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## Research article

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# A new leafhopper genus with two new species related to *Masiriipius* Dlabola, 1981 (Hemiptera, Deltocephalinae, Cicadellidae, Opsiini)

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**Abstract.** The genus *Oshaibahus* El-Sonbati & Wilson gen. nov. is described with the type species *Platymetopius zizyphi* Bergevin, 1922. Two new species, *O. kadiae* El-Sonbati & Wilson gen. et sp. nov. from Sudan and *O. linnauviorii* El-Sonbati & Wilson gen. et sp. nov. from Iraq are described, and a new combination, *Oshaibahus zizyphi* (Bergevin, 1922) gen. et comb. nov. is proposed. The genus *Masiriipius* Dlabola, 1981 (type species: *Mahalana lugubris* Distant, 1918) is redefined. An illustrated key to genera of the subtribe Opsiina and a key to species of *Oshaibahus* gen. nov. are presented to facilitate identification.

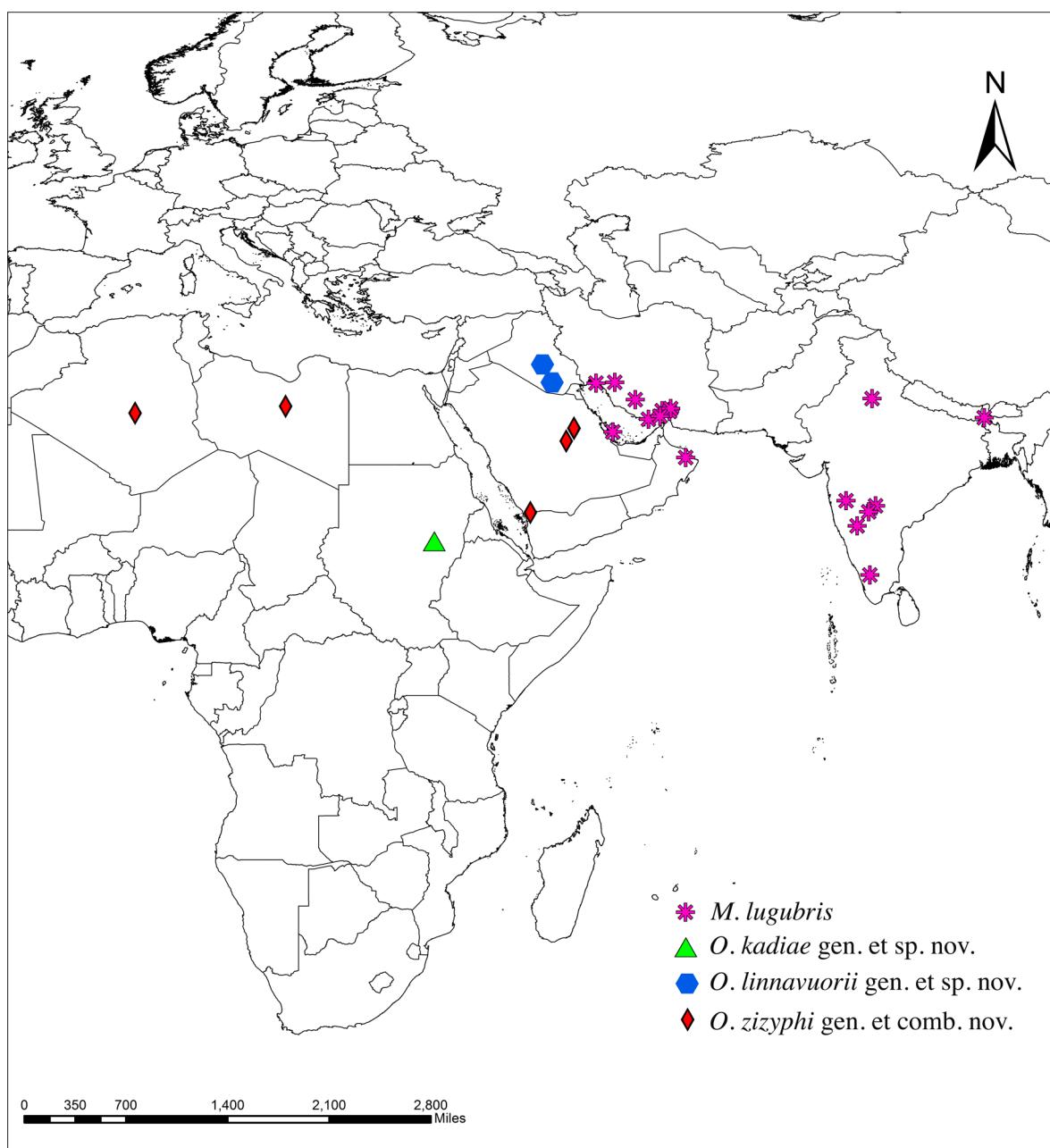
**Keywords.** Hemiptera, Auchenorrhyncha, Cicadellidae, Deltocephalinae, Opsiini, leafhoppers.

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## Introduction

Leafhoppers are an important group of insects for their often high abundance, host plant specialization, plant disease transmission, and response to environmental disturbance (Nielson & Knight 2000; Hollier *et al.* 2005; Zahniser & Dietrich 2008; Hamilton & Whitcomb 2010). The leafhopper tribe Opsiini is one of the most important tribes in the subfamily Deltocephalinae and species of this tribe are important vectors of viral and bacterial (phytoplasma and spiroplasma) phytopathogens (Nielson 1968; Fletcher & Wayadande 2002; Weintraub 2007; Munyaneza *et al.* 2008).

In this paper, we describe a new genus in the Opsiini—*Oshaibahus* El-Sonbati & Wilson gen. nov.—and two new species: *O. kadiae* El-Sonbati & Wilson gen. et sp. nov. from Sudan and *O. linnavuorii* El-Sonbati & Wilson gen. et sp. nov. from Iraq. The new genus is closely related to *Masiripius* Dlabola, 1981; male genitalia must be examined to distinguish between and separate the genera. The world distribution for both genera is shown in Fig. 1: *Oshaibahus* El-Sonbati & Wilson gen. nov. is known from Algeria, Libya, Iraq, Sudan and the Kingdom of Saudi Arabia (Muzahimiyah in Al Khararah and Rhodet Khorim, Figs 2–3); the known distribution of *Masiripius* includes India, Iran, and also Oman and Qatar of the Arabian Peninsula.



**Fig. 1.** World distribution of the genera *Oshaibahus* El-Sonbati & Wilson gen. nov. and *Masiripius* Dlabola, 1981.



**Figs 2–3.** Habitats of *Oshaibahus zizyphi* (Bergevin, 1922) gen. et comb. nov. **2.** Type locality: Muzahimiyah, Al Khararah, KSA. **3.** Additional locality: Rhodet Khorim, KSA.

## Material and methods

Specimens examined are deposited in King Saud University Museum of Arthropods, College of Food and Agriculture Sciences (KSMA), King Saud University, Riyadh, Saudi Arabia; in the National Museum of Wales, Cardiff, UK (NMWC) and in the American Museum of Natural History, New York, USA (AMNH). Genitalia preparations were made by soaking the excised apex of the abdomen in hot 10% KOH solution for 8–10 minutes. The apex of the abdomen was washed in distilled water and then transferred to glycerin for further dissection and examination. After examination, it was moved to fresh glycerin and stored in a micro vial pinned below the specimen. The distribution data were based on georeferencing material examined and plotted using Google Earth. The map was created using the program ArcGIS v.10.3. All specimens were examined with a Leica LABOPHOT-2 stereomicroscope, hand-drawings of the male genitalia were made with a NIKON microscope, with a drawing tube attachment. Images were taken using a Canon 70D DSLR attached to a Leica Z6 microscope. Individual source images were then stacked using Helicon Focus v.6.22 (Helicon Soft Ltd) extended depth of field software, with calibrated scale bars added using Syncroscopy Automontage v.5.4. Resultant images were saved as TIFFs (Tagged Image File Format) with LZW lossless compression at 3648 × 2432 pixel dimension. Morphological terminology follows Dietrich (2005). Measurements are in millimetres (mm).

This work was part of a M.Sc. degree program by the first author at King Saud University completed under the supervision of the second author at National Museum of Wales, Cardiff (NMWC).

## Abbreviations

### Morphology

A1, A2	=	claval veins
AD	=	anterodorsal
AM1	=	apical anteromedial
AV	=	anteroventral
PD	=	posterodorsal
PV	=	posteroventral

### Country

KSA	=	Kingdom of Saudi Arabia
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### Institutions

AMNH	=	American Museum of Natural History, New York, U.S.A.
BMNH	=	The Natural History Museum, London, U.K.
GKVK	=	The University of Agricultural Sciences, Bangalore, India
KSMA	=	King Saud University Museum of Arthropods, College of Food and Agriculture Sciences, Kingdom of Saudi Arabia
MNHN	=	Muséum national d'Histoire naturelle, Paris, France
NMWC	=	National Museum of Wales, Cardiff, U.K.
USDA-APHIS	=	US Department of Agriculture -Animal and Plant Health Inspection Service

## Results

### Key to genera of subtribe Opsiina (mostly based on males)

1. Crown with broad red arcuate transverse band at midlength ..... 2
  - Crown without broad red arcuate transverse band at midlength ..... 4
2. Pronotum with large median red spot; pair of sublateral longitudinal markings more or less continuous with spots on forewing clavus; scutellum with median red longitudinal stripe; forewing with three large oblong red or orange spots on claval area ..... 3
  - Pronotum without large median red spot; pair of sublateral longitudinal markings not continuous with forewing clavus; scutellum without median red longitudinal stripe; forewing without spots ..... *Introrsa* Dai & Zhang, 2010
3. Pygofer with paired inner processes arising dorsally; aedeagus with paired shafts and two gonopores, aedeagal shaft with apical processes ..... *Lampridius* Distant, 1918
  - Pygofer without inner process; aedeagus with one shaft and one gonopore, aedeagal shaft without apical process ..... *Paralampridius* Dai, Dietrich & Zhang, 2011
4. Crown, pronotum and scutellum with irregular red markings ..... 5
  - Crown, pronotum and scutellum not like above ..... 6
5. Abdomen with well-developed apodemes; Aedeagus without basal process ..... *Masiripius* Dlabola, 1981
  - Abdomen without apodemes; Aedeagus with basal process ..... *Oshaibahus* El-Sonbati & Wilson gen. nov.
6. Forewings, yellow, ivory or silvery white, occasionally with brown patches, particularly, wings at rest with large brown semicircular spot against midlength of commisural margin forming, and conspicuous circular spot along with that of opposite side ..... 7
  - Not like above ..... 10
7. Aedeagus with atrium not extending ventrad of shafts ..... *Hishimonus* Ishihara, 1953
  - Aedeagus with atrium extending ventrad of shafts ..... 8
8. Aedeagus without ventral processes ..... *Naevus* Knight, 1970
  - Aedeagus with ventral processes ..... 9
9. Aedeagal with a pair of ventral processes ..... *Litura* Knight, 1970
  - Aedeagal with unpaired ventral process bifurcate in apical half ..... *Libengaia* Linnauvori, 1969
10. Forewing, vertex, pronotum, and scutellum with dark-brown vermiculate lines ..... 11
  - Forewing, vertex, pronotum, and scutellum not like above ..... 13
11. Aedeagus with parallel or diverging or slightly converging branches, apices of branches with hooked process; in Pacific distribution; Pronotum and forewing without dark-brown filigranous stripes ..... *Nesophrosyne* Kirkaldy, 1907
  - Aedeagus with parallel or diverging or slightly converging branches, apices of branches without hooked process; pronotum and forewing with dark-brown filigranous stripes ..... 12
12. Aedeagus with parallel or diverging or slightly converging branches, apices of branches narrowly produced, neither reflexed nor hooked. ..... *Orosius* Distant, 1918

– Aedeagus with diverging branches bent inwards at midlength. Apices of branches distinctive curved or reflexed to form distinctive tips .....	<b><i>Paraorosius</i></b> El-Sonbati & Wilson, 2016
13. Aedeagus with basal process .....	14
– Aedeagus without basal process .....	25
14. Aedeagus socle with dorsal process .....	15
– Aedeagus socle with ventral process .....	17
15. Crown, pronotum and scutellum with irregular red markings .....	
.....	<b><i>Oshaibahus</i></b> El-Sonbati & Wilson gen. nov.
– Crown, pronotum and scutellum with irregular red markings .....	16
16. Anterior margin of head never with carinae or ridge, face convex, and neither horizontal nor concave .....	<b><i>Opsioides</i></b> Fieber, 1866 (in part)
– Anterior margin of head angularly curved to the face with a distinct angle .....	
.....	<b><i>Phlepsopsius</i></b> Dlabola, 1979
17. Aedeagal shafts curved backwards beyond the base of aedeagus .....	<b><i>Afrascius</i></b> Linnauori, 1969
– Aedeagal shafts not curved backwards beyond the base of aedeagus .....	18
18. Aedeagus with unpaired ventral process at base .....	<b><i>Norva</i></b> Emeljanov, 1969
– Aedeagus with pair of ventral processes at base .....	19
19. Aedeagus with 2 or 3 pairs of basal processes .....	<b><i>Hishimonoides</i></b> Ishihara, 1965
– Aedeagus with a pair of basal processes .....	20
20. Aedeagus nearly square basal socle in ventral aspect .....	21
– Aedeagus not square basal socle in ventral aspect .....	22
21. Aedeagus phragma forming a pair of large roundedly squarish plate ....	<b><i>Satsumanus</i></b> Ishihara, 1953
– Aedeagus phragma not forming a pair of large roundedly squarish plate .....	
.....	<b><i>Opsianus</i></b> Linnauori, 1960
22. Aedeagal with unpaired ventral process bifurcate in apical half .....	<b><i>Libengaia</i></b> Linnauori, 1969
– Aedeagal with a pair of ventral processes .....	23
23. Forewings, yellow, ivory or silvery white, occasionally with brown patches, particularly, wings at rest with large brown semicircular spot against midlength of commisural margin forming, and conspicuous circular spot along with that of opposite side .....	<b><i>Litura</i></b> Knight, 1970
– Not like above .....	24
24. Apical part of costal margin with reflexed dark false-veilets; connective much longer than aedeagus; apophysis of style thicker .....	<b><i>Navaia</i></b> Linnauori, 1960
– Apical part of costal margin without reflexed dark false-veilets; connective much shorter than aedeagus; apophysis of style very long, slender and straight .....	<b><i>Aladzoa</i></b> Linnauori, 1969
25. Pygofer with process .....	26
– Pygofer without process .....	27
26. Crown with broad red arcuate transverse band at midlength; pronotum with large median red spot; pair of sublateral longitudinal markings more or less continuous with spots on forewing clavus;	

- scutellum with median red longitudinal stripe; forewing with three large oblong red or orange spots on claval area ..... *Lampridius* Distant, 1918
- Crown, pronotum, scutellum and forewing with median yellowish longitudinal stripe flanked laterally by solid fuscous marking extending into tegmina with translucent and yellow cells ..... *Xerophytacolus* Stiller, 2012
  
- 27. Crown with broad red arcuate transverse band at midlength ..... 28
  - Crown without broad red arcuate transverse band at midlength ..... 29
  
- 28. Pronotum with large median red spot; pair of sublateral longitudinal markings more or less continuous with spots on forewing clavus; scutellum with median red longitudinal stripe; forewing with three large oblong red or orange spots on claval area ..... *Paralampridius* Dai, Dietrich & Zhang, 2011
  - Pronotum without large median red spot; pair of sublateral longitudinal markings not continuous with forewing clavus; scutellum without median red longitudinal stripe; forewing without spots ..... *Introrsa* Dai & Zhang, 2010
  
- 29. Crown, pronotum and scutellum with irregular red markings ..... *Masiripius* Dlabola, 1981
  - Crown, pronotum and scutellum without irregular red markings ..... 32
  
- 30. Pronotum and forewing without dark-brown filigranous stripes; apices of aedeagal branches with hooked process ..... *Nesophrosyne* Kirkaldy, 1907
  - Pronotum and forewing with dark-brown filigranous stripes; apices of aedeagal branches without hooked process ..... 31
  
- 31. Aedeagus with parallel or diverging or slightly converging branches, apices of branches narrowly produced, neither reflexed nor hooked ..... *Orosius* Distant, 1918
  - Aedeagus with diverging branches bent inwards at midlength. Apices of branches distinctive curved or reflexed to form distinctive tips ..... *Paraorosius* El-Sonbati & Wilson, 2016
  
- 32. Subgenital plate without macrosetae; pygofer lobe medially with dense cluster of setae ..... *Xerophytavorus* Stiller, 2012
  - Subgenital plate with macrosetae; pygofer lobe medially without dense cluster of setae ..... 33
  
- 33. Forewing with dark brown border to medial spot of approximately constant width ..... 34
  - Forewing without dark brown spots ..... 35
  
- 34. Aedeagus with shafts directed posteriorly at base and curving dorsally; atrium not extending ventrad of shafts ..... *Hishimonus* Ishihara, 1953
  - Aedeagus with shafts directed ventroposteriorly at base and curving dorsally; atrium extending ventrad of shafts ..... *Naevus* Knight, 1970
  
- 35. Aedeagus with long apical barblike processes ..... *Kirkaldiella* Osborn, 1935
  - Aedeagus without long apical barblike processes ..... 36
  
- 36. Subgenital plate with additional lateral plate at base; four small plates, fused basally ..... *Alishania* Vilbaste, 1969
  - Subgenital plate without additional lateral plate at base ..... 37
  
- 37. Vertex narrows basally, diamond shaped; compound eye are very close to each other posteriorly ..... *Pugla* Distant, 1908

– Vertex narrows basally, diamond shaped; compound eye are very close to each other posteriorly ...	38
.....	
38. Anterior margin of head rounded, never with carina or ridge; with anal collar .....	
.....	
..... <i>Opsius</i> Fieber, 1866 (in part)	
– Anterior margin of head angulate, with transverse carina; without anal collar <i>Japananus</i> Ball, 1931	

Genus ***Masiripius*** Dlabola, 1981

*Masiripius* Dlabola, 1981: 273.

Type species: *Platymetopius zizyphi* Bergevin in Bergevin & Zanon, 1922 (misidentified type species). Viraktamath & Anantha Murthy 1999: 44. Type species: *Mahalana lugubris* Distant, 1918 by subsequent designation.

*Masiripius* – Oman *et al.* 1990: 228 [Listed, Platymetopiini]. — Viraktamath & Anantha Murthy 1999: 44 [redescribed].

### Diagnosis

The combination of three characters must be examined to distinguish *Masiripius* from all other genera of Opsiini: (1) aedeagus without basal process with two shaft branches arising from base, (2) each shaft gradually narrowing at apex, and (3) vertex, pronotum, and scutellum with irregular red markings.

### Description

BODY LENGTH. Male 3.8 mm, female 4.2 mm.

COLOURATION. Irregular red markings on vertex, pronotum and scutellum ground colour brownish yellow with numerous scattered brown spots and irregular reddish-brown spots.

HEAD. Head as wide as pronotum, crown slightly shorter next to eye than median length, vertex punctate, shagreen and slightly more produced in male, longer than next to eye in female, irregularly rugose, rounded to face. Frontoclypeus narrow, longer than wide, length more than  $2 \times$  of width; clypeal suture straight and obsolete medially, clypellus tapered, parallel-sided, greatly produced beyond gena, apical margin sinuate, wider or subequal to lorium width; gena slightly incised; ocelli situated on anterior margin of head and close to eye; mesal margin of eye entire; lateral frontal suture reaching ocellus and directed mesad of ocelli; antennae long; antennal ledge weakly developed; antennal base situated; near middle or posteroventral (lower) corner of eye.

THORAX. Pronotum with short lateral margin, irregular blotch-like striations and produced anterad of eyes, without carinae, about  $1.5 \times$  as long as scutellum; scutellum wider than long, with separate irregular blotch-like striations beyond scutellar suture.

WINGS. Forewings about  $3 \times$  as long as wide, appendix restricted to anal margin, A1-A2 veins coalescing over part of their length.

LEGS. Legs yellow with brown spots. Profemur row AM with AM1, one intercalary row with more than five fine setae (or greatly reduced or absent), two dorsoapical setae, AV row with numerous stout setae, slightly short; protibia AD row with numerous macrosetae, PV row with 1–4 macrosetae; metatibia arched throughout its length, PD row with long and short macrosetae alternating or subequal in length, AD row with macrosetae and smaller intercalary setae, AV row with numerous macrosetae and extending nearly to base; metafemur setal formula 2+2+1; metatarsomere I length equal or longer to tarsomeres II and III combined; setal areolae on legs.

MALE GENITALIA (Figs 11–19). Pygofer with well differentiated rows of macrosetae, without a process, long-curved ventral margin, long setulate apically; valve articulated with pygofer, with narrow point of articulation; subgenital plate with one row of macrosetae at apical margin; style bent, small, fingerlike, broadly bilobed median anterior lobe and preapical lobe well developed, tooth well-developed preapically; connective articulated with aedeagus, linear, the arms contiguous; aedeagus without basal process, aedeagal shafts arising from base.

FEMALE GENITALIA (Figs 20–22). Seventh sternite 1.5 × as broad at base as long medially, narrowed posteriorly, posterior margin broadly convex with rounded lobe deeply notched in middle. Ovipositor depressed beyond pygofer apex. First valvula medially convex. Second valvula gradually tapered apically with variable serrations on dorsal surface. Numerous macrosetae on pygofer.

### Distribution

Palaearctic (Oman *et al.* 1990).

### *Masiripius lugubris* (Distant, 1918)

Figs 4–22

*Mahalana lugubris* Distant, 1918: 64.—Metcalf 1967: 2204.

*Zizyphoides punctatus* Rao, 1967: 239.

*Masiripius zizyphi* — Dlabola 1981: 274.

*Masiripius lugubris* — Webb & Godoy 1993: 424. — Viraktamath & Anantha Murthy 1999: 44.

*Zizyphoides punctatus* — Bhattacharyna & Harb 1973: 391 (syn. *Masiripius lugubris* — Webb 1981: 50).

### Specimens examined

Iran: 1 ♂, Masiri, S Iran, 11–12 Jun. 1973 (NMP Loc. No. 235); gender unknown, same collection data; 1 ♂, Jashak, 60 km SE Khormui, S Iran, 20–21 Apr. 1977 (NMP Loc. No. 304); 1 ♀, 15 km NE Bandar Lengeh, S Iran, 25–26 Apr. 1977 (NMP Loc. No. 313); 2 ♂♂, 6 km W Geno, S Iran, alt. 400 m, 7–9 May 1977 (NMP Loc. No. 338); 1 ♂, 1 ♀, 25 km W Ghasre-ghaad, SE Iran, 9–10 Apr. 1973 (NMP Loc. No. 153); 1 ♀, 16 km W Sabzevaran, C Iran, alt. 820 m, 19–20 May 1977 (NMP Loc. No. 338); 1 ♂, Hormozgan Gurband, 26 Mar.–2 Apr. 2001, R. Linnavuori leg. (AMNH); 1 ♀, 1 ♂, Hormozgan Qeshm Ramkan, 14–15 May 2002, R. Linnavuori leg. (AMNH); 2 ♀♀, Hormozgan Road, 6–12 May 2002, R. Linnavuori leg. (AMNH); 1 ♂, Khuzestan Sadde-Dez, 6–7 Jun. 2005, R. & S. Linnavuori leg. (AMNH); 1 ♂, Fars, Baba Arab, 50 km SE Yahrom, 16–17 Jun. 2003, R. & S. Linnavuori leg. (AMNH); 1 ♂, Fars, Farrahsband, 14–15 Jun. 2008, R. Linnavuori leg. (AMNH).

OMAN: 14 ♂♂, 2 ♀♀, Ash Sharqiyah N.Gov., 20 km NW Ibra, 22°44'12" N, 58°35'50" E, M.R. Wilson leg. (NMWC & KSMA).

QATAR: 1 ♀, Doha, Al Rayyan, 27 Apr. 2014, 25°18'0" N, 51°19'47" E, M.R. Wilson leg. (NMWC).

### Description

See genus *Masiripius*.

### Distribution

India (Metcalf 1967), Iran (Dlabola 1981), Oman and Qatar (present study).

Genus ***Oshaibahus*** El-Sonbati & Wilson gen. nov.  
[urn:lsid:zoobank.org:act:F3FA5987-C661-4D25-9CCD-E5F1467ACFFE](https://doi.org/10.1545/ejt.1700001)  
Figs 23–72

Type species: *Platymetopius zizyphi* Bergevin in Bergevin & Zanon, 1922.

### Diagnosis

*Oshaibahus* gen. nov. is externally similar to *Masiripius* (except *O. kadiae* gen. et sp. nov.) as both genera have irregular red markings on vertex, pronotum, and scutellum. These markings also occur in the opsiine genera, *Lampridius* Distant, 1918, *Paralampridius* Dai, Dietrich & Zhang, 2011 and *Introrsa* Dai & Zhang, 2010. Both *Lampridius* and *Paralampridius* can be easily distinguished externally from *Oshaibahus* gen. nov. and *Masiripius* by the vertex having a broad red arcuate transverse band at midlength, pronotum with large median red spot, pair of sublateral longitudinal markings approximately continuous with spots on forewing clavus, scutellum with median red longitudinal stripe; forewing with three large oblong red or orange spots on claval area. *Introrsa* can be distinguished by a distinctive pair of similar black spots at apex of crown, transverse orange convex fascia at anterior margin; pronotum with six orange longitudinal lines on posterior portion, and scutellum with black spot at apex.

The separation and distinctiveness of *Masiripius* from *Oshaibahus* gen. nov. is based on the basal process, apical shaft branches of the aedeagus and apodemes. In *Masiripius*, the aedeagus lacks a basal process, the shafts are relatively straight, narrowing at the apex. Additionally, the abdomen has well-developed apodemes. In *Oshaibahus* gen. nov., the aedeagus bears a basal process branching from base curving preapically with a stout apex. The abdomen lacks basal apodemes.

Both *Masiripius* and *Oshaibahus* gen. nov. share characters with numerous genera of Opsiina including *Afrasciuss* Linnauvori, 1969, *Pugla* Distant, 1908, *Japananus* Ball, 1931 (Zahniser & Dietrich 2013). Both *Masiripius* and *Oshaibahus* gen. nov. can be distinguished easily from *Afrasciuss* and *Japananus* by the absence of a marginal carina on the pronotum and the aedeagal shafts separated at the base, and from *Pugla* by the absence of a marginal carina on the pronotum, with compound eyes narrowly separated forming diamond-shaped crown.

### Etymology

This genus is named in honour of Prof. Alaa Oshaibah, Systematic Entomologist, Department of Zoology, Faculty of Science, Al-Azhar University, Cairo, Egypt. The gender is considered masculine.

### Description

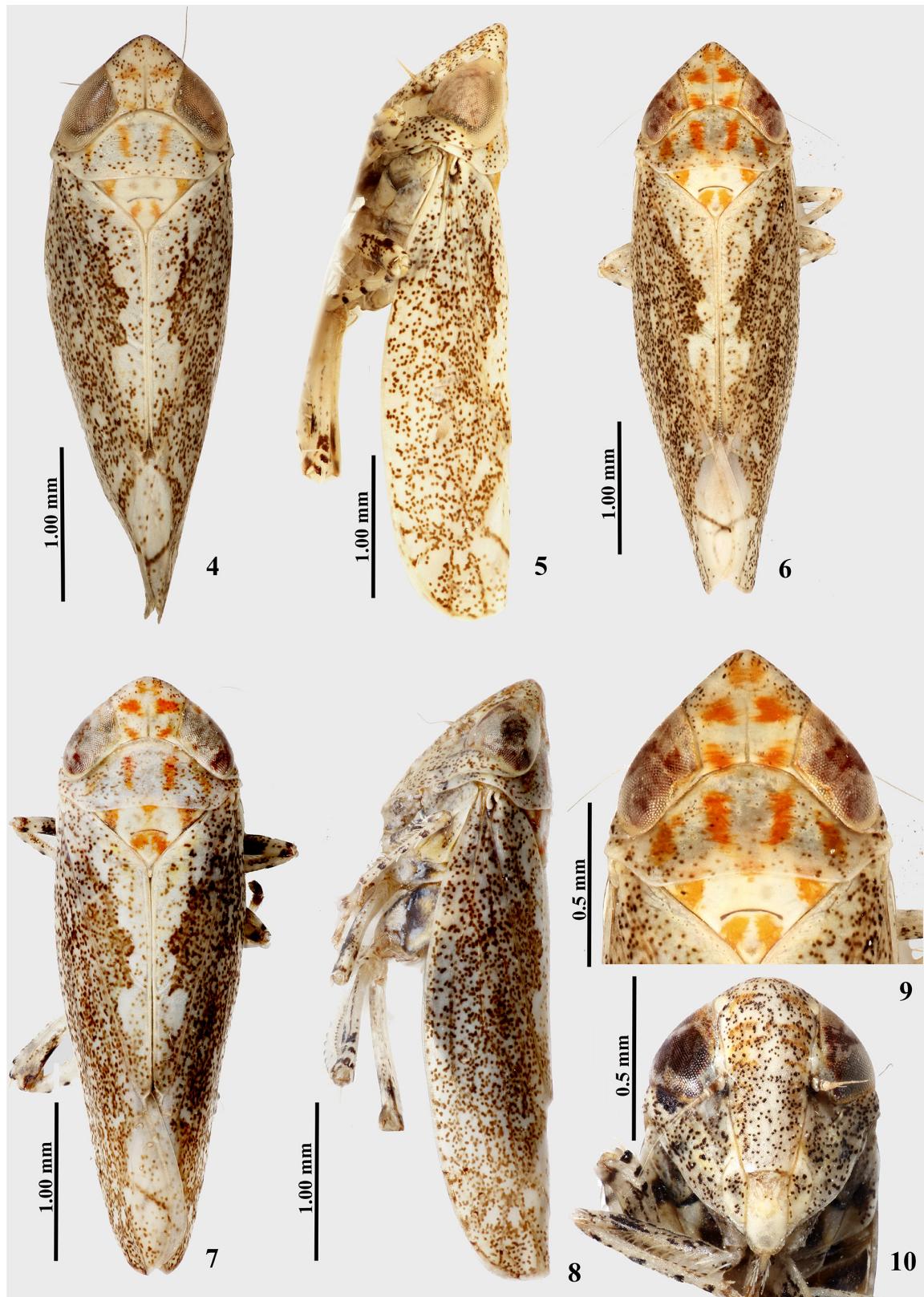
STRUCTURE. External colouration and morphology as in *Masiripius*, except *O. kadiae* gen. et sp. nov. that is dusky dorsally. *Oshaibahus* gen. nov. can be separated from *Masiripius* by the following characters:

MALE GENITALIA. Aedeagus with basal process, shafts arising from base but with stout apex.

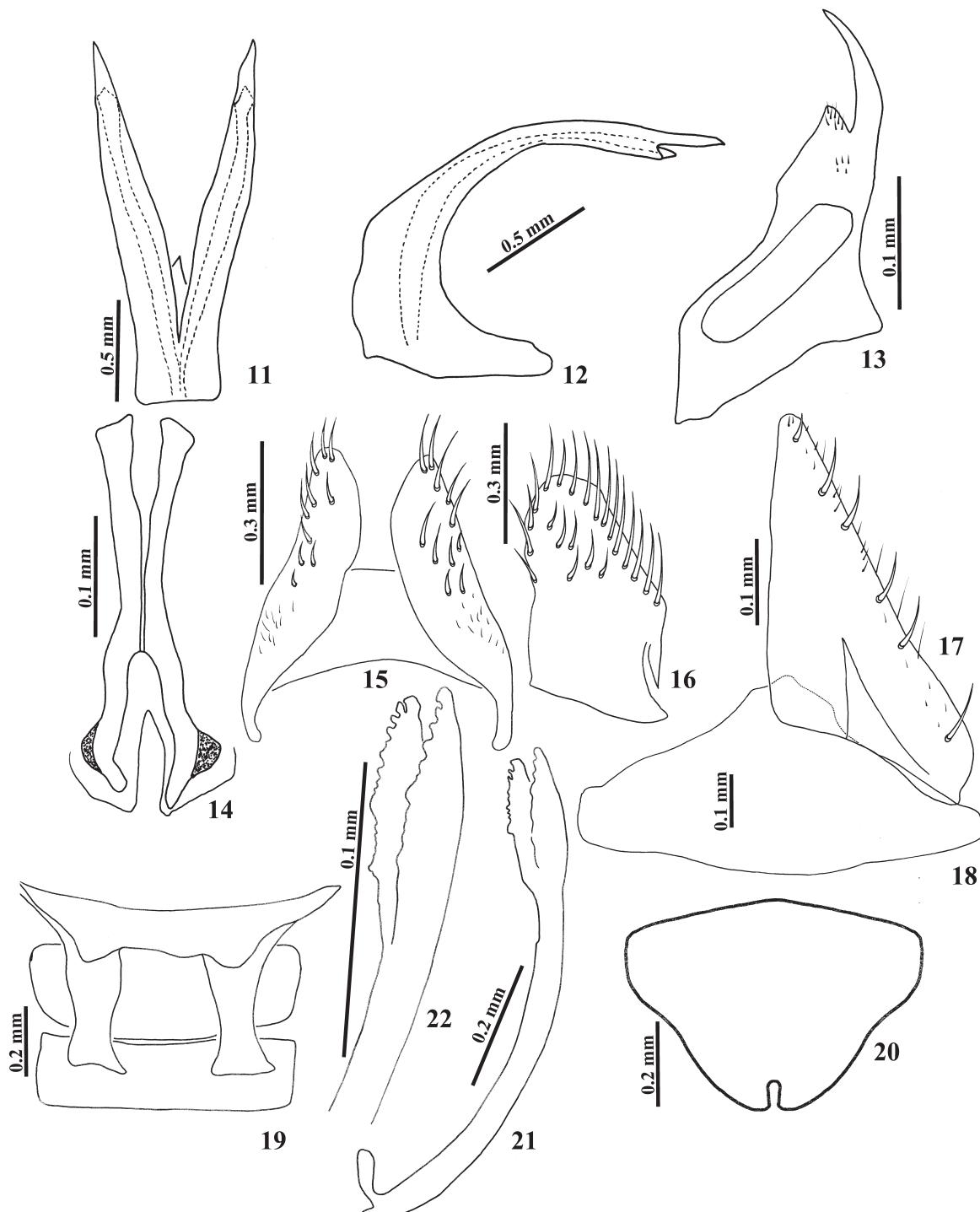
FEMALE GENITALIA. Seventh sternite more than  $2 \times$  as broad at base as long medially, posterior margin lobe-like, with median V-shaped notch in middle, posterolateral angles conically rounded or acutely rounded. Ovipositor depressed beyond pygofer apex. First valvula medially convex. Second valvula gradually tapered apically with variable serrations on dorsal surface. Numerous macrosetae on pygofer.

### Distribution

Libya (Abdul-Nour 2007), Iraq, Sudan, and KSA (present study).



**Figs 4–10.** *Masiripius lugubris* (Distant, 1918). 4. Dorsal view ( $\delta$  from Iran). 5. Lateral view ( $\delta$  from Iran). 6. Dorsal view ( $\varphi$  from Oman). 7. Dorsal view ( $\delta$  from Oman). 8. Lateral view ( $\delta$  from Oman). 9. Dorsal view of head and thorax ( $\varphi$  from Oman). 10. Face ( $\delta$  from Iran).



**Figs 11–22.** *Masiripius lugubris* (Distant, 1918). **11.** Aedeagus dorsal view. **12.** Aedeagus lateral view. **13.** Style. **14.** Connective. **15.** Ventral view of pygofer. **16.** Lateral view of pygofer. **17.** Subgenital plate. **18.** Valve. **19.** Apodems. **20.** ♀ 7<sup>th</sup> sternite. **21–22.** ♀ ovipositor.

**Key to species of genus *Oshaibahus* El-Sonbati & Wilson gen. nov.**

1. Aedeagal process not inflated at the base, the socle length  $2 \times$  width, process length equal or longer than length of socle, the tip of process acute and curved preapically, shaft branches arising from base with stout preapex and gradually acute at the apex, at the curve of shafts without external width laterally, with small projection dorsally (Figs 27–28, 30) .....  
..... *O. kadiae* El-Sonbati & Wilson gen. et sp. nov.
- Aedeagal process inflated at the base, the socle length equal or subequal the width, the process length equal or shorter than the socle length, the tip of process rounded and not curved preapically, aedeagal shafts arising from base with stout apex, at the curve of shafts with external width laterally, without small projection dorsally (Figs 42–44, 62–63) ..... 2
2. (1') Aedeagal process length shorter than the socle length, at the curve of shafts with little external width laterally (Figs 42–44) ..... *O. linnavuorii* El-Sonbati & Wilson gen. et sp. nov.
- Adeagal process length equal or longer than the socle length, at the curve of shafts with external width laterally (Figs 62–63) ..... *O. zizyphi* (Bergevin, 1922) gen. et comb. nov.

*Oshaibahus kadiae* El-Sonbati & Wilson gen. et sp. nov.

[urn:lsid:zoobank.org:act:810DFE69-AFD8-46EE-B3AF-B4BCFF054A9B](https://doi.org/10.1546/zoobank.810DFE69-AFD8-46EE-B3AF-B4BCFF054A9B)

Figs 23–36

**Etymology**

The patronym honours the co-author's youngest daughter, Kadi Al Dhafer.

**Type material**

**Holotype**

SUDAN: 1 ♂, Wad Medani, Blue Nile, 11–12 Nov. 1981, R. Linnavuori leg. (AMNH).

**Paratype**

SUDAN: 1 ♀, same data as holotype (AMNH).

**Description**

BODY LENGTH. Male 3.7 mm; female 4.2 mm.

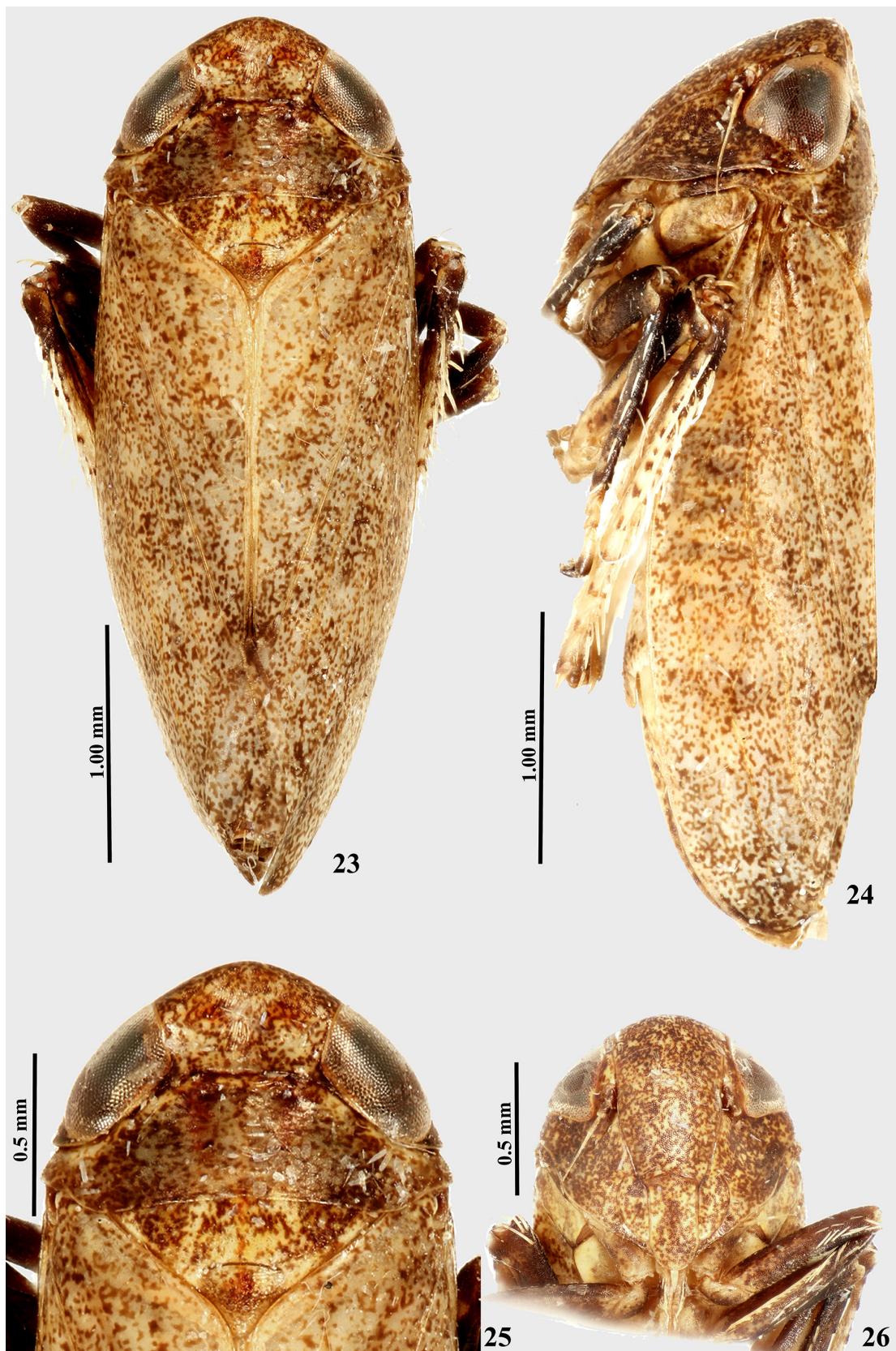
STRUCTURE (Figs 23–26). In addition to generic characters, the specific characters for this species are: clypellar suture convex at apex; lorum as wide as clypellus at base, not widely separated from genal margin; frontoclypeus texture rugose with “netlike” brown colour; crown  $2 \times$  as wide as eye.

MALE GENITALIA (Figs 27–35). Aedeagus with basal process, not inflated at the base, the socle  $2 \times$  as wide as long, the process equal or longer than the socle, process tip pointed, curved preapically, aedeagal shafts arising from base with stout preapex and gradually pointed at the apex, at the curve of shafts without extra width laterally, with small projection dorsally.

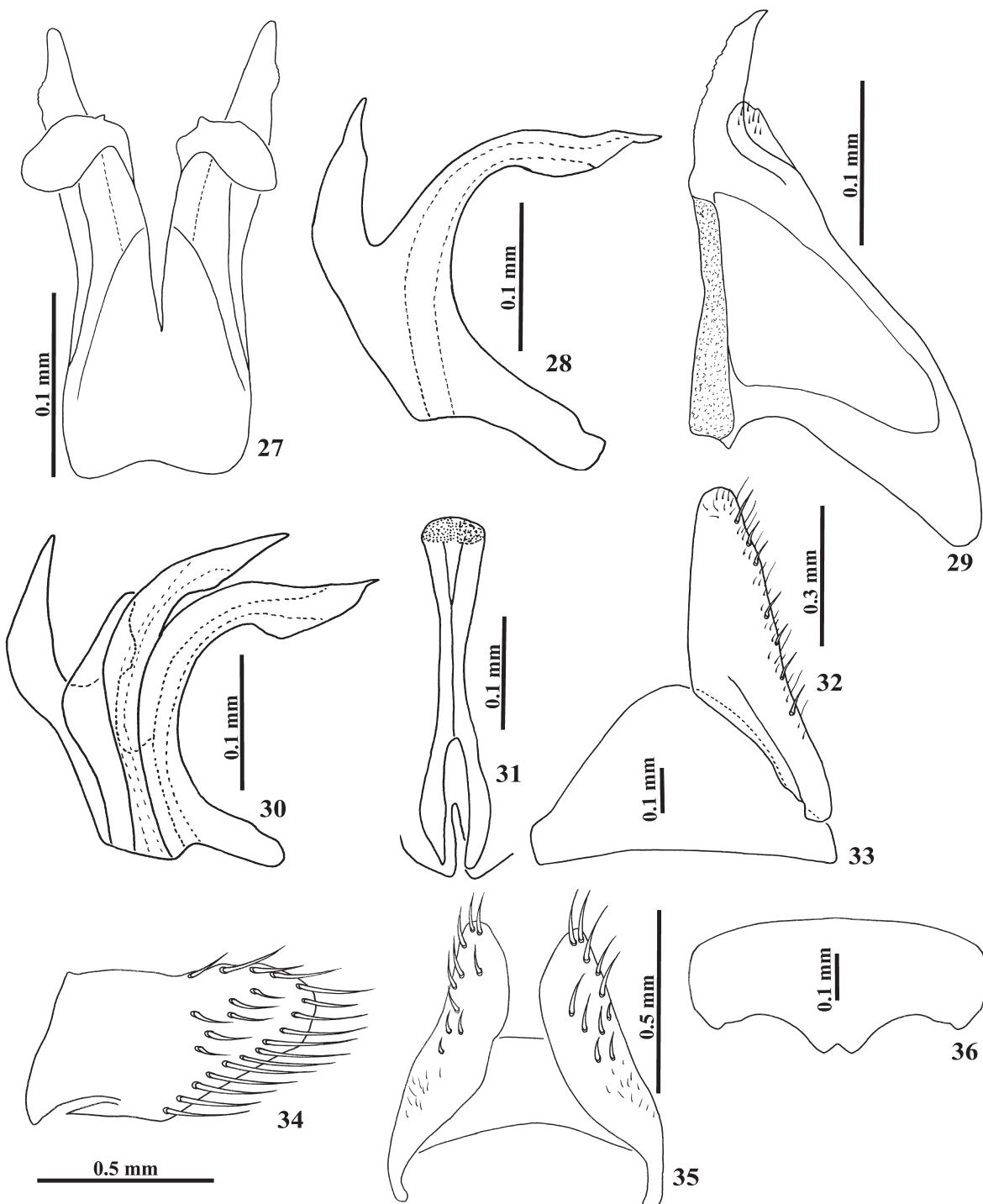
FEMALE GENITALIA (Fig. 36). Seventh sternite more than  $3 \times$  as broad at base as long medially, posterior margin lobe-like with median V-shape notch in middle, posterolateral angles slightly conically rounded.

**Distribution**

Sudan (present study).



Figs 23–26. *Oshaibahus kadiae* El-Sonbati & Wilson gen. et sp. nov. 23. Dorsal view. 24. Lateral view. 25. Dorsal view of head and thorax. 26. Face.



**Figs 27–36.** *Oshaibahus kadiae* El-Sonbati & Wilson gen. et sp. nov. **27.** Aedeagus dorsal view. **28, 30.** Aedeagus lateral view. **29.** Style. **31.** Connective. **32.** Subgenital plate. **33.** Valve. **34.** Lateral view of pygofer. **35.** Ventral view of pygofer. **36.** ♀ 7<sup>th</sup> sternite.

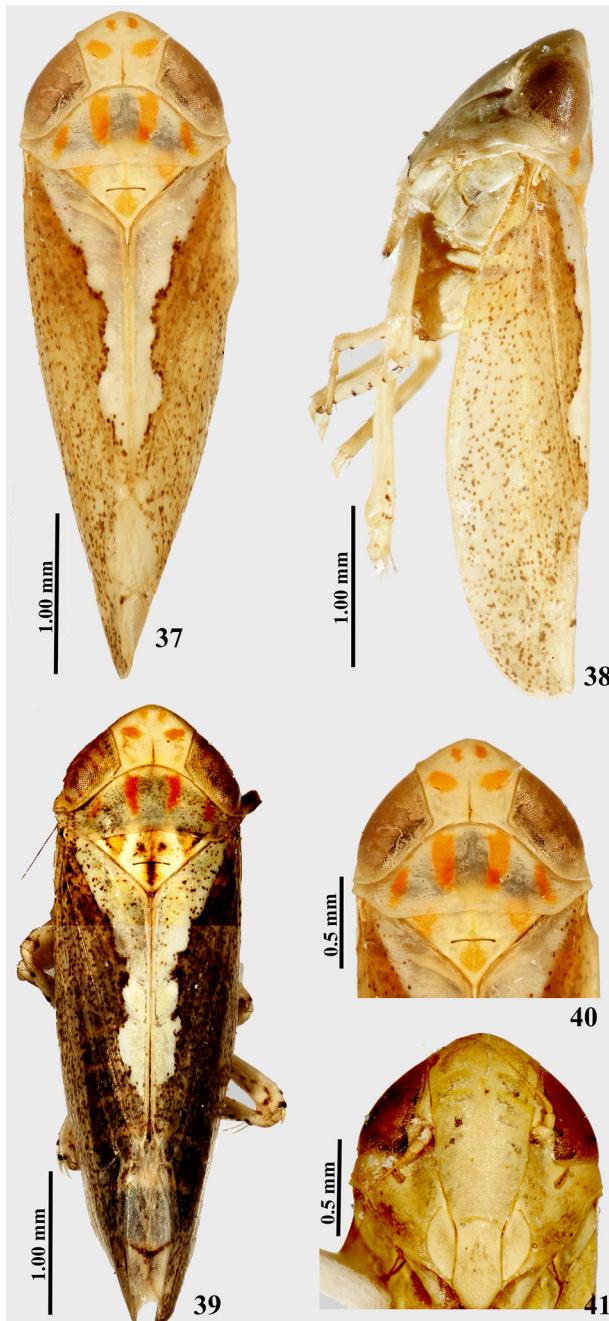
*Oshaibahus linnaviorii* El-Sonbati & Wilson gen. et sp. nov.

[urn:lsid:zoobank.org:act:4B216514-A3B9-4A5E-B026-4CEF4403CF32](http://urn.lsid.zoobank.org/act:4B216514-A3B9-4A5E-B026-4CEF4403CF32)

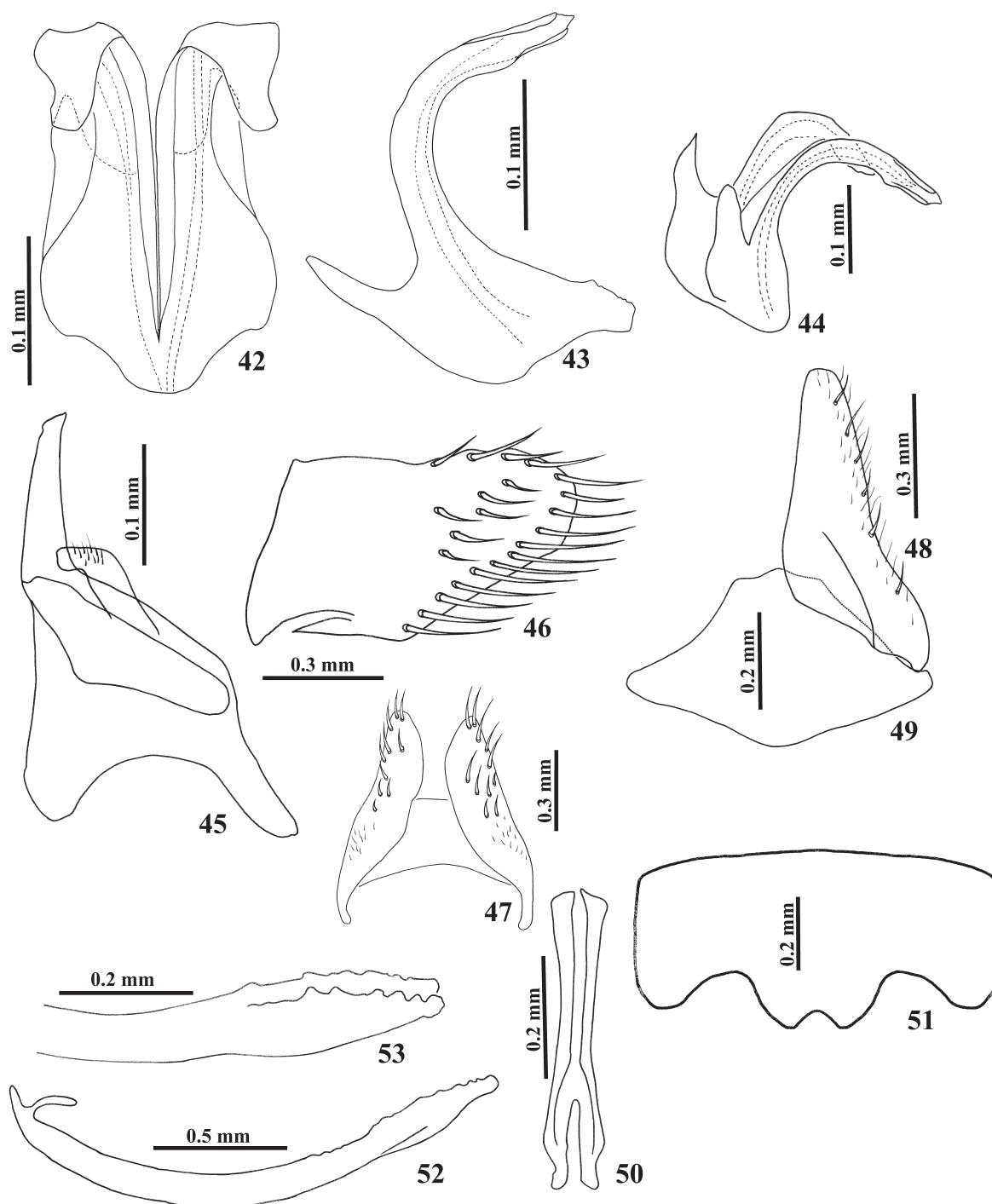
Figs 37–53

**Etymology**

This species is named in honour of the well-known hemipterist Prof. Rauno Linnaviöri, who collected the species in Iraq in 1981.



**Figs 37–41.** *Oshaibahus linnaviorii* El-Sonbati & Wilson gen et sp. nov. **37, 39.** Dorsal view. **38.** Lateral view. **40.** Dorsal view of head and thorax. **41.** Face.



**Figs 42–53.** *Oshaibahus linnavuorii* El-Sonbati & Wilson gen. et sp. nov. **42.** Aedeagus dorsal view. **43, 44.** Lateral view. **45.** Style. **46.** Lateral view of pygofer. **47.** Ventral view of pygofer. **48.** Subgenital plate. **49.** Valve. **50.** Connective. **51.** ♀ 7<sup>th</sup> sternite. **52–53.** ♀ ovipositor.

### Type material

#### Holotype

IRAQ: 1 ♂, al-Muthanna, As Salman, [Busaygah], 2 Apr. 1981, R. Linnavuori leg. (AMNH).

#### Paratypes

IRAQ: 2 ♂♂, 1 ♀, same data as holotype; 2 ♀♀, al-Najaf, 24 Jun. 1981, [Khan Ruhabah], R. Linnavuori leg. (AMNH).

### Description

BODY LENGTH. Male 4.1 mm; female 4.2 mm.

STRUCTURE (Figs 37–41). In addition to generic characters, the specific characters for this species are: clypellar suture straight, lorum distinctly narrower than clypellus at base, not separated at all from gena margin; frontoclypeus texture shagreen; crown slightly 2 × as wide as eye.

MALE GENITALIA (Figs 42–50). Aedeagus with basal process, inflated at the base, the socle equal or subequal as wide as long, process shorter than the socle, tip rounded, shafts arising from base with stout apex, laterally expanded near curvature, without dorsal projection.

FEMALE GENITALIA (Figs 51–53). Seventh sternite more than 2 × as broad at base as long medially, posterior margin with median lobe-like projection with median V-shape notch, posterolateral angles conically rounded.

### Distribution

Iraq (present study).

### *Oshaibahus zizyphi* (Bergevin, 1922) gen. et comb. nov.

Figs 54–72

*Platymetopius zizyphi* Bergevin in Bergevin & Zanon, 1922: 63. — Metcalf 1967: 2241.

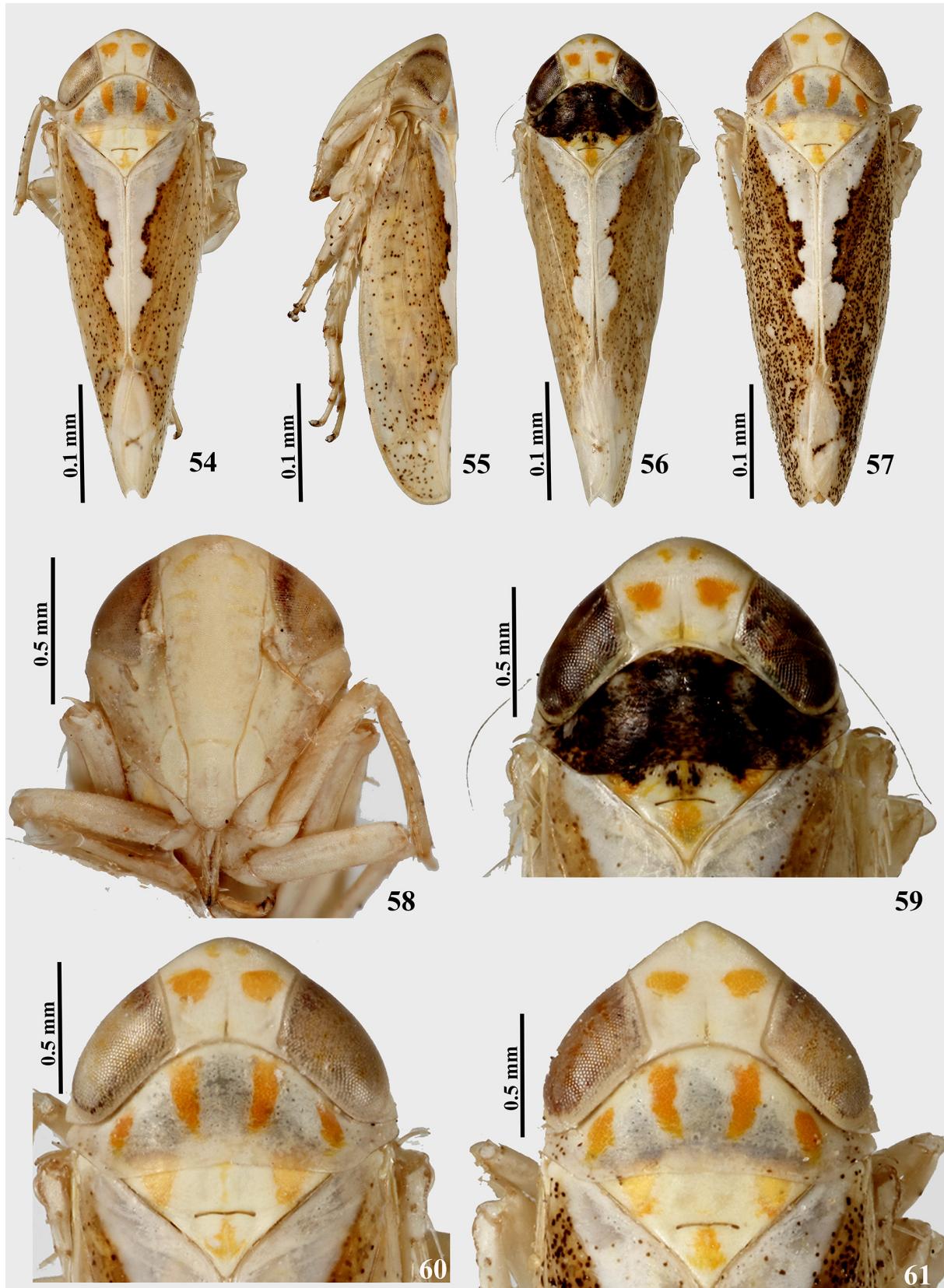
*Masiripius zizyphi* — Abdul-Nour 2007: 305.

### Differential diagnosis

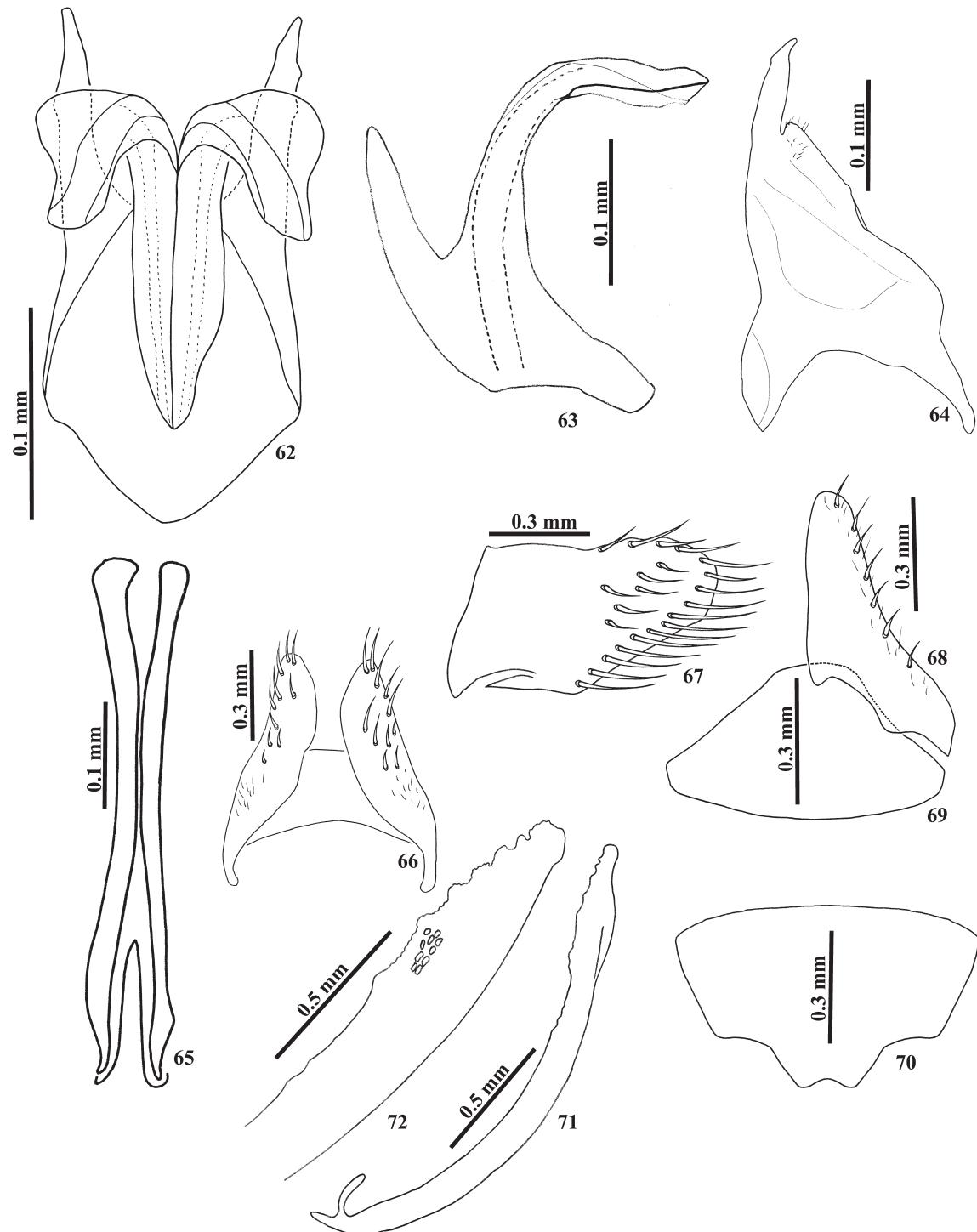
*Oshaibahus zizyphi* gen. et comb. nov. is similar to *O. linnavuorii* gen. et sp. nov., but can be distinguished easily by the aedeagal process equal or longer than the socle length, and by the curvature of the lateral expansion. This species also resembles *O. kadiae* gen. et sp. nov. but can be easily separated by the socle length equal or subequal to width, by the rounded tip of process, by shaft branches arising from base with stout apex, by the curvature of the shafts and the shape of the lateral expansion, the shafts also lack the dorsal projection.

### Material examined

KSA (all specimens deposited at KSMA and collected by H. Al Dhafer and S. El-Sonbati unless otherwise stated): 1 ♂, Rhodet Khorim, 25°22.686' N, 47°16.712' E, alt. 559 m, 7 Jan. 2012, pitfall trap, *Nitraria retusa* (A); 1 ♂, same locality, 4 Feb. 2012, beating, *Nitraria retusa*; 1 ♀, same locality, 6 Mar. 2012, *Nitraria retusa*; 1 ♂, same locality, 20 Mar. 2012, *Ziziphus nummularia*; 2 ♂♂, 2 ♀♀, same locality, 14 Apr. 2012, light trap; 1 ♂, same locality, 28 Apr. 2012, light trap; 5 ♂♂, 5 ♀♀, same locality, 28 Apr. 2012, beating, *Nitraria retusa*; 5 ♂♂, 9 ♀♀, same locality, 14 May 2012, beating, *Nitraria retusa*; 2 ♂, 1 ♀, same locality and date, pitfall trap; 3 ♂♂, 1 ♀, same locality and date, vacuum; 9 ♂♂, 4 ♀♀, same locality, 26 May 2012, vacuum, *Nitraria retusa*; 10 ♂♂, 13 ♀♀, same locality and date, beating; 1 ♂,



**Figs 54–61.** *Oshaibahus zizyphi* (Bergevin, 1922) gen. et comb. nov. **54, 56–57.** Dorsal view. **55.** Lateral view. **58.** Face. **59–61.** Dorsal view of head and thorax.



**Figs 62–72.** *Oshaibahus zizyphi* (Bergevin, 1922) gen. et comb. nov. **62.** Aedeagus dorsal view. **63.** Aedeagus lateral view. **64.** Style. **65.** Connective. **66.** Ventral view of pygofer. **67.** Lateral view of pygofer. **68.** Subgenital plate. **69.** Valve. **70.** ♀ 7<sup>th</sup> sternite. **71–72.** ♀ ovipositor.

same locality, 15 May 2012, light trap; 1 ♂, same locality, 2 Jun. 2013, vacuum, *Ziziphus nummularia*; 1 ♂, same locality and date, beating; 3 ♀♀, same locality, 9 Jun. 2012 vacuum, *Nitraria retusa*; 6 ♀♀, same locality and date, beating; 1 ♂, same locality, 10 Jun. 2012, light trap; 2 ♂♂, same locality, 15 Jun. 2013, beating, *Ziziphus nummularia*; 1 ♂, same locality, 19 Jun. 2012, pitfall trap, *Nitraria retusa*; 2 ♂♂, same locality, 30 Jun. 2012, vacuum; 1 ♂, same locality, 28 Jul. 2012, light trap; 2 ♂♂, same locality, 28 Aug. 2012, light trap; 1 ♂, Rhodet Khorim, 25°25.943' N, 47°13.863' E, alt. 572 m, 14 Jan. 2012, pitfall trap, *Lycium shawii* (B), H. Al Dhafer & S. El-Sonbati leg.; 1 ♂, 2 ♀♀, same locality, 14 Apr. 2012, light trap; 1 ♀, same locality, 29 Apr. 2012, light trap; 1 ♀, same locality, 28 Apr. 2012, light trap; 3 ♂♂, same locality, 27 May 2012 light trap; 1 ♂, 1 ♀, same locality, 11 May 2013, beating, *Acacia gerrardii*; 1 ♀, same locality, 18 May 2013, vacuum, *Ziziphus nummularia*; 1 ♂, same locality, 9 Jun. 2012, vacuum, *Rhazya stricta*; 1 ♂, same locality and date, *Nitraria retusa*; 1 ♂, 1 ♀, same locality, 10 Jun. 2012, light trap; 2 ♂♂, 2 ♀♀, same locality, 2 Jun. 2013, vacuum, *Ziziphus nummularia*; 1 ♂, same locality, 28 Aug. 2012, light trap; 2 ♂♂, same locality, 13 Nov. 2011, light trap; 3 ♂♂, 2 ♀♀, Muzahimiyah, Al Khararah, 3 Apr. 2012, light trap, 24°23'01" N, 46°41'14" E, Y. Al-Dryhim, H. Al Dhafer & A. El Gharbawy leg.; 1 ♀, Jazan, Fiyfa, Al Absia mountains, 17°15.831' N, 43°06.498' E, alt. 1770 m, 20 Mar. 2014, vacuum, S. El-Sonbati leg.

### Description

STRUCTURE (Figs 54–61). In addition to generic characters, the specific characters for this species are: clypear suture sinuate apically; lorum distinctly narrower than clypellus at base, not separated at all from gena margin; single fine erect seta on gena distance to lateral frontal suture; frontoclypeus texture shagreen; crown less than 2 × as wide as eye.

MALE GENITALIA (Figs 62–69). Aedeagus with basal process, inflated at the base, the socle equal or subequal as wide as long, process equal or longer than the socle, rounded tip, aedeagal shafts arising from base with stout apex, at the curve of shafts with external width laterally, without small projection dorsally.

FEMALE GENITALIA (Figs 70–72). Seventh sternite more than 1.5 × as broad at base as long medially, posterior margin with lobe slightly produced with median V-shape notch in middle, posterolateral angles acutely rounded.

### Host plants

*Ziziphus lotus* (L.) Lam. (Rhamnaceae).

### Distribution

Algeria (Metcalf 1967), Libya (Abdul-Nour 2007) and KSA (present study).

### Discussion

The genus *Masiripius* was described based on a misidentified specimen from Iran (Dlabola 1981). Webb & Godoy (1993) examined the holotype of *Mahalana lugubris* and designated this taxon as a senior synonym of *Zizyphoides punctatus* and also of *M. zizyphi*, which had been misidentified by Dlabola. Webb & Godoy (1993) also transferred *Mahalana lugubris* to *Masiripius*. Viraktamath & Anantha Murthy (1999) designated *M. lugubris* as type species of *Masiripius*. *Platymetopius zizyphi* is here designated as the type species of *Oshaibahus* gen. nov.

Despite the comprehensive studies of Cicadellidae carried out by Dlabola (1979, 1980, 1987) and El-Sonabti *et al.* (2015) in the KSA, as well as Linnauvori (e.g., 1973, 1989) and El-Sonbati *et al.* (2016) for the Middle East, the Arabian fauna is still relatively poorly known with vast areas unsampled.

Although our study indicated that *Masiripi* is closely related to *Oshaibahus* gen. nov., the geographical distribution of the genera are distinctive. *Masiripi* apparently dispersed from the Indian subcontinent into the Arabian Peninsula and is known from Oman and Qatar. Collections of leafhoppers from the southwestern and central provinces of the KSA have not included this genus. The distribution of species of *Oshaibahus* appears to include Palaearctic and Afrotropical elements, with *O. zizyphi* gen. et comb. nov. widely distributed between Asia and Africa.

The host plants of *Oshaibahus zizyphi* gen. et comb. nov. are species of *Ziziphus*; *Z. lotus* (L.) Lam. and *Z. mauritiana* Lam. (Rhamnaceae) (Bergevin & Zanon 1922; Bhattacharyna & Harb 1973; Viraktamath & Anantha Murthy 1999). *Ziziphus* species form small trees and are utilized as an important source of vegetable oil and protein from the seeds, whereas fruits and leaves are also utilized for medicinal purposes (Al-Khamis *et al.* 2012; Chouaibi *et al.* 2012; Alqarni 2015). In this study, specimens of *Oshaibahus* gen. nov. were collected at Muzahimiyah, Al Khararah and Rhodet Khorim from four species of plants: *Ziziphus nummularia* (Burm. f.) Wright & Arn. (family Rhamnaceae), *Acacia gerrardii* Benth. (family Leguminosae-Mimosoideae), *Nitraria retusa* (Forssk.) Asch. (family Nitrariaceae), and *Lycium shawii* Roem & Schult. (family Solanaceae).

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