

Status Changes in Leptohiphidae and Tricorythidae (Ephemeroptera)

by

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The genus *Coryphorus* Peters is moved from the Tricorythidae (Machadorythinae) to the family Leptohiphidae. The genus *Tricorythafer* Lestage, 1942 is synonymized with *Tricorythodes* Ulmer, 1920 syn. n., and its type species becomes *Tricorythodes fugitans* (Needham, 1920, originally described in *Caenopsis*) comb. n. The description of the labial palp of *Machadorythus* is emended to "two OR three-segmented." The subfamily Dicercomyzinae is transferred from Leptohiphidae to Tricorythidae, and the genus *Teloganella* Ulmer is moved to the Ephemerellidae, subfamily Teloganodinae.

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Peters (1981) established the genus *Coryphorus* for *C. aquilus*, a new species from the Amazon Basin. In discussing relationships, Peters (1981) reported that *Coryphorus* was similar in several character states to *Leptohiphes*, *Tricorythodes*, and other genera of the South American Tricorythidae (Leptohiphinae); however, *Coryphorus* was placed provisionally in the African subfamily Machadorythinae based on shared apomorphic nymphal characters because, at that time, adult stages of neither *Coryphorus* or *Machadorythus* were known. *Coryphorus* remained in Machadorythinae in the reclassification of Landa and Soldán (1985) and Machadorythinae, Ephemerythinae and Tricorythinae remained subfamilies of Tricorythidae; however, Leptohiphidae was elevated to familial status to include the subfamilies Leptohiphinae and Dicercomyzinae.

In 1989, Elouard and Gillies reported that the adult of *Machadorythus palanquim* Demoulin, 1959 was *Tricorythus maculatus* Kimmins, 1949, necessitating the new combination *Machadorythus maculatus* (Kimmins). The validity of the tricorythid subfamily Machadorythinae was reaffirmed (Elouard and Gillies 1989). In redescribing the mouthparts of *M. maculatus*, Elouard and Gillies (1989, Fig. 2b) stated that the labial palp was two-segmented, although Peters (1981, Fig. 16) showed a small third segment fused to the apex of the second segment. After comparing slides from which both sets of figures were prepared, we find that the difference is real, and that a fusion line may be apparent or absent. We do not know if this is a result of population differences, size differences, or whether a second species of *Machadorythus* occurs in Transvaal.

Adults of other African tricorythid subfamilies are known (Gillies 1960,

Ephemerythinae; Barnard 1932 and other authors, Tricorythinae; and Kimmins 1957, Diceromyzinae). While the adult of *Coryphorus* is unknown, it is clear from the developing nymphal wings that the venation is not that of Machadorythinae. *Machadorythus* has the typical tricorythid "cubital fork" (Gillies 1960) in which vein ICuA is abruptly angled to CuP making a broad, strong triangle. In the nymphal wing pads of *Coryphorus*, vein ICuA appears to run parallel to CuA until it reaches a basal cross vein. Vein ICuA is parallel to CuA in Leptoehyphidae, and may be free at the base, or attached to CuA or CuP (or both) by a basal cross vein; vein CuP of some Leptoehyphidae may be reduced or lost.¹

Since *Coryphorus* lacks the derived adult wings of Machadorythinae and shares a majority of nymphal characters with Leptoehyphidae, it is herein moved to the family Leptoehyphidae.

Only one representative of Leptoehyphinae (Leptoehyphidae) is reported from Africa. Lestage (1942) established *Tricorythafer* for *T. fugitans* (Needham, 1920, *Caenopsis*) from Zaire (Belgian Congo). In her redescription of the holotype, Traver (1958) defined most characters "as in *Tricorythodes*." However, she separated *Tricorythafer* from *Tricorythodes* on two characters, the ratio between lengths of the tibiae of the fore and hind legs, and the fact that the forceps of the male were "apparently four-jointed." The variation in tibial length cannot be considered a valid character: (1) such ratios are not consistent even in Traver (1958) – "not more than 2-1/2" in the key, "2-3/5" in the generic description, and almost equal in the aberrant species *T. australis* (Banks); (2) for comparison, we measured a dozen long-legged males of *T. minutus* Traver, and found the ratio ranged from 2.4 to 2.9; (3) on the holotype of *Tricorythafer fugitans*, the tibia of the hind leg is bent and it is the measurement to the bend that produces a ratio greater than 3.0, not a measurement to the apex (ratio approximately 2.4).

We reexamined the holotype genitalia. Traver (1958) followed Needham (1920) but qualified the redescription of the genitalia to "forceps apparently four-jointed." A line across the basal segment, producing the "four-jointed" appearance, occurs only on the ventral surface and might also be interpreted as an overlaying piece of tissue, less likely as an incomplete fold. Among comparative material, a series of genitalia slides of *Tricorythodes albilineatus* Berner, we found similar conditions; on one of these slides, the "collar" at the base of the penes is also positioned as in the holotype of *Tricorythafer*, a condition Traver (1958) thought to be atypical. In dorsal aspect, the genital forceps of *T. fugitans* are clearly three-segmented.

Although Traver (1958) recognized the strong resemblance between the two genera, she avoided synonymizing them pending, we believe, the discovery of additional material. (The existence of the Neotropical–Nearctic *Tricorythodes* in

1) Although not evident from Fig. 8 of Traver (1958), study of additional material of *Tricorythopsis* has shown that CuP is a weak vein which may be joined or detached from ICuA, but which does not from the "cubital fork" of Tricorythidae; small species of *Tricorythodes* may lose vein CuP (Traver 1958, our unpublished material).

Africa must have seemed improbable.) Despite extensive collecting in Africa (Gillies pers. comm.), *Tricorythafer* has never been found again; the report of one species in Tanzania (Gillies 1960) is in error (Gillies, pers. comm.). Considering this and the fact that there is no method of distinguishing *Tricorythafer* from *Tricorythodes*, we conclude that the genera are synonymous and we propose that the record of *Tricorythodes* from Africa is spurious. Perhaps it resulted from a recent, temporary introduction (with extinction) of *Tricorythodes* in Africa, or perhaps from the contamination of the collection at some stage of processing. Obviously, any revision of *Tricorythodes* must include the species *T. fugitans*.

The African subfamily Dicercomyzinae contains one genus, *Dicercomyzon* Demoulin. This unusual tricorythid was placed in Leptoxyphidae based on "ephemerelloid" (plesiomorphic) characters by Landa and Soldán (1985); Landa (1969) also cited several affinities between Dicercomyzinae and Tricorythinae. Since the adults of Dicercomyzinae share the apomorphic wing state of other Tricorythidae (sensu Landa and Soldán), we do not believe it should be retained in Leptoxyphidae on plesiomorphic characters, and herein transfer the subfamily to Tricorythidae.

Edmunds and Polhemus (1990) placed the genus *Teloganella* Ulmer into the Tricorythidae. Edmunds (pers. comm.) has supplied figures of the undescribed male and nymph of *Teloganella* upon which this decision was based. *Teloganella* does not fit perfectly into any family or subfamily, but displays a majority of the characters of the ephemerellid subfamily Teloganodinae as presently defined (Allen 1965), and not those of Tricorythidae (Gillies 1960, this paper). Herein, we return *Teloganella* to the Teloganodinae, recognizing that this placement may be temporary. It seems clear that relationships among the families and subfamilies of Ephemerelloidea need phylogenetic revision.

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