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TWO NEW SPECIES OF THE *EMPIS* (S. STR.) *NIGRIPES* GROUP (DIPTERA: EMPIDIDAE) FROM THE NORTH-WEST CAUCASUS

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ABSTRACT

Two new species of the *Empis* (*Empis*) *nigripes* group are described from the North-West Caucasus: *E. (E.) hilariformis* sp. nov. (Russia: Krasnodarskiy Territory) and *E. (E.) ovchinnikova* sp. nov. (Russia: Krasnodarskiy Territory). A key to species of the *E. nigripes* group from the Caucasus is provided.

Key words: Diptera, Empididae, *Empis*, new species, Palaearctic, Caucasus, Russia

ДВА НОВЫХ ВИДА ГРУППЫ *EMPIS* (S. STR.) *NIGRIPES* (DIPTERA: EMPIDIDAE) С СЕВЕРО-ЗАПАДНОГО КАВКАЗА

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РЕЗЮМЕ

С территории Северо-Западного Кавказа описаны два новых вида группы *Empis* (*Empis*) *nigripes*: *E. (E.) hilariformis* sp. nov. (Россия: Краснодарский край) и *E. (E.) ovchinnikova* sp. nov. (Россия: Краснодарский край). Составлена определительная таблица видов группы *E. nigripes* Кавказа.

Ключевые слова: Diptera, Empididae, *Empis*, новые виды, Палеарктика, Кавказ, Россия

INTRODUCTION

The species of *Empis* s. str. are slender-legged, small to middle-sized, greyish flies that can be recognised by a combination of the following characters: male eyes holoptic; proboscis with strongly sclerotised labium, labella very slender; antenna with short scape and pedicel; acrostichals present; radial fork broadly opened; hypandrium well sclerotised; females often with pennate legs. In the Palaearctic

Region the subgenus includes 125 species known mostly from Europe and the Mediterranean (Chvála and Wagner 1989; Syrovátka 2000; Çiftçi et al. 2012). Currently, 24 species of *Empis* s. str. are recorded from the Caucasus (Shamshev and Kustov 2006; Kustov and Mikhaylichenko 2013; Kustov and Shamshev 2013a, 2013b; Chvála 2012; Shamshev and Kustov 2014).

In this paper we describe two new species of *Empis* s. str. from Krasnodarskiy Territory of Russian, which belong to the *E. nigripes* group. Syrovátka (1991) separated this group to include several species

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of *Empis* s. str. sharing modified (with projections or tubercles) tergite 8 of the male. Chvála (1994) accepted generally the *E. nigripes* group but he believed that it covered phylogenetically unrelated species and some of them should be provisionally placed in the *E. pennipes* group. So, a definition of the *E. nigripes* group is still rough and disputable. To resolve this problem a rigorous cladistic analysis would be required. Our unpublished data shows that a concept of the *E. nigripes* group sensu Srovátka (1991) should be expanded to include some species lacking projections or tubercles on the male tergite 8.

Provisionally the *E. nigripes* group could be characterised by the following set of the characters: male fore basitarsus usually slender (except *E. hilariformis* sp. nov.); mesonotum with well differentiated setation, scutellum usually with 4 scutellar bristles; wing with complete anal vein; male abdominal tergite 8 with or without lateral projections or tubercles, when lateral projections present then tergite 7 with corresponding posteromarginal lateral excisions; male terminalia rather small, cerci partly enclosed within epandrium, usually elongate, often with internal projections bearing spines, epandrial lamella usually subtriangular, hypandrium subtriangular, large and bare, phallus short, usually hidden, thickened towards base, often with wing-like or keel-like prominences on middle part. Currently, 9 species of *E. nigripes* group are recorded from the Caucasus including two species described below. A key for the know species of *E. nigripes* group from the Caucasus is given.

Institutional abbreviations. ZIN, Zoological Institute of Russian Academy of Sciences (Saint Petersburg, Russia); KSU, Kuban State University, Krasnodar, Russia.

MATERIAL AND METHODS

This study is based on material deposited in ZIN and KSU. Terms used for adult structures primarily follow those of Cumming and Wood (2009) and Sinclair (2000). Label data for primary types are cited from the top downward, with the data from each label in quotation marks. Labels are cited in full, with original spelling, punctuation, and date, and label lines are delimited by a slash (/). Additional information is included in square [] brackets. The repository of each type is given in parentheses. Secondary type data are abridged and listed alphabetically.

SYSTEMATICS

Family Empididae Latreille, 1804

Genus *Empis* Linnaeus, 1758

Empis (Empis) hilariformis Kustov et Shamshev sp. nov.

(Figs 1–3)

Holotype. Male, RUSSIA: [printed in Cyrillic] “Krasnodarskiy Territory/ Goryacheklyuchevskoy District/ env. Oktyabrskiy/ 08.iii.2013, S.Yu. Kustov” (ZIN).

Paratypes. 51 males, 1 female (ZIN, KSU), same data as holotype. 11 males, 7 females (KSU), same locality as holotype, 31 May 2013, coll. S.Yu. Kustov. 10 males, 2 females (KSU), same locality as holotype, 3 April 2013, coll. S.Yu. Kustov. 5 males, 2 females (KSU), same locality as holotype, 14 April 2013, coll. S.Yu. Kustov. 1 male, 1 female (KSU), Russia, Krasnodarskiy Territory, Sochinskiy District, env. Soloch-Aul, pass “Nol”, 17 April 2013, coll. D.A. Zhrebilo. 19 males, 9 females (KSU), Apsheronskiy District, Nature Reserve “Kamishanova Polyana”, 1200 m asl, 25 April 2013, coll. S.Yu. Kustov. 3 males (KSU), Krimskiy District, env. Krimsk, 10 May 2013, coll. M.M. Babichev.

Etymology. The name of the new species refers to general resemblance of the male fore basitarsus to the typical representatives of the genus *Hilara* (Diptera: Empididae).

Diagnosis. Middle-sized species with labrum nearly 1.5 times as long as height of head; body black setose; halter black. Male: fore and hind tarsomere 1 swollen; wing hyaline; phallus hidden, short, T-shaped, curved apically. Female: wing darkened, legs with simple bristles.

Description. *Male* (Fig. 1). Head black. Eyes holoptic, with upper ommatidia enlarged. Frons represented by small, greyish triangular space above antennae. Face broad, greyish pollinose, nearly parallel-sided; clypeus shining. Ocellar tubercle with 1 pair of long thin and several short setae. Occiput densely greyish pollinose, covered with rather long black setae on upper part and with long brownish hairs below. Antenna black; postpedicel elongate-conical with straight margins, nearly 3 times as long as wide; stylus about 2 times shorter than postpedicel. Labrum brown, 1.5–1.7 times as long as height of head. Palpus black, with several short black setae apically and pair of longer setae on basal part.



Fig. 1. Male habitus of *Empis* (*Empis*) *hilariformis* sp. nov., lateral view. Scale bar = 1 mm.

Thorax black, with black setation; scutum (dorsal view) golden-grey pollinose without distinct stripes; mesopleuron grey pollinose. Antepronotum with several moderately long setae on each side. Proepisternum on lower and upper parts with black hair-like setae. Prosternum bare. Postpronotal lobe with 1 moderately long thin and several short setae. Mesonotum with main setae thin, including 3 presutural intra-alar setae of different lengths, 1 presutural supra-alar, 3 stronger notopleurals, 2 post-sutural supra-alars (posterior longer and stronger), 1 postalar, 2 scutellars; additionally, several short,

hair-like setae present on notopleural and supra-alar areas; acrostichals moderately long, thin, arranged in 2 close irregular rows, lacking on prescutellar depression; dorsocentrals longer than acrostichals, irregularly biserial on anterior part, becoming uniserial toward scutellum, 2 pairs of prescutellars longest. Laterotergite with numerous black setae. Anterior and posterior spiracles dark brown.

Legs entirely black; subshining, faintly greyish pollinose (denser on coxae). Coxae and trochanters with numerous brownish hairs and black setae. Fore femur slightly thickened; with anteroventral and

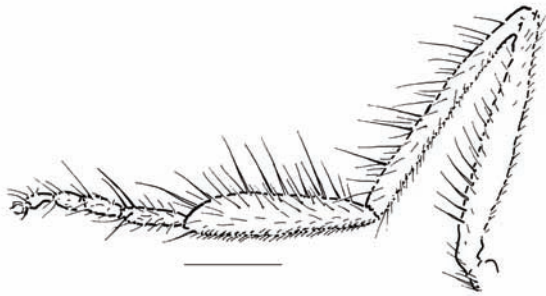


Fig. 2. Male fore leg of *Empis (Empis) hilariformis* sp. nov., anterior view. Scale bar = 0.4 mm.

posteroventral thin black setae becoming longer near base of femur (as long as width of femur). Fore tibia densely pubescent ventrally, bearing numerous long hair-like setae dorsally (longest ones about 2–2.5 times as long as width of tibia). Fore basitarsus (Fig. 2) elongate, strongly thickened, about twice as broad as fore tibia at apex, covered with numerous long hair-like setae; tarsomeres 2–4 clothed in rather long setae; tarsomeres 1–4 with cirplet of long somewhat stronger subapical setae. Mid femur with long anteroventral and posteroventral setae (longest ones about 1.5 times as long as width of femur). Mid tibia with 5–6 short to moderately long setae ventrally (at most slightly longer than width of tibia); covered with numerous short hair-like setae dorsally and bearing 6–7 long dorsal to anterodorsal setae (longest ones about 2–2.5 times as long as width of tibia). Mid basitarsus slender; covered with moderately long hair-like setae, bearing 2 long dorsal setae on about middle (at least twice as long as width of basitarsus), with strong setae ventrally; tarsomere 2 with strong ventral setae; tarsomeres 1–4 with cirplet of moderately long subapical setae. Hind femur slightly thickened; with longer dorsal and ventral setae on about apical half. Hind tibia slightly curved and thickened; covered with short ventral setae; with longer setae dorsally (longest ones 1.5–2 times as long as width of tibia). Hind basitarsus elongate, thickened, slightly broader than apex of hind tibia; covered with short ventral setae; bearing several rather long setae dorsally; tarsomeres 1–4 with cirplet of moderately long subapical setae.

Wing hyaline; veins dark brown apically and yellowish closer to base; costal seta short, black; pterostigma elongate, distinct, brown; veins R_4 and

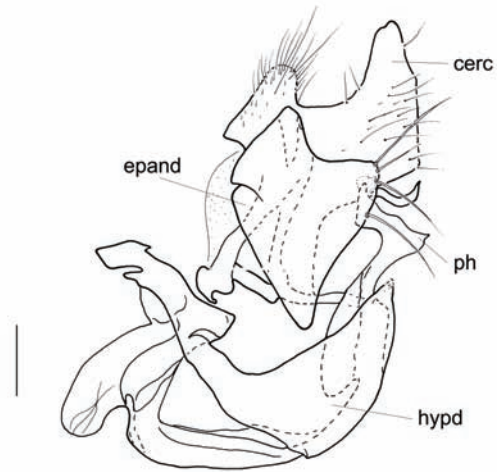


Fig. 3. Male terminalia of *Empis (Empis) hilariformis* sp. nov., lateral view. Scale bar = 0.1 mm.

M_{1+2} almost parallel near wing apex; radial fork broad; anal vein complete; axillary lobe almost rectangular. Calypter brown, with black hairs. Halter black.

Abdomen black, greyish pollinose (denser on sternites), covered with dark hairs and black setae; tergites with short setae dorsally, bearing long hairs laterally; tergite 8 unmodified. Terminalia (Fig. 3) black; cercus large, covered with short setae, deeply notched dorsally, with narrow, short, hook-shaped ventral process; epandrial lamella triangular, with broad excision on upper margin, bearing several long black marginal setae apically; hypandrium large, bare; phallus brown, hidden, relatively short, broader on middle, with narrow T-shaped curved apex.

Female. Frons broad, parallel-sided, bearing marginal setulae; occiput and ocellar tubercle with stronger setae than in male. Palpus shorter than in male. Acrostichals and dorsocentrals shorter than in male. Legs with shorter setation than in male; fore and mid legs with ordinary setation, only mid femur with longer setae; fore basitarsus slender; hind femur slightly thickened, with short dense ordinary dorsal and ventral setae; hind basitarsus elongate and slightly thickened; subequal to apex of tibia. Wing distinctly broader than in male, brownish. Abdomen covered with short hairs and setae, slightly longer on tergites 1–3; sternite 8 with thin finger-like apical process. Cercus black, long, covered with scattered hair-like setulae.

Length (mm). Body 3.5–3.8, wing 4.2–4.5.

Comparison. *Empis (Empis) hilariformis* sp. nov. is similar to *E. (E.) socrus* Syrovátka, 1983 described from the Caucasus (Barták and Syrovátka 1983). The new species can be readily distinguished from *E. (E.) socrus* by thickened basitarsus of fore and hind legs of the male. The female of *E. (E.) socrus* has broadly pennate hind femur while in the female of the new species the hind femur is covered with unmodified setae.

Distribution. Russia (Krasnodarskiy Territory). Known from the submountain and mountain forest, altitude 200–1300 m asl; earliest spring species among the Caucasian *Empis*, occurring from the beginning of March to the beginning of May; locally very common on flowers.

***Empis (Empis) ovchinnikovae* Kustov et Shamshev sp. nov.**

(Fig. 4)

Holotype. Male, RUSSIA: [printed in Cyrillic] “North-West Caucasus/ ridge Azish-Tau/ env. of biological station “Kamyshanova Polyana”/Great Glades/ 09.vii.2013, V.V. Gladun” (ZIN).

Paratypes. 1 male (KSU), same locality as holotype, 7 July 2009, V.V. Gladun. 1 male (KSU), Russia, Krasnodarskiy Territory: 1 male, Severskiy District, env. Stavropol’skaya, Shebsh ridge, 9 June 2009, Gladun V.V. 1 male (KSU), Goryacheklyuchevskoy District, env. Oktyabr’skiy, bank of river Mokriy Sepsil, 25 April 2010, Kustov S.Yu. 2 males, 2 females, (ZIN, KSU), Goryacheklyuchevskoy District, env. Oktyabr’skiy, bank of river Mokriy Sepsil, 18 May 2014, Kustov S.Yu.

Etymology. The new species is named in honour of Russian dipterologist, Olga G. Ovchinnikova (Saint Petersburg).

Diagnosis. Middle-sized species (nearly 4 mm), with labrum nearly 1.5 times as long as head height; body with black bristles; wing brownish, halter black; male terminalia with epandrial lamella trapezoidal, phallus hidden, thin.

Description. *Male.* Head black. Eyes holoptic, with upper ommatidia enlarged. Frons represented by small, densely greyish pollinose, triangular space above antennae. Face broad, densely greyish pollinose; almost parallel-sided. Ocellar tubercle with 1 pair of long and several short thin setae. Occiput densely greyish pollinose; covered with numerous, long black setae arranged at 2–3 irregular rows on upper part, with black hairs of different lengths on lower part.

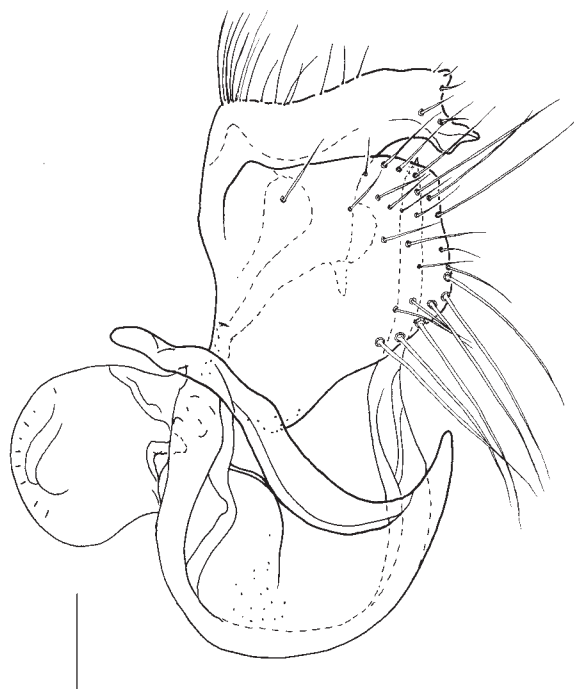


Fig. 4. Male terminalia of *Empis (Empis) ovchinnikovae* sp. nov., lateral view. Scale bar = 0.1 mm. Abbreviations: cerc – cercus; epand – epandrium; hypd – hypandrium; ph – phallus.

Antenna black; postpedicel elongate-conical, with almost straight margins, nearly 2.5 times as long as wide; stylus about 2/3 of postpedicel length. Labrum brown, nearly 1.5 times as long as head height. Palpus black, narrow, with several long black bristles apically and with pair of long setae closer to base.

Thorax black, with black setation; scutum subshining, faintly greyish pollinose, without distinct stripes; entire mesopleuron greyish pollinose. Anteprotonotum with several moderately long thin setae on each side. Proepisternum with several setae on lower and upper parts. Prosternum bare. Postpronotal lobe with 1 moderately long thin and several short thin setae. Mesonotum with 1 moderately long presutural intra-alar, 1 very strong presutural supra-alar, 3 strong notopleurals, 2–3 postsutural supra-alars, 1 long strong postalar and 4 scutellars (apical pair longer and stronger); additionally, several short, black setae present on notopleuron and supra-alar area; acrostichals moderately long, biserial, lacking on prescutellar depression; dorsocentrals slightly longer than acrostichals, biserial in anterior part, becoming uniserial toward scutellum, 2 pairs of pres-

cutellars longest and strongest. Laterotergite with numerous black setae of different lengths. Anterior and posterior spiracles blackish.

Legs entirely dark brown; subshining, only coxae densely greyish pollinose. Coxae and trochanters with black bristles and hairs. Fore femur with short dorsal setae, ventral setae small and present only on basal part. Fore tibia pubescent ventrally; bearing row of dorsal bristles, at most as long as width of tibia. Fore basitarsus somewhat thickened, not broader than apex of fore tibia; densely pubescent ventrally, with short dorsal setae; tarsomeres 2–5 ordinary, with cirlet of somewhat longer subapical setae. Mid femur bearing rows of anteroventral and posteroventral bristles becoming longer toward base of femur and 2.5–3 times as long as width of femur near base; dorsal bristles very long near base of femur (2–2.5 times longer than width of femur), becoming shorter toward apex. Mid tibia with 5–6 (including subapical) very long dorsal bristles, 3–4 times longer than width of tibia; ventral bristles biserial, longest ones 2–2.5 times longer than width of tibia. Mid tarsomeres simple; basitarsus with strong spine-like ventral setae; all tarsomeres with cirlet of strong setae. Hind femur slender, with ventral bristles and row of strong dorsal bristles, 1.5–2 times longer than width of femur. Hind tibia slightly curved and thickened, bearing short ventral and 2 rows of dorsal setae (5–6 pairs longer). Hind basitarsus slender; with numerous spine-like ventral setae and several moderately long dorsal bristles.

Wing brownish; veins dark brown on apical part and yellowish closer to base; 1 moderately long black costal seta; pterostigma indistinct; veins R_4 and M_{1+2} almost parallel near wing apex; radial fork broad; anal vein complete; axillary lobe almost rectangular. Calypter brownish, with black hairs. Halter black.

Abdomen black, greyish pollinose (denser on sternites), covered with black hairs and bristles; tergites with short strong bristles dorsally, bearing longer bristles laterally; tergites 1–4 laterally and sternites 1–4 with long hairs; tergite 8 unmodified. Terminalia (Fig. 4) black; cercus large, truncated apically, with short apical projection on lower margin, covered with short black hairs and bristles; epandrial lamella trapezoidal, with numerous black bristles of different lengths closer to margin; hypandrium large, black, bare; phallus short, hidden, thin, slightly curved at middle.

Female. Frons broad, parallel-sided, bearing strong marginal setulae; occiput and ocellar tubercle

with stronger setae than in male. Acrostichals and dorsocentrals shorter and stronger than in male. Legs with shorter setation than in male; mid femur bearing row of dorsal bristles as long as width of femur near base and becoming shorter toward apex, with ordinary ventral bristles; mid tibia with relatively short strong dorsal and ventral bristles, some dorsal setae slightly longer than width of tibia; hind femur slightly thickened, with relatively short dense dorsal and ventral setae; hind tibia slightly curved and thickened, bearing short ventral and 2 rows of dorsal setae (4–5 pairs longer than width of tibia); hind basitarsus elongate and slightly thickened, subequal to apex of tibia, bearing numerous spine-like ventral setae and several stronger dorsal and ventral bristles slightly longer than width of basitarsus. Wing distinctly broader than in male, brownish. Abdomen covered with short hairs and setae. Cercus black, long, covered with scattered hair-like setulae.

Length (mm). Body 3.5–4.1, wing 3.9–4.5.

Comparison. *Empis* (*Empis*) *ovchinnikovae* sp. nov. resembles *E. (E.) hirta* Loew, 1865 described from Georgia. The new species differs from *E. (E.) hirta* by 4 scutellar bristles (8–10 in *E. (E.) hirta*), biserial acrostichal and dorsocentral bristles (multiserial in *E. (E.) hirta*) and some other characters including the male terminalia.

Distribution. PALAEARCTIC: Russia (Krasnodarskiy Territory). Known from submountain and mountain forest, altitude 200–1300 m asl; spring-summer species, active from April to July; rare.

Key to species of the *E. nigripes* group from the Caucasus

1. Male 2
 - Female (unknown for *E. temryukiensis* Kustov et Shamshev, 2013 and *E. cherkessica* Kustov et Shamshev 2013) 10
2. Halter black to brown, at least darkened 3
 - Halter pale to yellow 5
3. Abdominal tergite 8 with finger-like projection on each side. Abdomen with pale setation
 - *E. consobrina* Syrovátka, 1983
 - Abdominal tergite 8 ordinary, without lateral projections 4
4. Fore basitarsus elongate, strongly thickened, about twice as broad as fore tibia at apex, covered with numerous long hair-like setae *E. hilariformis* sp. nov.
 - Fore basitarsus somewhat thickened, not broader than apex of fore tibia, with ordinary setae
 - *E. ovchinnikovae* sp. nov.

5. Abdominal tergite 8 with finger-like projection on each side *E. tenera* Syrovátka, 1983
 - Abdominal tergite 8 ordinary, without lateral projections 6
6. All hairs and setae on thorax and abdomen pale 7
 - All hairs and setae on thorax and abdomen mixed or black 8
7. Head with pale hairs and setae. Anal vein incomplete, not reaching wing margin. Phallus thin, brown
 - *E. albopilosa* de Meijere, 1935
 - Head mostly with black setae. Anal vein complete. Phallus thick
 - *E. cherkessica* Kustov et Shamshev, 2013
8. Wing hyaline or milky-white. Anal vein incomplete. Proboscis with labrum about 1.5 times as long as head is high *E. socrus* Syrovátka, 1983
 - Wing brownish 9
9. Legs entirely black. Anal vein complete. phallus dark brown, sinuate on subapical portion, with narrow, beak-like apex ... *E. temryukiensis* Kustov et Shamshev, 2013
 - All legs with femora near apex, tibiae and basitarsi near base yellowish. Phallus short, thick
 - *E. genualis* Strobl, 1893
10. Halter black to brown, at least darkened 11
 - Halter pale to yellow 13
11. Legs strongly pinnate ... *E. consobrina* Syrovátka, 1983
 - Legs with simple ciliation 12
12. Legs with short bristles. Sternite 8 with finger-like projection *E. hilariformis* sp. nov.
 - Mid and hind tibiae covered with longer dorsal setae equally as tibiae is wide. Sternite 8 ordinary, without projections *E. ovchinnikova* sp. nov.
13. All legs with femora near apex, tibiae and basitarsi near base yellowish. Mid and hind coxae with ordinary setae *E. genualis* Strobl, 1893
 - Legs entirely black 14
14. Legs strongly pinnate *E. socrus* Syrovátka, 1983
 - Legs with simple ciliation 15
15. Head, thorax and abdomen with pale hairs and setae. Anal vein incomplete, not reaching wing margin
 - *E. albopilosa* de Meijere, 1935
 - Head and thorax mostly with black setae. Anal vein complete *E. tenera* Syrovátka, 1983

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