



Revision of the *Alpheus cylindricus* Kingsley, 1878 species complex (Crustacea: Decapoda: Alpheidae), with revalidation of *A. vanderbilti* Boone, 1930

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Abstract

Alpheus cylindricus Kingsley, 1878, previously believed to be widely distributed in the tropical eastern Pacific and western and eastern Atlantic, is revised. Two species are recognized based on morphology, color pattern and genetics. *Alpheus cylindricus* is restricted to the tropical eastern Pacific, from the Gulf of California to the Galapagos. A neotype of *A. cylindricus* from the type locality, Las Perlas Islands, is designated. On the Pacific coast of Panama, this species commonly inhabits purple sponges growing among or under large intertidal rocks. *Alpheus vanderbilti* Boone, 1930 is formally resurrected from the synonymy of *A. cylindricus*; it occurs in the tropical western Atlantic, from Bermuda to Brazil, and in the tropical eastern Atlantic, around the islands of the Gulf of Guinea. In the Caribbean, *A. vanderbilti* is most often encountered in large loggerhead sponges, *Sphaciospongia vesparia* (Lamarck, 1814), while in the Gulf of Guinea it inhabits sponge-lined tunnels in coral rocks. Complete synonymies and GenBank barcodes (COI) are provided. Phylogeography of the *A. cylindricus* complex is discussed based on molecular data.

Key words: *Alpheus*, snapping shrimp, transisthmian taxa, color pattern, eastern Pacific, western Atlantic, eastern Atlantic, Caribbean, COI, barcode, molecular phylogeny, sponge, symbiosis

Introduction

Alpheus cylindricus Kingsley, 1878 is characterized by a uniquely shaped, cylindrical major chela, making it one of the most distinctive and unmistakable species of the genus *Alpheus* Fabricius, 1798. This hyper-diverse genus (the largest in the Decapoda) is traditionally subdivided into seven informal species groups. *Alpheus cylindricus* was initially placed in the *A. crinitus* Dana, 1852 group (Coutière 1899; Crosnier & Forest 1966; Kim & Abele 1988) based on its reduced rostrum and orbital teeth, swollen and largely smooth major chela, and distoventrally unarmed basicerite. However, the twisted dactylus and the presence of a deep longitudinal groove and subacute distal teeth on the palm of the major chela—remnants of reduced crests (see Kim & Abele 1988: fig. 19)—suggest affinities with species of the *A. macrocheles* (Hailstone, 1835) group (Anker 2001b). Molecular studies (Williams *et al.* 2001) support this hypothesis, as *A. cylindricus* was found to be close to *A. peasei* (Armstrong, 1940), a typical member of the *A. macrocheles* group. The highly modified morphology of *A. cylindricus* may reflect the fact that it typically lives in the enclosed spaces of sponges or sponge-lined rock cavities. The reduction of chela sculpture and blunting of acute structures such as the rostrum, orbital teeth and the basicerite tooth appear to have evolved independently in a number of sponge- and