

Three new species of the genus *Oligoneuriella* (Ephemeroptera, Oligoneuriidae)

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Taxonomy, Palaearct

The genus *Oligoneuriella* ULMER has hitherto comprised six Palaearctic species. Of these, four are known only from Europe (SOWA, 1961, 1973), one from the USSR (SOWA & ZOSIDZE, 1973) and one from Pakistan (ALI, 1971). Three new species from Asia, each named after the locality of the holotype are now described in the present paper.

Oligoneuriella baskale sp. n.

(Figs. 1, 3, 5, 7, 10, 12, 15)

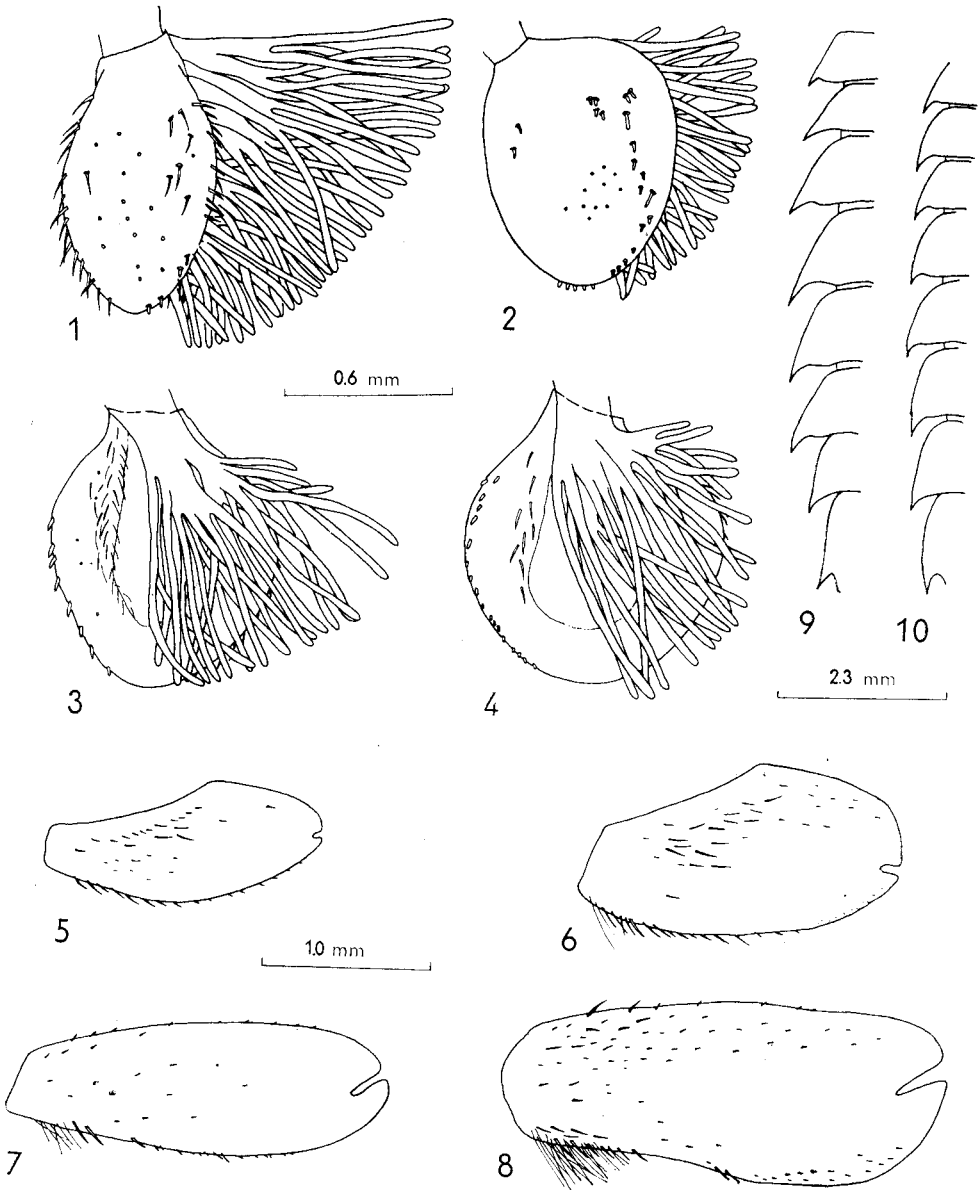
Larva: Head dark brown, narrow, eyes black, protruding in dorsal view. Antennae brown. Pronotum and mesonotum dark brown, wing pads darker. Abdomen light brown with two inconspicuous pale spots on tergites. Mouthparts as in *O. rhenana*. Legs light brown. Fore femora 2.4 times longer than wide. A regular row of about 10 spines along the base of filtering setae, a few longer spines below it. The posterior margin of femur bearing a row of spines diminishing toward tibia. Middle and hind femora narrow (about 3 times as long as wide), their hind margins very slightly concave. A group of bristles and a few spines near the bases of femora. Ratio femur : tibia : tarsus 1.8 : 2.5 : 0.6 for fore legs, 2.4 : 2.4 : 1 for middle legs, 2.6 : 2 : 1 for hind legs. Lateral abdominal spines rounded, almost appressed. The surface of tergites coarsely chagrined, with spatulate spines. A group of long pointed spines near the hind margin of sternites. The first gill long, oval, its margins sparsely covered with setae. Bunch of filaments thick, longer than gill. The other gills oval, with a narrow cavity, bristles and spines on the margins. Cerci dark brown with pale setae.

Body length: male larva 14 (13—15) mm, female larva 16.5 (14—17) mm. Length of cerci: male larva 6.5 (6—7.5) mm, female larva 6.0 (5—6) mm.

Subimago ♂: Head and eyes dark grey, ocelli with a dark border. Antennal flagellum brown. Thorax dark grey, abdomen lighter. Tergites III—IX with a longitudinal white stripe and 2 pale round spots on its sides. Another pair of pear-shaped pale spots near the margins of tergites. Tergites I and II pale, with diffused spots. The ventral side of abdomen yellow-brown with a hyaline whitish nerve band. The edges of fore femora bordered brown, tibiae brown, tarsi lighter. Middle and hind legs off white, unicoloured. Wings grey, longitudinal veins of the same colour as wing. Cerci yellowish, with pale cilia. Outer lobes of penis straight, their apical part only slightly bent over inner lobes, without spines. Medial projections of the penis lobes straight, with sharp denticles. The inner lobes of penis straight, membranous. Forceps

base medially projected into a rounded protuberance, separated on both sides by wide bow-shaped emarginations. Forceps yellowish.

Adult female: Thorax lighter brown, abdomen light grey, hyaline, without markings. Elongate dark brown spots on the sides of abdominal segments.



Figs. 1, 3, 5, 7, 10. *Oligoneuriella baskale* sp. n., larva (holotype). Figs. 2, 4, 6, 8, 9. *O. zanga* sp. n., larva (holotype). Figs. 1, 2 — first gill. Figs. 3, 4 — second gill. Figs. 5, 6 — fore femur. Figs. 7, 8 — middle femur. Figs. 9, 10 — spines of abdominal segments.

Legs with dark brown femora and yellowish tibiae and tarsi. Wings grey, hyaline, with darker longitudinal veins and whitish transverse ones. Cerci light, terminal filament very thin, shorter by 1/3 than cerci.

Body length: male subimago 10.5 mm, adult female 17.5 mm. Length of cerci: male subimago 4.3 mm, adult female 6 mm.

Holotype (male larva), paratype No. 1 (male subimago): Turkey, mountain stream 16 km N of Baskale, 2150 m, 20. 8. 1970 leg. J. Moucha. Paratype No. 2 (adult female): Iran, mountain stream, Gazanak, 1400 m, 20. 7. 1970 leg. L. Hoberlandt. Other paratypes (1 ♀, 4 larvae): Turkey mountain stream 16 km N of Baskale, 2150 m, 20. 8. 1970 leg. J. Moucha, coll. Soldán, Institute of Entomology, Czechoslovak Academy of Sciences, Prague.

Bionomy and distribution: Summer species, probably one generation only. Flying in July and August. Larvae in mountain streams together with *Epeorus*, *Rhithrogena* and *Baetis* spp. So far known only from Turkey and Iran.

Oligoneuriella zanga sp. n.

(Figs. 2, 4, 6, 8, 9, 11, 14)

Larva: Head and thorax light brown, eyes black, in dorsal view not protruding beyond the contour of the head. Antennae dark brown. Abdomen light brown, tergites and sternites unicoloured, without markings. Mouthparts as in *O. rhenana*. Legs light brown. Fore femora 1.8 times longer than wide. An irregular group of long, pointed spines, a few shorter ones among them, near the base of filtering setae. Spines on the hind margin of femur of middle leg only near the base of femur together with setae. Ratio femur : tibia : tarsus 2.2 : 3 : 0.8 for fore legs, 2.8 : 2.8 : 1.2 for middle ones and 2.6 : 2 : 1 for hind legs. Lateral abdominal spines conspicuous, with almost straight edges, their axis not parallel with the axis of abdomen. The surface of tergites finely chagrined, with short rounded spines. Spines of this kind also near the hind margin of sternites. The first gill oval, with a longitudinal row of tongue-shaped spines. Bunch of filament thick, longer than the gill. The other gill circular, with a wide cavity. Spines only on the outer edge of gill. Bunch of filaments very slightly longer than the gill. Cerci dark brown with pale setae. Penis (dissected from the larva before moulting into subimago): The outer lobes of penis massive, slightly curved, with a spine directed towards head on the inner side. The outer lobes only slightly projected over inner ones. Medial projections of the penis lobes curved, with fine denticles and pointed triangular protuberances. The inner lobes of penis membranous and hyaline.

Body length: male larva 13 (12—14.5) mm, female larva 16.5 (15—17) mm. Length of cerci: male larva 6.5 (5—7) mm, female larva 7 (6—7) mm.

Imago and subimago unknown.

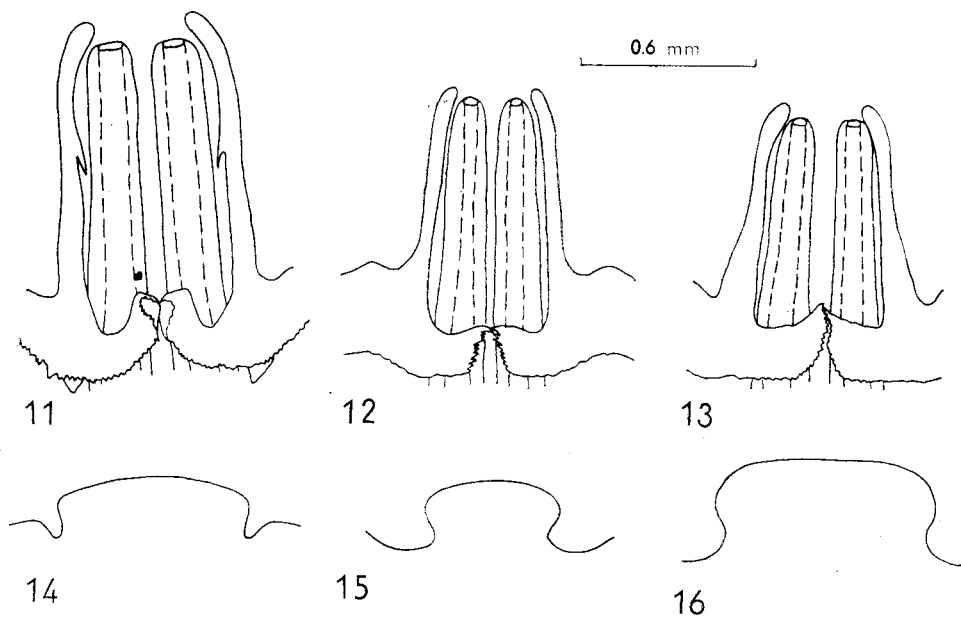
Holotype (male larva): USSR, Zanga river, Transcaucasia, without detailed data, 18. 6. 1912 leg. J. Komárek. Paratype No. 1 (female larva): USSR, submontane stream, Gegard, Armenia, 800 m, 14. 7. 1974 leg. Z. Pádrová. Other paratypes (5 larvae): USSR, Zanga river, Transcaucasia, without detailed data, 18. 6. 1912 leg. J. Komárek, coll. Soldán, Institute of Entomology, Czechoslovak Academy of Sciences, Prague.

Bionomy and distribution: Summer species, probably one generation, flying probably in June and July. Larvae live in submontane streams and rivers together with *Ecdyonurus*, *Rhithrogena*, and *Baetis* spp. larvae. So far known only from the foothills of the Caucasus.

Oligoneuriella mongolica sp. n.

(Figs. 13, 16)

Adult male: Head pale, yellow brown, compound eyes black, epicranial suture with a pale border. Antennae dark brown. Thorax yellow brown, abdomen lighter, whitish, hyaline. Abdominal tergites without markings, with a darker band near the anterior margin; the sides of tergites V–VII darkly dusted. The ventral side of abdomen whitish, without markings. The



Figs. 11, 14. *Oligoneuriella zanga* sp. n., adult (holotype). Figs. 12, 15. *O. baskale* sp. n., adult (paratype No. 1). Figs. 13, 16. *O. mongolica* sp. n., adult (holotype). Figs. 11–13 — penis, dorsal view. Figs. 14–16 — forceps base.

last two abdominal segments brown. Femora of fore legs with a conspicuous brown band, middle and hind legs whitish, with a conspicuous brown spot on the outer sides of femora. Forewings grey, dusted brown, longitudinal veins brown, pterostigma whitish. Hindwings grey, longitudinal veins of the same colour as wings. The sides of abdominal segments II–VII bearing parallel narrow spines, spines on the sides of segments VIII–IX wider, incurved. The outer lobes of penis S-curved, slightly overlapping the inner ones, without spines. Medial projections of the penis lobes wide, slightly curved caudad. The inner lobes of penis membranous, rounded. The hind margin of forceps base straight. Cerci white, with short, sparse setae.

Adult female: Head and thorax yellow brown, abdomen light yellow, tergites dusted dark brown, their sides darker, no markings. Sternites pale, hyaline. Legs ochraceous, middle and hind ones with a dark brown longitudinal spot on femora. Cerci white, without setae.

Subimago: Head and thorax yellow brown, abdomen light grey. Wings light grey, without brown dusting. The spot on legs not very distinct.

Larva unknown.

Body length: Adult male 13 (12—14) mm, adult female 12 (11—14) mm. Length of cerci: adult male 9 (8—9) mm, adult female 5 (4—6) mm.

Holotype (adult male), paratype No. 1 (male subimago), paratype No. 2 (adult female): Mongolia, Kerulen river, 15 km E of Öndörchaan, Chentej aimak, 1000 m 30. 7. 1965 leg Z. Kaszab. Other paratypes (10 ♂, 18 ♀, 15 subimagoes): Mongolia, tributary of the lake Bur nur, Cojbalsan aimak, 585 m, 11. 8. 1965 leg. Z. Kaszab, coll. Soldán, Institute of Entomology, Czechoslovak Academy of Sciences, Prague.

Bionomy and distribution: Probably summer species, only one generation. All specimens caught in light traps. So far known only from Mongolian streams and rivers at altitude of 585—1000 m. (Chentej aimak, Cojbalsan aimak, Suchebaator aimak, Bulgan aimak).

Differential diagnosis

Oligoneuriella zanga sp. n. and *O. baskale* sp. n. belong in the group of species including *O. rhenana* (IMHOFF), *O. pallida* (HAGEN), *O. kashmirensis* (ALI) and *O. tskhomelidzei* SOWA & ZOSIDZE. However, the first two species differ markedly in the structure of 1st gill. Critical larval characters are given in the following key:

- 1 (2) Tibiae of fore legs shorter than tibiae of hind ones. Gill 1 smaller than the others *O. kashmirensis* (ALI)
- 2 (1) Tibiae of fore legs longer than tibiae of hind ones. Gill 1 approximately the same size as the others.
- 3 (4) Lateral margins of spines on abdominal segments II—IV straight, gills 2—7 circular, as long as wide, with a broad cavity *O. zanga* sp. n.
- 4 (3) Lateral margins of spines on abdominal segments II—IV convex, gills 2—7 oval, longer than wide, with a narrow cavity.
- 5 (6) Compound eyes projected beyond the contour of head in dorsal view; spines near the posterior margin of sternites long and pointed *O. baskale* sp. n.
- 6 (5) Compound eyes not projected beyond the contour of head; spines near the posterior margin of sternites short and rounded *O. tskhomelidzei* SOWA & ZOSIDZE

Adults can be compared only with *O. rhenana*:

- 1 (2) Outer lobes of penis bearing a cranially directed spine on their inner side; penis lobes with sharp triangular projections *O. zanga* sp. n.
- 2 (1) Outer lobes of penis without spines, penis lobes without triangular projections.
- 3 (4) Medial projection of penis lobes curved, abdomen unicoloured, without markings on tergites *O. rhenana* (IMHOFF)
- 4 (3) Medial projection of penis lobes not curved, straight, abdomen with lighter markings on tergites *O. baskale* sp. n.

O. mongolica sp. n. belongs in the species group including *O. mikulskii* SOWA and *O. keffermuelleriae* SOWA. Critical adult characters are described in the following key:

- 1 (2) Outer lobes of penis markedly overlapping inner ones, not widening in the apical part *O. keffermuelleriae* SOWA
- 2 (1) Outer lobes of penis only slightly overlapping inner ones, club-shaped apically.
- 3 (4) Medial projections of penis broad, slightly curved caudad. The posterior margin of forceps base straight *O. mongolica* sp. n.
- 4 (3) Medial projections of penis lobes narrow and strongly curved caudad. The posterior margin of forceps base slightly convex *O. mikulskii* SOWA

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