

Two New Species of the Genus *Tshurtshurnella* Kusnezov (Hemiptera, Auchenorrhyncha, Fulgoroidea: Issidae) from Eastern Anatolia¹

V. M. Gnezdilov^a and I. Özgen^b

^aZoological Institute, Russian Academy of Sciences, St. Petersburg Russia

e-mail: vgnezdilov@zin.ru, vmgnezdilov@mail.ru

^bFirat University, Engineering Faculty, Bioengineering Department, Elazığ, Turkey

e-mail: inancozgen@gmail.com

Received March 31, 2018

Abstract—*Tshurtshurnella bicolorata* sp. n. and *T. curtulum* sp. n. are described from Elazığ and Malatya provinces of Turkey. *T. bicolorata* sp. n. is well distinguished from the other species of the genus by the presence of two color forms in males and females and *T. curtulum* sp. n., by darkly colored females and pale males. Also these new species differ from the other species of the genus in the characters of the structure of the male genitalia.

DOI: 10.1134/S0013873818020070

As the result of examination of the material collected by the authors in September of 2017 in two provinces of Eastern Anatolia, Elazığ and Malatya, two new species of the genus *Tshurtshurnella* Kusnezov were found; their descriptions are given below.

Tshurtshurnella, one of the largest genera of the family Issidae in the Western Palaearctic Region, comprises 43 species, including those described below; among these, 31 species are known from Turkey (Gnezdilov et al., 2014; Gnezdilov and Gjonov, 2015; Gnezdilov, 2016a). These species were collected by sweeping on grasses (including astragals) in light oak forests on steep slopes. *Tshurtshurnella bicolorata* sp. n. is one of the commonest species in these plant communities of Elazığ Province, whereas *T. curtulum* sp. n., on the contrary, was collected only in the environs of Malatya.

The morphological terminology and classification of the family Issidae follow those of Gnezdilov (2003, 2016b). The type specimens of the species described are deposited in the collection of the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZIN), and in Dr. I. Özgen's collection, Elazığ, Turkey (IOC).

Family **ISSIDAE** Spinola

Subfamily Issinae Spinola

Tribe **Issini** Spinola

Genus *Tshurtshurnella* Kusnezov, 1927

Tshurtshurnella bicolorata Gnezdilov et Oezgen,
sp. n. (Figs. 1–4, 10, 11, 14–22)

Description. Metope slightly longer along midline than wide between eyes, with distinct median carina extending from its upper margin to metopoclypeal suture and continuing onto postclypeus but being already strongly flattened there. Sublateral carinae of metope weak. Upper margin of metope straight; lateral margins weakly curved, nearly straight (Figs. 3, 11). Metopoclypeal suture sharply curved. Coryphe and metope converging at about right angle (lateral view) (Fig. 4). Coryphe transverse, twice as wide as long along midline, with median carina; its anterior margin weakly obtuse-angularly curved, nearly straight (Figs. 1, 2, 10). Ocelli absent. Pedicel spherical. Rostrum reaching hind coxae; 2nd and 3rd segments equal in length; 3rd segment narrowed toward apex. Pronotum as long as coryphe, with median carina; its anterior margin arcuately curved; posterior margin straight (Figs. 1, 2, 10). Mesonotum slightly longer than pronotum, with lateral carinae and median groove. Fore wings elongate, projecting considerably beyond apex of abdomen, without hypocoastal plate

¹ This article was originally submitted by the authors in Russian and is first published in translation.



Figs. 1–4. *Tshurtshurnella bicolorata* Gnezdilov et Oezgen sp. n., habitus: (1) female, paratype (dorsal view); (2) male, paratype (dorsal view); (3) male, paratype (front view); (4) male, paratype (lateral view).

(Fig. 4). *R* 2 (short 3rd branch occasionally present anterior to two others) *M* 2–3 (short furcation *M*_{1,1}–*M*_{1,2} occasionally present) *CuA* 1. Hind wings rudimentary. Hind tibia with 2 lateral spines in distal half, with 8–10 spines apically. 1st metatarsomere with 2 lateroapical and 1 intermedial spine. Arolium of pretarsus projecting beyond claws, shallowly emarginate posteriorly (dorsal view).

Coloration. Generally straw-colored (Figs. 2–4). Pedicel with dark brown spot at base. Antennal flagellum and apices of rostrum and spines of legs black. Claws brown. In some specimens, nearly half of fore wing, from median vein to claval suture, dark brown to black (Fig. 1).

Male genitalia (Figs. 14–21). Pygofer narrow, with slightly convex posterior margin, narrowed in upper part (lateral view) (Fig. 14). Anal tube wide, twice as

long as wide in middle part, obtused apically (dorsal view) (Fig. 21). Ventral surface of anal tube slightly convex (lateral view) (Fig. 20). Anal column (paraproct) long, half as long as anal tube (dorsal view). Phallobase with wide and deep lateral emarginations separating ventral and dorsolateral lobes. Ventral lobe of phallobase wide at base, sharply narrowed to apex, considerably not reaching ventral margin of phallorema (Fig. 16). Dorsolateral lobes of phallobase narrow, pointed, each marginate with 9 teeth (Fig. 17), with rounded process at base (lateral view). Aedeagus straight (lateral view), with pair of large apical teeth directed towards its dorsal surface (Fig. 15). Ventral margin of phallorema with pair of rounded processes. Connective with large and wide cup. Stylus with widely rounded caudodorsal angle and with convex posterior margin, without neck (Fig. 18). Capitulum



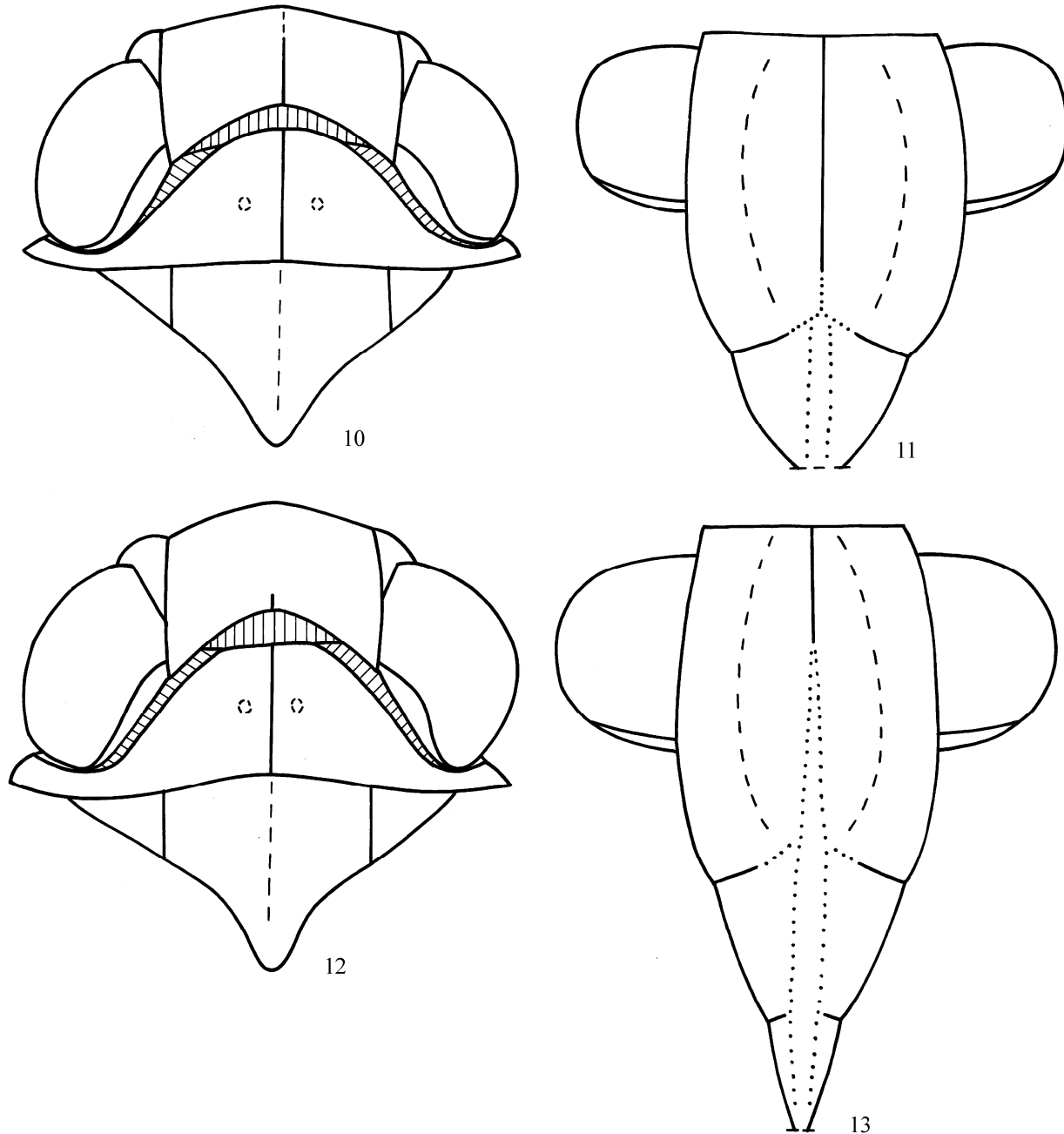
Figs. 5–9. *Tshurtshurnella curtulum* Gnezdilov et Oezgen sp. n., habitus: (5) male, paratype (dorsal view); (6) male, paratype (lateral view); (7) male, paratype (front view); (8) female, paratype (dorsal view); (9) female, paratype (front view).

with wide lateral tooth (lateral view), narrowed toward apical tooth (dorsal view) (Fig. 19).

Female genitalia (Fig. 22). Posterior margin of sternite VII nearly straight. Anal tube 2–2.5 times as long as wide, rounded apically (dorsal view) (Fig. 22). Anal column (paraproct) short.

Body length: 2.8–3.3 mm in males, 3.0–4.0 mm in females.

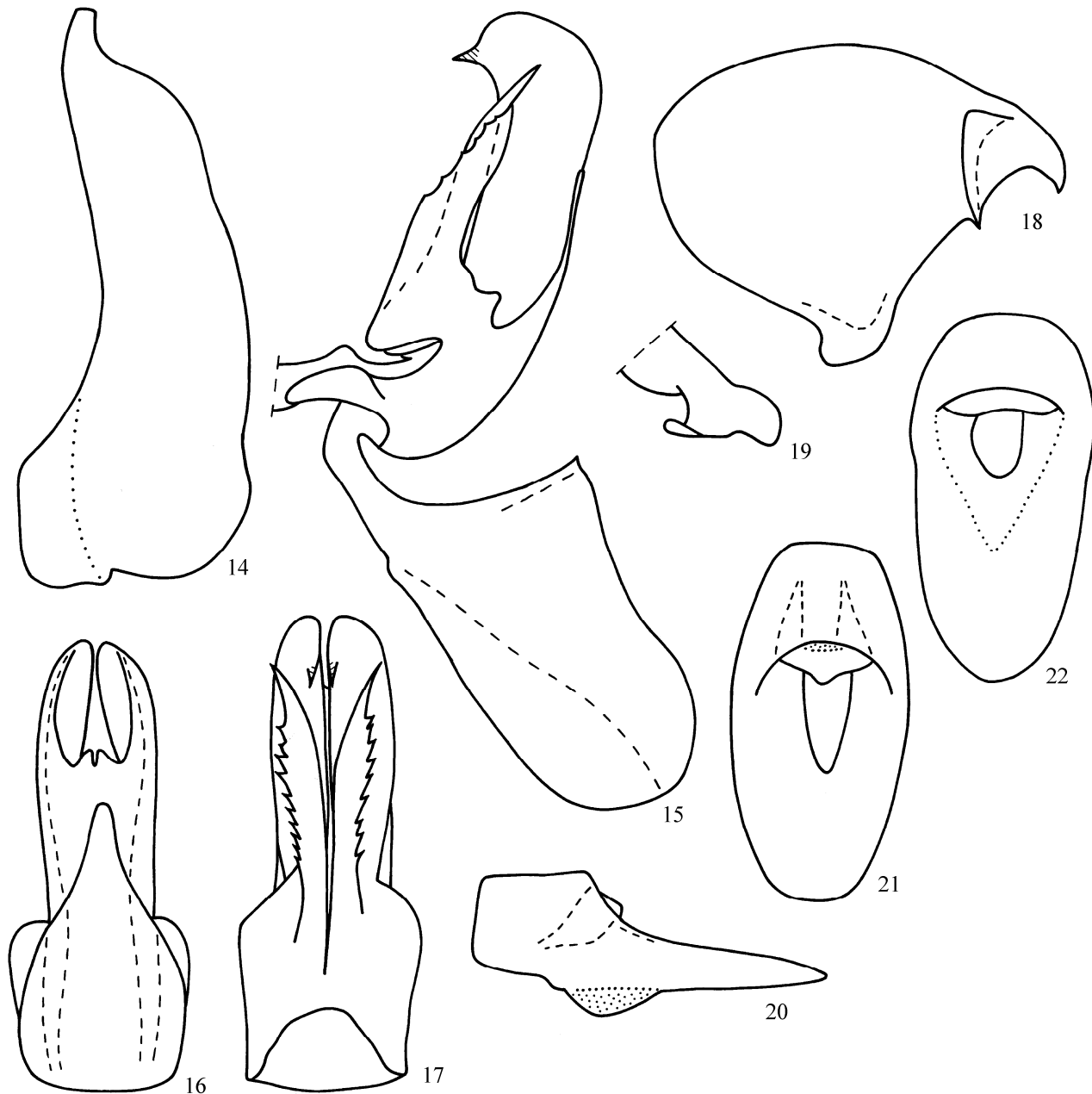
Material. Turkey. Holotype, ♂: *Elazığ Prov.*, near Harput, 20 km N of Elazığ, 38°44.304'N, 39°18.756'E, 1517–1550 m, 12.IX.2017 (V.M. Gnezdilov) (ZIN). Paratypes: *Elazığ Prov.*: 6 ♂, 9 ♀, as holotype



Figs. 10–13. *Tshurtshurnella* spp, head and pronotum: (10) *T. bicolorata* Gnezdilov et Oezgen sp. n. (dorsal view), (11) *T. bicolorata* Gnezdilov et Oezgen sp. n. (front view), (12) *T. curtulum* Gnezdilov et Oezgen sp. n. (dorsal view), (13) *T. curtulum* Gnezdilov et Oezgen sp. n. (front view).

(V.M. Gnezdilov) (ZIN); 13 ♂, 16 ♀, as above (I. Özgen) (ZIN, IOC); 8 ♂, 14 ♀, near Harput, 38°44.155'N, 39°18.593'E, 1567 m, 18.IX.2017 (V.M. Gnezdilov) (ZIN); 5 ♂, 8 ♀, Haroğlu Mt., 1596–1650 m, 38°36.623'N, 38°55.176'E, 14.IX.2017 (I. Özgen) (IOC, ZIN); 2 ♂, 3 ♀, as above (V.M. Gnezdilov) (ZIN); 1 ♀, Sahapli River, 38°33.087'N, 38°48.246'E, 1049 m, 14.IX.2017 (I. Özgen) (IOC); 1 ♂, 5 ♀,

Hazarbaba Mt., 1575 m, 38°25.634'N, 39°19.091'E, 17.IX.2017 (V.M. Gnezdilov) (ZIN); 2 ♀, as above (I. Özgen) (ZIN, IOC); 5 ♂, 10 ♀, near Koruk Village, 1058 m, 38°48.658'N, 38°58.055'E, 16.IX.2017 (V.M. Gnezdilov); 2 ♂, 6 ♀, as above (I. Özgen) (ZIN, IOC); 2 ♂, 1 ♀, 25 km W of Elazığ, 13.IX.2017 (V.M. Gnezdilov) (ZIN); 2 ♂, 2 ♀, Dürümlü Village, near Keban Dam, 924 m, 38°52.636'N, 38°43.435'E,



Figs. 14–22. *Tshurtshurnella bicolorata* Gnezdilov et Oezgen sp. n., male and female genitalia: (14) pygofer (lateral view), (15) penis and connective (lateral view), (16) penis (ventral view), (17) penis (dorsal view), (18) stylus (lateral view), (19) capitulum of stylus (dorsal view), (20) anal tube of male (lateral view), (21) anal tube of male (dorsal view), (22) anal tube of female (dorsal view).

17.IX.2017 (V.M. Gnezdilov) (ZIN); 7 ♂, 7 ♀, Kozluk (Günbaği) Village, 1626 m, 38°33.399'N, 38°54.975'E, 14.IX.2017 (V.M. Gnezdilov) (ZIN); 1 ♂, 4 ♀, as above (I. Özgen) (ZIN, CIO). *Malatya Prov.*: 1 ♂, 1 ♀, Hekimhan District, 50 km N of Malatya, 38°42.314'N, 38°07.060'E, 1141 m, 15.IX.2017 (V.M. Gnezdilov) (ZIN).

Comparative notes. The new species is similar to *T. mesopotamica* Dlabola, 1979 and *T. yozgatrica* Kar-

tal, 1985 in the structure of the penis (the aedeagus bears apical or subapical teeth directed toward its dorsal surface, and the dorsolateral lobes of the phallobase are marginate with teeth). *T. mesopotamica* has a larger body; the dorsolateral lobes of its phallobase are wide, not narrowed toward the apices (Dlabola, 1979, fig. 23); *T. yozgatrica* is characterized by the presence of a large subulate process on each dorsolateral lobe (Kartal, 1985, fig. D5).

Etymology. The name of the species reflects the presence of two color forms in its populations: entirely pale yellow and pale yellow with large dark brown spots on the fore wings.

Habitat. The species was collected on grasses in light oak forests with hawthorn, juniper, astragals, gramineans, and composites.

Tshurtshurnella curtulum Gnezdilov et Oezgen,
sp. n. (Figs. 5–9, 12, 13, 23–31)

Description. Metope elongate, about 1.5 times as long along midline as wide between eyes, weakly narrowed toward upper margin, gently convex laterally (Figs. 7, 9, 13), with distinct median carina extending from its upper margin to metopoclypeal suture and then continuing onto postclypeus, being strongly flattened there. Upper margin of metope straight. Sublateral carinae of metope presented only by brown stripes. Metopoclypeal suture sharply curved. Coryphe transverse, twice as wide as long along midline; anterior margin weakly obtuse-angularly curved, without median carina (Figs. 5, 8, 12). Ocelli absent. Pedicel spherical. Rostrum projecting beyond hind coxae. 2nd and 3rd segments of rostrum equal in length; 3rd segment narrowed toward apex. Pronotum slightly longer than coryphe, with weak median carina; anterior margin steeply arcuately curved; posterior margin straight. Mesonotum with lateral carinae and weak median carina. Fore wings projecting beyond apex of abdomen, shortly oval, without hypocostal plate (Fig. 6). *R* 2 *M* 2 *CuA* 1. Hind wings rudimentary. Hind tibia with 2 lateral spines in distal half, with 8 or 9 spines apically. 1st metatarsomere with 2 lateroapical and 1 intermedial spine.

Coloration. Male pale, with pale yellow head and body, including fore wings and abdomen (Figs. 5–7). In female, metope with dark brown traces of sublateral carinae and larval sensory pits (Fig. 9). Postclypeus of male and female with transverse pale brown stripes at sides of median carina. In male, pedicel, legs, and rostrum, except for apex, greenish pale yellow; pedicel of female brown. Antennal flagellum, apex of rostrum, and apices of spines of legs black. Veins of fore wing, midline of coryphe, and median carinae of pro- and mesonotum of female marginate with dark brown to black stripes (Fig. 8). In female, fore and middle femora with pair of dark spots on outer surface; fore and middle tibiae with longitudinal brown stripes. Claws dark brown.

Male genitalia (Figs. 23–30). Pygofer with slightly convex posterior margin, narrow, narrowed in upper part (lateral view) (Fig. 26). Anal tube wide, twice as long as wide in middle part, narrowed apically to form characteristic beak (dorsal view) (Fig. 30). Ventral surface of anal tube bubble-like convex (lateral view) (Fig. 29). Anal column (paraproct) long, 1/3 as long as anal tube. Phallobase with deep lateral emarginations separating ventral and dorsolateral lobes (Fig. 23). Ventral lobe of phallobase long, narrow, narrowed toward apex, nearly reaching phallostrema (Fig. 24). Dorsolateral lobes of phallobase wide, widened toward obliquely truncate apices (lateral view), considerably not reaching apex of aedeagus, each with large curved claw-shaped process directed toward ventral lobe of phallobase (Figs. 23, 25). Aedeagus weakly arcuately curved, slightly narrowed toward apex, with pair of large apical teeth directed toward its dorsal surface and with pair of teeth in upper third on dorsal surface (Figs. 23, 25). Ventral margin of phallostrema with pair of rounded processes. Stylus with widely rounded caudodorsal angle; its posterior margin straight; neck absent (Fig. 27). Capitulum with wide lateral tooth (lateral view), narrowed toward apical tooth (dorsal view) (Fig. 28).

Female genitalia (Fig. 31). Posterior margin of sternite VII nearly straight. Anal tube oval, twice as long as wide, narrowed toward apex (dorsal view) (Fig. 31). Anal column (paraproct) short.

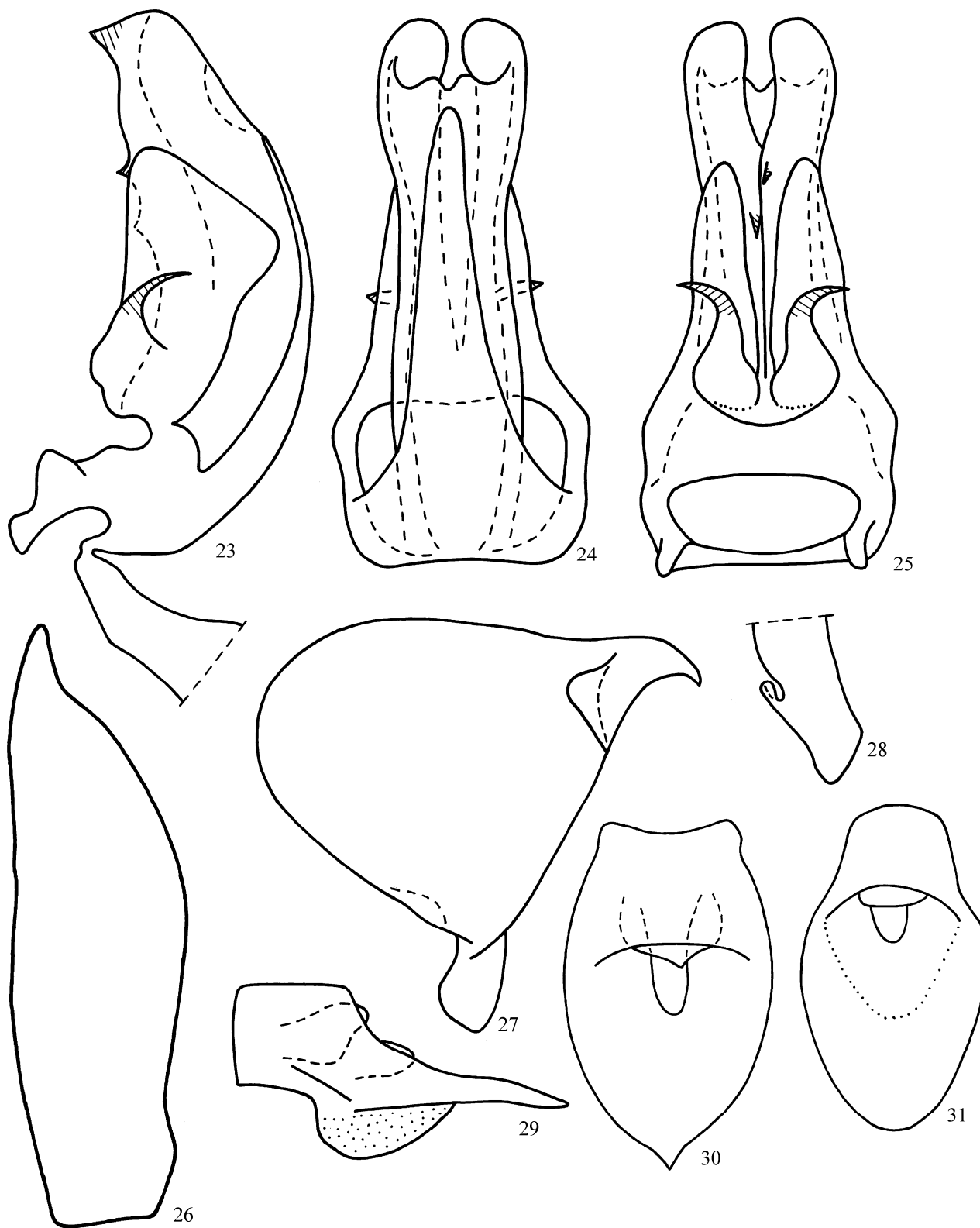
Body length: 2.5–2.8 mm in males, 2.8 mm in females.

Material. **Turkey.** Holotype, ♂: *Malatya Province*, Hekimhan District, 50 km N of Malatya, 38°42.314'N, 38°07.060'E, 1141 m, 15.IX.2017 (V.M. Gnezdilov) (ZIN). Paratypes: 8 ♂, 3 ♀, as holotype (ZIN, IOC).

Etymology. The name of species refers to its shortly oval fore wings which make the individuals look thickset.

Habitat. The species was collected from grasses in light oak forests with almonds, gramineans, and composites.

Comparative notes. The new species is similar to *T. linnavuori* Dlabola, 1985 (Dlabola, 1985, fig. 45) in the presence of teeth on the dorsal surface of the aedeagus but clearly differs in wide dorsolateral lobes of the phallobase and in smaller processes of these lobes.



Figs. 23–31. *Tshurtshurnella curtulum* Gnezdilov et Oezgen sp. n., male and female genitalia: (23) penis (lateral view), (24) penis (ventral view), (25) penis (dorsal view), (26) pygofer (lateral view), (27) stylus (lateral view), (28) capitulum of stylus (dorsal view), (29) anal tube of male (lateral view), (30) anal tube of male (dorsal view), (31) anal tube of female (dorsal view).

ACKNOWLEDGMENTS

V.M. Gnezdilov's study was performed within the framework of the State Project no. AAAA-A17-117030310210-3 and financially supported by the Russian Foundation for Basic Research (project no. 18-04-00065).

REFERENCES

1. Dlabola, J., "Tshurtshurnella, Bubastia und andere verwandte Taxone (Auchenorrhyncha, Issidae)," *Acta entomologica bohemoslovaca* **76**, 266–286 (1979).
2. Dlabola, J., "Neue mediterrane, eremische und ostafrikanische Issiden-Taxone (Hom., Auchenorrhyncha)," *Sbornik Narodniho Muzea v Praze Rada B Prirodni Vedy* **40** (3–4), 217–243 (1985).
3. Gnezdilov, V.M., "A Review of the Family Issidae (Homoptera, Cicadina) of the European Fauna, with Notes on the Structure of the Ovipositor in Fulgoroidea," in *Lectures in Memory of N.A. Chodkovsky* (St. Petersburg, 2003), vol. 56, issue 1, pp. 1–145.
4. Gnezdilov, V.M., *Doctoral Dissertation in Biology, Abstract of Thesis* (St. Petersburg, 2016a).
5. Gnezdilov, V.M., "Notes on the Phylogenetic Relationships of Planthoppers of the Family Issidae (Hemiptera, Fulgoroidea) of the Western Palaearctic Fauna, with Descriptions of Two New Genera," *Entomologicheskoe Obozrenie* **95** (2), 362–382 (2016b) [*Entomological Review* **96** (3), 332–347 (2016). DOI: 10.1134/S0013873816030106].
6. Gnezdilov, V.M. and Gjonov, I.V., "A New Species of the Genus *Tshurtshurnella* Kusnezov (Hemiptera: Fulgoroidea: Issidae) from Bulgaria," *Acta Entomologica Musei Nationalis Pragae* **55** (2), 559–567 (2015).
7. Gnezdilov, V.M., Holzinger, W.E., and Wilson, M.R., "The Western Palaearctic Issidae (Hemiptera, Fulgoroidea): an Illustrated Checklist and Key to Genera and Subgenera," in *Proceedings of the Zoological Institute RAS* **318** (Supplement 1), 1–124 (2014). http://www.zin.ru/journals/trudyzin/doc/vol_318_s1/TZ_318_1_Supplement_Gnezdilov.pdf.
8. Kartal, V., "Türkiye yukari kizilirmak havzasindaki Issidae (Homoptera, Auchenorrhyncha) familyasi Türlerinin taksonomik yönden incelenmesi," *Doga bilim dergisi. Ser. A2* **9** (1), 64–77 (1985).