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RESEARCH PAPER

Oblongiala zimbabwensis, a new assassin bug genus and species from Zimbabwe, with a key to the Afrotropical genera of Peiratinae (Hemiptera: Heteroptera: Reduviidae)

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Abstract. *Oblongiala zimbabwensis* Liu & Cai gen. & sp. nov. is described from Zimbabwe and placed in the subfamily Peiratinae (Hemiptera: Reduviidae). Habitus, male genitalia and some diagnostic characters of the new species are illustrated. The affinities of the new genus are discussed with a key provided to help distinguish peiratine genera distributed in the Afrotropical Region.

Key words. Hemiptera, Heteroptera, Reduviidae, Peiratinae, assassin bug, taxonomy, key, new genus, new species, Zimbabwe, Afrotropical Region

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Introduction

Containing more than 300 described species in 32 genera, Peiratinae is the sixth largest subfamily in Reduviidae (Maldonado Capriles 1990, Coscarón 2002, Chłond 2007, Zhang & Weirauch 2011, Melo 2012, Weirauch et al. 2014, Swanson 2019, Liu et al. 2020). Peiratinae can be easily distinguished from other reduviid subfamilies by the anterior pronotal lobe being distinctly longer than the posterior lobe, the elongated fore coxa, the prominent fossula spongiosa and the asymmetric male genitalia. Most peiratine species are predators living on the ground and can be attracted to light (Weirauch et al. 2014, Swanson 2019).

Subfamily Peiratinae is distributed worldwide but reaches its greatest diversity in the Afrotropical Region and the Neotropical Region. So far, 17 valid genera of this subfamily have been recorded in the Afrotropical Region, three of which, *Bekilya* Villiers, 1949, *Hovacoris* Villiers, 1964 and *Pseudolestomerus* Villiers, 1964 are endemic to Madagascar (Maldonado Capriles 1990, Zhang & Weirauch 2011, Chłond & Bugaj-Nawrocka 2015, Swanson 2019, Liu et al. 2020). Comprehensive taxonomic studies have been carried out on about half of Afrotropical peiratine genera, including the redescriptions of *Parapirates* Villiers, 1959 (Coscarón 1995) and *Rapites* Villiers, 1948 (Coscarón 1999) as well as the revisions of *Peirates* Serville, 1831 (Coscarón & Morrone 1995, Coscarón 1997), *Pachysandalus* Jeannel, 1916 (Coscarón 2002), *Bekilya* Villiers, 1949 and *Hovacoris* Villiers, 1964 (Zhang & Weirauch 2011), *Sirthenea* Spinola, 1837 (Chłond 2018) and *Neopirates* Miller, 1952 (Liu et al. 2020).

After examining Peiratinae in the collection of the Natural History Museum, London, we found a unique specimen collected from Zimbabwe which could not be placed in any known genus. In the present paper, we erect a new genus for this new species, describe both taxa and provide illustrations of external and male genitalic features of the new species. Several similar genera are briefly compared with the new genus and a key is provided to identify the genera of Peiratinae in the Afrotropical Region.

Material and methods

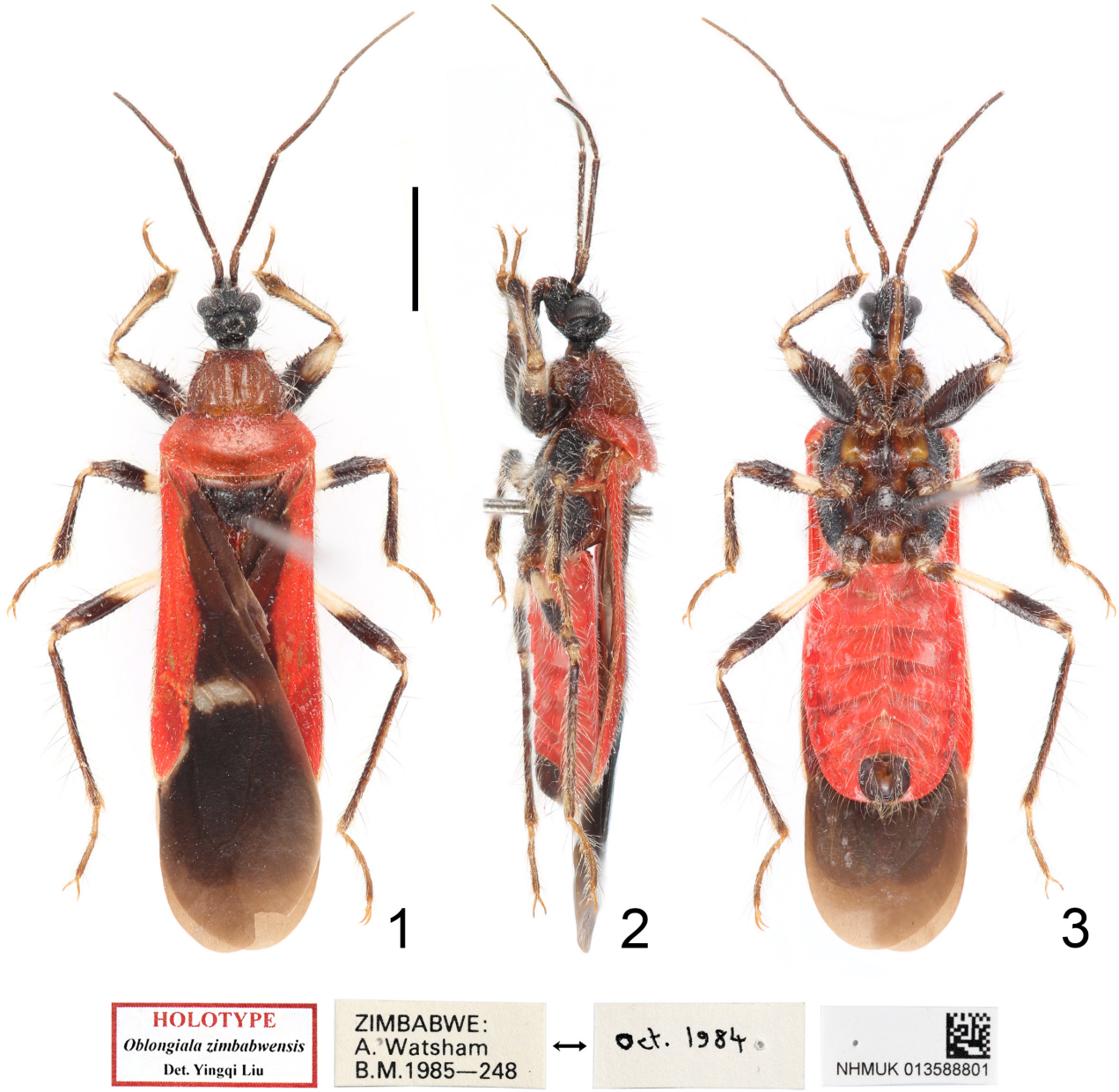
The holotype of the new species is kept in the collection of the Natural History Museum (NHMUK), London, UK. Male genitalia were soaked in hot 20% lactic acid solu-

tion for approximately ten minutes to remove soft tissue, rinsed in distilled water and dissected under a dissecting microscope. Dissected genitalia were placed in a vial with glycerin and pinned under the corresponding specimen after examination. Images were taken using a Canon 7D Mark II digital camera with Canon EF 100 mm micro lens and MP-E 65 mm micro lens. Helicon Focus version 5.3 was used for image stacking. Measurements were obtained using a calibrated micrometer. Body length represents the distance between the apex of the head and tip of the abdomen in resting condition. The key to the Afrotropical genera is based on the keys provided by Villiers (1948, 1968), Zhang & Weirauch (2011) and Swanson (2019) and our examination of type specimens of some Afrotropical species deposited in the Muséum national d'Histoire naturelle, France, Institut Royal des Sciences Naturelles de Belgique, Belgium and the Musée royal de l'Afrique centrale, Belgium. Morphological terminology mainly follows Cai & Taylor (2006) and Zhang & Weirauch (2011).

Taxonomy

Key to the Afrotropical genera of Peiratinae

1 Anteocular part of head more than 3 times as long as postocular; antennal insertion approximately at middle of anteocular part of head. .... ***Sirthenea*** Spinola, 1837
– Anteocular part of head less than 3 times as long as postocular; antennal insertion near anterior margin of eye (Fig. 6). 2
2 Transverse sulcus of pronotum obsolete or slight; metapleural sulcus represented only by single curved carina. ..... ***Neopirates*** Miller, 1952
– Transverse sulcus of pronotum distinct (Fig. 5); metapleural sulcus created by two closely situated ridges (Fig. 6). 3
3 Fore tibia strongly curved. ..... ***Phalantus*** Stål, 1863
– Fore tibia more or less straight (Fig. 8) or slightly recurved apically. 4
4 Fore tibia swollen near apex, fossula spongiosa reduced to brush of hairs occupying ventral surface of swollen portion. ..... ***Rapites*** Villiers, 1948
– Fore tibia not distinctly swollen near apex, fossula spongiosa typical (cushion-like expanded area composed of thousands of minute hairs) (Fig. 8). 5
5 Fore and mid tibiae dorsally flattened, carinate laterally; anterior pronotal lobe widened transversely, width of anterior lobe almost twice its length. ..... ***Androclus*** Stål, 1863
– Fore and mid tibiae nearly cylindrical or clavate, not carinate laterally (Figs 8, 9); width of anterior pronotal lobe less than twice its length (Fig. 5) or even less than its length. 6
6 Head width subequal to length; abdomen nearly rounded rectangular in cross section. ..... ***Parapirates*** Villiers, 1959
– Head width shorter than length (Fig. 5); abdomen oval in cross section (Fig. 11). 7
7 Interocular distance more than 3 times longer than width of eye in dorsal view. ..... ***Fusius*** Stål, 1862
– Interocular distance less than 2.5 times longer than width of eye in dorsal view (Fig. 5). 8
8 Fore tibia with fossula spongiosa occupying more than half of tibial length. 9
– Fore tibia with fossula spongiosa occupying less than half of tibial length (Fig. 8). 11
9 Interocellar distance more than 3 times longer than width of ocellus in dorsal view. ..... ***Lamotteus*** Villiers, 1948
– Interocellar distance less than 2.5 times longer than width of ocellus in dorsal view. 10
10 Most of body surface covered with white, procumbent, short pubescence; pronotum distinctly tuberculate. ..... ***Pteromalestes*** Miller, 1959
– Body surface without or with only coxal cavities covered with white, procumbent, short pubescence; pronotum smooth or slightly coarsely textured, without tubercles. ..... ***Ectomocoris*** Mayr, 1865
11 Fore femur with denticles on ventral surface (Fig. 8). 12
– Fore femur without denticles on ventral surface. ... 15
12 Head, pronotum, scutellum and legs with relatively short setae; anterior pronotal lobe without tubercles. ..... ***Lestomerus*** Amyot & Serville, 1843
– Head, pronotum, scutellum and legs with notably long setae (Figs 1–3); anterior pronotal lobe with tuberculate stripes (Fig. 5). 13
13 Anteocular part of head less than 1.5 times as long as postocular (Fig. 6); middle femur with denticles on ventral surface (Fig. 9). ..... ***Oblongiala* gen. nov.**
– Anteocular part of head slightly more than twice as long as postocular; middle femur without denticles on ventral surface. 14
14 Membrane of hemelytron with whitish patch (for macropterous male); posterior pronotal lobe much wider and slightly shorter than anterior lobe (for macropterous male); sixth and seventh abdominal tergites without a large patch of orange setae (for brachypterous female). ..... ***Bekilya*** Villiers, 1949
– Membrane of hemelytron entirely brown (for macropterous male); posterior pronotal lobe slightly wider and much shorter than anterior lobe (for macropterous male); sixth and seventh abdominal tergites with a large patch of orange setae (for brachypterous female). ..... ***Hovacoris*** Villiers, 1964
15 Body length about 5.5 mm; anterior pronotal lobe with a strongly depressed, median, longitudinal sulcus on posterior half. ..... ***Microcleptocoris*** Villiers, 1968
– Body length over 6 mm; anterior pronotal lobe broadly depressed or with a shallow, median longitudinal sulcus on posterior half. 16
16 Neck without 1+1 tubercles; anterior pronotal lobe with indistinct stripes. ..... ***Pachysandalus*** Jeannel, 1916
– Neck with 1+1 tubercles; anterior pronotal lobe with distinct stripes. 17
17 Anterior pronotal lobe rounded with lateral margin arcuate; apex of scutellar process knob-shaped. ..... ***Peirates*** Serville, 1831



Figs 1–3. *Oblongiala zimbabwensis* sp. nov., holotype, ♂, habitus. 1 – dorsal view; 2 – lateral view; 3 – ventral view. Scale bar: 2.00 mm.

– Anterior pronotal lobe somewhat quadrilateral with posterior half of lateral margin nearly straight; apex of scutellar process strongly compressed laterally. .... ***Pseudolestomerus*** Villiers, 1964

Oblongiala Liu & Cai, gen. nov.

Type species. *Oblongiala zimbabwensis* Liu & Cai sp. nov., here designated.

Diagnosis. Only macropterous male known. Body slender, small sized; head, pronotum, scutellum and legs with notably long setae (Figs 1–3); postocular part of head ellipsoidal, somewhat swollen (Fig. 5); anterior pronotal lobe with tuberculate stripes; transverse sulcus of pronotum somewhat sinuate (Fig. 5); scutellar process slender and horizontal (Figs 5, 6); metapleural sulcus curved (Fig. 6); hind coxae separated from each other by width of one coxa (Fig. 7); ventral surfaces of fore and middle femora with a row of denticles respectively (Figs 8, 9); fore and middle tibiae with fossula spongiosa occupying only apex of ventral surfaces (Figs 8, 9); hemelytron distinctly surpassing tip of abdomen, length of hemelytron nearly as long as body length; hind wing also distinctly surpassing tip of abdomen (Fig. 11); male genitalia with median pygophore process hook-shaped in caudal view (Fig. 14); parameres paddle-shaped (Figs 16, 17); basal plate bridge about 1.5 times longer than basal plate (Fig. 18); dorsal phallothecal sclerite broad with apex rounded (Figs 18, 20, 21).

Etymology. The generic name, *Oblongiala* is derived from Latin *oblongus* (meaning "elongated") and *ala* (meaning "wing"), referring to the elongated wings of this new genus. Gender feminine.

Distribution. Afrotropical Region (Zimbabwe).

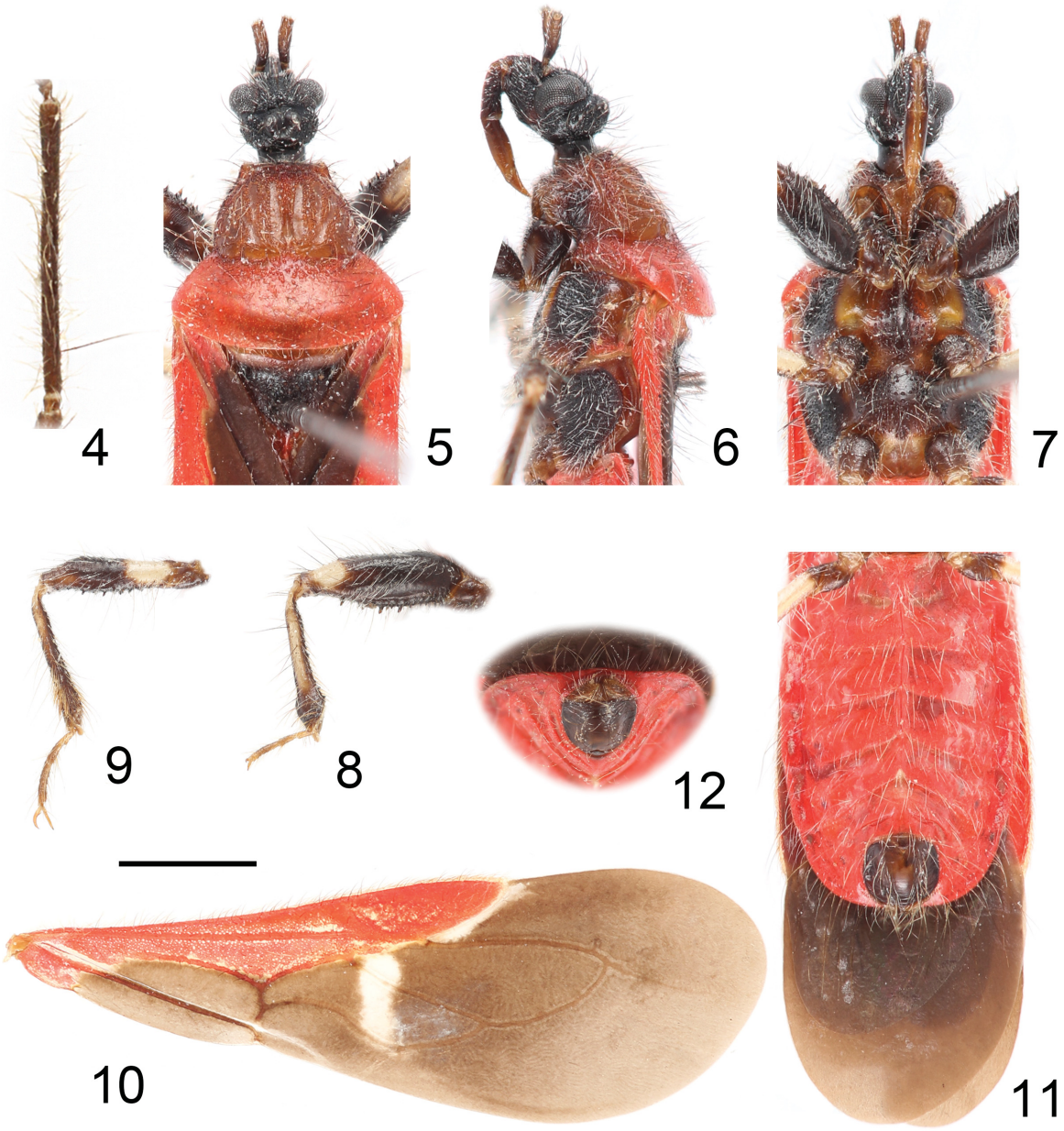
Oblongiala zimbabwensis Liu & Cai, sp. nov.

(Figs 1–21)

Type locality. Zimbabwe.
Type material. HOLOTYPE: ♂ (NHMUK), **ZIMBABWE**: "HOLOTYPE / *Oblongiala zimbabwensis* / Det. Yingqi Liu" // "ZIMBABWE: / A. Watsham B.M. / 1985-248" – "Oct. 1984" on reverse // "NHMUK 013588801".

Diagnosis. Body colour bright red with most of head, pleura and sterna black; legs blackish brown with yellowish white markings; hemelytron bright red and dark brown in large part, membrane with a white slender rectangular spot near middle of inner cell and a white stripe along base of costal margin. Male genitalia with median pygophore process hook-shaped in caudal view and nearly straight, slightly constricted at apical 2/5 in lateral view; parameres paddle-shaped, left paramere slightly longer than right paramere; length of basal plate bridge about 1.5 times longer than basal plate; dorsal phallothecal sclerite broad with apex rounded; endosoma with a patch densely covered with scale-like tubercles.

Description. Male macropterous (Figs 1–3), female unknown. ***Colouration.*** Bright red. Head black with ventral surface of labium, apical half of second visible labial segment and third segment brown (Figs 5–7); antennal scape brown with base blackish brown, pedicel to distiflagellomere dark brown (Figs 1–3). Anterior pronotal lobe orange-brown, posterior lobe bright red (Fig. 5); scutellum black with scutellar process bright red (Fig. 5); pleura and sterna black with marginal area diffuse brown (Figs 6, 7). Legs with coxae blackish brown; trochanters dark brown (Fig. 7); fore femur blackish brown, apical portion with a yellowish white spot on dorsal and lateral



Figs 4–12. *Oblongiala zimbabwensis* sp. nov., holotype, ♂. 4 – antennal pedicel, lateral view; 5 – anterior part of body with antennae and legs removed, dorsal view; 6 – same, lateral view; 7 – same, ventral view; 8 – left fore leg, ventral view; 9 – right middle leg, ventral view; 10 – right hemelytron, dorsal view; 11 – abdomen, ventral view; 12 – same, caudal view. Scale bar: 1.50 mm.

surface (Fig. 8); middle femur blackish brown with base and apex dark brown, basal half with a yellowish white spot on dorsal and lateral surface (Fig. 9); basal half of hind femur yellowish white with base dark brown, apical half blackish brown, apex brown with a yellowish white spot on ventral surface (Figs 1, 3); fore and middle tibiae blackish brown, dorsal surfaces with a yellowish white stripe occupying 3/4 and 1/2 of tibial length respectively (Figs 8, 9); hind tibia dark brown with most of base yellowish white (Figs 1, 3); tarsi yellowish brown (Figs 1, 3). Hemelytron with clavus dark brown except base bright red; most of corium bright red, area between Cu and Pcu dark brown; membrane dark brown, apical half paler, with a white slender rectangular spot near middle of inner cell and a white stripe along base of costal margin (Fig. 10). Abdomen bright red except eighth abdominal sternite and pygophore blackish brown (Figs 11, 12), parameres brown with mottled red markings (Figs 12, 16, 17).

Structure. Body slender, small sized. Surfaces of head, stripes on anterior pronotal lobe, anterior portion of posterior lobe of pronotum, pleura and sterna tuberculate (Figs 5–7), surfaces of legs and abdomen coarsely textured. Head, pronotum, scutellum, femora and tibiae covered with brown, erect, long setae (Figs 1–3); antennae densely covered with yellowish white, suberect, short pubescence (Figs 1, 3), pedicel with several trichobothria on apical portion and one notably long trichobothrium near base (Fig. 4); pronotum, pleura, sterna, legs, lateral margin of corium and abdomen densely covered with white to yellowish white pubescence of varying lengths (Figs 1–3); corium densely covered with black, suberect, short setae (Figs 1, 10).

Figs 13–21. Male genitalia of *Oblongiala zimbabwensis* sp. nov., holotype. 13 – pygophore, ventral view; 14 – same, caudal view; 15 – same, lateral view; 16 – left paremere, outer ventrolateral view; 17 – right paramere, outer ventrolateral view; 18 – phallus, dorsal view; 19 – same, ventral view; 20 – same, lateral view; 21 – same, lateral view. Scale bar: 0.50 mm (Figs 13–15), 0.40 mm (Figs 16–21).

Head moderately elongate, drop-shaped in dorsal view, anteocular part of head about 1.43 times as long as postocular part, postocular part ellipsoidal, somewhat swollen, interocular distance with a median, short, deep sulcus connecting to frontoclypeal sulcus (Fig. 5). Eye large, reniform in lateral view, nearly reaching dorsal and ventral margins of head (Fig. 6); transverse width of eye in dorsal view longer than half width of interocular distance (Fig. 5). Ocelli elevated (Fig. 6), separated from each other by more than one width of ocellus (Fig. 5). Antenna gracile, scape thickest and shortest, apical three segments subequal in length (Figs 1, 3). First and second visible labial segments thick, second segment longest, third segment tapered and shortest (Figs 6, 7). Neck without 1+1 tubercles (Figs 5, 7).

Pronotum with collar process not prominent, apex obtuse-angulate, anterior margin nearly straight; anterior pronotal lobe with a median, longitudinal depression on posterior half, tubercles on anterior pronotal lobe arranged in stripes; anterior lobe about 1.26 times as long as posterior lobe; transverse sulcus of pronotum somewhat sinuate; lateral pronotal angle round, posterior margin of pronotum nearly straight in middle and oblique bilaterally (Fig. 5). Scutellum triangular, Y-shaped ridges narrow, disc of scutellum flat, scutellar process slender and horizontal (Figs 5, 6). Stridulitrum long with total-striate type of sculpture (Fig. 7). Metapleural sulcus curved (Fig. 6). Middle of mesosternum slightly carinate (Fig. 7). Fore coxa elongated, middle coxae separated from each other by more than one width of coxa, hind coxae separated from each other by one width of coxa (Fig. 7); fore femur slightly incrassate, ventral surfaces of fore and middle femora with a row of denticles respectively (Figs 8, 9); fore and middle tibiae somewhat clavate, gradually incrassate to apex, with fossula spongiosa occupying only apex of ventral surfaces (Figs 8, 9). Hemelytron distinctly surpassing tip of abdomen, length of hemelytron (7.76 mm) nearly the same as body length (7.91 mm); two cells on membrane elongate and narrow (Fig. 10). Hind wing also distinctly surpassing tip of abdomen (Fig. 11).

Abdomen oval; connexivum not dilated, abdomen only 1.04 times wider than posterior lobe of pronotum; venter of abdomen with a median, longitudinal ridge running from anterior margin of second abdominal sternite to posterior margin of seventh abdominal sternite (Fig. 11).

Pygophore oval with anterior half somewhat quadrate in ventral view (Fig. 13); median pygophore process hook-shaped, oblique to right side in caudal view, middle of ventral surface carinate (Fig. 14), and nearly straight, slightly constricted at apical 2/5 in lateral view (Fig. 15). Parameres paddle-shaped, apical half broad and round, left paramere (Fig. 16) slightly longer than right paramere (Fig. 17). Phallus with phallobase moderately sclerotized, basal plate bridge about 1.5 times longer than basal plate (Fig. 18); pedicel nearly straight, only curved at base and length of pedicel subequal to length of basal plate (Fig. 20). Dorsal phallothecal sclerite strongly sclerotized, broad with apex rounded (Figs 18, 20, 21); lateral phallothecal sclerite weakly sclerotized, nearly membranous (Figs 20, 21). Endosoma with a patch densely covered with scale-like tubercles (Figs 18, 21).

Measurements [in mm, ♂ (n = 1)]. Body length 7.91; maximum width of abdomen 2.49; head length 1.30; length of anteocular part 0.50; length of postocular part 0.35; head width 0.98; eye width in dorsal view 0.27; width of interocular distance 0.45; width of interocellar distance 0.10; lengths of labial segments I : II : III = 0.54 : 0.71 : 0.33; lengths of antennal segments I : II : III : IV = 0.57 : 1.60 : 1.55 : 1.50; length of anterior pronotal lobe 1.17; length of posterior pronotal lobe 0.93; width of anterior pronotal lobe 1.54; width of posterior pronotal lobe 2.40; scutellum length 1.10; maximum width of scutellum 1.21; hemelytron length 7.76.

Etymology. The specific epithet is derived from the type locality (Zimbabwe) of this new species; adjective.

Distribution. Zimbabwe (this paper).

Remarks. In the Afrotropical Region, *Oblongiala* gen. nov. shares a number of characters with the *Bekilya* group (comprising *Bekilya* and *Hovacoris*, see Zhang & Weirauch 2011), such as head, pronotum, scutellum and legs with notably long setae, tuberculate stripes on anterior pronotal lobe and neck without 1+1 tubercles. In addition, males of *Bekilya* also have relatively well-developed wings, like those of *Oblongiala* gen. nov.

Nevertheless, *Oblongiala* gen. nov. can be easily separated from the *Bekilya* group by the following external characters: anteocular part of head less than 1.5 times as long as postocular (vs. anteocular part of head slightly more than twice as long as postocular in *Bekilya* group); transverse sulcus of pronotum somewhat sinuate (vs. transverse sulcus of pronotum almost straight in *Bekilya* and clearly curved in *Hovacoris*) and middle femur with denticles on ventral surface (vs. middle femur without denticles in *Bekilya* group). In addition, the following differences in the male genitalia can be used to separate *Oblongiala* gen. nov. from the *Bekilya* group, the latter described and illustrated by Zhang & Weirauch (2011: Figs 3-H3, 3-J1, 3-J2, 3-J3, 6): median pygophore process hook-shaped in caudal view (vs. median pygophore process bent and gradually tapered in caudal view in *Bekilya* group) and dorsal phallothecal sclerite broad with apex rounded (vs. apex of dorsal phallothecal sclerite sharply projected in *Bekilya* group). *Oblongiala* gen. nov. also differs from *Bekilya* in interocular distance longer than width of eye in dorsal view (vs. interocular distance much less than width of eye in dorsal view in *Bekilya*); scutellar process slender and horizontal (vs. scutellar process short and knob-shaped in *Bekilya*) and differs from *Hovacoris* in the posterior pronotal lobe being much wider and slightly shorter than the anterior lobe (vs. posterior pronotal lobe slightly wider and much shorter than anterior lobe in *Hovacoris*); Y-shaped ridges of scutellum narrow (vs. Y-shaped ridges of scutellum laterally swollen in *Hovacoris*).

Another peiratine genus, *Lestomerus* Amyot & Serville, 1843, also has denticles on the ventral surfaces of both fore femur and middle femur, as in *Oblongiala* gen. nov., but the latter can be clearly distinguished from

Lestomerus by the smaller body size, the brighter colouration, the longer and denser setation and the tuberculate stripes on the anterior pronotal lobe.

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