

**DESCRIPTION OF THE LARVA OF *TRIAENODES* SP. MCLACHLAN, 1865
(TRICHOPTERA: LEPTOCERIDAE) FROM ILE-IFE, NIGERIA***

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Abstract

A description is given of the larva of an unknown species of *Triaenodes* McLachlan, 1865 first time from Ile-Ife, southwestern Nigeria. The larvae of West African species of the caddisfly genus are not well known; hence any attempt to assign the larva described herein to any particular species is at best conjectural. Efforts are ongoing to breed out adult from larva for proper association and determination of the species. Larvae were found in a slow-flowing forested stream, where they were associated with leaf litter accumulations.

Key words: Trichoptera, Leptoceridae, *Triaenodes*, larva, Nigeria, West Africa.

1. Introduction

The long-horned caddisfly family Leptoceridae Leach, 1815 has 49 extant genera in 14 tribes and over 1,567 species worldwide, in two subfamilies (Leptocerinae Leach, 1815 and Triplectidinae Ulmer, 1906) (Morse, 1999; 2003) many of which are tropical in distribution (Johanson, 1992; Kjaerandsen and Andersen, 1997; Flint *et al.*, 1999; Andersen and Holzenthal, 2001, 2002; Paprocki *et al.*, 2004; Kjaerandsen, 2005; Tobias and Tobias, 2006). Their larvae usually construct dorsoventrally flattened cases from pieces of leaves, granite pebbles and sand grains, and often are abundant in streams and rivers where they feed on detritus. Nine genera are endemic in the Afrotropical faunal region with over 195 recognised species (Tobias and Tobias, 2006). Of the nine genera, *Oecetis* McLachlan, 1877 has the greatest number with 101 species, followed by *Triaenodes* McLachlan, 1865 (49 species), *Setodes* Rambur, 1842 (21 species) and *Trichosetodes* Ulmer, 1915 (10 species) in that order (Tobias and Tobias, 2006).

The genus *Triaenodes* is not restricted to the Afrotropics but cosmopolitan in distribution and well known in Australia, Central America and northern part of South American continent (Morse, 1993, 1999; Wiggins, 1996; Neboiss and Wells, 1998; Flint *et al.*, 1999; Morse *et al.*, 2001; Holzenthal and Andersen, 2004). Previous studies on the genus in Africa

include those of Kimmins (1962) which gave a key to African species, Kjaerandsen and Andersen (1997) which listed 17 species from Ghana. The two subgenera (*Triaenodella* Mosely and *Triaenodes* sensu stricto) of *Triaenodes* in West Africa were later studied in detail and some species were redescribed by Andersen and Holzenthal (2001, 2002), thus bringing to 20, the number of species of *Triaenodes* (6 for *Triaenodella* and 14 for *Triaenodes* s.s.) from West Africa. Ten of these species are widely distributed in Ghana, where extensive surveys of Trichoptera in general have been carried out (e.g. Gibbs, 1973; Andersen and Holzenthal, 2001, 2002; Andersen and Kjaerandsen, 2001; Kjaerandsen, 2005).

Presently, only three species of *Triaenodes* (*T. africanus* Ulmer, 1907; *T. palpalis* Banks, 1920 and *T. serratus* Ulmer, 1912) have been recorded in Nigeria (Medler, 1980; Andersen and Holzenthal, 2001), based on adult specimens only. None of the three species are known at larval stage in the country and elsewhere in West Africa. Most previous studies were based on keys to adults (e.g. Kimmins, 1962). Some leptocerid caddisfly larvae collected from a perennial forested stream in Obafemi Awolowo University, Ile-Ife in southwestern Nigeria, were examined and found to belong to *Triaenodes*. Our intent in this paper is to report the occurrence of

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Triaenodes for the first time in Ile-Ife, southwestern Nigeria and describe the larva of an unknown species. Consequently this report would provide additional information on the leptocerid caddisfly genera known to occur in the Nigeria in particular and the Afrotropical region in general.

2. Material and methods

Mature larvae were collected by the junior author (EEO) from a forested and well-shaded perennial stream in Obafemi Awolowo University, Ile-Ife, southwestern Nigeria, and stored in 70% ethanol. The streambed is composed of a mixture of sand, silt and rock. Larvae were associated with organic debris trapped by rocks and exposed roots of shade trees. The larvae were collected scooping the sides of the roots and rocks using a 220 micron mesh hand net. Leaf litter collected was thoroughly examined in the laboratory and removed. The remaining organic debris was examined in a white shallow pan. The larvae were examined under the microscope and identified to family level using the keys in Pescador *et al.* (1995) and Wiggins (1996). One larva was whole-mounted in Canada balsam for general observation. To study the anatomical features in detail the head capsule, prothorax, and legs were detached and boiled in KOH, dehydrated in 98% ethanol, cleared in xylene and mounted in Canada balsam. These body parts were observed under an Olympus compound microscope, model BHB and some important anatomical features are illustrated. The terminology used in the description of larva follows that of Ogbogu (2005) and Holzenthal and Andersen (2004) as adapted from Wiggins (1996). The material described in this paper and other specimens are preserved in 70% ethanol.

3. Description of larva

Diagnostic characters of larva

The larvae of the species belongs to the Leptoceridae in having long antennae, a subocular line along each side of the head, hindleg that is much longer than others with femur and tibia subdivided into two sections. The larvae of *Triaenodes* sp. described in this paper can be distinguished from those of other related leptocerid genera by the presence of long, dense setae on the hindleg, tibia and tarsus. Also, the hind tibia is long and divided into two subequal parts by a translucent constriction. The ventral apotome is rectangular in very mature larvae and triangular in early instars. Tarsal claw is narrow, long, with straight basal setae and similar in shape in all the legs.

Abdomen is cylindrical and the segments are similar in shape and almost of the same size tapering slightly towards the last segment. The posterior margin of tergite IX is with 6 long setae. Larval case of is

almost cylindrical, built with plant material arranged spirally and bound together by silken inner lining.

Description of larva

Head: Dark brown. Eyes black, situated in white unpigmented area (Fig. 1). Antenna more than 3 times longer than wide. Margin of clypeus with 8 setae. Labrum with setae located centrally. Mandible pointed apically, with lateral teeth. Ventral apotome is triangular (Fig. 2), with anterior margin superficially excised to form shallow anteromedian depression, the posterior angle more acute and tapered downwards, but not reaching posterior end of head. **Thorax:** Pronotum sclerotized, brown with median suture, anterior margin deeply excised (Fig. 1) and with row of setae, anterolateral corners blunt. Mesonotum sclerotized; metanotum membranous. **Legs:** Foreleg short, stout, well expanded at the femur, foretrochantin stout, and blunt. (Fig. 3); femur and tibia with 3 and 4 short, stout spines, respectively, at the outer margin. Middle leg longer than foreleg, the former bearing larger number of setae than the later and majority of the setae at the coxa. Hind leg (Fig. 5A) about 1.5X longer than middle leg (Fig. 5B) and characterised by dense rows of long setae. Tarsal claws similar in all legs, long, with single spine on inner side (Fig. 5).

Abdomen: Abdomen white. Gills with single filaments. Posterior margin of tergite IX with 6 long setae (2 median pairs and 2 single lateral setae). Anal proleg terminates in short hook-like claw with dorsal accessory hook, with rows of spines at the inner sides (Fig. 5) and 5 long setae apically.

Case: Average length 10 mm, cylindrical, built with fragments of plant material, lined with silk on inside; anterior opening wider than posterior opening and held open by plant fragments (Fig. 6).

Adult

Unknown.

4. Discussion

One problem associated with *Triaenodes* is lack of identity for African species. In a preliminary checklist of caddisflies of Ghana (Kjaerandsen and Andersen, 1997), 17 species of *Triaenodes* were listed from the country, nine of them assumed to be undescribed. Efforts at tackling this problem has resulted in the description of two new species and redescription of four others, which belong to the subgenus *Triaenodella* Mosely from West Africa (Andersen and Holzenthal, 2001). Andersen and Holzenthal (2002) went further to describe seven new species from Ghana and redescribed seven previously described species recorded from many countries in West Africa. The 14 species belong to the subgenus *Triaenodes* sensu stricto. However, the knowledge of the species of *Triaenodes* in West

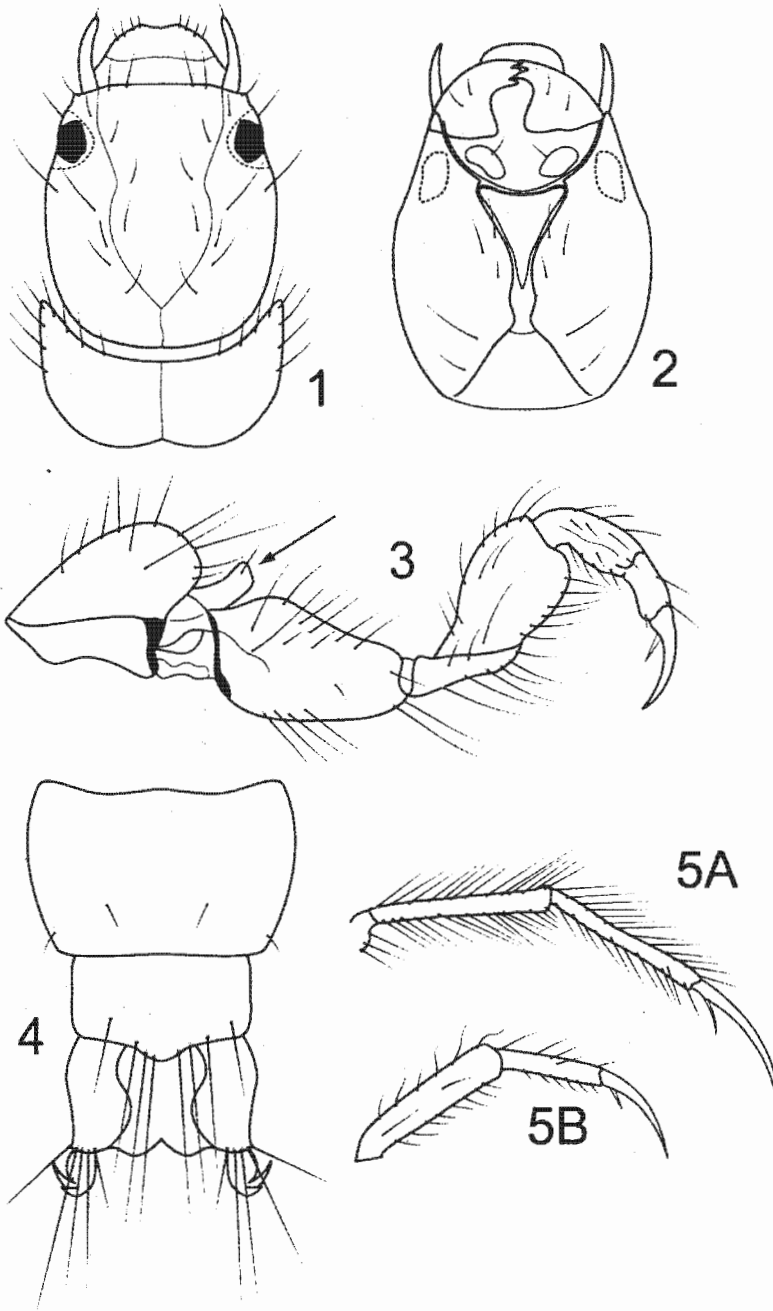


Fig. 1-5: *Triaenodes* sp. (larva). 1, Head and pronotum, dorsal view. 2, Head, ventral view. 3, Foreleg showing foretrochantin (arrow), lateral view. 4, Abdominal segments VIII-X and anal prolegs, dorsal view. 5A, Hind leg and 5B middle leg tibia and tarsus, lateral view.

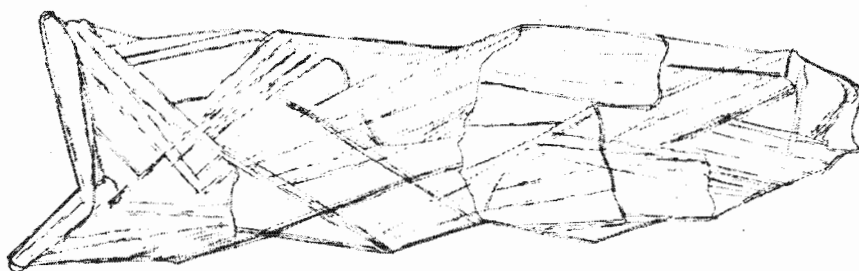


Fig. 6: *Triaenodes* sp. larval case.

Triaenodes sp. larva (unknown species)
 Material examined. NIGERIA: Osun State: Ile-Ife. 007° 29.7'N. 004° 34.3'E. 141 m a.s.l., 13.xi.2004. E.E. Okeze. 5 larvae.

Africa seems to be far fetched as long as additional species are continually discovered. It is therefore easy to conclude that there are far more species of West African *Triaenodes* than presently known. This situation would continue to exist as long as the lack of knowledge of the species at larval stage persists. Since no records exist of description of the larvae of West African species of *Triaenodes*, there is no information in the literature with which to compare the morphological features observed in the present study. In addition, adult specimens are not available for association with larva. Therefore, any attempt to assign this larva to any species would amount to a guess. The larva may be that of *T. africanus*, *T. palpalis*, *T. serratus* or a different species that have not been recorded in Nigeria. Given that Ghana for instance, is in the same subregion with Nigeria, it is surprising that only three species are known for Nigeria (see Andersen and Holzenthal, 2001, 2002). However, efforts are underway to trap adults near the streams from where the larvae were collected. In addition, attempts rearing the larvae to adult stage to determine the specific identity of the material described in this paper have not been successful.

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