



Tephritid flies (Diptera: Tephritidae) of the Caucasus and Transcaucasia: new records and new host plants

Мухи-пестрокрылки (Diptera: Tephritidae) Кавказа и Закавказья: новые находки и новые кормовые растения

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Abstract. New data on the distribution and host plants of nine species of Tephritidae are presented. *Tephritis oedipus* Hendel, 1927, *T. hendeliana* Hering, 1944 and *Terellia uncinata* White, 1989 are recorded for the first time from Transcaucasia. *Urophora sirunaseva* (Hering, 1938) is recorded for the first time from Armenia. New host plants are recorded for five species of tephritid flies: *Centaurea polyphylla* Ledeb. ex Nordm. and *Amberboa glauca* (Willd.) Grossh. for *Acanthiophilus helianthi* (Rossi, 1794), *Lactuca orientalis* (Boiss.) Boiss. for *Hypenidium roborowskii* (Becker, 1907), *Reichardia dichotoma* (DC.) Freyn for *Trupanea amoena* (Frauenfeld, 1857), *Cladochaeta candidissima* (M. Bieb.) DC. for *Trupanea stellata* (Fuessly, 1775), and *Centaurea cheiranthifolia* Willd. for *Xyphosia laticauda* (Meigen, 1826). The morphological details of all species of tephritid flies recorded here are illustrated in colour photos.

Резюме. Представлены новые данные о распространении и кормовых растениях девяти видов семейства Tephritidae. *Tephritis oedipus* Hendel, 1927, *T. hendeliana* Hering, 1944 и *Terellia uncinata* White, 1989 впервые указываются для Закавказья, а *Urophora sirunaseva* (Hering, 1938) – для Армении. Для пяти видов указаны новые кормовые растения: *Centaurea polyphylla* Ledeb. ex Nordm. и *Amberboa glauca* (Willd.) Grossh. – для *Acanthiophilus helianthi* (Rossi, 1794), *Lactuca orientalis* (Boiss.) Boiss. – для *Hypenidium roborowskii* (Becker, 1907), *Reichardia dichotoma* (DC.) Freyn – для *Trupanea amoena* (Frauenfeld, 1857), *Cladochaeta candidissima* (M. Bieb.) DC. – для *Trupanea stellata* (Fuessly, 1775), *Centaurea cheiranthifolia* Willd. – для *Xyphosia laticauda* (Meigen, 1826). Детали строения всех видов Tephritidae представлены на цветных фотографиях.

Key words: Armenia, Caucasus, Transcaucasia, host plants, diagnostic characters, Tephritidae, new records

Ключевые слова: Армения, Кавказ, Закавказье, кормовые растения, диагностические признаки, Tephritidae, новые находки

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Introduction

Information on the tephritid flies (Diptera: Tephritidae) of the Caucasus and Transcaucasia is fragmentary. This article continues the series of recent publications on the tephritid flies of the Caucasus and Transcaucasia (Evstigneev & S. Korneyev, 2018; S. Korneyev & Evstigneev, 2019; Evstigneev, 2020a, 2020b; Evstigneev & Glukhova, 2020; Evstigneev, 2021; Evstigneev & Przhiboro, 2021). It contains new data on the distribution and host plants of nine species of Tephritidae.

Material and methods

The material was collected in 2014–2021 and stored in the first author's private collection. Full description of methods is presented in our previous articles (Evstigneev & Glukhova, 2020; Evstigneev, 2021; Evstigneev & Przhiboro, 2021).

Diagnostic characters of all species recorded in this study are illustrated in colour photos. These illustrations confirm our records and allow one to identify other specimens based on these figures without using numerous sources.

In the present study, Transcaucasia is taken as a territory within the borders of the former Soviet Union, i.e. including Armenia, Georgia and Azerbaijan.

Results

Order Diptera

Family Tephritidae

Tribe Myopitini

Urophora sirunaseva (Hering, 1938) (Figs 1–7)

Material examined. Armenia, Kotayk Prov., nr. pre-Christian pagan temple of Garni in Garni Vill., 2 females and 1 male reared 31.III–13.IV.2020 from capitula of *Centaurea solstitialis* collected on 9.VIII.2019 (coll. D.A. Evstigneev).

Distribution. Turkey, Greece, Moldova (White & Clement, 1987; White & V. Korneyev, 1989), Ukraine (Kameneva & V. Korneyev, 1987; White

& V. Korneyev, 1989; V. Korneyev & White, 1993), Israel (White & V. Korneyev, 1989), Azerbaijan (V. Korneyev & White, 1993) and Iran (Karimpour, 2011; Mohamadzade Namin & V. Korneyev, 2018).

Comments. This species is recorded from Armenia for the first time. It was known from Turkey, Azerbaijan and Iran neighbouring with Armenia. The morphological details of *U. sirunaseva* are illustrated in Figs 1–7. This species is characterised by distinct subbasal, discal, preapical and apical crossbands (crossbands are listed from wing base to wing apex), distinct preapical primary and secondary steps and truncate apex of the aculeus. The species belongs to the *Urophora solstitialis* species-group (V. Korneyev & White, 1993) and differs from the other members of the group in the entirely yellow femur without any black spots (Figs 1, 2) and the short distance between the primary and secondary steps of the aculeus (Figs 6, 7).

Tribe Noetini

Hypenidium roborowskii (Becker, 1907) (Figs 8–14)

Material examined. Armenia, Ararat Prov., nr. Khor Virap monastery, stretch of rocky desert in hills, 2 females and 2 males reared 12.VIII.2018 from capitula of *Lactuca orientalis* collected on 3.VIII.2018 (coll. D.A. Evstigneev).

Distribution. China (Becker, 1907), Armenia (Zaitzev, 1947), Kazakhstan (Richter, 1965), Syria, Iraq, Jordan (V. Korneyev & Dirlbek, 2000), Iran (Gilasian & Merz, 2008), Azerbaijan, Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan (V. Korneyev et al., 2011), Turkey (Koçak & Kemal, 2013; Yaran & Kütük, 2015).

Comments. *Lactuca orientalis* (Boiss.) Boiss. [syn. *Scariola orientalis* (Boiss.) Soják] is recorded for the first time as a host plant of *H. roborowskii*. Previously *Lactuca* sp. (Mohamadzade Namin et al., 2010) and *L. serriola* L. (Pourhaji et al., 2016) were recorded as host plants of this species. The morphological details of *H. roborowskii* are illustrated in Figs 8–14. There is a hyaline area in cell r_{4+5} ; it is a continuation of broad hyaline area in cell *m* and it extends towards crossvein *R-M* (Figs 8, 9, 13).

Tribe Tephritini

Acanthiophilus helianthi (Rossi, 1794)

(Fig. 15)

Material examined. **Russia:** Kabardino–Balkarian Republic, Elbrus Distr., nr. Terskol Vill., meadow on mountainside, 2 females and 1 male reared 28.VIII.2014 from capitula of *Psephellus* sp. collected on 20–24.VIII.2014 (coll. D.A. Evstigneev); *Republic of Adygea*, Maykop Distr., Lagonaki Plateau, mountain meadow, 1 male reared 14.VIII.2014 from capitula of *Centaurea polyphylla* collected on 5.VIII.2014 (coll. D.A. Evstigneev); *Republic of North Ossetia–Alania*, Western Digoria, Tana glade bog, 1 km W of Kubus Mt., 42.89350°N 43.57733°E, 2077 m, 12.IX.2018, 2 females and 2 males, sweep-netting (coll. A.A. Przhiboro). **Georgia**, Tbilisi, 2 males reared 31.VII.2019 from capitula of *Amberboa glauca* collected on 29.VII.2019 (coll. D.A. Evstigneev).

Distribution. Eurasia and North Africa to Ethiopia (Morgulis et al., 2015).

Comments. The above specimens were reared from the capitula of several plant species. *Centaurea polyphylla* Ledeb. ex Nordm. [syn. *Grossheimia polyphylla* (Ledeb.) Holub, *G. ossica* (C. Koch) Sosn. et Takht.] and *Amberboa glauca* (Willd.) Grossh. are recorded for the first time as host plants of *A. helianthi*. The habitus of *A. helianthi* is illustrated in Fig. 15. The morphological details of specimens from the Caucasus and Transcaucasia agree with those of specimens from European Russia (Evstigneev, 2016).

Tephritis hendeliana Hering, 1944

(Figs 16–22)

Material examined. **Armenia**, Gegharkunik Prov., nr. Berdkunk Vill., shore of Lake Sevan contaminated with excreta of farm animals, 6 females and 2 males reared 2.VIII.2021 from capitula of *Carduus nutans* collected on 1.VIII.2021 (coll. D.A. Evstigneev).

Distribution. Kazakhstan, Mongolia (Richter, 1965, 1970), France (Foote, 1984), central European part of Russia (Richter, 1970), Moldova (V. Korneyev & Kameneva, 1992), Italy, Germany, Switzerland (Merz, 1994), Hungary (Merz, 2000), Andorra (Merz, 2001), Iran (Mohamadzade Namin, 2011), Turkey (Koçak & Kemal, 2013), Albania, Ukraine (S. Korneyev, 2016).

Comments. *Tephritis hendeliana* is recorded from Armenia and Transcaucasia for the first

time. The larvae were found to develop in the capitula of *Carduus nutans* L. (syn. *C. thoermeri* Weinm.), a typical host plant of this species. The morphological details of *T. hendeliana* are illustrated in Figs 16–22; they are in agreement with the diagnosis of the species. The glans of the phallus of *T. hendeliana* (Fig. 20) is illustrated for the first time.

Tephritis oedipus Hendel, 1927

(Figs 23–25)

Material examined. **Armenia**, Ararat Prov., nr. Zod Vill., “Salt marshes” natural monument heavily polluted by people and farm animals, tractor dug area with excreta of farm animals, 1 male reared 10.VIII.2021 from capitulum of *Lactuca tatarica* collected on 7.VIII.2021 (coll. D.A. Evstigneev).

Distribution. Mongolia (Richter, 1975), China (Foote, 1984), Kyrgyzstan (V. Korneyev & Kameneva, 1993), Russia, Ukraine (S. Korneyev & Karpyuk, 2009), Iran (Gharajedaghi et al., 2011).

Comments. This species is recorded from Armenia and Transcaucasia for the first time. The larvae develop in the capitula of *Lactuca tatarica* (L.) C.A. Mey. (V. Korneyev & Kameneva, 1993). The morphological details of *T. oedipus* male from Armenia are illustrated in Figs 23–25.

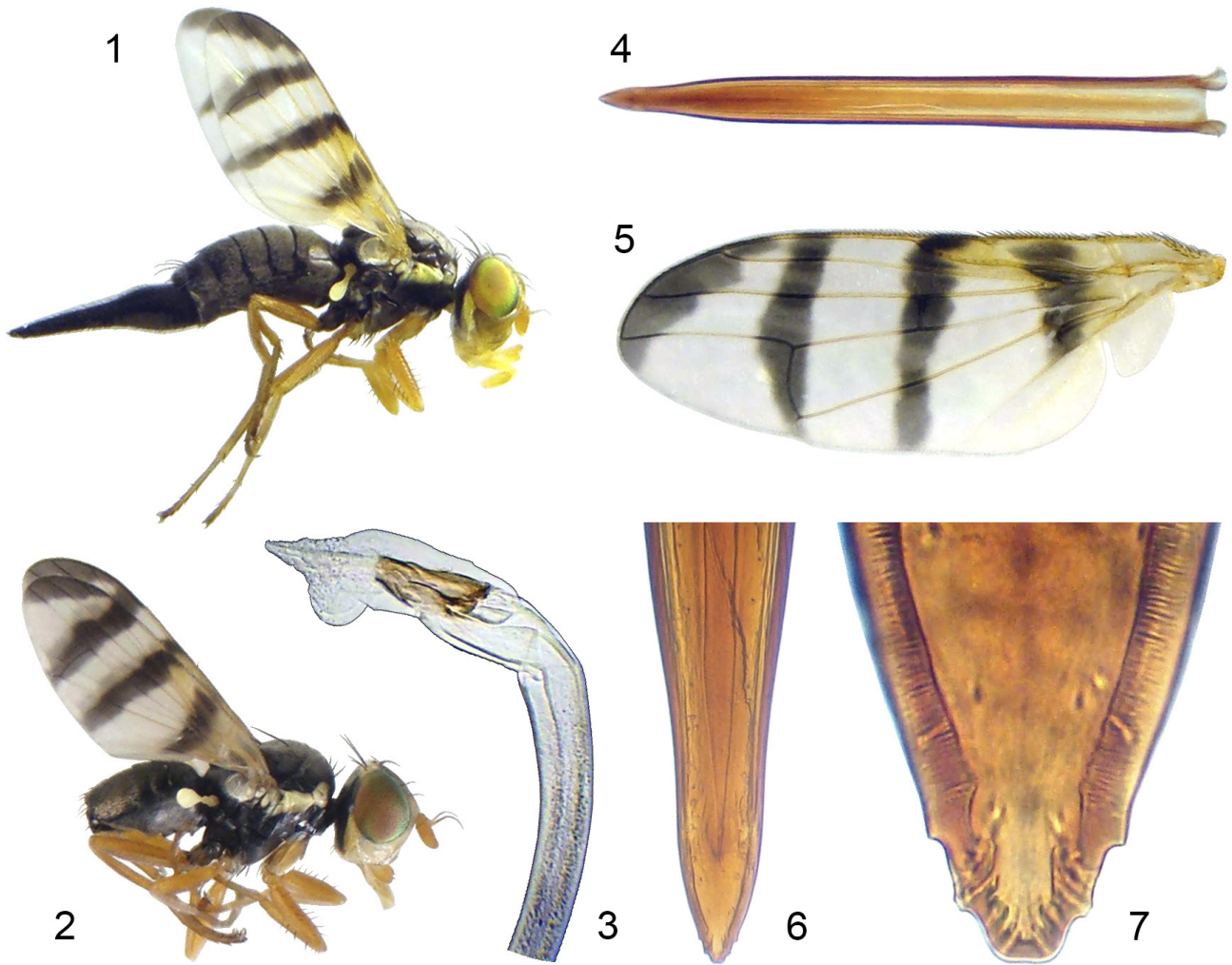
Trupanea amoena (Frauenfeld, 1857)

(Figs 26–32)

Material examined. **Armenia**, Vayots Dzor Prov., between Mozrov Vill. and Arpi Vill., crumbling mountainside along dirty road, 2 females reared 19.VII.2018 from capitula of *Reichardia dichotoma* collected on 18.VII.2018 (coll. D.A. Evstigneev). **Russia**, *Republic of North Ossetia–Alania*: nr. Vladikavkaz, ca. 2 km S of Chmi Vill., mountainside facing Suargom River, 4 females and 3 males reared 10.VIII.2020 from capitula of *Reichardia dichotoma* collected on 9.VIII.2020 (coll. D.A. Evstigneev); Western Digoria, Tana Glade bog, 1 km W of Kubus Mt., 42.89350°N 43.57733°E, 2077 m, 12.IX.2018, 1 female, sweep-netting (coll. A.A. Przhiboro).

Distribution. Transpalearctic species (Merz, 1994).

Comments. Larvae of this species live in the capitula of a wide range of Asteraceae (White, 1988; Merz, 1994; Freidberg & Kugler, 1989). *Re-*



Figs 1–7. *Urophora sirunaseva* (Hering, 1938), details of female (1, 4–7) and male (2–3). 1, female, habitus (in lateral view); 2, male, habitus (in lateral view); 3, glans of phallus; 4, aculeus; 5, female wing; 6, distal part of aculeus (magnified); 7, apex of aculeus (at large magnification).

ichardia dichotoma (DC.) Freyn (syn. *R. glauca* Matthews) is recorded for the first time as a host plant of *T. amoena*. Previously, another species of the genus *Reichardia*, *R. picroides* (L.) Roth, was recorded as a host plant for *T. amoena* in Italy (Mazzon et al., 2008). The morphological details of *T. amoena* are illustrated in Figs 26–32. This species can be distinguished from the similar *Trupanea stellata* (Fuessly, 1775) by the following features of wing coloration (Fig. 26): (1) brown ray on *DM-Cu* crossvein reaching posterior margin of wing (brown ray enclosing *DM-Cu* crossvein and apical part of *Cu*₁ vein); (2) narrow brown band extending from pterostigma to subapical area of cell *br*; (3) brown ray extending from subapical

star-shaped spot towards vein *C*, and reaching vein *C* at level of crossvein *R-M* (it is necessary to draw a line through crossvein *R-M* and continue it towards vein *C*).

Trupanea stellata (Fuessly, 1775)
(Figs 33–36)

Material examined. **Russia**, Republic of North Ossetia–Alania, nr. Vladikavkaz, ca. 2 km S of Chmi Vill., Suargom River bank, 3 females reared 16.VIII.2020 from capitula of *Cladochaeta candidissima* collected on 9.VIII.2020 (coll. D.A. Evstigneev).

Distribution. Transpalaeartic species (Merz, 1994).



Figs 8–14. *Hypenidium roborowskii* (Becker, 1907), details of male (8, 14) and female (9–13). **8**, male habitus (in lateral view); **9**, female habitus (in lateral view); **10**, spermatheca; **11**, aculeus; **12**, apex of aculeus (at large magnification); **13**, female wing; **14**, glans of phallus.

Comments. Larvae of this species live in the capitula of a wide range of Asteraceae (White, 1988; Merz, 1994; Freidberg & Kugler, 1989). *Cladochaeta candidissima* (M. Bieb.) DC. (syn. *Helichrysum candidissimum* Loudon) is recorded for the first time as a host plant of *T. stellata*. The morphological details of *T. stellata* are illustrated in Figs 33–36. This species can be identified by the following combination of wing coloration features: (1) brown ray on *DM-Cu* crossvein not reaching hind posterior margin of wing (brown ray located only on crossvein *DM-Cu*; vein *Cu*₁ entirely within a hyaline area); (2) no brown band extending from pterostigma to subapical area of cell *br*; (3) brown ray extending from subapical star-shaped spot to vein *C* and reaching it before level of crossvein *R-M* (Fig. 33).

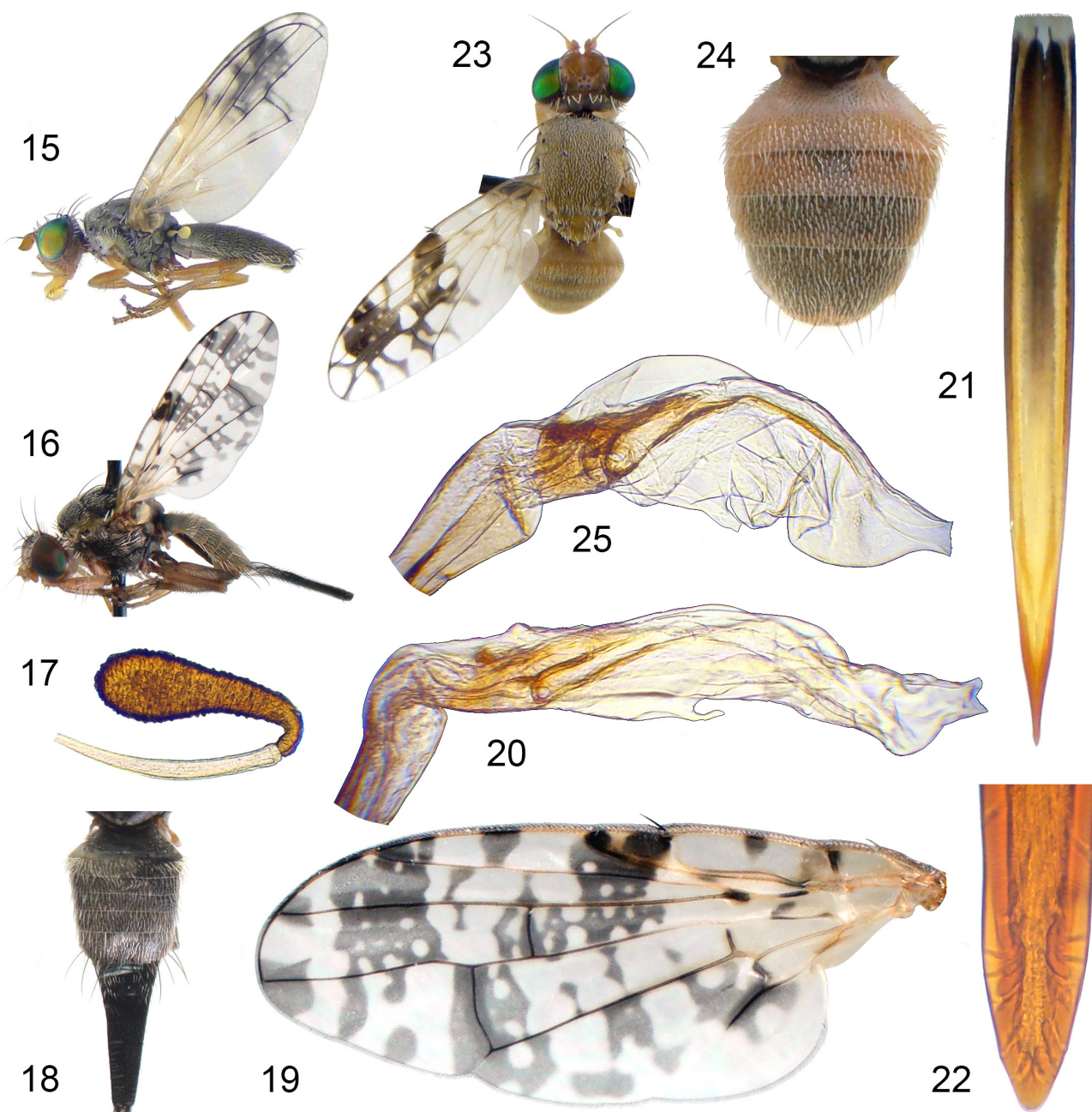
Tribe Terelliini

Terellia uncinata White, 1989 (Figs 37–43)

Material examined. **Armenia:** Erevan, vicinity of Erebuni fortress, 1 female reared 18.VII.2017 from capitulum of *Centaurea solstitialis* collected on 7.VII.2017 (coll. D.A. Evstigneev); *Kotayk Prov.*, near pre-Christian pagan temple of Garni in Garni Vill., 1 female and 3 males reared 31.III–12.IV.2020 from capitula of *Centaurea solstitialis* collected on 9.VIII.2019 (coll. D.A. Evstigneev).

Distribution. Bulgaria, Greece, Italy, Turkey (White, 1989) and Iran (Karimpour, 2011; V. Korneyev et al., 2013).

Comments. This species is recorded from Armenia and Transcaucasia for the first time.



Figs 15–25. Tephritidae: *Acanthiophilus helianthi* (Rossi, 1794) (15), *Tephritis hendeliana* Hering, 1944 (16–22) and *T. oedipus* Hendel, 1927 (23–25), details of male (15, 20, 23–25) and female (16–19, 21–22). 15, male habitus (in lateral view); 16, female habitus (in lateral view); 17, spermatheca; 18, female abdomen (in dorsal view); 19, female wing; 20, glans of phallus; 21, aculeus; 22, apex of aculeus (at large magnification); 23, male habitus (in dorsal view); 24, male abdomen (in dorsal view); 25, glans of phallus.

The morphological details of *T. uncinata* are illustrated in Figs 37–43. The members of *Terellia virens* species-group reliably differ from each other in the shape of glans of the phallus. White (1989) described *T. uncinata*, recorded *Centaurea solstitialis*

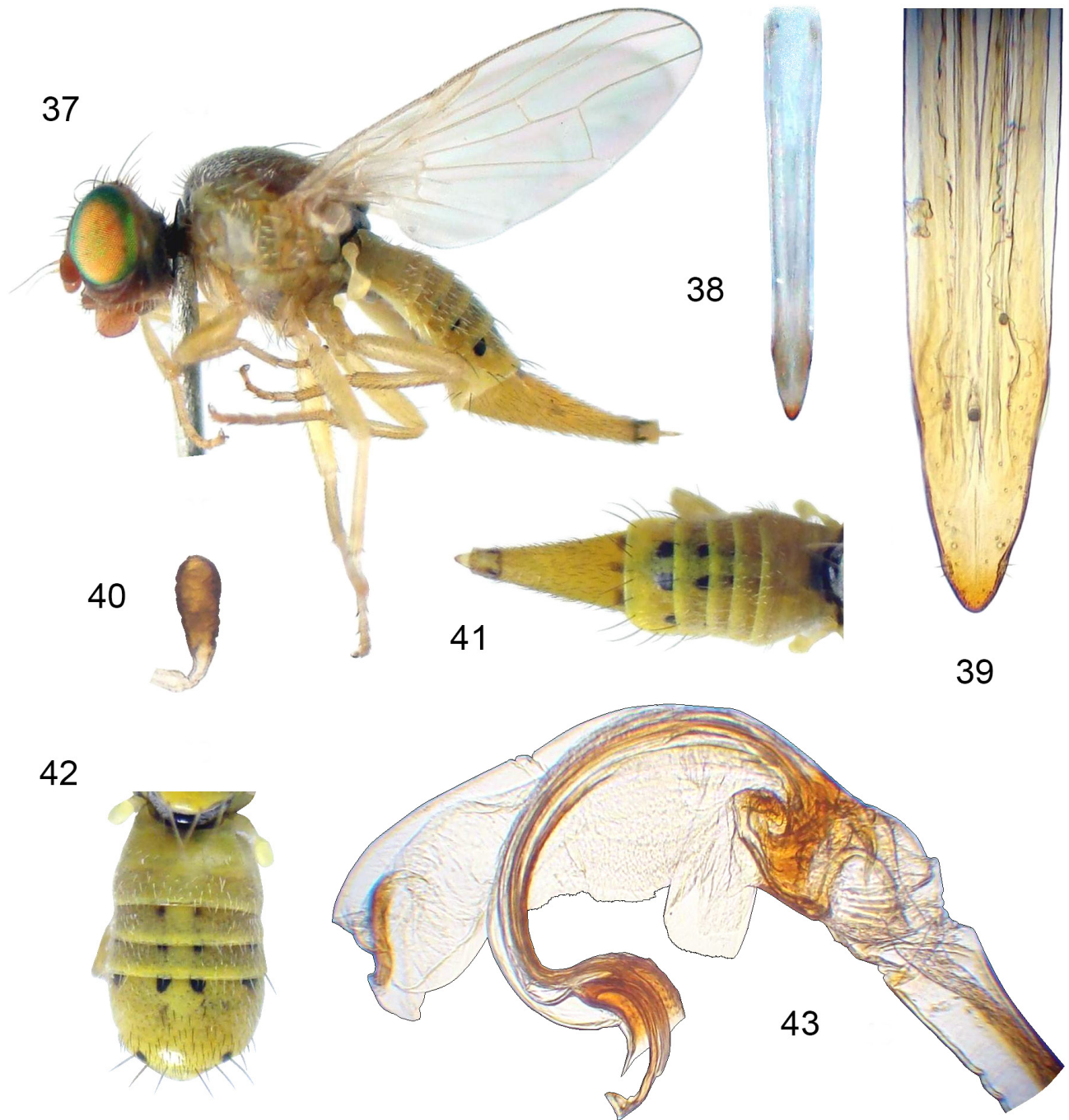
L. as its host plant, and designated a male reared from *C. solstitialis* in Italy (Puglia, San Severo) as the holotype. *Terellia uncinata* became the third species in the *Terellia virens* species-group specified by V. Korneyev (1985), in addition to *T. virens*



Figs 26–36. *Trupanea* spp.: *T. amoena* (Frauenfeld, 1857) (26–32) and *T. stellata* (Fuessly, 1775) (33–36), details of male (31–32) and female (26–30, 33–36). **26**, female wing; **27**, aculeus; **28**, distal part of aculeus (magnified); **29**, apex of aculeus (at large magnification); **30**, female abdomen (in dorsal view); **31**, epandrium; **32**, glans of phallus; **33**, female wing; **34**, aculeus; **35**, distal part of aculeus (magnified); **36**, apex of aculeus (at large magnification).

(Loew, 1846) and *T. zerovae* Korneyev, 1985. The latter species was described from specimens collected in Dushanbe (Tajikistan); a male reared from the capitulum of *Centaurea iberica* Trevir. ex Spreng was designated as the holotype. Subsequently, three more species from *T. virens* species-group were described (V. Korneyev et al., 2013):

T. freidbergi V. Korneyev, 2013, associated with capitula of *C. behen* L., *T. ivannikovi* V. Korneyev et Evstigneev, 2013, associated with capitula of *C. chartolepis* Greuter (syn. *Chartolepis intermedia* Boiss), and *T. whitei* V. Korneyev et Mohamadzade Namin, 2013, associated with capitula of various species of the genus *Cousinia*.



Figs 37–43. *Terellia uncinata* White, 1989, details of male (42, 43) and female (37–41). **37**, female habitus (in lateral view); **38**, aculeus; **39**, distal part of aculeus (magnified); **40**, spermatheca; **41**, female abdomen (in dorsal view); **42**, male abdomen (in dorsal view); **43**, glans of phallus.

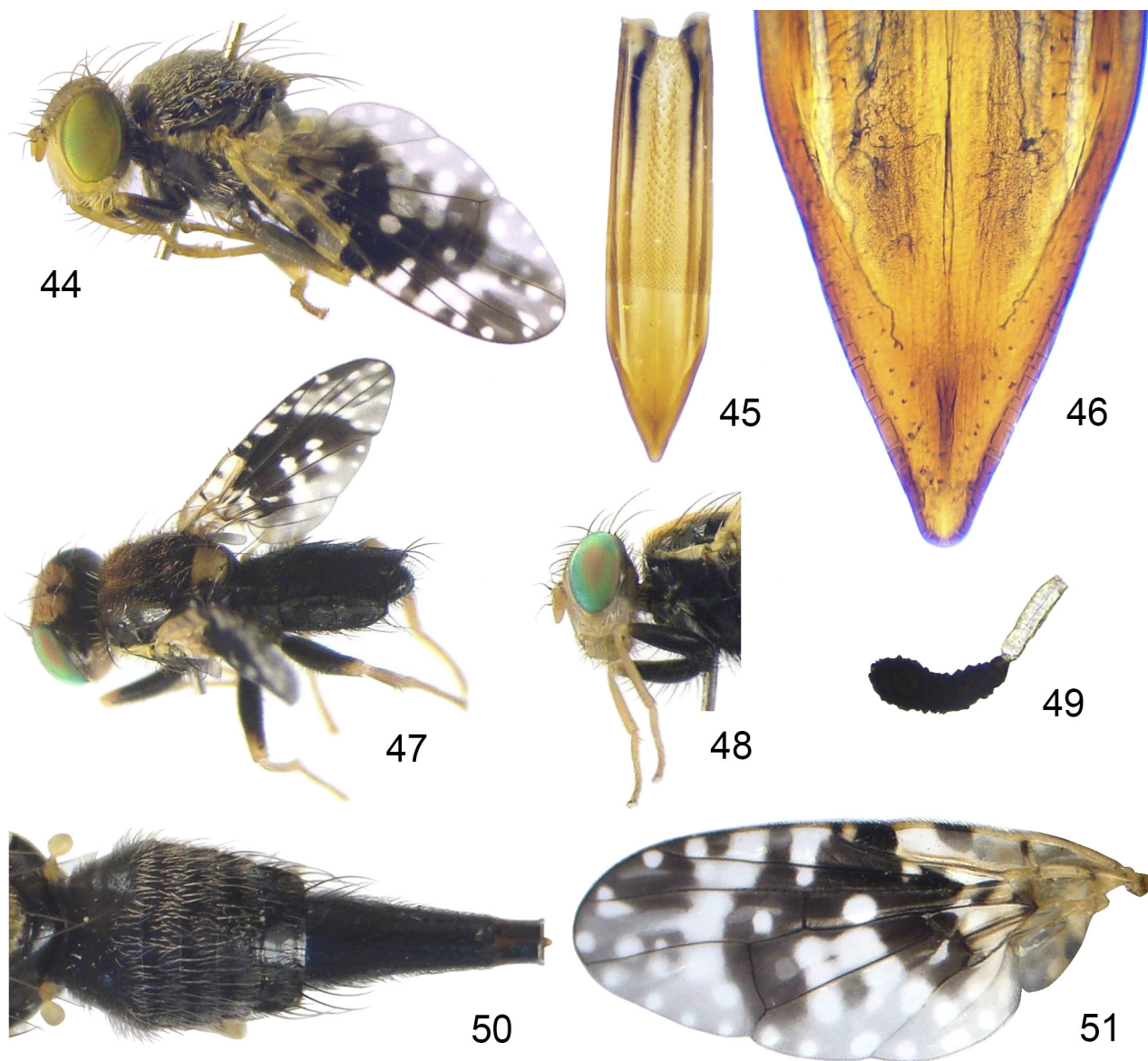
Tribe **Xyphosiini**

Xyphosia laticauda (Meigen, 1826)

(Figs 44–51)

Material examined. **Armenia**, *Aragatsotn Prov.*, Arailer Mt., mountainside facing Yeghvard town,

mountain meadow, 1 female reared 30.III.2019 from capitulum of *Centaurea* sp. collected on 24.VII.2018 (coll. D.A. Evstigneev). **Russia**, *Kabardino-Balkarian Republic*, Elbrus Distr., Cheget Mt., ca. 2100 m, 1 male reared 21.II.2015 from capitulum of *Centaurea*



Figs. 44–51. *Xyphosia laticauda* (Meigen, 1826), details of male (47, 48) and female (44–46, 49–51). 44, female habitus (in lateral view); 45, aculeus; 46, distal part of aculeus (magnified); 47, male habitus; 48, male head and thorax (in lateral view); 49, spermatheca; 50, female abdomen (in dorsal view); 51, female wing.

cheiranthifolia collected on 18–25.VII.2014 (coll. D.A. Evstigneev).

Distribution. Austria, France (Hendel, 1927), Armenia (V. Korneyev, 1983), Switzerland (Merz, 1994), Hungary (Mihályi, 1959), Ukraine (Merz, 1994; V. Korneyev, 2004), Czechoslovakia [without further details] (Merz, 1994), Slovakia (Diribek, 1999), North Caucasus in Russia (V. Korneyev, 2004), Italy (Mazzon et al., 2021).

Comments. *Centaurea cheiranthifolia* Willd. is recorded for the first time as a host plant of *X. laticauda*. The morphological details of *X. laticauda* are illustrated in Figs 44–51. This species can be distinguished from the widespread *X. miliaria* (Schrank, 1781) by the following characters: thorax and abdomen black (Figs 44, 47, 50), and margins of preapical narrowed part of aculeus smooth, not serrate (Fig. 46).

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