

Notes and Records

Mayfly diversity in East Africa

Although written records of mayflies (Order Ephemeroptera) go back to Aristotle (384–322 BC) and a detailed account of their biology was given by Ougert Cluyt (Augerius Clutius) in 1634 (cited in Williams & Feltmate, 1992), very little is known about their ecology, distribution and taxonomy in East Africa (i.e. Kenya, Uganda and Tanzania). They number about 2000 species world-wide and exist in most parts of the world, although they are poorly represented on oceanic islands. Mayflies are primarily invaders of the aquatic environment, and have a complex life cycle (Wilbur, 1980) involving both aquatic and terrestrial phases, thus creating an evolutionary dichotomy. Their distribution and occurrences have in the past been used to explain organic dispersal (Allen, 1990), continental drift (Edmunds, 1972), phoretic associations with other organisms (Arvy & Peters, 1973), water quality (Williams, 1980; Fremling & Johnson, 1990) and fish diet (Mathooko, 1993). Mayflies have also been very useful to man for several centuries as food and their morphologies have been utilized in constructing mimics for sport fishing. *Caenis kungu* (Caenidae), for instance, is noted by Eaton (1883) as edible and sold by Malawians in markets as cakes. Mayflies are very sensitive to perturbations (Aanes, 1980; Rosenberg, Wiens & Flannagan, 1980; Dejoux, 1981) and have a wide occurrence in less perturbed highland streams of East Africa. Although the actual distribution of mayfly species in East African streams and lakes is not known, I have attempted to compile a list of the recorded species and their distribution (Table 1). Until now, no exhaustive compilation has been made of the diversity and distribution of mayflies in East Africa, apart from that of M. T. Gillies (unpubl.) on the Afrotropical Ephemeroptera. About 85 species of Ephemeroptera are currently recorded from East Africa. Many of these species are not fully described and/or their descriptions need to be revised. According to M. T. Gillies (pers. comm.), the genus *Baetis* needs revision, probably into 3–4 genera, making it appropriate to use *Baetis sensu lato* (*s.l.*) (*sensu* Gillies, 1994). Furthermore, the subgenus *Nigrobaetis* Kazlauskas 1972, collected from the Naro Moru River (Kenya) in 1993–94, is being reported for the first time in East Africa, although having been previously collected by M. T. Gillies in Tanzania from a stony stream in Morogoro and Sigi River (Usambara Mountains) between 1985 and 1991. In addition, *Tanzaniella* will probably soon be synonymised with *Acentrella* or *Baetiella*.

Taxonomy, by its nature, is *ad hoc* and a decision has to be made about the identity and status of a group of organisms using available data (Oliver, 1979). The past and present decisions made on the systematics of mayflies are subject to continual revision and reassessment as we accumulate and expand existing information. Taxonomically, the mayfly fauna in East Africa is poorly known and the number of mayfly species unknown. Many more species probably remain to be discovered and described. There have been changes in naming some mayfly species over the years, with the majority of the earlier nomenclature now being obsolete. Therefore, fundamental systematics research should be encouraged in order to facilitate identification and

Table 1. A list of recorded mayflies (Ephemeroptera) in East Africa. Symbols indicate the East African countries where the species or genera are currently known to occur: ¶ (Kenya), † (Uganda) and ‡ (Tanzania). * = location in East Africa unavailable.

BAETIDAE	<i>Cloeon</i> Leach, 1815	<i>Adenophlebiodes</i> Ulmer, 1924	PROSOPISTOMATIDAE
Subfamily BAETINAE	<i>Cloeon amaniense</i> Gillies, 1985‡	Subgenus <i>Adenophlebiodes</i> Ulmer, 1924	<i>Prosopistoma</i> Fourcroy, 1769¶
<i>Baetis</i> Leach, 1815	<i>Cloeon areolatum</i> Navas, 1930a†	<i>Adenophlebiodes ornata</i> Ulmer, 1924†	<i>Prosopistoma africanum</i> Gillies, 1954‡‡
<i>Baetis bellus</i> Barnard, 1932†	<i>Cloeon cylindroculum</i> Kimmins, 1955*	Subgenus <i>Hyalophlebia</i> Demoulin, 1955	
<i>Baetis harrisoni</i> Barnard¶	<i>Cloeon perkinsi</i> Barnard, 1932*	<i>Adenophlebiodes demoulini</i> Kimmins, 1960†	CAENIDAE
<i>Baetis cataractae</i> Crass¶	<i>Cloeon rhodesiae</i> Barnard, 1932¶	<i>Choroerpes</i> Eaton, 1881	Subfamily CAENINAE
<i>Nigrobaetis</i> Kazlauskas, 1972‡‡	<i>Cloeon scitulum</i> Kimmins, 1955*	Subgenus <i>Euthraulius</i> Barnard, 1932¶	<i>Afrocaenis</i> Gillies, 1982¶
<i>Pseudopannota</i> Waltz & McCafferty, 1987	<i>Cloeon smaeleni</i> Lestage, 1924*	<i>Choroerpes bugandensis</i> Kimmins, 1956†‡	<i>Afrocaenis browni</i> Gillies, 1982‡
Subgenus <i>Hemipannota</i> Elouard & Gillies, 1990	<i>Cloeon tanzaniae</i> Gillies, 1985‡	<i>Choroerpes curtus</i> Kimmins, 1956†‡	<i>Afrocaenis major</i> Gillies, 1977‡
<i>Pseudopannota (Hemipannota) maculosa</i> Crass, 1947¶	<i>Cloeon virgiliae</i> Barnard, 1932¶	<i>Choroerpes tropicalis</i> Gillies, 1957‡	<i>Caenis</i> Stephens, 1832
<i>Tanzaniella</i> Gillies, 1991	<i>Mutelocloeon</i> Gillies & Elouard, 1990	<i>Choroerpes usambarae</i> Gillies, 1957‡	<i>Caenis alicae</i> Malzacher, 1990‡
<i>Tanzaniella spinosa</i> Gillies, 1991¶‡	<i>Mutelocloeon corbeti</i> Kimmins, 1956†		<i>Caenis brevipes</i> Kimmins, 1956†
Subfamily CLOEONINAE	<i>Potamocloeon</i> Gillies, 1990		<i>Caenis cincta</i> Demoulin, 1956‡
<i>Afrobaetodes</i> Demoulin, 1970	<i>Potamocloeon dentatum</i> Kimmins, 1956†	TRICORYTHIDAE	<i>Caenis corbeti</i> Malzacher, 1990†
<i>Afrobaetodes bernerii</i> Demoulin, 1970‡	<i>Rhithrocloeon</i> Gillies, 1985	Subfamily Ephemerithinae	<i>Caenis duodecima</i> Malzacher, 1990‡
<i>Afrobaetodes pugio</i> Gillies, 1991‡	<i>Rhithrocloeon indicator</i> Gillies, 1980‡	<i>Ephemerythus</i> Gillies, 1960¶	<i>Caenis edwardsi</i> Kimmins, 1939†
<i>Afroptilum</i> Gillies, 1990	<i>Rhithrocloeon permirum</i> Kopelke, 1980‡	Subgenus <i>Ephemerythus</i> Gillies, 1960	<i>Caenis gilliesi</i> Malzacher, 1990‡
Subgenus <i>Afroptilum s.str.</i>	OLIGONEURIIDAE	<i>Ephemerythus niger</i> Gillies, 1960‡	<i>Caenis jinjana</i> Kimmins, 1956†
<i>sudafricanum</i> group	<i>Elassoneuria</i> Eaton, 1881	<i>Ephemerythus kiboensis</i> Gillies, 1960‡	<i>Caenis kungu</i> Eaton, 1879¶
<i>Afroptilum decipiens</i> Gillies, 1990‡	<i>Elassoneuria grandis</i> Gillies, 1974‡	<i>Ephemerythus pictus</i> Gillies, 1960‡	<i>Caenis noctivaga</i> Malzacher, 1990‡
<i>Afroptilum erepens</i> Gillies, 1990‡	<i>Elassoneuria kidahi</i> Gillies, 1974‡	Subfamily Tricorythinae	<i>Caenopsella</i> Gillies, 1977
<i>Afroptilum montanum</i> Kimmins, 1960¶†	<i>Oligoneuriopsis</i> Crass, 1947	<i>Neurocaenis</i> Navas, 1936	<i>Caenopsella meridies</i> Gillies, 1977‡
<i>Afroptilum sudafricanum</i> Lestage, 1924¶	<i>Oligoneuriopsis dobbsi</i> Eaton, 1912¶	<i>Neurocaenis poincinsi</i> Navas, 1926¶	Subfamily Brachycercinae
<i>tarsale</i> group	HEPTAGENIIDAE	<i>Tricorythus</i> Eaton, 1968	<i>Afrocercus</i> Malzacher, 1987
<i>Afroptilum falcatum</i> Crass, 1947†	<i>Afronurus</i> Lestage, 1924	<i>Tricorythus lanceolatus</i> Kimmins, 1960†	<i>Afrocercus forcipatus</i> Malzacher, 1987†
<i>Afroptilum flavum</i> Crass, 1947†	<i>Afronurus aethereus</i> Navas, 1936¶†	<i>Tricorythus longus</i> Ulmer, 1916†	EUTHYPLOCHIDAE
<i>Afroptilum loweae</i> Kimmins, 1949†	<i>Afronurus gilliesi</i> Corbet, 1962‡	<i>Tricorythus tinctus</i> Kimmins, 1956¶†	Subfamily Exeuthyplociinae
<i>Afroptilum medium</i> Crass, 1947†	<i>Afronurus negi</i> Corbet, 1960†	<i>Machadorythus</i> Demoulin, 1959	<i>Exeuthyplocia</i> Lestage, 1918
<i>Afroptilum tarsale</i> Gillies, 1990‡	<i>Afronurus ugandanus</i> Kimmins, 1956†	<i>Machadorythus maculatus</i> Kimmins, 1949‡	<i>Exeuthyplocia minima</i> Ulmer, 1916†
<i>sudanense</i> group	<i>Componeuriella</i> Ulmer, 1939	Subfamily Dicercomyzinae	
<i>Afroptilum griseum</i> Gillies, 1990‡	<i>Componeuriella njalensis</i> Kimmins, 1937†	<i>Dicercomyzon</i> Demoulin, 1954	EPEMERIDAE
<i>Afroptilum notabile</i> Kimmins, 1956†‡	LEPTOPHLEBIIDAE	<i>Dicercomyzon costale</i> Kimmins, 1957‡	<i>Afromera</i> Demoulin, 1955
<i>Afroptilum sudanense</i> Ulmer, 1916†	<i>Adenophlebia</i> Eaton, 1881	<i>Dicercomyzon sjostedti</i> Ulmer, 1909‡	<i>Afromera aequatorialis</i> Kimmins, 1956†
Subgenus <i>Afroptiloides</i> Gillies, 1990¶	<i>Adenophlebia burgeoni</i> Navas, 1929†	<i>Dicercomyzon femorale</i> Demoulin, 1954¶	<i>Afromera natalensis</i> Barnard, 1932‡
<i>Afroptiloides variegatum</i> Gillies, 1991‡			<i>Eatonica</i> Navas, 1913
			<i>Eatonica crassi</i> McCafferty, 1971‡

description of the Ephemeroptera species. Because of their utility and their position in evolution, and as their habitats are increasingly being perturbed, it is appropriate to document their diversity and occurrence in East Africa. This report therefore serves as a first step towards such endeavours. I concur with Gillies (1988) that “workers on the African fauna in the past have been more conservative in their approach and, especially in the case of nymphs, have either tended to assign taxa with unusual characters to existing genera or else have avoided the use of formal nomenclature.” Therefore, this has created much taxonomical confusion.

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