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REVIEW OF *SPHEGINA CLAVIVENTRIS* SPECIES-GROUP (DIPTERA, SYRPHIDAE) WITH DESCRIPTION OF A NEW SPECIES FROM JAPAN

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The review of four species from *Sphagina claviventris*-group with description of new species *S. mikado* **sp. n.** from Japan (Honshu, Kyushu) and key to species is given. The phylogenetic connections of the *claviventris*-group and possible ways of its evolution are discussed.

KEY WORDS: Syrphidae, hover-flies, *Sphagina*, new species, taxonomy, phylogeny.

В. А. Мутин. Обзор мух-журчалок группы видов *Sphagina claviventris* (Diptera, Syrphidae) с описанием нового вида из Японии // Дальневосточный энтомолог. 2001. N 107. С. 1-8.

Дан обзор 4 видов мух-журчалок из группы *Sphagina claviventris* с описанием *S. mikado* **sp. n.** из Японии (Хонсю, Кюсю), приведена определительная таблица видов. Обсуждаются филогенетические связи группы видов *Sphagina claviventris* и возможные пути их эволюции.

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INTRODUCTION

When I study the Syrphidae in collection of Zoological Museum of Moscow University a single male of new species collected by R. Narumi in Honshu (Japan) and identified as "*Sphagina clunipes* Fallén, L. Zimina det. 1-67" has been discovered. The comparing of this specimen with the female, collected by V. Makarkin in Kyushu and preliminary identified by me as *S. stackelbergi* Viol., has shown that they are conspecific. New species belongs to the *S. claviventris* species group, which includes now four species. The discovering of new species permit me to discuss the origin and evolution of this group.

The description of a new species is given below. The holotype (male) of the new species is deposited in the Zoological Museum of Moscow University (Moscow), the paratype in the Institute of Biology and Soil Sciences (Vladivostok).

TAXONOMY

Sphagina claviventris-group

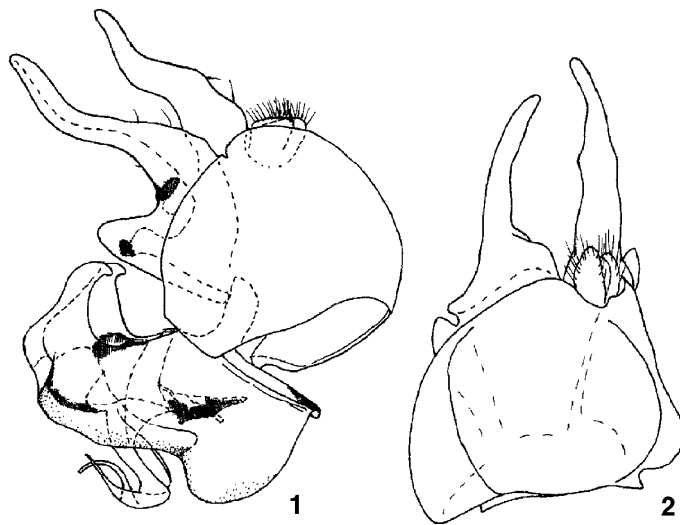
The *claviventris*-group includes four species: *S. claviventris* Stackelberg, 1956, *S. mikado* sp. n., *S. obscurifacies* Stackelberg, 1956 and *S. stackelbergi* Violovitsh, 1980. It is rather well isolated monophyletic group in the subgenus *Sphagina*, which has the specific aedeagus shape apically consisting of elongated serpentine lateral processes of the aedeagus base and the ejaculatory (Figs. 4-7). The sister-group [Nearctic species *S. (S.) flavimana* Malloch, 1922] distinguishes by the yellow postpronotum, by having of apical small tubercle on seventh sternum in male as well as by male genitalia pattern mainly by asymmetric tusk-shaped lateral processes of the aedeagus base (Fig. 3). Synapomorphies of the *claviventris*-group and the *flavimana*-group are evidently reduced aedeagus apodeme and asymmetric epandrium with rather strongly reduced cerci (Fig. 2).

BIOLOGY. Adult flies of *claviventris*-group are flying in the woodland in May-July. They visit the flowers of various plants, sometimes rather far from water whereas other *Sphagina (Sphagina)* spp. are found near the streams. Larvae of *claviventris*-group species are saproxylobionts and occupy dead trunks and branches flooded partly with water. Usually they meet under bark by small groups. The larvae pupate after wintering. Pupal stage continues about a week.

Sphagina (Sphagina) claviventris Stackelberg, 1956

Stackelberg, 1956: 942 [holotype - ♂, Sakhalin, 10.VII 1953 (Violovitsh)]; Violovitsh, 1960: 228; 1976: 333; 1980: 111; 1982: 197; 1983: 103; Mutin, 1983a: 87; 1984: 124; Peck, 1988: 147 (part.); Mutin & Barkalov, 1997: 210; 1999: 466. - *clunipes* (non Fallén): Mutin, 1983a: 89 (*Sphagina*).

DISTRIBUTION. Khabarovskii krai, Primorskii krai, Sakhalin, Siberia (Zabaikal'e, West Sayan).



Figs. 1-2. *Sphegina mikado*: 1) male genitalia, lateral aspect; 2) epandrium, dorsal aspect.

MATERIAL. 24 specimens (including the holotype): Khabarovskii krai (Myaochan Chain, Evoron Lake, Komsomolsk-na-Amure), Amurskaya Oblast (Zeya City), Primorskii krai (Taezhnaya River), Sakhalin (Yuzhno-Sakhalinsk), Chitinskaya oblast (Bukykn River), West Sayan (Stontyzh River).

NOTE. My examination of the holotype *S. claviventris* Stack. shows, that the figures of the male genitalia under this name in Violovitsh (1980) and Thompson & Torp (1986), belong to *S. obscurifacies*.

***Sphegina (Sphegina) obscurifacies* Stackelberg, 1956**

Stackelberg, 1956: 941 [holotype - ♂ Khabarovskii krai, Sovetskaya Gavan, 9.VIII 1951 (Violovitsh)]; Violovitsh, 1976: 333; 1980: 110; 1982: 197; 1983: 102; Mutin, 1983b: 101; 1984: 124; Peck, 1988: 148; Mutin & Barkalov, 1999: 466. - *claviventris* (non Stackelberg, 1956): Violovitsh, 1980: Fig. 6; Thompson & Torp, 1986:246; ? Kuznetsov, 1993: 35.

DISTRIBUTION. Khabarovskii krai, Primorskii krai, Siberia, East Europe, Korea.

MATERIAL. 53 specimens (including the holotype): Khabarovskii krai (Sovetskaya Gavan, the mouth of Gorin River, Komsomolsk-na-Amure, Pivan, Khabarovsk), Amurskaya oblast (Zeya City, Dichun River), Primorskii krai (30 km N of Terney, Ussuriysk, Ussuriyskiy Reserve, Kamenushka, Tigrovaya, Vladivostok, Kedrovaya Pad, Ryazanovka), Buratiya (Tankhoi), West Sayan (Abaza), Korea (Mt. Paekdu).

BIOLOGY. Adults are flying in June-August. Larvae are found in decayed cambium of trunks and branches of *Alnobetula hirsuta* and *Betula platyphylla*, fallen in the water of forest streams (Sivova, Mutin, 2000).

***Sphegina (Sphegina) stackelbergi* Violovitsh, 1980**

Violovitsh, 1980: 119 [holotype - ♂ Southern Primorye, reserve "Kedrovaya Pad", 6.VI 1962 (Rasnitsyn & Sulimov)]; 1982: 197; 1983: 103; Mutin, 1984: 124; Peck, 1988: 149; Mutin & Barkalov, 1999: 466.

DISTRIBUTION. Khabarovskii krai, Primorskii krai.

MATERIAL. 10 specimens (including the holotype): Khabarovskii krai (Khabarovsk), Primorskii krai (Kamenushka, Vladivostok, Kedrovaya Pad, Zanadvorovka).

BIOLOGY. Adults are flying in June. Larvae are found in the same conditions as *S. obscurifacies*.

***Sphegina (Sphegina) mikado* Mutin, sp. n.**

Figs. 1, 2, 7

TYPE MATERIAL. Holotype - ♂, Japan, Aomori Pref., Kuroishi-shi, Aoni, 13.VI 1965 (R. Narumi); paratype - ♀, Japan, Kumamoto Pref., Mt. Yamaingiri, Izumi-mura, 1000 m, 19.VII 1992 (V. Makarkin).

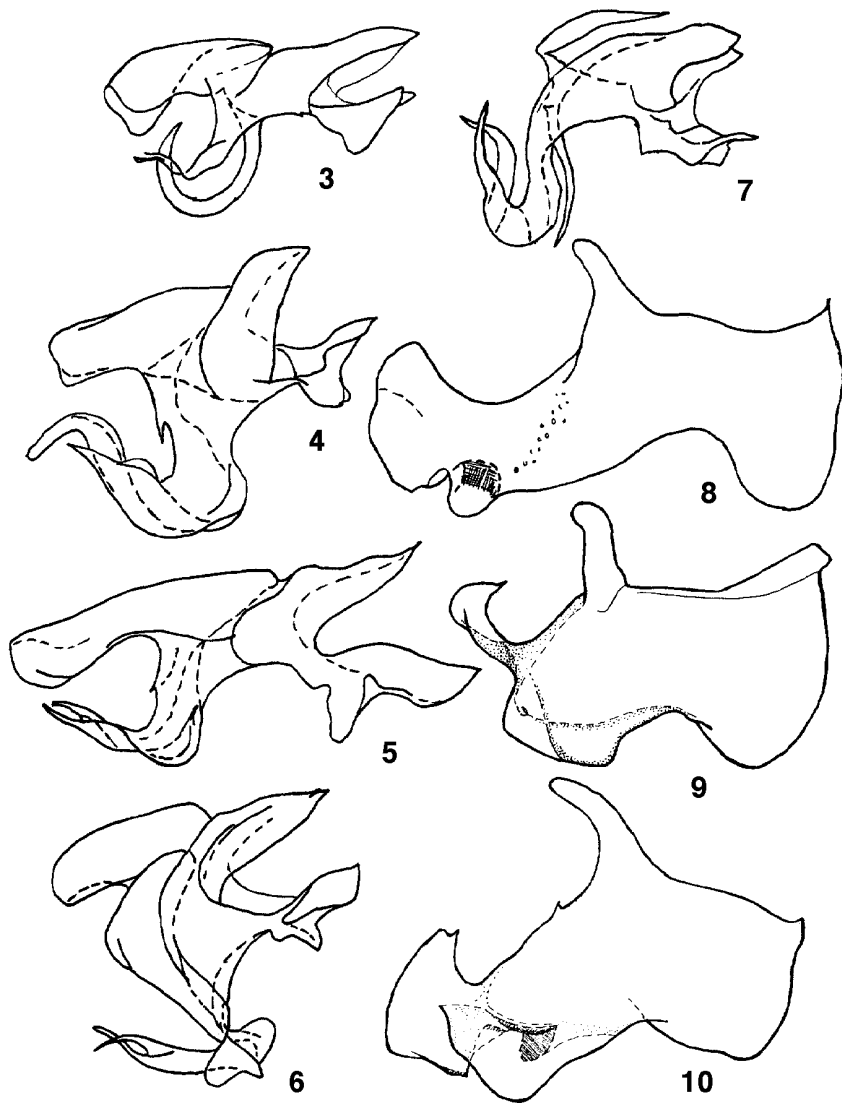
DESCRIPTION. MALE. Body length 6.6 mm, wing length 5.2 mm. Face black and yellow, deeply concave dorsally, weakly projected ventrally; epistoma shining, laterally brown; frons and vertex dull black, with narrow weakly shining medial vitta and short reddish subuppressed pile; vertex at the line of anterior ocellus near one fifth as wide as head. Scape and pedicel black, basiflagellomere and arista yellow.

Thorax black with short yellow pile; scutum weakly shining, with a pair of submedial pale pollinose vittae and the same lateral margins; pleura dense pollinose; scutellum black, rather shining, with a pair of long thin apical setae; wing hyaline, weakly darkish; vein M_1 rather oblique to R_{4+5} ; vein $dm-cu$ oblique to M_{1+2} . Fore and mid legs yellow, except two-three apical darkish tarsomeres; hind coxa brownish; hind trochanter yellow; hind femur strongly thickened, yellow in basal one third and black apically; hind tibia dark brown except middle yellow annulus, with large apicoventral dens; hind tarsus brown.

Abdomen short and strongly dilated to apical margin of tergum 3; tergum 1 black medially, with widely brownish margins; tergum 2 black, with yellow margin laterally; tergum 3 brownish-yellow except medial black vitta dilated apically and reached to whole apical margin; tergum 4 entirely shining black; sternum 1 rather transversal; sternum 4 large, black in basal two third and yellow apically, with long rare pale pile; sternum 7 and 8 black, with longer pale pile. Genitalia as Fig. 1, 2, 7.

FEMALE. Body length 6.8 mm, wing length 7.0 mm. Female similar with male except usual sexual dimorphism and differs in follows: face ventrally brownish-yellow; frons and vertex dense pollinose along eyes and weakly shining medially; submedial pale pollinose vittae of scutum wider and sharper; fore and mid tarsi darker; abdomen entirely black.

DISTRIBUTION. Japan: Honshu, Kyushu.



Figs 3-10. *Sphegina* spp. 3-7) aedeagus, lateral aspect; 8-10) theca of epandrium; 3) *S. flavimana*; 4, 8) *S. obscurifacies*; 5, 10) *S. stackelbergi*; 6, 9) *S. claviventris*; 7) *S. mikado*.

DIAGNOSIS. The new species is closest to *S. stackelbergi* Violovitsh by well developed pollinose of scutum, by large apicoventral dens of hind tibia and by the shape of hypandrium apically but differs from the latter by thinner hind femur, by black basal one third of hind tibia and the abdominal coloration.

DISCUSSION

Fossil *Sphegina* spp. are known from the Oligocene of France and USA (Hull, 1945), that testified about wide distribution of the genus *Sphegina* in Tertiary time. Apparently at that time the Far East turned out an area of the origin of the *claviventris*-group in a consequence of its deviation from the common ancestor with *S. flavimana*. The subsequent evolution of the *claviventris* group proceeded within the limits of the Far East.

Judging by the synapomorphic characters of *S. mikado* sp. n. and *S. stackelbergi*, they have arisen from the common ancestor. Current rather small and widely separated ranges of these species evolved apparently in a course of Pleistocene within the limits of their ancestor's area. However their isolation as species took place much earlier as a consequence of sympatric specification. It was indirectly confirmed by the well-expressed distinctions of male genitalia structure.

Wider distribution of *S. claviventris* and especially *S. obscurifacies* is the result of their migration westwards from the Far East together with the biota of southern taiga after the Pleistocene. These species and some others with similar areas are associated mainly with nemoral communities in the condition of the Far East and are more numerous there. The penetration of them in Southern Siberia as well as in the zone of southern taiga altogether is connected to the Holocene optimum, when mixed and coniferous forests with *Abies* and *Picea* of the East Asia had a wider distribution to northward and westward (Giterman et al., 1968).

Key to the species of *Sphegina claviventris*-group

1. Scutum with a pair of distinctly developed submedial pale pollinose vittae, which at the least near half as wide as frons width. Hind tibia with large apicoventral dens. Flagellomere yellow or brownish 2
- Scutum without submedial pollinose vittae or with a pair of indistinct pollinose vittae usually narrowed medially. Hind tibia without large apicoventral dens. Flagellomere black or brown, sometimes brownish basiventrally 3
2. Fore and mid tarsi yellow. Basal one third of hind tibia yellow or reddish-yellow. Male: Hind femur strongly thickened, its length less than 3 times as long as its diameter; abdomen black dorsally with a pair of reddish-yellow spots in basal half of tergum 3; genitalia as Figs. 5, 10. Female: Abdomen dorsally black except a pair of rounded reddish spots on tergum 3, which touch lateral margin. 6.5-7.3 mm *S. stackelbergi* Viol.
- Fore and mid tarsi darkish apically. Basal one third of hind tibia black. Male: Hind femur less thickened, its length more than 3.5 times as long as its diameter; abdomen mainly black; terga 1 and 2 with reddish lateral margins; tergum 3 with a pair of large reddish-yellow spots, which touch the whole of lateral margin; genitalia as Figs. 1, 2, 7. Female: Abdomen dorsally black. 6.6-6.8 mm *S. mikado* Mutin, sp. n.

3. Scutum without pale pollinose vittae. Hind tibia with a small apicoventral dens. Male: Frons more or less shining, with a pair of triangular pale pollinose spots on anterior half; genitalia as Figs. 6, 9. 6.3-7.0 mm *S. claviventris* Stack.
- Scutum with developed pale pollinose vittae. Hind tibia without apicoventral dens. Male: Frons densely pollinose anteriorly, with more or less developed medial shining vittae posteriorly; genitalia as Figs. 4, 8. 5.3-6.5 mm *S. obscurifacies* Stack.

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