

**A CLASSIFICATION FOR THE NEARCTIC SPECIES OF
WORMALDIA AND DOLOPHILODES**

(TRICHOPTERA, PHILOPOTAMIDAE)

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Intensive collecting in western Oregon by Kenneth M. Fender has unearthed an interesting species of *Wormaldia* which has led to a scrutiny of other members of this genus and its relative, *Dolophilodes*. Comparison of nearctic with pale-arectic forms indicates that *Dolophilus* must fall as a synonym of *Wormaldia*. Keys to the males of the nearctic species are presented here with the description of the new species from Oregon.

The male of this new species, *sisko*, has certain characteristics which set it off from other members of *Wormaldia*, including somewhat elongate maxillary and labial palps, the former with segment 4 only little longer than 3, and 5 extremely long; and the fork of R_{2+3} in the front wing being situated slightly beyond the discal crossvein. The genitalia, however, are of a simple type and females apparently well associated with the males showed peculiarities of neither palps nor venation.

A general survey of both genera under consideration brought out an interesting situation. The primitive members of each genus have male genitalia of a simple type, somewhat after the style illustrated by *sisko*, yet within each genus there are groups of species having highly developed genitalic structures. This is well exemplified in *Wormaldia* by *arizonensis* which has not only a curious development of the tenth tergite, but also a pair of sharp processes on the apical margin of the eighth tergite (Fig. 2). Several species groups contain only a single known species. Females and larvae of only a relatively few of these are known at present and it will be interesting to see how characters from these two stages influence groupings suggested by male genitalia.

WORMALDIA McLachlan

Wormaldia McLachlan, 1865, Trans. Ent. Soc. London, 3rd, ser., 5 (1): 140. Genotype, here designated.—*Hydropsyche occipitalis* Pictet.

Dolophilus McLachlan, 1868, Trans. Ent. Soc. London for 1868: 303. Genotype, monobasic.—*Dolophilus copiosus* McLachlan. NEW SYNONYMY.

In the original description, McLachlan included in *Wormaldia* the species *Hydropsyche occipitalis* Pictet and *Wormaldia subnigra* McLachlan, illustrating the male genitalia of both and the venation and maxillary palpus of the former species. Since no genotype has apparently been designated,

I am choosing *occipitalis* which was obviously the species used in such a practical capacity by McLachlan.

The reduction of *Dolophilus* to synonymy, explained in more detail in following paragraphs, necessitates a transfer to *Wormaldia* of all nearctic species formerly placed in *Dolophilus* (see Ross 1944, p. 292). In the key to world genera which I published in 1948 only a simple substitution of a name will be necessary.

The nearctic species of this genus fall into three distinct groups on the basis of male genitalia, characterized as follows:

Major group.—Tenth tergite divided into a pair of heavily sclerotized, large hooks; cerci wide and projecting chiefly dorsad; claspers curved dorsad, spatulate (Fig. 3). Contains only *major* (Banks).

Arizonensis group.—Tenth tergite single, but highly modified into a basal hump and apical knob (Fig. 2); cerci wide and trapezoidal; claspers with short and stubby apical segment. Contains only *arizonensis* (Ling).

Moesta group.—Tenth tergite simple and either triangular or slightly bulged at the sides; cerci elongate and slender, paralleling the tenth tergite. The species within this group may be segregated into three subgroups: (1) *anilla* (Ross) and *cruzensis* (Ling), in which the apical sternites are without mesal projections; (2) *moesta* (Banks) and *gabriella* (Banks), in which the seventh sternite has a long, straplike apico-mesal projection; and *shawnee* (Ross), *strota* (Ross), *occidea* (Ross) and *sisko*, n. sp., which form a heterogeneous group in which the seventh sternite has a broad, triangular apico-mesal projection (Fig. 4).

The genotype of *Wormaldia*, the European *occipitalis* (Pictet), falls in the *Moesta* group and the *anilla* subgroup. In male genitalia *occipitalis* and *anilla* differ only in small details of structure. In venation of the front wing, *occipitalis* seems always to have M_{3+4} unbranched, the character on which *Wormaldia* has been maintained heretofore as a distinct genus; *anilla* has M_{3+4} usually branched but occasionally specimens have a wing in which the vein is unbranched, or has only an isolated section of M_4 "floating" in the wing membrane. This venational character appears therefore to be an incidental development within a species group rather than an indication of a category at the generic level.

This same type of vein atrophy occurs with R_2 . Present in both wings of most members of the genus, it is atrophied in *strota*, *shawnee*, and *gabriella*, although present in the species most closely related to each of these.

In this regard the subgroup containing *moesta* and *gabriella* is of unusual interest. These are the genotypes of *Paraga-*

petus and *Dolophiliella* respectively. The two species differ in venation in that in both wings R_{2+3} is unbranched in *gabriella*, but branched (though R_2 is faint) in *moesta*. The extreme similarity of male genitalia, however, leaves no doubt but that the two species are extremely closely related. Two palearctic species are extremely close relatives of these two, *chinensis* (Ulmer) from China and *relicta* (Ulmer) from India, all four sharing the straplike process of the seventh sternite and similar shape of claspers and tenth tergite. The distribution of these four species and their close relationship seems to indicate the result of recent speciation following radial dispersal from a former circum-polar center.

The genotype of *Dolophilus*, the European *copiosa* (McLachlan), appears to fall in the *Moesta* group although it is not especially close to any nearctic forms.

KEY TO NEARCTIC SPECIES—MALES

1. Tenth tergite divided into a pair of heavily sclerotized hooks; claspers curving dorsad (Fig. 1)..... **major**
Tenth tergite not heavily sclerotized and at most only slightly hooked, in many species undivided (Figs. 2A, 4A)..... **♀**
2. Tenth tergite with a basal hump and ending in a knob (Fig. 2)..... **arizonensis**
Tenth tergite not ending in a knob..... 3
3. Seventh sternite having a long, narrow apico-mesal process..... 4
Seventh sternite having a triangular process broad at base, or none..... 5
4. Eighth sternite also with a long apico-mesal process (Ross 1944, Fig. 167)..... **moesta**
Eighth sternite with only a short process or none..... **gabriella**
5. Tenth tergite truncate and hooked ventrad at extreme tip (Ross 1938b, Fig. 6)..... **strota**
Tenth tergite with tip pointed or rounded and not hooked, (Fig. 4)...... 6
6. Clasper elongate and the apical segment slender and shorter than the basal segment (Fig. 4)..... **sisko**
Clasper either short and stocky (Fig. 2), or apical segment much longer than basal segment..... 7
7. Seventh sternite having a triangular apico-mesal process much as in Fig. 4C..... 8
Seventh sternite without an apico-mesal process, at most with a slight mesal angulation of the apical margin..... 9
8. Apical segment of clasper much longer than basal segment (Ross 1938a, Fig. 53)..... **shawnee**
Apical segment of clasper slightly shorter than basal segment (Ross 1938a, Fig. 54)..... **occidea**

9. Apical segment of clasper markedly constricted below middle
 (Ross 1941, Fig. 18).....anilla
 Apical segment of clasper parallel-sided, rounded at tip.....
cruzensis

Wormaldia sisko, new species

Male. Length 6.5 mm. Color light brown, the dorsum slightly darker. Maxillary palps long, first segment short and inconspicuous, next three subequal and each equal in length to depth of head capsule, fifth one and a half times as long as fourth. General structure otherwise typical for genus. Front and hind wings both with R_{2+3} branched, in the front wing the branch occurring at or just beyond crossvein *d*. Seventh sternite of abdomen with apical sternite produced into a broad triangular area (Fig. 4C); eighth and ninth sternites not produced.

Genitalia as in Fig. 4. Ninth segment forming a wide lateral and ventral band. Ninth and tenth tergites fused, the tenth tergite (Fig. 4A), undivided, tapering, and pointed; cerci appressed to and appearing to arise out of the base of the tenth tergite. Clasper long, slightly tapering from base to apex, the basal segment slightly longer than the apical one, which bears a mesal transverse pad of short dark spicules at apex. Aedeagus forming an elongate membranous sac in which are a series of appressed, long, curved, flattened, tusklike spines; the area these occupy is shown by a dotted area in Fig. 4.

Female. Size, color, and general structure similar to male, except that the fourth segment of the maxillary palp is shorter than the third, in this particular agreeing with other members of the genus. Apex of abdomen simple, tapering, and without conspicuous external processes.

Holotype, male.—Station 1, Peavine Ridge, near McMinnville, Ore., May 22, 1947, K. M. Fender. [Illinois Natural History Survey.]

Allotype, female.—Store Gulch Guard Station, Siskiyou Mts., Ore., Aug. 9, 1948, K. M. Fender. [INHS].

Paratypes, males.—Same data as for holotype, but May 15, 2 ♂; May 27, 1 ♂. Same data as for allotype, 2 ♂, 4 ♀. [INHS].

DOLOPHILODES Ulmer

The nearctic species form three distinct groups, characterized almost entirely by male genitalia, and with few differences in venation and other characters. The fauna of other parts of the world contains some species which represent groups quite different to any occurring in North America. Especially distinctive is *aurascens* Martynov, from Siberia. The groups represented by nearctic species are as follows.

Ornatus group.—Tenth tergite fairly small, triangular, and divided at apex into a pair of simple, finger-like processes; clasper elongate, its mesal area relatively flat and simple, the apical segment with mesal patches of short, brown setae. This

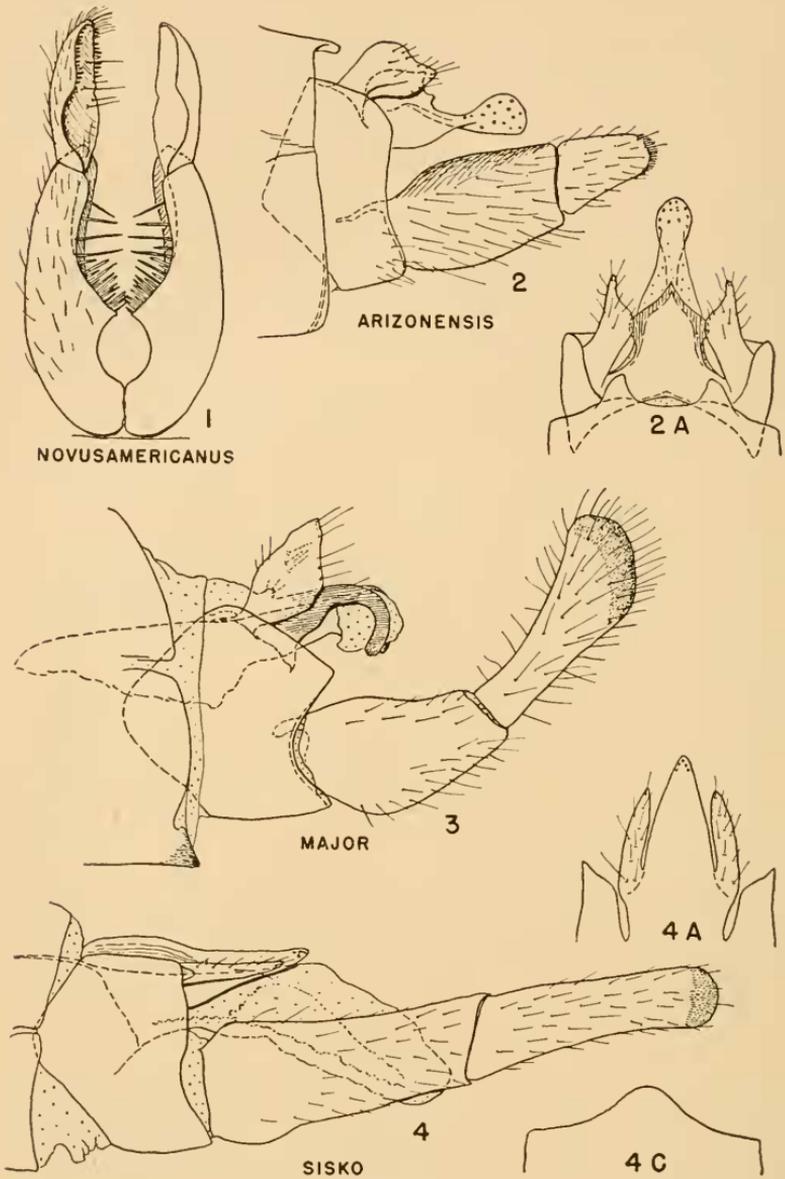


PLATE 13

Fig. 1, *Dolophilodes novusamericanus*, male genitalia, ventral aspect; fig. 2, *Wormaldia arizonensis*, male genitalia, lateral aspect; A, tenth tergite and cerci, dorsal aspect; fig. 3, *Wormaldia major*, male genitalia, lateral aspect; fig. 4, *Wormaldia sisko*, male genitalia, lateral aspect; A, tenth tergite and cerci, dorsal aspect; C, apex of seventh sternite.

includes the palearctic genotype *ornatus* Ulmer, and the nearctic species *distinctus* (Walker), *pallidipes* (Banks), and *aequalis* (Banks).

Novusamericanus group.—Tenth tergite similar to the above, but smaller and usually hidden behind the cercus; clasper highly modified (Fig. 1) the apical segment having the mesal surface cupped, and the basal segment having a ventromesal angulation and also a comb of stout, stiff spines beyond this angulation. Contains only the western species *novusamericanus* (Ling).

Dorcus group.—Similar in general to the *Ornatus* group, but having the tenth tergite notched at base and almost completely divided down meson to form a pair of lateral leaflike blades, each more closely associated with a cercus than with each other. Contains only the western species, *dorcus* (Ross).

KEY TO NEARCTIC SPECIES—MALES

1. Claspers having mesal surface deeply convex (Fig. 1), the ventral margin of apical segment sinuate, of basal segment curiously scalloped, the apical curved portion bearing an irregular comb of long, stiff, stout hairs.....
 **novusamericanus** (Ling)
- Claspers having mesal surface fairly flat and basal segment with mesal margin nearly straight, with only irregular hair, not a comb 2
2. Tenth tergite prominent with a sharp dorsal notch (Ross 1938a, Fig. 51)..... **dorcus** (Ross)
- Tenth tergite sunk between cerci, without a dorsal notch 3
3. Apical segment of clasper with posterior margin concave, the segment much wider at base than in middle (Betten and Mosely 1940, Figs. 5, 6; and Ross 1944, Fig. 172).....
 **distinctus** (Walker)
- Apical segment of clasper nearly parallel-sided and of about equal width for most of its length (Banks 1936, Fig. 8)..... 4
4. Color in general pale tawny..... **pallidipes** (Banks)
- Color in general dark brown to black **aequalis** (Banks)

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A BIONOMIC NOTE ON THE TAXONOMIC STATUS OF THE FORM PYRRHOCERUS OF EUSCHISTUS TRISTIGMUS SAY

(HEMIPTERA, PENTATOMIDAE)

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The variant referred to above was described as a species by Herrich-Schaeffer in 1842 and subsequent authors have expressed various views as regards its status. In general our hemipterists of the present century have termed it a variety of *E. tristigmus*, the principal exception being Malloch in editing Hart's posthumous publication (1919), in which Malloch states positively that he considers it a species. Hart himself seems to have been of two minds in the matter but apparently decided in favor of a subspecies. Van Duzee (1904) indicates a doubtful state of mind by placing a question mark after the term "variety."

In reviewing the literature it soon becomes apparent that various writers do not use the term "variety" in the same sense, a point which is aptly pointed out by McAtee (1920). Ferris (1928) has reviewed McAtee's paper and quoted several of the pertinent parts of it, in addition to presenting material and comments of his own. Summing it all up, it is evident that the term "variety" may mean anything from our present concept of subspecies to forms whose status is uncertain. In view of the uncertainty in meaning, Ferris (*op. cit.*) asks whether it might not be well to drop the use of this ambiguous term entirely. McAtee (*op. cit.*) on the other hand, proposes keeping the term on the premise that it facilitates handling, for these variants do exist, whether the taxonomist likes them or not, and some means of designating them is needed.

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