

Taxonomy of Podoscirtinae (Orthoptera: Gryllidae).
Part 15: *Asymmetrella* gen.n., *Zvenellomorpha* and *Ultratrella*
from Madagascar

Таксономия подсемейства Podoscirtinae (Orthoptera: Gryllidae).
Часть 15: *Асимметрелла* gen.n., *Звенелломорфа* и *Ультратрелла*
с Мадагаскара

A.V. Gorochov
А.В. Горохов

Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb., St Petersburg 199034, Russia. E-mail: orthopt@zin.ru
Зоологический институт РАН, Университетская наб. 1, Санкт-Петербург 199034, Россия.

KEYWORDS: Orthoptera, Gryllidae, Podoscirtinae, Podoscirtini, crickets, Madagascar, taxonomy, new taxa.

КЛЮЧЕВЫЕ СЛОВА: Orthoptera, Gryllidae, Podoscirtinae, Podoscirtini, сверчки, Мадагаскар, таксономия, новые таксоны.

ABSTRACT. Some Madagascan taxa belonging to the subtribe Podoscirtina of the tribe Podoscirtini are considered. A new genus with a new species, two new subgenera and three new species of the genus *Zvenellomorpha* Gorochov, and a new species possibly belonging to the genus *Ultratrella* Gorochov are described from Madagascar: *Asymmetrella longitubulosa* gen. et sp.n., *Z. (Euzvenellomorpha) carinata* subgen. et sp.n., *Z. (Z.) intermedia* sp.n., *Z. (Azvenellomorpha) separata* subgen. et sp.n. and *U.? ornata* sp.n. Additional data on *Ultratrella* are also provided, including description of the previously unknown female of *U. gracilis* Gorochov.

РЕЗЮМЕ. Рассмотрены некоторые мадагаскарские таксоны, принадлежащие подтрибе Podoscirtina трибы Podoscirtini. Из Мадагаскара описаны новый род с одним новым видом, два новых подрода и три новых вида рода *Zvenellomorpha* Gorochov, а также один новый вид, возможно, принадлежащий роду *Ultratrella* Gorochov: *Asymmetrella longitubulosa* gen. et sp.n., *Z. (Euzvenellomorpha) carinata* subgen. et sp.n., *Z. (Z.) intermedia* sp.n., *Z. (Azvenellomorpha) separata* subgen. et sp.n. и *U.? ornata* sp.n. Приведены также дополнительные данные по *Ultratrella*, в том числе описание ранее неизвестной самки *U. gracilis* Gorochov.

Introduction

This paper is the fifteenth communication in the series of publications on taxonomy of the cricket subfamily Podoscirtinae, which continues the third, fifth

and fourteenth communications devoted mainly to Madagascan representatives of the tribe Podoscirtini [Gorochov, 2004, 2006, 2021b]. Generic belonging for many Madagascan species of the subtribe Podoscirtina [Gorochov, 2021a] is rather problematic, because in Madagascar, this subtribe had intense and possibly incoherent adaptive radiation without serious competitors from related groups of Gryllidae. Such type of evolution usually leads to rapid adaptive changes in external morphology with the formation of numerous different life forms, but their general organization, including genital and probably genetic characters, remains much less modified [Gorochov, 2005]. Moreover, the rapid changes in external morphology may be significantly or partially parallel in some representatives from different branches of Podoscirtina. One of such cases is considered below: the genera *Ocellotrella* Gorochov, 2021 and *Asymmetrella* gen. n. belong to the same branch of this subtribe, judging by their male genitalia; but the general appearance in these genera are very different, and the latter genus has some adaptive characters of external morphology more similar to those of the subgenus *Euzvenellomorpha* subgen.n. from the genus *Zvenellomorpha* Gorochov, 2004 (another group of Podoscirtina according to its male genitalia) than to other subgenera of the latter genus.

Material and methods

The material used in this paper is deposited at the Zoological Institute, Russian Academy of Sciences, St Pe-

tersburg (ZIN). All the specimens are dry and pinned. Photographs of their morphological structures were made using a Leica M216 stereomicroscope and DFC290 camera.

Taxonomic part

Tribe Podoscirtini Saussure, 1878
Subtribe Podoscirtina Saussure, 1878

Genus *Asymmetrella* Gorochov, **gen. n.**

Type species *A. longitubulosa* Gorochov, **sp.n.**

DIAGNOSIS. Body rather small for this subtribe, moderately stout and distinctly pubescent (except for wings, pterothorax and abdomen). Head and pronotum dorsoventrally flattened; eyes not large, slightly longitudinal and strongly convex; ocelli small, poorly distinct (almost obliterated); rostrum roundly angular in profile, and space between antennal cavities slightly narrower than scape; maxillary palpi moderately short and with apical segment clearly but not strongly widened at apex; pronotum moderately transverse, with somewhat concave anterior edge, barely sinuate posterior edge, somewhat narrower (than middle area) anterior and posterior parts of disc, and low lateral lobes having distinct longitudinal keel in each of their middle areas (Figs 1–3). Metanotal gland in male developed, consisting of one rather small median tubercle outlined laterally and anteriorly by not large (and not deep) horseshoe-like concavity; legs rather short, with numerous long hairs, with somewhat widened and flattened fore and middle femora as well as middle tibiae, with both tympana well developed and oval, and with hind tibiae typical of this subtribe (i.e. its spines and denticles not reduced, not very large and not thickened); tegmina somewhat protruding beyond abdominal apex, with normally developed stridulatory apparatus in male dorsal field, with rather large longitudinal mirror and rather short apical area in this field, as well as with moderately narrow R–M area in male; hind wings slightly protruding beyond tegminal apices but somewhat not reaching apices of hind femora (Figs 1, 4–9). Abdomen without additional specializations, but anal plate roundly truncate apically and with narrow semisclerotized median groove in anterior half (this groove outlined by a pair of low folds laterally; Fig. 10), and genital plate rather large and ovaly widened but with long and narrowly angular posteromedian lobule (Fig. 10); genitalia with epiphallus somewhat similar to that of *Ocellotrella* (i.e. anterior epiphallal half with large asymmetrical fold around almost spiral-like semitube of sacculus or of rachial base; very long tube of spermatophore probably formed inside this semitube), but general shape of epiphallus somewhat different (not flattened laterally and with short dorsoapical tubercles only), rachis much more widened basally, and formula more complicated in shape as well as strongly asymmetrical and usually with sinuate (and also strongly asymmetrical) sclerotized ribbon almost reaching apices of rami (spermatophore with both ampulla and part of tube near ampulla possibly forming laterally from this ribbon; Figs 11–13, 15, 24). Ampulla of spermatophore almost globular; spermatophore tube very long and thin as well as almost irregularly twisted and practically without any anchor-like structure (Fig. 14).

INCLUDED SPECIES. Type species only.

COMPARISON. The new genus is more or less similar (possibly related) to the Madagascan genus *Ocellotrella* in the above-mentioned features of the male epiphallus, but it is strongly distinguished from the latter by a strongly pubescent

body, much smaller (almost absent) lateral ocelli, a distinctly wider head rostrum, a lower and shorter pronotum having characteristic longitudinal keels laterally, widened and flattened fore and middle femora as well as middle tibiae, a well developed male tegminal stridulatory apparatus, and the above-listed characters of the male genitalia.

ETYMOLOGY. This generic name originates from the Latinized Greek word “asymmetria” (asymmetry) and the generic name *Malgasotrella* (due to a strongly asymmetrical structure of the anterior epiphallal half).

Asymmetrella longitubulosa Gorochov, **sp.n.**

Figs 1–15.

MATERIAL EXAMINED. Holotype — ♂, **Madagascar**, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill., ~900 m, on leaf of bush in forest at night, 8–20.III.2013, A. Gorochov (ZIN). Paratypes: 1 ♂, same data as for holotype (ZIN); 1 ♂, same province and district, ~10 km NW of Andasibe Vill., Torotorofotsy Forest Reserve, ~1000 m, on leaf of small tree in forest at night, 22.II–11.III.2013, A. Gorochov (ZIN).

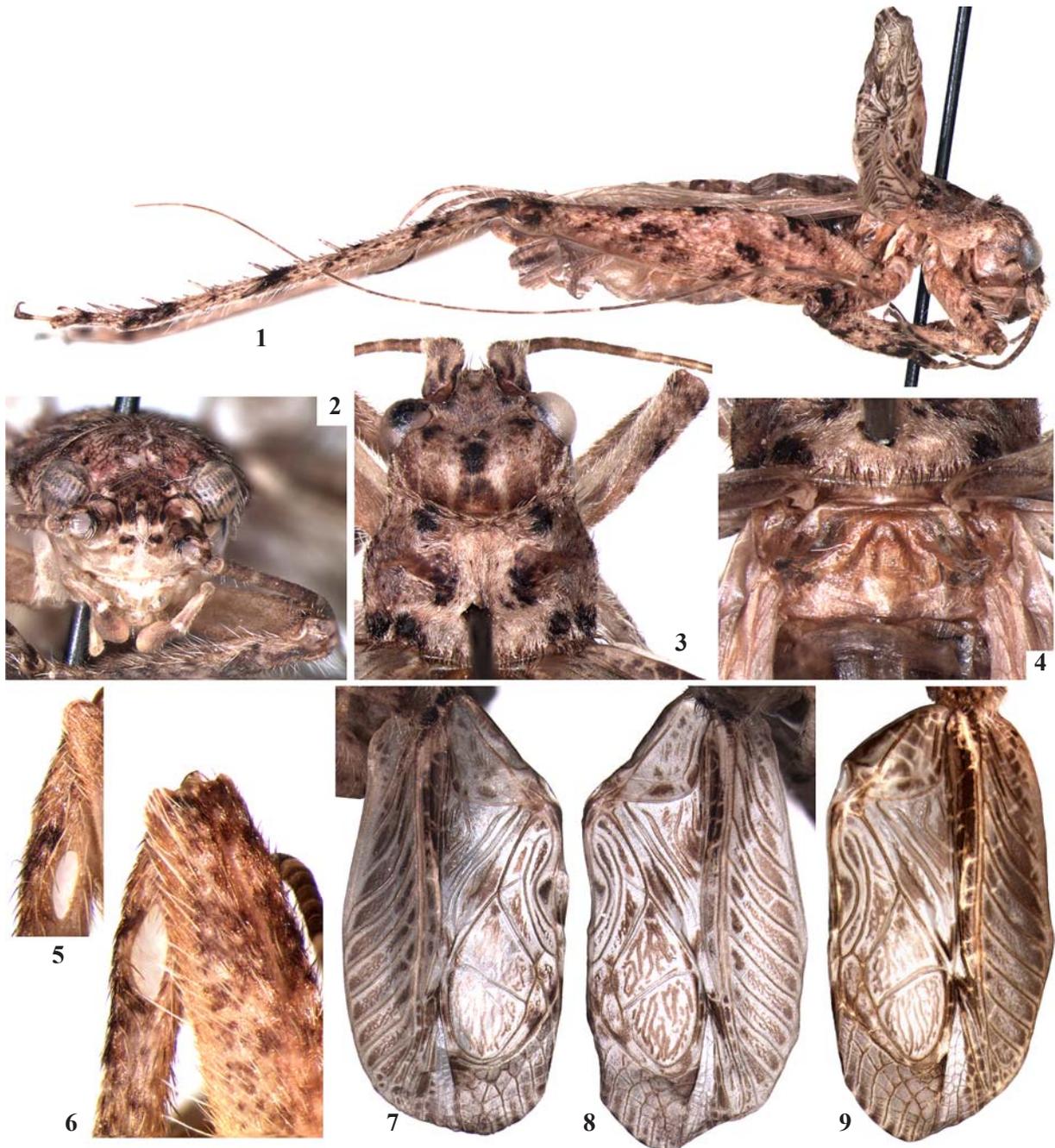
DESCRIPTION. Male (holotype). Body coloration light greyish with numerous darker marks: eyes light yellowish brown with four longitudinal brownish grey stripes; upper half of epicranium with a pair of dark brown lines along dorsal edges of antennal cavities, a few brown areas along anterior edge of pronotal disc, and several small brown to dark brown spots near rostral apex and on epicranial dorsum between eyes as well as on genae under eyes; mouthparts very light with barely darkened areas on two apical segments of maxillary palpi and on apex of labrum; antennae light with a few dark marks on dorsal half of scape, rather numerous darkish and lightish spots on proximal third of flagellum, and almost uniformly light brown rest of flagellum; pronotum also light with several dark brown spots on disc (Figs 1–4); pterothorax and abdomen light brown with brown transverse band on last abdominal tergite as well as a few lateral marks on anal plate (as in Fig. 10); legs light grey with rather sparse small brown to dark brown spots on fore femora and tibiae as well as with larger similar spots on middle and hind femora, tibiae and tarsi; tegmina with semitransparent dorsal field having whitish and light grey marks, and with whitish lateral field having light greyish brown veins and large areas on membranes between Sc branches (areas between proximal half of Sc and dorsal field greyish brown with whitish cross-veins; Figs 5–8); hind wings light yellowish grey; cerci light with numerous small dark marks on proximal parts and somewhat less numerous slightly darkened spots on other cercal parts. Outer tympanum almost 1.2 times as long as width of fore tibia and rather wide (fore tibia approximately 1.4 times as wide as this tympanum); inner tympanum slightly smaller but similar in shape (Figs 5–6). Tegmina: dorsal field with 4–5 oblique veins (two medial ones almost straight, others more or less curved) and with longitudinal mirror which clearly longer than diagonal vein and than apical area as well as having one obliquely transverse dividing vein; lateral field with 12–13 oblique and slightly curved branches of Sc (Figs 7–8). Anal and genital plates as in Fig. 10; genitalia with rather high and short epiphallus having six apical tubercles (a pair of ventroapical ones, and two pairs of dorsoapical tubercles: larger distal pair and smaller but more acute subdistal one) and small notch between them, with large arcuate rachis having strongly widened proximal part and thin (spine-like) apical part, with hook-like distal parts of elongate ectoparameres, and with asymmetrically V-shaped formula having a pair of semisclerotized plates dorsally and

characteristic heavily sclerotized ribbon anteriorly (Figs 11–13, 15); spermatophore as in Fig. 14.

Variations. Paratype from Torotorofotsy Forest Reserve with less numerous darkened spots on head dorsum and on pronotal disc (these pronotal spots partly fused with each other and forming a pair of arcuate lateral stripes on disc) as well as without distinct darkenings on abdominal apex (i.e. on last tergite and anal plate). Other paratype with dorsum of head and pronotal disc slightly darkened (small darkened

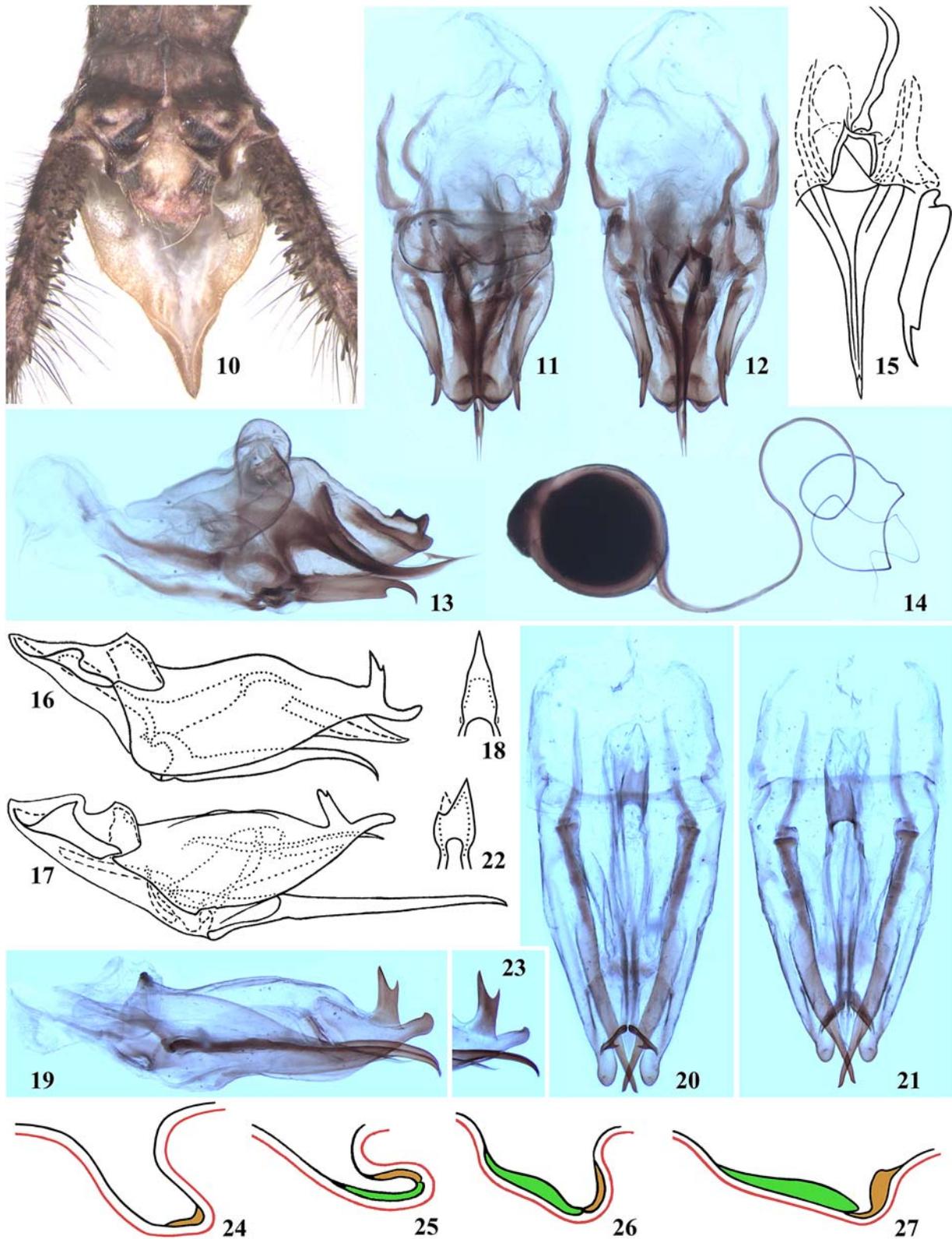
spots on these surfaces almost indistinct), lateral pronotal lobes having rather numerous darkened dots, legs less distinctly spotted (these spots smaller, lighter, more numerous and forming almost finely reticular pattern on outer surfaces of hind femora; thus, these femoral surfaces looking only slightly darkened), tegmina having slightly shorter basal area (Fig. 9), and genitalia practically lacking anterior sclerotized ribbon of formula.

Female unknown.



Figs 1–9. *Asymmetrella longitubulosa* sp.n., males: 1 — body from side (tegmina spread); 2 — head and one fore leg in front; 3 — head with pronotum and one fore leg from above; 4 — posterior part of pronotum and metanotal gland from above; 5–6 — inner (5) and outer (6) tympana; 7–9 — left (7) and right (8–9) tegmina; 1–8 — holotype; 9 — paratype.

Рис. 1–9. *Asymmetrella longitubulosa* sp.n., самцы: 1 — тело сбоку (надкрылья расправлены); 2 — голова и одна передняя нога, спереди; 3 — голова с переднеспинкой и одной передней ногой, сверху; 4 — задняя часть переднеспинки и метанотальная железа, сверху; 5–6 — внутренний (5) и наружный (6) тимпанумы; 7–9 — левое (7) и правое (8–9) надкрылья; 1–8 — голотип; 9 — паратип.



Figs 10–27. Structures of abdomen, male: 10–15 — *Asymmetrella longitubulosa* sp.n.; 16 — *Zvenellomorpha (Zvenellomorpha) bella* Gor.; 17–18 — *Z. (Z.) recta* Gor.; 19–23 — *Z. (Z.) intermedia* sp.n.; 24 — *A.* sp.; 25 — *Z. (Z.)* sp.; 26 — *Z. (Azvenellomorpha)* sp.; 27 — *Ultratrella* sp.; 10 — abdominal apex from above; 11–13, 16–17, 19–21 — genitalia (11, 20 — from above; 12, 21 — from below; 13, 16–17, 19 — from side); 14 — spermatophore from side, reconstruction; 15 — formula with rachis, endoparamere and ectoparamere from below; 18, 22 — formula from below; 23 — distal part of genitalia from side; 24–27 — scheme of sagittal section of formula [brown], of its sclerotized anterior ribbon [green] and of nearest portion of spermatophore tube [red]; 10, 23 — paratype; 11–22 — holotypes [16, 17 — after Gorochov, 2004, 2006.]

Length in mm. Body 14–15.5; body with wings 15.5–16.5; pronotum 2.7–2.9; tegmina 10.5–12; hind femora 11–12.5.

COMPARISON. The new species differs from the other related taxa by the characters given in the generic diagnosis.

ETYMOLOGY. This species name consists of the Latin prefix “longi-“ (long) and the Latin word “tubulosa” (tubular) due to a very long tube of the spermatophore.

Genus *Zvenellomorpha* Gorochov, 2004

NOTE. In this genus, some rather different species are here included. They are divided into three groups. The first group includes one species having its general appearance more or less similar to that of *Asymmetrella* **gen. n.**, but its male genitalia are very similar to those of *Zvenellomorpha* s. str., whereas those of *Asymmetrella* **gen. n.** are more similar to the male genitalia of *Ocellotrella*. Possibly the above-mentioned similarity to *Asymmetrella* **gen. n.** is connected with a similar mode of life: the both sit on the leaves of bushes or trees at night but probably on the bark of branches and trunks at daytime (the similarity in their general appearance, therefore, may be due to the same way of simulating the unevenness of the bark). The second and third groups have a very similar general appearance (without any simulating the bark unevenness) but a rather different structure of the male genitalia. These groups are here described as subgenera (see the subgeneric key below).

A KEY TO SUBGENERA OF *ZVENELLOMORPHA* S. L.

1. Body moderately large (lengths of pronotum 3.6 mm); all ocelli distinct (significantly convex), medium-sized (approximately equal to each other in size) and almost round (Fig. 28); pronotum strongly narrowing to head, strongly depressed dorsoventrally and with slight but distinct longitudinal keels on lateral lobes (these keels more or less similar to those of *Asymmetrella* **gen. n.**; Figs 31, 33); outer and inner tympana well developed (Figs 29–30); fore and middle femora as well as middle tibiae somewhat widened and strongly depressed laterally (they more strongly depressed than even in *Asymmetrella* **gen. n.** and with keel-like dorsal longitudinal edges on femora; Figs 31–33); male tegmina with well developed stridulatory apparatus having large longitudinal mirror in dorsal field (Fig. 32); male genitalia having rather long ventroapical epiphallal lobules and bifurcate dorsoapical epiphallal processes, long ectoparameres and rachis, and formula almost as in *Asymmetrella* **gen. n.** with long anterior sclerotized ribbon but completely symmetrical (Figs 34–36)
..... *Euzvenellomorpha* **subgen. n.**
- Body moderately small (lengths of pronotum 2.1–3.4 mm); all ocelli poorly distinct (insignificantly convex), but middle ocelli medium-sized or small as well as barely or slightly elongate, and median ocellus small and round or obliterate (Figs 42–43, 49); pronotum slightly narrowing to head, moderately depressed dorsoventrally and without keels on lateral lobes (Figs 38–39, 42–43, 47–48); fore and middle femora as well as middle tibiae not widened and slightly depressed laterally as well as without dorsal

- keels on femora (Figs 38–39, 42–43, 47–48, 56); male tegmina with partly reduced stridulatory apparatus having medium-sized or moderately small mirror of different shape in dorsal field (Figs 40–41, 51, 56); male genitalia rather diverse (Figs 16–23, 25–26, 52–54) 2
2. Median ocellus very small and round or obliterate; outer and inner tympana well developed; male genitalia similar to those of *Euzvenellomorpha* **subgen. n.** but with distinctly shorter rachis and anterior sclerotized ribbon of formula (this ribbon in shape of rather wide but poorly distinct semimembranous plate; Figs 16–23, 25)
..... *Zvenellomorpha* s. str.
 - Median ocellus obliterate; inner tympanum well developed, but outer one obliterate; male genitalia with rather short but hook-like ventroapical epiphallal lobules and almost non-bifurcate dorsoapical epiphallal processes, ectoparameres and rachis much shorter than in *Euzvenellomorpha* **subgen. n.**, and formula more similar to that of this subgenus than to that of *Zvenellomorpha* s. str. (Figs 26, 52–54) *Azvenellomorpha* **subgen. n.**

Zvenellomorpha (*Euzvenellomorpha*) *carinata*

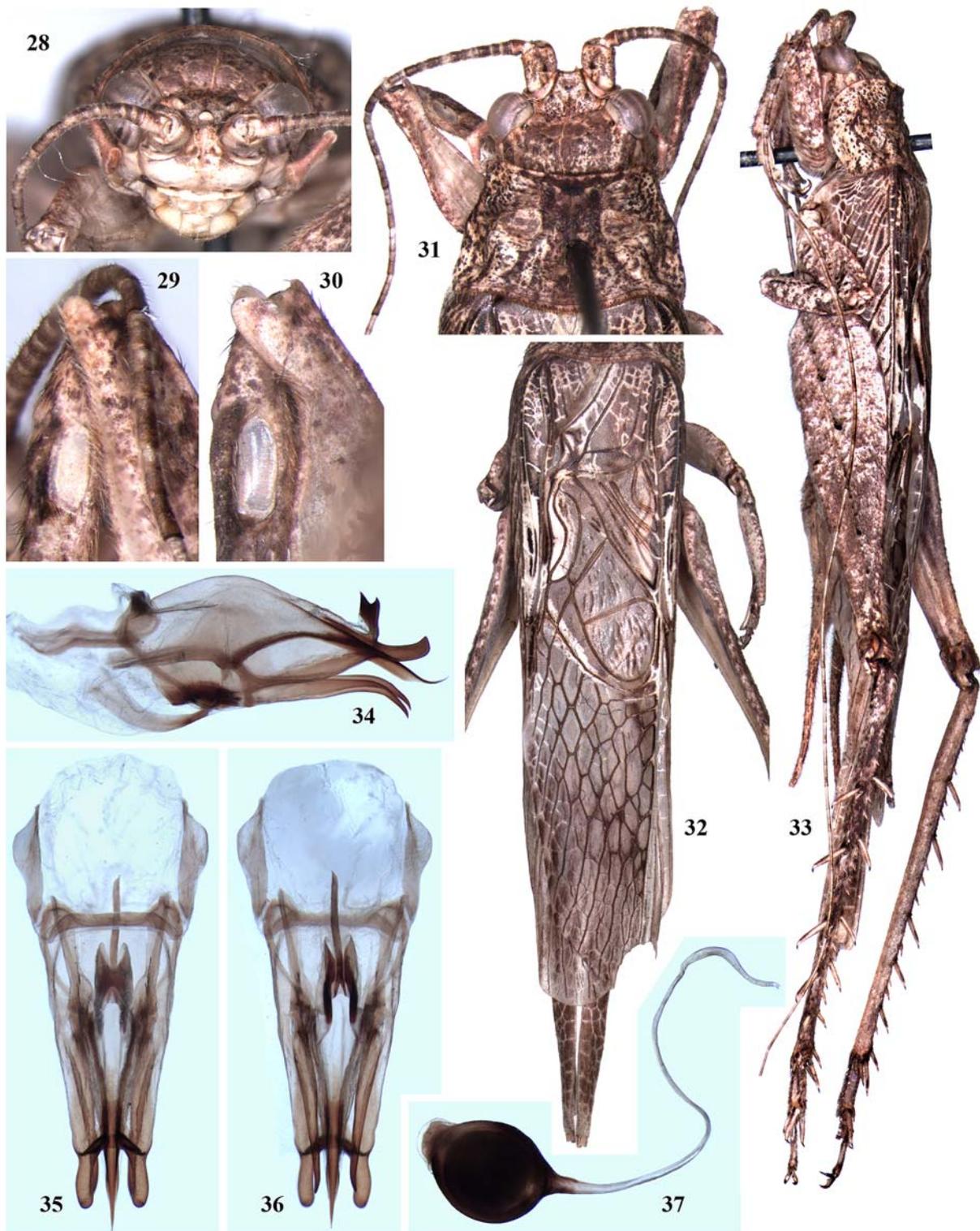
Gorochov, **sp. n.**

Figs 28–37.

MATERIAL EXAMINED. Holotype — ♂, **Madagascar**, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill., ~900 m, on leaf of bush in forest at night, 8–20.III.2013, A. Gorochov (ZIN).

DESCRIPTION. Male (holotype). Body coloration light greyish with following marks: eye greyish with three longitudinal darkish stripes on upper half and one yellowish stripe between two lower of these darkish stripes as well as numerous dense and arcuate darkish lines running along anterior and ventral edges of eye; epicranial dorsum also darkish (almost greyish brown) with numerous lighter and less numerous darker dots; genae with a few oblique darkish stripes; mouthparts with almost rose three distal segments of each maxillary palpus and a pair of small brown spots in dorsolateral corners of clypeus; antenna with dark ventral and lateral longitudinal stripes on scape, with one dark dot and barely darkish marks around it on dorsal surface of scape, and with rather numerous small darkish and whitish spots on flagellum (Figs 28, 31); pronotum with brown median quadrate on anterior half of disc, numerous light brown to greyish brown dots on rest parts of disc, and sparser brown dots on lateral lobes (Figs 31, 33); legs with rather numerous and small light brown to greyish brown dots and small spots on all femora and tibiae (but hind femur lighter and with these dots less distinct, except for 4–5 dark dots distinctly visible along median line of outer femoral surface; Figs 29–33); tegmina yellowish grey with light brown basal area (this area having whitish reticular pattern), semitransparent membranes, whitish some areas and all crossveins in medial and humeral regions as well as in lateral field, brown to brownish rest venation and numerous small marks on almost all membranes, and brown to light brown larger areas on membranes of proximal part of lateral field (Figs 32–33); visible parts of hind wings barely darkened but with lighter venation (Fig.

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Рис. 10–27. Структуры брюшка, самец: 10–15 — *Asymmetrella longitubulosa* **sp. n.**; 16 — *Zvenellomorpha* (*Zvenellomorpha*) *bella* Gor.; 17–18 — *Z. (Z.) recta* Gor.; 19–23 — *Z. (Z.) intermedia* **sp. n.**; 24 — *A. sp.*; 25 — *Z. (Z.) sp.*; 26 — *Z. (Azvenellomorpha) sp.*; 27 — *Ultratrella sp.*; 10 — вершина брюшка, сверху; 11–13, 16–17, 19–21 — гениталии (11, 20 — сверху; 12, 21 — снизу; 13, 16–17, 19 — сбоку); 14 — сперматофор сбоку, реконструкция; 15 — формула с рахисом, эндопарамером и эктопарамером, снизу; 18, 22 — формула, снизу; 23 — дистальная часть гениталий, сбоку; 24–27 — схема сагиттального сечения формулы [коричневый цвет], её склеротизованной передней ленты [зелёный цвет] и ближайшего участка сперматофорной трубы [красный цвет]; 10, 23 — паратип; 11–22 — голотипы [16, 17 — по: Gorochov, 2004, 2006.]



Figs 28–37. *Zvenellomorpha* (*Euzvenellomorpha*) *carinata* sp.n., male: 28 — head in front; 29–30 — outer (29) and inner (30) tympana; 31 — head with pronotum and fore legs from above; 32 — wings with middle and partly hind legs from above; 33 — body from side; 34–36 — genitalia (34 — from side; 35 — from above; 36 — from below); 37 — spermatophore from side, reconstruction.

Рис. 28–37. *Zvenellomorpha* (*Euzvenellomorpha*) *carinata* sp.n., самец: 28 — голова, спереди; 29–30 — наружный (29) и внутренний (30) тимпанумы; 31 — голова с переднеспинкой и передними ногами, сверху; 32 — крылья со средними и частично задними ногами, сверху; 33 — тело, сбоку; 34–36 — гениталии (34 — сбоку; 35 — сверху; 36 — снизу); 37 — сперматофор, сбоку, реконструкция.

32); venter of body with wide longitudinal greyish brown band on abdominal sternites, a pair of barely darkish areas on proximal half of genital plate, and numerous very small darkish dots on cerci (Fig. 33). Eyes slightly higher than long; rostrum roundly angular in profile but with low and thin transverse keel at apex; maxillary palpi approximately as in *Asymmetrella* **gen. n.**; pronotum also similar to that of this genus but more strongly narrowing to head and with lateral keels slightly shorter and more sinuate in profile (Figs 28, 31, 33); tegmina significantly protruding beyond abdominal apex and hind femora, with venation as in Figs 32–33; hind wings also significantly protruding beyond tegmina (Fig. 32); fore and middle legs rather stout, with a pair of dorsal longitudinal keels on fore tibia (Figs 31–33) having tympana as in Figs 29–30 (inner tympanum somewhat larger than outer one), with two keels on middle tibia (along dorsal and ventral tibial edges; Figs 32–33); hind leg more elongate and slender but also with more or less distinct dorsal keel on femur and a pair of dorsal longitudinal keels on tibia; spines and denticles of this tibia more or less similar to those of *Asymmetrella* **gen. n.**; genital plate elongately triangular and with almost spine-like but soft apical lobule; genitalia and spermatophore as in Figs 34–37.

Female unknown.

Length in mm. Body 20.3; body with wings 29.5; pronotum 3.6; tegmina 21.5; hind femora 13.4.

COMPARISON. The new species differs from all the other congeners in the same characters as the subgenus *Euzvenellomorpha* **subgen. n.** (see the subgeneric key above).

ETYMOLOGY. This species name is the Latin word “carinata” (carinate, with keels) due to the presence of characteristic keels on the lateral pronotal lobes.

Zvenellomorpha (Zvenellomorpha) intermedia

Gorochov, **sp. n.**

Figs 19–23, 38–46.

MATERIAL EXAMINED. Holotype — ♂, **Madagascar**, Toamasina Prov., Moramanga Distr., ~10 km NW of Andasibe Vill., Torotorofotsy Forest Reserve, ~1000 m, at light, 22.II–11.III.2013, A. Gorochov (ZIN). Paratypes: 1 ♂, 2 ♀, same data as for holotype (ZIN); 2 ♀, same province and district, Analamazaotra Forest Station near Andasibe Vill., ~900 m, at light, 1–7.III.2013, A. Gorochov, L. Anisyutkin (ZIN).

DESCRIPTION. Male (holotype). General appearance similar to that of two other species of this subgenus but somewhat intermediate between them. Body coloration yellowish with greyish tinge and following marks: upper half of epicranium, pronotum and dorsal tegminal field light brown with light greyish eyes, a pair of barely distinct yellowish interrupted stripes along both lateral edges of pronotal disc, brown M, yellowish stripe between M and Cu in humeral region of tegmen, light greyish brown diagonal vein, and almost semitransparent membranes of mirror and of some nearest cells (Figs 38–40); antenna with brown basal part of scape as well as middle and dorsal portions of flagellum, dark brown rest of scape and proximal portion of flagellum (Figs 38–39); lateral tegminal field yellowish with light brown venation and semitransparent membranes between veins and veinlets (Fig. 39). Head with oval (longitudinal) but poorly distinct lateral ocelli, small round and also poorly distinct median ocellus, and large barely elongate eyes; rostrum roundly angular in profile and rather narrow (scape approximately 1.7 times as wide as space between antennal cavities); maxillary palpi more or less similar to those of *Asymmetrella* **gen. n.**; pronotum slightly narrowing to head, insignificantly longer than wide, and almost not depressed dorsoventrally

(but lateral lobes moderately low; Fig. 39); legs without keels on femora and tibiae, with inner tympanum oval (almost as wide as half of fore tibia width and about 1.2 times as long as latter width; as in Fig. 42), and outer tympanum similar in shape but slightly smaller; Fig. 39); tegmina distinctly protruding beyond apices of hind femora, with mirror in dorsal field almost normal (less irregular than in *Z. bella*), dividing vein in this mirror more curved than in *Z. recta* (Fig. 40), and Sc having 9–10 branches; hind wings strongly protruding beyond tegminal apices; genital plate triangular in proximal half but with narrow, long and soft posteromedian lobule in distal half (this lobule narrowly rounded at apex). Genitalia very similar to those of *Z. bella* and *Z. recta* but with following differences: epiphallus somewhat lower than in these species; dorsoapical epiphallal process with slightly longer both (proximal and distal) spines than in *Z. bella* as well as with distinctly deeper apical notch than in *Z. recta*; ventroapical epiphallal lobule slightly shorter and less arcuate (almost S-shaped) than in *Z. bella* as well as apically more widened and hooked than in *Z. recta*; ectoparameres slightly protruding beyond epiphallus (in *Z. recta*, they strongly protruding beyond epiphallus, and in *Z. bella*, they not reaching epiphallal apices; compare Figs 16–18 and 19–22).

Variations. Second male with epicranial dorsum between eyes laterally darker (greyish brown), pronotal disc having brown median band, dividing vein of tegminal mirror clearly S-shaped (Figs 41–42), and genitalia having barely longer proximal spine of dorsoapical epiphallal process as well as slightly narrower (lower) distal part of ventroapical epiphallal lobule in profile (Fig. 23).

Female. Coloration and structure of body as in male, but scape and proximal portion of antennal flagellum somewhat lighter (more or less brown), pronotal disc and dorsal tegminal field sometimes almost yellowish with greyish tinge, posterior part of this disc sometimes completely brown (Fig. 43), tegminal R brown or greyish brown, median ocellus very small and round or obliterate, tegmina with 8–10 straight but somewhat obliquely situated longitudinal veins and moderately sparse crossveins in dorsal field as well as with 7–9 branches of Sc and almost without distinct crossveins in lateral field, and genital plate barely elongate as well as distally narrowing to roundly and rather widely bilobate apex (posteromedian notch of this apex short and almost angular; Fig. 44). Ovipositor normally developed, with distinctly drilling apical part (Figs 45–46).

Length in mm. Body: ♂ 13–14.5, ♀ 11–14; body with wings: ♂ 20–22, ♀ 18–21; pronotum: ♂ 2.1–2.3, ♀ 2.4–2.8; tegmina: ♂ 14–15.5; ♀ 13–15; hind femora: ♂ 10.8–11.5, ♀ 10–11.5; ovipositor 7–8.5.

COMPARISON. The new species differs from the two other species of the subgenus *Zvenellomorpha* **subgen. n.** mainly in the male genital characters listed above.

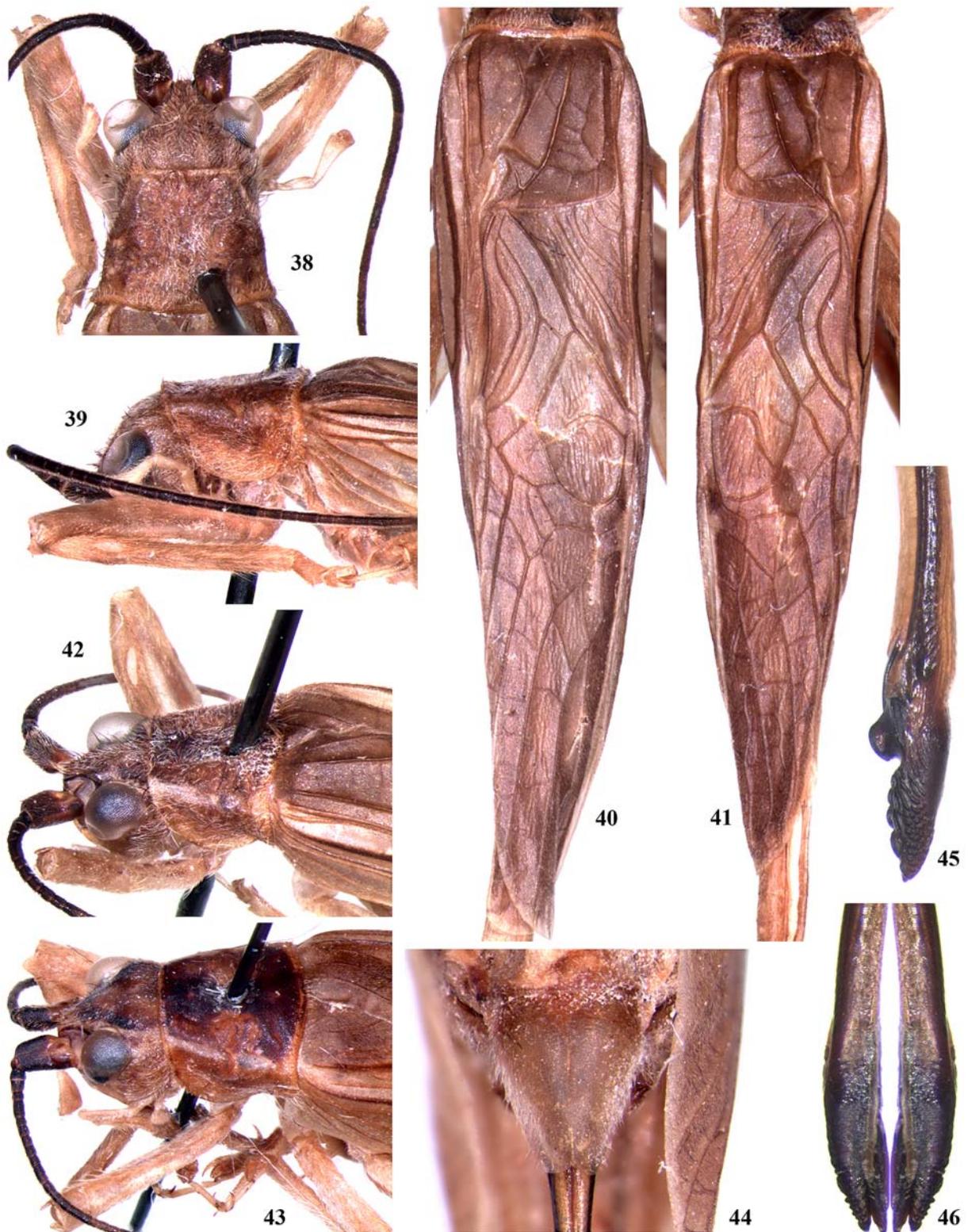
ETYMOLOGY. This species name is the Latin word “intermedia” (intermediate) due to the intermediate length of ectoparameres in the new species compared to both other species of this subgenus.

Zvenellomorpha (Azvenellomorpha) separata

Gorochov, **sp. n.**

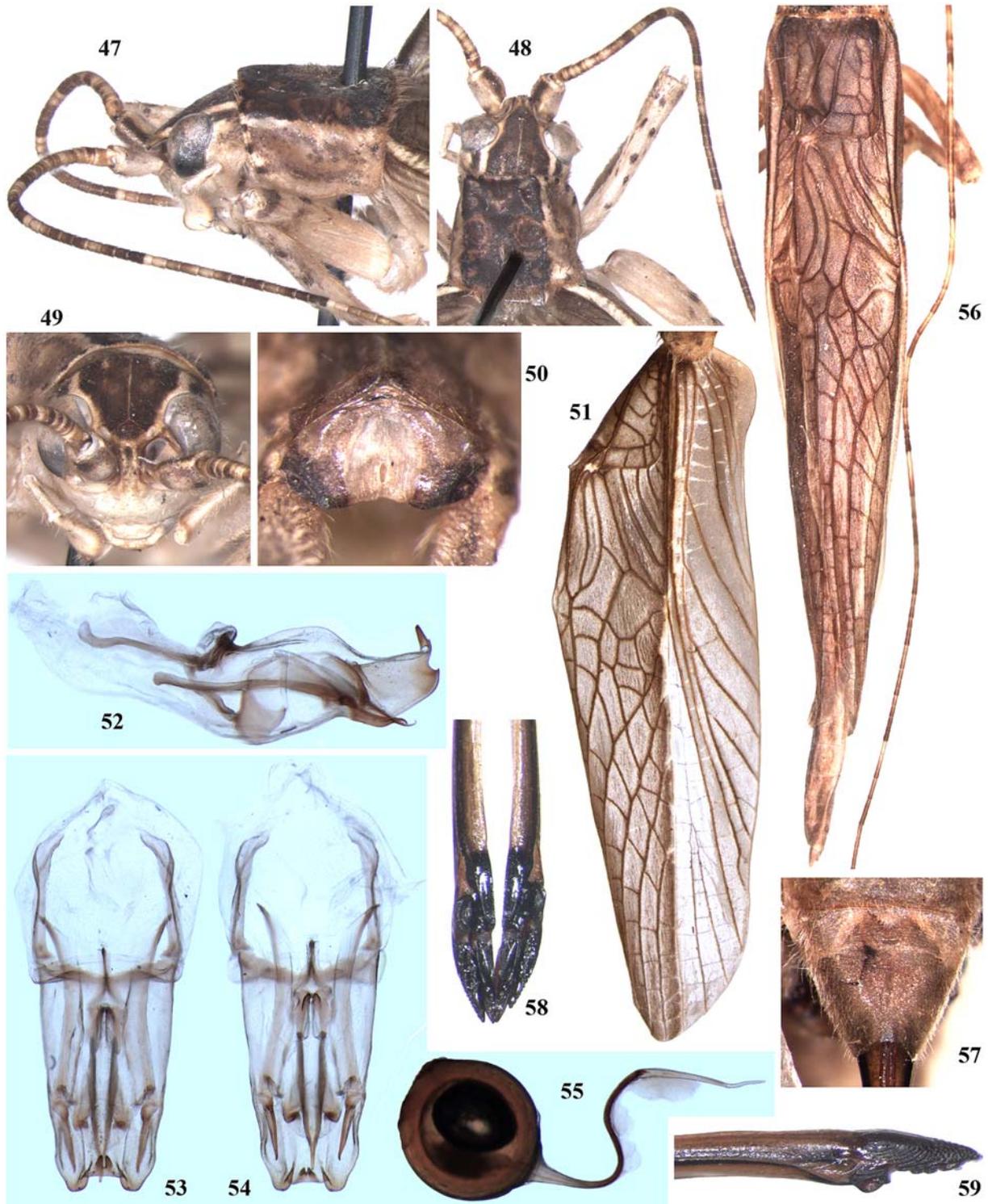
Figs 47–59.

MATERIAL EXAMINED. Holotype — ♂, **Madagascar**, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill. ~900 m, at light, 8–20.III.2013, A. Gorochov (ZIN). Paratypes: 16 ♀, same data as for holotype, but 11.II–20.III.2013, A. Gorochov, L. Anisyutkin (ZIN); 1 ♂, 2 ♀, same province and district, ~10 km NW of Andasibe Vill., Torotorofotsy



Figs 38–46. *Zvenellomorpha (Zvenellomorpha) intermedia* sp.n.: 38–39, 42–43 — head with pronotum and fore legs (38 — from above; 39 — from side, 42–43 — from side/above); 40–41 — tegmina in rest position from above; 44 — genital plate from below; 45–46 — distal part of ovipositor (45 — from side; 46 — from above); 38–42 — male (38–40 — holotype; 41–42 — paratype); 43–46 — female.

Рис. 38–46. *Zvenellomorpha (Zvenellomorpha) intermedia* sp.n.: 38–39, 42–43 — голова с переднеспинкой и передними ногами (38 — сверху; 39 — сбоку; 42–43 — сбоку/сверху); 40–41 — надкрылья в положении покоя, сверху; 44 — генитальная пластинка, снизу; 45–46 — дистальная часть яйцеклада (45 — сбоку; 46 — сверху); 38–42 — самец (38–40 — голотип; 41–42 — паратип); 43–46 — самка.



Figs 47–59. *Zvenellomorpha (Azvenellomorpha) separata* sp.n.: 47–48 — head with pronotum and fore leg (47 — from side; 48 — from above); 49 — head in front; 50 — anal plate from above; 51 — right tegmen; 52–54 — genitalia (52 — from side; 53 — from above; 54 — from below); 55 — spermatophore from side; 56 — wings with middle leg and antennal part in rest position from above; 57 — genital plate from below; 58–59 — distal part of ovipositor (58 — from below; 59 — from side); 47–56 — male (47–55 — holotype; 56 — paratype); 57–59 — female.

Рис. 47–59. *Zvenellomorpha (Azvenellomorpha) separata* sp.n.: 47–48 — голова с переднеспинкой и передней ногой (47 — сбоку; 48 — сверху); 49 — голова, спереди; 50 — анальная пластинка, сверху; 51 — правое надкрылье; 52–54 — гениталии (52 — сбоку; 53 — сверху; 54 — снизу); 55 — сперматофор, сбоку; 56 — крылья со средней ногой и частью антенны в положении покоя, сверху; 57 — генитальная пластинка снизу; 58–59 — дистальная часть яйцеклада (58 — снизу; 59 — сбоку); 47–56 — самец (47–55 — голотип; 56 — паратип); 57–59 — самка.

Forest Reserve, ~1000 m, at light, 22.II–11.III.2013, A. Gorochov (ZIN).

DESCRIPTION. Male (holotype). General appearance similar to that of all species of *Zvenellomorpha* s. str. Body coloration yellowish with following pattern: eyes greyish; dorsum of epicranium greyish brown with a pair of yellowish longitudinal stripes running from rostral apex to yellowish lateral ocelli and from these ocelli to posterior edge of head (along medial edges of eyes and behind them), with a pair of short and thin light longitudinal stripes between previous stripes on posterior part of epicranial dorsum, with also light median line on posterior two thirds of this dorsum (Figs 47–49); upper parts of membranes of antennal cavities and small areas on upper parts of genae behind eyes slightly darkened; scape with brown dorsal band along medial edge, darkish ventral stripe along same edge and darker (greyish brown) ventromedian spot in apical part; rest of antenna with brown to light brown spots in proximal and middle parts as well as with almost uniformly light brown distal part; pronotum with dark brown disc having a few thin lightish marks, with slightly darkish longitudinal band on each lateral lobe (this band occupying upper two thirds of this lobe but separated from dark disc by longitudinal light stripe), with a few small barely darker marks on above-mentioned darkish band, and with several dark and light spots along anterior edge of this lobe; legs with small and sparse dark and darkish spots (Figs 47–49); tegmen with yellowish grey dorsal field having darker (greyish brown) venation as well as yellowish both dot near plectrum and narrow stripe along lateral edge of distal half of this field, with light greyish (semitransparent) lateral field having greyish brown longitudinal veins and whitish crossveins, and with humeral region between these fields having dark (brown) proximal half of M and whitish crossveins as well as almost semimembranous membranes (Fig. 51); hind wings light greyish with somewhat darkened distal parts (in rest condition); anal plate with a pair of rather large greyish brown spots in its laterodorsal corners (Fig. 50); cerci with very small and moderately numerous darkish marks. Eyes rather large, slightly higher than long (Figs 47–49); rostrum practically angular in profile; scape approximately 2.3 times as wide as space between antennal cavities (Fig. 49); pronotum as in Figs 47–48; metanotal gland absent; fore leg with only inner tympanum which oval, almost as long as width of fore tibia, and almost as wide as half of latter width; tegmina distinctly protruding beyond apices of hind femora and with venation as in Fig. 51; hind wings clearly protruding beyond tegminal apices; anal plate small, transverse, truncate apically, widely rounded distolaterally and with large and almost longitudinally oval membranous median area (Fig. 50); genital plate more or less similar to that of *Zvenellomorpha* s. str. but with slightly wider distal lobule having almost angular apex. Genitalia (Figs 52–54): epiphallus more or less similar to that of other subgenera of this genus but with dorsoapical processes having much smaller (poorly distinct) distal tubercles, and with ventroapical lobules much shorter and more hooked; ectoparameres distinctly shorter; anterior sclerotized ribbon of formula longer and narrower than in *Zvenellomorpha* s. str. (i.e. not plate-like), located clearly less parallel to median part of rest of this formula than in the latter subgenus and in *Euzvenellomorpha* **subgen.n.** Spermatophore as in Fig. 55.

Variations. Second male distinguished from holotype by insignificantly less contrast coloration of head, lighter pronotal disc, yellowish brown tinge of tegmina, somewhat different venation of their dorsal field (Fig. 56), as well as genitalia with slightly smaller anterolateral (curved posteriorly) parts

of epiphallus and barely lower lateral plates of formula.

Female. Coloration and structure of body practically as in males, but scape somewhat lighter, dorsal tegminal field with 9–10 almost straight (barely oblique) longitudinal veins as well as rather numerous and partly irregular crossveins, genital plate almost as wide as long and somewhat narrowing in distal half as well as with distinct roundly angular posteromedian notch (Fig. 57); ovipositor normal and with drilling distal part as in Figs 58–59.

Length in mm. Body: ♂ 14.5–15.5, ♀ 15–17.5; body with wings: ♂ 24–25.5, ♀ 26–29; pronotum: ♂ 2.7–2.9, ♀ 3.1–3.4; tegmina: ♂ 17.5–18.5; ♀ 18–20; hind femora: ♂ 13–14, ♀ 13.5–15; ovipositor 9–9.5.

COMPARISON. The new species differs from all the other congeners in the same characters as the subgenus *Azvenellomorpha* **subgen.n.** (see the subgeneric key above).

ETYMOLOGY. This species name is the Latin word “separata” (separate) due to some distinct differences in the structure of the male genitalia.

Ultratrella? ornata Gorochov, **sp.n.**

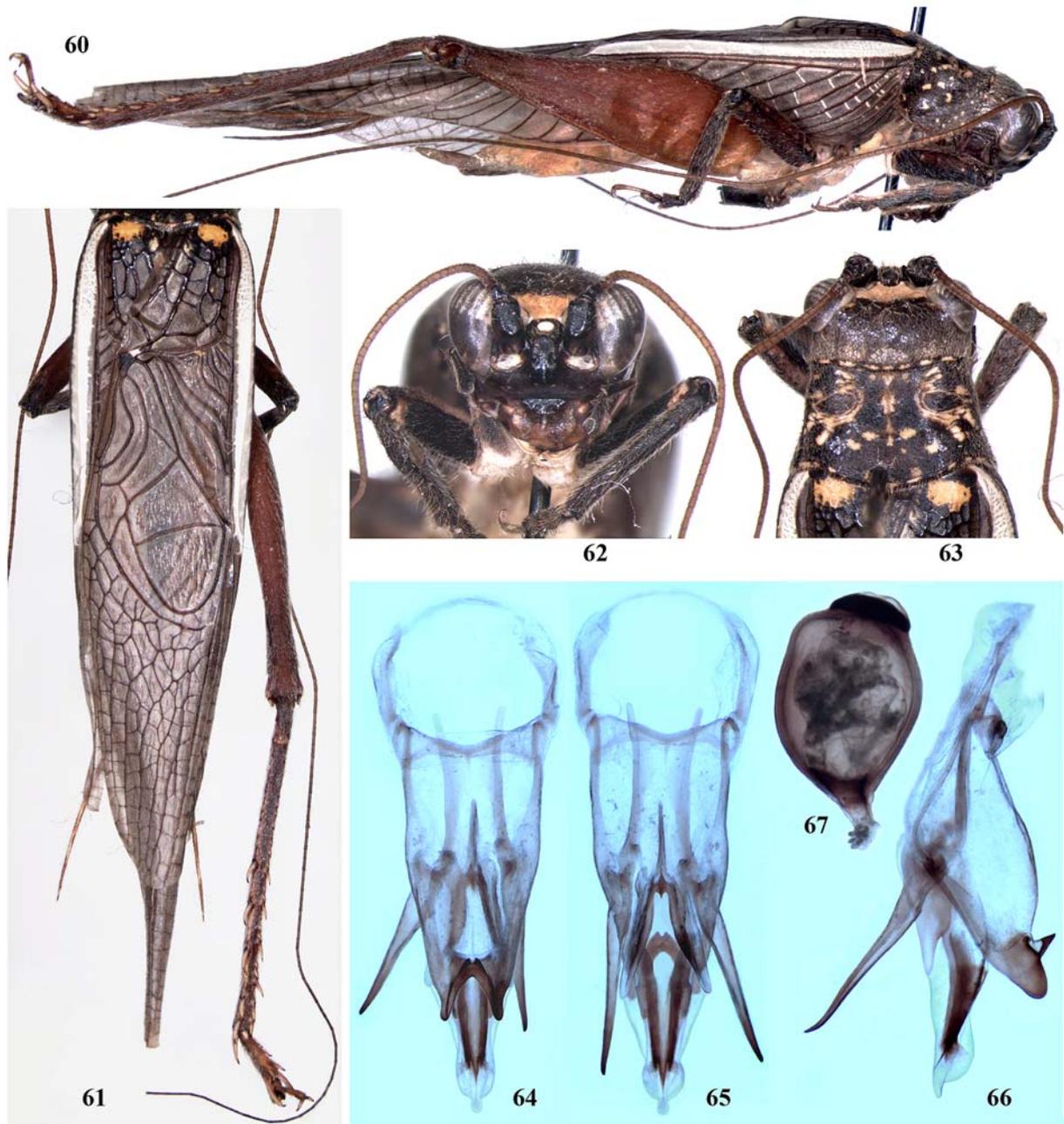
Figs 60–67.

MATERIAL EXAMINED. Holotype — ♂, **Madagascar**, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill. ~900 m, at light, 8–20.III.2013, A. Gorochov (ZIN).

DESCRIPTION. Male (holotype). General appearance distinctly different from that of *U. gracilis* Gorochov, 2004, i.e. body clearly smaller, and coloration more contrast: head and pronotum (Figs 60, 62–63) dark grey with slightly lighter (grey) stripe along posterior edge of epicranial dorsum, yellowish ocelli and dorsal transverse band between anterior parts of eyes (this band situated behind median ocellus but very near it, and lateral ocelli located on this band), almost black scape and pedicel as well as rostral area, brown antennal flagellum and light brown to yellowish spots on mouthparts as well as on pronotal disc (lateral lobes of pronotum with only sparse light dots; Figs 60, 63); fore and middle legs dark greyish brown with light brown ventral surfaces of tibiae and tarsi as well as with yellowish trochanters and coxae (each coxa with darkish lateral area); hind legs brown with light brown basal parts of femora and all spines and spurs (Figs 60–63); tegmina light grey with yellow spot at base of each tegmen (Figs 61, 63), greyish brown to blackish venation of dorsal field and longitudinal veins of lateral field, whitish crossveins in lateral field, slightly darkened spots on almost all membranes and rather wide whitish humeral stripe (Figs 60–61); visible distal parts of hind wings also light grey; other parts of body venter (including abdominal sternites, genital plate and cerci) yellowish to light brown. Head rather short, slightly concave dorsally (between middle parts of eyes), somewhat depressed dorsoventrally, with large eyes which slightly higher than long, with rather large and almost round ocelli, with short mouthparts and very short palpi, as well as with scape barely wider than space between antennal cavities (Figs 60, 62–63); pronotum distinctly transverse and moderately high (somewhat dorsoventrally depressed), with concave anterior edge of disc and convex posterior one (Figs 60, 63); fore and middle legs rather short, not flattened, without keels and with fore tibiae having outer and inner tympana oval and almost equal to each other in size (each of them 1.6–1.7 times as wide as maximal width of fore tibia and barely longer than latter width); tegmina strongly protruding beyond hind femora in rest position, with mirror clearly smaller than in *U. gracilis* and with rest venation as in Figs 60–61 (lateral field with very narrow Sc-R area, 15–16

branches of Sc, rather numerous crossveins in proximal half of this field and almost without crossveins in its distal half; hind wings distinctly protruding beyond tegminal apices; genital plate practically intermediate between those of *Zvenelomorpha* s. l. and *U. gracilis* [see Gorochov, 2004: figs X, 2 and 7]. Genitalia (Figs 64–66) also more or less similar to those of *U. gracilis* (including similar structure of formula and rachis), but: distal part of epiphallus higher (less narrow in profile) and with dorsoapical processes triangular (not

bilobate) in profile and located near convex part of epiphallus (in *U. gracilis*, this processes and latter part located not near each other); ventroapical epiphallic lobules higher (wider in profile); formula with shorter anterior ribbon and with lateral lobes angularly projected backwards (vs. not projected backwards); ectoparameres clearly longer; rachis with semimembranous subapical inflation (vs. without any inflation in distal part). Spermatophore with elongately rounded ampulla (other structures of spermatophore missing; Fig. 67).



Figs 60–67. *Ultratrella ornata* sp.n., male: 60 — body from side; 61 — wings, middle and hind legs as well as part of antennae and cerci in rest position from above; 62 — head with fore legs in front; 63 — head with pronotum and fore legs from above; 64–66 — genitalia (64 — from above; 65 — from below; 66 — from side); 67 — ampulla of spermatophore from side.

Рис. 60–67. *Ultratrella ornata* sp.n., самец: 60 — тело, сбоку; 61 — крылья, средние и задняя ноги, а также часть усиков и церки в положении покоя, сверху; 62 — голова с передними ногами, спереди; 63 — голова с переднеспинкой и передними ногами, сверху; 64–66 — гениталии (64 — сверху; 65 — снизу; 66 — сбоку); 67 — ампула сперматофора, сбоку.

Female unknown.

Length in mm. Body 10; body with wings 27; pronotum 2.8; tegmina 18.7; hind femora 10.

COMPARISON. The new species is clearly different from *U. gracilis* (type and only species of this genus) in the body smaller, coloration much more dark and contrast, a relatively smaller mirror in the male tegmen, and the above-mentioned characters of the male genitalia. These differences may be treated also as subgeneric or even generic ones, but this question may be clarified only after the study of some additional data.

ETYMOLOGY. This species name is the Latin word “ornata” (ornated, adorned) due to the characteristic (contrasting) body pattern.

Ultratrella gracilis Gorochov, 2004

MATERIAL EXAMINED. **Madagascar:** 1 ♂, 2 ♀, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill. ~900 m, at light, 8–20.III.2013, A. Gorochov (ZIN).

DESCRIPTION. Female (nov.). General appearance similar to that of male holotype [Gorochov, 2004] but with following differences: coloration even more uniformly light greyish brown, i.e. with less distinct lighter (yellowish white) stripes on head and pronotum, and practically without whitish humeral stripe on each tegmen; tegminal dorsal field with 13–14 longitudinal veins which barely S-shaped in lateral part of proximal half, as well as with numerous and slightly irregular crossveins; tegminal lateral field with 15–17 oblique branches of Sc which partly and slightly arcuate, with moderately numerous crossveins, and with area between Sc stem and R moderately narrow (in male, this area very strongly narrowed); genital plate elongate but slightly shorter than two last abdominal sternites together, gradually narrowing to roundly truncate apex having very short and roundly angular posteromedian notch; ovipositor long and with dis-

tinctly drilling apical part more or less similar to that of *Zvenellomorpha* s. l.

Male. Body very similar to that of holotype of this species, but tegmina with slightly longer chords and barely smaller mirror in dorsal field; genitalia almost identical to those of this holotype [Gorochov, 2004].

Length in mm. Body: ♂ 22, ♀ 19–21.5; body with wings: ♂ 35, ♀ 37–39; pronotum: ♂ 4.3, ♀ 4.4–4.7; tegmina: ♂ 25, ♀ 25–27; hind femora: ♂ 16, ♀ 17–17.5; ovipositor 16–17.

REMARKS. This species, originally described from “Jlôt-Prune” (Madagascar), is here recorded from another Madagascan locality.

Acknowledgements. This study was performed in the frames of the state research project No. 1021051302540-6 (Russian Federation).

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