A New Species of the Genus Bibio Geoffroy, 1764, B. kurentzovi sp. n., Close to B. consanguineus Loew, 1869 (Diptera, Bibionidae)

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Abstract—Diagnostic characters of Bibio consanguineus Loew, recorded for the first time from the North Caucasus, are precised. A new species, Bibio kurentzovi sp. n., is described from Eastern Siberia and the Russian Far East. Both species have darkened brownish wings but differ in the structure of the spurs on the fore tibia, in the wing venation, and in the morphology of the male genitalia.

Keywords: Bibio kurentzovi sp. n., B. consanguineus, morphology of male genitalia, tergite IX, cercus, hypoproct, aedeagus, wing venation, fore tibial spurs

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Bibio consanguineus Loew, 1869 belongs to the B. pomonae (Fabricius, 1775) species-group characterized by a dark body, except for the rufous femora, and by elongate cross-vein b-r which is usually twice as long as cross-vein r-m. The species clearly differs from the other representatives of this group in a uniformly colored brown wing with a darker anterior margin. The species was described from the material collected in the mountain areas of Georgia (Akhaltsikhe) (Loew, 1869), and little was known about it. Bibio consanguineus was earlier treated (Duda, 1930) as a subspecies of B. pomonae, but later was re-validated as a Trans-Palaearctic species (Krivosheina, 1969, 1986).

The author examined specimens of the dark-winged species of the genus Bibio Geoffroy, 1764 from the North Caucasus, Zabaikal’skii Territory, Amurskaya Province, and the south of Primorskii Territory in the collection of A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, and in the Zoological Museum of Moscow State University (Moscow). Comparative examination of the male genitalia is carried out for the first time, and the distinctions in the structure of tergite IX, aedeagus, cerci, and spurs of the fore tibia and in the wing venation between the specimens from the European and Asian parts of Russia are revealed, which has resulted in describing a new species, B. kurentzovi sp. n.

Descriptions of the species of the genus Bibio with brown wings

Bibio kurentzovi N. Krivosheina, sp. n.
(Fig. 1, 1–3; Fig. 2, 1–6)

Material. Holotype, ♂: Russia, Primorskii Terr., Primorskaya Station, “Kedrovaya Pad” Nature Reserve, at light, 16.IX.1968 (N. Krivosheina). Paratypes: same location, 15.IX.1968 (N. Krivosheina), 1 ♂; 15 and 17.IX.1968 (N. Krivosheina), 2 ♀. Russia. Zabaikal’skii Terr., Sokhondinskii Nature Reserve, 5 VIII.1982 (V. Krasilnikov), 1 ♂. Amurskaya Prov., Zeya, 7 VIII.1975 (M. Danilevsky), 1 ♂.

The holotype and paratypes of the new species are deposited in the Zoological Museum of Moscow State University (Moscow).

Description. Male, holotype. Body black; femora rufous; wing pale brown with darker anterior margin; humeral ridge brown. Pubescence of body long, dense, black.

Head black, spherical in dorsal view, with eyes of holoptic type. Antenna black; flagellum 8-segmented.
Palpus black, with long cylindrical ultimate segment 5 times as long as wide. Penultimate segment 3/4 as long as ultimate segment, slightly longer than preceding segment. Pubescence black on head, dark brown on eyes. Hairs on eyes not longer than 2 basal antennal segments; pubescence of head longer, especially that on ventral side.

Thorax black; humeral ridge brown. Mesonotum black with fine transverse and longitudinal striae becoming denser and finer toward sides; middle and posterior sections of mesonotum lustrous, with fine punctuation laterally. Pubescence of mesonotum forming 4 longitudinal rows separated by wide glabrous stripes. Hairs in anterior section of mesonotum slightly longer.

Fig. 1. *Bibio kurentzovi* sp. n. (1–3) and *B. consanguineus* Loew (4–6): (1, 4) anterior margin of male wing, (2, 5) spurs of fore male tibia; (3, 6) spurs of fore female tibia. *b-r*, basal radial vein; *r-m*, radial medial vein; *S*, sector of radial vein before pterostigma.
than, and those in posterior section 1.5 times as long as hairs on eyes. Anepisterna with dense tuft of hairs. Hairs on scutellum slightly longer.

Wing pale brown with weak yellowish tint and with darker anterior margin. Costal cell brown before subcosta, pale and transparent behind subcosta. Radial cell and widened part of anterior basal cell also brown. Area of wing membrane immediately behind anterior basal cell with whitish longitudinal stripe. Rest of wing surface pale brown, with weak yellowish tint. Anterior veins (costal and radial) dark brown; posterior veins (medial and cubital) pale brown, with yellowish tint (Fig. 1, 1). Pterostigma narrow, brown at center, dark brown (nearly black) along margin, darker than surface of costal cell, shifted from the level of contact between cross-veins b-r and r-m toward apex of wing, 1.5 times as long as area of radial vein before pterostigma (S). Basal radial vein b-r slightly more than twice as long as r-m. Halteres black.

Legs. Coxae and trochanters black; femora rufous; tibiae and tarsi dark brown; junctions of tibiae with femora black. Hind tibia nearly 3 times as long as metatarsus (8.5 : 3.0). Spurs of fore tibia rufous, narrow; apex of inner spur reaching the middle of outer spur (boundary of outer spur with apex of tibia is accepted as its base). Outer spur and base of metatarsus subequal in width (Fig. 1, 2). Long and dense hairs situated on fore coxa: length of those on anterior surface reaching width of coxa, length of those on posterior surface nearly 1.5 times exceeding width of coxa; hairs on other coxae distinctly shorter. Length of hairs of fore femur reaching half width of femur; length of hairs on middle femur mainly equal to width of femur, but length of some hairs 1.5 times exceeding it. Hairs and setae on hind femur mainly equal to width of femur, but length of some hairs slightly more than twice as long. Hairs and setae on all tarsi much shorter. Length of hairs on middle femur 1.5 times exceeding width of coxa, length of those on posterior surface nearly 1.5 times exceeding width of coxa.

Abdomen dark brown; lateral margins of tergites slightly paler. Hairs on abdomen shorter than those on scutellum.

Genitalia (Fig. 2). Tergite IX with 2 rounded asymmetrical lobes (Fig. 2, 3). Surface of lobes with long, rather dense setae mainly situated on their inner side in apical half. These lobes separated by conical emargination regularly narrowed toward base of tergite and rounded at the bottom. Depth of emargination constituting 2/3 of tergite height. Surface of tergite along emargination pale; area of tergite immediately under emargination with isolated small spines surrounded by glabrous areas (Fig. 2, 4). Sternite IX with deep outer emargination (Fig. 2, 1); depth of emargination equal to 2/3 of its width. Outer surface of medial section of sternite with numerous short scattered hairs and sparse setae. Hairs along midline of sternite slightly denser. Gonostylus arcuate or nearly straight; their narrowed parts slightly longer than their widened base (Fig. 2, 6). Apodeme of gonocoxite with widened apical section and rod-like base. Cerci wide, slightly longer than wide, with rounded apex slightly truncate on inner side (Fig. 2, 2). Surface of cerci with fine short hairs longer along their inner margin. Apex of cerci with long strong setae. Hypoproct in the form of a translucent lamella with darkened triangular plate at base. Surface of this plate in anterior section with small oval transverse glabrous darkened lamella; in medial section, surface with larger lamellae bearing low obtuse black tubercles. Tubercles, each bearing apically 2–5 fine hairs, situated lateral to triangular plate. Aedeagus wide, with obtuse rounded apex and parallel sides (Fig. 2, 5); in basal half, it gradually narrowed and connected with narrow short tube of aedeagus apodeme. In holotype, length ratio between the apical section, narrowed basal section, and apodeme of aedeagus 20 : 10 : 11. In paratypes, length ratio of these parts only slightly varying (18 : 9 : 8; 21 : 9 : 10; 19 : 11 : 10). In all specimens, widened part occupying nearly half length of aedeagus, including apodemes. Parameres in the form of two pairs of arcuate rods (Fig. 2, 5). One pair heavily sclerotized and slightly widened at the end adjoining aedeagus; its other end with sclerotized dark hook, connected through multicellular structures with rod-like section of gonocoxite apodeme. Second pair of parameres weakly sclerotized; its widened end connected with gonocoxite apodeme; the other end pale, fine, pointed, situated in parallel to the widened part of aedeagus and reaching apical section of its sheath. Parameres connected by teniform, weakly sclerotized lamella situated in usual position at the level of medial section of aedeagus. Parameres together with aedeagus concealed by translucent campaniform sheath.

Body length 9.5–10 mm.

Note. The paratypes demonstrate insignificant variations in coloration and structure of the body. In particular, the humeral ridge is dark yellow to brown. Basal radial vein b-r is 1.5–3.0 times as long as r-m. The sector of the radial vein before the pterostigma (S) is slightly
Fig. 2. Bibio kurentzovi sp. n., male genitalia: (1) sternite IX on outer side, (2) cerci and hypoproct, (3) tergite IX on outer side, (4) medial section of tergite IX, (5) phallosoma (aedeagus and parameres), (6) gonostylus. aed, aedeagus; ej. ap, apodeme of aedeagus; gcx, gonoxite; gcx. ap, apodeme of gonoxite; gst, gonostylus; pm, parameres.
A NEW SPECIES OF THE GENUS *BIBIO* GEOFFROY, 1764

longer than, as long as, or 0.7 times as long as the pterostigma. The medial cross-vein usually originates behind, but occasionally before the furcation. The hind tibia is occasionally slightly more than thrice as long as the metatarsus (8 : 2.5). The emargination of tergite IX is occasionally narrowed at the base.

**Female.** Head black, elongate, with eyes of dichoptic type, with flat dorsal surface, with large and high ocellar tubercle; length of occipital section reaching that of frons. Frons as wide as eyes combined (in dorsal view). Triangular anterior section of frons not lustrous, with distinct transverse striae along entire length. Small tubercle situated at apex of triangular projection. Rest of frons matt, finely punctate. Anterior half of frons between black triangle and medial section with fine transverse wrinkles and isolated setae without basal tubercles. Setae on area of frons between its medial section and ocellar tubercle with distinct prominences at bases. Length of sparse setae in anterior half of frons equal to height of ocellar tubercle; length of setae before tubercle slightly exceeding it. Dense tuft of setae situated in posterior section of ocellar tubercle, inclined forward, and not reaching anterior margin of tubercle.

Thorax black; humeral ridge brownish rufous along entire length. Mesonotum with hairs shorter than those in male. Hairs in anterior section of mesonotum not longer than those in medial section of frons; hairs on metanotum as long as those before ocellar tubercle; hairs on scutellum not more than 2/3 as long as scutellum.

Wing slightly more intensely colored than that in male. Darkest, brown areas are: anterior margin of costal cell before subcosta, radial cell, and anterior basal cell. Narrow longitudinal pale stripe situated immediately behind basal cell. Rest of wing surface pale brown, with yellowish tint. Anterior (costal and radial) veins dark brown; posterior (medial and cubital) veins yellow. Radial cross-vein *b-r* twice as long as *r-m*. Sector of radial vein before pterostigma (*S*) 0.7 times as long as pterostigma. Pterostigma dark, slightly shifted toward wing apex, being situated distal to the level of contact between *b-r* and *r-m*. Halteres black.

Legs. Coxae, trochanters, tibiae, and tarsi blackish brown; femora rufous. Hind femur with wide diffused brownish ring at base, and with narrow black ring at apex. Spurs of fore tibia as those in male (Fig. 1, 3).

**Distribution.** Russia: Zabaikalskii Territory, Amurskaya Province, the south of Primorskii Territory. In the southern part of Primorskii Territory, the species was collected in the oak forests on the slopes of a hill facing the sea coast.

**Etymology.** The species is named after Aleksei Ivanovich Kurentsov, an eminent biologist, entomologist, biogeographer, and the founder of the Far Eastern School of Entomologists.

*Bibio consanguineus* Loew, 1869

(Fig. 1, 4–6; Fig. 3, 1–6)

**Material.** Russia, Adygea: Lagonaki, 29–30 and 27–30.VI.2011 (N. Vikhrev), 1 ♂, 1 ♀; Inzhenernyi Mt. Range, 20.VI.1995 (A. Gusakov), 1 ♂.

**Description.** Male. Body black; femora rufous; wing uniformly brown with darkened anterior margin; humeral ridge black. Pubescence of body black, moderately dense.

Head black, spherical dorsally, with eyes of holoptic type. Antennae black; flagellum 8-segmented. Palpi black, with long cylindrical ultimate segment 5 times as long as wide. Penultimate segment 3/4 as long as ultimate segment and slightly longer than preceding one. Pubescence on head black; that on eyes dark brown. Pubescence on eyes not longer than two basal antennal segments; pubescence on head longer, especially on ventral side.

Thorax black; humeral ridge black, dark brown closer to sides. Mesonotum black. Pubescence moderately dense, black. Hairs on anterior section of mesonotum as long as those on eyes; hairs in posterior section only slightly longer. Hairs on scutellum longer, 1.5 times as long as scutellum.
Fig. 3. *Bibio consanguineus* Loew, male genitalia: (1) anterior section of sternite IX on outer side, (2) cerci and hypoproct, (3) tergite IX on outer side, (4) aedeagus, (5) medial section of tergite IX, (6) parameres.
Wing almost uniformly brown, with darker anterior margin. Costal cell before subcosta and radial cell in anterior section and near pterostigma dark brown. Area of wing along vein R4 + 5 and anterior basal cell slightly paler than costal cell but much darker than posterior part of wing membrane. Pale narrow longitudinal stripe situated immediately behind anterior basal cell. Anterior veins (costal and radial) dark brown; of posterior veins, medial vein pale brown to dark brown, cubital vein dark brown. Basal radial vein b-r 2–3 times as long as r-m (Fig. 1, 4). Sector of radial vein before pterostigma (S) 0.4 as long as pterostigma. Pterostigma paler at center, with distinctly outlined posterior margin, with narrow elongate anterior part situated immediately above the place of contact between b-r and r-m. Halteres black.

Legs. Coxae and trochanters black; femora rufous with black rings at apices, without darkening at bases; tibiae and tarsi dark brown. Spurs of fore tibia brown, not pointed, rounded apically (Fig. 1, 5). Inner spur short, 1/5–1/4 as long as outer spur. Outer spur widened at base, 1.5 times as wide as metatarsus. Hind tibia nearly thrice as long as metatarsus (8.5 : 3). Length of hairs on fore femur constituting at least half width of femur; length of hairs on hind femur smaller than half width of femur; length of some hairs on middle femur equal to, or 1.5 times exceeding width of femur.

Abdomen black, with pale brown sides of tergites and black pubescence.

Genitalia (Fig. 3). Tergite IX with deep emargination dividing its outer margin into 2 lobes (Fig. 3, 3). Lobes conical, symmetrical, rounded apically. Depth of emargination separating them equal to 2/3 of tergite length; base of emargination clearly separated, rounded. Lobes of tergite along margin of emargination with wide pale stripe lacking hairs but bearing sparse long setae densest immediately at apex of lobes. Basal part of tergite under emargination with dense dark spines closely adjoined by fine hairs situated along entire basal surface of tergite and outer part of its lobes (Fig. 3, 3, 5). Sternite IX with wide emargination occupying at least 1/3 of its width at the level of emargination (Fig. 3, 1). Depth of this emargination slightly smaller than its width. Outer surface of sternite with simple fine hairs and with long sparse setae in medial section immediately under emargination. Gonostyli slightly arcuately curved; widened part slightly longer than the narrow apical section. Apodeme of gonocoxite with elongate widened apical section in the form of a truncate triangle and with rod-like base. Cerci wide, rounded apically and slightly beveled along outer margin (Fig. 3, 2), with fine delicate hairs over the surface and with long strong setae at apices. Hairs on inner side of cerci longer, denser, and crossing. Hypoproct in the form of a pale lamella with darkened triangular plate at base, bearing various cuticular structures: isolated spines, groups of 2 or 3 spines, and also small lamellae bearing up to 6 obtuse spines. Sides of triangular plate mainly with fine hairs and isolated spines. Aedeagus oblong-oval, wide along most of its length, with obtuse rounded apex, without clear division into sections in basal half, with short narrowed base and with rather long tubular apodeme (Fig. 3, 4). Narrowed basal part of aedeagus short, shorter than apodeme (3 : 7). Widened part of aedeagus thrice as long as the basal tubular section. Aedeagus concealed by 2 paired, arcuate rods of parameres connected by narrow transverse band at base of conical aedeagus sheath (Fig. 3, 6).

Body length 12 mm.

**Female.** Head. Frons black, triangular in front view, with small tubercle at center; surface of frons smooth and lustrous before tubercle and with several transverse striae behind it. Then surface of frons matt; as far as the middle of eyes, the surface with fine strigosity and with simple sparse setae forming no prominences at bases. Before ocellar tubercle, bases of setae with rather low flat tubercles. Entire surface of frons with sparse strong setae becoming longer toward ocellar tubercle, but their length not exceeding height of ocellar tubercle.

Thorax black; humeral ridge nearly black (in dorsal view), dark brown along outer margin. Pubescence of body short. Hairs on scutellum 1/3–1/2 as long as scutellum; length of hairs on legs not exceeding half width of legs.

Wing. Narrow anterior margin of pterostigma situated above the place of contact between b-r and r-m. Sector of radial vein before pterostigma half as long as pterostigma; b-r twice as long as r-m. Halteres black.

Legs. All femora rufous. Fore tibia black; tarsi blackish brown. Middle and hind tibiae and tarsi black. Inner spurs of fore tibia slightly arcuately curved, 1/4–1/3 as long as outer spur. Outer spur more than twice as wide at base as metatarsus, with coarse longitudinal wrinkles (Fig. 1, 6).

Abdomen black; cerci black.
Distribution. The species was described from Georgia, recorded for Bosnia, Montenegro, and northern Mongolia. In Russia, it was recorded for the eastern regions of the European part and for Siberia (Duda, 1930), the southern part of Western and Eastern Siberia (Krivosheina, 1986). Examination of additional material shows that the data on the distribution of the species in Russia require clarification.

Morphological Distinctions between Bibio kurentzovi sp. n. and B. consanguineus

Bibio kurentzovi sp. n. Male. Humeral ridge laterally pale brown to brown. Spurs of fore tibia rufous, elongate, pointed; inner spur fine; outer spur as wide as metatarsus (see Fig. 1, 2). Inner spur of fore tibia half as long as outer spur. Basal radial vein b-r 1.5–3.0 times as long as r-m (see Fig. 1, 1). In holotype, b-r slightly more than twice as long as r-m. Pterostigma situated distal to the level of contact between b-r and r-m. Sector of radial vein before pterostigma (S) 0.7 times as long as pterostigma. Under emargination, tergite IX with isolated spines not surrounded with hairs (see Fig. 2, 3). Aedeagus widened in apical half, with conically and stepwise narrowed basal section, and with tubular apodeme (see Fig. 2, 5). Widened section of aedeagus as long as the basal section including apodemes.

Female. Humeral ridge brownish rufous. Outer spur of fore tibia without marked widening at base (Fig. 1, 3 see). Inner spur half as long as the outer spur. Sector of radial vein before pterostigma 0.7 times as long as pterostigma.

Bibio consanguineus Loew. Male. Humeral ridge black. Spurs of fore tibia brown, obtuse, with rounded apices (see Fig. 1, 5). Inner spur short, 1/5–1/4 as long as the outer spur. Basal radial vein b-r 2–3 times as long as r-m. Sector of radial vein before pterostigma 0.4 as long as pterostigma (see Fig. 1, 4). Under emargination, tergite IX with numerous sclerotized spines surrounded with hairs and situated along entire length of basal section of tergite IX (see Fig. 3, 5). Aedeagus oblong-oval along most of its length, with short narrower basal section connected with tubular elongate apodeme (see Fig. 3, 4). Widened section of aedeagus thrice as long as the narrowed tubular section.

Female. Humeral ridge black. Outer spur of fore tibia widened at base (see Fig. 1, 6). Inner spur 1/4–1/3 as long as outer spur. Anterior margin of pterostigma situated above the place of contact between b-r and r-m. Sector of radial vein before pterostigma half as long as pterostigma.

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COMPLIANCE WITH ETHICAL STANDARDS

Statement on the welfare of animals. All the applicable international, national, and institutional guidelines for the care and use of animals were followed. All the procedures performed in studies involving animals were in accordance with the ethical standards of the institution or practice at which the studies were conducted.

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