

New data on host-plants of grass flies of the subfamily Oscinellinae (Diptera: Chloropidae)

Новые данные о кормовых растениях злаковых мух подсемейства Oscinellinae (Diptera: Chloropidae)

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КЛЮЧЕВЫЕ СЛОВА: двукрылые, злаковые мухи, Oscinellinae, кормовые растения личинок, Воронежская область.

ABSTRACT. Information is presented on host plants of 25 species of grass flies of the subfamily Oscinellinae (Chloropidae) in Voronezh province. Host plants are recorded for 7 species for the first time (marked by *), list of host plants are enlarged for other species. Two species were found to be secondary invaders of plants, other species — primary invaders of monocots.

РЕЗЮМЕ. Представлены данные о кормовых растениях личинок 25 видов злаковых мух подсемейства Oscinellinae (Chloropidae) в Воронежской области. Для 7 видов кормовые растения указываются впервые (отмечены звездочкой), для остальных список кормовых растений расширен. Два вида фито-сапрофаги, развиваются в повреждённых растениях, остальные первичные фитофаги развиваются в живых однодольных растениях.

Introduction

Larvae of grass flies of the subfamily Oscinellinae (Chloropidae) are characterized by wide spectrum of alimentary association, develop in different substances and feed as mycetophagous, saprophagous, phyto-saprophagous, phytophagous and carnivorous [Nartshuk, 2014]. Real phytophagous and many sapro-phytophagous larvae (secondary invaders) are usually associated with monocotyledonous plants. This paper presents some observations on host plants of phytophagous and sapro-phytophagous larvae of the subfamily Oscinellinae. Observations were made in Voronezh province of Russia in 2000–2013. Voronezh province occupied the centre of Central Russian Upland between Voronezh and Don Rivers. The main territory of Voronezh province lies in forest-steppe zone which is characterized by alternation

of forb-steppe and broad-leaved forests. Southern part of Voronezh province lies in steppe zone. Flood-lands of rivers are occupied by meadows.

Some information of host-plants in Voronezh province was early published by Panteleeva in 2001 and 2007. Following method of rearing of flies was used: plants with rhizome were moved into laboratory, rhizome was placed into water, and part of plant was covered by plastic cowl. Flies were taken from cowl after flying out. Totally 99 specimens (18 ♂, 81 ♀) of flies were reared. Nomenclature of plants is done after Maevskiy [2006]. The present knowledge on the host-plants of considered species of Chloropidae are summarized in the Table.

List of species

1. *Calamoncosis stipae* Nartshuk, 1962.

Stipa capillata, *S. lessingiana*, *S. zalesskii* and *S. pennata* were cited as host plants [Nartshuk, 1962, 1972].

Adults (5♀) were reared from shoots of *Stipa capillata*, *S. pennata*, *S. pulcherrima*, collected on steppe near Divnogor'e.

2. *Conioscinella frontella* (Fallén, 1820).

Following host plants were indicated: *Avena sativa*, *Hordeum vulgare*, *Anthoxanthum odoratum*, *Avinella flexuosa*, *Dactylis glomerata*, *Deschampsia caespitosa*, *Festuca ovina*, *Elythria repens*, *Holcus lanatus*, *Phleum pratense*, *Secale sylvestre* [Balachowski, Mesnil, 1935; Nye, 1958; Nartshuk, 1972; Karpova, 1972; Ufen, Chandler, 1978; Tschirnhaus, 1981, 1992; Krusteva, Beschovsky, 1998, 2000].

Adults (4♀) were reared from shoots of *Brachypodium pinnatum* and *Poa nemoralis*, taken on water meadows of the River Tikhaya Sosna near Ostrogzhsk, of the River Don near Belogor'e and of the River Chernaya Kalitva near Novaya Kalitva.

3. **Conioscinella livida* Nartshuk, 1970.

A female was reared from shoots of *Poa nemoralis*, taken on edge of Tallerman forest near Borisoglebsk. Host plant is indicated for the first time.

4. **Conioscinella obscuripila* Duda, 1933.

Adults (2♀) were reared from shoots of *Brachypodium pinnatum* è *Poa nemoralis*, taken on water meadows of the River Tikhaya Sosna near Ostrogzhsk, and of the River Chernaya Kalitva near Novaya Kalitva. Host plant is indicated for the first time.

5. *Conioscinella sordidella* (Zetterstedt, 1848).

Karpova [1972] recorded *Elytrigia repens* as host plant; Tschirnhaus [1992] — *Agropyron* sp.

Adults (1♂, 5♀) were reared from shoots of *Phragmites australis*, collected on fens near Ostrogzhsk, fens in Khrenvskoy bor and water meadow of Lake Ilmen' near Bogana.

6. *Eribolus nana* (Zetterstedt, 1838).

Valley et al. [1969] found larvae in shoots of *Carex* sp., infested by *Cordilura varicornis* Curran in USA. Nartshuk [1972] — in *Carex* sp., *Scirpus* sp., and *Sparganium* sp.

A female was reared from shoots of *Carex acuta*, taken on bog in Khrenvskoy bor near Duginka, secondary invaders.

7. *Microcercis trigonella* (Duda, 1933).

Following host plants were recorded: *Glyceria fluitans*, *Festuca arundinacea*, *Deschampsia caespitosa*, *Juncus effusum*, *J. gerrardii*, *Phalaroides arundinacea*, *Hypochaeris* sp. [Rogocha, 1960; Tschirnhaus, 1981, 2007; Sharipov, 1991].

Adults (9♀) were reared from shoots of *Agrostis capillaris*, *Elytrigia repens*, *Hordeum vulgare*, *Poa annua*, *Triticum durum*, *Zea mays*, taken on forb steppe near Divnogor'e and Elan'-Koleno and on grass steppe near Krinitza, primary invaders.

8. *Oscinella alopecuri* Mesnil, 1935.

Host plants of this species is *Alopecurus pratensis* [Balachowsky, Mesnil, 1935; Nartshuk, 1956, 1972]. Rogocha [1960] listed also *Lolium perennis*.

Adults (3♂, 4♀) were reared from shoots of *Alopecurus pratensis*, collected on water meadows of the River Tikhaya Sosna near Divnogor'e and of the River Don near Belogor'e.

9. **Oscinella cariciphila* Collin, 1946.

Collin [1946] named this species *cariciphila* as it occurs on *Carex* beds, but not reared from this plants.

Adults (1♂, 2♀) were reared from shoots of *Carex acuta*, growing on bogging meadow of the River Usmanka near Krasnolesnyi. Host plant is indicated for the first time.

10. *Oscinella festucae* Mesnil, 1935.

Larvae of this species are primary invaders of shoots of *Festuca pratensis*, *F. gigantea*, *Lolium perenne* and *Elymus sibiricus* [Balachowsky, Mesnil, 1935; Nartshuk, 1956, 1972; Rogocha, 1960].

Adults (4♀) were reared from shoots of *Festuca gigantea*, *F. pratensis*, *F. rubra*, taken on water meadows of the River Tikhaya Sosna near Divnogor'e and of the River Devitza near Strelitza.

11. *Oscinella frit* (Linnaeus, 1758).

Larvae of this species are primary invaders of shoots of different grasses and cereals and *Avena* spikelets.

Adults (3♂, 5♀) were reared from shoots of *Agropyron cristatum*, *Agrostis capillaris*, *Avena sativa*, *Secale sylvestre*, *Triticum durum*, *Zea mays*, collected on forb steppe, long fallow steppe near Divnogor'e and grass steppe near Krinitza.

12. *Oscinella nigerrima* (Macquart, 1835).

Triticum spp. and *Phleum pratense* were indicated as host plants of this species [Rygg, 1966, Nartshuk, 1972; Ufen, Chandler, 1978].

Adults (3♀) reared from shoots of *Agrostis capillaris*, collected on forb steppe near Verkhniy Karachan and Divnogor'e.

13. *Oscinella nitidissima* (Meigen, 1838).

Larvae of this species are phytophagous in shoots of many species of grasses, including several species of *Agrostis* [Nartshuk, 1956 (as *Oscinella agrostis*), 1972; Ufen, Chandler, 1978].

Adults (1♂, 3♀) were reared from shoots of *Agrostis capillaris*, taken on forb steppe near Divnogor'e and shoots of *A. gigantea*, taken on edge forest Khrenvskoy bor near Khrenovoe.

14. *Oscinella phlei* Nartshuk, 1956.

Larvae of this species are known as primary invaders of shoots of grasses of the genus *Phleum* [Nartshuk, 1956, 1972]. Karpova [1972] reported also *Alopecurus pratensis* as host plant.

Adults (1♂, 4♀) were reared from shoots of *Phleum pratense*, taken on water meadows near Divnogor'e and Strelitza.

15. *Oscinella pusilla* (Meigen, 1830).

Larvae of this species are primary invaders of the grasses mostly of the tribe Triticeae, including cereals: wheat and barley.

Adults (3♂, 4♀) were reared from shoots of *Elytrigia repens*, *Hordeum vulgare*, *Triticum durum*, *Zea mays*, taken on forb steppe near Divnogor'e and Elan-Koleno.

16. **Oscinella smirnovi* Nartshuk, 1956.

A female was reared from shoots of *Agrostis gigantea*, collected on fens in the forest Khrenvskoy bor near Duginka. Host plant is indicated for the first time.

17. *Oscinella vastator* (Curtis, 1845).

This species is considered as pest of wheat (*Triticum* spp.), develop also in shoots of *Lolium perenne*, *L. multiflorum*, *Festuca rubra*, *F. pratensis*, *Phleum pratense* [Ufen, Chandler, 1978].

Adults (2♀) were reared from shoots of *Triticum aestivum* and *T. durum*, taken on long fallow steppe near Divnogor'e.

18. *Oscinella ventricosi* Nartshuk, 1956.

Larvae of this species are phytophagous in shoots of *Alopecurus ventricosus* (Nartshuk, 1956).

Adults (1♂, 3♀) were reared from shoots of *Alopecurus arundinaceus* and *A. pratensis*, collected on wet edge of the forest Usmanski bor near Shuberka and the Tallerman forest near Borisoglebsk.

19. **Oscinella vindicata* (Meigen, 1830).

Adults (2♀) were reared from shoots of *Melica transsilvanica*, taken on clearing in the forest Usmanski bor near Shuberka. Host plant is indicated for the first time.

20. *Oscinomorpha albisetosa* (Duda, 1933).

Following host plants were reported: *Elytrigia* sp., *Puccinellia* sp. [Bärmann, Weipert, 1989].

A female was reared from shoots of *Agrostis capillaris*, taken on forb-grass steppe near Divnogor'e.

21. **Oscinomorpha arcuata* (Duda, 1932).

A female reared from shoots of *Agrostis capillaris* taken on forb-grass steppe near Divnogor'e. Host plant is indicated for the first time.

22. *Oscinomorpha koeleriae* (Nartshuk, 1970).

Nartshuk [1972] reported *Koeleria gracilis* as host plant.

Adults (3♀) were reared from shoots of *Koeleria sclerophylla*, growing on grass steppe (steppen zona) near Sukhoi Donez and Volokonovka.

23. *Oscinomorpha minutissima* (Strobl, 1900).

As host plants were indicated *Oryza* sp., *Secale* sp., *Selene dioica* and *Salvia sclarea*, two last plants are dicotyledons [Nartshuk, 1972; Ufen, Chandler, 1978; Tschirnhaus, 1981, 2007], probably phyto-saprophag.

Adults (6♀) were reared from shoots of *Festuca ovina* and *F. vallesiaca*, taken on forb-grass steppe near Divnogor'e and Elan'-Koleno and grass steppe (steppen zona) near Volokonovka.

24. **Oscinomorpha sordidissima* (Strobl, 1893).

Adults (4♂, 4♀) were reared from shoots of *Briza media*, *Helictotrichon pratense*, *H. pubescens* and *Melica nutans*, growing on edges and clearings of oak forest near Lipovka (the Boyarskyi forest), Vorontzovka (the Shipov forest) and the forest Usmanskyi bor near Shuberka. Host plant is indicated for the first time.

25. *Rhopalopterum atricorne* (Zetterstedt, 1838).

Nartshuk [1972] indicated *Carex* sp. as host plant (as *Lioscinella platythorax* Nartshuk, 1958); Ufen, Chandler [1978] — *Eriophorum*.

Adults (2♀) were reared from shoots of *Carex acuta* and *C. riparia*, taken on fens in the forest Khrenvskoy bor near Duginka.

Conclusion

Larvae of the most examined species are phytophagous — primary invaders of plants (23 species) and larvae of two species are phyto-saprophagous — secondary invaders of plants. Most examined Oscinellinae species have a wide list of hostplants but all belong to the family Poaceae. Two species *O. cariciphila* and *R. atricorne* are associated only with Cyperaceae. *Microcercis trigonella* has hostplants from two plant family: Poaceae and Juncaceae.

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Table. Hostplant of Oscinellinae (Chloropidae) species.
Таблица. Кормовые растения видов Oscinellinae (Chloropidae).

Chloropidae (Oscinellinae) species	Host plants	Previously known	Herein confirmed	Newly reported
<i>Calamoncosis stipae</i> Nartshuk, 1962	<i>Stipa capillata</i>	+	+	
	<i>S. lessingiana</i>	+		
	<i>S. pennata</i>	+	+	
	<i>S. pulcherrima</i>			+
	<i>S. zalesskii</i>	+		
<i>Conioscinella frontella</i> (Fallén, 1820)	<i>Anthoxantum odoratum</i>	+		
	<i>Avena sativa</i>	+		
	<i>Avinella flexuosa</i>	+		
	<i>Brachypodium pinnatum</i>			+
	<i>Dactylis glomerata</i>	+		
	<i>Deschampsia caespitosa</i>	+		
	<i>Elytrigia repens</i>	+		
	<i>Festuca ovina</i>	+		
	<i>Holcus lanatus</i>	+		
	<i>Hordeum vulgare</i>	+		
	<i>Phleum pretense</i>			+
	<i>Poa nemoralis</i>	+		
	<i>Secale sylvestre</i>	+		
<i>Conioscinella livida</i> Nartshuk, 1970	<i>Poa nemoralis</i>			+
<i>Conioscinella obscuripila</i> Duda, 1933	<i>Brachypodium pinnatum</i>			+
	<i>Poa nemoralis</i>			+
<i>Conioscinella sordidella</i> (Zetterstedt, 1848)	<i>Agropyron</i> sp.	+		
	<i>Elytrigia repens</i>	+		
	<i>Phragmites australis</i>			+
<i>Eriobolus nana</i> (Zetterstedt, 1838)	<i>Carex acuta</i>			+
	<i>Carex</i> sp.	+		
	<i>Scirpus</i> sp.	+		
	<i>Sparganium</i> sp.	+		
<i>Microcercis trigonella</i> (Duda, 1933)	<i>Glyceria fluitans</i>	+		
	<i>Festuca arundinacea</i>	+		
	<i>Deschampsia caespitosa</i>	+		
	<i>Juncus effusum</i>	+		
	<i>J. gerrardii</i>	+		
	<i>Phalaroides arundinacea</i>	+		
	<i>Hypochaeris</i> sp.	+		
	<i>Agrostis capillaris</i>			+
	<i>Elytrigia repens</i>			+
	<i>Hordeum vulgare</i>			+
	<i>Poa annua</i>			+
<i>Triticum durum</i>			+	
<i>Zea mays</i>			+	

Table. Continue.
Таблица. Продолжение.

<i>Oscinella alopecuri</i> Mesnil, 1935	<i>Alopecurus pratensis</i>	+	+	
	<i>Lolium perennis</i>	+		
<i>Oscinella cariciphila</i> Collin, 1946	<i>Carex acuta</i>			+
	<i>Carex</i> sp.	+		
<i>Oscinella festucae</i> Mesnil, 1935	<i>Festuca pratensis</i>	+	+	
	<i>F. gigantea</i>	+	+	
	<i>F. rubra</i>			+
	<i>Elymus sibiricus</i>	+		
	<i>Lolium perenne</i>	+		
<i>Oscinella frit</i> (Linnaeus, 1758)	<i>Agropyron cristatum</i>	+	+	
	<i>Agrostis capillaris</i>			+
	<i>Avena sativa</i>	+	+	
	<i>Secale sylvestre</i>	+	+	
	<i>Triticum durum</i>	+	+	
	<i>Zea mays</i>	+	+	
<i>Oscinella nigerrima</i> (Macquart, 1835)	<i>Agrostis capillaris</i>			+
	<i>Phleum pratense</i>	+		
	<i>Triticum</i> spp.	+		
<i>Oscinella nitidissima</i> (Meigen, 1838)	<i>Agrostis capillaris</i>			+
	<i>A. gigantea</i>			+
	<i>Agrostis</i> spp.	+		
<i>Oscinella phlei</i> Nartshuk, 1956	<i>Alopecurus pratensis</i>	+		
	<i>Phleum pratense</i>			+
	<i>Phleum</i> spp	+		
<i>Oscinella pusilla</i> (Meigen, 1830)	<i>Elytrigia repens</i>	+	+	
	<i>Hordeum vulgare</i>	+	+	
	<i>Triticum durum</i>	+	+	
	<i>Zea mays</i>	+	+	
<i>Oscinella smirnovi</i> Nartshuk, 1956	<i>Agrostis gigantea</i>			+
<i>Oscinella vastator</i> (Curtis, 1845)	<i>Festuca rubra</i>	+		
	<i>F. pratensis</i>	+		
	<i>Lolium multiflorum</i>	+		
	<i>L. perenne</i>	+		
	<i>Phleum pratense</i>	+		
	<i>Triticum aestivum</i>	+	+	
	<i>T. durum</i>	+	+	
<i>Oscinella ventricosi</i> Nartshuk, 1956	<i>Alopecurus arundinaceus</i>			+
	<i>A. pratensis</i>			+
	<i>A. ventricosus</i>	+		
<i>Oscinella vindicata</i> (Meigen, 1830)	<i>Melica transsilvanica</i>			+
<i>Oscinimorpha albisetosa</i> (Duda, 1933)	<i>Agrostis capillaris</i>			+
	<i>Elytrigia</i> sp.	+		
	<i>Puccinellia</i> sp.	+		

Table. Continue.
Таблица. Продолжение.

<i>Oscinimorpha arcuata</i> (Duda, 1932)	<i>Agrostis capillaris</i>			+
<i>Oscinimorpha koeleriae</i> (Nartshuk, 1970)	<i>Koeleria gracilis</i>	+		
	<i>K. sclerophylla</i>			+
<i>Oscinimorpha minutissima</i> (Strobl, 1900)	<i>Festuca ovina</i>			+
	<i>F. vallesiaca</i>			+
	<i>Secale</i> sp.	+		
	<i>Selene dioica</i>	+		
	<i>Salvia sclarea</i>	+		
<i>Oscinimorpha sordidissima</i> (Strobl, 1893)	<i>Briza media</i>			+
	<i>Helictotrichon pratense</i>			+
	<i>H. pubescens</i>			+
	<i>Melica nutans</i>			+
<i>Rhopalopterum atricorne</i> (Zetterstedt, 1838)	<i>Carex</i> sp.	+		
	<i>Carex acuta</i>			+
	<i>C. riparia</i>			+
	<i>Eriophorum</i> sp.	+		