## A KEY TO THE GENERA OF KNOWN NYMPHS OF THE OLIGONEURIDAE

(EPHEMEROPTERA)

George F. Edmunds, Jr., University of Utah, Salt Lake City.1

Demoulin (1952: 2-3) has given a useful key to the adults of the family Oligoneuriidae. The present key will serve to determine the nymphs of this family, except those of the genera *Oligoneuria* Pictet and *Oligoneuriodes* Demoulin of South America, which remain unknown. This key is not intended as a guide to the relationships among the genera. Our present knowledge of the family does not permit a clear evaluation of these relationships, although some of the possible ones are outlined below.

Edmunds and Traver (1954) believed the genus *Pseudoligoneuria* to be the most primitive member of the family, and placed it in a separate subfamily. The dorsal position of the gills on segment one is shared with the related Isonychiinae (Siphlonuridae) in which the living members of the genus *Isonychia* of this subfamily possess traits similar to those which would be expected in the ancestors of the Oligoneuridae. *Pseudoligoneuria* has a peculiar combination of isonychiine, oligoneuriine, and intermediate characters. Demoulin (1958) placed *Pseudoligoneuria* in the family Paedephemeridae, superfamily Oligoneurioidea; *Isonychia* was placed in the Isonychiinae of the same superfamily, but the remaining Siphlonuridae are placed in a different superfamily.

Within the Oligoneuriinae the nymphs of Oligoneurisca and Homoeoneuria are very similar in their adaptations of legs and gills to a sand habitat. The adult of Oligoneurisca, when known, may prove the two genera to be closely related. However, the incipient adult wing venation seen in the wing pads of Oligoneurisca nymphs suggests a closer relationship to Oligoneuriella. The adult wing venation of the genus Elassoneuria suggests it may be related to Homoeoneuria, but the nymph is not specialized for a sandy habitat.

The genera Oligoneuriella and Oligoneuriopsis appear to be very closely related, but because they may be distinguished readily in both nymphal and adult stages, it seems advisable to keep them as full genera. Eventually the two might be ranked as subgenera of a single genus.

The genus Lachlania is a clearly delimited genus of widespread occurrence in the Americas. Of the several generic and subgeneric names listed as synonyms by Edmunds and Traver (1954: 237) one or more might be retained as subgenera, but current evidence does not favor such a view. The genus Lachlania is probably most closely re-

<sup>&</sup>lt;sup>1</sup>The research on which this paper is based was supported by a grant-in-aid from the National Science Foundation.

lated to the South American genus Spaniophlebia Eaton which it resembles to some degree in both adult and nymphal stages.

Of the two Neotropical genera whose nymphs remain unknown, Oligoneuria Pictet appears to be closest to Spaniophlebia, and Oligoneuriodes resembles Oligoneuriella and Oligoneuriopsis in wing venation. The true relationship of Oligoneuriodes might be more closely with Spaniophlebia or even Elassoneuria. Although the name Oligoneuria has been applied to nymphal specimens on several occasions, these nymphs have actually been representatives of either Oligoneuriella, Homoeoneuria or Spaniophlebia.

## KEY TO GENERA

1.	Gills on first abdominal segment dorsal (Oriental)
	Pseudoligoneuriinae, Pseudoligoneuria Ulmer
	Gills on first abdominal segment ventral Oligoneuriinae, 2
2.	Foretarsi greatly reduced, claws wanting 3
	Foretarsi well developed, claws present4
3.	Fibrilliform portion of gills two to seven present; gill lamellae less
	than twice as long as broad (Russia and Poland) Oligoneurisca Lestage
	Fibrilliform portion of gills two to seven wanting; gill lamellae at least
	three times as long as broad (North and Central America)
	Homoeoneuria Eaton
4.	Median terminal filament well developed, at least half as long as cerci 5
	Median terminal filament went developed, at least half as long as cerci
	Median terminal filament wanting, with cerci only (Pan-American)
5	Lachlania Hagen
υ.	Frontoclypeal region of head enormously expanded so as to form a
	dome shaped structure anterior to the antennae (South America)
	Spaniophlebia Eaton
	Frontoclypeal region of head not expanded, head round or subtriangular
	(Eurasia or Africa)6
6.	Gill lamellae acuminate apically, each gill lamella longer than the
	segment from which it arises; head with a carina extending from
	between the antennal bases to the front of the headElassoneuria Eaton
	Gill lamellae rounded apically, each gill lamella shorter than the segment
	from which it arises; head lacking a carina
7.	Ventral gill on segment one consists of fibrilliform tuft without a
	lamella (Africa)Oligoneuriopsis Crass
	Ventral gill on segment one consists of a fibrilliform tuft with lamella
	(Eurasia, Africa) Oligoneuriella Ulmer
	· · · · · · · · · · · · · · · · · · ·
	T C

## LITERATURE CITED

- Demoulin, G., 1952. Essai de nouvelle clé pour la détermination des Oligoneuridae (Insectes Éphéméroptères). Bull Inst. R. Sci. Nat. Belg., 28 (43):1-4.
- , 1958. Nouveau schema de classification des Archodonates et des Éphéméroptères. *Ibid.*, 34 (27): 1-19.
- Edmunds, G. F. and Traver, J. R., 1954. An outline of a reclassification of the Ephemeroptera. Proc. Ent. Soc. Wash., 56 (5): 236-240.