: pygophore; so: socket of insertion of paramere; st: struts; VIII: eighth abdominal segment.

Zelurus abalosi Lent & Wygodzinsky, 1951 (Figs. 1-5)

Type material. *Zelurus abalosi* Lent & Wygodzinsky, 1951 [CTIOC]. **Paratype male:** [bordered label:] [handwritten:] *Zelurus / abalosi /* Lent y Wygod. / [printed:] Wygodzinsky det. / [printed:] INST. MED. REG. // [bordered label:] [printed:] N. [handwritten:] 1022 / [printed:]

HEMIPTERA / [printed:] Inst. Oswaldo Cruz // [handwritten red label:] PARATIPO [Paratype] // [bordered label:] [printed:] IMR / [handwritten:] 748 // [bordered printed label:] CTIOC / N°. 2912.

Non-type material. *Zelurus abalosi* Lent & Wygodzinsky, 1951. 1 male [CTIOC, 13182], Bolivia, Santa Barbara, Nor Yungas, XII / 1997, Sanchez, P. leg., Gil-Santana det., 2021.



Figures 1-5. *Zelurus abalosi* Lent & Wygodzinsky, 1951. 1-4. Male paratype deposited in CTIOC. 1-3. Scales: 3.0 mm. 1. Dorsal view. 2. Ventral view. 3. Lateral view. 4. Labels. 5. Male specimen from Bolivia, dorsal view. Scale: 5.0 mm. / 1-4. Paratipo macho depositado en CTIOC. 1-3. Escalas: 3,0 mm. 1. Vista dorsal. 2. Vista ventral. 3. Vista lateral. 4. Etiquetas. 5. Macho de Bolivia, vista dorsal. Escala: 5,0 mm.

Since *Zelurus montivagus*, the species which shows more morphological similarities with *Zelurus galvaoui* sp. nov., was considered by Lent and Wygodzinsky (1955) as proximate to *Z. abalosi*, the latter was included in this study for a more thorough comparison. *Zelurus abalosi* was described based on 12 type specimens (9 males and 3 females) from Argentina (Lent and Wygodzinsky 1951), without further records so far (Maldonado 1990). Photographs of a male paratype deposited in CTIOC are presented here (Figs. 1-4).

In their description, Lent and Wygodzinsky (1955) presented only schematic drawings of some portions of *Z. abalosi*. Therefore, the first photographs of the species are presented here (Figs. 1-3, 5). Additionally, *Z. abalosi* is recorded from Bolivia for the first time, based on a male specimen from this country (Fig. 5).

Comments. The paratype and the male from Bolivia (Figs. 1-3, 5) agree well with the original description (Lent and Wygodzinsky 1951). Lent and Wygodzinsky (1955) briefly stated that the differences between *Z. abalosi* and *Z. montivagus* were the following: interocular distance, size of eyes, apical process of scutellum longer in relation to those of pronotum, absence of abdominal denticle and coloration of hemelytra.

In relation to each species, these differences are: 1 - interocular distance smaller (*Z. abalosi*) or somewhat larger (*Z. montivagus*) than the width of an eye; 2 - eyes larger in *Z. abalosi*; 3 - processes of pronotum smaller in *Z. montivagus* and therefore smaller in relation to the process of scutellum; 4 - spiniform process on apicolateral angle of first connexival segment present (*Z. abalosi*) or absent (*Z. montivagus*); 5 - corium of hemelytra darkened with the basolateral portion pale and a subapical large yellow rounded spot in *Z. abalosi* (Figs. 1, 5) and pale orange to pale yellowish with basolateral portion (in less extent), inner portion of corium, and apices brownish in *Z. montivagus* (Figs. 37, 42).

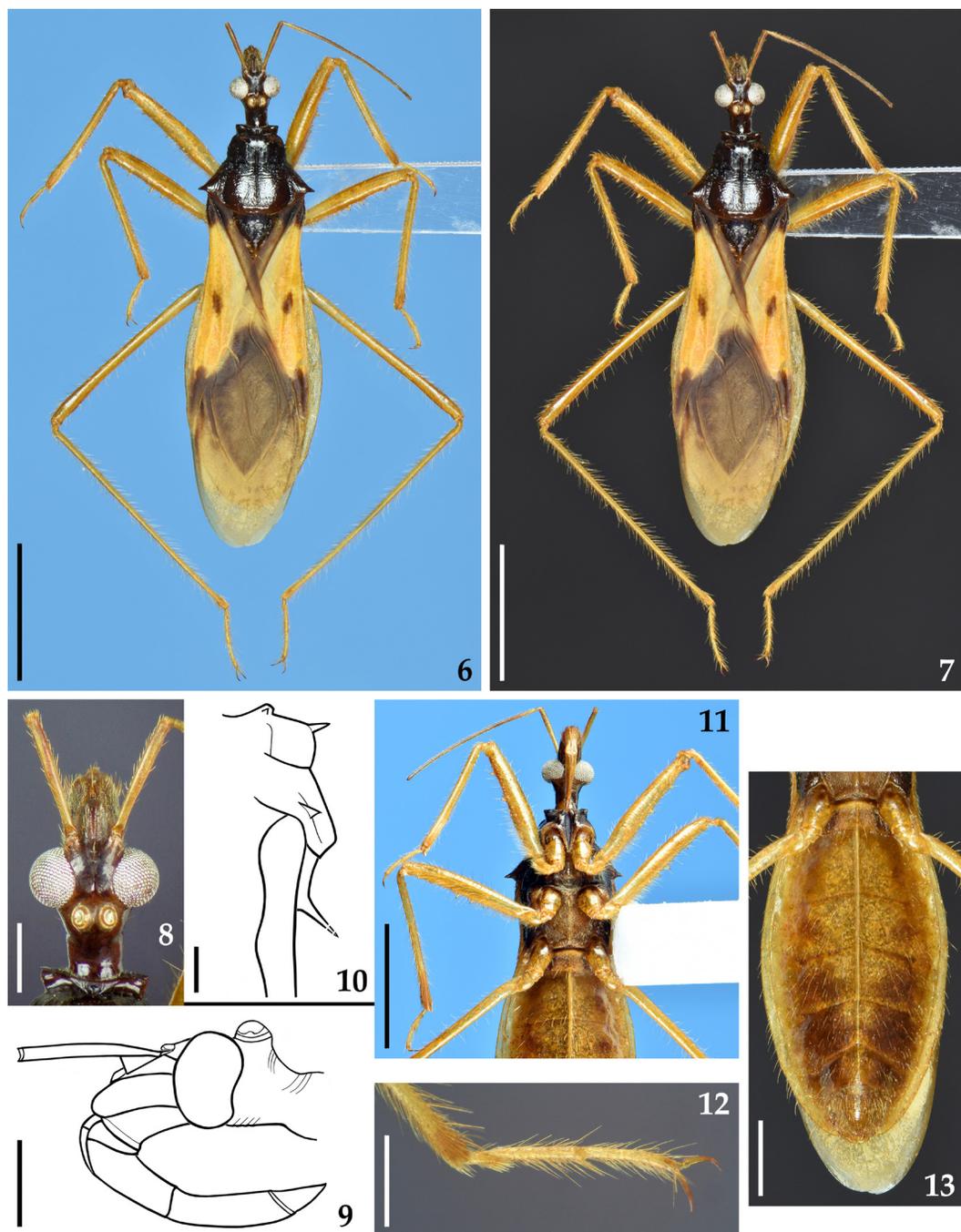
Distribution. Argentina, Bolivia (**new record**).

Zelurus galvaoui sp. nov.
(Figs. 6-36)

Type material. Holotype male/ Paratype female [CTIOC, 13183 / 13184, respectively], Peru, Amazonas departament, Marañón River margin, I / 1997, Sanchez, P. leg.

Etymology. The new species is named in honor of the Brazilian entomologist Cleber Galvão (IOC), for his outstanding contributions to the study of Triatominae, vectors of Chagas' disease.

Diagnosis. The new species most closely resembles *Zelurus montivagus* Lent & Wygodzinsky, 1955. The two species can be separated by the following differences: 1 - General color of head and pronotum brownish in *Z. montivagus* (Figs. 37-40, 42-43) and blackish in *Z. galvaoui* sp. nov. (Figs. 6-8, 30-32). 2 - Hemelytra with the inner portion of corium, adjacent to claval suture, and basal portion of the cells of membrane paler, whitish in *Z. galvaoui* sp. nov. (Figs. 6-7, 30-31), while these portions are brownish in *Z. montivagus* (Figs. 37, 42). 3 - Antecular portion of the head narrower in *Z. galvaoui* sp. nov.; 4 - Eyes smaller in *Z. montivagus*; in the males, not reaching dorsal and ventral margins of head in lateral view, while in *Z. galvaoui* sp. nov., the eyes surpass both margins (Fig. 9). 5 - Discal spines of fore lobe of pronotum and humeral spines shorter in *Z. montivagus* (Figs. 6, 10, 30, 33-34; 37, 39-40). 6 - Median keel of sternites present on all segments of the females in *Z. montivagus* (Figs. 38, 43) and absent on sternites IV to basal half of sternite VII in *Z. galvaoui* sp. nov. (Fig. 36)



Figures 6-13. *Zelurus galvaoi* sp. nov., male holotype. 6-7. Dorsal view. Scales 5.0 mm. 8-9. Head. Scales: 1.0 mm. 8. Dorsal view. 9. Lateral view. 10. Upper portion of thorax, schematic outline, lateral view. Scale: 1.0 mm. 11. Anterior portion of body, ventral view. Scale: 5.0 mm. 12. Right hind tarsus, lateral view. Scale: 1.0 mm. 13. Abdomen, ventral view. Scale: 2.0 mm. / Holotipo macho. 6-7. Vista dorsal. Escalas: 5,0 mm. 8-9. Cabeza. Escalas: 1,0 mm. 8. Vista dorsal. 9. Vista lateral. 10. Parte superior del tórax, contorno esquemático, vista lateral. Escala: 1,0 mm. 11. Parte anterior del cuerpo, vista ventral. Escala: 5,0 mm. 12. Tarso posterior derecho, vista lateral. Escala: 1,0 mm. 13. Abdomen, vista ventral. Escala: 2,0 mm.

Description. Male holotype (Figs. 6-29). Measurements: (in mm): total length: to tip of abdomen: 17.0; to tip of hemelytra: 18.5. Head length: (including neck): 3.1; (excluding neck): 2.6; length of anteocular portion: 1.1; length of postocular portion (excluding neck): 0.6; width across eyes: 1.9; interocular distance between eyes in dorsal view (synthlipsis): 0.5; in ventral view: 0.3; width of eye: 0.6; length of eye, dorsal view: 0.9; maximum height of eye, lateral view: 1.2; ocellar tubercle width: 0.7; ocellus width: 0.25; maximum width between ocelli: 0.15; lengths of antennal segments: I: 1.9; II: 6.0; III: absent; IV: absent; lengths of labial segments: II [first visible]: 1.3; III: 1.6; IV: 0.6. Thorax: pronotum: fore lobe: length (at midline): 1.4; maximum width between anterolateral angles: 1.6; maximum width at posterior margin: 2.2; hind lobe: length: 1.8; maximum width at posterior margin (spines not included): 3.8 (spines included): 4.3; fore legs: length of femur: 5.0; maximum width of femur: 0.7; length of tibia: 5.0; length of spongy fossa: 1.7; length of tarsus (claws excluded): 1.5; length of claws: 0.4; middle legs: length of femur: 5.0; maximum width of femur: 0.6; length of tibia: 5.0; length of spongy fossa: 1.5; length of tarsus (claws excluded): 1.6; length of claws: 0.4; hind legs: length of femur: 7.8; maximum width of femur at median portion: 0.4; maximum width of femur at subapical portion: 0.5; length of tibia: 9.5; length of tarsus (claws excluded): 2.3; length of claws: 0.5. Abdomen: length: 9.3; maximum width: 5.1. **Coloration: Head** (Figs. 6-8, 11): generally blackish on dorsal surface, somewhat paler behind inner portion of eyes and apices of antennifers; red brownish just around ocelli, which are pale yellow; eyes with white ommatidia; upper margin of maxillary plate, clypeus, anterior portion of head adjacent to insertion of the labium and ventral surface dark brownish; labium and two first antennal segments (other absent) pale brownish; basal portion of antennal pedicel paler. **Thorax** (Figs. 6-7, 11-12): blackish; discal spines of fore lobe and spine of scutellum (its apex missing), except at their bases, paler, red brownish; upper portion of propleura laterally to hind lobe of pronotum and the posterior margin of the latter also paler, brownish; pale rounded spots on lateral surface of each supracoxal lobe, larger on anterior lobe, progressively smaller on the remaining lobes; metasternum dark brownish. Legs: Coxae dark and pale orange on approximately their basal and distal halves, respectively; trochanters, femora, tibiae and tarsi pale orange, yellow or pale yellowish; apices of tibiae slightly darkened, the fore ones more and the hind ones less darkened (Figs. 6-7, 11); distal portion of tarsal claws darkened or blackish (Fig. 12). Hemelytra (Figs. 6-7): corium mostly orange with a median subovall small blackish marking; basal portion of corium and clavus dark blackish; remaining of clavus grayish black; inner portion of corium, adjacent to claval suture, paler, whitish; apical portion of corium blackish, except at extreme apex, where it is paler; membrane mostly darkened on the portion occupied by the cells, except on the basal portion of them, which are whitish, contiguous to the whitish portion of corium, whereas the subbasal portion of the cells are even darker, blackish; posteriorly to the cells, the membrane becomes progressively paler towards its apex. **Abdomen:** connexivum pale yellowish (Figs. 6-7, 13); esternites orange to pale brownish (Fig. 13). **Vestiture: Head:** anteocular portion covered by numerous stout adpressed or oblique long pale to golden setae (Fig. 8); long fairly stout pale setae scattered on labrum, clypeus and anterior portion of head adjacent to insertion of the labium; on the latter, numerous similar setae of variable sizes on first visible labial segment, many of which even longer on last labial segment and shorter and sparser on second visible labial segment, which has its ventral surface almost glabrous. Area between eyes on dorsal and ventral surfaces, postocular portion and neck almost completely glabrous (Fig. 8); dorsally, besides a few very short adpressed scattered thin pale setae, two stout golden setae on midline, between diverging anterior branches of median sulcus; antennifers with lateral tufts of a few stiff setae; a pair of short stout setae laterally on neck, behind posterior margin of eye. Antenna: first segment glabrous basally, with scattered, somewhat stout and curved pale to golden setae, which are more numerous on inner surface and apex; second segment covered with a pubescence formed by very numerous thin, short, small whitish setae, and scattered

somewhat curved and stout oblique, pale setae; remaining antennal segments absent. **Thorax:** pronotum: numerous very short, thin, whitish setae on anterior margin of collar and two or three long oblique thin setae on anterior margin of anterolateral angles; scattered long thin pale setae more numerous on anterior portion of fore lobe, between collar and discal spines, and more sparse between transverse sulcus and posterior margin; about a ten slightly curved setae around humeral spines; short sparse thin pale setae on inferior portion of posterior margin of hind lobe at level of scutellar base. Scutellum mostly glabrous on the disc, with some scattered, thin, short, pale setae, which are longer and stouter on the remaining portion of its posterior process (apex absent). Pleura generally with few sparse thin, very small, pale setae; a numerous series of long, thin, pale setae, similar to those on dorsal portion of pronotum, on upper portion of propleura of hind lobe; a group of thin, short, pale setae on inferoposterior margins of supracoxal lobes. Blunt tubercles on prosternum with a group of stout straight brownish setae; inner margins of approximately distal half of prosternum, laterally to stridulitrum, with a sparse pubescence formed by very short, adpressed, pale, thin setae; lateral margins of posterior prolongation of prosternum, between fore coxae and contiguous portion of inner margin of fore acetabulum, with a fringe of numerous thin, yellowish, curved setae. Median portion of meso- and metasternum covered by very numerous decumbent thin yellowish to golden pale setae; on lateral margin of mesosternum, contiguous to mesopleura, a group of numerous, thin, decumbent, whitish setae, forming a dense line. Legs. Coxae: basomedian portions almost completely glabrous; some stout, straight, brownish setae on laterosuperior portion of fore coxae; scattered thin pale setae on lateral and distal portions, on the latter they are more numerous and have variable lengths, including longer elements on hind coxae. Fore and middle trochanters with their ventral portion covered by very numerous long yellowish thin curved setae; on hind trochanter similar setae are present, but much less numerous. Femora and tibiae generally covered by numerous long, straight, erect, yellowish to golden setae (Fig. 7); on approximately basal fifth of ventral surface of fore and middle femur, series of more numerous similar setae; on tibiae the setae are generally more numerous; on fore and middle tibiae they are somewhat shorter and stouter on ventral midline. Tarsi covered by long, thin, pale setae, longer and more numerous on ventral surface (Fig. 12). Hemelytra: corium mostly glabrous, with few short decumbent pale yellowish setae on basal and apical portion, a group of numerous longer setae on inclined portion at basolateral portion, followed by a fringe of numerous short, thin pale setae on lateral (costal) margin, the setae are longer and more numerous basally, becoming gradually shorter and less numerous towards distal portion in which they are absent; membrane glabrous. **Abdomen:** connexivum with thin sparse short decumbent setae, less numerous ventrally; inferior margin with a lateral series of moderately curved, long, yellowish setae, well visible in dorsal view. Sternite II covered by numerous thin decumbent yellowish setae; near posterior margin, between hind coxae, a series of about eight long, stout golden setae directed backwards; other sternites generally covered by long, stiff, yellow to golden setae, obliquely directed backwards, somewhat more numerous on the genital capsule (Fig. 13). **Structure:** integument generally shiny. **Head** (Figs. 6-9, 11): approximately 1.35 times as long as wide across eyes (neck excluded), shorter than pronotum, anteocular portion almost twice longer than postocular and strongly declivous; mandibular and maxillary plates with apices rounded. Antennifers somewhat elongated, close to inner anterior margin of eyes. Antenna: first segment straight, somewhat thinner basally, thicker than second, which is approximately three times longer than first and somewhat curved; remaining segments absent. Labium curved, thick; segment II (first visible) slightly shorter than segment III; segment IV approximately half shorter than the segment II, tapering, reaching stridulatory sulcus on its basal portion. Eyes proximate at median portion, coarsely faceted, prominent, projecting laterally, subcircular in dorsal view, surpassing dorsal and ventral margins of head; minimum distance between their inner margins in dorsal view slightly less than

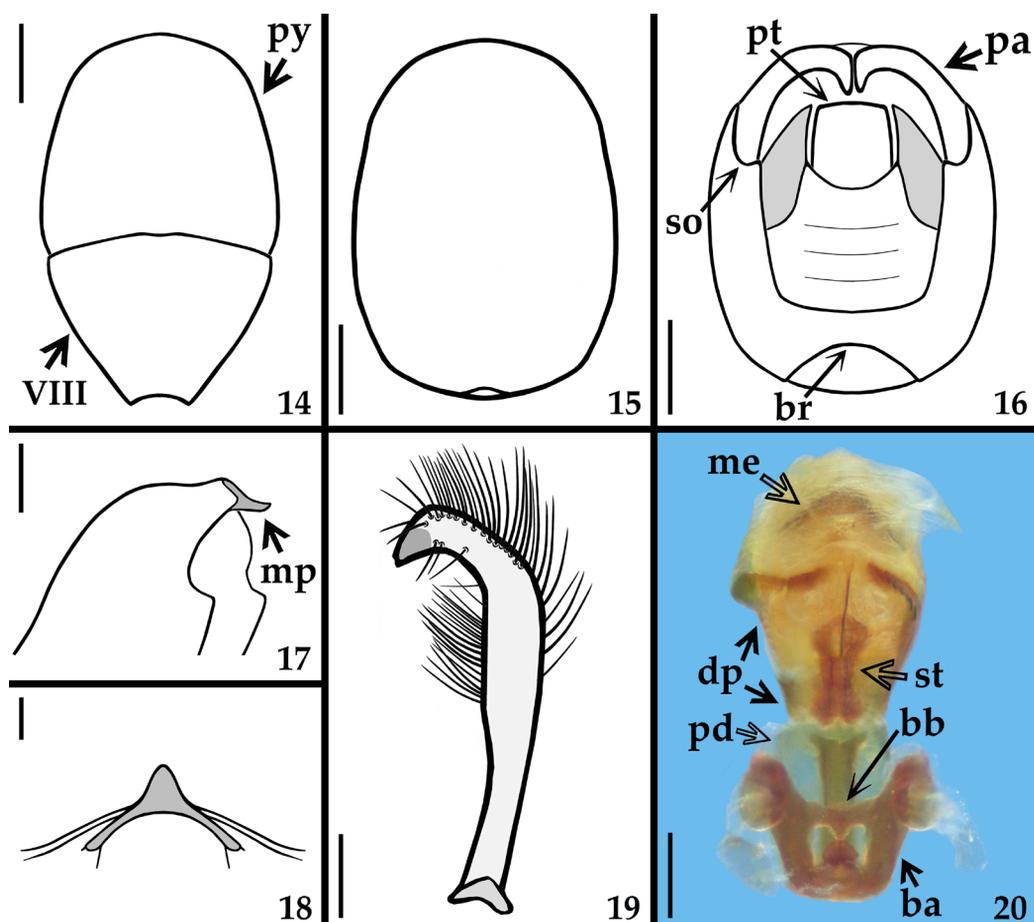
transverse width of an eye. Transverse sulcus shallow; just anterior to it, on midline, a small oval fossa, followed anteriorly by a short thin shallow median sulcus which splits in two diverging branches running forward, ending between antennifers bases. Ocelli large and prominent; their anterior margin lies just behind transverse sulcus and posterior edge of the eyes. Some transverse parallel shallow impressions on ventral surface from the space between posterior margins of eyes to postocular portion before neck. The latter elongate, slightly narrower than basal portion of anteocular region. **Thorax** (Figs. 6-7, 10-12): pronotum: anterolateral angles prominent, with apex acute; anterior collar moderately large, with a posteromedian depressed area; fore lobe with a discal pair of somewhat long and laterally diverging spines and very short blunt prominences laterally; transverse sulcus shallow; longitudinal sulcus narrow, on fore lobe it is very thin, linear and shallow, beginning just above level of discal spines and becoming slightly larger and deeper at distal portion, near transverse sulcus; on the hind lobe it ends slightly below level of humeral angles, far from posterior margin; on fore lobe three shallow longitudinal rugose carinae at each side, the lateral, more prominent, runs from the collar to the transverse sulcus, with the lateral prominence over it; the submedian is interrupted by the discal spine and the intermediate is curved at approximately midportion of the lobe, meeting the lateral carina; between them, areas with smooth integument. Hind lobe with wrinkled integument, more pronounced on basal portion, becoming progressively smoother toward posterior margin, specially medially to the sublateral sulci on the posterior half of the lobe; these sulci are shallow and curved. Humeral angle with a strong spine. Scutellum triangular, moderately large; disc with a somewhat rugous surface bordered by distinct thin carina, with an apical spine (apex of which broken). Supracoxal lobes of propleura and mesopleura somewhat prominent, those of metapleura not; integument of propleura mostly smooth, wrinkled below the basal portion of hind lobe; integument of mesopleura with several linear shallow subparallel lines, which are deeper in the metapleura forming subparallel ridges; the dorsal margin of metapleura thickened and curved. Stridulitrum elongate, occupying the median portion of prosternum; a pair of anterior blunt tubercles beside stridulitrum and anterior to fore acetabula; on posterior half, the prosternum forms a cylindrical median process, which surpasses fore coxae for a short distance. Mesosternum with a median suboval depression. Metasternum slightly elevated at median portion, with a longitudinal median keel and thickened lateral and distal margins. Legs: long and slender; hind femora and tibiae longer than the others; fore femora slightly thicker than middle femora, which are somewhat thicker than hind femora; the latter somewhat thickened subapically; tibiae straight, the hind ones somewhat thickened apically; tarsi three-segmented, in which the first segment is much shorter than the others, claws symmetrical and slender. All trochanters with basal spines on medial and lateral portions. Ventral surface of fore and middle femora with two somewhat irregularly parallel longitudinal rows of sclerotized short and acute small dark spines along the segment; the anterior row with about twenty small spines; the posterior row, besides small spines, with a few scattered pale larger spines with apices darkened, among which about three are more developed and other three to five are less developed; the two distal larger spines are separated by a space without small spines; apices of all femora with a pair of lateral small acute prominences. Fore and middle tibiae with a single series of short, acute, brownish spines on ventral midline from just below extreme base to basal margin of spongy fossa. A small comb on mesal surface of apex of fore tibia. Spongy fossae on ventral portion of apices of fore and middle tibiae narrow, measuring approximately $1/3$ of the length of the respective tibia, slightly surpassing the apex of the latter. Hemelytra surpassing tip of abdomen for approximately 1.5 mm. **Abdomen**: connexivum with its external margin continuous, without processes (Figs. 6-7, 13). Abdomen (Fig. 13) moderately elongate, suboval, with a median keel along sternites II-VI and basal half of VII, fainter on sternite II, even shallower on basal half of sternite VII, more pronounced on sternite III, progressively becoming slightly shallower

towards distal segments; sutures between sternites thin, suture between II and III thicker and with small transverse striations along posterior margin; integument of sternite II somewhat rugous and dull; integument of remaining sternites shiny and with very fine transverse striations, less numerous on two last sternites; spiracles small, located approximately at median portion of the segment, adjacent to the lateral margin. **Male terminalia:** abdominal segment VIII (Fig. 14) sclerotized on ventral portion, which becomes wider towards distal margin; latter slightly curved and with long setae; basal margin curved; dorsal portion entirely membranous and narrower. **Male genitalia** (Figs. 13-29): pygophore (py) densely setose on its exposed surface (Fig. 13); suboval in ventral and dorsal views (Figs. 15-16); in dorsal view (Fig. 16): between anterior and posterior genital openings, a broad dorsal (transverse) bridge (br); socket of insertion of paramere (so) approximately in distal third of pygophore, and usually with numerous, somewhat long, erect setae inserted above it, medially; proctiger (pt) subsquared, with long setae, more numerous on distal margin; posterior genital opening covered by a smooth membrane which is heavily sclerotized between proctiger and distal portion of inner wall of pygophore. Parameres (pa) (Figs. 16, 19) symmetrical, elongate, very curved at apical third, slightly enlarged at median third, and with a large apical tooth; covered by long and numerous setae on mid portion of internal surface and apical third of outer surface. Median process of pygophore (mp) sclerotized; in lateral view (Fig. 17): elongate, apex acute; in dorsal view (Fig. 18): subtriangular, apex rounded. Phallus (Figs. 20-27): articulatory apparatus with moderately short basal plate arms (ba) (Figs. 20-22, 24-25); basal arms and basal plate bridge (bb) forming a subsquared set in dorsal view (Figs. 20, 24-25); pedicel (pd) elongated, enlarged, subrectangular in ventral and dorsal views, curved in lateral view (Figs. 21-23, 25). Dorsal phallothecal plate (dp) more sclerotized on its margins and basal portion; with a median thin shallow dorsal crest on approximately distal two thirds; sublozenge in shape, apex rounded (Figs. 20-22, 26). Arms of the struts (st) parallel, largely united at basal portion; curved and separated laterally at distal portion; slightly enlarged at approximately their median third; converging and becoming united at apex (Figs. 26-27). Endosoma wall longitudinally striated (Figs. 21, 23). Endosoma with the following processes: 1 - a pair of lateral processes (lp) on basal portion (Figs. 22-23, 28), which are wrinkled and faintly sclerotized, and 2 - a subapical median process (me), laminar, sub hemispherical, with a median notch and a few pairs of oblique diverging curved wrinkles (Figs. 20, 22, 29).

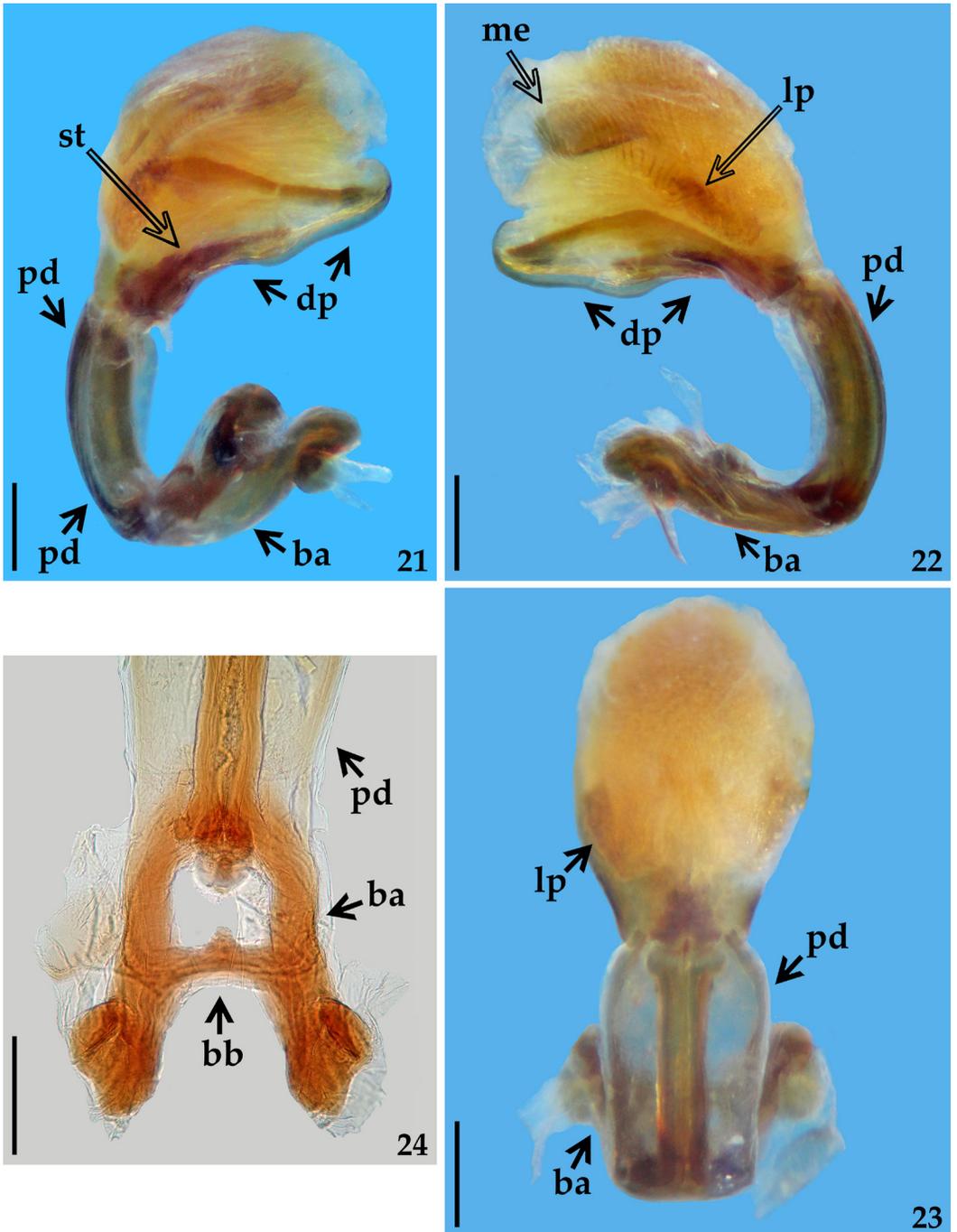
Female paratype (Figs. 30-36). Measurements: (in mm): total length: to tip of abdomen: 18.0; to tip of hemelytra: 19.0. Head length: (including neck): 3.1; (excluding neck): 2.6; length of anteocular portion: 1.3; length of postocular portion (excluding neck): 0.6; width across eyes: 1.8; interocular distance between eyes in dorsal view (synthlipsis): 0.6; in ventral view: 0.5; width of eye: 0.5; length of eye, dorsal view: 0.8; maximum height of eye, lateral view: 1.1; ocellar tubercle width: 0.6; ocellus width: 0.2; maximum width between ocelli: 0.1; lengths of antennal segments: I: 1.8; II: 5.2; III: 4.4; IV: absent; lengths of labial segments: II [first visible]: 1.3; III: 1.6; IV: 0.6. Thorax: pronotum: fore lobe: length (at midline): 1.5; maximum width between anterolateral angles: 1.6; maximum width at posterior margin: 2.2; hind lobe: length: 1.9; maximum width at posterior margin (spines not included): 3.6 (spines included): 4.5; fore legs: length of femur: 4.9; maximum width of femur: 0.7; length of tibia: 4.8; length of spongy fossa: 1.7; length of tarsus (claws excluded): 1.5; length of claws: 0.4; middle legs: length of femur: 5.1; maximum width of femur: 0.6; length of tibia: 4.9; length of spongy fossa: 1.6; length of tarsus (claws excluded): 1.6; length of claws: 0.4; hind legs: length of femur: 7.6; maximum width of femur at median portion: 0.4; maximum width of femur at subapical portion: 0.5; length of tibia: 9.0; length of tarsus (claws excluded): 2.3; length of claws: 0.5. Abdomen: Length: 10.1; maximum width: 5.2. Similar to male (Figs. 30-36). Median subovall small marking on corium absent (Figs. 30-31). **Head** (Figs. 32-33); approximately 1.4 times as

long as wide across eyes (neck excluded); anteoocular portion twice longer than postocular portion; eyes and ocelli somewhat smaller; eyes reaching dorsal and ventral margins of head; transverse parallel shallow impressions on ventral surface of head more numerous, present basally and on all space between eyes too. First antennal flagellomere (absent in the male) thinner and slightly shorter than the preceding segment (pedicel), and with a similar vestiture. **Thorax:** hind lobe of pronotum more rugous on lateral portion at approximately its distal third (Figs. 30-31). Apex of spine of scutellum broken too. Spines of ventral surface of fore and middle femora generally slightly larger (Fig. 35). Hemelytra somewhat shorter, surpassing tip of abdomen for approximately 1.0 mm. Median keel on sternites II and III narrower; on the latter segment becoming shallower towards their distal portion; absent on sternites IV to basal half of VII, and very shallow on the distal half of sternite VII (Fig. 36). Setae on genital segments shorter, stouter and darker.

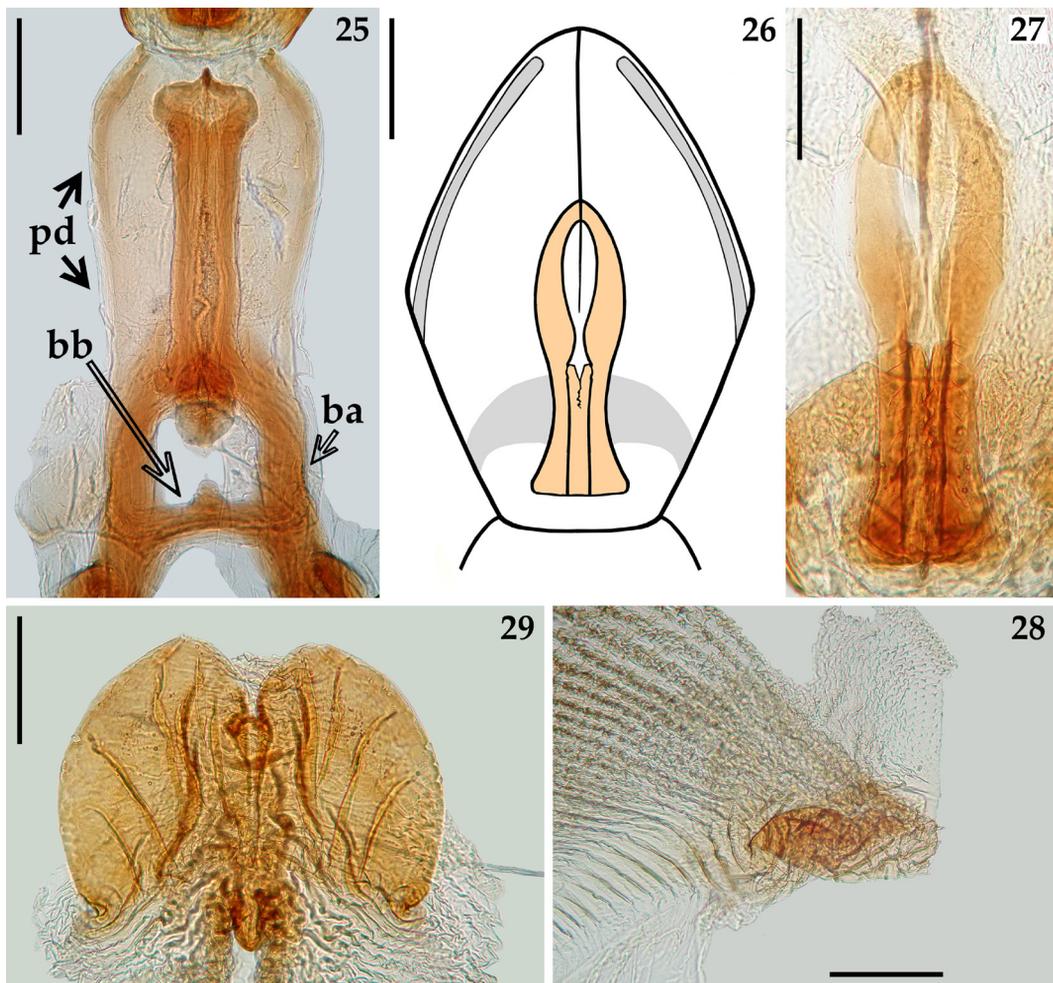
Distribution. Peru, Amazonas departament.



Figures 14-20. *Zelurus galvai* sp. nov., holotype, male terminalia. 14-17. Scales: 0.5 mm. 14-15. Ventral view. 14. Abdominal segment VIII and pygophore. 15-17. Pygophore. 16. Dorsal view. 17. Without parameres, laterodorsal view of distal portion. 18. Median process of pygophore, dorsal view. Scale: 0.2 mm. 19-20. Scales: 0.3 mm. 19. Paramere, outer surface. 20. Phallus, dorsal view. / Holotipo, terminalia masculina. 14-17. Escalas: 0,5 mm. 14-15. Vista ventral. 14. Segmento abdominal VIII y pigóforo. 15-17. Pigóforo. 16. Vista dorsal. 17. Sin parámetros, vista laterodorsal de la porción distal. 18. Proceso mediano del pigóforo, vista dorsal. Escala: 0,2 mm. 19-20. Escalas: 0,3 mm. 19. Parámetro, superficie exterior. 20. Fallo, vista dorsal.

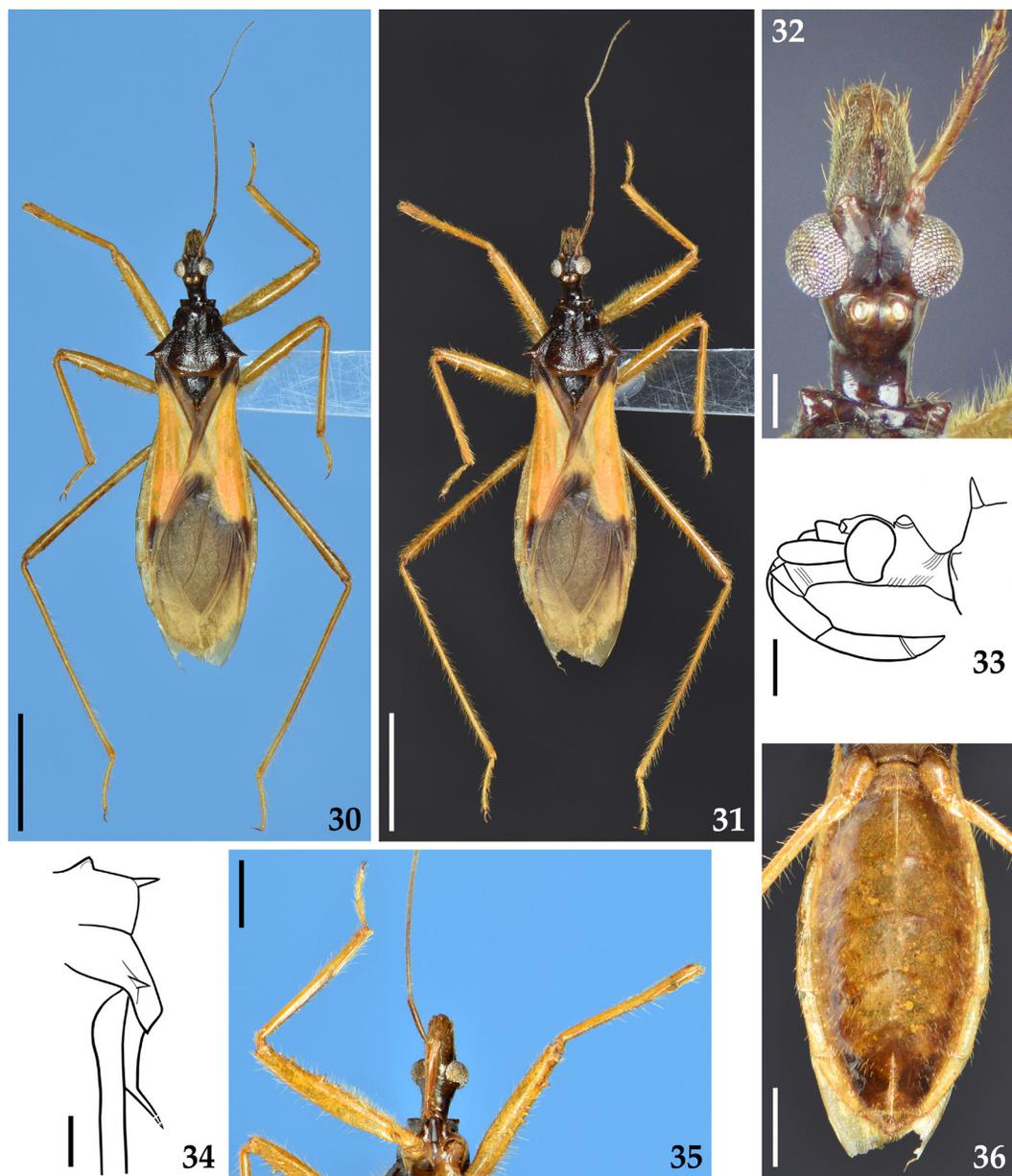


Figures 21-24. *Zelurus galvaoi* sp. nov., holotype, male genitalia. Scales: 0.3 mm. 21-23. Phallus. 21-22. Lateral views. 23. Ventral view. 24. Articulary apparatus and basal portion of pedicel, dorsal view. / Holotipo, genitalia masculina. 21-23. Fallo. 21-22. Vistas laterales. 23. Vista ventral. 24. Aparato articular y porción basal del pedicelo, vista dorsal.



Figures 25-29. *Zelurus galvai* sp. nov., holotype, male genitalia. 25-27. Dorsal view. 25-26. Scales: 0.3 mm. 25. Articular apparatus (except basal portion) and pedicel. 26. Dorsal phallosome plate and struts. 27-29. Scales: 0.2 mm. 27. Struts. 28. Lateral process of endosoma, lateral view. 29. Median process of endosoma, dorsal view. / Holotipo, genitalia masculina. 25-27. Vista dorsal. 25-26. Escalas: 0,3 mm. 25. Aparato articular (excepto la porción basal) y pedicelo. 26. Plato falotecal dorsal y struts. 27-29. Escalas 0,2 mm. 27. Struts. 28. Proceso lateral do endosoma, vista lateral. 29. Proceso medio do endosoma, vista dorsal.

Comments. Some of the slight differences between the male and female described here are in accordance with the sexual dimorphic features recorded in several other species of Reduviidae such as larger eyes and more prominent ocelli in males (HRG-S pers. obs.). On the other hand, other structural differences as described above, as well as regarding the coloration, *i.e.*, the absence of the median subovall small marking on the corium of the female may be due to inter-individual variation and not to sexual dimorphism. Therefore, only future examination of more specimens of *Z. galvai* sp. nov. will make it possible to ascertain to what extent these features vary among individuals and whether there is any additional sexual dimorphism.



Figures 30-36. *Zelurus galvai* sp. nov., female paratype. 30-31. Dorsal view. Scales: 5.0 mm. 32-33. Head. 32. Dorsal view. Scale: 0.5 mm. 33. Lateral view. Scale: 1.0 mm. 34. Upper portion of thorax, schematic outline, lateral view. Scale: 1.0 mm. 35-36. Ventral view. Scales: 2.0 mm. 35. Head and fore legs. 36. Abdomen. / Paratipo hembra. 30-31. Vista dorsal. Escalas: 5,0 mm. 32-33. Cabeza. 32. Vista dorsal. Escala: 0,5 mm. 33. Vista lateral: Escala: 1,0 mm. 34. Parte superior del tórax, contorno esquemático, vista lateral. Escala: 1,0 mm. 35-36. Vista ventral. Escalas: 2,0 mm. 35. Cabeza y patas anteriores. 36. Abdomen.

Discussion

The general structure and the coloration of *Z. galvai* sp. nov. seem more similar to *Z. montivagus* than other congeners. Besides differences in coloration between the two

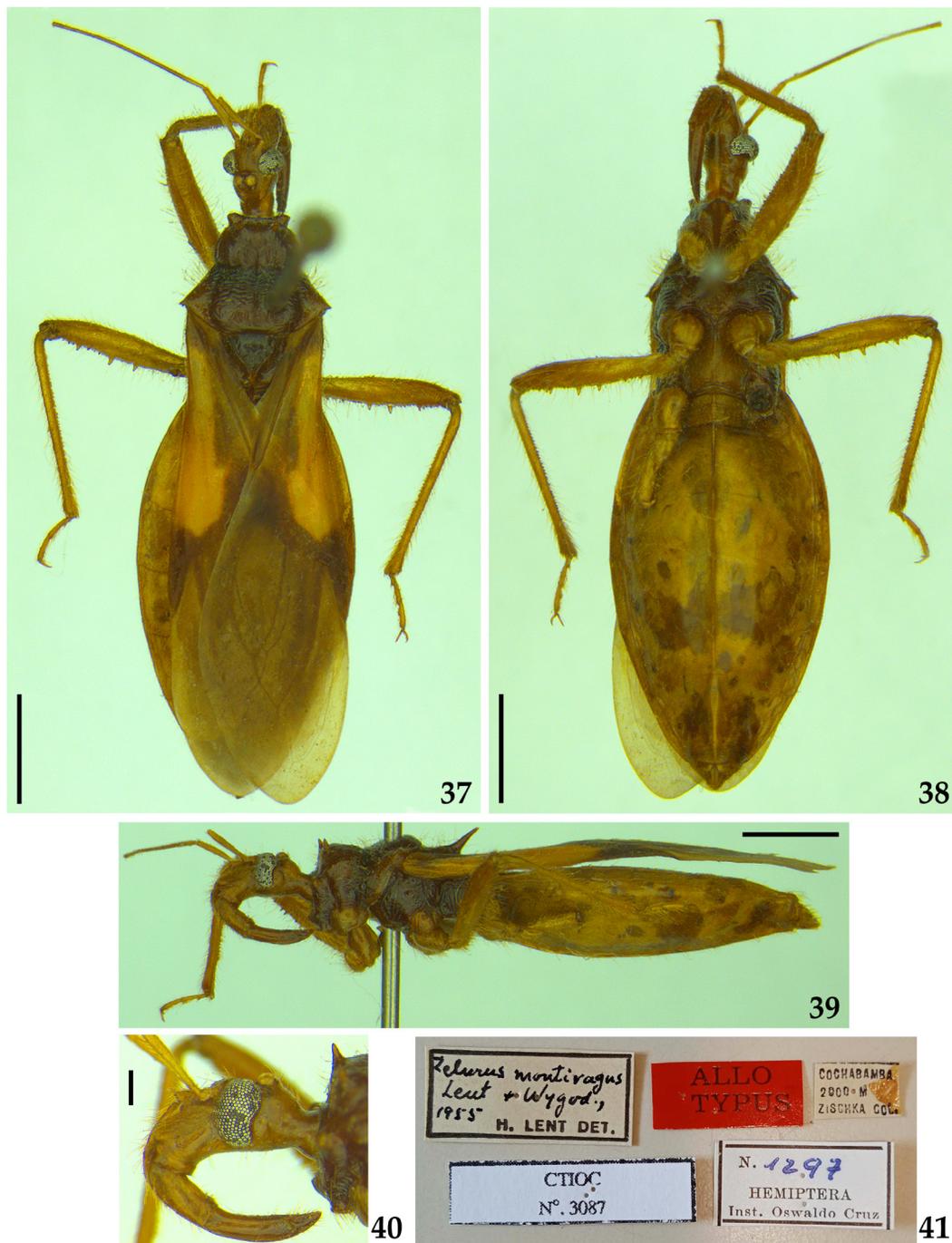
species, the structural differences already recorded in the diagnosis provided above, give more support to the validity of the new species. This set of differential characteristics is in accordance to previous concepts and observations about the taxonomic value of morphological characteristics among species of *Zelurus* (e.g., Stål 1859, 1869, 1872; Costa Lima 1940; Lent and Wygodzinsky 1945, 1951, 1955, 1957). On the other hand, *Z. galvaoui* sp. nov. is also generally similar in structure with *Z. abalosi*, a species considered closer to *Z. montivagus* (Lent and Wygodzinsky, 1955). In relation to the differential characteristics pointed between *Z. abalosi* and *Z. montivagus* (see above), *Z. galvaoui* sp. nov. and *Z. abalosi* have the following differences or similarities: 1 - interocular distance smaller (*Z. abalosi* and male of *Z. galvaoui* sp. nov.) or 1,2 times larger (female of *Z. galvaoui* sp. nov.) than the width of an eye; 2 - eyes large in both species, larger in the males, even more in *Z. abalosi*; 3 - processes of pronotum similarly developed in *Z. abalosi* and *Z. galvaoui* sp. nov.; those of the disc of fore lobe about as long as the process of scutellum; 4 - spiniform process on apicolateral angle of first connexival segment present (*Z. abalosi*) or absent (*Z. galvaoui* sp. nov.); 5 - corium of hemelytra darkened with the basolateral portion pale and a subapical large yellow rounded spot in *Z. abalosi* (Figs. 1, 5), while in *Z. galvaoui* sp. nov. it is mostly orange, with a median subovall small blackish marking (absent in the female); basal portion of corium and clavus dark blackish; remaining of clavus grayish black; inner portion of corium, adjacent to claval suture, paler, whitish; apical portion of corium blackish, except at extreme apex, where it is paler (Figs. 6-7, 30-31). Additionally, *Z. galvaoui* sp. nov. differs in relation to both *Z. abalosi* and *Z. montivagus* in the following: 1 - general color of head and pronotum brownish (*Z. abalosi* and *Z. montivagus*) (Figs. 1-3, 5; 37-40, 42-43) or blackish (*Z. galvaoui* sp. nov.) (Figs. 6-8, 30-32); 2 - median keel of sternites present on all segments of the females (*Z. abalosi* and *Z. montivagus*) (Lent and Wygodzinsky 1951, 1955) (Figs. 38, 43) or absent on sternites IV to basal half of sternite VII (*Z. galvaoui* sp. nov.) (Fig. 36).

***Zelurus montivagus* Lent & Wygodzinsky, 1955**
(Figs. 37-44)

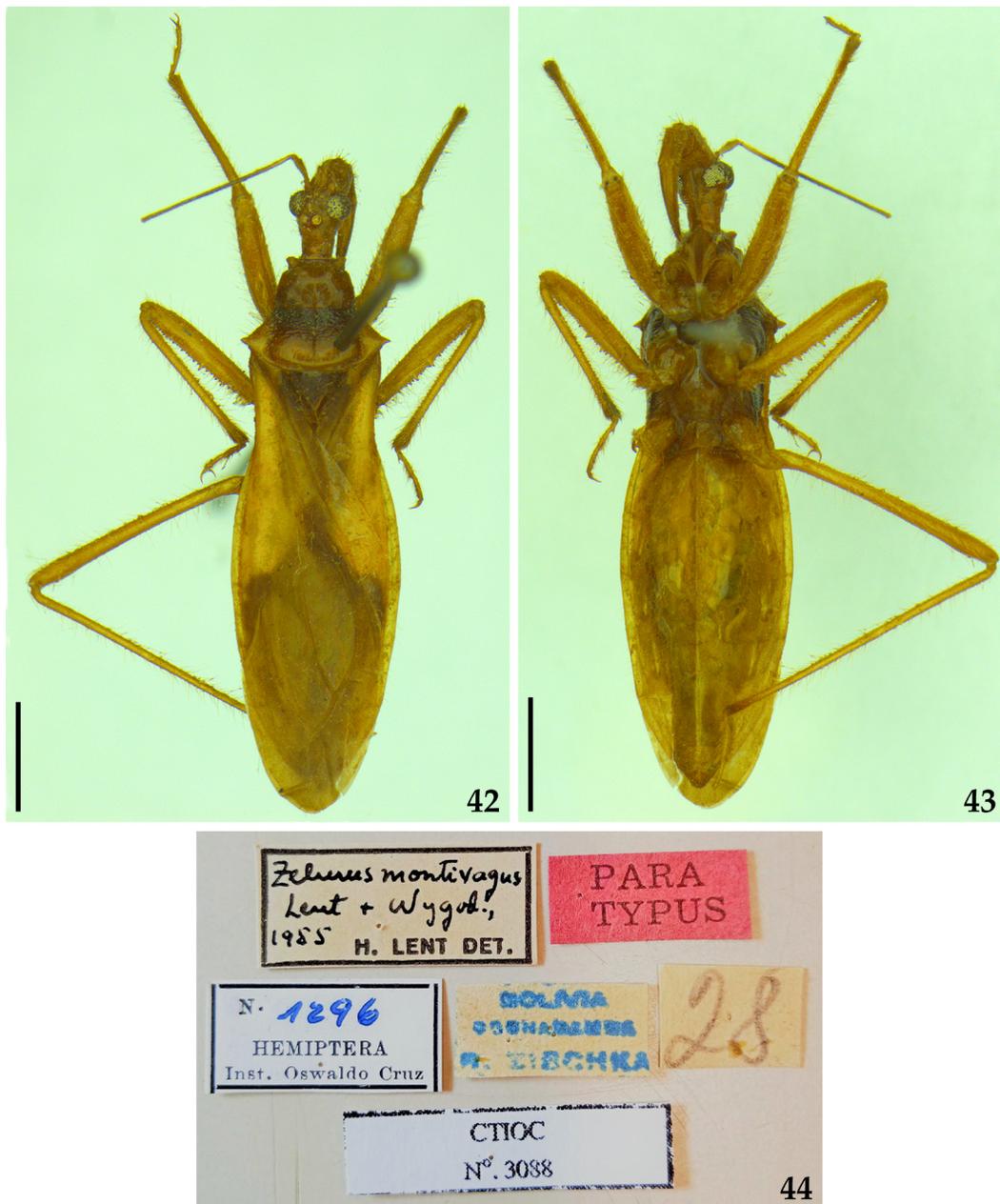
Zelurus montivagus was described based on a male and two females from Cochabamba, Bolivia (Lent and Wygodzinsky 1955). The latter are deposited in CTIOC and were examined here (Figs. 37-44). An additional female from the same locality was mentioned by Lent and Wygodzinsky (1957), without other references to the species. Lent and Wygodzinsky (1955) stated that *Z. montivagus* belong to the *fulvomaculatus* group of *Zelurus* and close to *Z. abalosi* Lent & Wygodzinsky, 1951.

Type material. *Zelurus montivagus* Lent & Wygodzinsky, 1955 [CTIOC]. **Paratype female** ("allotype"): [bordered label:] [handwritten:] *Zelurus montivagus* / Lent + Wygod., / 1955 / [printed:] H. LENT DET. // [printed red label:] ALLO / TYPUS // [printed label:] COCHABAMBA / 2000 M / ZISCHKA COL. [leg.] // [bordered printed label:] CTIOC / N°. 3087 // [bordered label:] [printed:] N. [handwritten:] 1297 / [printed:] HEMIPTERA / [printed:] Inst. Oswaldo Cruz. **Paratype female:** [bordered label:] [handwritten:] *Zelurus montivagus* / Lent + Wygod., / 1955 / [printed:] H. LENT DET. // [printed red label:] PARA / TYPUS // [bordered printed label:] CTIOC / N°. 3088 // [bordered label:] [printed:] N. [handwritten:] 1296 / [printed:] HEMIPTERA / [printed:] Inst. Oswaldo Cruz // [printed label (badly readable):] BOLIVIA / COCHABAMBA / R. ZISCHKA [leg.] // [handwritten label:] 28.

Comments. The female paratypes examined agree well with the original description (Lent and Wygodzinsky 1955) and the comparison with the type specimens of *Z. galvaoui* sp. nov. corroborates the diagnosis of the latter as presented above.



Figures 37-41. *Zelurus montivagus* Lent & Wygodzinsky, 1955, female paratype (“allotype”). 37-39. Scales: 3.0 mm. 37. Dorsal view. 38. Ventral view. 39. Lateral view. 40. Head, lateral view. Scale: 0.5 mm. 41. Labels. / Paratipo hembra (“alotipo”). 37-39. Escalas: 3,0 mm. 37. Vista dorsal. 38. Vista ventral. 39. Vista lateral. 40. Cabeza, vista lateral. Escala: 0,5 mm. 41. Etiquetas.



Figures 42-44. *Zelurus montivagus* Lent & Wygodzinsky, 1955, female paratype. 42-43. Scales: 3.0 mm. 42. Dorsal view. 43. Ventral view. 44. Labels. / Paratipo hembra. 42-43. Escalas: 3,0 mm. 42. Vista dorsal. 43. Vista ventral. 44. Etiquetas.

Zelurus singularis Lent & Wygodzinsky, 1947
(Figs. 45-48)

Zelurus singularis was described based on four males from Argentina. The species presents a conspicuous elevated pair of large prominences on the posterior lobe of pronotum, what was considered very characteristic by Lent and Wygodzinsky (1947), since it had never been recorded to other species of *Zelurus* so far. Probably because of

that Lent and Wygodzinsky (1947) did not compare the species with any other, besides naming it as they did.

Considering some characteristics of *Zelurus singularis*, such as the corium of hemelytra mostly pale, orange (Fig. 45), similar to those of *Z. galvaoui* sp. nov. (Figs. 6-7, 30-31) and *Z. montivagus* (Figs. 37, 42), the species was also included in this study.

Type material. *Zelurus singularis* Lent & Wygodzinsky, 1947 [CTIOC]. **Holotype male:** [bordered label:] [handwritten:] *Zelurus singularis* / n. sp. 10/946 / Wygod. & [printed:] H. LENT DET. // [bordered label:] [printed:] N. [handwritten:] 599 / [printed:] HEMIPTERA / [printed:] Inst. Oswaldo Cruz // [bordered printed label:] CTIOC / N°. 3174 // [written on typewriter:] Bosq // [handwritten:] San Juan // [handwritten:] fotografado [photographed] // [printed red bordered label:] HOLOTIPO [holotype].



Figures 45-48. *Zelurus singularis* Lent & Wygodzinsky, 1947, male holotype. 45-47. Scales: 3.0 mm. 45. Dorsal view. 46. Ventral view. 47. Lateral view. 48. Labels. /Holotipo macho. 45-47. Escalas: 3,0 mm. 45. Vista dorsal. 46. Vista ventral. 47. Vista lateral. 48. Etiquetas.

Comments. *Zelurus singularis* has a general similarity with the species studied here such as the dense and long setosity of the body, particularly on the legs; the general coloration, including corium mostly pale orange with dark portions on basal, medial and distal

portions; pale legs; and fore and middle femora and tibiae with a similar armature as recorded in the other species (Lent and Wygodzinsky 1951, 1955; this work) (Figs. 45-47). On the other hand, apart from the conspicuous large prominences on posterior lobe of pronotum, unique in the genus, the longer process of scutellum (Fig. 47) is prone to separate *Z. singularis* from the other species studied here.

Discussion

As *Zelurus galvaoi* sp. nov. shows more morphological similarities with *Z. montivagus* it would be considered as belonging to *fulvomaculatus* group of *Zelurus* sensu Lent and Wygodzinsky (1951, 1955). However, it is noteworthy that the groups (Costa Lima and Costa Leite 1950; Lent and Wygodzinsky 1951; Lent and Wygodzinsky 1954; Lent and Wygodzinsky 1968) as well as the “divisions” (Stål 1859, 1872) formerly stated within *Zelurus* are in need of a more thorough evaluation, including cladistic studies in order to clarify their validity. Therefore, the systematic relationship of the new species with other species such as *Z. abalosi*, *Z. montivagus* and *Z. singularis*, even if the similarities recorded among them are taken into account, must also be clarified with the aforementioned approaches in more comprehensive future studies, including more species of the genus.

Acknowledgments

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