

Additions and corrections to “The Muscidae of Central Europe” II. Two new species of *Spilogona* (Diptera, Muscidae)

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Abstract: Two species of *Spilogona*, *S. angustigena* sp. n. and *S. tatraca* sp. n., are described from the Czech Republic and Slovakia, respectively. Both species are characterised by a gynaecomorphic shape of the male head, i.e., by a broad frons and the presence of a pair of orbital setae. Three species with this type of head are already known in the Palaearctic region: *S. karelica* (Tiensuu, 1935) from Russian Karelia, *S. lapponica* (Ringdahl, 1932) occurring in Norway and Sweden and redescribed here from material collected recently in Russia and Sweden, and *S. spinicosta* (Stein, 1907) from Tibet. All five species are compared and a new identification key is given. Apart from the external similarity of the male heads, the species under study are hardly closely related and their dichoptic heads may be explained as a homoplasy among similar ecomorpha.

Key words: *Spilogona angustigena* sp. n.; *S. tatraca* sp. n.; Muscidae; Diptera; Czech Republic; Russia; Slovakia; Sweden; gynaecomorphic males; ecomorphism

Introduction

A review of the Central European Muscidae (Gregor et al. 2002) summarized basic information on the adult morphology, development, biology and classification, and included identification keys for the subfamilies, tribes, genera and species recorded in Austria, the Czech Republic, Germany, Hungary, Poland, Slovakia and Switzerland. The first set of additions dealing with the taxonomy and distribution of some species was published by Rozkošný et al. (2004). In this second part, two new species of *Spilogona* are described.

Three Palaearctic species of the species-rich and widely distributed genus *Spilogona* Schnabl, 1911, are characterised by the broad male frons and a distinct orbital seta: *S. karelica* (Tiensuu, 1936), *S. lapponica* (Ringdahl, 1932) and *S. spinicosta* (Stein, 1907). *S. lapponica* was proposed as the type species of a new subgenus *Spilogonoides* Ringdahl, 1932. Subsequently, however, neither Hennig (1959) nor Pont (1986) accepted this name at the subgeneric level. Descriptions of all three species are based on the male holotypes and their distribution is very inadequately known. *S. karelica* is known only from Russian Karelia (Sortavala). *S. lapponica* was described from Torneträsk in Sweden and Pont (2007) recorded it also from Norway. On the other hand, records from the Austrian and Swiss Alps (quoted by Hennig 1959, from Ringdahl 1957) are

an obvious error due to a misprint. Actually the final distribution note under *S. kuntzei* was reprinted again as the first paragraph under *S. lapponica* (see Hennig 1959: 307), and Austria and Switzerland have thus been correctly rejected (cf. Pont 1986, 2007). In any case, *S. lapponica* is not mentioned in Ringdahl (1957). *S. spinicosta* was described from Tibet in China and no additional records are known. Recently, when we studied *Spilogona* species collected by Prof. M. Barták in the Czech Republic, Slovakia and Russia, we found two new species with dichoptic males: *S. angustigena* sp. n. and *S. tatraca* sp. n.

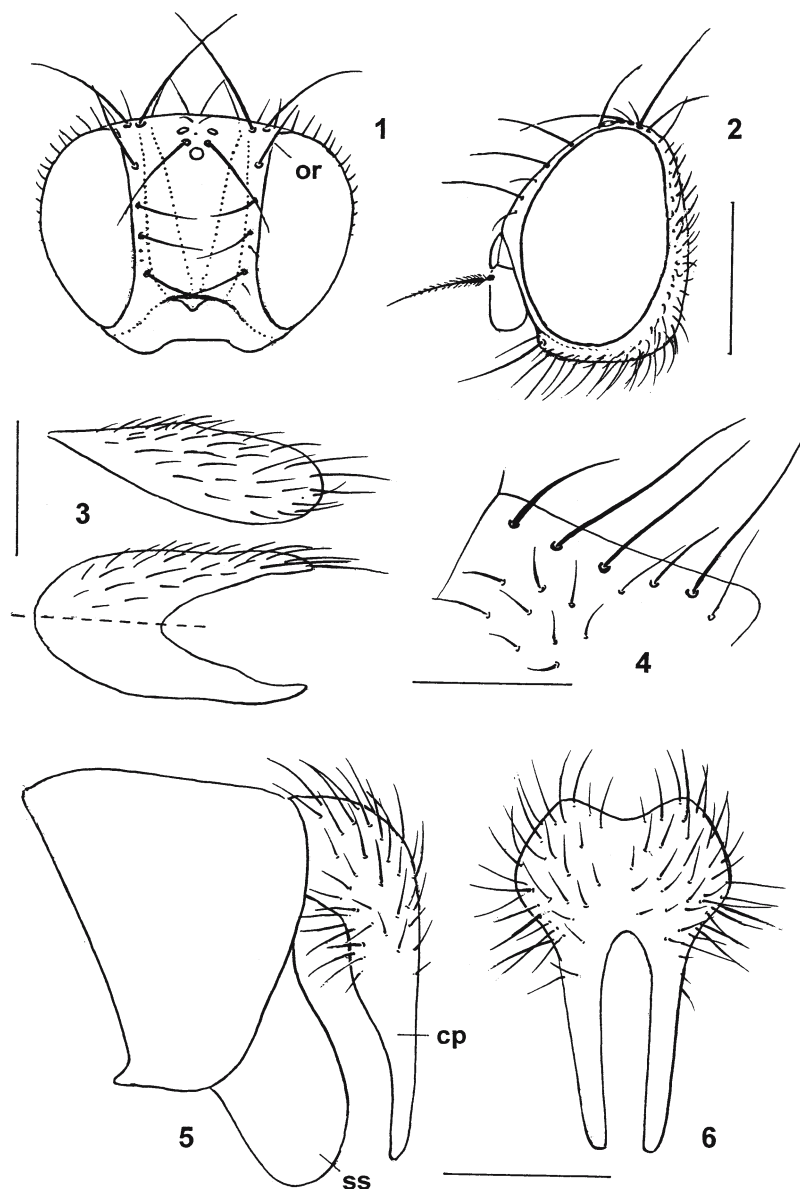
Descriptions of new species

Spilogona angustigena sp. n.

Diagnosis. A species with a broad male frons and a reclinate orbital seta on each fronto-orbital plate. Frontal triangle reaching anterior margin of frons, parafacial and gena very narrow, three postsutural dorsocentrals, basicosta pale, yellowish-brown.

Description. Male. Head (Figs 1, 2) black, silvery-whitish dusted on fronto-orbital plates, frontal triangle, face and gena. Bare eyes separated by a frons hardly occupying one-third of head width. Anterior ocellus circular, distinctly larger than posterior ones. Frontal vitta

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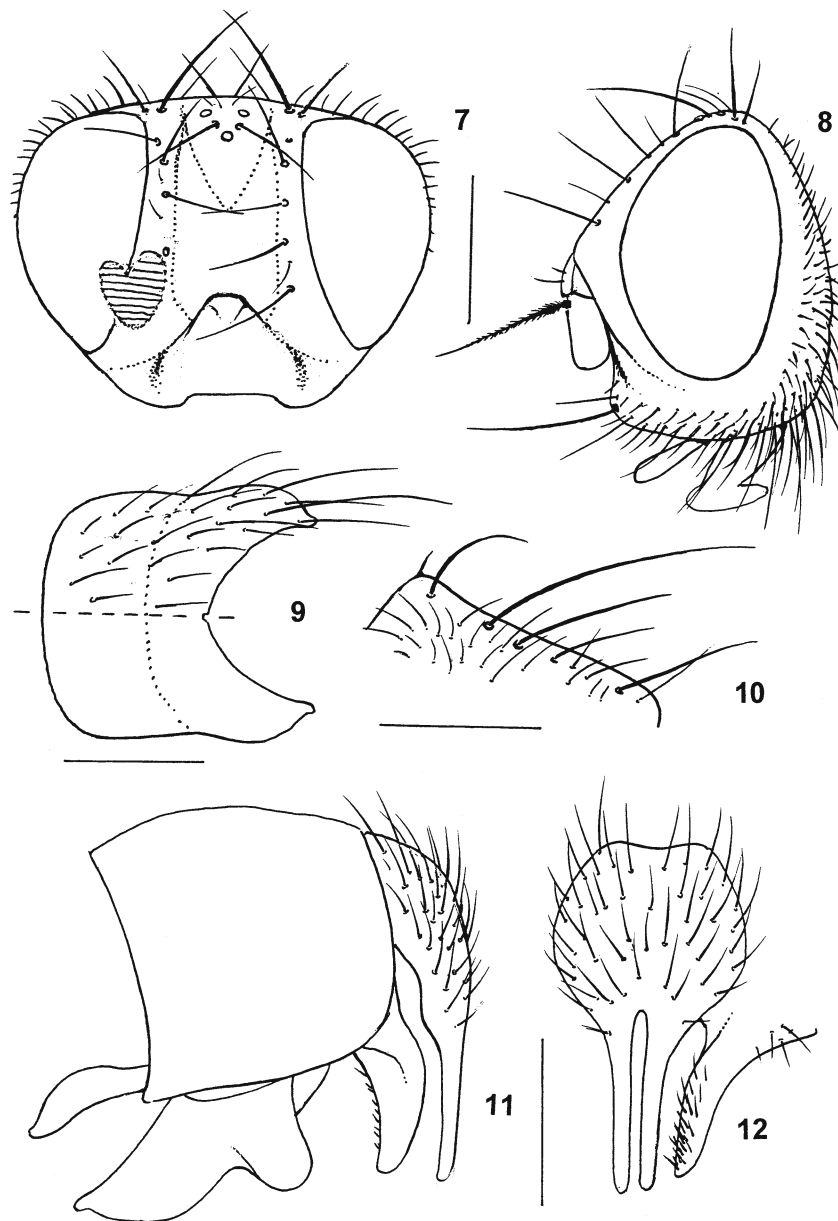
Figs 1–6. Diagnostic characters of *Spilogona angustigena* sp. n. (male): 1 – head in frontal view; 2 – head in lateral view; 3 – sternite 5 in lateral (above) and ventral (below) view; 4 – posterior margin of anepisternum (no supplementary seta between two upper setae present); 5 – terminalia in lateral view; 6 – cercal plate in caudal view. Scales 0.5 mm (head), 0.3 mm (sternite 5 and posterior margin of anepisternum), 0.2 mm (male terminalia and cercal plate). cp – cercal plate, or – orbital seta, ss – surstylus.

dull black in dorsal view, but with a silvery frontal triangle, reaching anterior margin of frons, clearly visible in frontal view. Each fronto-orbital plate hardly one-fourth as broad as frontal vitta, parafacial unusually narrow, in middle about half as broad as width of flagellomere, gena distinctly narrower than flagellomere. Postocellar seta very short, much shorter than outer vertical seta. Inner vertical seta about as strong and long as ocellar seta and vibrissal setae, outer vertical seta shorter but much longer than postocular ciliae. Orbital seta reclinate, about as long as 3 inclinate frontals. Only two additional setulae visible on each fronto-orbital plate. Antenna black, though with a slight whitish pollen from certain angles. Flagellomere 1.5 times as long as broad, arista very short pubescent. Proboscis and palpi black, theca shining, undusted.

Thorax black, not too densely greyish dusted, with a narrow brownish midline along acrostichals. 3 postsutural dorsocentrals, acrostichals in 2 almost regular rows, reaching nearly to scutellum, ground-setulae very sparse. Notopleuron bare, supplementary seta on anepisternum absent (Fig. 4). Insertions of three katepisternal setae forming an almost equilateral triangle but lower seta much thinner than the upper two.

Wing (Fig. 19) conspicuously rounded, without any infuscation, venation including basicosta yellow. Costal spine somewhat shorter than anterior crossvein, every second costal setula somewhat stronger. Vein A_1 unusually short, thickened in basal fourth only and then abruptly ending. Calypters white, halteres yellow.

Legs black, indistinctly grey dusted. Fore femur with 6 posterodorsals to dorsals and 6 posteroventrals,



Figs 7–12. Diagnostic characters of *Spilogona tatrlica* sp. n. (male): 7 – head in frontal view; 8 – head in lateral view, 9 – sternite 5 in ventral view; 10 – posterior margin of anepisternum (no supplementary seta between two upper setae present); 11 – terminalia in lateral view; 12 – cercal plate in caudal view. Scales 0.5 mm (head), 0.3 mm (sternite 5 and posterior margin of anepisternum), 0.2 mm (male terminalia).

fore tibia with a short posterior seta in middle. Mid femur with a long posteroventral in basal fifth, mid tibia with two posterior setae. Hind femur with 7–8 long anterodorsals in a row, one strong anteroventral in distal fourth and 3–4 short setae in front of it, and 1 posteroventral in basal third. Hind tibia with 2 submedial anteroventrals and 2 anterodorsals. Pulvilli barely half as long as last tarsomere.

Abdomen dissected and preserved in glycerine, abdominal pattern thus not visible. Male terminalia (Figs 5, 6): projections of cercal plate relatively long and slender, surstylus unusually broad, rounded distally. Sternum 5 (Fig. 3) relatively narrow in ventral view and high in lateral view, with a deep emargination.

Length: body 2.8 mm, wing 2.3 mm.

Material examined. **Holotype** – male, labelled: “Czech Republic, 2 km E of Duchcov, deciduous forest, 220 m, 50°36'N, 13°43'E, 1.vii.1993, M. Barták leg.” and “HOLOTYPE, *Spilogona angustigena* sp. n. Gregor & Rozkošný 2006” (red printed label). Deposited in the Moravian Museum, Brno, Czech Republic.

Etymology. The specific name refers to the very narrow gena below the eye, which is clearly narrower than the width of flagellomere.

Spilogona tatrlica sp. n.

Diagnosis. Another species with a broad male frons but frontal triangle hardly reaching middle of frons,

parafacial and gena much broader than flagellomere, four postsutural dorsocentrals, basicosta black.

Description. Male. Head (Figs 7, 8) black, densely silvery-grey dusted. Eyes bare, frons broad but somewhat narrower than one-third of head width at level of ocellar triangle, widened towards anterior margin. All ocelli of the same size. Frontal vitta dull black in dorsal view, frontal triangle relatively short, hardly reaching middle of frons, fronto-orbital plates slightly narrower than half width of frontal vitta. All of frons including fronto-orbital plates and the entire frontal vitta densely grey dusted in frontal view, like the parafacial. Postocellar setae relatively strong, as long as outer verticals. Inner verticals longer, as long as ocellars but distinctly thinner than vibrissal. Orbital seta reclinate, shorter than the 5–6 inclinate frontals. Lowest frontal seta almost as long as inner vertical seta. Parafacial broad, at middle nearly 1.5 times as wide as flagellomere, gena almost twice as broad as flagellomere. Vibrissal angle prominent but not reaching beyond frontal angle in lateral view. Antenna black in frontal view, flagellomere about twice as long as broad at base, arista short pubescent. Palpi and proboscis black, theca of proboscis shining.

Thorax black and grey dusted, 4 postsutural dorsocentrals, acrostichals short, in 2 irregular rows, behind suture virtually indistinguishable from ground-setulae. Notopleuron bare, supplementary seta on anepisternum absent (Fig. 10), lower katapisternal seta weak and shifted towards upper posterior katapisternal, almost indistinct among katapisternal setulae.

Wing membrane slightly and uniformly brownish infuscated, veins including basicosta black, posterior crossvein almost straight. Costal spine hardly as long as anterior crossvein, every second costal spinula thickened. Vein A_1 gradually tapered, reaching over half distance between its base and wing margin. Calypters white, halteres yellow.

Legs completely black. Fore femur with an irregular row of 5–6 posterodorsals and 8 strong posteroventrals, fore tibia with distinct posterior seta. Mid femur with 8 posteroventrals and 2 posterior preapicals, mid tibia with 2 weak median posterior setae. Hind femur with about 10 long anterodorsals and 4 long anteroventrals in apical half, hind tibia with 1 anteroventral and 1 anterodorsal seta. Pulvilli about half as long as last tarsomere.

Abdomen dissected and preserved in glycerine, abdominal pattern thus not visible. Male terminalia (Figs 11, 12): projections of cercal plate slender and long, narrowly separated, surstylus subtriangular, pointed distally, conspicuously haired. Sternum 5 (Fig. 9) broad and its distal emargination not too deep.

Length: body 4.0 mm, wing 4.2 mm.

Material examined. Holotype – male, labelled: “Slovakia, High Tatra Mts, Javorová valley, deciduous forest, 1400 m, 49° 12' N, 20° 11' E, 3.viii.1985, M. Barták leg.” and “HOLOTYPE, *Spilogona tatriva* sp. n. Gregor & Rozkošný

2007”. Deposited in the Moravian Museum, Brno, Czech Republic.

Etymology. The specific name indicates the High Tatra Mts where the holotype was collected.

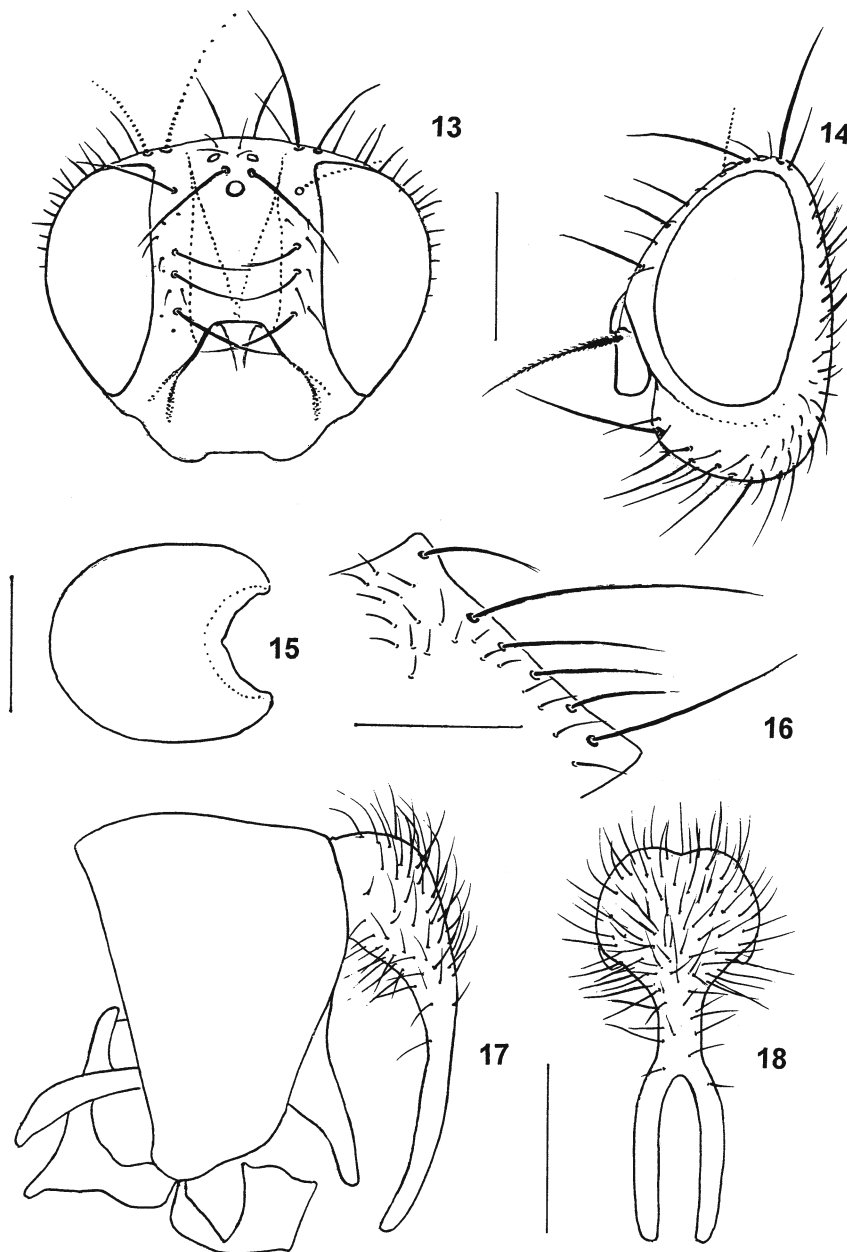
Redescription of *Spilogona lapponica*

Spilogona lapponica was briefly described by Ringdal (1932), and Hennig (1959) only reproduced the old description with a few comments. He especially stressed Ringdahl's statement about the very unusual shape of the male hypopygium which, however, has not yet been described or figured. We succeeded in finding a male in the Barták collection which fits the description well and really has very species-specific male genitalia. It originates from the central part of European Russia and was captured at a locality north of Moscow. A.C. Pont (pers. commun.) has compared our description with his material of *S. lapponica* from north Sweden and has also sent us a note on the previously undescribed female.

Diagnosis. A species with a broad frons and one orbital seta. Frontal triangle reaching anterior margin of frons, parafacial hardly as broad as and gena about 2.5 times as broad as flagellomere, three postsutural dorsocentrals, basicosta black.

Redescription. Male. Head (Figs 13, 14) black, greyish dusted. Bare eyes separated by a broad frons occupying one-third of head width. Anterior ocellus slightly transversely oval, somewhat broader than posterior ocelli. Each fronto-orbital plate slightly broader than half width of frontal vitta, frontal triangle large, reaching anterior margin of frons. Rest of frontal vitta black in dorsal view. In frontal view all of frons including frontal vitta uniformly dusted. Pollen of fronto-orbital plates, frontal triangle, parafacial and face silvery and often with a golden tinge, anterodorsal part of gena sometimes more brownish. Postocellar setae usually slightly weaker than outer verticals, inner verticals and ocellars about as long as vibrissal setae. Outer verticals somewhat longer than postocular ciliae. Orbital seta reclinate, 3 pairs of inclinate frontals, lowest of them stronger than all other setae on fronto-orbital plates. A few additional setulae distinct on fronto-orbital plates. Parafacial in middle about 0.8 as broad as and gena about 2.0 times as broad as flagellomere. Antenna matt black, flagellomere 1.5 times longer than wide at base, arista short pubescent, the longest individual hairs no longer than basal diameter of arista. Palpi black, slender. Theca of proboscis mostly dusted, broadly shining at base.

Thorax grey dusted, without vittae or pattern on mesonotum, 3 postsutural dorsocentrals, acrostichals hair-like, in 2–3 irregular rows, lower proepimeral seta directed forwards not upwards, notopleuron bare, supplementary seta at posterior margin of anepisternum absent (Fig. 16). Lower katapisternal seta weak and distinctly closer to upper posterior katapisternal.



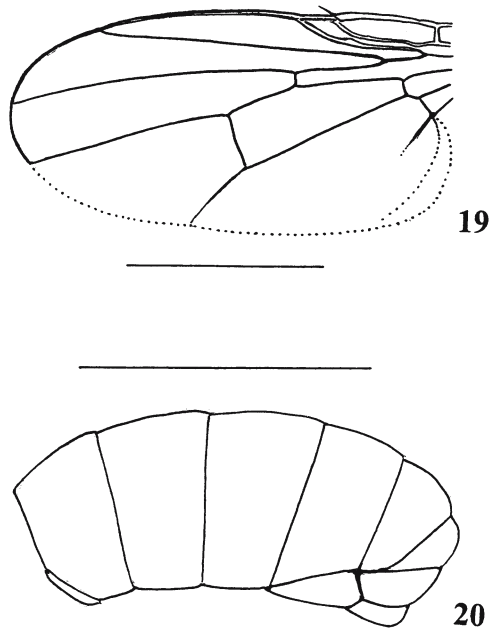
Figs 13–18. Diagnostic characters of *Spilogona lapponica* (Ringdahl) (male): 13 – head in frontal view; 14 – head in lateral view, 15 – sternite 5 in ventral view; 16 – posterior margin of anepisternum (no supplementary seta between two upper setae present); 17 – terminalia in lateral view; 18 – cercal plate in caudal view. Scales 0.5 mm (head), 0.3 mm (sternite 5 and posterior margin of anepisternum), 0.2 mm (male terminalia and cercal plate).

Wings hyaline, indistinctly infuscated, partly yellowish at base, basicosta black. Costal spine as long as anterior crossvein, every second costal spinula thickened. Posterior crossvein almost straight. Vein A1 gradually weakened, longer than half the distance between its base and wing margin. Calypters creamy to yellowish, the margins yellow, halteres yellow.

Legs black and greyish dusted but not as densely as thorax and abdomen. Fore femur with 8–10 irregular posterodorsals and 9–11 posteroventrals, fore tibia without posterior seta. Mid femur with a complete row of 6–8 posteroventrals, mid tibia with a weak anterodorsal in lower third and 2–3 posterior setae. Hind femur with the usual row of anterodorsals, and 3 anterovent-

trals in distal third, without posteroventrals, hind tibia with 1–2 weak anteroventrals and 1–2 anterodorsals but no posterodorsals; dorsal preapical seta about one-fourth length of hind tibia in Russian male, otherwise only 1.5 times diameter of the tibia, the anterodorsal preapical equal to diameter of tibia. All pulvilli almost as long as last tarsomere.

Abdomen (Fig. 20) uniformly grey dusted, without any dark pattern. Male terminalia (Figs 17, 18): cercal plate long and arched in profile, conspicuously tapered in middle and then bifurcate, surstylus subtriangular, sharply pointed distally. Sternum 1 bare. Sternum 5 (Fig. 15) short suboval, with only shallow distal emargination.



Figs 19–20. Wing of *Spilogona angustigena* sp. n. (19) and abdomen of *S. lapponica* (Ringdahl) (male) in lateral view (20). Scales 1.0 mm.

Length: body 4.0 mm, wing 3.8 mm.

Female. Agreeing in almost all characters with the male. Postocellar and outer vertical setae stronger. Mid femur without posteroventral setae. Hind tibia with the preapical dorsal seta shorter. Ovipositor with only fine setae at tip, without spines on sternite 8 or hypoproct. Body length 4.0 mm.

Material examined. Russia, Zvenigorod, along river, 230 m a.s.l., 55°43' N, 36°54' E, 30.v.1989, 1 male, leg. M. Barták, coll. F. Gregor. A.C. Pont (pers. commun.) has collected 10 males and 1 female at Abisko, Torne Lappmark, North Sweden (1970, 1984, 1987, 1996).

Discussion

We were able to compare these three species with the relatively detailed descriptions of *S. karelica* and *S. spinicosta* included in Hennig (1959) (see Table 1). *S.*

angustigena sp. n. resembles the Asian *S. spinicosta* with its narrow parafacial and gena but the latter species differs distinctly by the elongated setulae on the second section of the costa (reaching at least the length of the anterior crossvein) and by the black halteres. Moreover, the male of *S. angustigena* sp. n. seems to be unique with its broad head in the area of the vertex combined with the relatively large compound eyes and different size of the facets. The unusually rounded apex of the wing and small body size indicate some adaptations to a specialised mode of life. *S. tatrlica* sp. n. is the only species of this group which possesses four postsutural dorsocentral setae. Its parafacials are unusually wide (about 1.5 times as wide as the flagellomere) and the frontal triangle is as short as in *S. spinicosta* (reaching only the middle of the frontal vitta). The redescribed *S. lapponica* has a long frontal triangle and very characteristic male genitalia with a long and arched cercal plate which is medially narrowed to a slender common base with a pair of distal projections. Unfortunately, the male genitalia of *S. spinicosta* and *S. karelica* could not be examined. The female is known only in *S. spinicosta*, the genital plate of which is provided with spines, and in *S. lapponica*, which has no spines at the apex of the ovipositor.

In our opinion, the species under discussion are not closely related and do not form a monophyletic group which Hennig (1959) thought might be a possibility. The shape of the frons and the presence of an orbital seta in males is apparently the only evidence of similarity, and this is known as a parallelism in many species of Muscidae and Calliphoridae. Gregor (1988, 2004) interpreted this ecomorphism as the result of adaptation by the compound eyes (in their position, form, size and arrangement of facets) to the special light conditions of the habitats (quality and intensity of sun radiation in particular) which are preferred by certain species.

The most important diagnostic characters may be summarised as follows:

Key to the Palaearctic species of *Spilogona* with dichoptic males

- 1 Four postsutural dorsocentrals, parafacial 1.5 times as broad as flagellomere (Slovakia) *S. tatrlica* sp. n.

Table 1. The main distinguishing characters of the Palaearctic *Spilogona* species with dichoptic males.

Species/Character	<i>angustigena</i> sp. n.	<i>karelica</i>	<i>lapponica</i>	<i>spinicosta</i>	<i>tatrlica</i> sp. n.
Frontal triangle: length of frons	1.0	0.6	1.0	0.5	0.5
Parafacial: width of flagellomere	0.5	1.2	1.0	0.5	1.5
Gena: width of flagellomere	0.8	2.0	2.5	1.0	2.0
Postsutural dorsocentrals	3	3	3	3	4
Rows of presutural acrostichals	2	3	2	2	2
Colour of basicosta	yellow	black	black	black	black
Colour of halteres	yellow	yellow	yellow	black	yellow
Posterior seta on fore tibia	1	0–1	0	0	1
Anterodorsal seta on mid tibia	0	1	1 (weak)	1	0

- Only three postsutural dorsocentrals, parafacial narrower 2
- 2 Parafacial narrower than flagellomere..... 3
- Parafacial at least as broad as flagellomere 4
- 3 Halteres pale yellow, setulae on second section of costa not elongate, shorter than anterior crossvein (Czech Republic) *S. angustigena* sp. n.
- Halteres black, setulae on second section of costa as long as anterior crossvein (Tibet).....
..... *S. spinicosta* (Stein, 1907)
- 4 Frontal triangle reaching anterior margin of frons, mentum of proboscis mostly dusted, abdominal tergites without any dark spots (Norway, Sweden, Russia) *S. lapponica* (Ringdahl, 1932)
- Frontal triangle not reaching anterior margin of frons, mentum of proboscis shining, abdominal tergites 3 and 4 with paired dark spots (Russian Karelia)
..... *S. karelica* (Tiensuu, 1936)

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