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Dance flies (Diptera: Empididae) in A.P. Fedtschenko's Collection from Turkestan: *Empis negrobovi* species group

Мухи-толкунчики (Diptera: Empididae) в коллекции А.П. Федченко из Туркестана: группа видов *Empis negrobovi*

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КЛЮЧЕВЫЕ СЛОВА. Diptera, Empididae, новый вид, А.П. Федченко, Средняя Азия.

ABSTRACT. A part of material on dance flies of the genus *Empis* Linnaeus (Diptera: Empididae) from the collection taken by A.P. Fedtschenko in Middle Asia (1869–1871) was examined. A new species of the *E. negrobovi* species group is described: *E. jiptykiensis* **sp.n.** (Kyrgyzstan). The female of *E. rohdendorfi* Shamshev, 2001 (Uzbekistan) is described for the first time.

РЕЗЮМЕ. Изучена часть материала по мухам-толкунчикам рода *Empis* Linnaeus (Diptera: Empididae) из коллекции, собранной А.П. Федченко в Средней Азии (1869–1871). Описан новый вид из группы видов *E. negrobovi*: *E. jiptykiensis* **sp.n.** (Кыргызстан). Впервые описана самка *E. rohdendorfi* Shamshev, 2001 (Узбекистан).

Introduction

The Russian naturalist and explorer Aleksey Pavlovich Fedtschenko (1844–1873) is well known for his 1869–1871 Expedition in different regions of Turkestan (a historical region partly coinciding with an area now commonly called Central Asia or Middle Asia) [Fedtschenko, 1950; Leonov, 1972]. This expedition resulted in large material on insects, including flies, however, many of their families have remained taxonomically untreated. The collection of Empididae taken by A.P. Fedtschenko is deposited in Zoological Museum of Moscow University, Moscow. It includes about 200 specimens (intermixed with specimens of Hybotidae, Brachystomatidae and Microphorinae of Dolichopodidae, following modern classification of Empidoidea). The material is generally in good condition and has never been specially studied. Dance flies remain insufficiently investigated in Middle Asia (about 50 known species), although, they are a marked element of the biota of the region, primarily in submontane and montane areas.

Our paper covers material on the *Empis negrobovi* group of species that is a group with uncertain subgeneric position within the genus *Empis* Linnaeus, 1758 [Shamshev, 2001]. The group currently includes 15 described species and has a Holarctic distribution. In Eurasia, it is especially diverse in Middle Asia (10 species), one species was described from the south of the Ukraine, two species — from mountains of Altay, one species — from Yakutia, and one species is known only from Wrangel Island [Shamshev, 2001, 2019; Shamshev et al., 2020]. In North America, three undescribed species are known from Yukon in Canada [Shamshev et al., 2020].

The Fedtschenko's collection comprises two species of the *Empis negrobovi* group, including a new species described herein.

Material and Methods

This study is primarily based on material deposited in Zoological Museum of Moscow University, Moscow (ZMMU); in addition, some species housed in Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZISP) were examined. The photographs were taken using a Canon EOS 11 40D camera using a Canon MP-E 65 mm objective, with multiple

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layers combined using the Helicon Focus 5.3.14 software. To facilitate observations, the terminalia were macerated in cold 10% KOH, then immersed for a short period in 85% lactic acid and viewed in glycerine. Additional information to label data is included in square [ ] brackets. The repository of specimens is given in parentheses (ZMMU, when omitted).

The specimens examined usually bear two labels — upper, small, almost quadrate, coloured label and lower, small, very narrow, white label with printed geographic locality (Cyrillic, Russian, pre-1918 orthography). The coloured labels include coded information. They are of different colour that refers to a month of collecting (lilac — April, pink — May, bluish green — June, yellow — July, blue — August, orange — September); a number on a label means the day of the month; no line on both sides of a label means 1869, a black line on lower side — 1870, and a red line on upper side — 1871 [after P.P. Semyonov-Tyan-Shansky's hand-written notes about material of different collectors housed in Coleoptera Department of ZISP]. The dates on the labels are according to the old Julian calendar and they are therefore 13 days behind the modern Gregorian calendar. The name of the collector is always absent. It should be noted that printed geographic name usually indicates a whole region visited by the expedition during some period. A list of exact localities within the region (arranged by years, months and days, often with short ecological remarks) was provided by A. Fedtschenko in a separate booklet [Fedtschenko, 1871].

Taxonomy

Family Empididae Latreille, 1804

Subfamily Empidinae Latreille, 1804

Genus *Empis* Linnaeus, 1758

Empis jiptykiensis Shamshev, **sp.n.**

Figs 1–3.

TYPE MATERIAL. Holotype, ♂, [**Kyrgyzstan**] Jiptyk [Pamir-Alay mountain system; "3270–3749 m, on mountain slopes along Shchurovsky Glacier" [Fedtschenko, 1871]; ~ 39°36′N, 70°34′E; see additional remarks below], 24.vi.1871 (ZMMU, terminalia dissected, pinned in a microvial with holotype).

DIAGNOSIS. Mid-sized (body about 5 mm) species with brown palpus, legs and halteres; occiput behind eyes, proepisternum, hind femur and abdomen with flattened setae; phallus gently curved, broadened on apical third.

DESCRIPTION. **Male** (Fig. 1). Body 4.8 mm, wing 4.5 mm. Head black, with faint, greyish pruinosity on frons, face (except shiny lower margin), ocellar triangle, postgena and occiput; clypeus shiny; setation black to brown. Eyes dichoptic, ommatidia equally small. Frons broad, below ocellar triangle slightly broader than distance between outer margins of posterior ocelli, somewhat more broadened above antennae; with curiously long marginal setulae. Face very broad, bare. Ocellar setae undifferentiated; ocellar triangle with several subequally long, fine setae. Occiput somewhat convex behind eye laterally; postoculars long, fine; similar dense setae on upper part and numerous long, flattened setae on convex part of occiput; postgena with paler hair-like setae. Antenna with scape and pedicel brown, postpedicel and stylus black; scape slightly longer than pedicel, with longer setulae; postpedicel 3X longer than basal width, with straight margins; stylus 1.5X shorter than postpedicel. Proboscis long, labrum 1.4X as long as eye height; palpus rather long and somewhat thickened, brown; with numerous long, black, fine setae.

Thorax brown, faintly greyish pruinose, black setose; mesoscutum (Fig. 2) with 4 narrow, indistinct, brownish vittae (dorsal view). Prosternum bare. Proepisternum with tuft of numerous, intermixed slightly flattened and simple setae on lower part, bare on upper part in front of anterior spiracle. Antepronotum with several short, strong setae dorsally and 3–4 longer fine setae laterally on each side. Postpronotal lobe with tuft of mostly long, simple setae. Mesonotal setation (somewhat variable on right and left sides): 1 weak presutural supra-alar (with 3–4 additional finer setae), 1 postsutural supra-alar (with several additional finer setae of different lengths anteriorly and posteriorly), 4–5 notopleurals, 1 very long and 1 very short postalars, about 16 scutellars of different lengths and robustness; additional short, fine setae present on notopleuron anteriorly; acrostichals arranged in 2 close irregular rows, long, fine, lacking on prescutellar depression; presutural dorsocentrals irregularly 3–4-serial, fine, nearly as long as acrostichals, flanked with several similar intra-alar setae, postsutural dorsocentrals mostly uniserial, 3 pairs of strong prescutellars longest. Laterotergite with numerous setae. Anterior and posterior spiracles brownish yellow.

Legs entirely brown; faintly greyish pruinose, including coxae; black setose. Legs structure: robust; hind femur on middle slightly broader than fore and mid femora; hind tibia not-geniculate, slightly narrower on about apical half; fore and hind basitarsi slender. Coxae and trochanters with simple setae. Fore femur with short, stronger (especially closer to apex) setae anteroventrally; very long (longer than femur width) hair-like setae posteroventrally and posteriorly. Fore tibia with moderately long, fine setae dorsally and posterodorsally. Fore tarsomeres with somewhat longer setae dorsally and posterodorsally. Mid femur with complete rows of short, strong anteroventral and similar, longer posteroventral setae, covered with dense, spinule-like setae ventrally. Mid tibia with somewhat longer setulae dorsally, bearing erect spinule-like setulae ventrally. Hind femur with similar ventral setation to mid femur; in addition, bearing anterodorsal fringe of flattened setae (except narrow subapical portion). Hind tibia with similar dorsal setation to mid tibia; covered with erect setulae ventrally; no seta in "comb" at tip behind. Fore and mid basitarsi with some minute, spinule-like setulae ventrally; hind basitarsus only whitish pubescent ventrally.

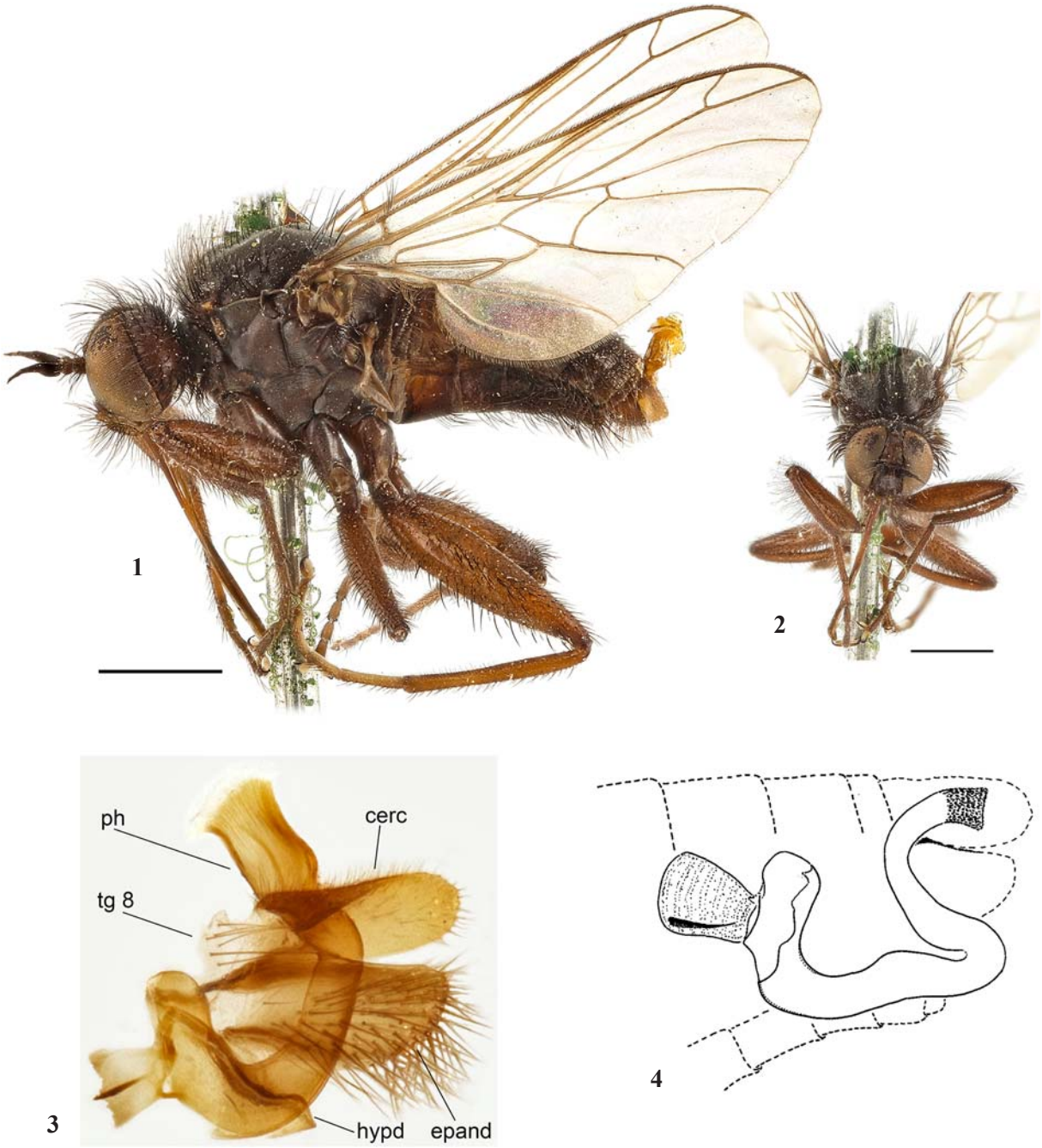
Wing membrane almost hyaline, faintly uniformly infuscate, with brownish veins; CuA+CuP (anal vein) complete but weakened on middle portion; cell dm short, with elongate apex. Pterostigma absent. Basal costal seta absent. Anal lobe well-developed; axillary incision acute. Squama brownish, brown fringed. Halter brown.

Abdomen brown, subshiny, faintly brownish grey pruinose; black setose, covered with long, dense, slightly flattened setae on tergites laterally and sternites (intermixed with some simple setae); short and sparse setae on tergites dorsally, sternite 1 bare. Pregenital segments: segment 8 with tergite and sternite separated; tergite 8 mostly membranous, represented by two weakly sclerotized, narrow lateral sclerites each bearing 5–6 setae; sternite 8 simple.

Terminalia (Fig. 3) moderately large; cercus mostly yellowish to brownish yellow, brownish near base; pubescent

with microtrichia, with scattered, dark, fine setulae on outer surface; erect setulae on inner surface anteriorly; epandrial lamella brown, subshiny, covered with dense, uniformly moderately long, fine setae; phallus yellowish. Epandrium divided into two lamellae (dorsal bridge absent); epandrial lamella subtriangular, narrow, with posterior margin broadly rounded (lateral view). Hypandrium mostly membranous, rim-like sclerotized along posterior margin, bare. Cerci separated from epandrium and each other; cercus large, unilobate, subrectangular in lateral view, with rounded posterior margin and straight upper margin, posterior margin reaching nearly level of epandrial lamella apex. Hypoproct inconspicuous. Phallus hidden on about basal 2/3; thick, with broader apical 1/3 extended beyond cerci, more or less gently curved, with apex directed obliquely forward; sulcate on subapical portion. Ejaculatory apodeme extended far beyond basal curvature of phallus, with small lateral wings.

Female. Unknown.



Figs 1–4. *Empis* Linnaeus: 1–3 — *E. jiptykiensis* Shamshev, **sp.n.**, male, holotype: 1 — habitus, lateral view; 2 — head and mesonotum, anterior view; 3 — hypopygium, lateral view; 4 — *E. nartshukae* Shamshev, 2001, male, phallus, lateral view (from Shamshev, 2001, with modificatins). Abbreviations: cerc — cercus; epand — epandrium; hypd — hypandrium; ph — phallus; tg 8 — tergite 8. Scale bar is 1 mm.

Рис. 1–4. *Empis* Linnaeus: 1–3 — *E. jiptykiensis* Shamshev, **sp.n.**, самец, голотип: 1 — габитус, вид сбоку; 2 — голова и среднеспинка, вид спереди; 3 — гипопигий, вид сбоку; 4 — *E. nartshukae* Shamshev, 2001, male, phallus, lateral view (из Shamshev, 2001, с изменениями). Сокращения: cerc — церк; epand — эпандрий; hypd — гипандрий; ph — фаллус; tg 8 — 8-й тергит. Масштаб: 1 мм.

DIFFERENTIAL DIAGNOSIS. Within the key to species of the *Empis negrobovi* group the new species would run to *E. nartshukae* Shamshev, 2001 described from the East Pamir of Tajikistan [Shamshev, 2001]. These species differ from all other members of the group by a combination of brown palpus, legs and halteres. The new species can be distinguished from *E. nartshukae* by 3–4-serial presutural dorsocentral setae (versus irregularly biserial), longer posterodorsal setae on the fore tibia, brownish yellow spiracles and by absolutely different shape of the phallus (Figs 3–4). It should be noted that the new species differs from all other species of the *E. negrobovi* group by gently curved phallus (versus S-like bend, with apex directed back, as in Fig. 4).

ETYMOLOGY. The epithet refers to the type locality of the new species, Jiptyk (Kyrgyzstan, Osh Province).

REMARKS. Fedtschenko indicated "Jiptyk" (alternative spelling "Jiptik") as a basic locality of the expedition 1871 during June 22–25 [Fedtschenko, 1871]. However, he noted in his comments a pass and a river with the same name. The new species was collected on mountain slopes along Shchurovsky Glacier, i.e., close to upper reaches of Jiptyk River (meeting point of Turkestan and Alay Ranges). Fedtschenko [1875: 78] described in details his excursion of June 24, when the new species was collected (e.g., he mentioned many insects visited flowers).

DISTRIBUTION. Kyrgyzstan (Pamir-Alay mountain system).

Empis rohdendorfi Shamshev, 2001
Figs 5–6.

Shamshev, 2001: 221, figs 23, 24. Type locality: Uzbekistan, Tashkent.

MATERIAL EXAMINED. **Uzbekistan.** Tashkent: 11.iv.1871 (1 ♀) ["426 m, Chimkent road to Bossa, steppe" [Fedtschenko, 1871]], 22.iv.1871 (1 ♂), 23.iv.1871 (3 ♂♂, 4 ♀), 24.iv.1871 (ZISP, 2 ♂♂, 1 ♀), 25.iv.1871 (1 ♂), no locality label, 22.iv.1871 (1 ♀).

REMARKS. This species was described after single male collected by B.B. Rohdendorf from "Tashkent". The collection of A.P. Fedtschenko includes 13 specimens of *E. rohdendorfi* taken from the same locality and one specimen without locality label. The female of *E. rohdendorfi* is described for the first time herein. In addition, we provide a habitus photo of the male of this species (Fig. 5).

DESCRIPTION**. Female** (Fig. 6, described for the first time). Body 4.1–4.7 (in male 4.7–5.1 mm); wing 4.5–5.2 mm (in male 5–5.5 mm). Frons broader than in male, below ocellar triangle slightly broader than distance between outer margins of posterior ocelli, parallel-sided. Occiput with sparser, simple setae laterally. Mesonotum with shorter setae. Legs generally with sparser and shorter setae; mid and hind femora not pubescent ventrally, with shorter, finer and sparser anteroventral and posteroventral setae; mid and hind tibiae with simple setulae ventrally (in male mid tibia covered with dense, minute, erect setulae ventrally; hind tibia with scattered minute setulae ventrally), 2 short anteroventral setae on middle portion. Wing slightly uniformly infuscate. Abdomen with segments 1–7 densely whitish grey pruinose, segment 8 black, subshiny; mostly covered with scattered, minute setulae; tergites 1 and 2 with short, sparse, pale, hair-like setae laterally; sternites 6 and 7 with several, rather long, fine posteromarginal setae. Cercus dark, long, slender, with simple minute setulae.

DISTRIBUTION. Uzbekistan.

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Figs 5—6. *Empis rohdendorfi* Shamshev, 2001: 5 — male, habitus, lateral view; 6 — female, habitus, lateral view. Scale bar is 1 mm.
Рис. 5—6. *Empis rohdendorfi* Shamshev, 2001: 5 — самец, габитус, вид сбоку; 6 — самка, габитус, вид сбоку. Масштаб: 1 мм.

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* Probably privately printed and not dated; in Russian. This booklet was inserted at the end of an exemplar of Fedtschenko's "A journey to Turkestan" [1875] housed in ZISP (Library of Russian Academy of Sciences). It has a separate pagination and a different publisher, indicated above.