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Redescription and lectotype designation of the endemic South African mayfly *Lestagella penicillata* (Barnard, 1932) (Ephemeroptera: Teloganodidae)

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Abstract

The imago and nymph of *Lestagella penicillata* are redescribed based on historic specimens and new material from Table Mountain slopes (Skeleton Gorge and Window Stream), Western Cape, South Africa. A male from Barnard's syntype series is designated as the lectotype. Wear-and-tear of mouthparts, particularly the mandibles, has led to errors in identification of diagnostic characters for the nymphs in earlier publications. Previous descriptions of the mandibles being atrophied, in terms of dentition, are erroneous. The generic diagnosis of *Lestagella* is modified to account for these errors and intraspecific variability. Adults are distinguished from other Teloganodidae by the combination of a short, detached iMP vein on the forewing, three caudal filaments and gill socket vestiges on segments II - IV. Nymphs are distinguished from other Teloganodidae by a conspicuous head fringe, lamellate gills on abdominal segments II–IV and a dorso-ventrally flattened body.

Key words: South Africa, Western Cape, acid streams, worn mouthparts, mouthpart regeneration

Introduction

Teloganodidae (Ephemeroptera) are pannote mayflies (McCafferty & Edmunds 1979, McCafferty & Wang 2000) placed in the superfamily Ephemerelloidea Demoulin, along with ten other families (Jacobus & McCafferty 2006). Originally assigned to Ephemerellidae, they were elelvated to family level ranking (McCafferty & Wang 1997). Teloganodidae can be distinguished from all other sister groups by shared derived characteristics of the abdominal gills (McCafferty & Wang 1997; 2000). Jacobus & McCafferty (2006) included that the stout and spatulate setae found on the margins of the coxal projections of the nymphs are apomorphic and characteristic of the family.

The relationships between teloganodid genera are still uncertain and have differed between studies depending on the use and treatment of various characters utilised in the morphological analyses. McCafferty & Benstead (2002) used the characters and cladogram from McCafferty & Wang (1997) to produce a cladogram including the Madagascan genus *Manohyphella* Allen, 1973. In a later study, Jacobus & McCafferty (2006) published a larger study on Pannota (including the Teloganodidae genera), using more characters including egg morphology. Any autapomorphies and characters considered to be ambiguous, prone to convergence or highly variable were excluded from the analysis (Jacobus & McCafferty 2006).

Teloganodidae have a disjunct distribution throughout the southern Afrotropical and Oriental regions (Sartori *et al.* 2008). Currently, there are 22 species in eight genera of Teloganodidae described globally (Sartori *et al.* 2008), with five species in four genera from continental Africa (McCafferty & Wang 1997, 2000): *Lestagella penicillata* (Barnard, 1940) (discussed in this paper); *Ephemerellina barnardi* Lestage, 1924; *Lithogloea harrisoni* Barnard, 1932 and *Nadinetella* McCafferty & Wang, 1998, with two species *N. brincki* (Demoulin, 1970) and *N. crassi* (Allen & Edmunds, 1963).

The African Teloganodidae are endemic to pristine mountain streams found in the southern and western Cape of South Africa, with only one genus known to extend to the Amathole Mountains (Eastern Cape). They commonly occur on stones and vegetation, usually in swiftly flowing currents including waterfalls (McCafferty & Wang

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Concluding remarks

This comprehensive account of *Lestagella penicillata*, including descriptions of all life stages, and the importance of choosing freshly moulted penultimate nymphs with unworn mouthparts for species diagnosis, sets a benchmark for all further studies of not only new species of *Lestagella*, but of all Afrotropical Teloganodidae.

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