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A review of the *luteitarsis* group of the genus *Pipiza* Fallén (Diptera: Syrphidae) with description of a new species from the Balkan Peninsula

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Abstract

The *luteitarsis* species group of the aphidophagous genus *Pipiza* Fallén is defined as a monophyletic unit and the European species of this group are revised. Based on material from Serbia found at two lowland localities, *P. luteibarba* **n. sp.** is described. This species is closely related to *P. luteitarsis* Zetterstedt and *P. accola* Violovitsh. A key for the West Palaearctic species of the *Pipiza luteitarsis* species group is provided and records of all species from the Balkan Peninsula are presented. The distribution of the new species is discussed and conservation implications considered.

Key words: *Pipiza luteitarsis*, *Pipiza luteibarba*, new species, Syrphidae, Balkan Peninsula, West Palaearctic

Introduction

Hoverflies (Diptera, Syrphidae) are a large insects group with presently 829 described species in West Palaearctic including Russia (Fauna Europaea Web Service 2004). Knowledge of biological diversity is a basal step in investigation of ecology, biogeography, evolutionary and conservation biology.

The Balkan and Iberian Peninsulas are sources of large species diversity in Europe due to climatic oscillations during the Pleistocene (Hewitt 2000; 2004). Recent publications concerning hoverfly diversity in these areas include descriptions of new species (Nielsen 2004; Claussen & Ståhls 2007; Vujić *et al.* 2007), revisions of some taxa (Marcos-García *et al.* 2007; Vujić *et al.* 2008) and integrative taxonomy studies with implications for conservation priorities (Mengual *et al.* 2006; Milankov *et al.* 2007).

Species of genus *Pipiza* Fallén are medium-sized, blackish flies with aphidophagous larvae. Adults prefer habitats on the forest edge and larvae are most often predators of gall-forming aphids (Speight 2007).

Of the 17 species listed by Peck (1988) for the Palaearctic region, five are not present in Europe. The European species of the genus *Pipiza* are badly in need revision - and arguably more so then the species of any other syrphid genus. Species concepts in this genus are uncertain and the number of European species cannot be decided (Speight, 2007). For this reasons, some of the European *Pipiza* "species" referred to in recent literature are not covered by Speight (2007). At present, the genus *Pipiza* with 11 species on the Balkan Peninsula (Vujić, 2003), includes many proposed species whose status is still poorly known.

A well-defined group of Palaearctic *Pipiza* species, here named the *luteitarsis* group, is characterized by lacking a pair of ventral, longitudinal ridges at the distal end of hind femora, which is present in other *Pipiza* spp. In Europe it comprises the following species: *P. accola* Violovitsh, *P. luteitarsis* Zetterstedt and *P. quadrimaculata* (Panzer). Among material collected in Serbia, one additional species from this group was found. This new species is described here and a key for the West Palaearctic species of the *P. luteitarsis* group is provided. The biogeographical importance and conservation of the new species are discussed.

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Material and methods

The material from the Balkan Peninsula studied here is deposited in the collection of Department of Biology and Ecology of University of Novi Sad, except for holotype of *Pipiza luteibarba* **n. sp.** which is deposited at the Natural History Museum in Belgrade, Serbia (PMB).

Additional material of two species from *Pipiza luteitarsis* group from Far East analyzed in this paper is deposited at Finnish Natural History Museum (FNHM):

Pipiza aurea Violovitsh: Russia, Silkhote-Alinskii Reserve 30km North Termey 31.05.1982. ♂, 1.06.1982. ♂ ♀, 3.06.1982. ♀, *leg.* and det. Mutin;

Pipiza magnomaculata Violovitsh: Russia, Konsomolsk na Amure, Central District, 21.06.1999. ♂ ♀ *leg.* and det. Mutin; Konsomolsk na Amure, skver KGPI 8.06.1998. ♀ *leg.* and det. Mutin.

Figures of male genitalia have been prepared from macerated material and drawings of all morphological features have been made using drawing tube attached to a binocular microscope. The terminology follows that of Thompson (1999) except for terms of the male genitalia which have been adopted from Verlinden (1999) who studied the related genus *Pipizella* Rondani.

Results and discussion

Species from *Pipiza luteitarsis* group

One problem in revising *Pipiza* is the large group of taxa described from Russia: *P. aurea* Violovitsh, *P. convexifrons* Violovitsh, *P. magnomaculata* Violovitsh, *P. mutini* Violovitsh, *P. nielseni* Violovitsh, *P. tristis* Violovitsh and *P. tuvinica* Violovitsh (Violovitsh 1988). Original descriptions are unfortunately often incomplete. Studies of some available material (e.g. Finnish Museum of Natural History) showed that at least *P. aurea* and *P. magnomaculata* (described from Russian Far East) belong to the species group analysed in this paper.

The *Pipiza luteitarsis* group, is characterized by the smooth hind femora without a pair of ventral, longitudinal ridges at the distal end (Fig. 12) and ventral part of basoflagellomere reddish (Figs. 4–9). The main synapomorphic characters of this species group were found in the structure of male genitalia. Lower gonocercus of hypandrium is very short, about 1/3 length of theca (Fig. 19: lgc). In other species of genus *Pipiza*, hypandrium always has long lower gonocercus, in lateral view it is about 3/4 length of theca (Fig. 27: lgc). The *P. luteitarsis* group comprises four species in the West Palaearctic.

Pipiza accola Violovitsh, 1985

(Figs. 8, 9, 23, 24)

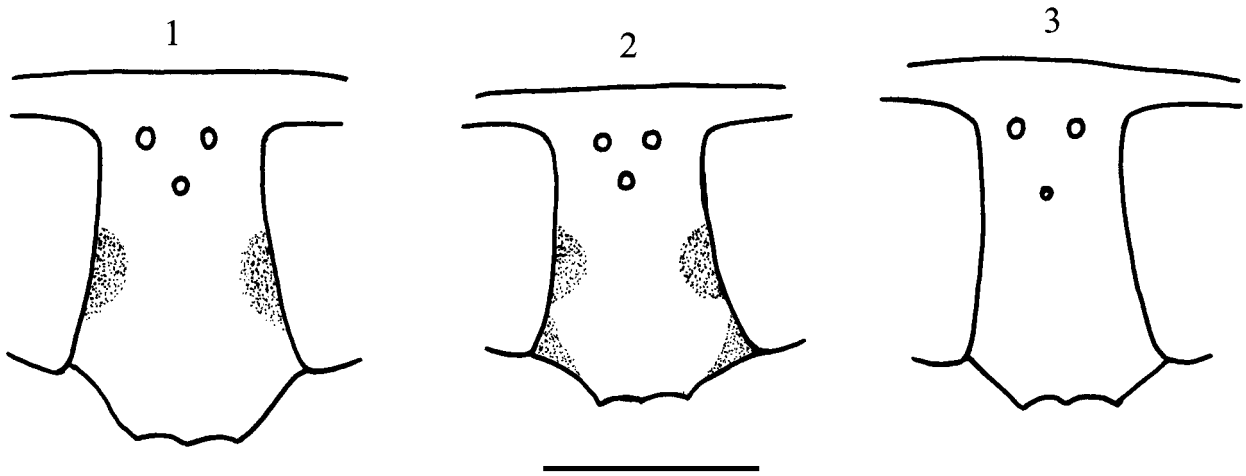
Material studied (4♂ 3♀): **Russia**: Komsomolsk - na - Amure, Silinski park, 12.05.2001, ♂ ♀, leg. and det. Mutin.

FNHM: **Russia**: Komsomolsk - na - Amure, Silinski park 20.05.1986. ♂ leg. and det. Mutin, 11.05.1993. ♂ leg. and det. Mutin, 11.05.1985. ♀ leg. and det. Mutin; **Sweden**: UP [Uppland], 2001-05-07.019, Järf. [Järfälla], Järvaf., S Säbysjön, RN10l8d 0-2-14, *Prunus padus*, ♂ leg. and det. H. Bartsch; UP, 2007-05-08.016, Upplands Bro, Bro, 500m S Smidö, RN10H13, *Prunus padus*, ♀ leg. and det. H. Bartsch.

This species is very similar to *P. luteitarsis*, from which it can only be reliably distinguished in the male sex using features of the male genitalia (Figs. 21–24). In the female, sternite 5 is noticeably wider than long (as in Fig. 14), whereas it is longer than wide in *P. luteitarsis* (Fig. 16). These features are figured by Wolff (1998), who recently records this species from Baden-Württemberg (Germany).

Distribution: Finland (Haarto & Kerppola, 2007), Sweden (Bartsch, pers. comm.), Germany (Niedersachsen, Baden-Württemberg), Russia, Siberia (Speight 2007).

Ecology (based on Speight 2007): preferred environment: forest; deciduous forest, along streams with *Alnus* and *Fraxinus* in *Quercus/Carpinus/Ulmus* forest (Wolff 1998), in association with *Prunus padus* close to water. Flowers visited: *Prunus padus*, *Salix*. Flight period: end April/mid May.



FIGURES 1–3. Frons of female, dorsal view. 1. *Pipiza luteitarsis*; 2. *Pipiza luteibarba* **n. sp.**; 3. *Pipiza quadrimaculata*. Scale 1mm.

***Pipiza luteibarba* n. sp.**
(Figs. 2, 4, 5, 10, 12, 14, 15, 19, 20)

Material studied (♂, ♀): **Holotype**: Serbia, Seličevica, 16.04.1989, ♂, leg. Vujić (PMB, coll. 595773: Inv. No. 40). **Paratype**: Serbia, Obedska bara, Debela gora, 23.04.1986, ♀, leg. Vujić.

Etymology: the name is derived from Latin words *luteus* – yellow, golden colour and *barba* – beard, refer to the yellow colour of hairs on face.

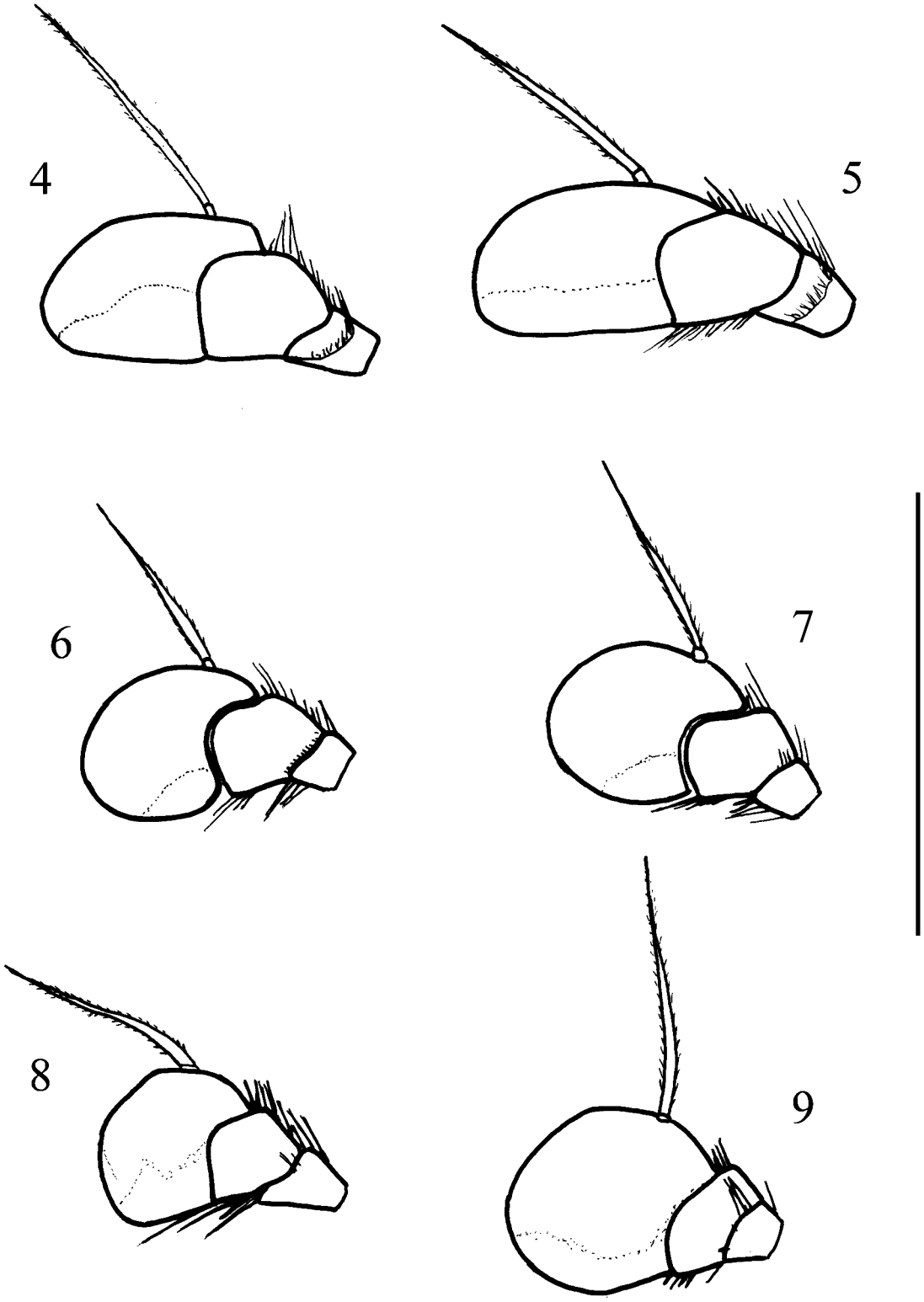
Diagnosis: hind femora without pair of ventral longitudinal ridges at the distal end (Fig. 12); basoflagellomere elongated (about 1.5 times longer than wide, Figs. 4, 5), ventral half of basoflagellomere reddish (Figs. 4, 5); body hairs predominantly pale; all tarsi pale, except metatarsus of hind legs. Closely resembling *Pipiza luteitarsis* and *P. accola* but differs in the following characteristics: male: face yellowish haired, predominantly black in *P. luteitarsis* and *P. accola*; body hairs longer; abdomen broader; tergite 2 with long sticking out hairs (Fig. 10); genitalia: basal part of surstyli with well-developed semicircular lobe (Figs. 19, 20: sl), in *P. luteitarsis* it is reduced (Figs. 21, 22: sl) and in *P. accola* small (Figs. 23, 24: sl); female: basoflagellomere elongated (more than 1.5 times longer than wide, Fig. 5), in *P. luteitarsis* and *P. accola* oval and shorter (1.1 – 1.2 times longer than wide, Figs. 7, 9); pollinose lateral spots on frons smaller (about 1/6 of frons width, Fig. 2), in *P. accola* and *P. luteitarsis* about 1/5 of frons width (Fig. 1). The species is related to two East Palaearctic species *P. aurea* and *P. magnomaculata*. *P. luteibarba* **n. sp.** differs by completely pale tarsi of pro- and metalegs (apical 2–3 segment darkened in *P. aurea* and *P. magnomaculata*) and in structure of male genitalia (in *P. aurea* surstyli more similar to *P. accola*; in *P. magnomaculata* semicircular lobe on basal part of surstyli extremely well-developed, almost as long as rest of surstyli, in *P. luteibarba* **n. sp.** about 1/3 of length of surstyli, Fig. 19).

Description:

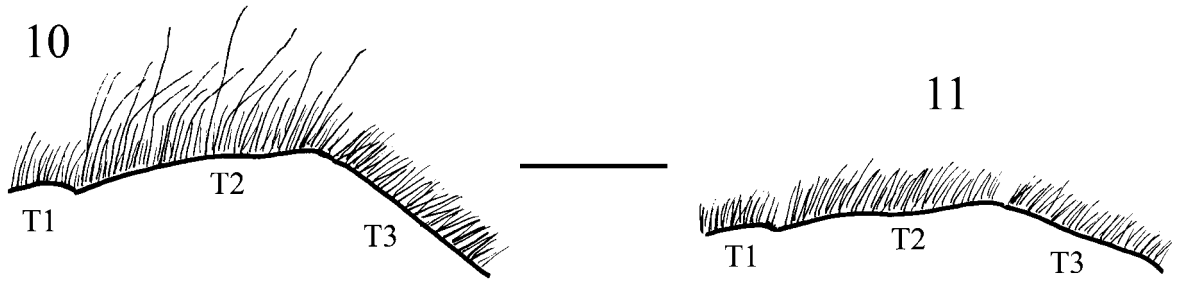
MALE

Head: face black, dark-grey pollinose, covered with yellowish hairs. Frons heavy dark-grey pollinose, pale haired, except black hairs above and laterally of antennae; angle of eye approximation about 120^0; height

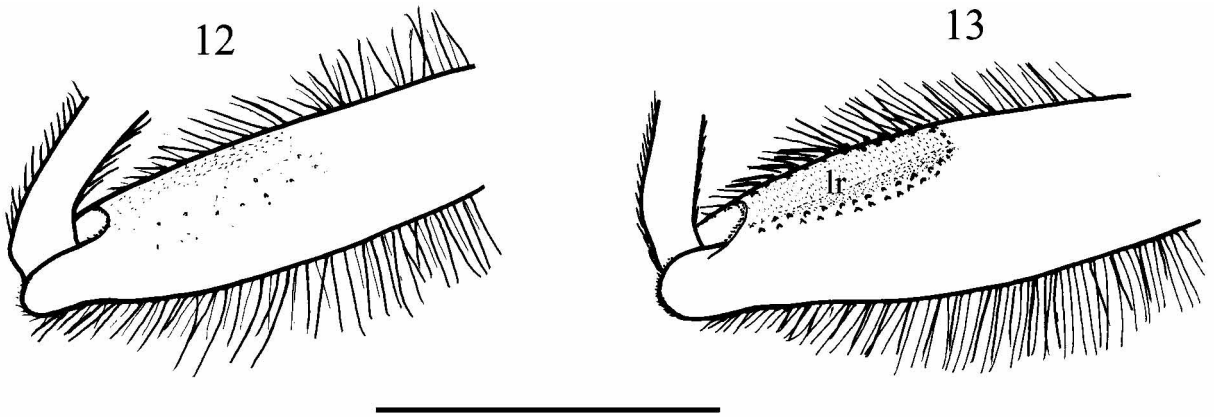
of frons 1.7 times longer than eye suture. Vertex dark pollinose, covered with mixed pale and dark long hairs; ocelar triangle equilateral. Occiput silver pollinose, pale haired, except a few longer black hairs. Eyes uniformly covered with long grey hairs. Antennae dark, except reddish ventral area on basoflagellomere; arista pale; basoflagellomere elongated (Fig. 4).



FIGURES 4–9. Antenna, lateral view. 4, male, 5, female, *Pipiza luteibarba* **n. sp.**; 6, male 7, female, *Pipiza luteitarsis*; 8, male, 9, female, *Pipiza accola*. Scale 1mm.



FIGURES 10, 11. Tergites 1–3 of male, lateral view. 10. *Pipiza luteibarba* **n. sp.**; 11. *Pipiza luteitarsis*; T1 – tergite 1; T2 – tergite 2; T3 – tergite 3. Scale 1mm.



FIGURES 12, 13. Hind femur of male, ventral view. 12. *Pipiza luteibarba* **n. sp.**; 13. *Pipiza festiva*; lr – longitudinal ridge. Scale 1mm.

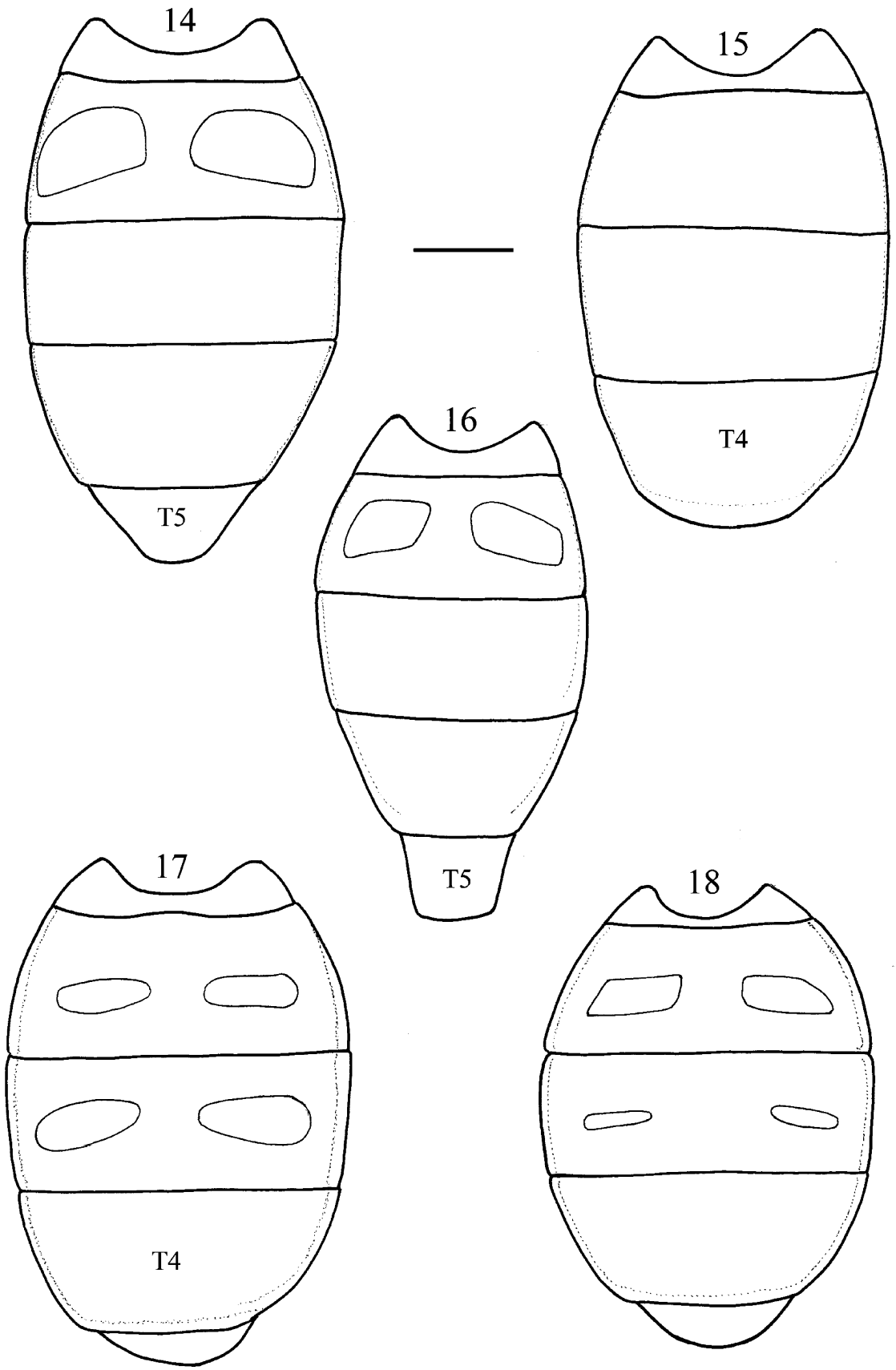
Thorax: mesoscutum slightly pollinose, moderately punctured, completely pale haired, except few black hairs on lateral sides; scutellum with pale hairs. Pleurae slightly pollinose, pale haired, except mixed pale and black hairs on upper half of anepisternum; katepisternum with upper and lower hair patches separated, and shiny central area; metasternum bare. Femora dark, except pale apices; fore tibiae pale with dark submedian area; middle tibiae pale with dark submedian ring; hind tibiae dark, except pale basal 1/4 and top 1/5; all tarsi pale, except dark dorsal surface of hind basitarsus; legs almost completely pale haired. Squamae reddish; halteres reddish, except darker spot on capitulum. Wing with dark-brown to yellow-brown veins; without darkened area; microtrichia slightly reduced in basal part of alula and cells BR and BM.

Abdomen (Figs. 10, 15)**:** entirely black, with blue lustre; yellow haired except short, black hairs on hind margin of tergites 2 and 3. Tergite 2 with long, porrect hairs (Fig. 10). Besides long pale-yellow hairs, sternites 1 – 2 and anterior half of sternite 3 covered with dense microtrichia; the rest of sternites slightly microtrihose.

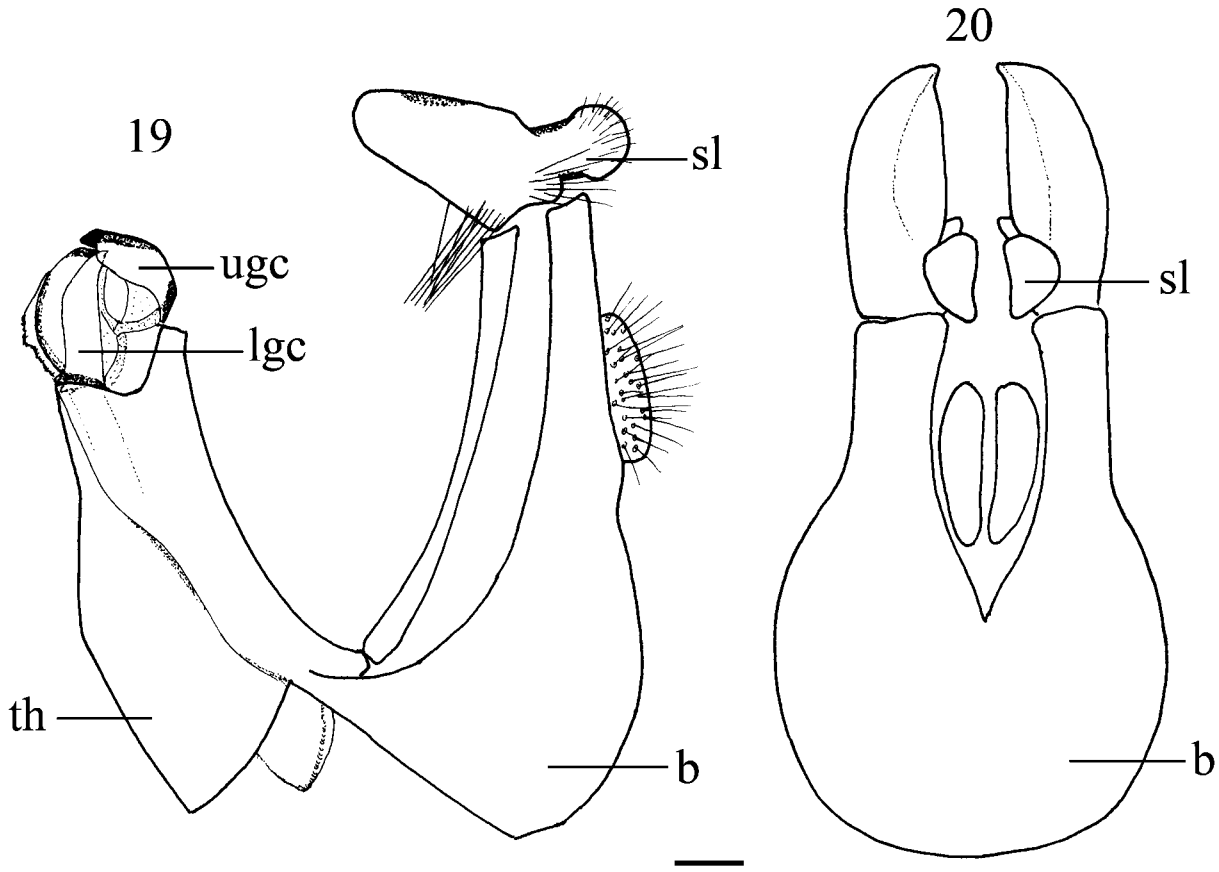
Genitalia (Figs. 19, 20)**:** theca of hypandrium (Fig. 19: th) and basale of epandrium elongated (Figs. 19, 20: b). Lower gonocercus short (1/3 length of theca; Fig. 19: lgc). Upper gonocercus without conspicuous teeth (Fig. 19: ugc). Basal semicircular lobe of surstyli well-developed, petiolate (Figs. 19, 20: sl).

Size: Body length 9.1mm, wing length 8.0mm.

FEMALE: differs from the male in the following characters: Frons and vertex shiny black except pollinose lateral spots that occupy about 1/6 of frons width (Fig. 2). Frons, vertex and occiput predominantly yellow haired except black hairs above and laterally of antennae and along eye margin, above pollinose lateral spots. Hairs on mesoscutum shorter than in male, all yellow. Microtrichia on wing more reduced than in male: basal 1/3 of cell CuP, basal 1/2 of cell BR and almost complete cell BM bare. Tergit 2 with two lateral yellow spots.



FIGURES 14–18. Abdomen, dorsal view. 14, female 15, male, *Pipiza luteibarba* **n. sp.**; 16, female, *Pipiza luteitarsis*; 17, male, 18, female, *Pipiza quadrimaculata*; T4 – tergite 4; T5 – tergite 5. Scale 1mm.



FIGURES 19, 20. Male genitalia of *Pipiza luteibarba* **n. sp.** 19. lateral view; 20. dorsal view of epandrium; th – theca of hypandrium; b – basale of epandrium; lgc – lower gonocercus; ugc – upper gonocercus; sl - semicircular lobe of surstylus. Scale 0.1mm.

Distribution: Presently known only from two localities in Serbia. Seličevica Mountain belongs to biome of Submediterranean mostly oak woodlands while Obedska bara marsh lies in the biome of South European mostly deciduous woods in inundated areas (based on Matvejev & Puncer 1989). This is the first discovered locally endemic species from the *Pipiza luteitarsis* group. All other species have wide distributions, mainly Europe or in the Palaearctic generally.

Habitats. The species was discovered on two localities about 200km apart from each other. Mountain Seličevica is placed in south-eastern part of Serbia. It is a medium high mountain with the highest peak on 902m. The Seličevica is 20km long and 5–10km width, its area is about 150km^2. It lies in a semiarid region with temperately continental clime and great influence of the Mediterranean. 80% of Seličevica is covered by forest vegetation from associations: *Orno-Quercetum pubescentis* Gaj. 52, *Quercetum frainetto-cerris* Rud. 49, *Quercetum montanum moesiacum* Černj. Et Jov. 50, *Quercetum-Carpinetum moesiacum* Rudski 1940 and *Fagetum moesiacum* Rudski 1940 (Ranđelović 1980).

Obedska Bara marsh is located in the south part of the Pannonian plain. The site is important for threatened breeding bird species, rare insects, fish, reptiles, amphibians and mammals. Its status has been established by the Ramsar Convention on swamps since 1977, and included in the List of areas of special significance for birds of Europe of Important Bird Area project, and UNESCO's list of world's most important wetland areas. The site is a seasonally inundated area of the River Sava floodplain, with marshes, ponds, wet meadows and the Obedska Bara oxbow lake. Obedska Bara has a great variety of plant communities, such as coastal, shallow water, surface water, swamp, and wet forest communities, with all types of vegetation. The oxbow lake is 13.5 km long, with a maximum width of 0.75 km. The whole area of Obedska Bara proper

includes the oxbow lake, the inner area bordered by the lake and the immediate outer belt; this measures about 2.400 ha (Janković 1974).

Conservation and traits: The specimens of *Pipiza luteibarba* **n. sp.** were found in similar habitats. In both localities the specimens were captured along water (river in Seličevica and Obedska bara oxbow) in *Quercus* forests, where grow the same plant species from the family Apiaceaea (*Epilobium* spp, *Heracleum* spp) and some species from the family Asteraceae (*Cirsium* spp). Regarding presence of these plant species in both localities, we can suppose that there is some connection with the life cycle of *P. luteibarba* **n. sp.**, which can explain their appearance in similar habitats. Such localities are extremely rarely preserved in Serbia, because of high human impact in past centuries. The lowlands and hilly areas in central part of Serbia were occupied by humans during history because of excellent condition for inhabitation and especially for agriculture. That can explain the scarcity of data for species during long term faunistic investigations in these areas (since 1958). The Seličevica mountain is unprotected and increasingly becomes part of the large city Niš. The presence of *P. luteibarba* **n. sp.** has not been reconfirmed after the first record in 1989. Therefore, we can supposse that *P. luteibarba* **n. sp.** could be extinct from Seličevica mountain. A similar situation concerns the Obedska bara marsh, but this Nature reserve is protected and can offer an opportunity for conservation of this endemic species. Future conservation efforts must be concentrated to rediscover populations of species in natural habitats and to study species biology. Based on these results strict protection of these localities must be one of the conservation priorities.

***Pipiza luteitarsis* Zetterstedt, 1843**
(Figs. 1, 6, 7, 11, 16, 21, 22)

Material studied (18♂ 9♀): **Serbia:** mountain Fruška gora (Stari Ledinci, 19.04.1988, ♂, leg. Radnović, 01.05.1988, ♂, leg. Vujić; Glavica, 25.04.1989, ♂, leg. Vujić); mountain Seličevica, 02.04.1989, 6♂, leg. Vujić; mountain Kopaonik (Srebrenac, 24.05.1987, ♂, leg. Vujić); marsh Obedska bara (Debela gora, 15.04.1990, ♀, leg. Vujić). **Montenegro:** mountain Durmitor (Sušičko jezero-Skakala, 31.05-01.06.1998, 6♂ 8♀, leg. Vujić, 20.06.1998, 2♂ leg. Vujić).

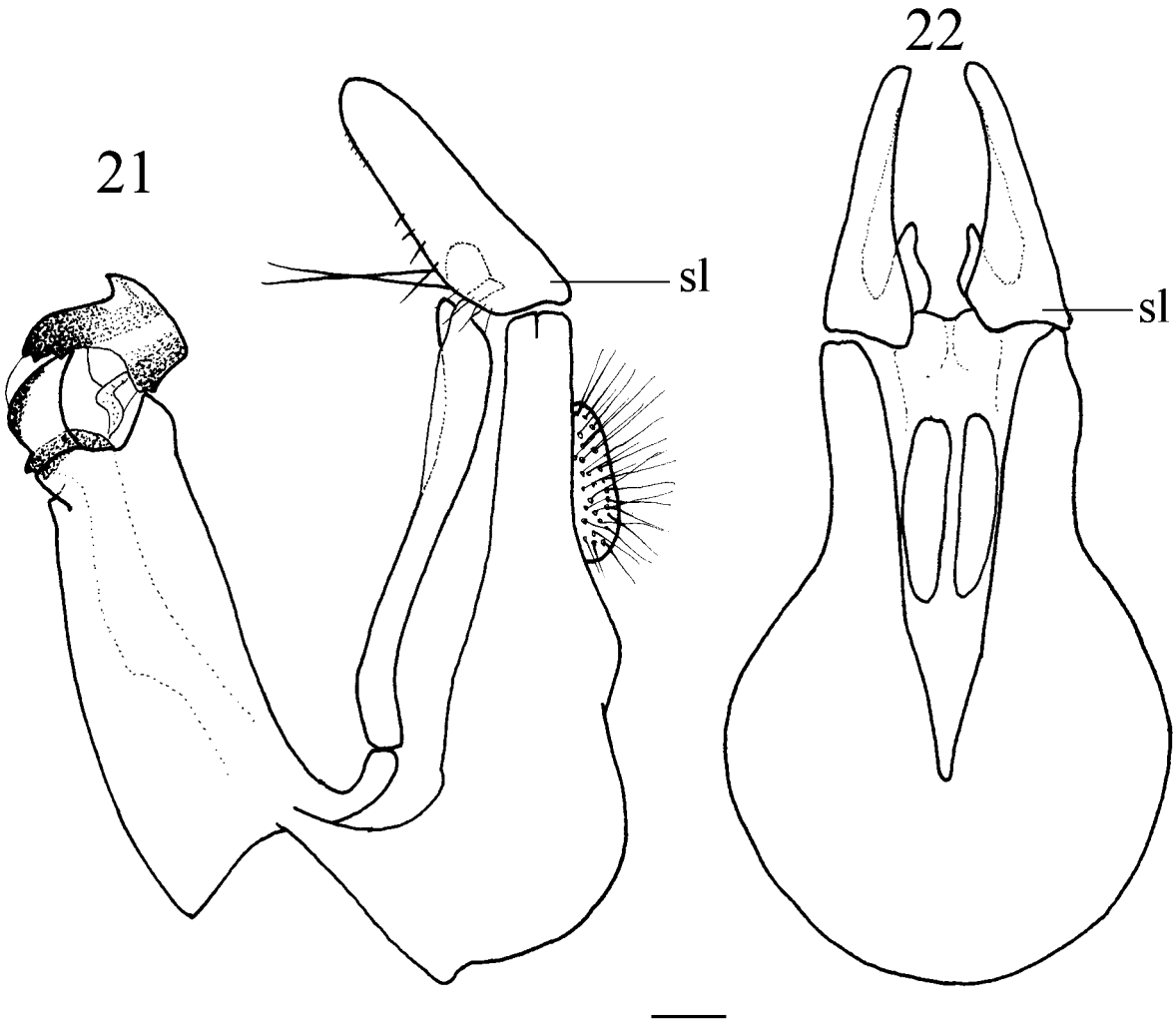
In males of *P. quadrimaculata* the hairs on the thoracic pleura and abdomen are almost entirely black, whereas they are pale whitish-yellow in *P. luteitarsis*. Males of *P. luteitarsis* may only be reliably distinguished from *P. accola* by features of the terminalia at the moment (Figs. 21–24).

Variability: pale area on basoflagellomere sometimes very small; some specimens with more black hairs on thorax; sternite 2 pale or all sternites unicolorous; tergite 2 with pair of yellow spots (Fig.16); if they missing tergite with dusted marks; colour of legs variable, but front tarsi always pale.

Distribution: Fennoscandia south to Belgium and France; from Ireland eastwards through central Europe (Alps) into European parts of Russia (Speight 2007).

Ecology (based on Speight 2007): preferred environment: forest: deciduous forest; mature humid *Fagus* and acidophilous *Quercus* forest and woodland; also in mature suburban gardens. Adult habitat and habits: to a significant extent arboreal, flying at up to 5m from the ground round the foliage of mature trees and shrubs; settles on foliage of the lower branches of oak and beech at the edge of clearings and paths etc., and on bushes, e.g. *Rubus fruticosus*. Flowers visited: *Euphorbia*, *Prunus*, *Ranunculus*, *Tussilago*. Flight period: mid April/ end May, with occasional later records. Larva: described by Rotheray (1987) and illustrated in colour (Rotheray, 1994).

The Balkan populations of *P. luteitarsis* are found at lower altitudes, from 0 up to 900m, in *Quercus* and *Fagus* woodlands. This species was recorded in only a few Balkan localities and belongs to a group of vulnerable insect species in Serbia.

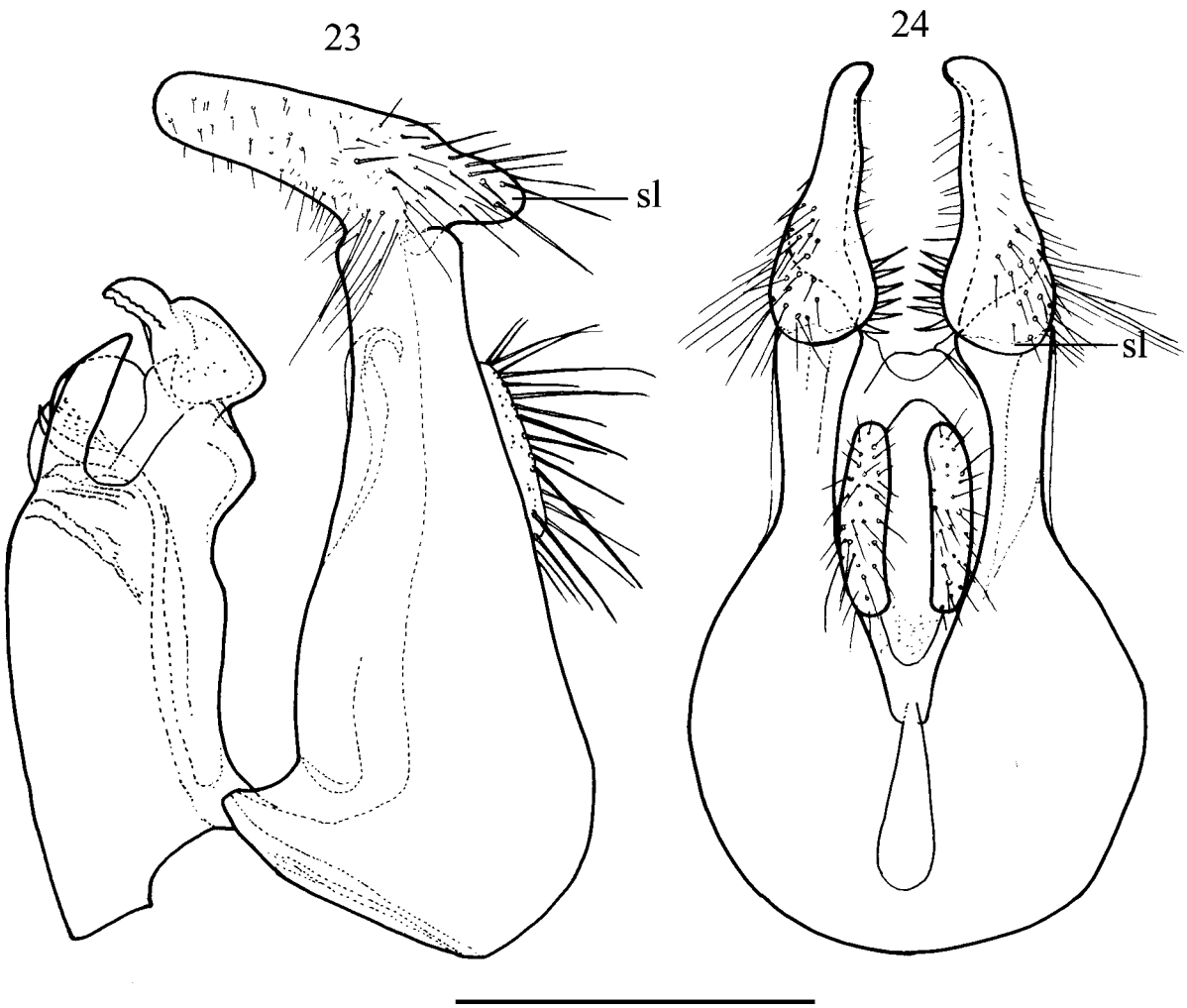


FIGURES 21, 22. Male genitalia of *Pipiza luteitarsis.* 21. lateral view; 22. dorsal view of epandrium; sl - semicircular lobe of surstylus. Scale 0.1mm.

***Pipiza quadrimaculata* (Panzer)**
(Figs. 3, 17, 18, 25, 26)

Material studied (104♂ 136♀): **Slovenia**: Julian Alps (Savica, 22.05.1988, ♂, leg. Radnović, 14.06.1988, ♂ 5♀, leg. Vujić); Kamniške and Savinjske Alps (Kamniška bistrica, 16.06.1988, ♂, leg. Vujić; Savinja, 16.06.1988, ♂ 2♀, leg. Radnović, Vujić; Matkov kot, 01.07.1989, ♂, leg. Vujić; Matkov kot - Logarska dolina, 25.05.1989, ♂, leg. Vujić; Logarska dolina, 25.05.1989, ♂, leg. Vujić); mountain Menina, 24.05.1989, ♂, leg. Vujić; mountain Menina - Kamnik, 24.05.1989, ♂ ♀, leg. Vujić. **Croatia**: mountain Gorski Kotar, 27.05.1990, 3♂, leg. Vujić. **Bosnia and Herzegovina**: Kladanj, 13.05.1989, ♂, leg. Vujić; mountain Konjuh, 25.06.1989, 3♂ ♀, leg. Vujić, 30.07.1989, ♀, leg. Vujić; mountain Jahorina, 26.06.1989, 2♂ 2♀, leg. Vujić, 14.06.1991, ♂ ♀, leg. Vujić; mountain Bjelasica, 26.06.1989. ♀, leg. Vujić. **Montenegro**: mountain Durmitor (17.07.1981, ♀, leg. Šimić; Žabljak, 02.07.1983, ♀, leg. Šimić; Mlinski potok, 22.06.1985, 7♂ 7♀, leg. Vujić, 28.06.1989, ♂, leg. Vujić, 20.07.1997, 3♀, leg. Radenković, 3♀ leg. Vujić; 23.06.1998, ♂ ♀ leg. Milenković; Sušičko jezero, 25.06.1985, ♀, leg. Vujić; Sušičko jezero-Zlatica, 19.05.2000, ♂ leg. Vujić; Otoka Crnog jezera, 02.07.1981, ♀, leg. Aleksić, 02-04.07.1981, ♀, leg. Ercegovac, 20.06.1983, 2♂, leg. Aleksić, Vujić,

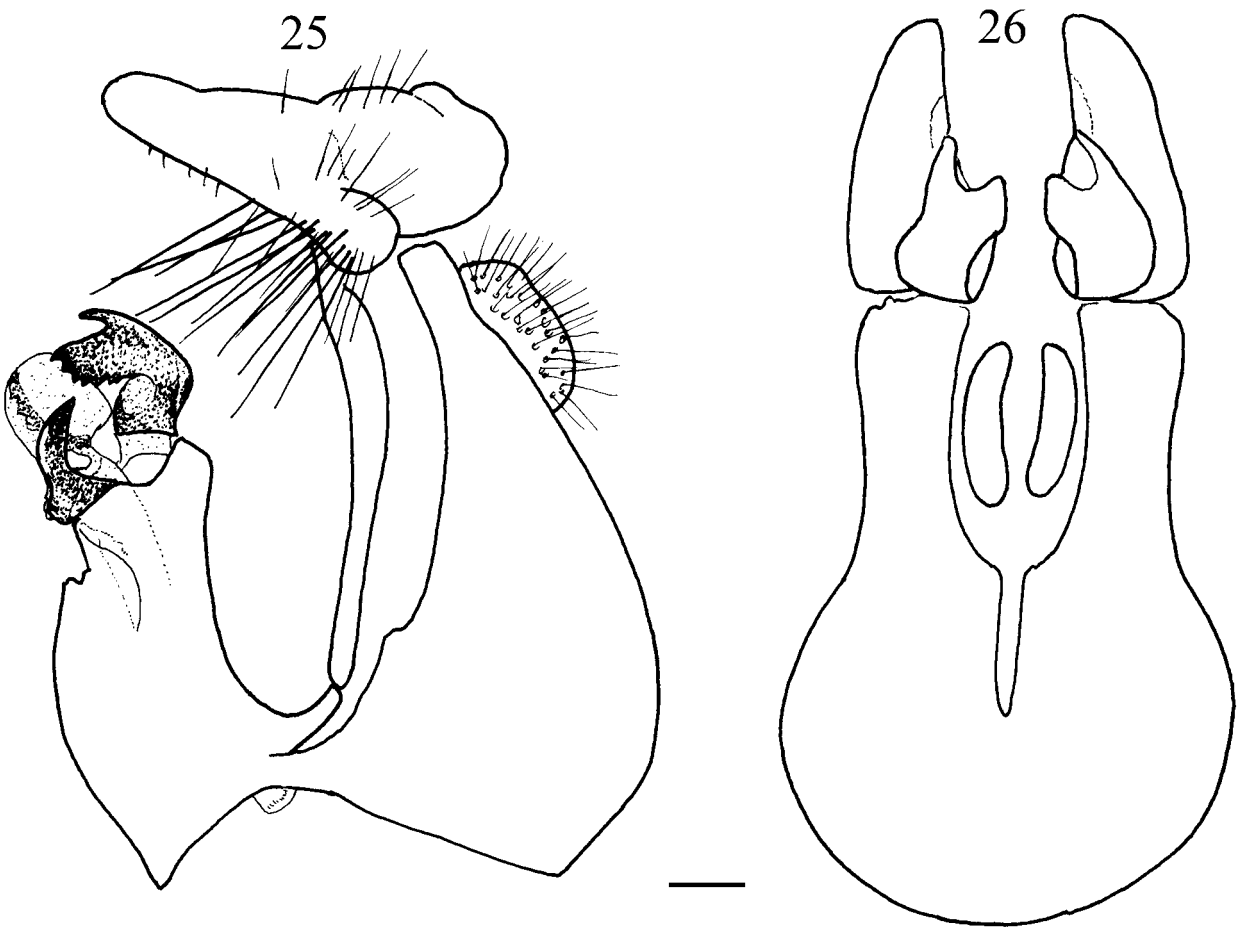
24.06.1983, 2♂ 8♀, leg. Aleksić, Vujić, 26.06.1983, 2♀, leg. Aleksić, Vujić, 03.07.1994. ♂ leg. Radenković; 14.07.1997, 4 ♀ leg. Mićić, 5♀ leg. Radenković; Crno jezero, 21.06.1983, ♀, leg. Šimić; Čeline, 27.06.1983, ♂ 2♀, leg. Aleksić, Vujić; Mlinski potok - Ivan do, 02.08.1998, ♂ leg. Vujić; Ivan do, 27.06.1993, ♀ leg. Vujić; Savin kuk, 25.06.1983, 3♀, leg. Aleksić, Vujić; Donja Ališnica, 06.07.1991, ♀, leg. Radnović; Jablan jezero, 07.07.1991, ♀, leg. Vujić; Jablan jezero, 06.07.1992, ♀, leg. Vujić). **Serbia**: mountain Kopaonik (*Picea abies* forest, ♂ leg. Milenković; 20.07.1985, ♂ 2♀, leg. Šimić; 17-20.07.1985, ♂, leg. Šimić; 17.07.1985, ♂, leg. Šimić; Samokovska reka, 19.07.1985, ♀, leg. Vujić, 19.06.1996, ♂ 3♀ leg. Milankov; 14.08.1997, ♀ leg. Vujić, 14.08.1997, 2♀ leg. Milidragović; 14.08.1997, ♀ leg. Milidragović; 16.06.1986, ♂ ♀, leg. Božičić, Šimić, 05.07.1986, ♂16♀, leg. Radišić, Radnović, Vujić, 21.06.1991, 2♂ ♀, leg. Šimić, Vujić; 16.06.1986, 21♂ 2♀, leg. Božičić, Šimić, Vujić, 03.08.1987, ♀, leg. Vujić, 22.06.1991, 2♂ ♀, leg. Šimić, Vujić; 22.06.1991, ♀, leg. Vujić; 24.05.1992, 2♀, leg. Vujić; Velika reka, 14.06.1986, 6♂ 4♀, leg. Vujić; Jasle-Jablanova ravan, 14.06.1986, 17♂ 4♀, leg. Božičić, Šimić, Vujić; Jablanova ravan, 04.07.1986, 2♀, leg. Radišić, Vujić; Jankove bare, 15.06.1986, 3♂, leg. Božičić, Šimić, Vujić; 07.07.1986, 4♀, leg. Šimić; Marina voda, 15.06.1986, ♂, leg. Božičić; Pajino preslo, 18.06.1986, 4♂, leg. Božičić, Šimić, Vujić; Duboka reka, 06.07.1986, 4♀, leg. Radišić, Radnović, Vujić; 18.06.1986, 4♂, leg. Božičić, Šimić, Vujić; Bačište, 06.07.1986, ♂ ♀, leg. Šimić; Karamanski potok, 07.07.1986, 14♀, leg. Radišić, Radnović, Vujić, 18.06.1996, 4♀ leg. Radović, Tanurdžić; Sunčana dolina, 23.06.1991, ♀, leg. Vujić); mountain Stara planina (Topli do Pilj, 25.06.1987, ♀, leg. Vujić).



FIGURES 23, 24. Male genitalia of *Pipiza accola*. 23. lateral view; 24. dorsal view of epandrium; sl - semicircular lobe of surstylus. Scale 0.1mm.

Pipiza quadrimaculata can be distinguished from other *luteitarsis* group species by short and broad abdomen (tergite 4 more than 2 times wide as long, Figs. 17, 18), presence of pale spots on tergites 2 and 3 (Figs. 17, 18) and well defined marginal ridge of abdomen (Figs. 17, 18). In male, the body is predominately black haired. In female, frons lacks pollinose lateral spots (Fig. 3), body hairs are very short and wing is densely microtrichose.

Variability: female mesoscutum can be from pale haired to almost entirely black haired; spots on tergites can be distinct but sometimes tergites 2 and (or) 3 more or less all black (Figs. 17, 18); basoflagellomere from pale brown to predominantly dark.

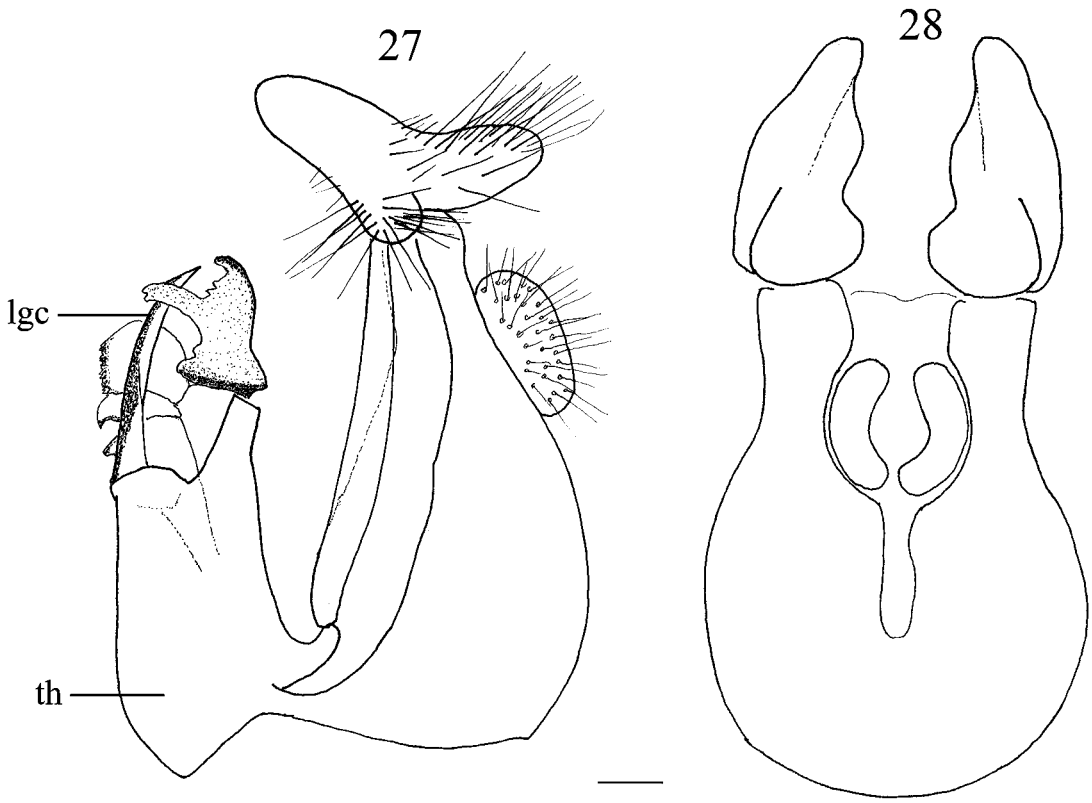


FIGURES 25, 26. Male genitalia of *Pipiza quadrimaculata*. 25. lateral view; 26. dorsal view of epandrium. Scale 0.1mm.

Distribution: from Finland south to the Pyrenees, Bulgaria and the former Yugoslavia; through northern and central Europe into Russia as far as the Pacific (Sakhalin). Also, this species supposedly occurs in North America (Speight 2007).

Ecology (based on Speight 2007): preferred environment: forest; conifer forest from the *Fagus/Picea* zone up into *Picea* forest; on occasion also in humid *Fagus* forest. Adult habitat and habits: tracksides, clearings and open, mature forest. Flowers visited: yellow composites; umbellifers; *Alliaria*, *Allium ursinum*, *Caltha*, *Cardamine*, *Cornus*, *Euphorbia*, *Fragaria*, *Malus*, *Meum*, *Potentilla*, *Ranunculus*, *Rubus*, *Salix*, *Sambucus*, *Sorbus aucuparia.* Flight period: end May/July, with occasional later specimens, especially at higher altitudes. Larva: not described, but Kula (1982) records larvae as overwintering among leaf litter on the floor of spruce (*Picea*) forest.

On the Balkan Peninsula *Pipiza quadrimaculata* appears in localities at higher altitudes, up to 700m. The main habitats of this species are *Fagus* and *Picea* forests, especially near swamps, rivers and streams. This is the most numerous species from the *P. luteitarsis* group on the Balkans.



FIGURES 27, 28. Male genitalia of *Pipiza festiva*. 27. lateral view; 28. dorsal view of epandrium; th – theca of hypandrium; lgc – lower gonocercus. Scale 0.1mm.

Key to the European species of *Pipiza luteitarsis* group

1 Hind femora without pair of ventral longitudinal ridges at the distal end (as on Fig. 12); ventral part of basoflagellomere reddish (Figs. 4–9); male genitalia: hypandrium with short lower gonocercus (about 1/3 length of theca; Figs. 19, 21, 23, 25: lgc) ..... *Pipiza luteitarsis* species-group... 2

- Hind femora with pair of ventral longitudinal ridges at the distal end (as on Fig. 13: lr); basoflagellomere dark; male genitalia: hypandrium with long lower gonocercus, in lateral view (about 3/4 length of theca; as on Fig. 27: lgc) .....other West-Palearctic *Pipiza* species

2 Holoptic: males 3

- Dichoptic: females 6

3 Abdomen short and broad (tergite 4 more than 2 times as wide as long, Fig. 17: T4), usually with pair of pale spots on tergites 2 and 3 (Fig. 17); marginal ridge of abdomen well defined (Fig. 17); body predominantly black haired; male genitalia on Figs. 25, 26 ..... *Pipiza quadrimaculata* (Panzer)

- Abdomen elongated (tergite 4 less than 2 times as wide as long, as on Fig. 15: T4), without, or only with a pair of pale spots on tergite 2; marginal ridge of abdomen less conspicuous (as on Fig. 15); body predominantly pale haired.....4

4 Face pale haired; basoflagellomere elongated (almost 1.5 times longer than wide, Fig. 4); only metatarsus of hind legs darkened; tergite 2 with long sticking out hairs (Fig. 10); male genitalia: basal part of surstyli

with well-developed semicircular lobe (Figs. 19, 20: sl) ..... *Pipiza luteibarba* **n. sp.**

- Face predominantly black haired; basoflagellomere short, oval (wider than long); tarsi of all legs partly darkened or at least of middle and hind legs; tergite 2 without long sticking out hairs (as on Fig. 11); male genitalia: surstyli with reduced or with small basal semicircular lobe (Figs. 21–24: sl) 5

5 Male genitalia: surstyli with small basal semicircular lobe surpassing epandrium (Figs. 23, 24: sl); inner part of basal semicircular lobe with dense pale spines (Fig. 24: sl) ..... *Pipiza accola* Violovitsh

- Male genitalia: surstyli with reduced basal semicircular lobe not surpassing epandrium and without inner spines (Figs. 21, 22: sl) ..... *Pipiza luteitarsis* Zetterstedt

6 Frons without pollinose lateral spots as in Fig. 3; body hairs very short; wing densly microtrichose, without bare areas in cells BR and BM ..... *Pipiza quadrimaculata* (Panzer)

- Frons with pollinose lateral spots as in Figs. 1 and 2; body hairs longer; wing with bare areas in cells BR and BM 7

7 Tergite 5 longer than wide (Fig. 16: T5)..... *Pipiza luteitarsis* Zetterstedt

- Tergite 5 wider than long (as in Fig. 14: T5) 8

8 Basoflagellomere short, oval (slightly longer than wide, Fig. 9); frons in the level of anterior end of pollinose lateral spots broader than eye diameter (dorsal view) ..... *Pipiza accola* Violovitsh

- Basoflagellomere elongated (1.5 times longer than wide, Fig. 5); frons in the level of anterior end of pollinose lateral spots narrower than eye diameter (dorsal view) ..... *Pipiza luteibarba* **n. sp.**

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