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## SYRPHID FAUNA (DIPTERA: SYRPHIDAE) OF TUMNIN RIVER BASIN, THE EASTERN MACROSLOPE OF THE NORTHERN SIKHOTE-LIN, RUSSIA

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An annotated list of the 236 hoverflies species belonging to 61 genera which have been found in the basin of the Tumnin River (Khabarovskii krai) is given. *Paragus albifrons* (Fallén, 1817) and *Cheilosia rufimana* Becker, 1894 are recorded for the first time from the Russian Far East. One new synonym is proposed: *Pipiza quadrimaculata* (Panzer, 1804) = *Pipiza mutini* Violovitsh, 1985 **syn. n.** The local faunas of the Sikhote-Alin Mountains are compared.

KEY WORDS: Diptera, Syrphidae, hoverflies, fauna, new synonym, Sikhote-Alin Mountains.

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Приводится аннотированный список мух-журчалок (236 видов из 61 рода), найденных в бассейне реки Тумнин, Хабаровский край. *Paragus albifrons* (Fallén, 1817) и *Cheilosia rufimana* Becker, 1894 впервые указываются для Дальнего Востока России. Установлена новая синонимия: *Pipiza quadrimaculata* (Panzer, 1804) = *Pipiza mutini* Violovitsh, 1985, **syn. n.** Проведено сравнение локальных фаун сирфид в горах Сихотэ-Алиня.

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## INTRODUCTION

The basin of the Tumnin River (Khabarovskii krai, Russia) is situated within the eastern macroslope of the Northern Sikhote-Alin Mountains. Here we find a pronounced ecotone between the coniferous boreal forests of Siberia and the mixed subboreal forests of East Asia. Entomologists have rarely visited the basin of Tumnin River, although V.K. Arsenyev collected insects in the vicinity of the Emperor's Harbor (now Sovetskaya Gavan City) as far back as 1908. His entomological collection, which was sent to Saint-Petersburg before World War I, has not been examined and is now unfortunately mostly lost (Novomodnyi, 1999, 2000). However, 16 of Arsenyev's hoverflies were designated as paratypes of *Melangyna arsenjevi* Mutin, 1986 (= *Stenosyrphus motodomariensis* Matsumura, 1917) and these are kept in the Zoological Institute of Russian Academy of Sciences together with a few of his other syrphids. Data on 109 species (including two undetermined species from the genus *Cheilosia*) belonging to 38 genera of syrphids from the environs of Tumnin village have been published previously (Mutin & Syachina, 2007; Mutin & Bogunova, 2010; Mutin, 2012b).

## MATERIALS AND METHODS

In June 2013, a group of participants of the 7th International Symposium on Syrphidae, all authors of the present paper, made a trip to the Russian Far East and

visited Tumnin Spa and its surroundings as well as the coast of the Tatar Strait near the estuary of the Tumnin River. A lot of new information about syrphids of the area was gathered and is the reason for the preparation of this review. During 2014 and 2015 the first author continued to collect hoverflies near Tumnin Spa. In addition, we also refer to the collections made by the first author near Dyanka Village (1990–1998) and at the Tumnin Spa during July 2012. Determinations of these hoverflies were made mainly by the collectors, although the first author also examined a subset of the specimens collected by coauthors. Some specimens of the genus *Cheilisia* were determined by Anatolii Barkalov (Novosibirsk, Russia). Gerard Pennards (Amersfoort, the Netherlands) determined hoverflies collected by Theo Zeegers. The *Cheilisia* and *Platycheirus* specimens collected by Ximo Mengual were determined by Claus Claussen (Flensburg, Germany) and Tore R. Nielsen (Sandnes, Norway) respectively.

The list contains information about the classification of hoverflies captured, the origin of examined specimens, some taxonomic remarks and ecological information. The hoverflies were collected at five sites: **I** – Tumnin Spa and environs of sanatorium “Rodnik” in the valley of Chope Stream, 10 km to south of the Tumnin Village (49.64653°N, 139.9929865°E, 230-275 m); **II** – hilltop, 1,5-2 km north of Tumnin Spa (49.66787°N, 139.97954°E, 847 m); **III** – Tumnin river bank, 1,5-2 km downstream of the Tumnin Village (49.64590°N, 140.08465°E, 50-65 m); **IV** – Kirpichnaya Stream, coast of Tatar Strait between Storozh Bay and Tumnin estuary (49.25960°N, 140.33719°E, 10-15 m); **V** – bank of Tatar Stream (Silantjev Bay) near Dyanka Village (49.19607°N, 140.33715°E, 10-15 m).

Abbreviation of collectors is as follow: AS – Axel Ssymank, CP – Christopher Palmer, GMW – Gisela Merkel-Wallner, JS – Jeffrey Skevington, JvS – Jeroen van Steenis, MPZ – Menno P. van Zuijlen, SB – Sander Bot, TZ – Theo Zeegers, VM – Valerii Mutin, WvS – Wouter van Steenis, XM – Ximo Mengual.

Examined material has been deposited in the collections of the Canadian National Collection, Ottawa (CNC) (mostly material of JS), Zoologisches Forschungsmuseum Alexander Koenig, Bonn (ZFMK) (mostly material of XM) and the personal collections of AS, CP (destined eventually for World Museum Liverpool, UK), GMW, JvS, MPZ, SB, VM and WvS. Material collected by Theo Zeegers (TZ) is in the private collection of Gerard Pennards, Amersfoort.

Species and taxa of higher rank are listed in alphabetical order. Species are ordered in Subfamilies, Tribes and Subtribes according to common opinion of authors. Plant names were extracted mostly from the 'Flora of the Russian Far East' (Kozhevnikov & Probatova 2002), but synonyms follow The Plant List (2013).

Statistical tests such as cluster analysis and correspondence analysis were conducted using PAST (PALaeontological STATistics, version 1.57) to compare the syrphid species lists of the Tumnin River basin and other faunal regions of Sikhote-Alin.

## **A LIST OF SYRPHIDAE OF THE TUMNIN RIVER BASIN**

### **Family Syrphidae**

#### **Subfamily Eristalinae**

## Tribe Brachyopini

### Subtribe Brachiopina

1. *Brachyopa cinerea* Wahlberg, 1844

MATERIAL. I – 22.V 2014, 4 ♂ (VM).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 32). Flower visiting on *Prunus padus* L. and *Salix bebbiana* Sarg.

2. *Brachyopa dorsata* Zetterstedt, 1837

MATERIAL. I – 14.VI 2013, 1 ♂, 2 ♀ (JvS, WvS); 21-28.V 2014, 29 ♂, 7 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea*, *Prunus padus*, and *Salix bebbiana*. Specimens of *B. dorsata* and other species (*B. panzeri*, *B. pivanica*, *B. testacea*, *B. zhelochovtsevi*) were flying around damaged conifer trees on a partly shaded south facing slope along a foot path with low growing shrubs.

3. *Brachyopa maritima* Violovitsh, 1980

MATERIAL. I – 14.VI 2013, 1 ♂ (JS).

4. *Brachyopa panzeri* Goffe, 1945

MATERIAL. I – 14.VI 2013, 1 ♀ (JvS).

5. *Brachyopa pivanica* Mutin, 1984

MATERIAL. I – 14.VI 2013, 2 ♂ (JvS).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).

6. *Brachyopa testacea* (Fallén, 1817)

MATERIAL. I – 14.VI 2013, 6 ♂ (AS, JvS, WvS, XM).

NOTES. Flower visiting on *Swida alba* (L.) Opiz.

7. *Brachyopa violovitshi* Mutin, 1985

MATERIAL. I – 22.V 2014, 28.V 2015, 3 ♂, 2 ♀ (VM); III – 15.VI 2013, 1 ♀ (AS).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 32). Flower visiting on *Prunus padus*, *Salix bebbiana*.

8. *Brachyopa vittata* Zetterstedt, 1843

MATERIAL. I – 14.VI 2013, 4 ♂, 1 ♀ (JS, XM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).

9. *Brachyopa zhelochovtsevi* Mutin, 1998

MATERIAL. I – 14.VI 2013, 2 ♂ (JvS, XM); 22.V 2014, 2 ♂ (VM).

10. *Chrysosyrphus niger* (Zetterstedt, 1843)

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea*, *Taraxacum* sp.

11. *Hammerschmidtia ingrlica* Stackelberg, 1952

MATERIAL. I – 14.VI 2013, 1 ♂ (AS).

NOTES. Flower visiting on *Swida alba*.

### Subtribe Spheginina

12. *Neoscia (Neoscia) tenur* (Harris, 1780)  
MATERIAL. **III** – 15.VI 2013, 1 ♀ (XM); **IV** – 16.VI 2013, 11 ♂, 34 ♀ (AS, CP, SB, XM); **V** – 14.VI 1990, 1 ♀ (VM).
13. *Neoscia (Neosciella) amurensis* Mutin, 1990  
MATERIAL. **IV** – 16.VI 2013, 1 ♂ (CP).
14. *Neoscia (Neosciella) confusa* Mutin, 1990  
MATERIAL. **III** – 15.VI 2013, 1 ♀ (AS).
15. *Neoscia (Neosciella) subchalybea* (Curran, 1925)  
MATERIAL. **IV** – 16.VI 2013, 1 ♀ (CP).  
NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57). Flower visiting on *Caltha membranacea*.
16. *Sphegina (Asiosphegina) sibirica* Stackelberg, 1953  
MATERIAL. **I** – 17-22.VII 2012, 11 ♂, 2 ♀ (VM); 14.VI 2013, 14 ♂ (JvS, MPZ, WvS); **III** – 15.VI 2013, 14 ♂, 15 ♀ (AS, CP, JvS, MPZ, WvS, XM).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47; Mutin, 2012b: 33). Flower visiting on *Prunus padus*, *Swida alba*, *Spiraea* sp., *Sorbaria sorbifolia*.
17. *Sphegina (Sphegina) carbonaria* Mutin, 1998  
MATERIAL. **I** – 14.VI 2013, 2 ♂, 1 ♀ (AS, JvS); **III** – 15.VI 2013, 1 ♂, 1 ♀ (SB, WvS).  
NOTES. Flower visiting on *Spiraea* sp.
18. *Sphegina (Sphegina) claviventris* Stackelberg, 1956  
MATERIAL. **I** – 14.VI 2013, 3 ♂ (MPZ, WvS); **III** – 15.VI 2013, 1 ♀ (WvS).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).
19. *Sphegina (Sphegina) melancholica* Stackelberg, 1956  
MATERIAL. **I** – 14.VI 2013, 5 ♀ (JvS, VM).  
NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea*, *Potentilla fragarioides*.
20. *Sphegina (Sphegina) montana* Becker, 1921  
MATERIAL. **I** – 14.VI 2013, 3 ♂, 1 ♀ (AS, WvS).  
NOTES. Flower visiting on *Swida alba*.
21. *Sphegina (Sphegina) obscurifacies* Stackelberg, 1956  
MATERIAL. 2 ♂, **I** – 21-22.VII 2012 (VM).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).
22. *Sphegina (Sphegina) spheginea* (Zetterstedt, 1838)  
MATERIAL. 7 ♀, **I** – 14.VI 2013 (JS, JvS).  
NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea*.

23. *Sphegina (Sphegina) spiniventris* Stackelberg, 1953  
MATERIAL. I – 17, 22.VII 2012, 2 ♂ (VM); 14.VI 2013, 1 ♀ (JvS).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).

24. *Sphegina (Sphegina) tuvinica* Violovitsh, 1980  
MATERIAL. I – 14.VI 2013, 1 ♂ (AS).

### Tribe Callicerini

25. *Callicera aenea* (Fabricius, 1781)  
MATERIAL. III – 15.VI 2013, 1 ♂ (JvS).  
NOTES. Flower visiting on *Crataegus maximowiczii*.

### Tribe Eristalini Subtribe Eristalina

26. *Eristalinus sepulchralis* (Linnaeus, 1758)  
MATERIAL. V – 26.VI 1990, 1 ♀ (VM).

27. *Eristalis (Eoseristalis) abusiva* Collin, 1931  
MATERIAL. V – 26.VI 1990, 1 ♀ (VM).

28. *Eristalis (Eoseristalis) alpina* (Panzer, 1798)  
MATERIAL. I – 14.VI 2013, 2 ♂ (WvS); III – 15.VI 2013, 1 ♀ (AS); V – 26 vi.1990, 1 ♀ (VM).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Sorbaria sorbifolia*.

29. *Eristalis (Eoseristalis) arbustorum* (Linnaeus, 1758)  
MATERIAL. III – 15.VI 2013, 1 ♂, 2 ♀ (AS, MPZ, TZ); IV – 16.VI 2013, 1 ♂ (SB).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47; Mutin, 2012b: 33). Flower visiting on *Swida alba*, *Aster novi-belgii*.

30. *Eristalis (Eoseristalis) cerealis* Fabricius, 1805  
MATERIAL. V – 26.VI 1990, 1 ♀ (VM).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Aster novi-belgii*.

31. *Eristalis (Eoseristalis) hirta* Loew, 1866  
MATERIAL. III – 15.VI 2013, 1 ♂ (XM).

32. *Eristalis (Eoseristalis) interrupta* (Poda, 1761)  
MATERIAL. I – 14.VI 2013, 5 ♂ (AS, CP, JvS, SB); III – 15.VI 2013, 5 ♂, 2 ♀ (AS, CP, JvS, SB, TZ).  
NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47; Mutin, 2012b: 33). Flower visiting on *Swida alba*.

33. *Eristalis (Eoseristalis) rabida* **Violovitsh, 1977**  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Sorbaria sorbifolia*.
34. *Eristalis (Eoseristalis) rossica* **Stackelberg, 1958**  
 MATERIAL. **III** – 15.VI 2013, 4 ♂, 2 ♀ (AS, JvS, XM); **V** – 26.VI 1990, 1 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Swida alba*, *Crataegus maximowiczii*, *Aster novi-belgii*.
35. *Eristalis (Eoseristalis) rupium* **Fabricius, 1805**  
 MATERIAL. **I** – 14.VI 2013, 1 ♂ (MPZ); **III** – 15.VI 2013, 1 ♀ (MPZ).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Aster novi-belgii*.
36. *Eristalis (Eoseristalis) pseudorupium* **Kanervo, 1938**  
 MATERIAL. **III** – 15.VI 2013, 1 ♀ (WvS).
37. *Eristalis (Eristalis) tenax* (**Linnaeus, 1758**)  
 MATERIAL. **III** – 15.VI 2013, 1 ♀ (WvS); **V** – 16-18.VII 1998, 1 ♂, 2 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Calendula officinalis*, *Aster novi-belgii*. This species avoids natural landscapes.

#### Subtribe Helophilina

38. *Anasimyia lunulata* (**Meigen, 1822**)  
 MATERIAL. **III** – 15.VI 2013, 11 ♂, 2 ♀ (AS, JvS, MPZ, WvS, XM); **IV** – 16.VI 2013, 2 ♂ (AS, XM).  
 NOTES. Flower visiting on *Taraxacum* sp. and *Caltha* sp.
39. *Helophilus continuus* **Loew, 1854**  
 MATERIAL. **III** – 15.VI 2013, 3 ♂ (MPZ, JvS).  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 33).
40. *Helophilus parallelus* (**Harris, 1776**)  
 MATERIAL. **I** – 22.V 2014, 2 ♂, 2 ♀ (VM); **V** – 16.VII 1998, 1 ♀ (VM).
41. *Helophilus sapporensis* **Matsumura, 1911**  
 MATERIAL. **III** – 15.VI 2013, 2 ♂, 5 ♀ (AS, GMW, SB, TZ, XM); **V** – 16.VII 1998, 1 ♂ (VM).  
 NOTES. Flower visiting on *Swida alba*.
42. *Mallota bicolor* **Sack, 1910**  
 MATERIAL. **I** – 14.VI 2013, 1 ♂ (MPZ).
43. *Mallota eurasiatica* **Stackelberg, 1950**  
 MATERIAL. **III** – 15.VI 2013, 4 ♂, 1 ♀ (AS, JvS, WvS, XM).  
 NOTES. Flower visiting on *Crataegus maximowiczii*.

44. *Mallota megilliformis* (Fallén, 1817)

MATERIAL. **I** – 14.VI 2013, 7 ♂ (AS, MPZ, WvS); **II** – 14.VI 2013, 1 ♂ (CP); **III** – 15.VI 2013, 10 ♂, 7 ♀ (AS, CP, JvS, MPZ, TZ, WvS, XM).

NOTES. Flower visiting on *Swida alba*, *Spiraea* sp., *Crataegus maximowiczii*.

45. *Mallota rossica* Portschinsky, 1877

MATERIAL. **I** – 14.VI 2013, 4 ♂ (JvS, MPZ, WvS).

Subtribe Sericomomyina

46. *Sericomyia dux* (Stackelberg, 1930)

MATERIAL. **II** – 14.VI 2013, 2 ♂ (MPZ, XM).

47. *Sericomyia nigra* Portschinsky, 1873

MATERIAL. **I** – 14.VI 2013, 1 ♂ (WvS); **III** – 15.VI 2013, 1 ♂ (SB).

Tribe Merodontini

48. *Eumerus flavitarsis* Zetterstedt, 1843

MATERIAL. **I** – 17, 18.VII 2012, 3 ♀ (VM); **III** – 15.VI 2013, 1 ♂ (AS).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).

49. *Eumerus strigatus* (Fallén, 1817)

MATERIAL. **I** – 14.VI 2013, 1 ♂ (WvS).

50. *Psilota innupta* Rondani, 1857

MATERIAL. **I** – 21-22.V 2014, 28.V 2015, 3 ♂, 2 ♀ (VM); **V** – 14.VI 1990, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 33). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Salix bebbiana*.

Tribe Milesiini

Subtribe Blerina

51. *Blera (Blera) fallax* (Linnaeus, 1758)

MATERIAL. **I** – 14.VI 2013, 2 ♂, 1 ♀ (AS, SB, WvS); **II** – 15.VI 2013, 1 ♂, 1 ♀ (JS); **III** – 15.VI 2013, 1 ♂ (CP).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).

52. *Blera (Blera) japonica* (Shiraki, 1930)

MATERIAL. **I** – 14.VI 2013, 1 ♀ (WvS); **II** – 15.VI 2013, 1 ♂ (JvS).

53. *Blera (Blera) nitens* (Stackelberg, 1923)

MATERIAL. **II** – 14.VI 2013, 1 ♂ (XM); 15.VI 2013, 18 ♂, 1 ♀ (JS, JvS).

NOTES. All found hilltopping.

54. *Blera (Blera) violovitshi* Mutin, 1991

MATERIAL. **III** – 15.VI 2013, 1 ♀ (TZ).

55. *Blera (Silvina) eoa* (Stackelberg, 1928)

MATERIAL. **I** – 14.VI 2013, 4 ♂ (SB, JvS); **II** – 15.VI 2013, 5 ♂ (JS).

NOTES. All specimens at site II were hilltopping.



56. *Blera (Silvina) yudini* Barkalov, 1991

MATERIAL. **II** – 14.VI 2013, 1 ♂ (XM); 15.VI 2013, 11 ♂, 2 ♀ (JS, JvS).

NOTES. All found hilltopping.

57. *Lejota (Blerina) korsakovi* (Stackelberg, 1955)

MATERIAL. **I** – 14.VI 2013, 1 ♂, 3 ♀ (JvS, MPZ).

NOTES. Sitting and flying around a large dead pine log.

58. *Lejota (Lejota) ruficornis* (Zetterstedt, 1843)

MATERIAL. **I** – 14.VI 2013, 3 ♂ (JvS, SB); 21-22.V 2014, 2 ♂, 1 ♀ (VM); **II** – 14.VI 2013, 1 ♂ (XM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea*, *Potentilla fragarioides*. One male found together with previous species on the same pine log.

Subtribe Criorhinina

59. *Criorhina aino* (Stackelberg, 1955)

MATERIAL. **I** – 14.VI 2013, 1 ♂ (AS); **II** – 14.VI 2013, 1 ♂ (XM); 15.VI 2013, 5 ♂, 4 ♀ (JS, JvS).

NOTES. Flower visiting on *Swida alba*. Specimens collected at site II were hilltopping.

60. *Criorhina alexandri* Mutin, 1999

MATERIAL. **I** – 21-22.V 2014, 27-28.V 2015, 26 ♂, 25 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 33). Flower visiting on *Prunus padus* and *Salix bebbiana*.

61. *Criorhina brevipila* Loew, 1871

MATERIAL. **I** – 14.VI 2013, 7 ♂, 2 ♀ (JS, JvS); **II** – 14.VI 2013, 6 ♂, 1 ♀ (CP, XM); 15.VI 2013, 9 ♂ (JS); **III** – 15.VI 2013 6 ♂, 8 ♀ (AS, CP, GMW, JvS, MPZ, TZ, WvS).

NOTES. Flower visiting on *Swida alba* and *Crataegus maximowiczii*. Specimens collected at site II were hilltopping.

62. *Criorhina sichotana* (Stackelberg, 1955)

MATERIAL. **I** – 22.V 2014, 27-28.V 2015, 7 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57). Flower visiting on *Prunus padus*, *Rhododendron aureum* and *Salix bebbiana*.

63. *Criorhina ussuriana* (Stackelberg, 1955)

MATERIAL. **I** – 14.VI 2013, 1 ♂ (GMW); **II** – 15.VI 2013, 4 ♂ (JS, JvS).

NOTES. Specimens collected at site II were hilltopping.

64. *Sphecomyia vespiformis* (Gorski, 1852)

MATERIAL. **I** – 14.VI 2013, 1 ♀ (SB); **III** – 15.VI 2013, 2 ♀ (JvS, SB).

NOTES. Flower visiting on *Crataegus maximowiczii*.

#### Subtribe Milesiina

65. *Spilomyia maxima* Sack, 1910

MATERIAL. **I** – 17-22.VII 2012, 3 ♂ (VM).

NOTES. Flower visiting on *Sorbaria sorbifolia*.

#### Subtribe Temnostomina

66. *Temnostoma apiforme* (Fabricius, 1794)

MATERIAL. **I** – 22.VII 2012, 1 ♀ (VM); 14.VI 2013, 14 ♂, 4 ♀ (AS, JvS, MPZ, SB, TZ, WvS); **II** – 14.VI 2013, 5 ♂, 3 ♀ (CP, XM); 15.VI 2013, 1 ♂, 2 ♀ (JS); **III** – 15.VI 2013, 5 ♂, 3 ♀ (AS, MPZ, XM).

NOTES. All the Far Eastern specimens correspond to *Temnostoma pallidum* Sack, 1910 in sensu N.P. Krivosheina (2003), but their differences from European specimens of *T. apiforme* and *T. carens* Gaunitz, 1936 are nothing more than clinal variability. Flower visiting on *Sorbaria sorbifolia* and *Swida alba*.

67. *Temnostoma angustistriatum* Krivosheina, 2002

MATERIAL. **I** – 14.VI 2013, 3 ♂, 4 ♀ (AS, JvS, TZ, WvS); **III** – 15.VI 2013, 1 ♀ (WvS).

68. *Temnostoma nitobei* Matsumura, 1916

MATERIAL. **I** – 14.VI 2013, 1 ♀ (JvS).

69. *Temnostoma vespiforme* (Linnaeus, 1758)

MATERIAL. **I** – 18, 22.VII 2012, 3 ♂, 1 ♀ (VM); 14.VI 2013, 9 ♂, 1 ♀ (AS, JvS, WvS); **II** – 14.VI 2013, 1 ♀ (XM); **III** – 15.VI 2013, 3 ♀ (JvS, SB, TZ).

NOTES. According to N.P. Krivosheina (2004), specimens collected in the Southern Far East (Khabarovskii Krai, Primorskii Krai) and determined by others as *T. vespiforme* are *Temnostoma sibirica* (Portschinsky, 1758). They differ by narrower pale fascia of 3rd and 4th terga from typical forms of *T. vespiforme* from Europe. However, we do not see specific differences both in coloration and in male genitalia between specimens collected in various regions of Siberia and the Far East. This species was recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Sorbaria sorbifolia*.

#### Subtribe Tropidiina

70. *Syrirta pipiens* (Linnaeus, 1758)

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Aster novi-belgii* and *Calendula officinalis*.

#### Subtribe Xylotina

71. *Brachypalpus nipponicus* Shiraki, 1952

MATERIAL. **I** – 14.VI 2013, 1 ♂ (WvS); 22.V 2014, 1 ♀ (VM); **II** – 15.VI 2013, 1 ♂ (JS).

NOTES. Flower visiting on *Prunus padus*. Specimen collected at site II was hilltopping.

72. *Brachypalpus* sp.

MATERIAL. **I** – 20.V 2014, 1 ♂ (VM).

NOTES. This is an undescribed species with unusual characters of male head in comparison with other species of the genus. Some males and females have been collected in Japan as well. Description of this species will be published together with Japanese entomologists in the near future. Recorded from Tumnin River basin as *Crioprora* sp. (Mutin, 2012b: 33).

73. ***Chalcosyrphus (Chalcosyrphus) admirabilis* Mutin, 1984**

MATERIAL. **I** – 27-28.V 2015, 3 ♂, 1 ♀ (VM).

NOTES. Flower visiting on *Salix bebbiana*.

74. ***Chalcosyrphus (Chalcosyrphus) tuberculifemur* (Stackelberg, 1963)**

MATERIAL. **I** – 14.VI 2013, 3 ♂ (JvS, WvS); 20.V 2014, 1 ♂, 1 ♀ (VM).

NOTES. Collected along a footpath on a concrete water drainage system with mosses and twigs covering most part of the concrete.

75. ***Chalcosyrphus (Xylotina) nemorum* (Fabricius, 1805)**

MATERIAL. **I** – 14.VI 2013, 11 ♂, 2 ♀ (AS, GMW, JvS, SB, VM, WvS); 21-22.V 2014, 2 ♂ (VM); **II** – 14.VI 2013, 1 ♀ (XM); **III** – 15.VI 2013, 1 ♂ (MPZ).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 33). Flower visiting on *Caltha membranacea*.

76. ***Chalcosyrphus (Xylotina) nitidus* (Portschinsky, 1879)**

MATERIAL. **I** – 14.VI 2013, 12 ♂, 1 ♀ (GMW, JvS, MPZ, SB, TZ, WvS, XM); **II** – 14.VI 2013, 4 ♂ (CP, XM); 15.VI 2013, 5 ♂ (JS).

NOTES. Specimens collected at site II were hilltopping.

77. ***Chalcosyrphus (Xylotodes) jacobsoni* (Stackelberg, 1921)**

MATERIAL. **III** – 15.VI 2013, 1 ♀ (JvS).

78. ***Chalcosyrphus (Xylotodes) piger* (Fabricius, 1794)**

MATERIAL. **I** – 14.VI 2013, 2 ♂ (JvS).

79. ***Chalcosyrphus (Xylotomima) amurensis* (Stackelberg, 1925)**

MATERIAL. **I** – 14.VI 2013, 3 ♂, 2 ♀ (CP, GMW, SB, WvS); **II** – 14.VI 2013, 1 ♂ (XM); 15.VI 2013, 1 ♂, 1 ♀ (JS).

NOTES. Specimens collected at site II were hilltopping.

80. ***Chalcosyrphus (Xylotomima) femoratus* (Linnaeus, 1758)**

MATERIAL. **I** – 14.VI 2013, 3 ♂ (GMW, SB, WvS); **II** – 15.VI 2013, 1 ♂, 1 ♀ (JS).

NOTES. This species (= *Chalcosyrphus curvipes* auct.) is common in East Asia. Males have more extensive black coloration of basal part femora, which is designated as alternative character in the original description of *Zelima sapporensis* Shiraki, 1930. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 48). Specimens collected at site II were hilltopping.

81. ***Chalcosyrphus (Xylotomima) rufipes* (Loew, 1873)**

MATERIAL. **II** – 15.VI 2013, 5 ♂, 1 ♀ (JS, JvS).

NOTES. All specimens were hilltopping.

82. *Chalcosyrphus (Xylotomima) valgus* (Gmelin, 1790)  
 MATERIAL. I – 14.VI 2013, 3 ♂ (SB); 22.V 2014, 2 ♂ (VM); II – 14.VI 2013, 1 ♀ (XM); 15.VI 2013, 10 ♂, 3 ♀ (JS, JvS).  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 33). Flower visiting on *Potentilla fragarioides*. Specimens collected at site II were hilltopping.
83. *Hadromyia cimbiciformis* (Portschinsky, 1879)  
 MATERIAL. II – 14.VI 2013, 1 ♂ (CP).
84. *Spheginoides obscurus* Szilady, 1939  
 MATERIAL. I – 14.VI 2013, 1 ♀ (WvS).
85. *Xylota (Haploxygota) sichotana* Mutin, 1985  
 MATERIAL. I – 14.VI 2013, 1 ♂, 1 ♀ (MPZ, WvS).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 48).
86. *Xylota (Xylota) abiens* Meigen, 1822  
 MATERIAL. III – 15.VI 2013, 1 ♂, 1 ♀ (AS, TZ).
87. *Xylota (Xylota) caeruleiventris* Zetterstedt, 1838  
 MATERIAL. I – 14.VI 2013, 1 ♂ (AS).
88. *Xylota (Xylota) danieli* Mutin et Ichige, 2014  
 MATERIAL. III – 15.VI 2013, 1 ♀ (MPZ).  
 NOTES. This species was mentioned erroneously by some authors from the Russian Far East as *Xylota amamiensis* (Shiraki, 1968) or *X. coquilletti* (Hervé-Bazin, 1914) (Mutin & Ichige, 2014).
89. *Xylota (Xylota) filipjevi* (Stackelberg, 1952)  
 MATERIAL. III – 15.VI 2013, 1 ♂ (MPZ).
90. *Xylota (Xylota) ignava* (Panzer, 1798)  
 MATERIAL. I – 14.VI 2013, 7 ♂ (AS, JvS, MPZ, WvS); III – 15.VI 2013, 4 ♀ (AS, JvS, MPZ).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 48; Mutin, 2012b: 33). Flower visiting on *Swida alba*.
91. *Xylota (Xylota) jakutorum* Bagatshanova, 1980  
 MATERIAL. III – 15.VI 2013, 1 ♀ (WvS).
92. *Xylota (Xylota) meigeniana* Stackelberg, 1964  
 MATERIAL. II – 14.VI 2013, 1 ♂, 2 ♀ (JS).
93. *Xylota (Xylota) pseudoignava* Mutin, 1984  
 MATERIAL. I – 17-22.VII 2012, 3 ♂, 5 ♀ (VM); 14.VI 2013, 1 ♂, 1 ♀ (WvS).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 48). Males aggregate on recently sawn trunks and wood in Tumnin Spa territory.

94. *Xylota (Xylota) suecica* (Ringdahl, 1943)

MATERIAL. **III** – 15.VI 2013, 1 ♀ (XM).

95. *Xylota (Xylota) triangularis* Zetterstedt, 1838

MATERIAL. **I** – 14.VI 2013, 2 ♂ (AS, VM); **III** – 15.VI 2013, 2 ♂, 2 ♀ (AS, JvS, XM).

NOTES. Flower visiting on *Swida alba*.

### Tribe Rhingiini

96. *Cheilosia (Cheilosia) albohirta* (Hellen, 1930)

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 31). Flower visiting on *Potentilla fragarioides*.

97. *Cheilosia (Cheilosia) annulifemur* (Stackelberg, 1930)

MATERIAL. **I** – 14.VI 2013, 4 ♂, 3 ♀ (AS, GMW, JS, MPZ).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57). Flower visiting on *Caltha membranacea*, *Swida alba*.

98. *Cheilosia (Cheilosia) gigantea* (Zetterstedt, 1838)

MATERIAL. **V** – 16.VII 1998, 7 ♂, 16 ♀ (VM).

99. *Cheilosia (Cheilosia) impressa* Loew, 1840

MATERIAL. **I** – 14.VI 2013, 2 ♂, 3 ♀ (SB, VM, WvS); **II** – 14.VI 2013, 1 ♂ (XM); **III** – 15.VI 2013, 3 ♂, 3 ♀ (AS, CP, JvS, MPZ); **V** – 16.VII 1998, 3 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Sorbaria sorbifolia*.

100. *Cheilosia (Cheilosia) mutabilis* (Fallén, 1817)

MATERIAL. **V** – 30.VI 1991, 1 ♀ (VM).

101. *Cheilosia (Cheilosia) occulta* Barkalov, 1988

MATERIAL. **II** – 14.VI 2013, 1 ♂ (XM).

102. *Cheilosia (Cheilosia) pagana* (Meigen, 1822)

MATERIAL. **I** – 17.VII 2012, 21.V 2014, 27-28.V 2015, 3 ♂, 6 ♀ (VM); 14.VI 2013, 4 ♀ (JvS, XM); **III** – 15.VI 2013, 1 ♀ (JvS); **IV** – 16.VI 2013, 1 ♂, 1 ♀ (CP, WvS); **V** – 14-26.VI 1990, 14-18.VII 1998, 19 ♂, 7 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 31). Flower visiting on *Caltha membranacea*, *Potentilla ancerina*, *P. fragarioides*, *Salix bebbiana* and *Taraxacum* sp.

103. *Cheilosia (Cheilosia) pollinata* Barkalov, 1982

MATERIAL. **I** – 14.VI 2013, 2 ♀ (TZ, WvS).

104. *Cheilosia (Cheilosia) primoriensis* Barkalov, 1990

MATERIAL. **I** – 14.VI 2013, 1 ♂, 2 ♀ (AS, MPZ, WvS); 21-22.V 2014, 2 ♂, 1 ♀ (VM); **II** – 14.VI 2013, 6 ♂ (CP, XM); **III** – 15.VI 2013, 3 ♂, 9 ♀ (MPZ, SB, WvS, XM); **IV** – 16.VI 2013, 1 ♀ (GWM); **V** – 30.VI 1991, 16.VII 1998, 4 ♀ (VM).

NOTES. Females of this species don't differ from females of *C. occulta* Barkalov, 1988. Because *C. primoriensis* is the most abundant species in the male sex, we list all females here. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 31). Flower visiting on *Caltha membranacea* and *Potentilla fragarioides*.

105. *Cheilosia (Cheilosia) reniformis* (Hellen, 1930)

MATERIAL. I – 20-21.V 2014, 2 ♂, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 31). Flower visiting on *Caltha membranacea* and *Potentilla fragarioides*.

106. *Cheilosia (Cheilosia) richterae* Barkalov, 2007

MATERIAL. I – 22.V 2014, 1 ♂ (VM).

NOTES. This species is similar to *C. annulifemur* and it is possible that previous authors could mistakenly determine some specimens as *C. annulifemur* from other parts of the Southern Russian Far East.

107. *Cheilosia (Cheilosia) rufimana* Becker, 1894

MATERIAL. III – 15.VI 2013, 2 ♀ (AS, VM).

NOTES. This species is a new find for the Far Eastern fauna.

108. *Cheilosia (Cheilosia) sapporensis* (Shiraki, 1930)

MATERIAL. I – 21-22.V 2014, 1 ♂, 1 ♀ (VM); IV – 16.VI 2013, 1 ♀ (XM); V – 14.VI 1990, 1 ♂ (VM).

109. *Cheilosia (Cheilosia) sichotana* (Stackelberg, 1930)

MATERIAL. I – 14.VI 2013, 3 ♀ (CP, VM, WvS); 22.V 2014, 27.V 2015, 2 ♂ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 31). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Taraxacum* sp.

110. *Cheilosia (Cheilosia) urbana* (Meigen 1822)

MATERIAL. I – 21.V 2014, 2 ♂ (VM); 18 ♀, III – 15.VI 2013 (AS, JvS, MPZ, SB, VM, WvS, XM); IV – 16.VI 2013, 2 ♀ (WvS, XM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 31). Flower visiting on *Caltha membranacea* and *Salix bebbiana*.

111. *Cheilosia (Cheilosia) velutina* Loew, 1840

MATERIAL. III – 15.VI 2013, 1 ♀ (GMW); V – 14-18.VII 1998, 8 ♂, 10 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Sorbaria sorbifolia*.

112. *Cheilosia (Cheilosia) vernalis* Fallén, 1817

MATERIAL. IV – 16.VI 2013, 1 ♂ (SB); V – 29.VI 1990, 16-18.VII 1998, 4 ♂, 3 ♀ (VM).

113. *Cheilosia (Eucartosyrphus) lugubris* Zetterstedt, 1838

MATERIAL. I – 21.V 2014, 1 ♂ (VM); III – 15.VI 2013, 1 ♀ (CP).

NOTES. Recorded from Tumnin River basin as *Cheilosia (Eucartosyrphus) angustigena* (Becker, 1894) (Mutin, 2012b: 33). Flower visiting on *Prunus padus*.

114. *Cheilosia (Eucartosyrphus) flavissima* Becker, 1894  
 MATERIAL. I – 21.VII 2012, 1 ♂ (VM); 14.VI 2013, 4 ♂ (AS, JvS, WvS); III – 15.VI 2013, 1 ♀ (GMW).  
 NOTES. Flower visiting on *Sorbaria sorbifolia*.
115. *Cheilosia (Eucartosyrphus) longula* (Zetterstedt, 1838)  
 MATERIAL. I – 17-22.VII 2012, 5 ♂, 27 ♀ (VM); 14.VI 2013, 1 ♀ (WvS); II – 15.VI 2013, 1 ♂ (JS); V – 16.VII 1998, 4 ♂ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Calendula officinalis*, *Aster novi-belgii* and *Solidago canadensis*. The specimen collected at site II was hilltopping.
116. *Cheilosia (Eucartosyrphus) nuda* (Shiraki, 1930)  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 460).
117. *Cheilosia (Eucartosyrphus) posjetica* Barkalov, 1981  
 MATERIAL. II – 14.VI 2013, 5 ♂ (CP, JvS, XM).
118. *Cheilosia (Eucartosyrphus) scutellata* (Fallén, 1817)  
 MATERIAL. I – 14.VI 2013, 3 ♂, 1 ♀ (GMW, MPZ).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47).
119. *Cheilosia (Eucartosyrphus) zinovievi* Stackelberg, 1963  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 32). Flower visiting on *Taraxacum* sp.
120. *Cheilosia (Floccocheila) motodomariensis* Matsumura, 1916  
 MATERIAL. I – 17.VII 2012, 1 ♂ (VM); V – 14-18.VII 1998, 8 ♂, 5 ♀ (VM).
121. *Cheilosia (Neocheilosia) convexifrons* Stackelberg, 1963  
 MATERIAL. I – 14.VI 2013, 1 ♂ (JvS); 27.V 2015, 1 ♂, 6 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 57; Mutin, 2012b: 32). Flower visiting on *Caltha membranacea* and *Salix bebbiana*.
122. *Cheilosia (Neocheilosia) mutini* Barkalov, 1984  
 MATERIAL. I – 2.VI 2011, 22.V 2014, 2 ♀ (VM).
123. *Cheilosia (Taeniocheilosia) nigripes* (Meigen, 1822)  
 MATERIAL. I – 14.VI 2013, 3 ♂, 2 ♀ (AS, GMW, MPZ, WvS, XM); II – 14.VI 2013, 1 ♂ (XM).
124. *Ferdinandea ruficornis* (Fabricius, 1775)  
 MATERIAL. I – 14.VI 2013, 1 ♂ (SB); II – 14.VI 2013, 2 ♂ (XM); 15.VI 2013, 1 ♂ (JS).  
 NOTES. The specimens collected at site II were hilltopping.
125. *Rhingia campestris* Meigen, 1822  
 MATERIAL. V – 14.VI 1990, 1 ♂, 1 ♀ (VM).

126. *Rhingia borealis* Ringdahl, 1928  
MATERIAL. IV – 16.VI 2013, 1 ♂ (CP).

#### Tribe Volucellini

127. *Volucella bombylans* (Linnaeus, 1758)  
MATERIAL. III – 15.VI 2013, 1 ♀ (XM).

128. *Volucella pellucens tabanoides* Motschulsky, 1859  
NOTES. The Far Eastern subspecies is *V. p. tabanoides*. It differs distinctly from the nominative subspecies by external characters as well as characters of the male genitalia. The status of this subspecies should be re-examined. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 47). Flower visiting on *Aster novi-belgii*.

#### Subfamily Microdontinae

##### Tribe Microdontini

129. *Microdon analis* (Macquart, 1842)  
MATERIAL. II – 14.VI 2013, 1 ♂ (XM); III – 15.VI 2013, 1 ♀ (VM).
130. *Microdon miki* Doczkal et Schmid, 1999  
MATERIAL. I – 14.VI 2013, 1 ♀ (AS); III – 15.VI 2013, 3♂, 1 ♀ (AS).  
NOTES. Common species in the Amurland (southern part of the Russian Far East).

#### Subfamily Pipizinae

131. *Cryptopipiza notabilis* (Violovitsh, 1985)  
MATERIAL. I – 14.VI 2013, 1 ♂ (WvS).  
NOTES. In Amurland this species prefers to visit blooming wild roses; sometimes it forms large aggregations.
132. *Neocnemodon brevidens* (Egger, 1865)  
MATERIAL. III – 15.VI 2013, 1 ♂ (XM).
133. *Neocnemodon pubescens* (Delucchi et Pschorn-Walcher, 1955)  
MATERIAL. I – 14.VI 2013, 2 ♂ (WvS).  
NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 30). Flower visiting on *Caltha membranacea*, *Potentilla fragarioides* and *Prunus padus*.
134. *Neocnemodon verrucula* (Collin, 1931)  
MATERIAL. I – 14.VI 2013, 1 ♀ (AS); 21.V 2014, 27-28.V 2015, 8 ♂ (VM).  
NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 30). Common visitor of blooming *Salix bebbiana*. Later flower visiting on *Caltha membranacea*, *Potentilla fragarioides* and *Swida alba*.
135. *Neocnemodon vitripennis* (Meigen, 1822)  
MATERIAL. I – 14.VI 2013, 5 ♂ (WvS, TZ, VM); 20-21.V 2014, 2 ♂ (VM); III – 15.VI 2013, 1 ♂ (MPZ).



NOTES. In the Far East this species has variable vestiture of the body and wing membrane. There are specimens with a pale pilose scutum and trichose first basal cell as well as specimens with mainly dark pilose scutum and extensively bare membrane of first basal cell. The use of these characters is not always diagnostic of this species to separate it from *Neocnemodon larusi* Vujić, 1999. Thus, we use only the name *N. vitripennis* for the males with a specific form of postanal lamella (Vujić, 1999). Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 30). Flower visiting on *Caltha membranacea* and *Potentilla fragarioides*.

136. ***Pipiza accola* Violovitsh, 1985**

MATERIAL. **III** – 15.VI 2013, 1 ♀ (CP).

NOTES. Females of this species and *P. aurea* Violovich, 1985 are difficult to distinguish, but the presence of the latter is less likely as it is known only in southern part of Primorskii krai.

137. ***Pipiza bimaculata* Meigen, 1822**

MATERIAL. **I** – 14.VI 2013, 1 ♂, 1 ♀ (WvS); 22.V 2014, 1 ♂ (VM); **III** – 15.VI 2013, 1 ♀ (TZ).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45).

138. ***Pipiza convexifrons* Violovitsh, 1985**

MATERIAL. **I** – 14.VI 2013, 2 ♀ (JvS); **III** – 15.VI 2013, 1 ♀ (SB).

139. ***Pipiza quadrimaculata* (Panzer, 1804)**

*Syrphus quadrimaculata* Panzer, [1804]: 19 (type-locality: “Germania”).

*Pipiza mutini* Violovitsh, 1985: 204 (holotype – male, type-locality: Russian Far East, Sikhote-Alin, 30 km north of the Ternei Village); **syn. n.**

MATERIAL. **I** – 17.VII 2012, 21-22.V 2014, 3 ♀ (VM); 14.VI 2013, 4 ♂, 21 ♀ (AS, CP, JvS, MPZ, SB, VM, WvS, XM); **II** – 14.VI 2013, 1 ♂, 8 ♀ (CP, XM); **III** – 15.VI 2013, 1 ♀ (XM).

NOTES. This species is characterized by variable coloration of body pile as well as the shape and size of pale maculae on abdominal tergites. We compared the holotype of *Pipiza mutini* Violovitsh, 1985 with many males of *P. quadrimaculata* collected in Europe, Siberia and the Russian Far East and found them to be identical. Thus, we confirm the previously expressed opinion (Mutin, 2002) that *Pipiza mutini* Violovitsh, 1985 is a junior synonym of *Pipiza quadrimaculata* (Panzer, 1804). Among examined specimens of *P. quadrimaculata* from the environs of Tumnin Spa there are a male and females with mostly pale pubescence. This species was recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 31). Common visitor of blooming *Caltha membranacea*. Flower visiting was also observed on *Spiraea* sp.

140. ***Pipizella viduata* (Linnaeus, 1758)**

MATERIAL. **I** – 14.VI 2013, 1 ♂, 2 ♀ (SB, WvS); **III** – 15.VI 2013, 1 ♂, 3 ♀ (CP, TZ, WvS, XM).

NOTES. This species is the only member of the genus confirmed from the fauna of Lower Amurland and boreal forests of the Far East where females have been collected by other collectors. It should be critically compared to *Pipizella nartshukae* Kuznetsov, 1990.

141. *Trichopsomyia flavitarsis* (Meigen, 1822)

MATERIAL. I – 14.VI 2013, 2 ♀ (WvS).

142. *Triglyphus primus* Loew, 1840

MATERIAL. III – 15.VI 2013, 9 ♂ (CP, JvS, SB, WvS, XM).

**Subfamily Syrphinae**

**Tribe Bacchini**

143. *Baccha elongata* (Fabricius, 1775)

MATERIAL. I – 14.VI 2013, 1 ♂ (VM).

144. *Baccha maculata* Walker, 1852

MATERIAL. I – 14.VI 2013, 2 ♂ (JS).

145. *Melanostoma boreomontanum* Mutin, 1986

MATERIAL. I – 14.VI 2013, 2 ♀ (CP); 22.V 2014, 1 ♂ (VM); II – 14.VI 2013, 1 ♂ (CP); III – 15.VI 2013, 2 ♂ (JvS, SB); IV – 16.VI 2013, 1 ♀ (WvS); V – 14.VI 1990, 3 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 29).

146. *Melanostoma mellinum* (Linnaeus, 1758)

MATERIAL. I – 14.VI 2013, 2 ♂, 3 ♀ (MPZ, SB, VM, XM); III – 15.VI 2013, 3 ♀ (AS); IV – 16.VI 2013, 3 ♂, 2 ♀ (AS, SB); V – 14.VI 1990, 2.VII 1991, 14-16.VII 1998, 3 ♂, 4 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Caltha membranacea*, *Potentilla* sp. and Graminae.

147. *Melanostoma orientale* (Wiedemann, 1824)

MATERIAL. I – 14-15.VI 2013, 4 ♂, 8 ♀ (AS, JvS, MPZ, SB, VM, WvS); III – 15.VI 2013, 1 ♀ (JvS); IV – 16.VI 2013, 1 ♀ (AS); V – 14.VI 1990, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 29).

148. *Melanostoma scalare* (Fabricius, 1794)

MATERIAL. I – 14.VI 2013, 3 ♀ (JvS, WvS); III – 15.VI 2013, 1 ♀ (CP); IV – 16.VI 2013, 31 ♂, 7 ♀ (AS, CP, GMW, WvS, XM); V – 14.VI 1990, 4 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 29). Flower visiting on *Potentilla* sp. and *Caltha membranacea*.

149. *Platycheirus albimanus* (Fabricius, 1781)

MATERIAL. I – 14.VI 2013, 1 ♂ (SB); IV – 16.VI 2013, 1 ♀ (XM).

150. *Platycheirus angustatus* (Zetterstedt, 1843)

MATERIAL. I – 17.VII 2012, 1 ♀ (VM); III – 15.VI 2013, 1 ♂ (VM); V – 14.VI 1990, 14.VII 1998, 2 ♂ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46).

151. *Platycheirus ciliatus* Bigot, 1884  
 MATERIAL. II – 14.VI 2013, 1 ♂ (XM).
152. *Platycheirus clypeatus* (Meigen, 1822)  
 MATERIAL. I – 14.VI 2013, 2 ♂, 5 ♀ (AS, MPZ, WvS); 1 ♀, 22.VI 2014 (VM); II – 14.VI 2013, 1 ♀ (XM); V – 14.VI 1990, 7 ♂♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 30). Flower visiting on *Calamagrostis purpurea* (Trin.) Trin., *Carex* sp.
153. *Platycheirus discimanus* (Loew, 1871)  
 MATERIAL. I – 20-22.V 2014, 27-28.V 2015, 45 ♂, 22 ♀ (VM); IV – 16.VI 2013, 3 ♂ (AS, XM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 30). Flower visiting on *Caltha membranacea*, *Prunus padus*, *Potentilla fragarioides*, *Taraxacum* sp. and *Salix bebbiana*.
154. *Platycheirus europaeus* Goeldlin, Maibach et Speight, 1990  
 MATERIAL. I – 14-15.VI 2013, 15 ♂, 19 ♀ (AS, CP, JvS, MPZ, SB, VM, WvS, XM); III – 15.VI 2013, 3 ♂ (CP, GMW, JvS).  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 30).
155. *Platycheirus immaculatus* Óhara, 1980  
 MATERIAL. I – 14.VI 2013, 1 ♀ (JvS); I – 21-22.V 2014, 12 ♂, 1 ♀ (VM); III – 15.VI 2013, 1 ♀ (WvS).  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 30). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Potentilla fragarioides*.
156. *Platycheirus jakuticus* Violovitsh, 1978  
 MATERIAL. II – 14.VI 2013, 1 ♂ (CP), 15.VI 2013, 1 ♂ (JS); IV – 16.VI 2013, 1 ♂, 2 ♀ (GMW, SB).  
 NOTES. Specimens collected at site II were hilltopping.
157. *Platycheirus latimanus* Wahlberg, 1844  
 MATERIAL. I – 14.VI 2013, 1 ♂ (WvS).
158. *Platycheirus peltatus* (Meigen, 1822)  
 MATERIAL. I – 14-15.VI 2013, 13 ♂, 4 ♀ (AS, CP, SB, WvS, XM); II – 14.VI 2013, 2 ♂ (XM); III – 15.VI 2013, 1 ♂ (JvS); IV – 16.VI 2013, 1 ♀ (GMW).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 30).
159. *Platycheirus podagratus* (Zetterstedt, 1838)  
 MATERIAL. I – 14.VI 2013, 6 ♂, 1 ♀ (AS, CP, SB).  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 30).
160. *Platycheirus pulcherum* Mutin, 1999  
 NOTES. Recorded from Tumnin River basin (Mutin, 2012b). Flower visiting on *Caltha membranacea*. This species is very similar to *Platycheirus jakuticus* Violovitsh, 1978, except for the shiny face.

161. *Platycheirus scambus* (Staeger, 1843)

MATERIAL. **III** – 15.VI 2013, 1 ♂ (WvS).

162. *Platycheirus* aff. *scutatus* (Meigen, 1822)

MATERIAL. **I** – 17.VII 2012, 1 ♂ (JvM); 14.VI 2013, 1 ♂, 3 ♀ (SB, WvS).

NOTES. This species is similar to *P. aurolateralis* Stubbs, 2002 by pale maculae on the abdominal tergites and similar facial vestiture. It differs from *P. sibiricus* Barkalov and Nielsen, 2007 primarily by the presence of pale pile on face. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 30). Flower visiting on *Salix bebbiana*.

163. *Xanthandrus comtus* (Harris, 1780)

MATERIAL. **I** – 14.VI 2013, 1 ♀ (JvS); **II** – 15.VI 2013, 2 ♀ (JS); **III** – 15.VI 2013, 5 ♀ (AS, TZ, WvS, XM); **V** – 30.VI 1991, 1 ♀ (VM).

NOTES. Flower visiting on *Rosa amblyotis*.

### Tribe Paragini

164. *Paragus (Pandasyophthalmus) haemorrhous* Meigen, 1822

MATERIAL. **I** – 14.VI 2013, 2 ♀ (WvS); **III** – 15.VI 2013, 1 ♂ (SB).

165. *Paragus (Paragus) albifrons* (Fallén, 1817)

MATERIAL. **I** – 14-15.VI 2013, 2 ♂, 1 ♀ (XM).

NOTES. This is the first record of this species from the Russian Far East. Among specimens determined earlier by V. Mutin as *P. albifrons* (Mutin & Barkalov, 1999; Mutin, 2012a) there are only *Paragus pecchiolii* Rondani, 1857 and *P. mariae* Sorokina, 2003.

166. *Paragus (Paragus) pecchiolii* Rondani, 1857

MATERIAL. **III** – 15.VI 2013, 1 ♂, 1 ♀ (XM).

NOTES. This species was mistakenly identified as *P. albifrons* for the Russian Far East (Mutin & Barkalov, 1999; Mutin, 2012a).

### Tribe Syrphini

167. *Asarkina porcina* (Coquillett, 1898)

MATERIAL. **II** – 15.VI 2013, 1 ♂ (JS).

168. *Betasyrphus nipponensis* (van der Goot, 1964)

MATERIAL. **I** – 14.VI 2013, 1 ♀ (CP).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45). Flower visiting on *Aster novi-belgii*.

169. *Chrysotoxum biguttatum* Matsumura, 1911

MATERIAL. **I** – 14.VI 2013, 3 ♂, 1 ♀ (JvS, SB, XM).

170. *Chrysotoxum fasciolatum* (De Geer, 1776)

MATERIAL. **I** – 14.VI 2013, 1 ♂ (AS).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45). Flower visiting on *Swida alba*.

171. *Dasysyrphus hilaris* Zetterstedt, 1843

MATERIAL. **I** – 14.VI 2013, 2 ♂, 3 ♀ (JS, JvS, SB, VM); **II** – 14.VI 2013, 1 ♂, 2 ♀ (JS, XM); **V** – 26-30.VI 1991 1 ♂, 3 ♀ (VM).

172. *Dasysyrphus lenensis* Bagatshanova, 1980

MATERIAL. **I** – 21-22.V 2014, 16 ♂, 4 ♀ (VM); **II** – 15.VI 2013, 3 ♂ (JS).

NOTES. We are using this name to conform to Mutin & Barkalov (1999). However, there are different opinions about the status of *Dasysyrphus lenensis* Bagatshanova, 1980 (Barkalov, 2007; Speight, 2011) and there is a necessity to revise, at the very least, the *Dasysyrphus pinastri* (De Geer, 1776) species group. This species was recorded from Tumnin River basin as *Dasysyrphus nigricornis* (Mutin & Bogunova, 2010: 55; Mutin, 2012b: 27). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Potentilla fragarioides*. Specimens collected at site II were hilltopping.

173. *Dasysyrphus postclaviger* Štys et Moucha, 1962

MATERIAL. **I** – 14.VI 2013, 1 ♀ (XM); **II** – 14.VI 2013, 1 ♀ (CP); **IV** – 16.VI 2013, 1 ♂ (CP).

174. *Dasysyrphus tricinctus* (Fallén, 1817)

MATERIAL. **I** – 14.VI 2013, 2 ♂ (JvS); **II** – 15.VI 2013, 1 ♂ (JS).

NOTES. The specimen collected at site II was hilltopping.

175. *Dasysyrphus venustus* (Meigen, 1822)

MATERIAL. **I** – 14.VI 2013, 11 ♂, 17 ♀ (AS, CP, GMW, JvS, MPZ, SB, TZ, VM, WvS); 20-22.V 2014, 28.V 2015, 12 ♂, 9 ♀ (VM); **II** – 14.VI 2013, 1 ♂ (CP); **III** – 15.VI 2013, 2 ♂, 2 ♀ (JvS, MPZ, TZ, WvS); **IV** – 16.VI 2013, 2 ♂, 1 ♀ (SB). **V** – 16.VII 1998, 2 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 55; Mutin, 2012b: 27). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Salix bebbiana*.

176. *Didea alneti* (Fallén, 1817)

MATERIAL. **I** – 14.VI 2013, 1 ♂, 2 ♀ (AS, WvS).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45). Flower visiting on *Aster novi-belgii*.

177. *Didea fasciata* Macquart, 1834

MATERIAL. **I** – 22.VII 2012, 1 ♂ (VM); 14.VI 2013, 1 ♀ (SB).

178. *Epistrophe aino* (Matsumura, 1917)

MATERIAL. **I** – 14.VI 2013, 1 ♂ (SB)

179. *Epistrophe cryptica* Doczkal et Schmid, 1994

MATERIAL. **I** – 14.VI 2013, 2 ♀ (JvS, XM); **III** – 15.VI 2013, 20 ♀ (AS, CP, JvS, MPZ, SB, VM, WvS).

NOTES. Flower visiting on *Crataegus maximowiczii* and *Swida alba*.

180. *Epistrophe flava* Doczkal et Schmid, 1994

MATERIAL. **I** – 14.VI 2013, 1 ♀ (JvS); **II** – 14.VI 2013, 1 ♂ (XM); **III** – 15.VI 2013, 2 ♀ (MPZ).

181. *Epistrophe latifrons* Mutin, 1990  
 MATERIAL. I – 28.V 2015, 1 ♂ (VM).  
 NOTES. Flower visiting on *Salix bebbiana*.
182. *Epistrophe melanostoma* (Zetterstedt, 1843)  
 MATERIAL. I – 14.VI 2013, 1 ♀ (XM); III – 15.VI 2013, 1 ♀ (SB); V – 26, 30.VI 1991, 1 ♂, 1 ♀ (VM).
183. *Epistrophe nitidicollis* (Meigen, 1822)  
 MATERIAL. I – 14.VI 2013, 2 ♂ (MPZ); II – 15.VI 2013 3 ♂ (JS) ; III – 15.VI 2013 1 ♀ (JvS).  
 NOTES. All specimens at site II were hilltopping.
184. *Epistrophe obscuripes* (Strobl, 1910)  
 MATERIAL. I – 14.VI 2013, 1 ♂ (JvS); III – 15.VI 2013, 4 ♀ (MPZ, WvS).
185. *Epistrophe ochrostoma* (Zetterstedt, 1849)  
 MATERIAL. I – 14.VI 2013, 1 ♂ (MPZ); III – 15.VI 2013, 1 ♂ (AS).  
 NOTES. Flower visiting on *Swida alba*.
186. *Epistrophe olgae* Mutin, 1990  
 MATERIAL. II – 14.VI 2013, 1 ♂ (XM).
187. *Episyrphus balteatus* (De Geer, 1776)  
 MATERIAL. I – 18, 21.VII 2012, 27-28.V 2015, 1 ♂, 4 ♀ (VM); 14.VI 2013, 2 ♂, 16 ♀ (AS, CP, GMW, JvS, WvS, XM); III – 15.VI 2013, 3 ♀ (XM, AS); II – 15.VI 2013, 1 ♀ (JS); V – 16.VII 1998, 2 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45; Mutin, 2012b: 28). Flower visiting on *Caltha membranacea*, *Prunus padus*, *Salix bebbiana* and *Sorbaria sorbifolia*.
188. *Eriozona syrphoides* (Fallén, 1817)  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45). Flower visiting on *Aster novi-belgii*.
189. *Eupeodes bucculatus* (Rondani, 1857)  
 MATERIAL. I – 22.VII 2012, 1 ♂ (VM); 14.VI 2013, 1 ♀ (JvS).
190. *Eupeodes corollae* (Fabricius, 1794)  
 MATERIAL. I – 14.VI 2013, 2 ♀ (WvS, XM); IV – 16.VI 2013, 3 ♂ (AS, CP, SB).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45; Mutin, 2012b: 28). Flower visiting on *Aster novi-belgii*, *Potentilla fragarioides* and *Taraxacum* sp.
191. *Eupeodes latifasciatus* (Macquart, 1829)  
 MATERIAL. I – 14.VI 2013, 1 ♀ (WvS); III – 15.VI 2013, 1 ♀ (GMW).
192. *Eupeodes lundbecki* (Soot-Ryen, 1946)  
 MATERIAL. I – 14.VI 2013, 1 ♀ (WvS); III – 15.VI 2013, 1 ♀ (WvS).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46).

193. *Eupeodes nielseni* (Dušek et Láška, 1976)  
 MATERIAL. I – 14.VI 2013, 1 ♂, 2 ♀ (SB, AS).
194. *Eupeodes nitens* (Zetterstedt, 1843)  
 MATERIAL. I – 14.VI 2013, 4 ♂, 4 ♀ (CP, JvS, SB).  
 NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 55; Mutin, 2012b: 28). Flower visiting on *Taraxacum* sp.
195. *Lapposyrphus lapponicus* (Zetterstedt, 1838)  
 MATERIAL. I – 14.VI 2013, 1 ♂, 9 ♀ (AS, MPZ, SB, VM, WvS); 21-22.V 2014, 27.V 2015, 6 ♀ (VM); II – 14.VI 2013, 1 ♂, 2 ♀ (CP, XM); III – 15.VI 2013, 1 ♂, 3 ♀ (AS, CP, SB, XM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 28). Flower visiting on *Aster novi-belgii*, *Salix bebbiana* and *Swida alba*.
196. *Leucozona inopinata* Doczkal, 2000  
 MATERIAL. I – 14.VI 2013, 1 ♂ (TZ).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46).
197. *Leucozona lucorum* (Linnaeus, 1758)  
 MATERIAL. I – 14.VI 2013, 1 ♂ (WvS).
198. *Leucozona glaucia* (Linnaeus, 1758)  
 MATERIAL. I – 18.VII 2012, 1 ♀ (VM); V – 16.VII 1998, 1 ♀ (VM).
199. *Leucozona laternaria* (Müller, 1776)  
 MATERIAL. I – 19.VII 2012, 1 ♂ (VM).
200. *Megasyrphus erratica* (Linnaeus, 1758)  
 MATERIAL. I – 14.VI 2013, 2 ♀ (AS, WvS).  
 NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 45). Flower visiting on *Aster novi-belgii* and *Spiraea* sp.
201. *Melangyna barbifrons* (Fallén, 1817)  
 MATERIAL. I – 21.V 2014, 27-28.V 2015, 22 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56). Flower visiting on *Caltha membranacea* and *Salix bebbiana*.
202. *Melangyna compositarum* (Verrall, 1873)  
 MATERIAL. I – 21-22.VII 2012, 22.V 2014, 2 ♂, 2 ♀, (VM); V – 14.VII 1998, 1 ♂ (VM).
203. *Melangyna lasiophthalma* (Zetterstedt, 1843)  
 MATERIAL. I – 27-28.V 2015, 3 ♂, 2 ♀ (VM); V – 30.VI 1991, 1 ♀ (VM).  
 NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56). Flower visiting on *Salix bebbiana*.
204. *Melangyna lucifera* Nielsen, 1980  
 MATERIAL. I – 21.V 2014, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56). Flower visiting on *Salix bebbiana*.

205. ***Melangyna motodomariensis* (Matsumura, 1917)**

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Aster novi-belgii* and *Calendula officinalis*.

206. ***Melangyna olsuffevi* (Violovitsh, 1956)**

MATERIAL. **I** – 22.V 2014, 27.V 2015, 3 ♀ (VM).

NOTES. Flower visiting on *Salix bebbiana*.

207. ***Melangyna pavlovskiy* (Violovitsh, 1956)**

MATERIAL. **I** – 27.V 2015, 3 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56). Flower visiting on *Salix bebbiana*.

208. ***Melangyna quadrimaculata* (Verrall, 1873)**

MATERIAL. **I** – 27.V 2015, 1 ♀ (VM).

NOTES. Flower visiting on *Salix bebbiana*.

209. ***Melangyna umbellatarum* (Fabricius, 1794)**

MATERIAL. **I** – 14.VI 2013, 1 ♀ (AS).

NOTES. Flower visiting on *Spiraea* sp.

210. ***Meligramma cingulata* (Egger, 1860)**

MATERIAL. **I** – 14.VI 2013, 2 ♀ (JvS, WvS); 21-22.V 2014, 10 ♂, 12 ♀ (VM); **II** – 14.VI 2013, 1 ♀ (CP); **III** – 15.VI 2013, 1 ♀ (WvS).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 28). Flower visiting on *Prunus padus* and *Potentilla fragarioides*.

211. ***Meligramma triangulifera* (Zetterstedt, 1843)**

MATERIAL. **I** – 14.VI 2013, 3 ♀ (WvS); **III** – 15.VI 2013, 2 ♀ (AS, JvS).

NOTES. Flower visiting on *Swida alba*.

212. ***Meliscaeva cinctella* (Zetterstedt, 1843)**

MATERIAL. **I** – 14.VI 2013, 2 ♂, 1 ♀ (JvS, MPZ, SB); **II** – 14.VI 2013, 2 ♂ (XM); **IV** – 16.VI 2013, 2 ♂ (XM); **V** – 14, 16.VII 1998, 2 ♂, 4 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 28). Flower visiting on *Aster novi-belgii* and *Prunus padus*.

213. ***Parasyrphus annulatus* Zetterstedt, 1838**

MATERIAL. **I** – 14-15.VI 2013, 39 ♂, 17 ♀ (AS, CP, GMW, JvS, MPZ, SB, WvS); **II** – 14.VI 2013, 2 ♂, 2 ♀ (XM); 2 ♂, 7 ♀, **III** – 15.VI 2013 (AS, GMW, JvS, MPZ, SB, WvS, XM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Aster novi-belgii*, *Crataegus maximowiczii*, *Solidago canadensis* and *Swida alba*.

214. ***Parasyrphus iridae* Mutin, 1987**

MATERIAL. **I** – 28.V 2015, 2 ♀ (VM).

Flower visiting on *Salix bebbiana*.



215. *Parasyrphus lineolus* (Zetterstedt, 1843)

MATERIAL. **I** – 14.VI 2013, 2 ♂, 2 ♀ (JvS, SB); 20.V 2014, 1 ♀ (VM); **III** – 15.VI 2013, 1 ♀ (GMW).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Aster novi-belgii*.

216. *Parasyrphus macularis* (Zetterstedt, 1843)

MATERIAL. **I** – 14.VI 2013, 3 ♂, 1 ♀ (MPZ); 20-22.V 2014, 28.05 2015, 12 ♂, 3 ♀ (VM); **II** – 14.VI 2013, 2 ♂ (XM), 15.VI 2013, 11 ♂ (JS).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 28). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Salix bebbiana*. All specimens at site II were hilltopping.

217. *Parasyrphus malinellus* (Collin, 1952)

MATERIAL. **I** – 14.VI 2013, 2 ♂, 4 ♀ (GMW, MPZ, WvS); 20-22.V 2014, 6 ♂, 3 ♀ (VM); **II** – 14.VI 2013, 1 ♀ (XM); **III** – 15.VI 2013, 4 ♀ (GMW, MPZ, XM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 28). Flower visiting on *Caltha membranacea*, *Potentilla fragarioides* and *Salix bebbiana*.

218. *Parasyrphus nigrirarsis* (Zetterstedt, 1843)

MATERIAL. **I** – 14.VI 2013, 7 ♂, 2 ♀ (CP, MPZ, SB, WvS); 22.V 2014, 1 ♂ (VM); **II** – 14.VI 2013, 1 ♂ (XM), 15.VI 2013, 4 ♂ (JS); **III** – 15.VI 2013, 1 ♀ (WvS); **IV** – 16.VI 2013, 5 ♂, 1 ♀ (AS, CP, SB, VM, XM).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 28). Flower visiting on *Caltha membranacea*, *Prunus padus*, *Potentilla fragarioides* and *Taraxacum* sp. All specimens at site II were hilltopping.

219. *Parasyrphus proximus* Mutin, 1990

MATERIAL. **I** – 21-22.V 2014, 28.V 2015, 4 ♀ (VM); **III** – 15.VI 2013, 1 ♀ (MPZ).

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 28). Flower visiting on *Caltha membranacea*, *Prunus padus* and *Salix bebbiana*.

220. *Parasyrphus punctulatus* (Verrall, 1873)

MATERIAL. **I** – 14.VI 2013, 2 ♂, 6 ♀ (GMW, JvS, MPZ, WvS, XM); 20-22.V 2014, 27-28.V 2015, 100 ♂, 54 ♀ (VM); **II** – 14.VI 2013, 1 ♀ (CP); **III** – 15.VI 2013, 2 ♀ (AS, CP); **V** – 16.VII 1998, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 29). Flower visiting on *Crataegus maximowiczii*, *Prunus padus*, *Potentilla fragarioides* and *Salix bebbiana*.

221. *Sphaerophoria abbreviata* Zetterstedt, 1859

MATERIAL. **IV** – 16.VI 2013, 1 ♂ (AS).

NOTES. Flower visiting on *Taraxacum* sp.

222. *Sphaerophoria chongjini* Bankowska, 1964

MATERIAL. **III** – 15.VI 2013, 6 ♂ (AS, JvS, WvS); **V** – 14.VI 1990, 1 ♂ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Bogunova, 2010: 56; Mutin, 2012b: 29). Flower visiting on *Potentilla fragarioides*.

223. *Sphaerophoria indiana* Bigot, 1884

MATERIAL. **I** – 14.VI 2013, 5 ♂ (AS, WvS, XM); 22.V 2014, 1 ♂ (VM); **III** – 15.VI 2013, 2 ♂ (CP, JvS); **IV** – 16.VI 2013, 2 ♂ (SB, XM); **V** – 14.VI 1990, 16.07 1998, 8 ♂, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Swida alba* and *Taraxacum* sp.

224. *Sphaerophoria macrogaster* (Thomson, 1869)

MATERIAL. **V** – 14.VI 1990, 1 ♂ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46).

225. *Sphaerophoria pallidula* Mutin, 1999

MATERIAL. **I** – 14.VI 2013, 2 ♂ (SB).

226. *Sphaerophoria potentillae* Claussen, 1984

NOTES. Recorded from Tumnin River basin (Mutin, 2012b: 29).

227. *Sphaerophoria scripta* (Linnaeus, 1758)

MATERIAL. **I** – 14.VI 2013, 4 ♀ (WvS, XM); **III** – 15.VI 2013, 1 ♀ (AS); **IV** – 16.VI 2013, 1 ♀ (AS); **V** – 14.VI 1990, 2 ♂ (VM).

NOTES. Flower visiting on *Potentilla anserina*, *Swida alba* and *Taraxacum* sp. In Khabarovskii krai (Russian Far East) the species inhabits only landscapes modified by human activity, mainly settlements and agricultural systems.

228. *Sphaerophoria shirchan* Violovitsh, 1957

MATERIAL. **I** – 14.VI 2013, 5 ♂, 2 ♀ (SB, WvS); 28.V 2015, 1 ♂ (VM); **II** – 15.VI 2013, 3 ♂ (JS); **III** – 15.VI 2013, 1 ♀ (GMW).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Potentilla fragarioides*, *Salix bebbiana* and *Taraxacum* sp. Specimens collected at site II were hilltopping.

229. *Sphaerophoria taeniata* (Meigen, 1822)

MATERIAL. **I** – 14.VI 2013, 4 ♂ (WvS); **III** – 15.VI 2013, 1 ♂ (XM).

230. *Sphaerophoria tuvinica* Violovitsh, 1966

MATERIAL. **III** – 15.VI 2013, 1 ♂ (CP).

231. *Syrphus admirandus* Goeldlin, 1996

MATERIAL. **I** – 14.VI 2013, 29 ♂, 16 ♀ (AS, CP, GMW, JvS, MPZ, SB, VM, WvS, XM); **II** – 14.VI 2013, 2 ♂, 2 ♀ (CP, XM); **III** – 15.VI 2013, 12 ♂, 15 ♀ (AS, CP, GMW, JvS, MPZ, VM, WvS, XM); **IV** – 16.VI 2013, 1 ♂ (AS).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46). Flower visiting on *Aster novi-belgii*, *Potentilla fragarioides* and *Swida alba*.

232. *Syrphus annulifemur* Mutin, 1997

MATERIAL. **I** – 14.VI 2013, 1 ♂, 2 ♀ (GMW, WvS); 21.V 2014, 28.V 2015, 2 ♂, 1 ♀ (VM); **III** – 15.VI 2013, 1 ♀ (SB).

NOTES. Flower visiting on *Salix bebbiana*.

233. *Syrphus ribesii* (Linnaeus, 1758)

MATERIAL. **I** – 17, 21.VII 2012, 20.V 2014, 2 ♂, 1 ♀ (VM); 14.VI 2013, 41 ♂, 10 ♀ (AS, CP, GMW, JvS, MPZ, SB, VM, WvS, XM); **II** – 14.VI 2013, 2 ♂, 1 ♀ (XM); **III** – 15.VI 2013, 4 ♂, 3 ♀ (AS, GMW, SB, WvS); **IV** – 16.VI 2013, 1 ♂ (XM); **V** – 30.vi-2.VII 1991, 3 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Aster novi-belgii*, *Caltha membranacea*, *Crataegus maximo-wiczii* and *Swida alba*.

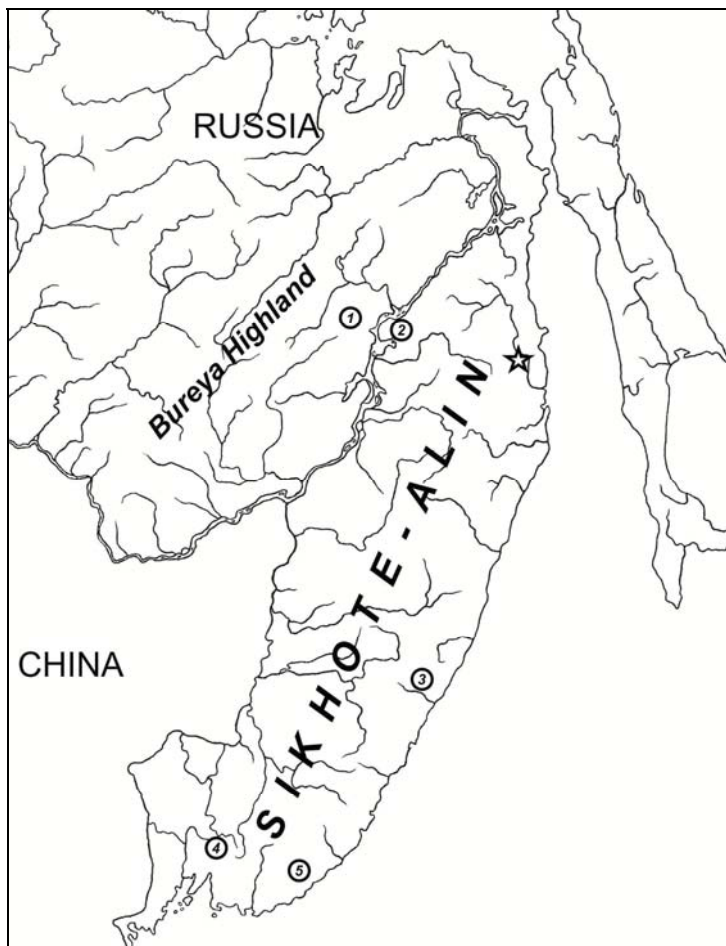


Fig. 1. A map of Sikhote-Alin with symbols of local syrphid faunas use for comparative analysis: star – Tumnin River basin (North-Eastern Sikhote-Alin), 1 – Myaochan Mountains (eastern fringe of the Bureya Highland); 2 – environs of Pivan Village (North-Western Sikhote-Alin); 3 – the Sikhote-Alin Reserve (Middle Sikhote-Alin); 4 – the Ussuri Reserve (South-Western Sikhote-Alin); 5 – the Lazovskii Reserve (South-Eastern Sikhote-Alin).

234. *Syrphus torvus* Osten Sacken, 1875

MATERIAL. I – 14.VI 2013, 3 ♂, 1 ♀ (GMW, XM); 28.V 2015, 1 ♀ (VM); V – 30.VI 1991, 1 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Aster novi-belgii*, *Caltha membranacea* and *Salix bebbiana*.

235. *Syrphus vitripennis* Meigen, 1822

MATERIAL. I – 14.VI 2013, 1 ♂, 11 ♀ (CP, GMW, JvS, MPZ, VM, WvS, XM); III – 15.VI 2013, 1 ♂, 11 ♀ (AS, GMW, MPZ, TZ, XM); V – 26.VI 1990, 30.VI 1991, 2 ♀ (VM).

NOTES. Recorded from Tumnin River basin (Mutin & Syachina, 2007: 46; Mutin, 2012b: 29). Flower visiting on *Aster novi-belgii*, *Calendula officinalis* and *Caltha membranacea*.

236. *Xanthogramma laetum* (Fabricius, 1794)

MATERIAL. I – 14.VI 2013, 1 ♀ (GMW).

## DISCUSSION

So far 236 species have been recorded in the basin of the Tumnin River. They belong to 61 genera, 11 tribes and 4 subfamilies. Pipizinae are regarded as an independent subfamily, represented by 6 genera and 12 species. The subfamily Microdontinae, known for taxonomic diversity in the tropics, includes only 2 species of the nominative genus which is rather characteristic of a boreal fauna. In contrast, there are 8 species of the genus *Microdon* in the Southern Sikhote-Alin where nemoral forests dominate. On the other hand, the taxonomic dominance of the subfamily Eristalinae (128 species, 30 genera, 7 tribes) unites the investigated fauna with others of subboreal humid forests as does a smaller share of Syrphinae (94 species, 24 genera, 3 tribes).

The syrphid fauna of the investigated territory contains many local endemics, which are typical inhabitants of the mixed forest of Eastern Asia (*Blera japonica*, *Brachyopa maritima*, *B. violovitshi*, *Chalcosyrphus amurensis*, *Cheilosia sichotana*, *C. zinovievi*, *Criorhina alexandri*, *C. sichotana*, *C. ussuriana*, *Melangyna olsuffjevi*, *Neoascia amurensis*, *N. confusa*, *Sericomyia dux*, *Xylota filipjevi*). In contrast, other species are associated mainly with the boreal forests of Asia (*Blera nitens*, *B. violovitshi*, *B. yudini*, *Brachyopa pivanica*, *B. zhelochovtsevi*, *Platycheirus jakuticus*, *Xylota sichotana*). These records also provide a good indication of the overall syrphid fauna of the East macroslope of Northern Sikhote-Alin Mountain area.

Using our findings and data about syrphids from other local faunas of the Sikhote-Alin (Mutin, 2012a), we compare species lists to establish the place of the investigated Tumnin River basin fauna among others of the wider mountain system (Fig. 1). The explored area, as a part of eastern macroslope of the Sikhote-Alin, together with the Pivan Village environs (western macroslope of the Sikhote-Alin) constitute the Northern Sikhote-Alin. However, the territory studied by us has a more maritime climate. The syrphid list of the Myaochan Mountains, as an eastern fringe of the Bureya Highland (Mutin, 2011), was included in the comparative analysis as a fauna

from an outside territory. The area has similar physiographic (ecological) characteristics to the Northern Sikhote-Alin. The cluster analysis shows that the syrphid fauna of the Tumnin River basin has a high similarity with the western part of the Northern Sikhote-Alin (Fig. 2). At the same time, the fauna of Northern Sikhote-Alin (Tumnin River basin and the Pivan Village environs) and the fauna of middle part of Sikhote-Alin are united by numerous endemic species which are confined to the subboreal forests of East Asia (Fig. 2, 3). However, a cluster, formed by faunas of the Northern Sikhote-Alin and the Middle Sikhote-Alin, is associated with the fauna of the Bureya Highlands, which has a more boreal expression and contains a

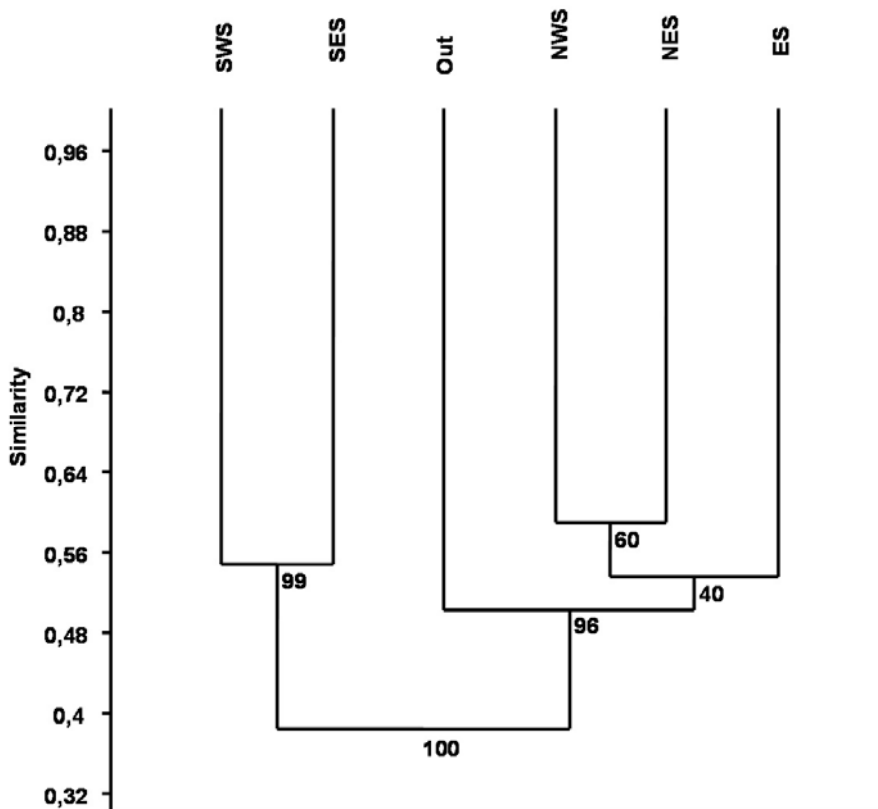


Fig. 2. Dendrogram illustrating the similarity of syrphid species lists of Sikhote-Alin and Myaochan Mountains (Out): Tumnin River basin – north-eastern part (NES), environs of Pivan Village – north-western part (NWS), the Sikhote-Alin Reserve – middle part (ES), the Lazovskii Reserve – south-eastern part (SES), the Ussuri Reserve – south-western part (SWS). Sorensen coefficient, boot-strap – 1000.

smaller share of local (subboreal eastern-asian) endemics than faunas of Southern Sikhote-Alin. Moreover, in the Southern Sikhote-Alin, besides the high number of local endemics there are some species known from tropical Asia (*Allobacha apicalis*, *Phytomya zonata*, *Ischiodon s scutellaris*).

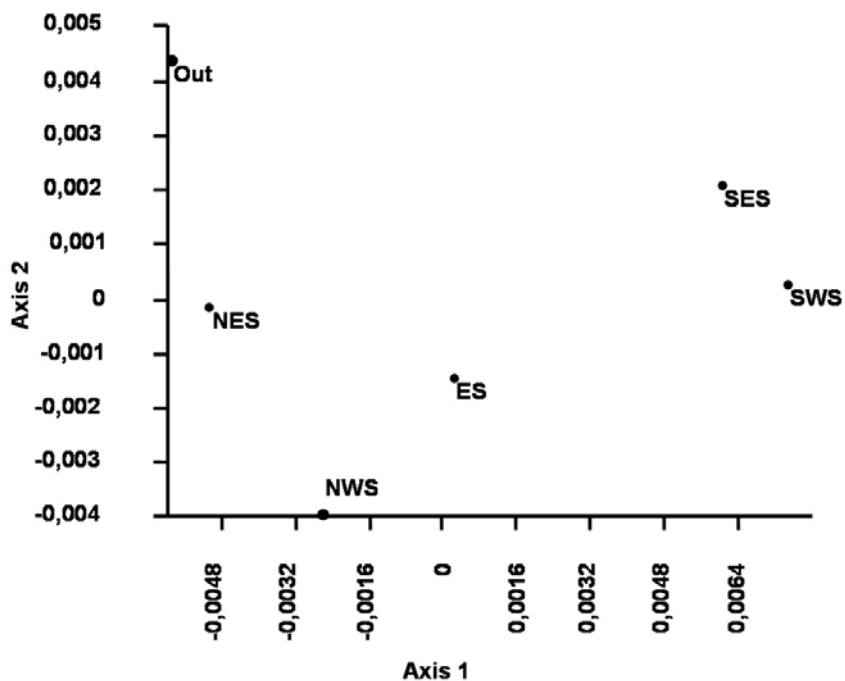


Fig. 3. Ordination (Correspondence Analysis) of syrphid species lists of Sikhote-Alin and Myaochan Mountains. Abbreviations as in Fig. 2.

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