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The jumping plant-lice (Hemiptera: Psylloidea) of Belarus

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Abstract: A checklist of the known psyllids of Belarus is given: 12 species (one of them doubtful) have been previously reported and 43 species are added here, bringing the number of confirmed species to 54. The psylloid fauna of the country remains poorly known. Based on information from surrounding countries, another 73 species can be expected. An illustrated identification key is provided for the 127 species whose occurence in Belarus has been confirmed or is likely.

Keywords: Psyllids - Sternorrhyncha - host-plants - faunistics - identification key - Europe - Palaearctic Region.

INTRODUCTION

Jumping plant-lice or Psylloidea, a superfamily of Sternorrhyncha, are plant-sap sucking insects (Photo 1). Most psyllid species are associated with dicotyledonous plants, and are usually highly host-plant specific. At present there are almost 4000 described psyllid species world-wide (Li, 2011) representing probably less than half of the actually existing species number. Despite the fact that psyllids are most species-rich in the tropics and south temperate regions, the west Palaearctic fauna is the one which is best studied with around 400 species reported from Europe (Burckhardt, 2004). The study of Eastern European psyllids was initiated by Flor (1861) with a survey on the fauna of Livonia followed by a large number of publications dealing with the European part of the former Soviet Union (Gegechkori & Loginova, 1990).

The information on the psyllid fauna of Belarus is, however, scarce with only 12 recorded species of which one is doubtful (Loginova, 1961, 1962b; Palyakova, 1969; Byazdzenka *et al.*, 1973; Gorlenko *et al.*, 1988; Sidlyarevich & Bolotnikova, 1992; Petrov, 2004, 2011; Petrov *et al.*, 2011; Petrov & Sautkin, 2013).

In the last 15 years psyllids were collected in all administrative regions of Belarus, mostly as by-catch of an Auchenorrhyncha survey. The aim of the present paper is to provide an updated checklist of psyllids from Belarus based on literature data and recently collected material. We also provide an illustrated identification key for the species recorded and those potentially occurring in Belarus, as the existing keys are outdated or incomplete.

MATERIAL AND METHODS

Unless stated otherwise, the material was collected by O. Borodin, is dry mounted and deposited in the Laboratory of Terrestrial Invertebrates of the State Science and Production Association "Research and Practical Centre of the National Academy of Sciences of Belarus for Bioresources" (Gosudarstvennoye Nauchno-Proizvodstvennoye Ob'yedineniye "Nauchno-Prakticheskiy Tsentr Natsional'noy Akademii Nauk Belarusi po Bioresursam") in Minsk. Material from the Naturhistorisches Museum, Basel (Switzerland) was examined for comparison.

For the transliteration of names and organisations from the Cyrillic to the Latin alphabet the BGN/PCGN system was used.

Morphological terminology mainly follows Ossiannilsson (1992), Hollis (2004) (wing venation) and Burckhardt (2010). Botanical nomenclature and classification follows Sautkina *et al.* (1999). Additional information on psyllid host-plants is available in Ossiannilsson (1992) and Ouvrard (2014). Generally useful identification keys are by Loginova (1964), Klimaszewski (1975) and Ossiannilsson (1992), though they are more or less outdated and should be used with caution. Photos and drawings were prepared from slide mounted specimens located in the Naturhistorisches Museum, Basel. Photos were made with KEYENCE VHX-2000 digital microscope.

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Photo 1. Living *Livia junci*, photo kindly provided by Gernot Kunz.

Following abbreviations are used:
Checklist: BSU – Belarusian State University, MKAD – Minsk automobile ring road (Minskaya kol'tsevaya avtomobil'naya doroga).
Identification key: AEL – length of distal portion of aedeagus, ALHW – antenna length : head width ratio, FPHW – female proctiger length : head width ratio, MP – male proctiger length.

SYSTEMATIC ACCOUNT

Checklist

The checklist is alphabetical using the classification of Burckhardt & Ouvrard (2012).

Aphalaridae
Aphalarinae
Aphalara affinis (Zetterstedt, 1828)

Material examined: Minsk: 1 adult without abdomen, Molodechno district, nr Myasota, 6.ix.2002.

***Aphalara avicularis* Ossiannilsson, 1981**

Material examined: Brest: 1♀, Stolin district, Belousha, 15.viii.2005.

Comments: The record of *A. polygoni* by Loginova (1961) from the Vitebsk region may concern *A. avicularis* or *A. freji*. Without revising the original material it is not possible to decide which species is concerned.

***Aphalara freji* Burckhardt & Lauterer, 1997**

Material examined: Gomel': 1♂, Lel'chitsy district, 0.5 km NE Krasnoberezh'ye, river Ubort' floodplain, 5.viii.2004. – Minsk: 1♀, Minsk district, Shchemyslitsy, Dubrava Natural Monument, 26.ix.2013, on conifers (L. Serbina). – 3♂, same but nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest. – 5♂, 1♀, same but nr Tarasovo, nr Gardeners' partnership Zvezdnoye, 29.ix.2013.

Comments: The record of *A. polygoni* by Loginova (1961) from the Vitebsk region may concern *A. avicularis* or *A. freji*. Without revising the original material it is not possible to decide which species is concerned.

Craspedolepta crispati Lauterer & Burckhardt, 2004

Material examined: Minsk: 4♂, 2♀, Volozhin district, Rakov, 28.vii.1997, meadow.

Craspedolepta flavipennis (Foerster, 1848)

Material examined: Minsk: 1♀, Myadel' district, Logoviny, train station, 5.vii.2009, meadow (L. Serbina).

Craspedolepta latior Wagner, 1944

Material examined: Minsk: 2♂, 1♀, Minsk district, river Ptich' bank, nr train station Ptich', 15.vii.2009 (L. Serbina). – 1♀, same but Molodechno district, nr Vyazynka, canal bank, 9.vii.2002. – 11♂, 27♀, same but Myadel' district, Logoviny, nr train station, 5.vii.2009, meadow (L. Serbina). – 1♂, 1♀, same but nr Naroch', 9.vii.2009.

Craspedolepta malachitica (Dahlbom, 1851)

Material examined: Gomel': 1♀, Kalinkovichi district, 0.5 km E Turovichi, 23.vii.2005, dry meadow, on *Artemisia* sp. – Grodno: 1 adult without abdomen, Mosty district, 3.5 km NW Peski, river Zel'vyanka floodplain, 24.vi.2005 (Y. Gerashchenko). – Minsk: 4♀, Minsk district, Shchemyslitsy, Dubrava Natural Monument, 15.v.2008 (L. Serbina). – 2♀, same but river Ptich' bank, nr train station Ptich', June 2008. – 1♀, same but Molodechno district, nr Povyazyn', 1.vii.2001. – 2♂, same but nr canal bank, 9.vi.2002. – 1♂, same but nr Radoshkovichi, slope Minsk-Vileyka channel system, 22.vi.2005. – 1♀, same but nr Sitsevichi, 12.vii.2005, pine forest (A. Egiyan). – 2♂, 6♀, same but river Udranka bank, nr bus stop, 14.vii.2009 (L. Serbina). – 1♂, 2♀, same but Myadel' district, nr Naroch', 2.vii.2009. – 10♂, 24♀, same but Logoviny, nr train station, 5.vii.2009. – 84♂, 99♀, same but nr Naroch', 9.vii.2009. – 1♀, same but Volozhin district, nr Kaldyki, 11.vii.2007, mixed forest. – Vitebsk: 2♀, Lepel' district, nr Domzheritsy, nr boarding school and pond, 31.vii.2001, on *Artemisia dracunculus*. – 1♀, same but river Buzyanka, 300 m upstream from boat station, 1.viii.2001.

Craspedolepta nervosa (Foerster, 1848)

Material examined: Grodno: 1♀, Mosty district, 3.5 km NW Peski, 24.vi.2005, river Zel'vyanka floodplain. – Minsk: 1♀, Borisov district, 2 km NW Peresady, nr train station "Proletarskaya pobeda", lowland, 6.viii.2002, pine forest. – 1♀, same but Logoysk district, nr Besyady, river Udra floodplain, 26.vi.2002. – 1♀, same but Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow. – 4♂, 3♀, same but 0.5 km SW Matski, hill, meadow. – 1♀, same but Minsk district, nr train station Kryzhovka, 3.vi.2001, meadow in pine forest. – 1♂, 1♀, same but nr Chirovichi, 9.vi.2002, dry meadow. – 1♂, same but Shchemyslitsy, nr Biological Faculty, BSU, 18.vi.2002. – 1♀, same but Dubrava Natural Monument, 19.vi.2002. – 1♀, same but nr Biological Faculty, BSU, 1.vii.2002. – 1♂, 3♀, same but 19.vi.2006 (L. Serbina). – 1♂, same but Molodechno district, nr Vyazynka, 16.vi.2001, dry meadow. – 1♀, same but 2.vii.2001. – 1♂, same but 0.5 km E Vyazynka, hill, 3.vii.2001. – 1♂, same but nr Vyazynka, canal bank, 12.vi.2002. – 1♂, 3♀, nr Shipulichi, river Zapadnaya Berezina bank, 27.vi.2002. – 1♂, same but river Udranka bank, nr bus stop, 14.vii.2009 (L. Serbina). – 1♂, 1♀, same but Myadel' district, nr Naroch', 2.vii.2009. – 2♂, 3♀, same but Logoviny, nr train station, 5.vii.2009, meadow. – 3♂; same but 0.5 km S Nikol'tsy, Gomza Dendrological Garden, 6.vii.2009. – 1♂, 1♀, same but Soligorsk district, 7 km from Soligorsk, 24.vi.2004 (A. Egiyan). – 1♀, same but 25.vi.2004. – 1♀, same but Stolbtsy district, nr train station Kolosovo, 26.v.1993, field in front of pine forest (V. Karasev). – Vitebsk: 2♂, 2♀, Gorodok district, 17.vi.2008, dry meadow, on *Achillea millefolium*.

Craspedolepta omissa Wagner, 1944

Material examined: Minsk: 1♀, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow. – 1♀, same but Minsk district, 2 km NE Shchemyslitsy, along train station, 12.vii.2005, forest plantation. – 2♂, 1♀, same but river Ptich' bank, nr train station Ptich', 15.vii.2009 (L. Serbina). – 2♀, same but Botanical Garden (Minsk), 16.vii.2009. – 1♂, same but Molodechno district, nr Vyazynka, station, hill, 3.vii.2001. – 2♂, 2♀, same but nr station Shipulichi, 27.vi.2002, river Zapadnaya Berezina bank, on *Artemisia* sp. – 1♂, same but Myadel' district, nr Naroch', 2.vii.2009 (L. Serbina). – 6♂, 10♀, same but Logoviny, nr train station, 5.vii.2009. – 1 adult without abdomen, same but nr Antonisberg, 300 m behind resting place, meadow. – 3♂, 5♀, same but 0.5 km S Nikol'tsy, Gomza Dendrological Garden, 6.vii.2009. – 1♀, same but nr Naroch', 9.vii.2009. – 1♂, same but Vileyka district, nr hydraulic station, 0.5 km N Budishche, 9.vii.2005, dry meadow.

Craspedolepta subpunctata (Foerster, 1848)

Material examined: Minsk: 1♀, Molodechno district, nr Vyazynka, 16.vi.2001, willow thicket. – 1♀, same but nr Chirovichi, 9.vi.2002.

Rhinocolinae
***Rhinocola aceris* (Linnaeus, 1758)**

Material examined: No locality data, 1♂, 1♀ (S. Buga).

Liviidae
Euphyllurinae
***Psyllopsis discrepans* (Flor, 1861)**

Material examined: Gomel': 1♀, Khoyniki district, Orevichi, Polesskiy Natural Reserve, 21.viii.1991, Malaise trap. – Minsk: 15♂, 30♀, Soligorsk district, 7 km from Soligorsk, 24.vi.2004 (A. Egiyan).

***Psyllopsis distinguenda* Edwards, 1913**

Material examined: Vitebsk: 1♂, 1♀, Gorodok district, Carla-Marksa Street, 17.vi.2008, on *Fraxinus* sp. (S. Buga).

***Psyllopsis fraxini* (Linnaeus, 1758)**

Records: Recorded by Petrov (2011) from the south central region of the Belarusian Ridge.

***Psyllopsis fraxinicola* (Foerster, 1848)**

Material examined: Minsk: 1♂, Soligorsk district, 7 km from Soligorsk, 24.vi.2004 (A. Egiyan).

***Strophingia ericae* (Curtis, 1835)**

Material examined: Grodno: 2♀, Iv'yev district, Naliboki pushcha, 4 km NE Malaya Chapun', 22.vi.2002, pine forest, on *Calluna* sp.

Liviinae
***Camarotoscena speciosa* (Flor, 1861)**

Material examined: Minsk: 1♂, Minsk, alley nr Lyubimov Ave., 23.iv.2013, on *Tilia* sp. – 3♀, same but Botanical Garden (Minsk), 26.iv.2013, on *Rhododendron* sp. (L. Serbina).

Psyllidae
Psyllinae
***Arytaina genistae* (Latreille, 1804)**

Material examined: Vitebsk**:** 2♂, 1♀, Lepel' district, nr Kraytsy, 1 km along road in direction Perechodtsy, 2.viii.2001, pine forest.

***Baeopelma foersteri* (Flor, 1861)**

Records: Recorded by Loginova (1962b) as *Psylla foersteri* from the Vitebsk region.

Material examined: Gomel': 2♂, 3♀, Zhitkovichi district, Khvoyensk, 11.vii.1999, pine forest, on *Alnus glutinosa* (S. Buga). – 3♂, same but 1.5 km SW Novyye Milevichi, river Sluch' floodplain, 4.viii.2004. – 15♂, 9♀, same but 2 km SW Otskovannoye, 5.viii.2004. – 1♂, same but nr Novyye Milevichi, nr river Sluch', 15.ix.2004. – Minsk: 1♂, 2♀, Logoysk district, 0.5 km SW Matski, hill, 7.vii.2004, meadow. – 1♀, same but Minsk district, Kupalovskiy National Park, nr Lekarovka, dry meadow, on *Alnus incana*. – 1♂, 1♀ same but Botanical Garden (Minsk), 16.vii.2009, on *Alnus* sp. (L. Serbina). – 2♂, 1♀, same but river Ptich' bank, nr train station Ptich', 22.vii.2009. – 3♂, 5♀, same but Myadel' district, Naroch', nr Antonisberg, 30.vi.2005, (A. Egiyan). – 4♂, 3♀, same but 1.vii.2005, on *Alnus incana*. – 1♀, same but nr Naroch', 3.vii.2009, on *Alnus* sp. (L. Serbina). – 1♂, same but 0.5 km S Nikol'tsy, Gomza Dendrological Garden, 6.vii.2009. – 1♀, same but Soligorsk district, Soligorsk, 25.vi.2004 (A. Egiyan). – 5♂, 4♀, same but Volozhin district, Rakov, river Isloch' floodplain, 28.vii.2004. – 3♂, 6♀, same but on *Alnus glutinosa*. – 2♂, 2♀, same but nr Kaldyki, 19.vii.2007, mixed forest, on *Alnus* sp. (L. Serbina). – Mogilev: 1♀, Klichev district, Lozovitsa, 20.vii.1997, pine forest. – Vitebsk: 1♀, Postavy district, lake Chetvert' south bank, 10.vii.2005.

***Cacopsylla ambigua* (Foerster, 1848)**

Material examined: Brest: 2♂, Drogichin district, Wildlife sanctuary "Zvonets", 16.vi.1999. – Gomel': 2♀, Zhitkovichi district, 1.5 km SW Novyye Milevichi, river Sluch' floodplain, 4.viii.2004, on *Salix* sp. – Grodno: 1 adult without abdomen, Iv'yev district, Naliboki pushcha, 0.5 km S Potashnya, nr river, 22.viii.2002, meadow (E. Shestakov). – Minsk: 4♂, 8♀, Logoysk district, nr Gayany, 28.vi.2004, on *Salix* sp. – 1♂, 2♀, same but Minsk district, train station Kryzhovka, river Poplav bank, 3.vi.2001, floodplain meadow. – 2♀, same but nr Shchemyslitsy, NW Dubrava Natural Monument, 6.vi.2002. – 1♀, 1 adult without abdomen, same but 15.vi.2002. – 4♀, same but 18.vi.2002. – 2♀, same but 4.vii.2002. – 1♂, 1♀, same but field between MKAD Kurasovshchina and South-West district, 24.v.2003. – 1♂, same but Shchemyslitsy, nr Biological Faculty, BSU, 19.vi.2006. – 1♂, 4♀, same but Molodechno district, nr Vyazynka, 16.vi.2001, bog. – 1♂, 3♀, same but nr station Shipulichi, river Zapadnaya Berezina floodplain, meadow edge, 27.vi.2002. – 1♀, same but nr Vyazynka, 20.v.2003. – Vitebsk: 1♂, Gorodok district, 2 km NE Machalovo, river Lovat' floodplain, 4.vi.2000, bog (S. Buga).

Cacopsylla brunneipennis (Edwards, 1896)

Material examined: Minsk: 2♂, 3♀, Logoysk district, Gayany, 28.vi.2004. – 2♂, 3♀, same but Minsk district, nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest, on conifers (L. Serbina).

Cacopsylla crataegi (Schrank, 1801)

Records: Recorded from Belarus by Gorlenko *et al*. (1988) as *Psylla crataegi* and by Petrov & Sautkin (2013) as *Cacopsylla crataegi* from the Minsk region.

Cacopsylla hippophaes (Foerster, 1848)

Material examined: Minsk: 1♂, 3♀, Minsk district, nr Tarasovo, nr Gardeners' partnership Zvezdnoye, 29.ix.2013, on *Hippophae rhamnoides* (L. Serbina).

Cacopsylla ledi (Flor, 1861)

Material examined: Gomel': 1♀, Zhitkovichi dictrict, Pripyatskiy National Park, 11.vii.1999, pine forest, on *Ledum* sp. – Minsk: 1♀, Myadel' district, 1 km SW Kochergi, 16.vii.2005, pine forest, on *Ledum* sp. – 1♀, same but Leytsy, 5.v.2008. – Mogilev: 1♀, Klichev district, Razvadovo, 20.vii.1997, pine forest, on *Ledum* sp. – 1♂, 1♀, same but Lozovitsa, 31.viii.1997. – 1♀, Razvadovo, 23.vii.1998. – 3♀, same but 17.viii.1998. – 1♂, same but, 17.ix.2000, pine forest. – Vitebsk: 1♂, Dokshitsy district, Krulevshizna, 11.vii.2000, pine forest (L. Chumakov). – 1♀, same but 22.x.2000. – 1♀, same but Rossony district, 0.8 km N Osinniki, 11.ix.1998, pine forest, on *Ledum* sp.

Cacopsylla mali (Schmidberger, 1836)

Records: Recorded by Byazdzenka (1973) as *Psylla mali* from the Minsk region.

Material examined: Minsk: 1♂, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow. – 1♂, 2♀, same but Minsk district, Shchemyslitsy, Dubrava Natural Monument, 16.ix.1997, on *Malus sylvestris* (S. Buga). – 1♀, same but 15.vii.2009, on *Malus* sp. (L. Serbina). – 1♀, same but Molodechno district, nr Vyazynka, 16.vi.2001, bog. – 2♀, same but 29.vii.2001. – 1♀, same but nr station Shipulichi, river Zapadnaya Berezina floodplain, 27.vi.2002. – 2♀, same but Myadel' district, Naroch' orchards, 2.vii.2009 (L. Serbina). – 1♀, same but Volozhin district, nr Kaldyki, 11.vii.2007, mixed forest.

Cacopsylla mali (Schmidberger, 1836) group

Material examined: Minsk: 1♀, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, meadow. – 1♀, same but Minsk district, Shchemyslitsy, Dubrava Natural Monument, 15.vi.2002. – 1♀, same but nr Biological Faculty, BSU, 1.vii.2002. – 1♀, same but Molodechno district, nr Vyazynka, 1.vi.2001. – 1 adult without abdomen, same but Myadel' district, nr Naroch', 4.vii.2009 (L. Serbina). – 1♂, same but Nesvizh district, nr Nesvizh, 29.vi.2004, on *Prunus cerasifera*.

Comment: Due to the poor state of the material the specimens cannot be identified to species. They could be any member of the *C. mali* group: *C. mali*, *C. peregrina*, *C. sorbi* or *C. ulmi*.

Cacopsylla moscovita (Andrianova, 1948)

Material examined: Grodno: 1♂, 1♀, Iv'yev district, Naliboki pushcha, 4.5 km E Malaya Chapun', 22.viii.2002, on *Salix* sp.

Cacopsylla parvipennis (Löw, 1877)

Material examined: Minsk: 1♀, Myadel' district, 2 km W Cheremshitsy, river Narochanka floodplain, 9.vii.2005.

Cacopsylla peregrina (Foerster, 1848)

Material examined: Minsk: 3♂, 7♀, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow. – 1♂, 1♀, same but Minsk district, stop "Kurasovshchina", 9.ix.1997, on *Crataegus* sp. (S. Buga). – 4♀, same but stop "Bol'nitsa", 13.ix.1997. – 4♂, 4♀, same but Shchemyslitsy, Dubrava Natural Monument, 21.v.1999. – 3♀, same but station "Polzhelishche", 18.ix.1999. – 2♀, same but Shchemyslitsy, track nr bus stop "Filial BGU", 11.vii.2009 (L. Serbina). – 1♂, 1♀, same but 22.vii.2009. – 15♀, same but 29.vii.2009. – 3♂, 4♀, same but Volozhin district, nr Kaldyki, 19.vii.2007, mixed forest.

Cacopsylla pulchella (Löw, 1877)

Material examined: Gomel': 8♂, 2♀, Khoyniki district, Orevichi, 21.v.-18.vi.1991, Malaise trap. – 2♂, same but Zhitkovichi district, 14 km from Chvoensk, Pripyatskiy National Park, 26.viii.1999, pine forest. – Minsk: 2♂, Molodechno district, nr Vyazynka, 16.vi.2001, dry meadow.

Cacopsylla pulchra (Zetterstedt, 1838)

Material examined: Gomel': 1♂, Zhitkovichi district, Pripyatskiy National Park, 20.x.1998, pine forest. – Minsk: 1♂, Logoysk district, Gayany, 28.vi.2005. – 2♂, 1♀, same but Minsk district, nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest, on conifers (L. Serbina). – 1♂, same but Molodechno district, nr Vyazynka, 16.vi.2001, bog, on *Salix* sp.

Cacopsylla pyri (Linnaeus, 1758)

Records: Recorded from Belarus by Palyakova (1969), Gorlenko *et al.* (1988) as *Psylla pyri*.

Cacopsylla pyrisuga (Foerster, 1848)

Records: Recorded from Belarus by Palyakova (1969) as *Psylla pyrisuga*.

Cacopsylla saliceti (Foerster, 1848) group

Material examined: Grodno: 1♀, Iv'yev district, Naliboki pushcha, 2 km S Potashnya, 23.vi.2002, on *Salix* sp. – 1♀, same but 4.5 km E Malaya Chapun', 28.ix.2002. – Minsk: 1♀, Minsk district, nr Kryzhovka station, 3.vi.2001, alder forest. – 1♀, same but Myadel' district, Leytsy, 25.vi.2008. – 1♀, same but 0.5 km S Nikol'tsy, Gomza Dendrological Garden, 6.vii.2009, on *Salix* sp. (L. Serbina).

Comment: Single females of this species group cannot be correctly identified to species.

Cacopsylla sorbi (Linnaeus, 1767)

Material examined: Minsk: 38♂, 32♀, Myadel' district, Naroch', nr Antonisberg, 28.vi.2005, on *Sorbus* sp. (A. Egiyan).

Cacopsylla ulmi (Foerster, 1848)

Records: Recorded by Petrov (2011) from the south central region of the Belarusian Ridge.

Material examined: Gomel': 3♂, 3♀, Khoyniki district, Orevichi, Pripyatskiy National Park, 23.vii.1991, Malaise trap. – 6♂, 32♀, same but Polesskiy Natural Reserve, 21.viii.1991. – 1♀, same but Zhitkovichi district, Khvoyensk, truck patch, 14.vii.1999 (S. Buga). – Minsk: 1♂, Minsk district, Shchemyslitsy, nr train station "Roshcha", 15.vii.2009, on *Ulmus* sp. (L. Serbina).

Chamaepsylla hartigii (Flor, 1861)

Material examined: Minsk: 1♀, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow, on *Betula pendula*.

Psylla alni (Linnaeus, 1758)

Material examined: Brest: 4♂, 2♀, Gantsevichi district, 3 km SE Borki, 23.vii.2005, pine forest. – Gomel': 2♀, Zhitkovichi district, 1.5 km SW Novyye Milevichi, river Sluch' floodplain, 4.viii.2004. – 3♂, 5♀, 2 km, same but SW Otskovannoye, 5.viii.2004. – Grodno: 1♀, Mosty district, 3.5 km NW Peski, river Zel'vyanka floodplain, 23.vi.2005. – 1♀, same but 24.vi.2005. – Minsk: 62♂, 66♀, Logoysk district, nr Gayany, roadside lowland, 28.vi.2004, on *Alnus incana*. – 1♀, same but Kupalovskiy National Park, nr Lekarovka, 7.vii.2004. – 3♂, 6♀, same but 0.5 km SW Matski, hill, meadow. – 3♂, 4♀, same but Molodechno district, nr Vyazynka, 16.vi.2001, bog. – 6♂, 3♀, same but 1.vii.2001, on *Alnus* sp. – 2♂, 4♀, same but river Udranka bank, nr bus stop, 2.vii.2008, on *Alnus incana* (L. Serbina). – 1♂, same but nr Naroch', 3.vii.2009, on *Alnus* sp. – 2♀, same but Nesvizh district, park "Al'ba", 29.vi.2004. – 2♂, 5♀, same but Volozhin district, Rakov, river Isloch' floodplain, 28.vii.2004, on *Alnus glutinosa*. – Vitebsk: 1♂, Gorodok district, 0.3 km SW Zadrach'ye, river Zadrach bank, 7.vi.2000, on *Alnus incana* (S. Buga).

Psylla betulae (Linnaeus, 1758)

Material examined: Mogilev: 1♀, Klichev district, Razvadovo, 23.vii.1988, pine forest.

Psylla buxi (Linnaeus, 1758)

Records: Recorded by Petrov *et al.* (2011), Petrov & Sautkin (2013) from the Minsk region.

Psylla fusca (Zetterstedt, 1828)

Material examined: Minsk: 1♀, Logoysk district, Kupalovskiy National Park, nr Lekarovka, 26.vi.2002, dry meadow. – 28♂, 23♀, same but nr Gayany, downhill, 28.vi.2004, on *Alnus incana*. – 1♂, 1♀, same but Kupalovskiy National Park, nr Lekarovka, 7.vii.2004, dry meadow. – 5♂, 4♀, same but 0.5 km SW Matski, hill, meadow. – 1 adult without abdomen, same but Molodechno district, nr Vyazynka, station, 1.vii.2001. – 1♂, same but 2.vii.2001, on *Alnus* sp. – 1 adult without abdomen, same but 29.vii.2001, linden alley. – 20♂, 17♀, same but river Udranka bank, nr bus stop, 2.vii.2008, on *Alnus incana* (L. Serbina). – 1♂, same

but Volozhin district, nr Kaldyki, 19.vii.2007, mixed forest, on *Alnus* sp.

Triozidae

***Bactericera acutipennis* (Zetterstedt, 1828)**

Material examined: Vitebsk: 3♂, 1♀, Dokshitsy district, nr station Krulevshizna, 20.x.2000, pine forest (L. Chumakov).

***Bactericera curvatinervis* (Foerster, 1848)**

Material examined: Minsk: 1♂, Minsk district, nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest, on conifers (L. Serbina). – 1♂, 2♀, same but nr Tarasovo, nr Gardeners' partnership Zvezdnoye, 29.ix.2013. – Vitebsk: 1♂, Dokshitsy district, nr station Krulevshizna, 20.x.2000, pine forest (L. Chumakov).

***Bactericera* ? *femoralis* (Foerster, 1848)**

Material examined: Vitebsk: 1♀, Dokshitsy district, station Krulevshizna, 20.x.2000, pine forest (L. Chumakov).

Comment: Due to the poor state of the specimen at hand the identification is questionable and it could be also *Bactericera acutipennis* or *B. bohemica*.

Bactericera reuteri (Šulc, 1913)

Material examined: Gomel': 2♂, Khoyniki district, Orevichi, Pripyatskiy National Park, 23.vii.1991, Malaise trap.

***Bactericera striola* (Flor, 1861)**

Records: Recorded by Loginova (1962b) as *Trioza striola* from the Vitebsk region.

***Bactericera substriola* Ossiannilsson, 1992**

Material examined: Minsk: 1♂, Minsk district, Shchemyslitsy, Dubrava Natural Monument, 4.vii.2002, on *Salix* sp. – 1♂, same but Molodechno district, station Shipulichi, river Zapadnaya Berezina bank, 27.vi.2002.

***Trichochermes walkeri* (Foerster, 1848)**

Records: Recorded from Belarus by Petrov (2004).

Material examined: Minsk: 1♂, Molodechno district, nr Vyazynka, 29.vii.2001.

***Trioza anthrisci* Burckhardt, 1986**

Material examined: Minsk: 1♂, 1♀, Minsk district, nr Tarasovo, nr Gardeners' partnership Zvezdnoye, 29.ix.2013, on conifers (L. Serbina). – 1♀, same but Molodechno district, station Shipulichi, canal bank, 27.vi.2002. – Vitebsk: 1♂, Postavy district, lake Chetvert' south bank, 10.vii.2005.

***Trioza apicalis* Foerster, 1848**

Records: Recorded from Belarus by Sidlyarevich & Bolotnikova (1992).

***Trioza cerastii* (Linnaeus, 1758)**

Material examined: Minsk: 1♀, Volozhin district, nr Kaldyki, 11.vii.2007, mixed forest (L. Serbina).

***Trioza flavipennis* Foerster, 1848**

Material examined: Minsk: 1♀, 3♀, Minsk district, nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest, on conifers (L. Serbina).

***Trioza galii* Foerster, 1848**

Material examined: No locality data, 1♂ (S. Buga).

***Trioza proxima* Flor, 1861**

Material examined: Minsk: 1♀, Minsk district, nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest, on conifers (L. Serbina).

***Trioza remota* Foerster, 1848**

Material examined: Gomel': 4♀, Zhitkovichi district, Pripyatskiy National Park, 20.x.1998, pine forest (L. Chumakov). – Minsk: 2♂, 3♀, Minsk district, Shchemyslitsy, Dubrava Natural Monument, 26.ix.2013, on conifers (L. Serbina).

***Trioza urticae* (Linnaeus, 1758)**

Material examined: Gomel': 9♂, 10♀, Zhitkovichi district, Krasnosel'ye, Pripyatskiy National Park, 21.v.1991, Malaise trap. – 1♂, 6♀, same but Orevichi, 21.v.-18.vi.1991. – 8♂, 20♀, same but 23.vii.1991. – Minsk: 3♂, 3♀, Logoysk district, Kupalovskiy National Park, nr Besyady, river Udra floodplain, 26.vi.2002, on various plants including *Urtica dioica*. – 1♂, 1♀, same but Minsk district, nr train station Kryzhovka, river Poplav bank, 3.vi.2001, floodplain meadow. –

1♂, same but nr Chirovichi, hill, 9.vi.2002, dry meadow. – 13♂, 4♀, same but Shchemyslitsy, Dubrava Natural Monument, 15.v.2008, on *Urtica dioica* (L. Serbina). – 1♂, same but 15.viii.2008. – 1 adult without abdomen, same but 25.vi.2009. – 2♂, 2♀, same but Botanical Garden (Minsk), 16.vii.2009. – 2♂, 14♀, same but Shchemyslitsy, Dubrava Natural Monument, 27.vii.2009. – 4♂, 2♀, same but 26.ix.2013, on conifers. – 1♂, 1♀, same but nr Aksakovshchina, Wildlife sanctuary Podsady, 28.ix.2013, mixed forest. – 1♂, same but nr Tarasovo, Gardeners' partnership Zvezdnoye, 29.ix.2013. – 7♂, 3♀, same but on conifers. – 2♂, 7♀, same but Molodechno district, nr Vyazynka, 16.vi.2001. – 1♂, 1♀, same but 17.vi.2001, alder forest. – 3♂, 4♀, same but nr train station Shipulichi, river Zapadnaya Berezina bank, 27.vi.2002. – 1♀, same but nr Sitsevichi, riverbank, behind station, 18.v.2007. – 3♀, same but river Udranka bank, nr bus stop, 2.vii.2008 (L. Serbina). – 1♂, 1♀, same but Myadel' district, nr Naroch', 4.vii.2009, on *Urtica dioica*. – 8♂, 10♀, same but Volozhin district, nr Kaldyki, 11.vii.2007, mixed forest. – Vitebsk: 2♂, Dokshitsy district, Krulevshizna, 20.x.2000, pine forest (L. Chumakov).

Trioza velutina Foerster, 1848

Material examined: Minsk: 1♂, Molodechno district, nr Sitsevichi, riverbank, behind station, 18.v.2007.

DISCUSSION AND CONCLUSION

Despite the fact that the psylloid fauna of Central and Eastern Europe is generally well studied (Gegechkori & Loginova, 1990; Klimaszewski, 1975), little is known from Belarus with only 12 recorded species one of which is doubtful, i.e. *Aphalara polygoni* (Loginova, 1961, 1962b; Palyakova, 1969; Byazdzenka *et al.*, 1973; Gorlenko *et al.*, 1988; Sidlyarevich & Bolotnikova, 1992; Petrov, 2004, 2011; Petrov *et al.*, 2011; Petrov & Sautkin, 2013). Based on recent collections we confirm the presence of 4 previously recorded species and add 43 species, bringing the number of confirmed Belarusian psyllid species to 54. The majority of these are widely distributed in Europe and slightly more than half of them are associated with woody plants. The rest of the species is either introduced (*Cacopsylla pulchella*) or represents possible boreal elements ("peatbog" species as *Cacopsylla ledi*, *Psylla betulae*, *Bactericera acutipennis*). *Craspedolepta crispati* is rare and has been recorded from only a few countries (Lauterer & Burckhardt, 2004).

The 54 species represent probably less than half of the number of species existing in the country by comparison with the surrounding countries: Poland 112 spp. (Klimaszewski, 1975; Głowacka, 1989, 1991; Głowacka & Migula, 1996; Drohojowska & Głowacka, 2011; Kuznetsova *et al.*, 2012), Northwest Russia 47 spp. (Loginova, 1954, 1961, 1962a, b, 1966, 1967, 1968, 1972a, b), Lithuania 12 spp. (Vengeliauskaitė, 1974; Malumphy *et al.*, 2009) and the former Livonia (now parts of Estonia and Latvia) 43 spp. (Flor, 1861) (Appendix 2). There are no published data available for the psyllid fauna from the North of Ukraine and it is, therefore, not included in Appendix 2. Based on the occurrence of their respective host-plants following additional species (not listed in Appendix 2) can be also expected to occur in Belarus: *Aphalara longicaudata* Wagner & Franz, 1961, *A. polygoni* Foerster, 1848, *A. ulicis* Foerster, 1848, *Craspedolepta campestrella* Ossiannilsson, 1987, *C. innoxia* (Foerster, 1848), *Arytaina maculata* (Löw, 1886), *Cacopsylla affinis* (Löw, 1880), *C. breviantennata* (Flor, 1861), *C. picta* (Foerster, 1848), *C. rhamnicola* (Scott, 1876), *C. rhododendri* (Puton, 1871), *Psylla betulaenanae* Ossiannilsson, 1970, *Trioza scottii* Löw, 1880.

To stimulate further research on Belarusian psyllids we provide here an illustrated identification key for 127 species whose occurrence in the country has been documented or is likely given that they have been reported from adjacent countries (Appendix 2) or their host-plants occur in Belarus. Targeted field work sampling on potential host-plant is necessary to find also the more localised and rarer species.

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APPENDIX 1

Identification key to adult psyllids of Belarus
(*Cacopsylla merita* and *Eryngiofaga deserta* are not included in the key as their occurrence in Belarus is unlikely).

1 Vein R+M+Cu of forewing bifurcating into veins R and M+Cu (Fig. 1)..... 2
– Vein R+M+Cu of forewing trifurcating into veins R, M and Cu. – Triozidae (Fig. 2) 84
2 Metacoxa slender with flattened, tubercular meracanthus. On *Acer* – Aphalaridae, Rhinocolinae ..... ***Rhinocola aceris***
– Metacoxa massive with distinct, spur-shaped meracanthus 3
3 Vertex longer than wide. Segment 2 the longest antennal segment. On monocots (*Carex*, *Juncus*). – Liviidae, Liviinae, *Livia* 4
– Vertex shorter than wide. Segment 3 the longest antennal segment. On dicots 6
4 Vertex, in dorsal view, forming narrowly rounded anterior lobes with deep median cleft between lobes. Forewing short, oval, with evenly curved anterior margin, bearing indistinct dots in apical half. On *Juncus*..... ***Livia junci***
– Vertex, in dorsal view, forming broadly rounded anterior lobes with shallow indentation between lobes. Forewing longer, oblong oval or rhomboidal, in the middle with almost straight anterior margin, pattern different. On *Carex*..... 5
5 Forewing with subparallel fore and hind margins, without dark band along apical and anal margin. On *Carex* ..... ***Livia crefeldensis***
– Forewing widening towards apical third, with broad dark band along apical and anal margin. On *Carex* ..... ***Livia limbata***
6 Basal spine of metabia always absent; apical metatibial spurs spaced in equal intervals, forming open crown; if grouped, then vertex flattened and rectangular with anterior lobes, or evenly passing into genae 7
– Basal spine of metatibia often developed; apical metatibial spurs always grouped. Head with distinct, though sometimes small, genal processes. – Psyllidae, Psyllinae 37
7 Head bearing genal processes. On *Fraxinus* – Liviidae, Euphyllurinae, *Psyllopsis* 8
– Head without genal processes, genae rounded anteriorly..... 11
8 Body green, forewing lacking dark pattern. Paramere axe-shaped (Fig. 3). Female proctiger distal to circumanal ring abruptly tapered (Fig. 4)..... ***Psyllopsis fraxinicola***
– Body with dark areas, forewing with dark veins and more or less expanded dark pattern. Male and female terminalia different..... 9
9 Forewing lacking continuous marginal band apically; membrane dark at apices of veins M and Cu, in the middle of vein Cu_{1a} and along vein Cu_{1b} (Fig. 5). Thorax yellow-orange, dark brown dorsally. Paramere, in profile, hammer-shaped with large anteriorly directed lobe (Fig. 6). Apex of female proctiger broad (Fig. 7). ..... ***Psyllopsis discrepans***
– Forewing with dark band along apical margin stretching from fore to hind margin (Figs 8, 11). Thorax yellow with brown or black pattern. Paramere, in profile, with posteriorly directed lobe (Figs 9, 12). Apex of female proctiger narrow (Figs 10, 13) 10
10 Forewing pattern very dark, extended and well-delimited (Fig. 8). Paramere with large rectangular posterior lobe (Fig. 9). Female proctiger with slight hump distal to circumanal ring (Fig. 10). ..... ***Psyllopsis distinguenda***
– Forewing pattern slightly lighter, more reduced, often forming only narrow band, and less clearly delimited towards interior (Fig. 11). Paramere with small triangular posterior lobe (Fig. 12). Female proctiger straight or concave distal to circumanal ring (Fig. 13). ..... ***Psyllopsis fraxini***
11 Metabasitarsus without black spurs. On *Populus* – Liviidae, Liviinae ..... ***Camarotoscena speciosa***
– Metabasitarsus with 2 black spurs..... 12
12 Male proctiger without posterior lobes (Fig. 14). ALHW always < 1.0. On *Calluna vulgaris*. – Liviidae, Euphyllurinae ..... ***Strophingia ericae***
– Male proctiger with long, wing-like posterior lobes. ALHW often > 1.0. – Aphalaridae, Aphalarinae..... 13
13 Vertex with distinct angular anterior lobes which are separated by narrow transverse groove from genae. Clypeus more or less distinctly protruding from lower head surface. – *Aphalara*..... 14
– Vertex with weakly developed anterior lobes, smoothly passing into genae. Clypeus short, pressed against lower head surface, not strongly protruding from genae. – *Craspedolepta* 24
14 Forewing with dark pattern consisting of well-defined spots or patches. Apical dilatation of aedeagus with large dorso-apical membranous sack. Circumanal ring of female proctiger never expanded caudally 15
– Forewing without well-defined dark pattern but sometimes infuscate. Apical dilatation of aedeagus without or with small dorso-apical membranous sack. Circumanal ring on female proctiger usually expanded caudally (exceptions *A. longicaudata*, *A. purpurascens*) 17

15 Clypeus long, clearly visible from above; cylindrical, constricted subapically. Forewing narrow, with dark patches concentrated in apical third, basal half clear. On *Polygonum* ..... ***Aphalara maculipennis***
– Clypeus short, not or hardly visible from above; conical, apically blunt or subacute. Forewing broad, with dark patches extending also into basal half 16
16 Surface spinules of forewing forming short rows of 2-4 spinules (Fig. 15). Paramere produced apico-posteriorly (Fig. 17). On *Rumex* ..... ***Aphalara exilis***
– Surface spinules of forewing forming longer rows (Fig. 16). Paramere not produced apico-posteriorly (Fig. 18). On *Rumex* ..... ***Aphalara ulicis***
17 Head and thorax dark brown or black. On *Stellaria graminea* ..... ***Aphalara affinis***
– Head and thorax ochreous with orange or brownish markings 18
18 Forewing with surface spinules arranged in irregular, transverse rows (Figs 19, 22-23)..... 19
– Surface spinules of forewing arranged in irregular squares or rhombi (Figs 24-26) 22
19 Paramere with posterior extension apically (Fig. 20). Female terminalia long (Fig. 21). On *Polygonum bistorta* .. .. ***Aphalara longicaudata***
– Paramere not extented postero-apically. Female terminalia shorter..... 20
20 Body dimensions large (length from head to apex of forewing when folded over body ≥ 2.9 mm). Forewing membrane amber-coloured, surface spinules arranged in very dense, transverse rows (Fig. 22). On *Caltha* .... ***Aphalara calthae***
– Body dimensions small (≤ 3.2 mm). Forewing membrane colourless or fumose, surface spinules arranged in sparse rows (Fig. 23) 21
21 Circumanal ring caudally consisting of several rows of pores. On *Polygonum*, *Rumex*..... ***Aphalara polygoni***
– Circumanal ring caudally consisting of two rows of pores. On *Rumex* ..... ***Aphalara purpurascens***
22 Male paramere with anterior finger-like process situated subapically (Fig. 27). Aedeagus as in Fig. 28. Female terminalia as in Fig. 29. On *Polygonum* ..... ***Aphalara borealis***
– Male paramere with anterior finger-like process situated close to apex (Figs 30, 33). Aedeagus as in Figs 31, 34. Female terminalia as in Figs 32, 35..... 23
23 Tip of distal portion of aedeagus directed in an angle of about 30° to longitudinal axis of segment (Fig. 31). On *Polygonum aviculare* group..... ***Aphalara avicularis***
– Tip of distal portion of aedeagus directed in an angle of about 90° to longitudinal axis of segment (Fig. 34). On *Polygonum* ..... ***Aphalara freji***
24 Forewing with pattern consisting of well-defined, dark spots of 10-30 µm diameter..... 25
– Forewing without pattern, or with pattern consisting of dark bands, or membrane irregularly infuscate 29
25 Body bearing macroscopic setae which often are covered in wax and thus resemble scales. On *Artemisia abrotanum* ..... ***Craspedolepta alevtinae***
– Body lacking macroscopic setae..... 26
26 Forewing with surface spinules completely covering membrane (Fig. 36). Terminalia as in Figs 41-42. On *Artemisia*..... ***Craspedolepta artemisiae***
– Forewing with surfaces spinules forming hexagonal pattern (Figs 37-38) 27
27 Forewing with dark spots densely spaced, partly confluent in apical part. On *Artemisia campestris* .... ***Craspedolepta campestrella***
– Forewing with dark spots sparsely spaced, not confluent in apical part of wing (Figs 39-40) 28
28 Dark spots on forewing dark brown or almost black; surface spinules relatively sparsely spaced (Fig. 37). Terminalia as in Figs 43-44. On *Artemisia vulgaris* ..... ***Craspedolepta latior***
– Dark spots on forewing pale to yellow brown; surface spinules relatively dense (Fig. 38). Terminalia as in Figs 45-46. On *Artemisia absinthum, A. maritima*..... ***Craspedolepta malachitica***
29 Male paramere with large apical triangular posterior lobe, and subapical anterior process which is very long and directed backwards (Fig. 47). Female proctiger ending in two points (Fig. 48). On *Chamerion* .... ***Craspedolepta subpunctata***
– Male paramere, in profile, club-shaped, or if triangular, then anterior process not directed backwards (Figs 50, 53, 57, 61, 63, 65-66). Female proctiger ending in a single point..... 30
30 Body length from head to apex of forewing when folded over body < 3.2 mm 31
– Body length > 3.5 mm 35
31 Forewing without dark patches or stripes..... 32
– Forewing with yellow to brown patches or stripes..... 33
32 Surface spinules of forewing arranged in irregular transverse rows (Fig. 49). Male paramere with large triangular apex and long straight anterior process on inner surface (Fig. 50). Female proctiger more than 4 times longer than pore ring length (Fig. 51). On *Daucus*..... ***Craspedolepta innoxia***

– Surface spinules of forewing widely spaced, sometimes partially reduced not forming transverse rows (Fig. 52). Male paramers club-shaped, with short, claw-like anterior process (Fig. 53). Female proctiger less than 4 times as long as pore ring length (Fig. 54). On *Artemisia vulgaris* ..... ***Craspedolepta omissa***

33 Forewing pattern with dark brown, well-delimited patches forming bands along outer margin and in the middle stretching between the apices of veins R_1 and Cu_{1b}, and a spot in cell cu_2 (Fig. 55). Male proctiger with broad wing-like posterior processes lacking a basal hook (Fig. 56). Paramere as in Fig. 57. Female subgenital plate suddenly narrowed subapically (Fig. 58). On *Chamerion* ..... ***Craspedolepta nebulosa***

– Forewing pattern ochreous to brown, forming bands along the veins in apical half or a band along wing margin. Male proctiger with narrow single-like processes bearing a basal hook. Paramere different, with rounded to angular apical dilatation. Female subgenital plate evenly tapered 34

34 Antenna usually 8-segmented. Forewing pattern distinct, restricted to narrow stripes along veins in apical half (Fig. 59). Terminalia as in Figs 61-62. On *Achillea* ..... ***Craspedolepta nervosa***

– Antenna usually 10-segmented. Forewing pattern forming a band along outer wing margin (Fig. 60). Terminalia as in Figs 63-64. On *Achillea* ..... ***Craspedolepta bulgarica***

35 Anterior margin of vertex strongly indented in the middle with two distinct tubercles anteriorly; antero-lateral margin of vertex dorsal of antennal insertion distinctly concave. Forewing yellowish to brownish ochreous. On *Leontodon* ..... ***Craspedolepta flavipennis***

– Anterior margin of vertex weakly indented in the middle with two indistinct tubercles anteriorly; antero-lateral margin of vertex dorsal of antennal insertion more or less straight. Forewing semitransparent to whitish. 36

36 Forewing veins dark brown, membrane light, sometimes with light brownish spots or brownish tinge apically. Paramere stalk robust, apical spoon-like part shorter and rounded as in Fig. 65. Female terminalia as in Fig. 67. On *Senecio integrifolius* ..... ***Craspedolepta crispati***

– Forewing veins concolorous with membrane, membrane with yellowish tinge and brownish dots in apical third. Paramere stalk slender, apical spoon-like part longer and subangular as in Fig. 66. Female terminalia as in Fig. 68. On *Leontodon* ..... ***Craspedolepta sonchi***

37 Metabasitarsus with only one outer black spur, rarely also with much smaller inner spur. Propleurites divided by vertical suture 38

– Metabasitarsus with two well-developed black spurs which are subequal in size. Propleurites divided by diagonal suture 44

38 Either genal processes longer than vertex, or length ratio of veins Cu / Cu_{1b} of forewing 0.9-1.1. Paramere usually slender. – *Livilla* 39

– Character combination different 41

39 Forewing oval, strongly convex, coriaceous. On *Cytisus*, *Genista* ..... ***Livilla ulicis***

– Forewing oblong oval, flat, membranous (Figs 69-70) 40

40 Forewing long and narrow, branches of vein M forming an acute angle, pattern as in Fig. 69. On *Genista* ..... ***Livilla horvathi***

– Forewing short and broad, branches of vein M forming a right angle, pattern as in Fig. 70. On *Chamaecytisus*, *Cytisus* ..... ***Livilla radiata***

41 Forewing broadest in apical third, lacking colour pattern. Paramere very slender, curved caudad, digitiform apically. Dorsal margin of female proctiger, in profile, concave. On *Cytisus scoparius* ..... ***Arytainilla spartiophila***

– Forewing broadest in the middle or in basal third, with conspicuous brown pattern. Paramere broader, parallel-sided, in profile, truncate apically with large, forward pointing apical tooth. Dorsal margin of female proctiger, in profile, straight. – *Arytaina* 42

42 Forewing broadest in the middle, fore margin relatively flat. Paramere broad, dorsal margin distinctly concave. On *Cytisus*, *Genista* ..... ***Arytaina genistae***

– Forewing broadest in basal third, fore margin strongly curved. Paramere narrow, dorsal margin weakly convex. On *Chamaecytisus ratisbonensis* ..... ***Arytaina maculata***

43 Antennal segment 9 longer than 10 44

– Antennal segment 9 shorter than 10 48

44 Genal processes short and broad. Forewing with costal break and pterostigma developed; membrane yellow, veins concolorous. Dorsal margin of female proctiger serrate in apical third. On *Alnus* ..... ***Baeopelma foersteri***

– Character combination different. – *Psylla* 45

45 Forewing with cell cu_1 almost as high as long; membrane yellowish, veins concolorous, yellow or green. On *Buxus* ..... ***Psylla buxi***

– Forewing with cell cu_1 at most 1.5 times as long as high. On Betulaceae 46

46 Forewing lacking costal break and pterostigma. On *Alnus* ..... ***Psylla fusca***

– Forewing bearing costal break and pterostigma 47

47 Genal processes short, rounded. Forewing with dark brown or black veins in apical two thirds. On *Alnus* ..... ***Psylla alni***
– Genal processes longer, conical. Forewing veins paler. On *Betula* 48
48 Body length, including forewings when folded over the body, longer than 3.5 mm in males and 4.1 mm in females. Forewing colourless or with yellow tinge. On *Betula* ..... ***Psylla betulae***
– Body length, including forewings when folded over the body, shorter than 3.7 mm in males and females. Forewing amber-coloured. On *Betula* ..... ***Psylla betulaenanae***
49 Metatibia with 4 apical spurs. On *Betula*. ..... ***Chamaepsylla hartigii***
– Metatibia with 5 apical spurs. – *Cacopsylla* 50
50 Dorsal surface spinules in cell r_2 of forewing above bifurcation of vein M arranged in squares or rhombi of about 20 µm length; surface spinules in cell c+sc restricted to apical portion of cell or entirely reduced; surface spinules reduced in basal part of r_2, at most a few spinules present; fields of surface spinules tapering along apical wing margin; forewing membrane always colourless; pterostigma oblong cuneate, evenly tapering. Antenna shorter than 1.75 mm, if longer, then forewing longer than 3 mm. Male paramere simple, lamellar. Female terminalia short, cuneate 51
– Forewing spinulation different, or wing membrane yellowish or brownish, or pterostigma elongate with subparallel margins. If antenna longer than 1.75 mm, then forewing shorter than 3.0 mm. Male paramere often complex. Female terminalia different 54
51 Antenna shorter than 1.2 mm. On *Crataegus* ..... ***Cacopsylla peregrina***
– Antenna longer than 1.3 mm 52
52 Antenna longer than 1.75 mm. On *Ulmus* ..... ***Cacopsylla ulmi***
– Antenna shorter than 1.55 mm 53
53 Antennal segments 4-8 with black apex. On *Sorbus* ..... ***Cacopsylla sorbi***
– Antennal segments 4-8 with yellow or ochreous apex. On *Malus* ..... ***Cacopsylla mali***
54 Dorsal surface spinules of forewing in cell r_2 above bifurcation of vein M irregularly, densely spaced (2-10 µm) or arranged in transverse rows 55
– Dorsal surface spinules of forewing forming more or less even squares or rhombi of 20 µm distance in cell r_2 above bifurcation of vein M 62
55 Surface spinules arranged in transverse rows 56
– Surface spinules densely, irregularly spaced 58
56 Paramere, in profile, with large basal lobe. Dorsal margin of female proctiger straight or weakly convex. On *Salix* ..... ***Cacopsylla elegantula***
– Paramere, in profile, lamellar with anteriorly directed apical tooth. Dorsal margin of female proctiger sinuous. On *Salix* 57
57 Thorax brown, abdomen green. Terminalia ochreous or brown. On *Salix* ..... ***Cacopsylla abdominalis***
– Body colour evenly light or reddish. On *Salix* ..... ***Cacopsylla intermedia***
58 Forewing with an apical dark brown band or completely brown to dark brown 59
– Forewing light, at most yellow or ochreous 60
59 Forewing bearing dark band apically (Fig. 71). Metatibia without genual spine. Male subgenital plate bearing apical tubercular extension (Fig. 72). Female proctiger and subgenital plate ending in thorn-like processes (Fig. 75). On *Sorbus* ..... ***Cacopsylla breviantennata***
– Forewing irregulary dark without distinct apical ribbon (Fig. 73). Metatibia with genual spine. Male subgenital plate rounded apically (Fig. 74). Female proctiger and subgenital plate evenly tapering in profile (Fig. 76). On *Prunus* ..... ***Cacopsylla pruni***
60 Forewing bearing ventral surface spinules in cell c+sc. Surface spinules on forewing very densely arranged. On *Salix* ..... ***Cacopsylla ambigua***
– Ventral surface spinules lacking in cell c+sc. Surface spinules on forewing more sparsely arranged. 61
61 Forewing oval, widest in the middle; wing apex near apex of vein M_{1+2}. Antenna shorter than 1.0 mm. On *Salix repens* and *S. rosmarinifolia* ..... ***Cacopsylla parvipennis***
– Forewing widest in apical third; wing apex at the middle of outer margin of cell r_2. Antenna longer than 1.0 mm. On *Salix* ..... ***Cacopsylla flori***
62 Forewing bearing dark brown patches on tips of veins, at the bifurcation of vein M, and in the middle of vein Cu_{1a}. On *Cercis siliquastrum* ..... ***Cacopsylla pulchella***
– Forewing pattern different 63
63 Dorsal surface spinules covering entire cell c+sc of forewing apart from stripes along veins; forming extended fields in other cells which taper towards wing margin; membrane colourless or fumate but never with brown, strongly contrasting stripe along vein Cu_{1b} 64

– Dorsal surface spinules of forewing more or less reduced, or not tapering towards wing margin, or wing pattern consisting with dark, strongly contrasted stripe along vein Cu_{1b} 67

64 Antenna usually longer than 1.2 mm. Genal processes broad and blunt. Paramere broad, lanceolate (Fig. 77). Dorsal margin of female proctiger, in profile, weakly sinuous, apex narrowly rounded (Fig. 78). On *Pyrus* ..... ***Cacopsylla pyrisuga***

– Antenna usually shorter than 1.1 mm. Paramere narrow or with apical processes. Dorsal margin of female proctiger concave in the middle, or apex truncate 65

65 Paramere, in profile, with square base bearing 2 apical processes (Fig. 79). Dorsal margin of female proctiger, distal of circumanal ring, evenly concave; apex rounded (Fig. 80). On *Malus*..... ***Cacopsylla picta***

– Paramere, in profile, elongate; apex with inward and forward pointing tooth. Dorsal margin of female proctiger raised in the middle; apex angular 66

66 Paramere long, in profile, narrowed in the middle. Apex of distal segment of aedeagus weakly curved (Fig. 81). On *Crataegus*..... ***Cacopsylla melanoneura***

– Paramere short, in profile, evenly tapering from base to apex. Apex of distal segment of aedeagus strongly curved, hook-shaped (Fig. 82). On *Crataegus* ..... ***Cacopsylla affinis***

67 Forewing with fields of surface spinules tapered along apical wing margin; membrane bearing dark brown patch along vein Cu_{1b} (Figs 83-84)..... 68

– Character combination different 69

68 Areas of radular spinules of cells m_1, m_2 and cu_1 of forewing light; dark patch along vein Cu_{1b} not reaching bifurcation of Cu, not narrowed in proximal half (Fig. 83); surface spinules forming extended fields in cells c+sc and r_1. On *Sorbus* ..... ***Cacopsylla albipes***

– Areas of radular spinules of cells m_1, m_2 and cu_1 of forewing more or less dark; dark patch along vein Cu_{1b} reaching bifurcation of Cu, straight in proximal half (Fig. 84); surface spinules reduced in cells c+sc and r_1. On *Crataegus*. ..... ***Cacopsylla crataegi***

69 Surface spinules of forewing forming very narrow fields. On *Rhamnus* ..... ***Cacopsylla rhamnicola***

– Surface spinules of forewing forming extended fields 70

70 Forewing with fields of surface spinules tapering towards apical margin; clavus with brown apex. 71

– Character combination different 72

71 Paramere sickle-shaped (Fig. 85). Female proctiger strongly narrowed in the middle (Fig. 86). On *Pyrus*..... ***Cacopsylla pyri***

– Paramere lamellar (Fig. 87). Female proctiger cuneate (Fig. 88). On *Pyrus* ..... ***Cacopsylla pyricola***

72 Antenna longer than 1.6 mm 73

– Antenna shorter than 1.3 mm 75

73 Metatibia with 1+1+(2-3)+1 sclerotised apical spurs. Antennal segments 3-7 yellowish or ochreous with dark brown apex. Fields of surface spinules tapering along apical wing margin. On *Viscum* ..... ***Cacopsylla visci***

– Character combination different 74

74 Body colour dark brown. Paramere with short, angular apical, sclerotised apex (Fig. 89). Valvula 2 of female terminalia with straight ventral margin (Fig. 91). On *Hippophae* ..... ***Cacopsylla zetterstedti***

– Body colour green or yellow. Paramere with long, curved apical, sclerotised apex (Fig. 90). Valvula 2 of female terminalia with concave ventral margin (Fig. 92) On *Hippophae*..... ***Cacopsylla hippophaes***

75 Pterostigma cuneate, broad and short, with converging margins ending in the middle of vein Rs; wing membrane yellowish or ochreous, veins ochreous or light brown 76

– Pterostigma long and narrow, with subparallel margins ending in apical third of vein Rs; wing membrane colourless or dark, veins light or dark..... 79

76 Fore margin of forewing relatively straight. On *Rhododendron.* ..... ***Cacopsylla rhododendri***

– Fore margin of forewing strongly curved..... 77

77 Surface spinules entirely covering cell c+sc of forewing. On *Vaccinium* ..... ***Cacopsylla myrtilli***

– Surface spinules absent from basal third of cell c+sc of forewing..... 78

78 On *Vaccinium myrtillus* ..... ***Cacopsylla fraudatrix***

– On *Ledum palustre* ..... ***Cacopsylla ledi***

79 Male paramere bearing subapical lobe along hind margin..... 80

– Male paramere lacking subapical lobe along hind margin 82

80 Paramere lacking basal lobe at hind margin. On *Salix.* ..... ***Cacopsylla moscovita***

– Paramere bearing basal lobe at hind margin..... 81

81 Basal lobe at hind margin of paramere not incised dorsally. On *Salix.* ..... ***Cacopsylla saliceti***

– Basal lobe at hind margin of paramere strongly incised dorsally. On *Salix.* ..... ***Cacopsylla iteophila***

82 Apex of paramere forming simple, backwards directed sclerotised tooth. On *Salix* ..... ***Cacopsylla pulchra***

– Apex of paramere with two strongly sclerotised teeth 83
83 Paramere, in rear view, with a tooth in apical third; in profile, as in Fig. 93. On *Salix*..... ***Cacopsylla brunneipennis***
– Paramere, in rear view, with lobe in the middle of inner margin; in profile, as in Fig. 94. On *Salix* ..... ***Cacopsylla nigrita***
84 Metatibia with 1+3 sclerotised apical spurs 85
– Metatibia with 1+2 sclerotised apical spurs 107
85 Forewing with extended dark pattern consisting of small points; fore margin straight to concave between apices of veins Rs and M_{1+2} (Fig. 95). On *Rhamnus cathartica*..... ***Trichochermes walkeri***
– Forewing pattern different; fore margin convex. – *Trioza* p.p. 86
86 Forewing short and broad, angular apically; branching of vein M distinctly distal to Rs–Cu_{1a} line. Antennal colour strongly contrasted, segment 3 light, segments 4-10 dark..... 87
– Forewing elongate, sometimes rounded apically; Rs–Cu_{1a} line proximal to or on branching of vein M. Antennal colour variable. 89
87 Genal processes short. Paramere, in profile, strongly narrowed in apical quarter, forming anterior tubercle and posterior process (Fig. 96). Female subgenital plate truncate apically, consequently strongly convex dorsally (Fig. 97). Terminal setae on antennal segment 10 subequal. On *Valerianella*..... ***Trioza centranthi***
– Genal processes long. Male paramere in apical quarter regularly narrowing to apex (Figs 98, 100). Female subgenital plate evenly tapering to apex, dorsal margin almost straight (Figs 99, 101). Terminal setae on antennal segment 10 strongly unequal. 88
88 Forewing without surface spinules. Male paramere robust, angular apically; distal portion of aedeagus with large apical hook (Fig. 98); female subgenital plate, in profile, with obtuse apex (Fig. 99). On *Galium* and other Rubiaceae ..... ***Trioza galii***
– Forewing with surface spinules. Male paramere slender, curved apically (Fig. 100); female subgenital plate, in profile, with small sharp tooth at apex (Fig. 101). On *Galium*..... ***Trioza velutina***
89 Forewing with surface spinules present at most in cell cu_2. Male paramere long and slender, lamellar (Fig. 102). Female terminalia long, dorsal margin of proctiger more or less straight (Fig. 103). On *Urtica* ..... ***Trioza urticae***
– Forewing with surface spinules present in all cells, covering smaller or larger areas..... 90
90 Terminal antennal setae strongly differing in length, both distinctly shorter than antennal segment 10; shorter seta very short, stout and truncate apically. Axes of genal processes diverging forward; genal processes relatively massive and blunt, evenly narrowed. Body orange to reddish, sometimes brownish to black..... 91
– Terminal antennal setae different; axes of genal processes parallel, or genal processes slender and pointed or fusiform, or body yellowish or greenish..... 94
91 Surface spinules of forewing spaced at 5-10 µm intervals or forming transverse rows in the middle of cell r_2 at level of branching of vein M, never reduced along outer wing margin. Male paramere basally robust (Fig. 104), female terminalia short with proctiger, in profile, dorsally straight (Fig. 105). On *Hieracium* ..... ***Trioza proxima***
– Surface spinules of forewing forming regular rectangles or rhombes of 15-10 µm distance, sometimes reduced along outer wing margin. Terminalia different 92
92 Male paramere with weak subapical constriction. Female proctiger cuneate, regularly tapering to apex, short, about twice as long as circumanal ring. On *Mycelis* ..... ***Trioza foersteri***
– Male paramere with strong subapical constriction (Fig. 106, 108). Female terminalia different 93
93 Male paramere about as long as or longer than proctiger, apical portion bent inwards and weakly backwards (Fig. 106). FPHW less than 0.8, proctiger truncate apically (Fig. 107). On *Taraxacum* ..... ***Trioza dispar***
– Male paramere shorter than proctiger or apical portion straight, directed upwards (Fig. 108). FPHW more than 0.8, proctiger regularly narrowed apically (Fig. 109). On *Hieracium*..... ***Trioza tatrensis***
94 Surface spinules of forewing in cell r_2 at level of branching of vein M densely spaced in a distance of 6-12 µm... 95
– Surface spinules of forewing in cell r_2 at level of branching of vein M arranged in regular rectangles or rhombi in a distance of 10-20 µm 97
95 Forewing distinctly angular apically; vein Cu much more than twice as long as Cu_{1b}, cell cu_1 flat. Male paramere slender in apical half; apex turned backwards. Female proctiger blunt apically. On *Aegopodium*..... ***Trioza flavipennis***
– Forewing irregularly rounded apically; vein Cu at most slightly more than twice as long as Cu_{1b}, cell cu_1 high. Male paramere massive in apical half; apex turned inwards or forwards (Fig. 110). Female proctiger pointed apically (Fig. 111) 96
96 Male parameres with large antero-basal lobe. Distal aedeagal segment with large apical hook. Female subgenital plate short, truncate apically. Lateral abdominal setae present on tergites 3 and 4 in males, and 4 and 5 in females.

Relative lengths of terminal antennal segment : shorter terminal antennal seta : longer terminal antennal seta = 1.0 : 0.4 : 0.7. On *Cardamine*, *Stellaria* ..... ***Trioza rotundata***

– Male parameres without distinct antero-basal lobe. Distal aedeagal segment with short hook. Female subgenital plate long, pointed apically. Lateral abdominal setae present on tergites 3 in males, 4 in females. Relative lengths of terminal antennal segment : shorter terminal antennal seta : longer terminal antennal seta = 1.0 : 0.3 : 0.8. On *Valerianella tripteridis*..... ***Trioza tripteridis***

97 Forewing with very long, sinuous vein Rs; membrane transparent, colourless, wing margin with dark dots at intersections of veins and near radular spinules. One terminal antennal seta less than three times shorter than the other seta. On *Rhamnus* ..... ***Trioza rhamni***

– Combination of characters different 98

98 Body almost completely dark brown or black..... 99

– Body green, yellow or reddish; sometimes thorax dark but abdomen green 100

99 Forewing membrane dirty whitish. Apex of paramere pointing forwards. Female proctiger truncate apically. On *Saxifraga*..... ***Trioza saxifragae***

– Forewing membrane ochreous. Apex of paramere pointing backwards. Female proctiger subacute apically. On *Astrantia major*..... ***Trioza schrankii***

100 Body straw-coloured or ochreous. Paramere simple, broadly lamellar. Female proctiger short, about twice as long as circumanal ring. On *Rumex scutatus*..... ***Trioza rumicis***

– Body green, light yellow, sometimes thorax brown. Paramere with inner process or with broad base and narrow apical portion. Female proctiger about three times as long as circumanal ring 101

101 Forewing broadly irregularly rounded apically. Male proctiger with posterior lobe; paramere with inner process (Fig. 112). On *Cerastium*..... ***Trioza cerastii***

– Forewing angular apically. Male proctiger without posterior lobe; paramere without inner process 102

102 Body always, also in overwintered specimens, yellow or green, never yellowish orange, or with brown to black spots 103

– Body never exclusively yellow or green; either yellow-orange or with brown to black spots 105

103 Antennal segments 6-8 brown. Basal portion of male paramere with distinct antero-apical tubercle (Fig. 113). Female proctiger, in profile, with weakly sinuous dorsal margin (Fig. 114). On *Cirsium* ..... ***Trioza cirsii***

– Antennal segments 6-8 light. Male and female terminalia different 104

104 Basal portion of male paramere angled antero-apically. Female terminalia long. On *Cirsium*..... ***Trioza agrophila***

– Basal portion of male paramere oblique antero-apically. Female terminalia short. On *Senecio*... ***Trioza senecionis***

105 Postero-apical process of paramere very slender and straight. Female subgenital plate much shorter than proctiger. On *Chrysanthemum* ..... ***Trioza chrysanthemi***

– Postero-apical process of paramere wider and curved. Female subgenital plate about as long as proctiger 106

106 Paramere with very small anterior lobe (Fig. 115). Female subgenital plate slender apically. On *Achillea* .... ***Trioza abdominalis***

– Paramere with large anterior lobe. Female subgenital plate massive apically. On *Knautia*..... ***Trioza munda***

107 Branching of vein M of forewing distinctly distal to Rs–Cu_{1a} line; vein Rs straight or concavely curved to fore margin; forewing angular apically..... 108

– Branching of vein M of forewing proximal to or about on Rs–Cu_{1a} line, or vein Rs sinuate, or apex of forewing broadly rounded..... 110

108 Genal processes short. Forewing very narrow with low cell cu_1; surface spinules absent. Male paramere narrow (Fig. 116); female terminalia as in Fig. 117. On *Laurus* ..... ***Trioza alacris***

– Genal processes longer. Forewing broader; cell cu_1 higher; surface spinules present or absent. Male paramere broad, female terminalia different 109

109 Large species, forewing longer than 2.65 mm. Surface spinules of forewing always present. Terminalia as in Figs 118-119. On *Quercus*..... ***Trioza remota***

– Small species, forewing shorter than 2.6 mm. Surface spinules present or absent. Terminalia different. On Amaranthaceae ..... ***Trioza chenopodii***

110 Body green or yellow 111

– Body colour different..... 113

111 Antennal segments 4-6 yellow or light ochreous; apical two or three dark segments strongly contrasting with the lighter more basal segments. On Apiaceae..... ***Trioza apicalis***

– Antennal segments 4-6 dark ochreous or light brown; antennal segments gradually becoming darker from segment 3 to apex..... 112

112 Paramere with short dorsal projection and narrow anterior lobe (Fig. 120). Female subgenital plate with terminal process forming a long parallel sided projection (Fig. 121). On *Anthriscus* and other Apiaceae ... ***Trioza anthrisci***

– Paramere with long dorsal projection and narrow anterior lobe (Fig. 122). Female subgenital plate with short and regularly tapering terminal process (Fig. 123). On *Laserpitium* ..... ***Trioza laserpitii***

113 Surface spinules present in distal cells of forewing 114

– Surface spinules absent, or present at most in cell cu_1 120

114 Surface spinules absent from cell r_1 of forewing ..... ***Bactericera maura***

– Surface spinules present in cell r_1 of forewing 115

115 Antennal segments 4-7 dark 116

– Antennal segments 4-7 light 117

116 Surface spinules entirely covering cell r_1 of forewing. Abdominal venter whitish, distinctly lighter than dorsum. Male paramere, in profile, sinuous with wide base and slender apex (Fig. 124). Ventral margin of female subgenital plate straight or concave subapically. On *Salix*. ..... ***Bactericera albiventris***

– Surface spinules of forewing present only in basal half of cell r_1. Abdominal venter not whitish, or the same colour as dorsum. Male paramere, in profile, straight, with mostly subparal margins (Fig. 125). Ventral margin of female subgenital plate straight or convex subapically. On *Salix*. ..... ***Bactericera salicivora***

117 Surface spinules in apical half of forewing covering the whole surface up to the veins; wing angular apically (Fig. 2). Terminalia as in Figs 126-127. On *Comarum palustre* ..... ***Bactericera acutipennis***

– Surface spinules leaving spinule-free stripes along veins of forewing 118

118 Antennal segments 4 and 6 with each a group of rhinaria, therefore strongly dilated apically. Terminalia as in Figs 128-129. On *Alchemilla* ..... ***Bactericera femoralis***

– Antennal segments 4 and 6 with each 1 rhinarium, not strongly dilated apically 119

119 Surface spinules of forewing also present in distal half of cell r_1 and entirely covering cell c+sc. On *Potentilla anserina* ..... ***Bactericera reuteri***

– Surface spinules of forewing present only in proximal half of cell r_1 and strongly reduced in cell c+sc. On *Geum* ..... ***Bactericera bohemica***

120 Genal processes at most as long as two thirds of vertex. Antenna entirely dark brown to black. Terminalia as in Figs 130-131. Polyphagous on dicotyledonous herbs ..... ***Bactericera nigricornis***

– Genal processes about as long as vertex. At least antennal segment 3 light 121

121 Antenna completely black. On *Artemisia* ..... ***Bactericera calcarata***

– At least antennal segment 3 light 122

122 Antennal segments 3-5 partly or entirely light. On *Sanguisorba* ..... ***Bactericera modesta***

– Antennal segment 3 light, 4 and 5 dark 123

123 Forewing widest in the middle. On *Berberis vulgaris* ..... ***Trioza scottii***

– Forewing widest in apical thirds. On *Salix* 124

124 Forewing with vein A entirely dark ..... ***Bactericera curvatinervis***

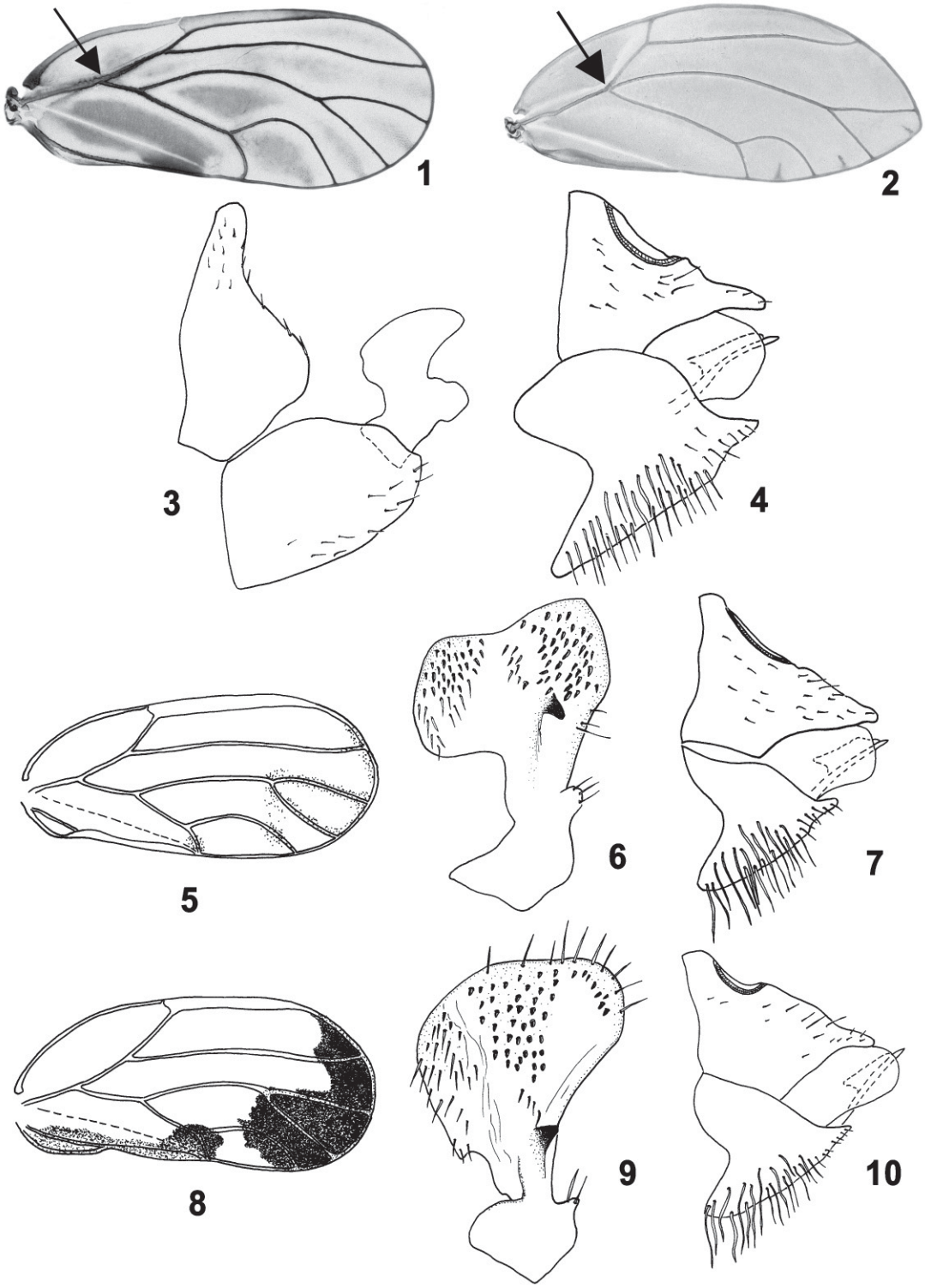
– Dark colour on vein A of forewing reduced to a spot 125

125 Dark spot on vein A of forewing distinct. Male paramere, in profile, more or less straight with large anteriorly directed tooth (Fig. 132). Female proctiger short with apical two thirds of dorsal outline strongly convex ..... ***Bactericera striola***

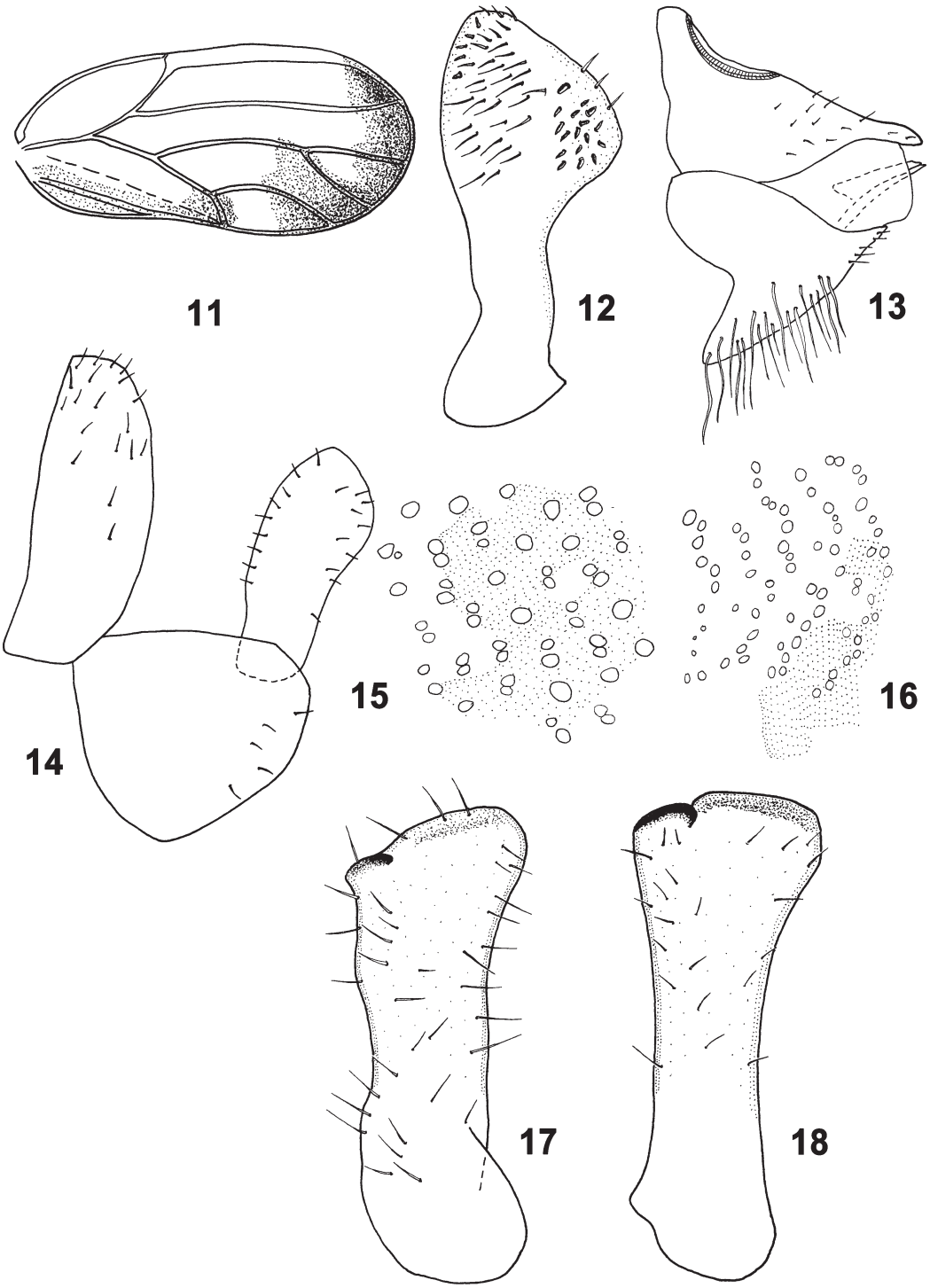
– Dark spot on vein A of forewing indistinct. Male paramere sickle-shaped or with small apical hook. Female proctiger longer with apical two thirds of dorsal outline straight or concave 126

126 Male parameres, in profile, sickle-shaped. Female subgenital plate long with indistinct, long apical process ..... ***Bactericera substriola***

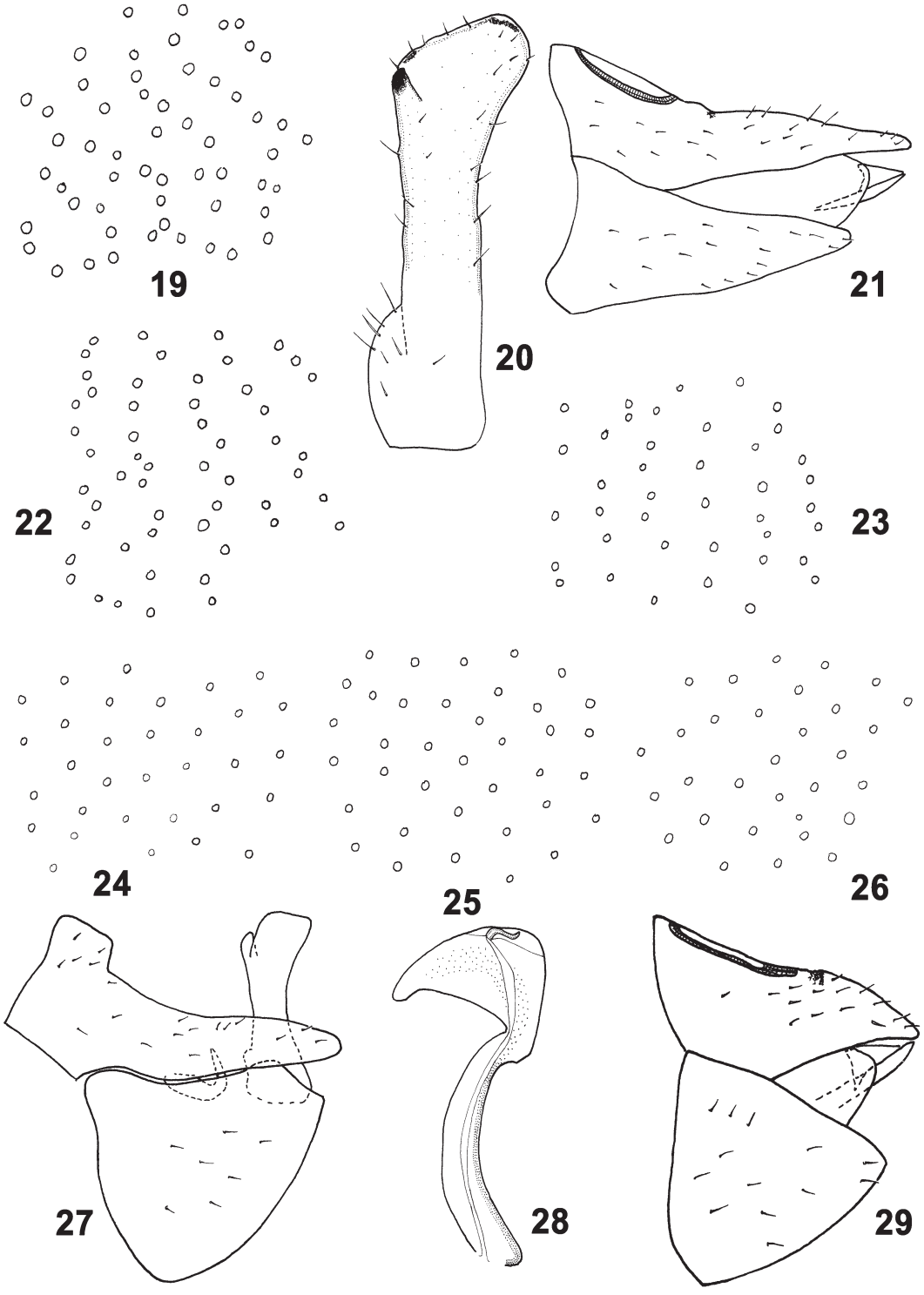
– Male parameres, in profile, straight, lamellar, with small apical tooth. Female subgenital plate short with distinct short apical process ..... ***Bactericera parastriola***



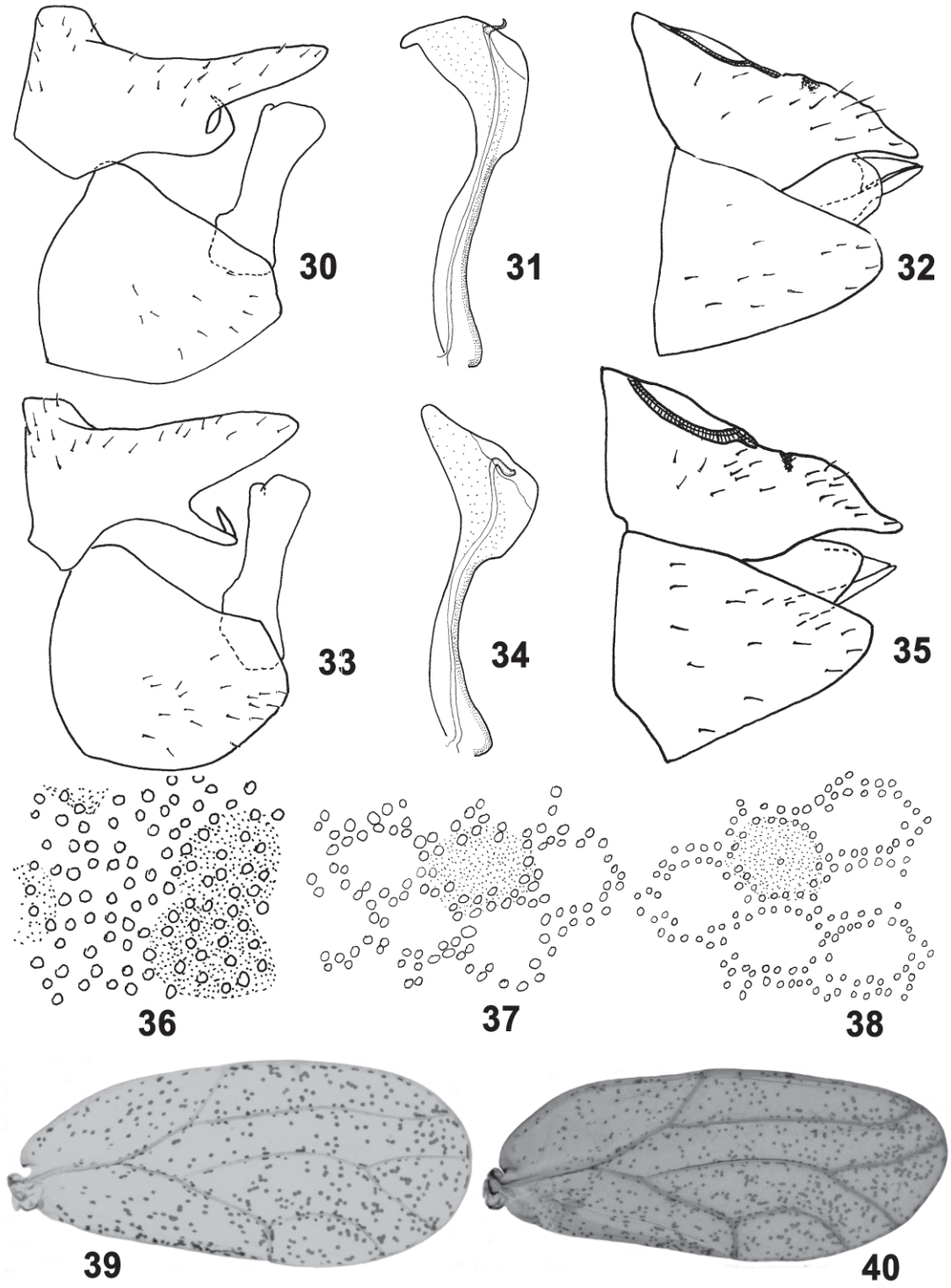
Figs 1-10. (1) *Cacopsylla pyricola,* forewing. (2) *Bactericera acutipennis*, forewing. (3) *Psyllopsis fraxinicola*, male terminalia. (4) *Psyllopsis fraxinicola*, female terminalia. (5) *Psyllopsis discrepans*, forewing. (6) *Psyllopsis discrepans*, paramere. (7) *Psyllopsis discrepans*, female terminalia. (8) *Psyllopsis distinguenda,* forewing. (9) *Psyllopsis distinguenda,* paramere. (10) *Psyllopsis distinguenda,* female terminalia.



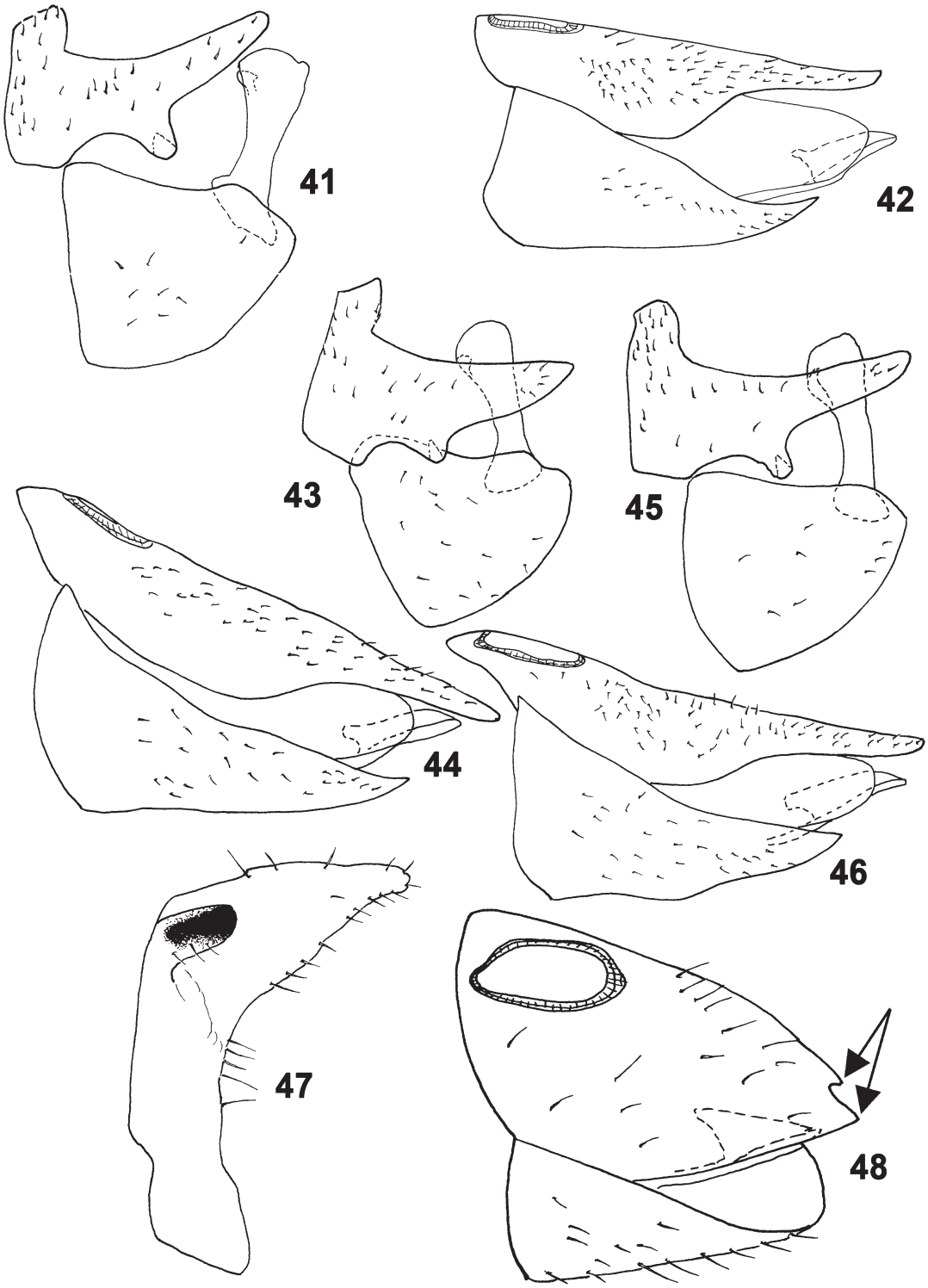
Figs 11-18. (11) *Psyllopsis fraxini,* forewing. (12) *Psyllopsis fraxini,* paramere. (13) *Psyllopsis fraxini,* female terminalia. (14) *Strophingia ericae*, male terminalia. (15) *Aphalara exilis,* forewing surface spinules. (16) *Aphalara ulicis,* forewing surface spinules. (17) *Aphalara exilis,* paramere. (18) *Aphalara ulicis*, paramere.



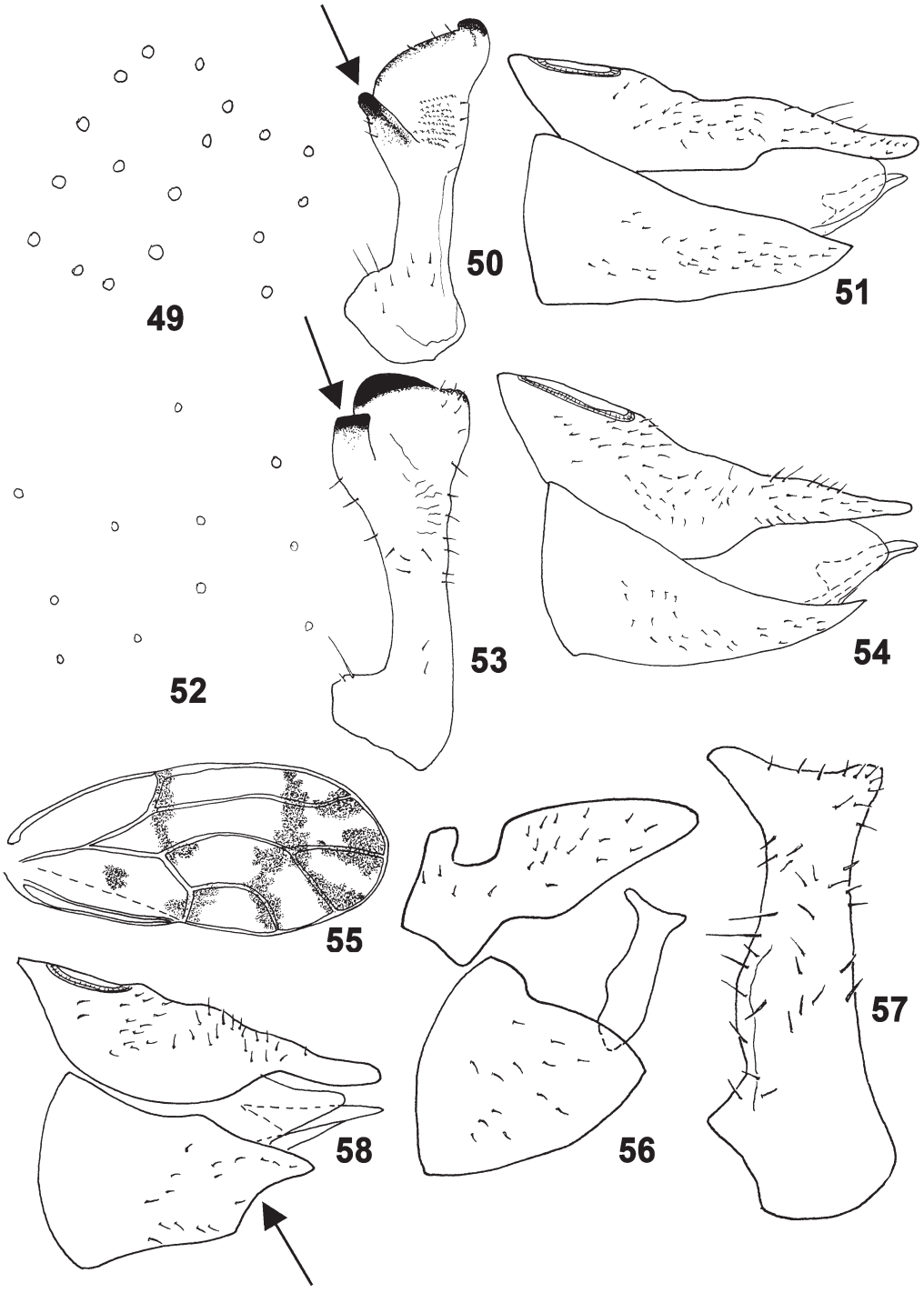
Figs 19-29. (19) *Aphalara longicaudata*, forewing surface spinules. (20) *Aphalara longicaudata*, paramere. (21) *Aphalara longicaudata*, female terminalia. (22) *Aphalara calthae,* forewing surface spinules. (23) *Aphalara polygoni*, forewing surface spinules. (24) *Aphalara borealis*, forewing surface spinules. (25) *Aphalara avicularis*, forewing surface spinules. (26) *Aphalara freji*, forewing surface spinules. (27) *Aphalara borealis*, male terminalia. (28) *Aphalara borealis*, aedeagus. (29) *Aphalara borealis*, female terminalia.



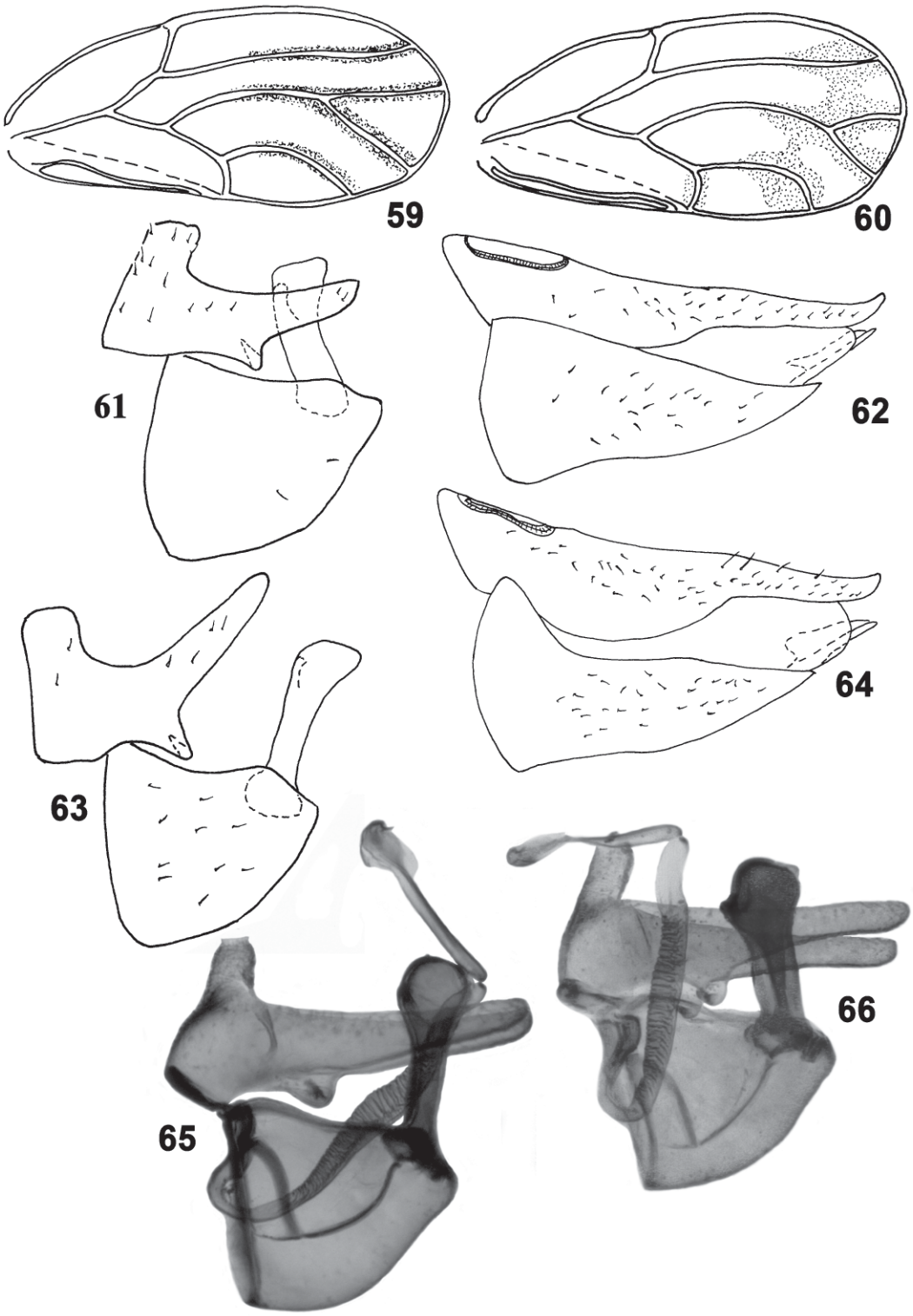
Figs 30-40. (30) *Aphalara avicularis*, male terminalia. (31) *Aphalara avicularis*, aedeagus. (32) *Aphalara avicularis*, female terminalia. (33) *Aphalara freji*, male terminalia. (34) *Aphalara freji*, aedeagus. (35) *Aphalara freji*, female terminalia. (36) *Craspedolepta artemisiae*, forewing surface spinules. (37) *Craspedolepta lation*, forewing surface spinules. (38) *Craspedolepta malachitica*, forewing surface spinules. (39) *Craspedolepta lation*, forewing. (40) *Craspedolepta malachitica*, forewing.



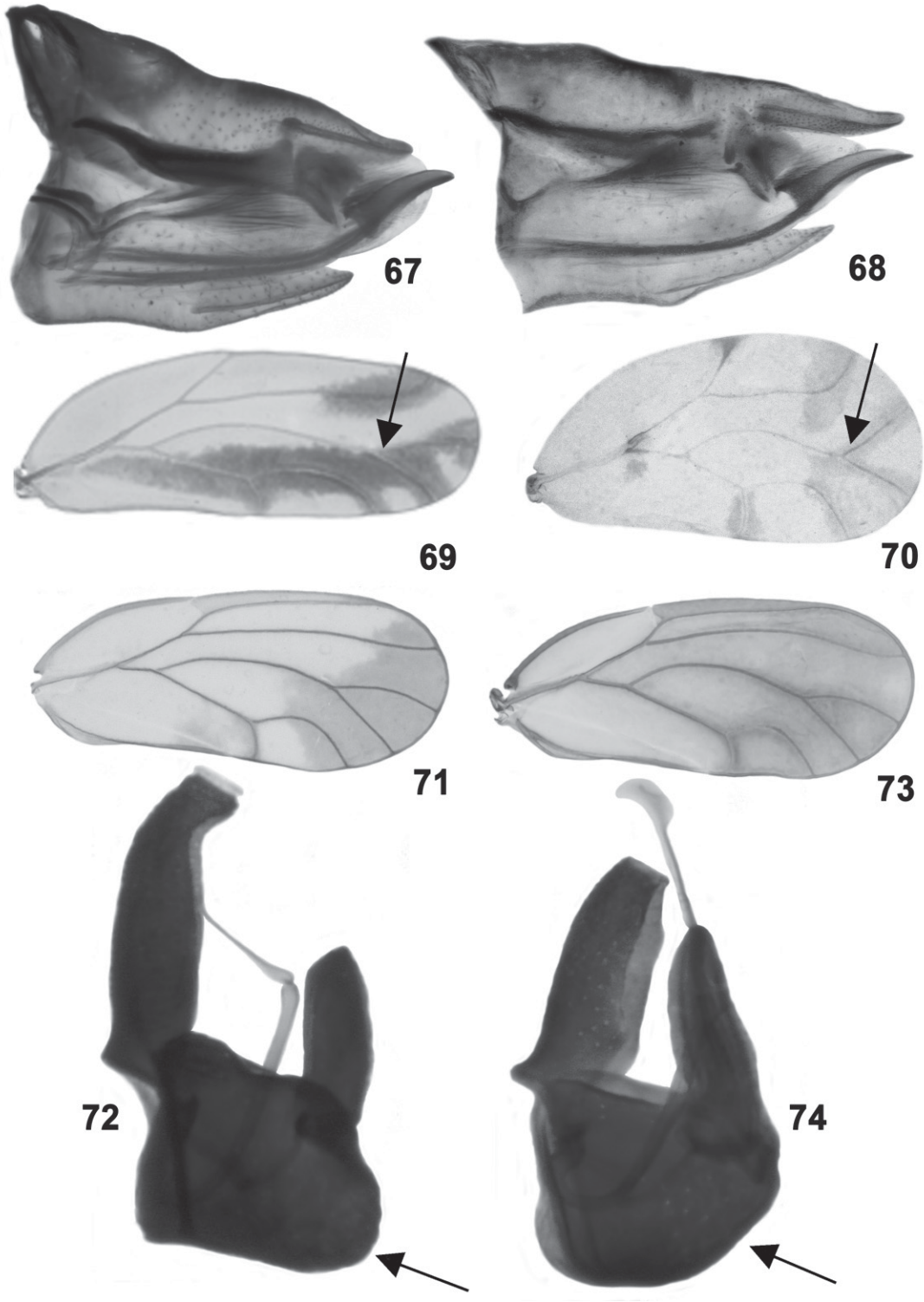
Figs 41-48. (41) *Craspedolepta artemisiae*, male terminalia. (42) *Craspedolepta artemisiae*, female terminalia. (43) *Craspedolepta latior*, male terminalia. (44) *Craspedolepta latior*, female terminalia. (45) *Craspedolepta malachitica*, male terminalia. (46) *Craspedolepta malachitica*, female terminalia. (47) *Craspedolepta subpunctata*, paramere. (48) *Craspedolepta subpunctata*, female terminalia.



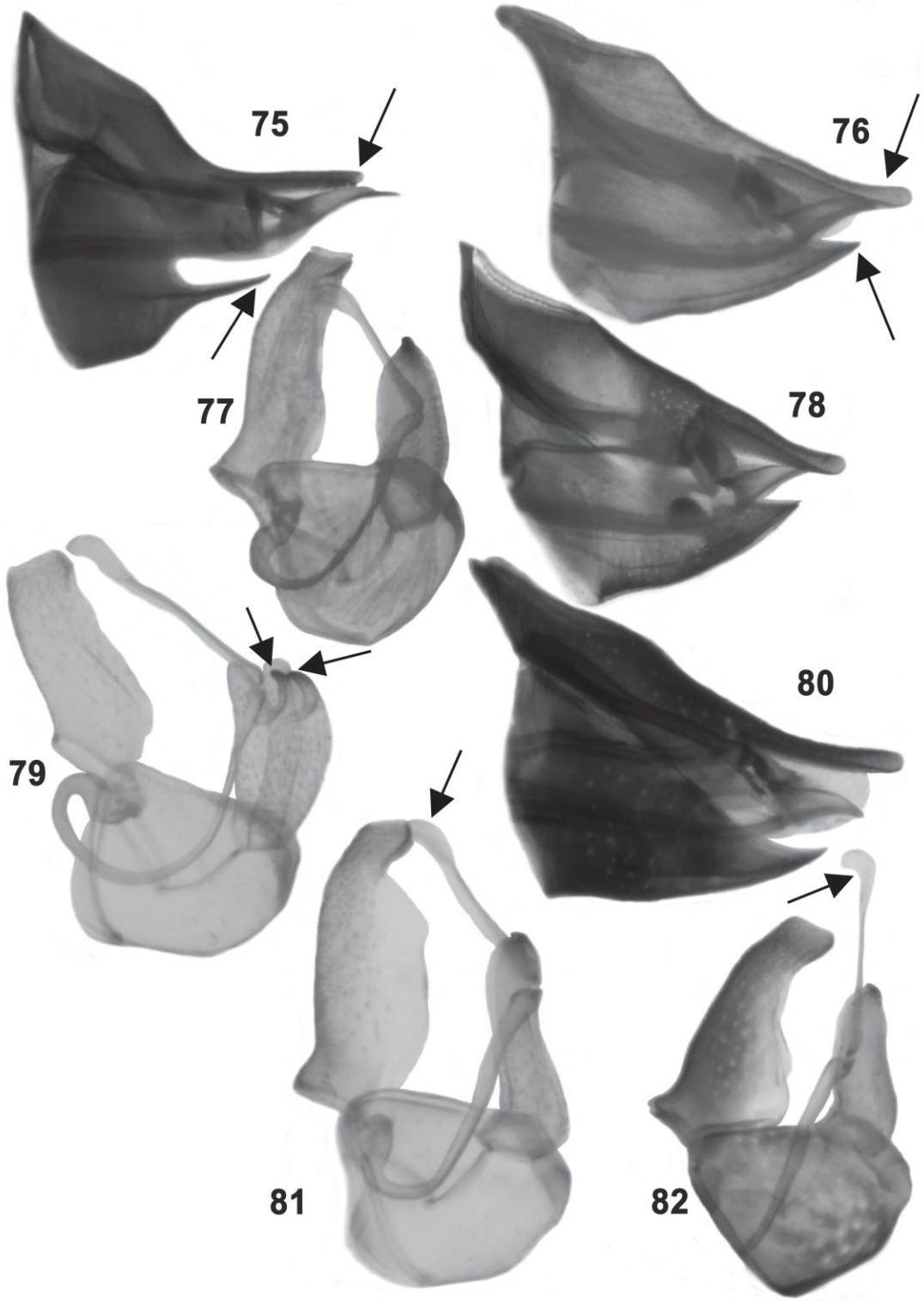
Figs 49-58. (49) *Craspedolepta innoxia*, forewing surface spinules. (50) *Craspedolepta innoxia*, paramere. (51) *Craspedolepta innoxia*, female terminalia. (52) *Craspedolepta omissa*, forewing surface spinules. (53) *Craspedolepta omissa*, paramere. (54) *Craspedolepta omissa*, female terminalia. (55) *Craspedolepta nebulosa*, forewing. (56) *Craspedolepta nebulosa*, male terminalia. (57) *Craspedolepta nebulosa*, paramere. (58) *Craspedolepta nebulosa*, female terminalia.



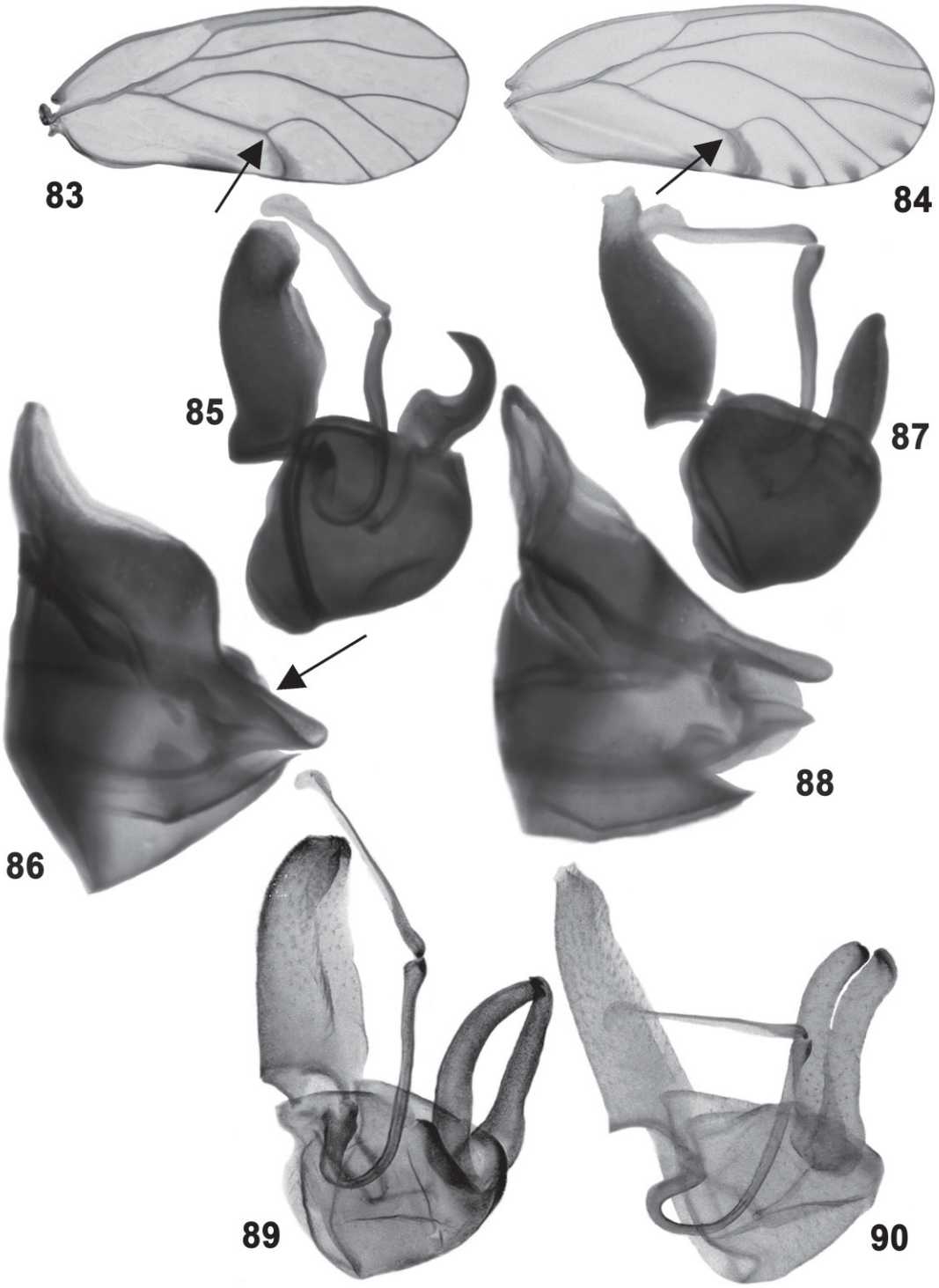
Figs 59-66. (59) *Craspedolepta nervosa*, forewing. (60) *Craspedolepta bulgarica*, forewing. (61) *Craspedolepta nervosa*, male terminalia. (62) *Craspedolepta nervosa*, female terminalia. (63) *Craspedolepta bulgarica*, male terminalia. (64) *Craspedolepta bulgarica*, female terminalia. (65) *Craspedolepta crispati*, male terminalia. (66) *Craspedolepta sonchi*, male terminalia.



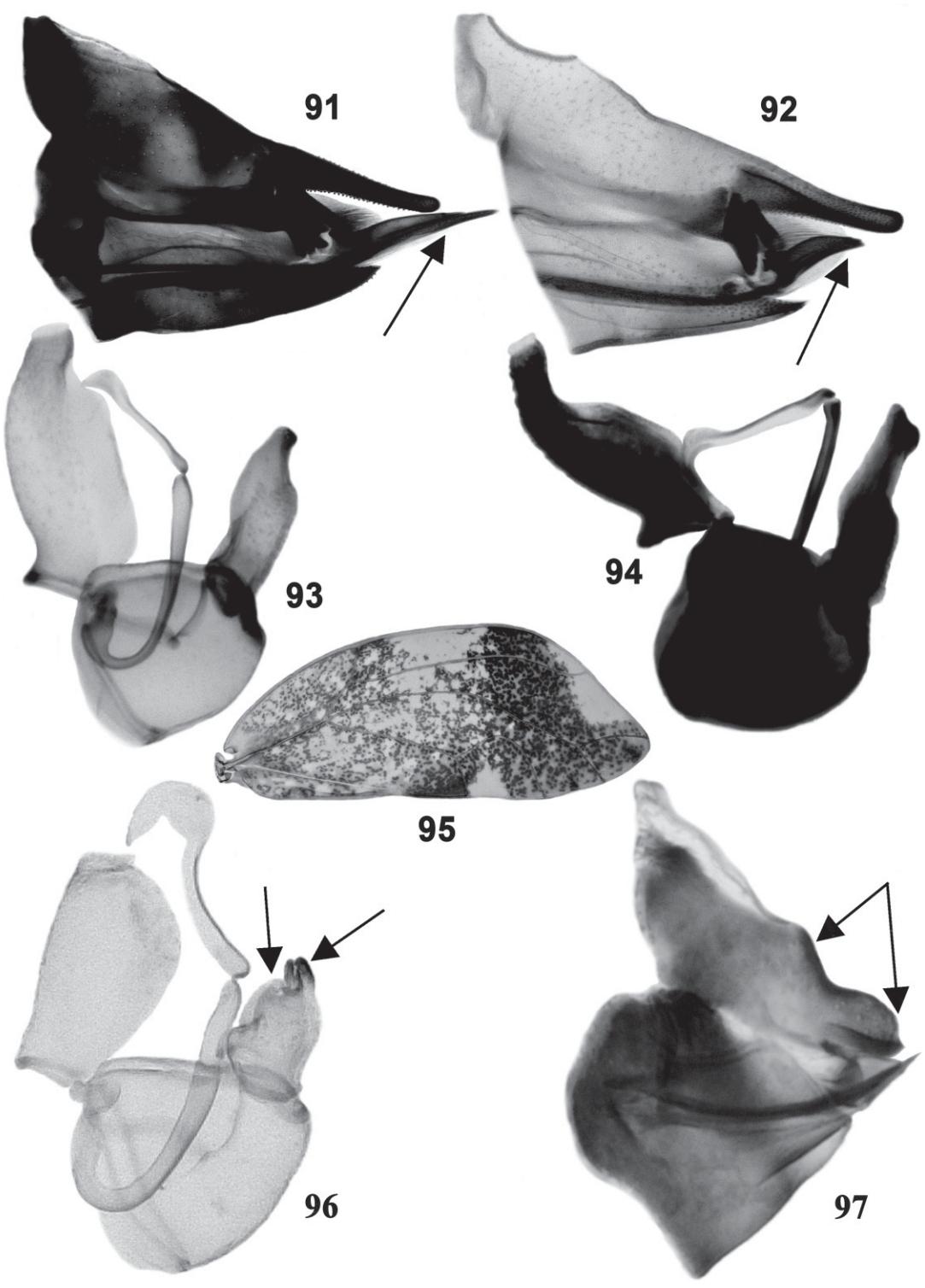
Figs 67-74. (67) *Craspedolepta crispati*, female terminalia. (68) *Craspedolepta sonchi*, female terminalia. (69) *Livilla horvathi*, forewing. (70) *Livilla radiata*, forewing. (71) *Cacopsylla breviantennata*, forewing. (72) *Cacopsylla breviantennata*, male terminalia. (73) *Cacopsylla pruni*, forewing. (74) *Cacopsylla pruni*, male terminalia.



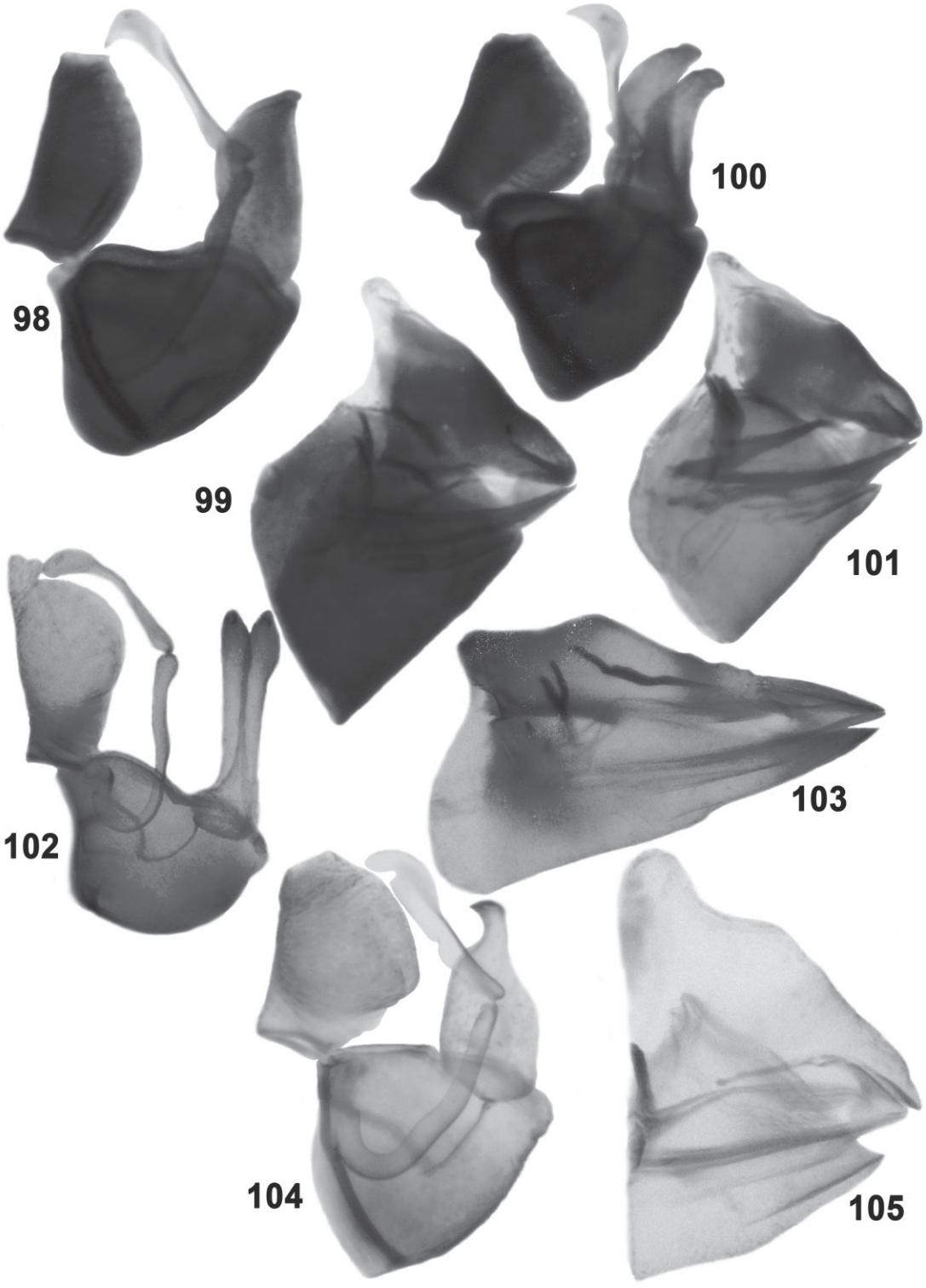
Figs 75-82. (75) *Cacopsylla breviantennata*, female terminalia. (76) *Cacopsylla pruni*, female terminalia. (77) *Cacopsylla pyrisuga*, male terminalia. (78) *Cacopsylla pyrisuga*, female terminalia. (79) *Cacopsylla picta*, male terminalia. (80) *Cacopsylla picta*, female terminalia. (81) *Cacopsylla melanoneura*, male terminalia. (82) *Cacopsylla affinis*, male terminalia.



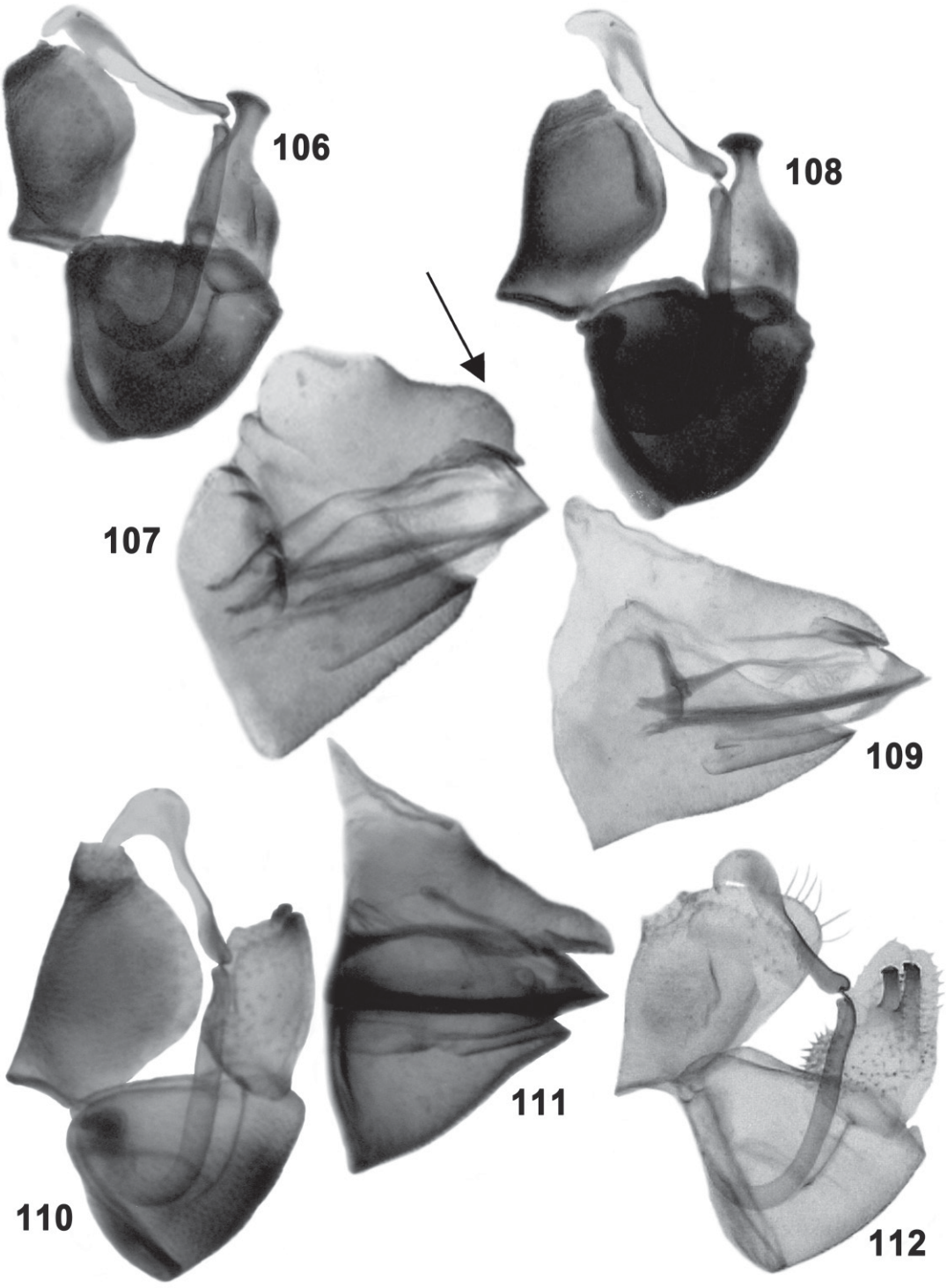
Figs 83-90. (83) *Cacopsylla albipes*, forewing. (84) *Cacopsylla crataegi*, forewing. (85) *Cacopsylla pyri*, male terminalia. (86) *Cacopsylla pyri*, female terminalia. (87) *Cacopsylla pyricola*, male terminalia. (88) *Cacopsylla pyricola*, female terminalia. (89) *Cacopsylla zetterstedti*, male terminalia. (90) *Cacopsylla hippophaes*, male terminalia.



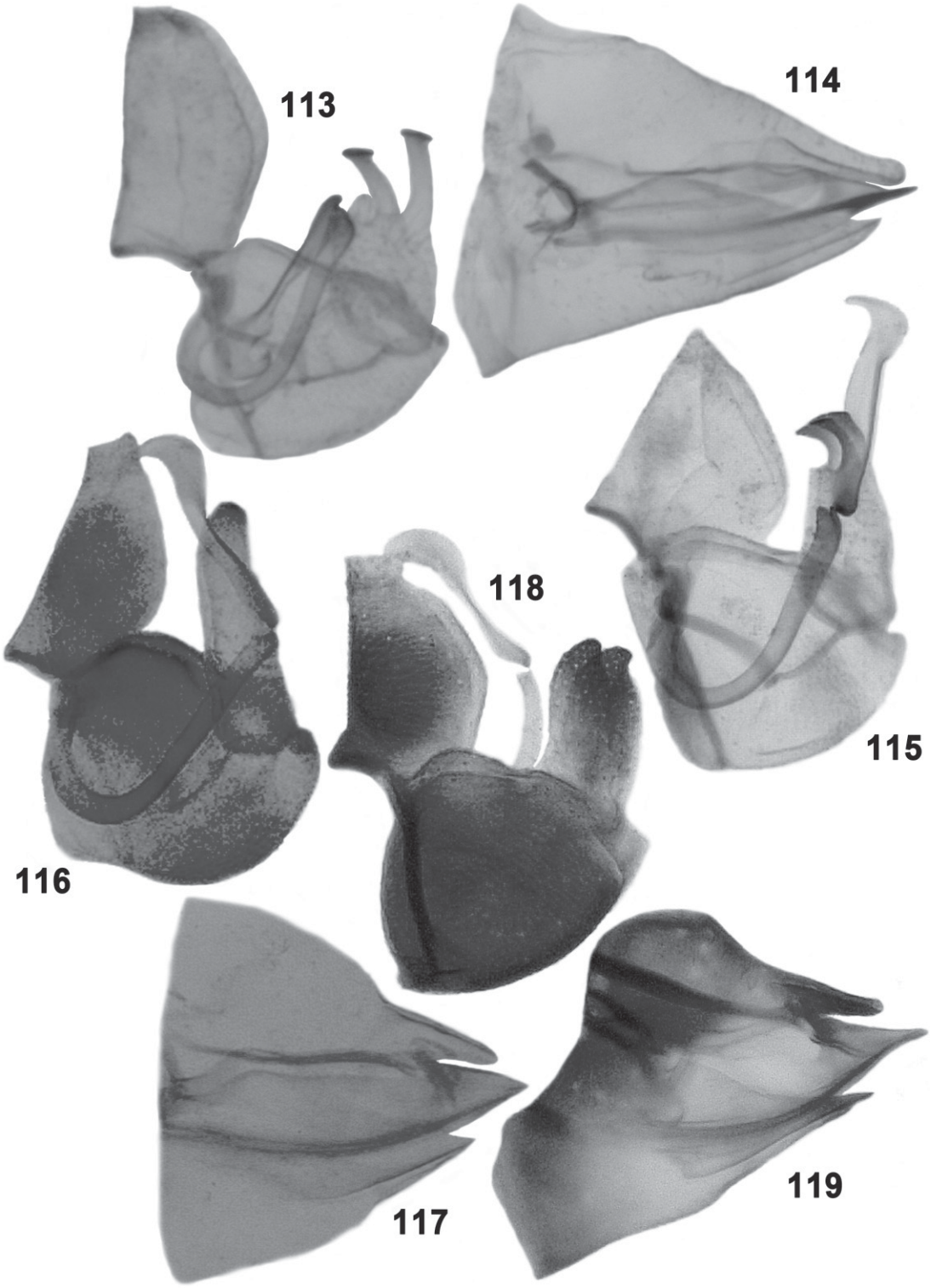
Figs 91-97. (91) *Cacopsylla zetterstedti*, female terminalia. (92) *Cacopsylla hippophaes*, female terminalia. (93) *Cacopsylla brunneipennis*, male terminalia. (94) *Cacopsylla nigrita*, male terminalia. (95) *Trichochermes walkeri*, forewing. (96) *Trioza centranthi*, male terminalia. (97) *Trioza centranthi*, female terminalia.



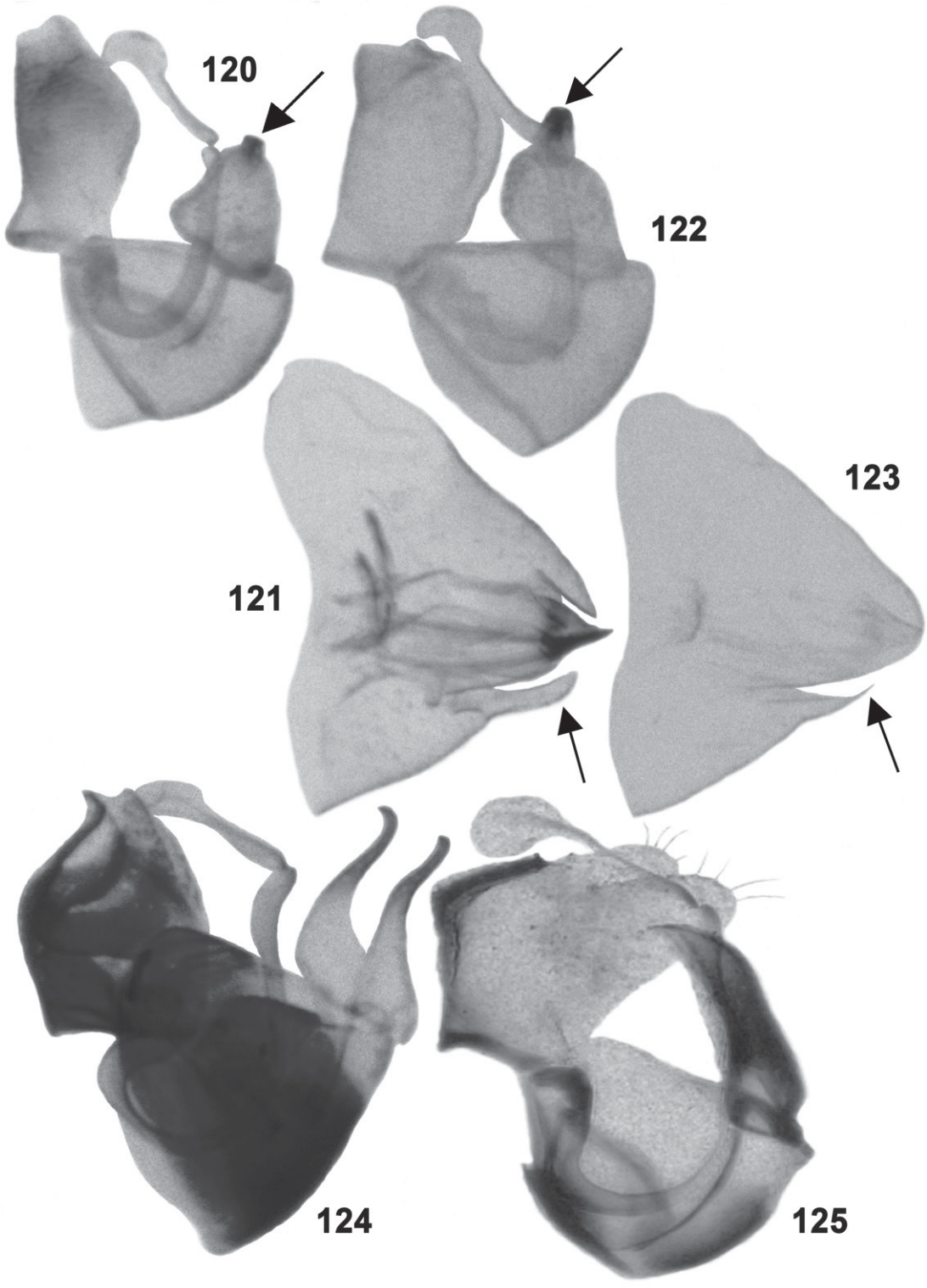
Figs 98-105. (98) *Trioza galii*, male terminalia. (99) *Trioza galii*, female terminalia. (100) *Trioza velutina*, male terminalia. (101) *Trioza velutina*, female terminalia. (102) *Trioza urticae*, male terminalia. (103) *Trioza urticae*, female terminalia. (104) *Trioza proxima*, male terminalia. (105) *Trioza proxima*, female terminalia.



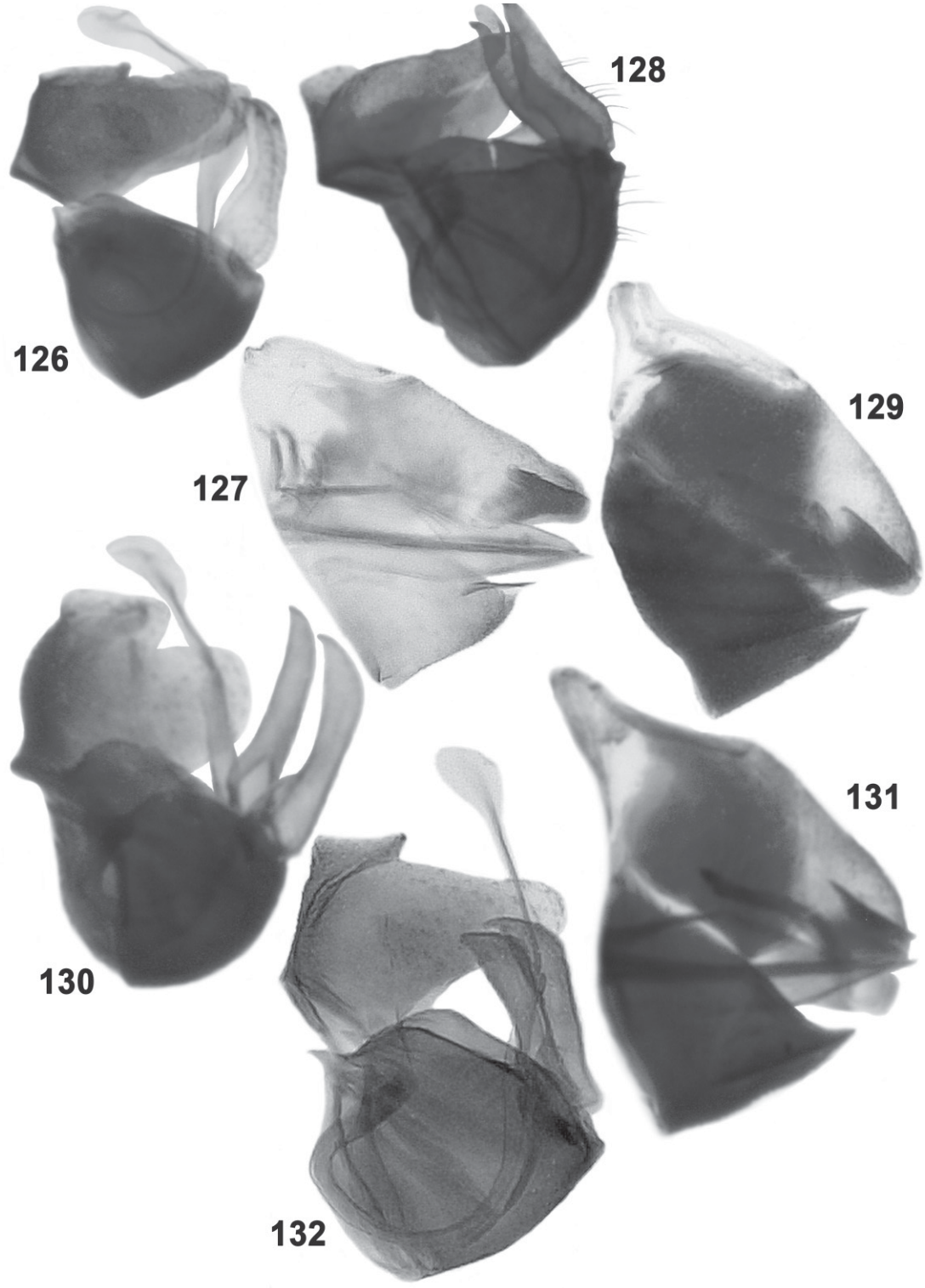
Figs 106-112. (106) *Trioza dispar*, male terminalia. (107) *Trioza dispar*, female terminalia. (108) *Trioza tatrensis*, male terminalia. (109) *Trioza tatrensis*, female terminalia. (110) *Trioza rotundata*, male terminalia. (111) *Trioza rotundata*, female terminalia. (112) *Trioza cerastii*, male terminalia.



Figs 113-119. (113) *Trioza cirsii*, male terminalia. (114) *Trioza cirsii*, female terminalia. (115) *Trioza abdominalis*, male terminalia. (116) *Trioza alacris*, male terminalia. (117) *Trioza alacris*, female terminalia. (118) *Trioza remota*, male terminalia. (119) *Trioza remota*, female terminalia.



Figs 120-125. (120) *Trioza anthrisci*, male terminalia. (121) *Trioza anthrisci*, female terminalia. (122) *Trioza laserpitii*, male terminalia. (123) *Trioza laserpitii*, female terminalia. (124) *Bactericera albiventris*, male terminalia. (125) *Bactericera salicivora*, male terminalia.



Figs 126-132. (126) *Bactericera acutipennis*, male terminalia. (127) *Bactericera acutipennis*, female terminalia. (128) *Bactericera femoralis*, male terminalia. (129) *Bactericera femoralis*, female terminalia. (130) *Bactericera nigricornis*, male terminalia. (131) *Bactericera nigricornis*, female terminalia. (132) *Bactericera striola*, male terminalia.

APPENDIX 2

Psyllids reported from Belarus, Poland, Northwest Russia, Lithuania and the former Livonia. Sources: 1 – species recorded in the present paper; 2 – Klimaszewski (1975); 3 – Loginova (1961); 4 – Loginova (1962b); 5 – Loginova (1968); 6 – Loginova (1972a); 7 – Loginova (1962a); 8 – Loginova (1966); 9 – Loginova (1954); 10 – Petrov *et al*. (2011); 11 – Petrov & Sautkin (2013); 12 – Loginova (1967); 13 – Gorlenko *et al.* (1988); 14 – Byazdzenka *et al.* (1973); 15 – Palyakova (1969); 16 – Loginova (1972b); 17 – Petrov (2004); 18 – Sidlyarevich & Bolotnikova (1992); 19 – Kuznetsova *et al.* (2012); 20 – Malumphy *et al.* (2009); 21 – Vengeliauskaitė (1974); 22 – Głowacka (1989); 23 – Głowacka (1991); 24 – Głowacka & Migula (1996); 25 – Drohojowska & Głowacka (2011); 26 – Ossiannilsson (1992); 27 – Flor (1861); 28 – Petrov (2011).

Species	Belarus	Poland	Northwest Russia	Lithuania	Livonia
Aphalaridae					
Aphalarinae					
Aphalara affinis	1	2	3, 4		27
Aphalara avicularis	1, 3 as *A. polygoni*, see checklist	26			27 p.p. as *Aphalara polygoni*
Aphalara borealis	2				
Aphalara calthae	2	3, 4			
Aphalara exilis	2	3, 4, 5, 6		27	
Aphalara freji	1, 3 as *A. polygoni*, see checklist	2 as *Aphalara polygoni*		27 p.p. as *Aphalara polygoni*	
Aphalara maculipennis	2				
Aphalara purpurascens	2 as *A. rumicicola*, 24 as *A. crispicola*				
Craspedolepta alevtinae	2 as *C. alevtinae smreczynskii*				
Craspedolepta artemisiae	2			27 as *Aphalara artemisiae*	
Craspedolepta bulgarica	2	4, 5, 7			
Craspedolepta crispati	1				
Craspedolepta flavipennis	1	2	4		27 p.p. as *Aphalara picta*
Craspedolepta latior	1	2	4		
Craspedolepta malachitica	1	2			
Craspedolepta nebulosa	2	4			
Craspedolepta nervosa	1	2	4, 5		27 as *Aphalara nervosa*
Craspedolepta omissa	1	2			
Craspedolepta sonchi	2	4		27 p.p. as *Aphalara picta*	
Craspedolepta subpunctata	1	2	4		

Species	Belarus	Poland	Northwest Russia	Lithuania	Livonia
Rhinocolinae					
Rhinocola aceris	1	2	4, 5		27
Liviidae					
Euphyllurinae					
Psyllopsis discrepans	1	2		20	
Psyllopsis distinguenda	1	2			
Psyllopsis fraxini	28	2	4, 9		27 as *Psylla fraxini*
Psyllopsis fraxinicola	1	2	9	20	27 as *Psylla unicolor*
Strophingia ericae	1	2 as *Aphalaroida ericae*	4		27 as *Rhinocola ericae*
Liviinae					
Camarotoscena speciosa	1	2			27 as *Rhinocola speciosa*
Livia crefeldensis	2 as *Diraphia crefeldensis*				27 as *Livia crefeldensis*
Livia junci	2 as *Livia juncorum*	4, 8 as *Livia juncorum*		27 as *Livia juncorum*	
Livia limbata	2 as *Diraphia limbata*				
Psyllidae					
Psyllinae					
Arytaina genistae	1	2			
Arytainilla spartiophila			20		
Baeopelma foersteri	1, 4 as *Psylla foersteri*	2 as *Psylla foersteri*	4 as *Psylla foersteri*		27 as *Psylla foersteri*
Cacopsylla abdominalis	2				
Cacopsylla albipes	2				
Cacopsylla ambigua	1	2	4, 5, 8, 12 as *Psylla ambigua*		27 as *Psylla melina*
Cacopsylla brunneipennis		1	2 as *Cacopsylla klapaleki*		
Cacopsylla crataegi	11, 13	2			
Cacopsylla elegantula	2				
Cacopsylla flori	2			27 as *Psylla insignis*	
Cacopsylla fraudatrix	19				
Cacopsylla hippophaes	1	2			
Cacopsylla intermedia	22				

Species	Belarus	Poland	Northwest Russia	Lithuania	Livonia
Cacopsylla iteophila	2				
Cacopsylla ledi	1	2			27 as *Psylla ledi*
Cacopsylla mali	1, 13, 14 as *Psylla mali*	2	4 as *Psylla mali*	21	27 as *Psylla mali*
Cacopsylla melanoneura	2		20		
Cacopsylla merita	23	12 as *Psylla merita*			
Cacopsylla moscovita	1	2	4, 12 as *Psylla moscovita*		
Cacopsylla myrtilli	2				
Cacopsylla nigrita	2	4, 12 as *Psylla nigrita*		27 as *Psylla pineti*	
Cacopsylla parvipennis	1	2	4, 12 as *Psylla parvipennis*	27 as *Psylla saliceti*	
Cacopsylla peregrina	1	2		20	27 as *Psylla crataegicola*
Cacopsylla pruni	2	8 as *Psylla pruni*			
Cacopsylla pulchella	1				
Cacopsylla pulchra	1	2	4, 5, 12 as *Psylla pulchra*		
Cacopsylla pyri	13, 15 as *Psylla pyri*	2	4 as *Psylla pyri*	21	27 as *Psylla pyri*
Cacopsylla pyricola	2				
Cacopsylla pyrisuga	15 as *Psylla pyrisuga*	2			
Cacopsylla saliceti	2			27 as *Psylla salicicola*	
Cacopsylla sorbi	1	2	4, 6 as *Psylla sorbi*		
Cacopsylla ulmi	1, 28	2	8 as *Psylla ulmi*		
Cacopsylla visci	2				
Cacopsylla zetterstedti	2				
Chamaepsylla hartigii	1	2 as *Psylla hartigi*	4 as *Psylla hartigi*		27 as *Psylla hartigii*
Livilla horvathi	2 as *Floria horvathi*				
Livilla radiata	2 as *Alloeoneura radiata*				
Livilla ulicis	2				
Psylla alni	1	2	4		27
Psylla betulae	1	2	4		27
Psylla buxi	10, 11	2 as *Spanioneura buxi*			
Psylla fusca	1	2	4		27 as *Psylla perspicillata*

Species	Belarus	Poland	Northwest Russia	Lithuania	Livonia
Triozidae					
Bactericera acutipennis	1	2	4, 8 as *Trioza acutipennis*		27 as *Trioza acutipennis* and *T. munda*
Bactericera albiventris	2 as *Heterotrioza albiventris*	4, 5, 8 as *Trioza albiventris*	27 as *Trioza albiventris*		
Bactericera bohemica	2	4, 16 as *Trioza bohemica*			
Bactericera calcarata	24				
Bactericera curvatinervis	1	2	4 as *Trioza curvatinervis*		
Bactericera femoralis	1, see checklist	2	4, 5 as *Trioza femoralis*		27 as *Trioza femoralis*
Bactericera maura	2	5 as *Trioza maura*			
Bactericera modesta	2				
Bactericera nigricornis	2		20	27 as *Trioza nigricornis*	
Bactericera parastriola	25				
Bactericera reuteri	1	2			
Bactericera salicivora	2	4, 5 as *Trioza salicivora*			
Bactericera striola	4 as *Trioza striola*	2	4, 16 as *Trioza striola*		27 as *Trioza striola*
Bactericera substriola	1				
Eryngiofaga deserta	23				
Trichochermes walkeri	1, 17	2			27 as *Trioza walkeri*
Trioza abdominalis	2 as *Trioza abdominalis abdominalis*	4		27	
Trioza agrophila	2				
Trioza alacris	2 as *Heterotrioza alacris*				
Trioza anthrisci	1	2 as *Heterotrioza pallida*	4 as *Trioza pallida*		
Trioza apicalis	18	2 as *Heterotrioza apicalis*	21	27 as *Trioza viridula*	
Trioza centranthi	2				
Trioza cerastii	1	2	4		
Trioza chenopodii	2 as *Heterotrioza chenopodii*				
Trioza chrysanthemi	24				
Trioza cirsii		2 as *Trioza viridula*			
Trioza dispar	2				

Species	Belarus	Poland	Northwest Russia	Lithuania	Livonia
Trioza flavipennis	1	2	4	20	27
Trioza foersteri	2				
Trioza galii	2	4, 8		27	
Trioza laserpitii	25				
Trioza munda	2				
Trioza proxima	1	2	4		
Trioza remota	1	2 as *Heterotrioza remota*	20	27 as *Trioza dryobia*	
Trioza rhamni	2	4, 5, 8		27 as *Troza abieticola*	
Trioza rotundata	2				
Trioza rumicis	2				
Trioza saxifragae	2				
Trioza schrankii	1	2 as *Trioza schranki*			
Trioza senecionis	2				
Trioza tatrensis	2				
Trioza tripteridis	25				
Trioza urticae	1	2	4	20	27
Trioza velutina	1	2 as *T. galii* (in part)			27