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Anopheles coluzzii and *Anopheles amharicus*, new members of the *Anopheles gambiae* complex

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Abstract

Two new species within the *Anopheles gambiae* complex are here described and named. Based on molecular and biological evidence, the *An. gambiae* molecular "M form" is named *Anopheles coluzzii* Coetzee & Wilkerson **sp. n.**, while the "S form" retains the nominotypical name *Anopheles gambiae* Giles. *Anopheles quadriannulatus* is retained for the southern African populations of this species, while the Ethiopian species is named *Anopheles amharicus* Hunt, Wilkerson & Coetzee **sp. n.**, based on chromosomal, cross-mating and molecular evidence.

Key words: Subgenus *Cellia*, morphology, taxonomy, systematics, description

Introduction

Historically, the taxon *Anopheles (Cellia) gambiae* Giles was known as a major vector of malaria in Africa, exhibiting a wide range of biological attributes (de Meillon 1947; Gillies & de Meillon 1968). Ecologically, it was highly diverse, reportedly feeding indoors or outdoors on humans or cattle, resting indoors or outdoors, and its larvae were found in a wide variety of habitats including rain pools, hoof prints, rice paddies, mineral springs and saline water. In some places it did not even transmit malaria (Mastbaum 1957).

Taxonomy. Work in the 1940s and 50s provided clear evidence for the species distinctness of the salt-water breeding forms in East and West Africa (Ribbands 1944; Muirhead-Thompson 1947, 1951), but this was ignored for over 15 years (see Hunt & Coetzee 1995). From 1962 to 1964, a series of papers appeared that provided genetic evidence for "freshwater" *An. gambiae* being a species complex (Paterson 1962, 1963a, 1964; Davidson & Jackson 1962) explaining many of the earlier conundrums that faced malariologists in those days (see Gillies & Coetzee 1987). By 1967, the complex was recognized as comprising three fresh-water and one mineral-water breeding species (designated as species A, B, C and D) and the two salt-water breeders (retaining the early names of *An. merus* for the East African species and *An. melas* for the West African species) (Davidson *et al.* 1967). All could be distinguished on the characteristics of inter-species hybridization resulting in sterile male progeny (Davidson *et al.* 1967) and, later, the banding patterns of the giant polytene chromosomes found in the larval salivary glands and the female ovaries (Coluzzi & Sabatini 1967, 1968a, 1968b, 1969).

Several publications appeared proposing names for various members of the *An. gambiae* complex (Paterson