

A new species of the genus *Tshurtshurnella* (Hemiptera: Fulgoroidea: Issidae) from Bulgaria

Vladimir M. GNEZDILOV¹⁾ & Ilia V. GJONOV²⁾

¹⁾Zoological Institute of the Russian Academy of Sciences, Universitetskaya nab.1, 199034 Saint Petersburg, Russia; e-mails: vmgnezdilov@mail.ru, vgnezdilov@zin.ru

²⁾Department of Zoology and Anthropology, Faculty of Biology, Sofia University “St. Kliment Ohridski” 8, Dragan Tzankov blvd., 1000 Sofia, Bulgaria; e-mail: gjonov@cicadina.com

Abstract. A new species of the genus *Tshurtshurnella* Kusnezov, 1927, *T. decempunctata* sp. nov., is described from Bulgaria. This is the first record of the genus from this country. According to the coloration of the head and the structure of the male genitalia the new species is closely related to *T. lodosi* Dlabola, 1979. For the first time in the genus, a fifth instar nymph of *T. decempunctata* is described and illustrated.

Key words. Auchenorrhyncha, Issinae, Issini, planthoppers, taxonomy, immature morphology, Europe, Balkan peninsula, Palaearctic Region

Introduction

The Western Palaearctic genus *Tshurtshurnella* Kusnezov, 1927 comprises 40 species and is largely limited in distribution to the Eastern Mediterranean Basin (GNEZDILOV et al. 2014). Twenty-nine species are known from Turkey, 7 from Greece, and 1 or 2 species from Cyprus, Italy, Iraq, Syria, Lebanon, and Israel, respectively. A single species, *Tshurtshurnella eugeniae* Kusnezov, 1927 (type species of the genus), was described from Crimea (KUSNEZOV 1927) and later recorded from the Belgorod Province of Russia where it was collected on slopes of chalk outcrops (GNEZDILOV 2010). The new species described below is the first record of the genus from Bulgaria.

Tshurtshurnella is well distinguished from other issid genera by a complex of the following morphological features (GNEZDILOV 2003; GNEZDILOV et al. 2014; Gnezdilov, unpublished data): fore wings without hypocostal plate; fore wing venation formula R 2 M 2–3 CuA 1; hind wings rudimentary; hind tibia with two lateral spines; first metatarsomere with two lateral and 1–2 intermediate spines apically; apical processes of aedeagus with enlarged apices, well visible above the dorso-lateral phallobase lobes (Fig. 3); aedeagus with large phallostrema and without ventral hooks.

There are almost no data on ecology of the species of the genus except for a brief information on *T. eugeniae* which occurs on herbs in steppe biotopes in Crimea (LOGVINENKO 1975). Apparently, all species of *Tshurtshurnella* are xerophilous, which is also true for most of other Western Palaearctic Issidae (GNEZDILOV et al. 2014).

Material and methods

The morphological terminology for the head and pronotum of the adult follows ANUFRIEV & EMELJANOV (1988), that for the first metatarsomere spination and the male genitalia GNEZDILOV et al. (2014), and that for the nymph EMELJANOV (2001). For fore wing venation we accept terminology suggested by BOURGOIN et al. (2015).

Type specimens of the new species described below are deposited in the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN), the National Museum, Prague, Czech Republic (NMPC), and in the private collection of Ilia Gjonov, Sofia, Bulgaria (IGSB).

The photographs of dry specimens were taken by a Nikon SMZ 1500 stereomicroscope with a Nikon Digital Sight DS-U1 camera and ACT-2U imaging software and then assembled with Combine Z5 and Photoshop software. The photographs of live specimens were taken by an Olympus E-500 DSLR camera with a Sigma 150 mm F2.8 EX DG OS HSM APO Macro lens, a Raynox DCR-250 macro lens and a ring flash.

Taxonomy

Genus *Tshurtshurnella* Kusnezov, 1927

Tshurtshurnella Kusnezov, 1927: 219. Type species: *Tshurtshurnella eugeniae* Kusnezov, 1927, by monotypy.

Tshurtshurnella decempunctata sp. nov.

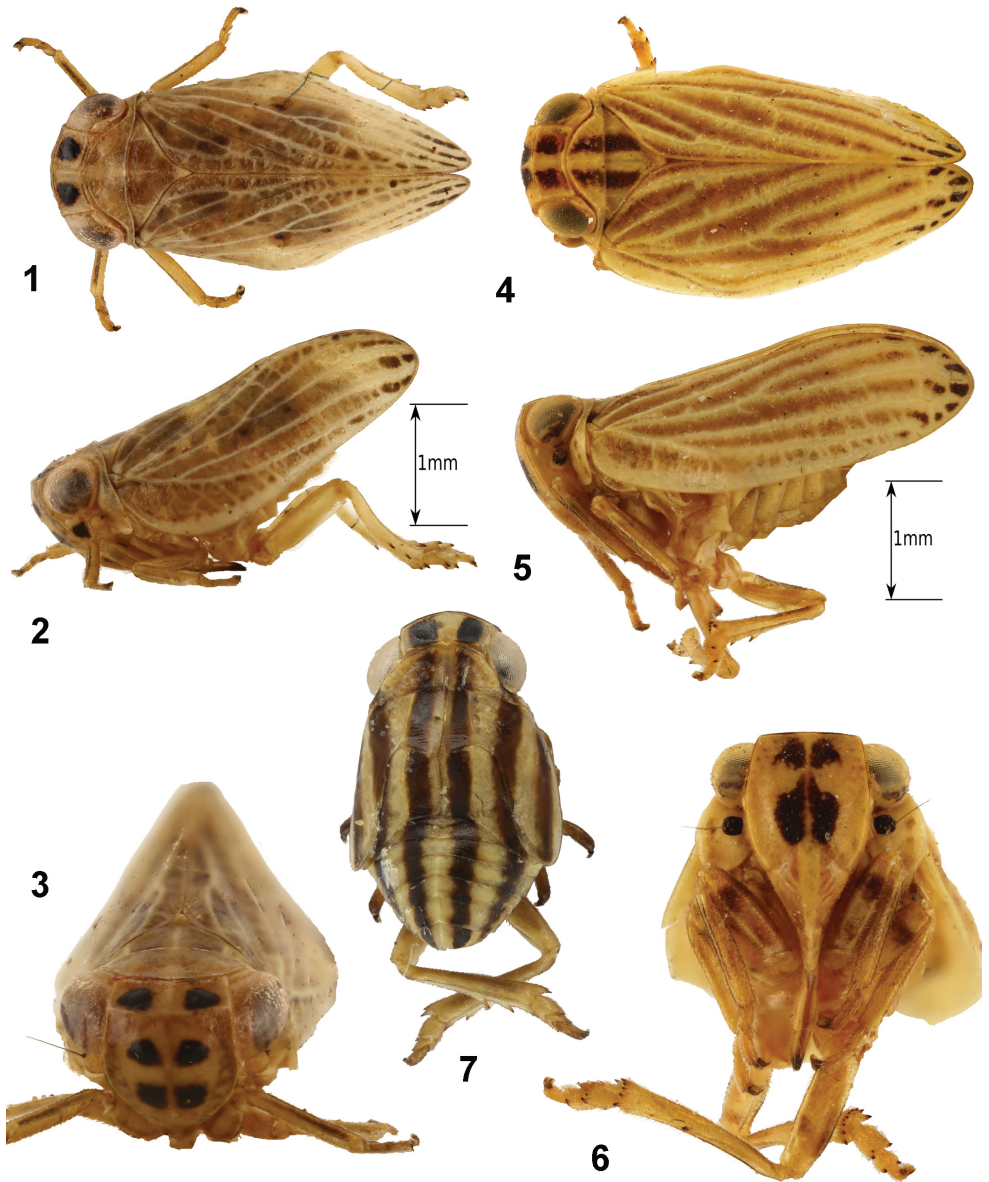
(Figs 1–3, 7–22)

Type locality. Bulgaria, Stara Planina Mts., Zetjovo village, 42°74'89"N, 27°24'89"E, 334 m a.s.l.

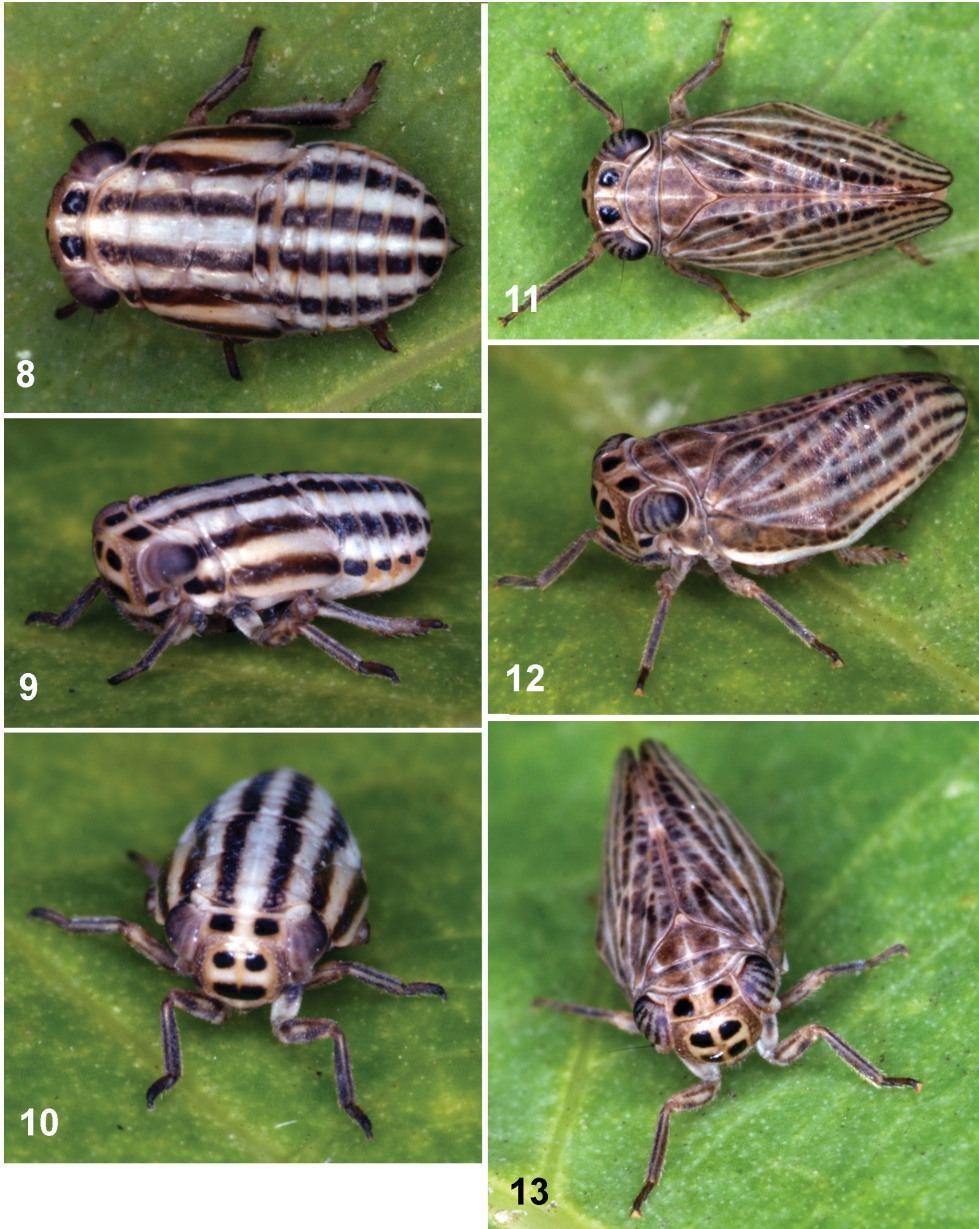
Type material. HOLOTYPE: ♂, labelled 'Bulgaria, Stara Planina Mts, Zetjovo vill. / 42°74'89'N, 27°24'89'E, 334 m / 28.07.2011, m=67/11 / I. Gjonov leg.' (ZIN). PARATYPES: 3 ♂♂ 12 nymphs, same data as the holotype (ZIN, IGSB); 40 ♂♂ 31 ♀♀ 39 nymphs, 'Bulgaria, Stara Planina Mts, Zetjovo vill. / 42°74'89'N, 27°24'89'E, 334 m / 06.08.2014, m=37/14 / I. Gjonov leg.' (29 ♂♂ 20 ♀♀ 28 nymphs in IGSB; 10 ♂♂ 10 ♀♀ 10 nymphs in ZIN; 1 ♂ 1 ♀ 1 nymph in NMPC).

Description. Adult. *Coloration* (Figs 1–3, 11–13). General coloration light yellow. Metope with 4 large glossy black spots on sides of median carina. Each gena with small black spot above metopoclypeal suture. One large black spot between lateral margin (keel) of metope and pedicel on each side of head below eye. Postclypeus with a pair of black lateral spots below metopoclypeal suture. Coryphe with a pair of large glossy black spots on sides of median carina. Fore wings with light costal margin and apical cells dark brown. Apices of spines on legs black.

External morphology. Metope wide, convex, with distinct but smoothed median and very weak sublateral carinae, all joined at one point apically on metopial upper margin (Figs 3, 13).

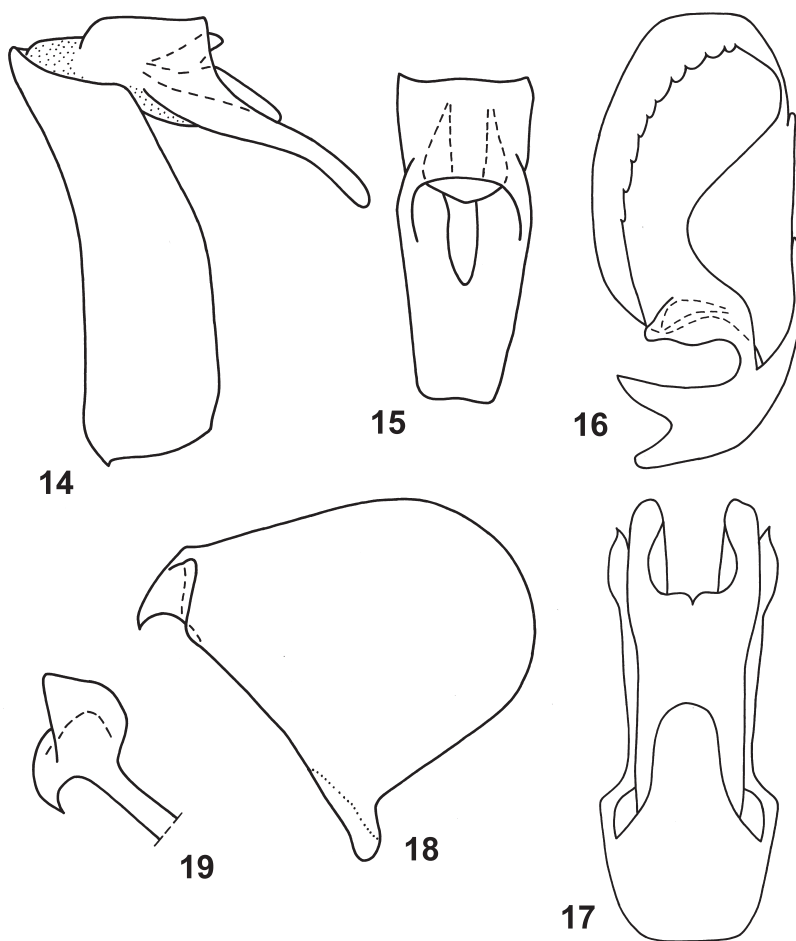


Figs 1–7. *Tshurtshurnella* spp. 1–3 – *T. decempunctata* sp. nov., paratypes (1 – male, dorsal view; 2 – same, lateral view; 3 – same, frontal view). 4–6, *T. lodosi* Dlabola, 1979 (4 – female, dorsal view; 5 – same, lateral view; 6 – same, frontal view). 7 – *T. decempunctata* sp. nov., fifth instar nymph in dorsal view.



Figs 8–13. *Tshurtshurnella decempunctata* sp. nov., live specimens (paratypes). 8 – fifth instar nymph, dorsal view; 9 – same, lateral view; 10 – same, frontal view; 11 – adult male, dorsal view; 12 – same, lateral view; 13 – same, frontal view.

Metopoclypeal suture distinct, strongly convex. Ocelli absent. Pedicel elongate, cylindrical. Coryphe transverse, 3 times wider than long medially, with median carina, anterior margin widely convex, posterior margin obtusely angulately concave (Figs 1, 11). Pronotum without carinae, as long as coryphe medially. Paradiscal fields of pronotum narrow behind eyes. Paranotal lobes of pronotum wide, without carinae. Mesonotum longer than pronotum, with median and lateral carinae. Tegulae small. Fore wings elongate, narrowing apically, with wide subcostal area proximally (Fig. 2), without hypocostal plate. Basal cell narrow. ScP+R(+MA) furcating into RA and RP; MP 2-branched; CuA simple (R 2 M 2 CuA 1). Radius furcates near basal cell, median near middle of wing. Hind wings rudimentary. Hind tibia with 2 lateral spines distally. First metatarsomere with 2 lateral and 2 intermediate spines apically.

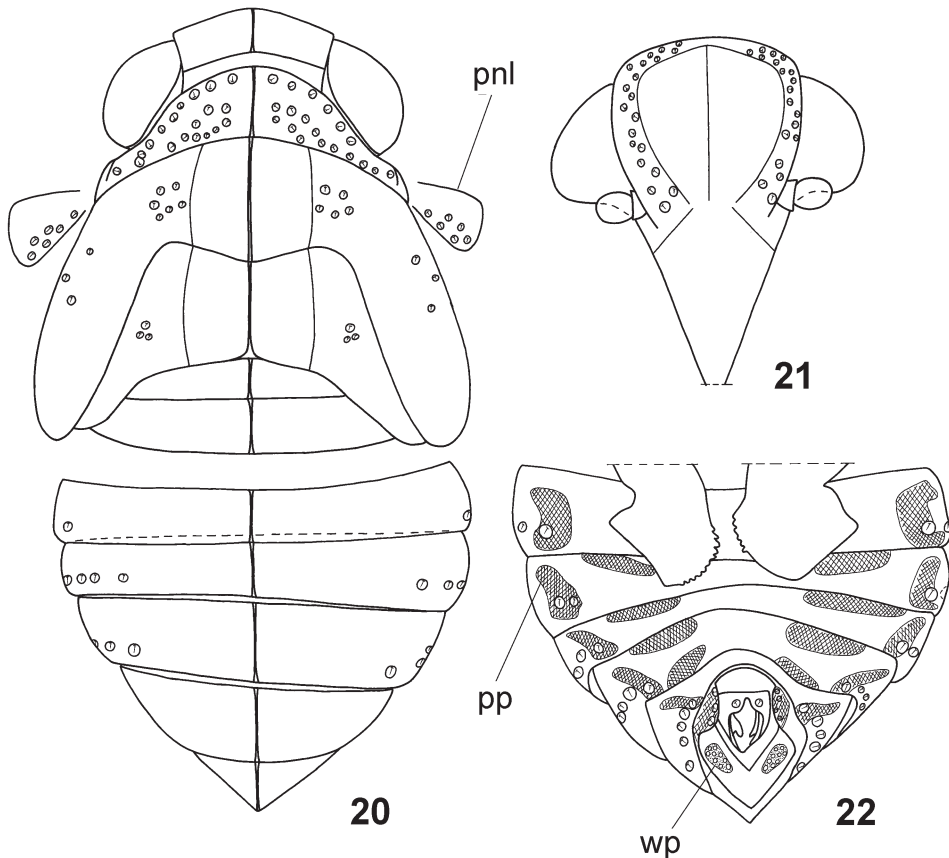


Figs 14–19. *Tshurtshurnella decempunctata* sp. nov., paratype, male genitalia. 14 – pygofer and anal tube, lateral view; 15 – anal tube, dorsal view; 16 – penis, lateral view; 17 – penis, ventral view; 18 – style, lateral view; 19 – capitulum of style, dorsal view.

Male genitalia (Figs 14–19). Hind margin of pygofer slightly convex (in lateral view; Fig. 14). Anal tube elongate, weakly narrowing apically, truncate (in dorsal view; Fig. 15). Anal column (epiproct) long, 0.3 times as long as whole tube. Apical processes of aedeagus enlarged, well visible above phallobase (Figs 16–17). Dorso-lateral phallobase lobes with marginal teeth dorsally (Fig. 16). Ventral phallobase lobe wide, narrowing apically, reaching almost half of penis length (Fig. 17). Phallotrema with concave ventral margin. Style massive, with hind margin straight and caudo-dorsal angle widely rounded (Fig. 18). Capitulum of style without neck (in lateral view; Fig. 18), narrowing apically (in dorsal view; Fig. 19), with large lateral tooth and distinct apical tooth.

Female genitalia. Hind margin of sternum VII widely concave. Anal tube twice as long as wide, rounded apically (in dorsal view). Anal column long, 0.3 times as long as whole tube.

Total body length. Males: 3.7–4.4 mm, females: 4.0–4.7 mm.



Figs 20–22. *Tshurtshurnella decempunctata* sp. nov., fifth instar nymph, paratype. 20 – dorsal view; 21 – head, frontal view; 22 – abdomen, ventral view; pnl – paranotal lobe; pp – pigmented patches; wp – wax plate.

Fifth instar nymph (Figs 20–22). *Coloration* (Figs 7–10). Metope with 4 large black spots – 2 separate spots in its upper part and 2 joined spots above clypeus. One black spot between lateral margin (keel) of metope and pedicel on each side of head. Postclypeus with 2 lateral black spots. Each paranotal lobe with large black spot. Coryphe with a pair of black spots. Apex of rostrum, tarsomeres of fore and middle legs, and third tarsomere of hind legs dark brown. Two wide longitudinal dark brown or black stripes extending through pronotum, mesonotum, metanotum, and abdomen. Another wide longitudinal dark brown or black stripe extending from paradiscal field of pronotum through wing pad and abdomen on each side of body. One more dark brown stripe extending through wing pad near its costal margin on each side of body. Fore and middle femora and tibiae with dark brown longitudinal stripes. Abdominal laterotergites dark brown or black.

External morphology. Metope with median and sublateral carinae joined below its upper margin (Fig. 21). Metope with 19–20 sensory pits in 2 rows between lateral margins (keels) and sublateral carinae on each side (Fig. 21). Coryphe with tiny median carina, anterior margin obtusely angulate, lateral margins parallel to each other, posterior margin concave. Pronotum with tiny median carina. In every discal-paradiscal group of pronotum 18 pits arranged in 3 rows, in every paranotal group 6 pits arranged in 2 rows (2 + 4) on each side (Fig. 20). Mesonotum with tiny median carina and raised lateral carinae, every median paradiscal group with 5–6 pits on each side. Metanotum with tiny median carina and weak lateral carinae reaching only middle of segment, every median paradiscal group with 3 pits on each side. Forewing



Fig. 23. Type locality of *Tshurtshurnella decempunctata* sp. nov.: an oak woodland near Zetjovo village in the Stara Planina Mts., Bulgaria.

pads reaching anterior half of abdominal tergite III. Each forewing pad with 3 sensory pits. Tergite III with 3 lateral pits, tergite IV with 4–5 pits, tergites V–VII with 5 lateral pits, tergite VIII with 3–4 lateral pits, and tergite IX with a single pit on each side (Figs 20, 22). Abdominal segment VII without wax-pore plates. Abdominal segment VIII with two wax-pore plates. Hind tibia with 2 lateral spines distally and 8–10 apical spines. First metatarsomere with 2 lateral and 2 intermediate spines apically.

Total body length. 2.2–3.0 mm.

Differential diagnosis. According to the head coloration pattern (arrangement of spots) and also the structure of the male genitalia, the new species is closely related to *Tshurtshurnella lodosi* Dlabola, 1979 described from southeastern Turkey (DLABOLA 1979). The differences between these two species are summarized in the key couplet below. The dark spot pattern clearly distinguishes *T. decempunctata* sp. nov. and *T. lodosi* from the other species of the genus. The new species also differs from the other *Tshurtshurnella* spp. in the presence of two intermediate apical spines on the first metatarsomere instead of one single spine, which is the characteristic feature of the other species (GNEZDILOV 2003).

Etymology. From the Latin adjective *decempunctatus* (= ten-spotted), referring to the number of 10 large spots on the head of adult.

Ecology. The new species was collected on herbs in an oak (*Quercus*) forest (Fig. 23).

Tshurtshurnella lodosi Dlabola, 1979

(Figs 4–6)

Type material examined. 4 ♂♂, Turkey: “Cizre, 16.6.1976 // Museum Paris / collection Dlabola // Museum Paris / MNHN(EH) / 21910 // *Tshurtshurnella lodosi* sp. n. / det. Dlabola 1978” (Muséum National d’Histoire Naturelle, Paris, France).

Remark. Apparently the specimens cited above are paratypes (according to the original publication by DLABOLA 1979), but they have not been originally labelled as types.

Key to separate adults of *T. lodosi* and *T. decempunctata* sp. nov.

- 1 Total number of large black spots on the head is 10 (Figs 11–13). Pedicel light yellow. Anterior margin of coryphe more convex. First metatarsomere with 2 lateral and 2 intermediate spines apically. *T. decempunctata* sp. nov.
- Total number of large black spots on the head is 6 (no spots near pedicel and on postclypeus) (Figs 4–6). Pedicel black. Anterior margin of coryphe less convex. First metatarsomere with 2 lateral and single intermediate spines apically. *T. lodosi* Dlabola, 1979

Acknowledgements

We are sincerely grateful to Prof. Dr. Thierry Bourgoïn and Mr. Laurent Fauvre (Paris, France) for their hospitality at the Muséum national d’Histoire naturelle and the photographs of the dry specimens, to Dr. Romyana Kostova and Dr. Rostislav Bekchiev (Sofia, Bulgaria) for the photograph of the habitat and to Prof. Dr. Adalgisa Guglielmino (Viterbo, Italy), Dr. Christoph Bückle (Tübingen, Germany), and Dr. Werner Holzinger (Graz, Austria) for their

kind reviews of the manuscript. The first author was financially supported by the Muséum national d'Histoire naturelle (Paris, France) and the Alexander von Humboldt Stiftung (Bonn, Germany).

References

- ANUFRIEV G. A. & EMELJANOV A. F. 1988: Podotryad Cicadinea (Auchenorrhyncha). [Suborder Cicadinea (Auchenorrhyncha)]. Pp. 12–495. In: LER P. A. (ed.): *Opredelitel' nasekomykh Dal'nego Vostoka SSSR v shesti tomakh. Vol. 2. Ravnokrylye i poluzhestkokrylye*. [Keys to the insects of the Far East of the USSR in six volumes. Volume II Homoptera and Heteroptera.] Nauka, Leningrad, 972 pp (in Russian).
- BOURGOINT T., WANG R.-R., ASCHE M., HOCH H., SOULIER-PERKINS A., STROIŃSKIA., YAPS. & SZWEDO J. 2015: From micropterism to hyperpterism: recognition strategy and standardized homology-driven terminology of the forewing venation patterns in planthoppers (Hemiptera: Fulgoroidea). *Zoomorphology* **134**: 63–77.
- DLABOLA J. 1979: Tshurtshurnella, Bubastia und andere verwandte Taxone (Auchenorrhyncha, Issidae). *Acta Entomologica Bohemoslovaca* **76**: 266–286.
- EMELJANOV A. F. 2001: Larval characters and their ontogenetic development in Fulgoroidea (Homoptera, Cicadina). *Zoosystematica Rossica* **9**: 101–121.
- GNEZDILOV V. M. 2003: Obzor semeystva Issidae (Homoptera, Cicadina) evropeyskoy fauny s zamechaniyami o stroenii yaytseklada fulgoroidnykh tsikadovykh. (Review of the family Issidae (Homoptera, Cicadina) of the European fauna, with notes on the structure of ovipositor in planthoppers). *Chteniya Pamyati N. A. Kholodkovskogo (Meetings in Memory of N. A. Cholodkovsky)*, St. Petersburg **56**: 1–145 (in Russian, English summary).
- GNEZDILOV V. M. 2010: Novye sinonimy, kombinatsii i faunisticheskie nakhodki zapadnopalearkticheskikh tsikadovykh sem. Issidae (Homoptera, Fulgoroidea). (New synonyms, combinations, and faunistic records of Western Palearctic planthoppers of the family Issidae (Homoptera, Fulgoroidea)). *Entomologicheskoe Obozrenie* **89**: 413–422 (in Russian, English summary; English translation published in *Entomological Review* **90**: 1024–1030).
- GNEZDILOV V. M., HOLZINGER W. E. & WILSON M. R. 2014: The Western Palearctic Issidae (Hemiptera, Fulgoroidea): an illustrated checklist and key to genera and subgenera. *Proceedings of the Zoological Institute of the Russian Academy of Sciences* **318(Suppl. 1)**: 1–124.
- KUSNEZOV V. 1927: Eine neue Fulgoriden-Gattung und Art (Homoptera). *Konowia* **6**: 219–221.
- LOGVINENKO V. N. 1975: *Fulgoroidni Tsikadovi Fulgoroidea. Fauna Ukraini. Tom 20, vypusk 2. [Fulgoroid Cicadas Fulgoroidea. Fauna of Ukraine. Volume 20, issue 2.]*. Naukova Dumka, Kiev, 287 pp (in Ukrainian).