

**A New Species of the Genus *Oligoneuriella*
(Ephemeroptera: Oligoneuriidae) from Spain**

by

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ABSTRACT

Oligoneuriella marichuae sp.n. (nymph, subimago, male and female imago) from the south of Spain is described and illustrated. Characters distinguishing this species from the other Palearctic *Oligoneuriella* spp. are keyed.

The genus *Oligoneuriella* was established by Ulmer (1924) for a European and African species known as *Oligoneuria rhenana* Imhoff. Since then, ten additional species from the palaeartic region have been described. Of these, four are known from Europe (Sowa, 1961; 1973), two from USSR (Sowa et al., 1973; Soldán et al, 1977), and one each from Pakistan (Ali, 1971), Mongolia (Soldán et al., 1977), Turkey and Syria (Koch, 1980), and from Morocco (Dakki et al., 1980). In Algeria, there is an undescribed species close to *O. orotensis* Koch, 1980 (Dr. Soldán, Czechoslovakia, pers. comm.). During a year of sampling in rivers and streams of the Sierra Nevada we obtained numerous nymphs and adults of the genus *Oligoneuriella*. Some adults were also obtained by rearing nymphs in rearing cages (Müller-Liebenau, 1970; Edmunds et al., 1976) in streams. Our material resembled *O. rhenana*. Comparison with nymphs and adults of *O. rhenana* (caught and identified by Dr. Sowa, Poland) revealed it to be a new species.

***Oligoneuriella marichuae* sp. n.**

Material: Holotype (♂ imago) and the following paratypes: 29 ♂♂, 7 ♀♀, 7 male, 3 female subimagines, 22.VIII.1979; 11 male, 3 female nymphs, 31.VIII.1979, all from Rio Dúrcal, Sierra Nevada, Prov. Granada, Spain, 760 m, U.T.M.: 30S. VF. 492 952, J. Alba Tercedor leg. We caught additional specimens in the following streams of the Sierra Nevada: Rio Aguas Blancas, 1140 m, U.T.M. 30S. VG. 649 206; 800 m, U.T.M. 30S. VG. 564 154; Rio Torrente, 840 m, U.T.M. 30S. VF. 519 917; Rio Lanjarón, 640 m, U.T.M. 30S. VF. 581 865.

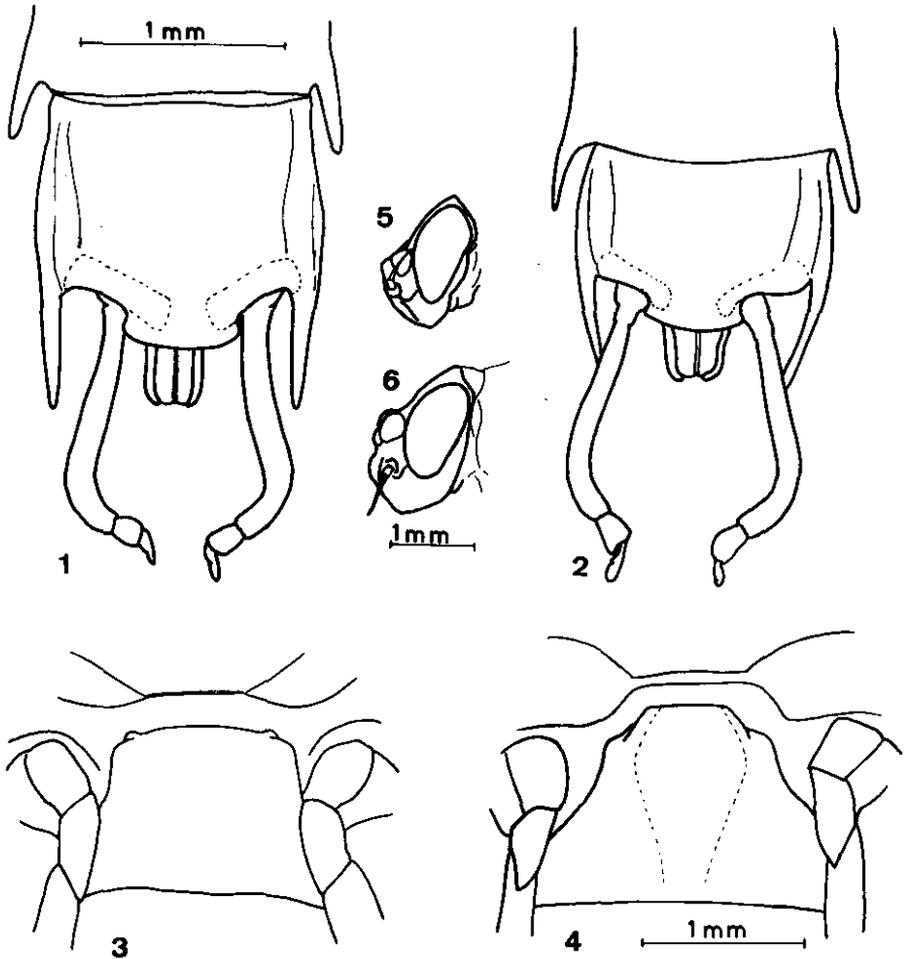
The material is conserved in 75% alcohol and partially also as microscopic preparations (numbers: 50, 56, 136, 137, 138, 140, 216 and 217) in my collection in the Department of Zoology, University of Granada, Spain.

Etymology: Species is named for Dr. Marichu Alejandre, the author's wife, for her encouragement and help with the sampling.

Male imago

Body length: 13.00-15.56 mm (\bar{x} = 14.09; s = 0.73). Length of cerci: 13.56-15.97 mm (\bar{x} = 14.85; s = 0.75). Length of terminal filament: 11.29-14.14 mm (\bar{x} = 12.83; s = 0.89).

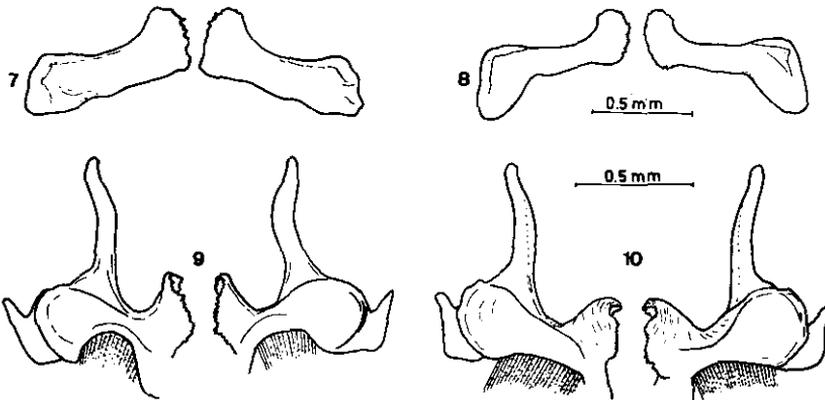
Compound eyes black and very close to each other but not touching. Antennae with light scape and pedicellus, flagellum dark. Thorax yellowish, pronotum darker with two sinuous stripes; mesonotal sutures dark; scutellum brown;



Figs. 1-6: *Oligoneuriella rhenana* (1, 3, 5) and *O. marichuae* (2, 4, 6): external male genitalia (1, 2); first abdominal sternite of male (3, 4) and female head in lateral view (5, 6; 5 after Sowa, 1973).

prosternum whitish with dark shades. A dark transverse zone present between the middle coxae. Ratio femur: tibia: tarsus is 32:45:17 for fore legs, 37:89:32 for middle legs, and 37:65:25 for hind legs. Fore legs with dark stripes on femora, tibiae and two first tarsal segments. Middle and hind legs light with longitudinal fine dark stripes on femora; tibiae white. Forewings grey; longitudinal veins light brown; pterostigma whitish. Abdomen lighter than thorax with segments 1-7 translucent. The translucent fore zones of 2nd to 5th segments *ca.* half total length of respective segment, slightly less in the remaining ones; first abdominal sternite of different shape than in *O. rhenana* (compare Figs. 3, 4), with a pigmented zone in the middle almost twice longer than wide. Lateral and hind margins of tergites darker than rest.

External genitalia very similar to *O. rhenana* but forceps less clearly S-curved (Figs. 1, 2). Sometimes the hind margin of the forceps base is either straight or only slightly curved. Shape of internal sclerites supporting penis also different. Ventral internal process (titillator, after Sowa, 1973) of lateral penis sclerites of different shape than in *O. rhenana*, the zone of muscle insertions being more curved in *O. rhenana* than in the new species (Figs. 9 and 10). Ventral sclerites (below styliger) supporting the penis lobes (Figs. 7 and 8) more slender and of different shape than in *O. rhenana*.



Figs. 7-10: *Oligoneuriella rhenana* (7, 9) and *O. marichuae* (8, 10): ventral sclerite supporting the penis lobes (7, 8); lateral sclerites of penis lobes (9, 10).

Female imago

Body length: 12.50-16.90 mm (\bar{x} = 13.85; s = 1.35). Caudal filaments *ca.* half the abdominal length.

Colour similar to male but abdomen less translucent. Eyes in lateral view wider and below less triangular than in *O. rhenana* (Figs. 5 and 6).

Subimagines

Length similar to adults but in both sexes the caudal filaments are *ca.* half as long

as the abdomen and the abdominal segments are not as translucent as they are in the adult.

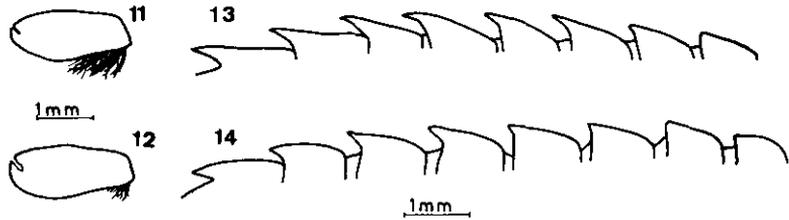
Nymph

Body length of mature nymph: ♂: 13.43-15.86 mm (\bar{x} = 14.72; s = 0.84); ♀: 13.15-16.79 mm (\bar{x} = 16.15; s = 0.69) in nymphs from Rio Dúrcal. One female nymph from Rio Lanjarón is 18.72 mm long.

Colour in general lighter than in *O. rhenana*. Eyes black. Thorax olive brown. Abdomen yellowish brown with two tiny light spots on middle tergites, sometimes also on tergites 2 and 8. In the middle of each of these light spots a fine streak or dark point can sometimes be observed. Caudal filaments yellowish brown, with white setae.

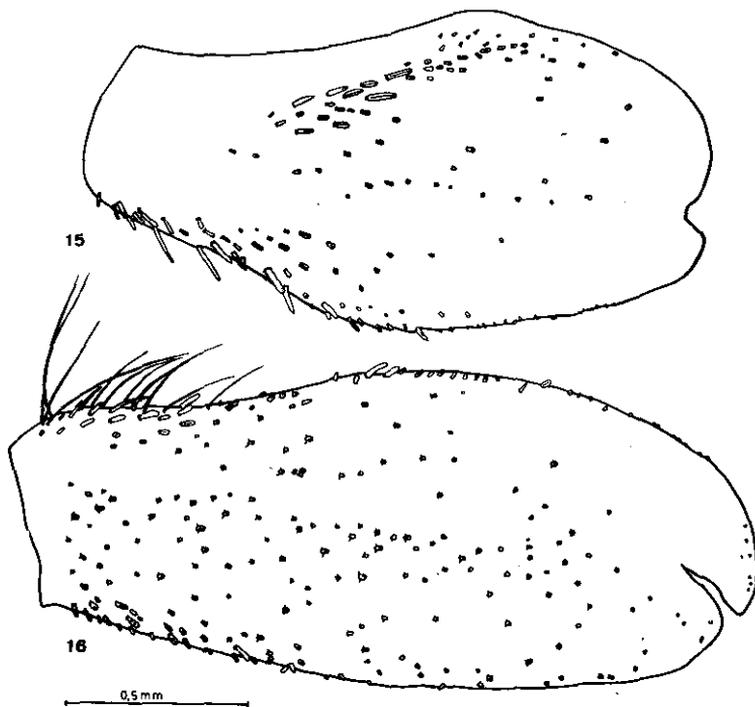
Head somewhat more depressed and with a different position of the eyes than in *O. rhenana* compare Figs. 19-26.

Dorsal surface of fore femora chagreened, with short spatulate and some stronger and longer bristles (Fig. 15). Ventrally, bristles are scarce and distributed over the anterior half; hind margin with a set of strong long bristles which decrease in number and length towards the distal part. Surface of fore tibiae with fine long bristles; on the distal third of the ventral surface are ca. 10 of them, as well as some spatulate bristles. A few spines and a group of very long bristles near bases of middle (Fig. 16) and hind femora, although they are clearly shorter and less numerous than in *O. rhenana* (see Figs. 11 and 12).



Figs. 11-14: *Oligoneuriella rhenana* (11, 13) and *O. marichuae* (12, 14), nymphs: general aspect of middle femur of male (11, 12); ventral view of lateral abdominal spines of a female nymph (13, 14)

Abdomen less flat, lateral abdominal spines shorter and differently shaped than in *O. rhenana* (Figs. 13 and 14); lateral margins of 9th abdominal segment more convex than in *O. rhenana* (Figs. 17 and 18). Plate of gill 1 similar to that of *O. rhenana*, clearly larger than following ones, bunch of filaments as long as or longer than plate, surface with spatulate bristles, margins with sharp or blunt bristles. However, gill plates of abdominal segments 2-7 clearly differ from *O. rhenana* in general shape (less rounded and longer in the new species than in *O. rhenana*), in the shape of the ventral cavity and in that bristles of the inner distal zone are clearly shorter than in *O. rhenana* (Figs. 27-38).



Figs. 15, 16: *Oligoneuriella marichuae*, dorsal views of fore (15) and middle (16) femur of a male nymph.

Taxonomical Position of the New Species

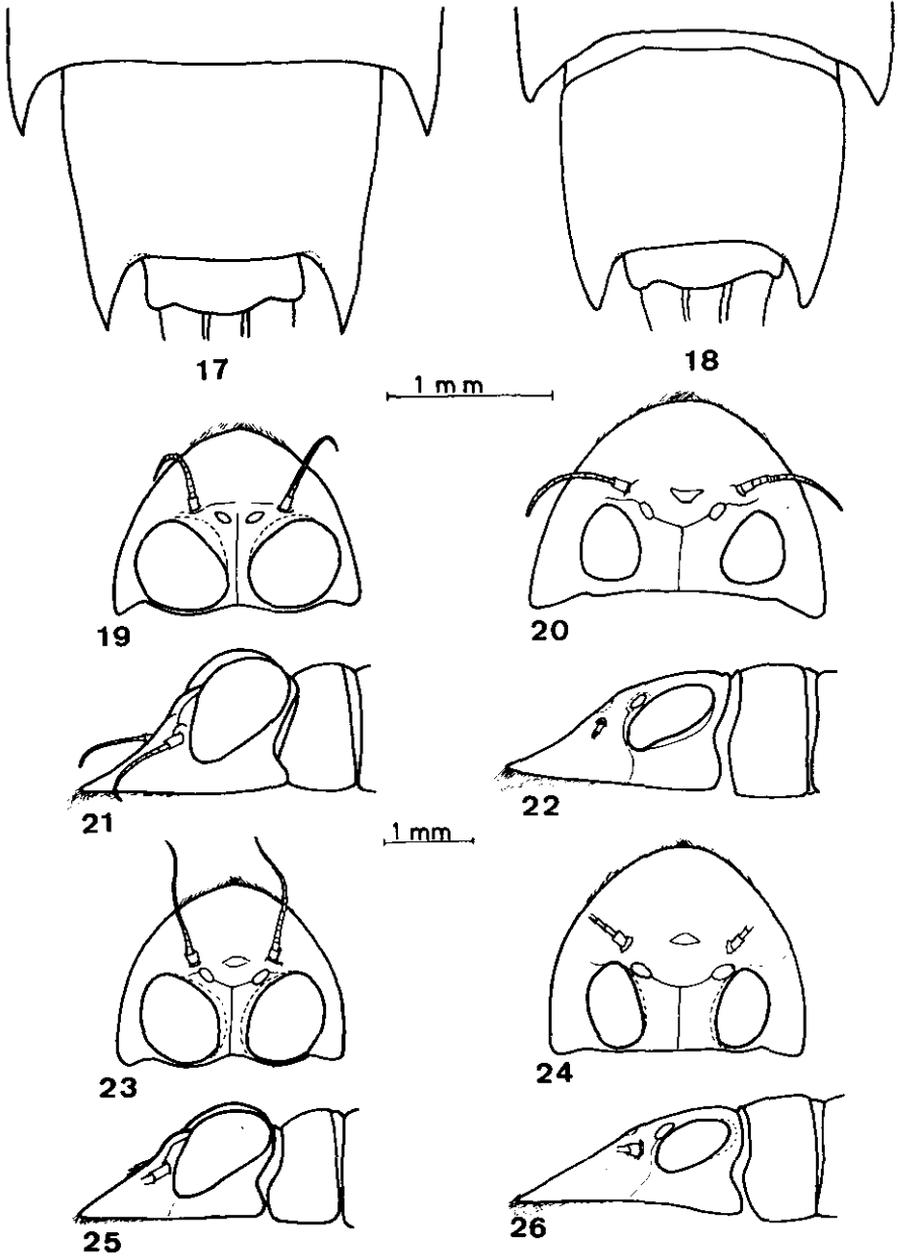
The new species is closely related to *O. rhenana* but differs from it in the following characters:

Adult ♂: Fore zone of first abdominal sternite clearly narrower than the hind one (Figs. 3 and 4). Forceps not so pronouncedly S-curved (Figs. 1 and 2) and internal sclerites supporting penis differently shaped than in *O. rhenana* (Figs. 7-10).

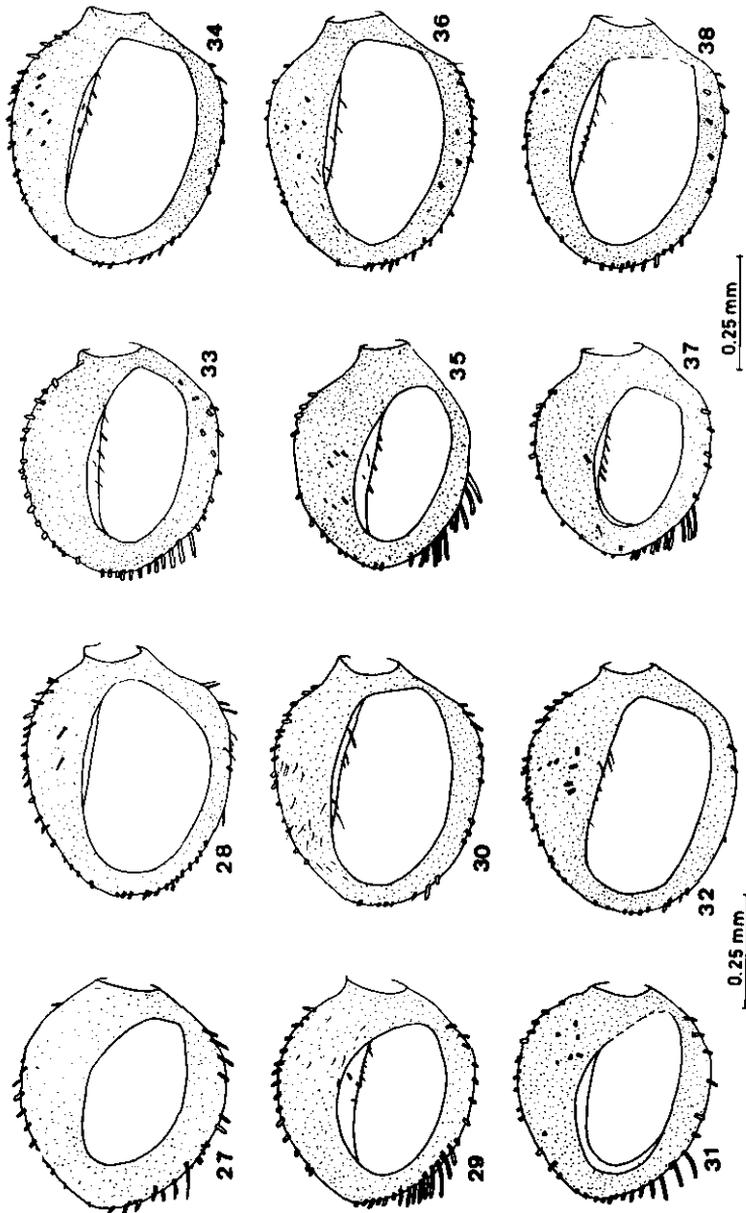
Adult ♀: In lateral view, the eyes are wider and less triangular than in *O. rhenana* (Figs. 5 and 6).

Nymph: Head somewhat more depressed, the position of the eyes differs from *O. rhenana* (Figs. 19-26). Long bristles near the bases of middle and hind femora clearly shorter and less numerous than in *O. rhenana* (Figs. 11 and 12), 9th abdominal segment with lateral margins more convex than in *O. rhenana* (Figs. 17 and 18). Gill plates of abdominal segments 2-7 less rounded and longer, the bristles of the inner distal zone clearly shorter, shape of ventral cavity differs from *O. rhenana* (Figs. 27-38).

To facilitate distinction of nymphs of the various palaearctic species, the



Figs. 17-26: *Oligoneuriella rhenana* (17, 19, 21, 23, 25) and *O. marichuae*, nymphs: dorsal view of ♀ abdominal tip (17, 8) and dorsal and lateral views of heads of male (19, 21, 23, 25) and female (20, 22, 24, 26) nymphs.



Figs. 27-38: *Oligoneuriella rhenana* (27, 29, 31, 33, 35, 37) and *O. marichuae* (28, 30, 32, 34, 36, 38), nymphs: plates of second to seventh gill

following key is provided. It is based on characters described by Sowa (1973), Soldán et al. (1977), and Koch (1980). *O. mongolica* Soldán et Landa, 1977 is not included because its nymph is unknown.

Key to Nymphs of Palearctic Species of *Oligoneuriella*

1. Hind proximal margins of middle and hind femora with a group of very long bristles (Figs. 11, 12, 15 and 16) 2
 - Without groups of very long bristles on hind proximal margins of middle and hind femora . 10
2. Plate of gill 1 clearly larger than the following ones 3
 - Plate of gill 1 similar to or smaller than the others 6
3. Bunch of filaments of gill 1 clearly shorter than gill plate. Compound eyes projecting beyond lateral contour of head in dorsal view *O. pallida* (Hagen, 1885)
 - Lengths of bunch of filaments and of plate of gill 1 similar. Compound eyes not projecting beyond the contour of the head (Figs. 19, 23) 4
4. Plate of gill 2 clearly (*ca.* 1.6 times) longer than wide *O. skoura* Dakki et Giudicelli, 1980
 - Plate of gill 2 hardly (*ca.* 1.2 times) longer than wide (Figs. 27, 28) 5
5. Bristles on hind proximal margins of middle and hind femora very numerous and as long as basal width of femora, or longer (Figs. 11). Sides of 9th abdominal segment almost straight (Fig. 17) *O. rhenana* (Imhoff, 1852)
 - Bristles on hind proximal margins of middle and hind femora less numerous and shorter than basal width of femora (Fig. 12). Sides of 9th abdominal segment pronouncedly convex (Fig. 18) *O. marichuae* sp. n.
6. Plate of gill 1 smaller than others. Filaments of gill 3 clearly shorter than the plate 7
 - Plate of gill 1 of approximately same size as the others. Filaments of gill 3 of approximately same length as plate 8
7. Tibiae of fore legs shorter than tibiae of hind legs *O. kashmirensis* (Ali, 1971)
 - Tibiae of fore legs longer than tibiae of hind legs *O. orontensis* Koch, 1980
8. Lateral margins of spines on abdominal segments 2-7 straight, gills 2-7 as long as wide, with broad cavity *O. zanga* Soldán et Landa, 1977
 - Lateral margins of spines on abdominal segments 2-4 convex, gills 2-7 oval, longer than wide, with narrow ventral cavity 9
9. Bunch of filaments of gill 1 clearly longer than plate. Compound eyes projecting beyond contour of head in dorsal view. Spines near the posterior margin of sternites long and pointed *O. baskale* Soldán et Landa, 1977
 - Bunch of filaments and plate of gill 1 of similar length. Compound eyes not projecting beyond contour of head. Spines near posterior margin of sternites short and rounded *O. iskhomelidzei* Sowa et Zosidze, 1973.
10. Plate of gill 1 clearly smaller than others, conical, well sclerotized and with a distinct ventral protuberance. Tibiae of middle legs 1.5 times longer than tarsi . *O. keffermuelleriae* Sowa, 1973
 - Plate of gill 1 slightly smaller than the others and generally oval, flat, little sclerotized and without protuberance. Length of tibiae of middle legs approximately similar to tarsi *O. mtkulskii* Sowa, 1961

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REFERENCES

- ALI, S. R. (1971): Certain mayfly nymphs (Order Ephemeroptera) of Azad kashmir and Swat. — Pakist. J. Sci., 23: 209-214.
- DAKKI, M. and GIUDICELLI, J. (1980): Ephéméroptères d'Afrique du nord. 2 — Description d'*Oligoneuriella skoura* n. sp. et d'*Oligoneuriopsis skhounate* n. sp., avec notes sur leur écologie (Ephem., Oligoneuriidae). — Bull. Inst. scient. cherif., Rabat, 4 (1979): 13-28.
- EDMUNDS, G. F. Jr., S. L. JENSEN and L. BERNER (1976): The mayflies of North and Central America. — Univ. of Minneapolis Press, 330 pp.
- KOCH, S. (1980): Beschreibung der Larve von *Oligoneuriella orontensis* n. sp. aus dem Vorderen Orient und Vergleich mit den paläarktischen Arten von *Oligoneuriella* Ulmer (Ephemeroptera). Ergebnisse der Reisen von R. Kinzelbach im Vorderen Orient, Nr. XX. — Ent. Z., 90 (14): 153-160.
- MÜLLER-LIEBENAU, I. (1970): Revision der europäischen Arten der Gattung *Baetis* Leach, 1815 (Insecta, Ephemeroptera). — Gewäss. Abwäss. 48/49 (1969): 1-214.
- SOLDÁN, T. and LANDA, V. (1977): Three new species of the genus *Oligoneuriella* (Ephemeroptera, Oligoneuriidae). — Acta ent. bohemoslov., 74: 10-15.
- SOWA, R. (1961): *Oligoneuriella mikulskii* n. sp. (Ephemeroptera). — Acta Hydrobiol. Kraków, 3: 287-294.
- (1973): Contribution à l'étude des *Oligoneuriella* Ulm. européennes (Ephemeroptera, Oligoneuriidae). — Bull. Acad. Pol. Sci., 10: 657-665.
- SOWA, R. and ZOSIDZE, R. S. (1973): *Oligoneuriella tskhomelidzei* sp. n. nouvelle representante des Oligoneuriidae du Petit Caucase (Ephemeroptera). — Bull. Acad. Pol. Sci., 21, 9: 601-603.
- ULMER, G. (1924): Einige alte und neue Ephemeropteren. — Konowia, 3: 23-37.

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