

Description of a new hoverfly species of the genus *Ferdinandea* and the female of *Eumerus muratovi* from Tajikistan (Diptera: Syrphidae: Eristalinae)

Описание нового вида мух-журчалок из рода *Ferdinandea* и самки *Eumerus muratovi* из Таджикистана (Diptera: Syrphidae: Eristalinae)

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Abstract. A new species of the genus *Ferdinandea* Rondani, 1844 and the unknown female of *Eumerus muratovi* Barkalov, 2020 are described. The new species *F. volkovae* sp. nov. differs from all Palaearctic species of the genus in the coloration of the face, the frons and mesonotum completely covered with grey pollen, black scape and pedicel, and the details of the male genitalia. The female of *E. muratovi* is similar to that of *E. kozlovi* Stackelberg, 1952, but differs in the completely black legs, larger size and presence of brown spot on the wing.

Резюме. Описываются новый вид из рода *Ferdinandea* Rondani, 1844 и ранее неизвестная самка *Eumerus muratovi* Barkalov, 2020. Новый вид *F. volkovae* sp. nov. отличается от всех палеарктических видов рода окраской лица, лбом и среднеспинкой, полностью покрытыми серым налётом, черной окраской скапуса и педичела и деталями строения гениталий самца. Самка *E. muratovi* похожа на *E. kozlovi* Stackelberg, 1952, но отличается полностью черными ногами, более крупным размером и наличием коричневого пятна на крыле.

Key words: Tajikistan, female, Syrphidae, Eristalinae, *Eumerus muratovi*, *Ferdinandea*, new species

Ключевые слова: Таджикистан, самка, Syrphidae, Eristalinae, *Eumerus muratovi*, *Ferdinandea*, новый вид

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Introduction

The hoverflies or Syrphidae is one of the largest families of Diptera, comprising more than 6100 species worldwide (Courtney et al., 2017). A total of 180 species of hoverflies are recorded within the Republic of Tajikistan (Barkalov, unpublished data). Since the publication of the last summary of syrphids in Tajikistan (Peck, 1988), the list of species recorded from this country has

increased by 57 (from 127 to 180) and in the two last years eight species new to science have been discovered. The descriptions of some of these species have already been published (*Merodon eumerusi* Vujić, Radenković et Likov in Vujić et al., 2019, *M. nigrocapillatum* Vujić, Likov et Radenković, 2020, *Rohdendorfia khakimovi* Barkalov in Ximo & Barkalov, 2019, and *Eumerus muratovi* Barkalov, 2020), while the descriptions of several other species are currently in preparation.

Ferdinandea Rondani, 1844 is a relatively small genus, comprising eight described species in the Palaearctic (Peck, 1988; Mutin & Barkalov, 1999; Speight, 2017). In the habitat preference, species of the genus gravitate towards deciduous forests, so the discovery of a new *Ferdinandea* species in the arid conditions of Tajikistan is surprising. A comparison of the collected male with other Palaearctic representatives of *Ferdinandea* showed that it belongs to a new species.

The species *Eumerus muratovi* Barkalov, 2020 was described from two males collected on a mountain ridge in the West Pamirs at an altitude of 4300 m (Barkalov, 2020). In July 2021, two females were collected in the West Pamirs from the localities distant from each other. A comparison of these females with the males indicated that they are conspecific.

In this article, we describe a new species, *Ferdinandea volkovae* sp. nov. and a previously unknown female of *Eumerus muratovi*.

Material and methods

The study is based on the material collected in 2021 during a joint Russian–Tajik entomological expedition, in accordance with an agreement on scientific cooperation between the Institute of Systematics and Ecology of Animals (Siberian Branch of the Russian Academy of Sciences, Novosibirsk) and E.N. Pavlovsky Institute of Zoology and Parasitology (National Academy of Sciences of Tajikistan, Dushanbe). The insects were collected using Malaise traps, yellow pan traps and individually trapped with a net. These three techniques allowed us to obtain a representative set of specimens in a short time that makes it possible to judge about the species composition of hoverflies in a study area. The material is deposited at the Siberian Zoological Museum of the Institute of Animal Systematics and Ecology (Novosibirsk).

For species identification, the keys to European species of *Ferdinandea* (Ricarte et al., 2010; Speight & Sarthou, 2011) and a key to Palaearctic species of *Eumerus* (Stackelberg, 1961) were used. We also compared our specimens with the descriptions and with specimens from the collection of the Siberian Zoological Museum. Figures were made using an ocular grid and graph paper. Photos

were taken with a Zeiss Stemi-2000 stereoscopic microscope. Body length was measured dorsally from the anterior margin of the lunule to the tip of the abdomen. Wing length was measured from the tip of the wing to its base. The male genitalia were dissected and prepared for study following Hippa (1968).

Morphological terminology follows Thompson (1999) with the exception of the numbering of the legs and parts of the male genitalia, which are given according to Barkalov & Cheng (2004).

Results

Order Diptera

Family Syrphidae

Subfamily Eristalinae

Genus *Ferdinandea* Rondani, 1844

Ferdinandea volkovae sp. nov.

(Figs 1A–E, 2A, B)

Holotype. Male, Tajikistan, “GBAO [Gorno-Badakhshan Autonomous Prov.], Bodom-Dara ushch. [Gorge], 37°10'N 71°53'E, 2870 m, 29.VII.2021, A. Barkalov leg.” [in Russian].

Description. *Male*. Body length 11.8 mm; wing length 10.5 mm.

Head. Face broad, distinctly broadened ventrally, with distinct broad tubercle, dark brown in dorsal and lateral parts and broadly yellow medially (Figs 1A, 2B). Paraface moderately broad yellow in dorsal two-thirds and brown in ventral one-third, covered with silver pollen and short fine pile. Gena broad yellow, with white pollen and long yellow pile. Frons broad, black, with dense white pollen and comparatively short fine black pile; frontal angle slightly more than 90°. Antenna with scape and pedicel black, basoflagellomere enlarged, rounded, mostly brown, with a large orange spot posteroventrally (Fig. 1B), arista long, gradually tapering, brown, without pile. Eyes connected for distance approximately equal to length of ocellar triangle, densely covered with white pile. Vertex with dense grey pollen and long black pile; ocellar triangle isosceles: distance between anterior and posterior ocelli distinctly longer than distance between posterior ocelli.

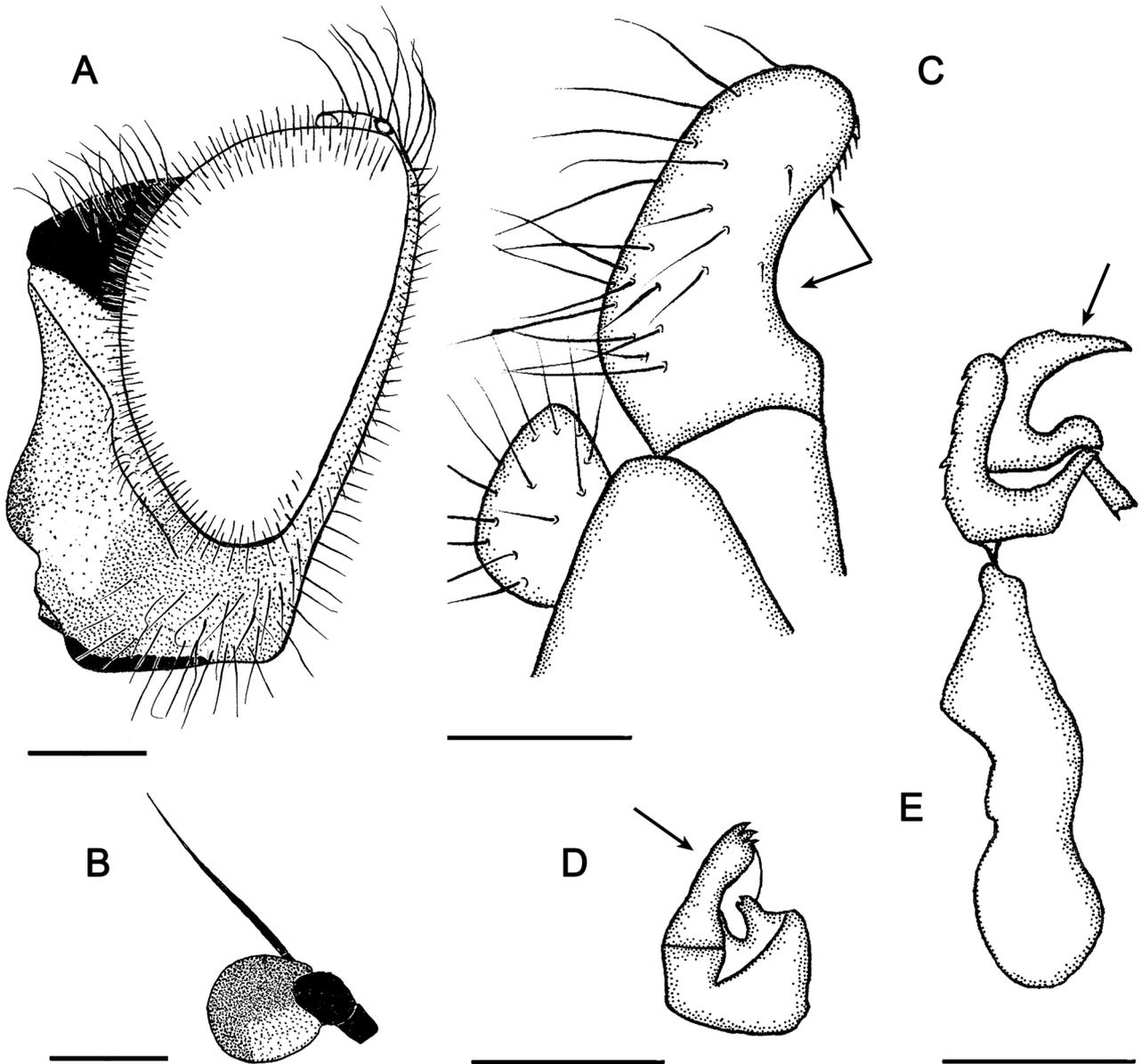


Fig. 1. *Ferdinandea volkovae* sp. nov., male (holotype). **A**, head, in lateral view; **B**, antenna, in lateral view; **C**, surstylus and cercus, in lateral view; **D**, superior lobe of hypandrium, in lateral view; **E**, aedeagus with apodeme. Arrows indicate diagnostic characters. Scale bars: 0.45 mm (A, B), 0.23 mm (C–E).

Thorax. Postpronotum yellowish, with dense grey pollen. Scutum with dense grey pollen and mixed short white and long black pile, on sides with strong black bristles. Scutellum mostly yellow, darkened in anterior half, with eight strong long black bristles on posterior margin (Fig. 2A). Pleura black, with dense grey pollen and yellow pile, with some black pile on posterior anepisternum. Posterodorsal corner of posterior anepisternum with three strong,

long black bristles. Legs: coxae black, with dense grey pollen and yellow pile; femora black in basal half and yellow in apical half, covered with black and yellow pile; fore and mid tibiae yellow with narrow black ring in apical half; hind tibia completely yellow; tarsi yellow. Wings finely infuscate brown with veins black in apical half and yellow in basal half, without black macula. Squama yellow with yellow cilia. Halteres yellow with brown head.

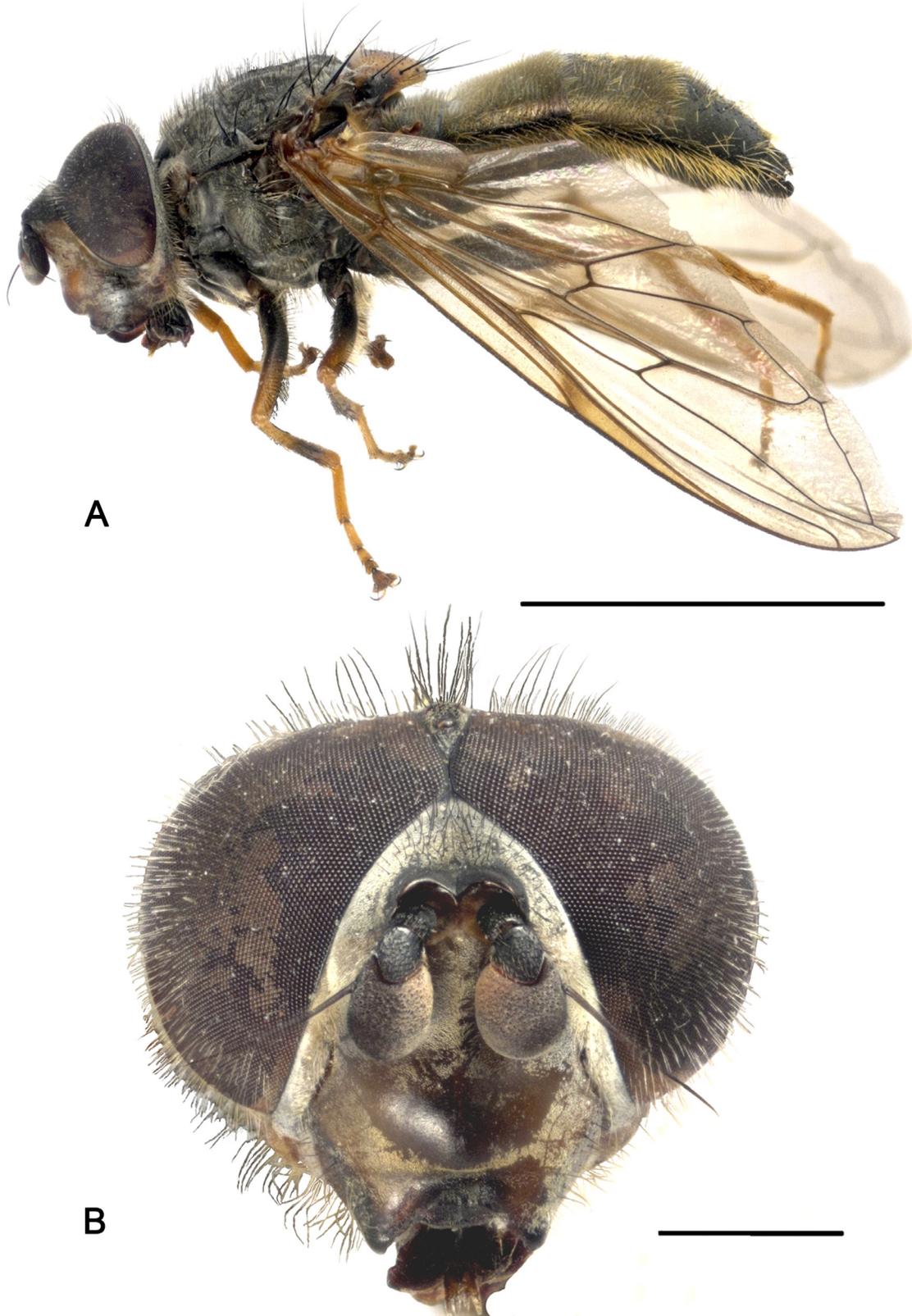


Fig. 2. *Ferdinandea volkova* sp. nov., male (holotype). **A**, general appearance, in lateral view; **B**, head, in anterior view. Scale bars: 5 mm (A), 1 mm (B).

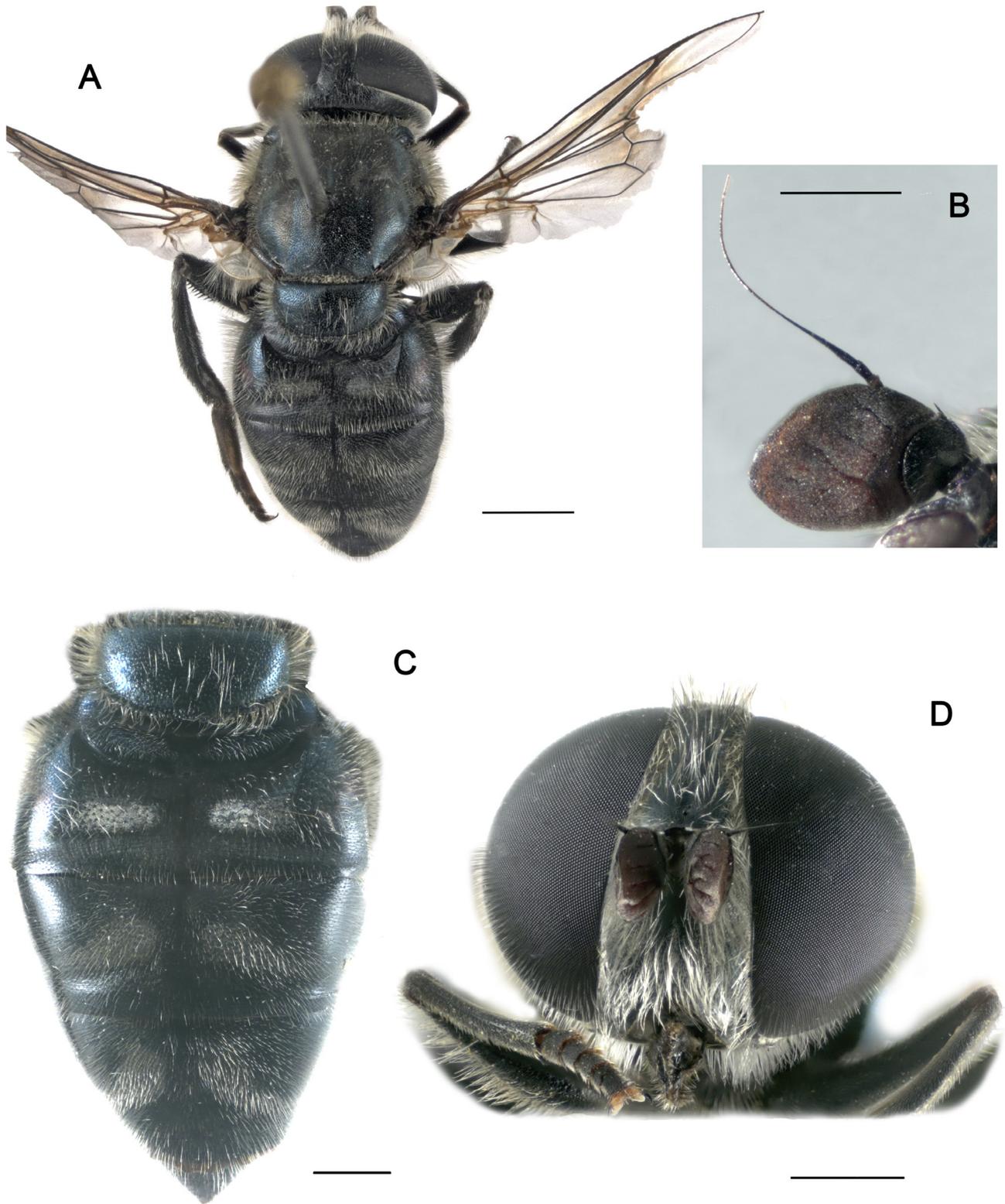


Fig. 3. *Eumerus muratovi* Barkalov, 2020, female. **A**, general appearance, in dorsal view; **B**, antenna, in lateral view; **C**, scutellum and abdomen, in dorsal view; **D**, head, in anterior view. Scale bars: 2 mm (A), 0.5 mm (B), 1 mm (C, D).

Abdomen black with metallic luster. Terga I–II covered with grey pollen; tergum II with large shiny yellow maculae laterally; terga III–IV completely shiny, covered with dense yellow erect and semierect pile. Sterna black with narrow yellow vittae, with grey pollen along hind margin; sterna I–II with long yellow erect pile; sterna III–IV with yellow pile laterally and short black adjacent pile medially.

Genitalia as in Fig. 1C–E. Surstylus in lateral view uniformly thickened. Upper lobe of hypandrium with elongate left plate. Apical sclerite of aedeagus with a hump dorsally.

Female unknown.

Comparison. *Ferdinandea volkovae* **sp. nov.** differs from all valid Palaearctic species of the genus in the following characters: face dark brown in upper part, frons and mesonotum completely covered with grey pollen, scape and pedicel black, and in the details of the male genitalia (most important diagnostic details of the genitalia indicated by arrows in Fig. 1C–E).

In the key to European species of the genus *Ferdinandea* (Speight & Sarthou, 2011) the new species keys out to *F. aurea* Rondani, 1844, but differs from it in the rounded postpedicel and black basal half of femora and middle part of tibiae (in *F. aurea*, postpedicel is deeper than long and all femora and tibiae are entirely yellow).

Distribution. *Ferdinandea volkovae* **sp. nov.** is known only from the type locality (Fig. 4), situated in the Roshtkala District of the Gorno-Badakhshan Autonomous Province of Tajikistan.

Note. The holotype was collected on a poplar trunk (*Populus* sp.) in the floodplain thickets of sea buckthorn (*Hippophae rhamnoides*) and willow (*Salix* sp.). These thickets are located on the path for driving flocks of sheep and goats, so that the area around them is an anthropogenic desert.

Etymology. The new species is named in the honour of Tatyana Volkova, who helped to organise the expedition of 2021.

Genus *Eumerus* Meigen, 1822

Eumerus muratovi Barkalov, 2020
(Fig. 3A–D)

Material examined. **Tajikistan, Gorno-Badakhshan Autonomous Prov.:** 1 female, Ishkashim Distr., near Yamchun Vill., 36°59'N 72°16'E, 2256 m, 23.VII.2021, V. Zinchenko leg.; 1 female, Rushan Distr., Khuf-dara Gorge, Khuf Vill., 37°50'N 71°39'E, 2860 m, 6.VII.2021, V. Zinchenko leg.

Description. Female. Body length 14 mm; wing length 10 mm.

Head. Face narrow, parallel-sided, black with dense silver pollen and pile; cheeks very narrow, without pollen, covered with silver pile (Fig. 3D). Frons narrow, in narrowest part narrower than width of basoflagellomere, shiny black in middle part, with vittae of dense silver pollen along eyes, covered with comparatively short silver pile being semierect laterally and erect medially; lunula black. Antenna: scape and pedicel black with grey pollen; basoflagellomere very large, irregular in shape (Fig. 3B), with 4–5 longitudinal brown furrows being more distinct on inner side; arista black, strongly thickened in basal third. Vertex shiny, with black and white pile. Vertical triangle



Fig. 4. Collecting localities in Tajikistan. 1, *Ferdinandea volkovae* **sp. nov.** (holotype); 2, 3, *Eumerus muratovi* Barkalov, 2020 (females).

isosceles. Occiput shiny, with white pile. Eye covered with comparatively short, dense white pile.

Thorax. Scutum with bluish reflection, in anterior half with indistinct grey vittae; pile of scutum comparatively short, erect, dense, white. Pleura bluish with very dense yellow pile. Legs almost completely black, only extreme tips of femora brown. Posterior sides of femora with long erect white pile, anterior sides of femora with short adpressed black pile. Fore and mid tibiae with short adpressed pile; hind tibia with adpressed and semidepressed black pile, only basal third of tibia dorsally with short adpressed white pile. Tarsi black, with white pile; segments of fore and mid tarsi with short but distinct black bristles posteroventrally; hind tarsus flattened dorsoventrally, covered with black pile; hind basitarsus equal in length to segments 2–4 combined. Wing with small brown spot medially; veins black or dark brown. Calypter white with white cilia; halter brown with black knob.

Abdomen (Fig. 3A, C) broad, distinctly broader than scutum at level of wing bases. Abdomen black with bluish reflection, covered with erect and semierect, mostly white pile; median parts of terga III–IV with black pile; tergite II with small reddish spots laterally and elongate spots of white pollen; terga III–IV with small spots of white pollen, tergite IV with narrow brown vitta posteriorly; sterna black with white pile.

Comparison. The female of *E. muratovi* is easily differentiated from females of all other Palaearctic species of the genus *Eumerus* in the large size, completely black legs and characteristic structure of the basoflagellomere. In the Stackelberg's key to the genus *Eumerus* (Stackelberg, 1961), the female of *E. muratovi* runs to *E. kozlovi* Stackelberg, 1952, from which it differs in the completely black legs, larger size of the body (14 mm) and presence of brown spot on the wing (in *E. kozlovi*, the apex of femora and the basal third of tibiae are yellowish brown, body length is 11–12 mm and the wing has no brown spot medially).

Taxonomic position. According to the presence of radial furrows and apical ellipsoidal fossa on the basoflagellomere of antenna, the presence of yellow spots on terga II–III and structure of the male genitalia, *E. muratovi* should be assigned to the *Eumerus tricolor* species–group.

Distribution. *Eumerus muratovi* is known only from high mountains of the West Pamirs in Tajikistan (Fig. 4).

Note. Both females and males were collected from rocks and bare ground but were not found on flowering plants growing around. Typically, many other species of the genus *Eumerus* can be seen on bare ground and mountain roads. In these species, males and females probably use open space for mating.

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