



Geometric morphometrics uncovers a new species of ponyfish (Teleostei: Leiognathidae: *Equulites*), with comments on the taxonomic status of *Equula berbis* Valenciennes

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Abstract

A new species of *Equulites* is revealed using geometric morphometric techniques and is herein described. Based on features recovered in recent comparative analyses, members of *Equulites* have been diagnosed on the basis of internal and external male-specific traits related to their light-organ system (LOS; Sparks *et al.*, 2005; Sparks, 2006; Sparks and Chakrabarty, 2007; Chakrabarty and Sparks, 2008). These sexually-dimorphic traits are hypothesized to allow males to signal to conspecific females in photic sexual displays using bacterially-generated luminescence (Woodland *et al.*, 2002; Sasaki *et al.*, 2003; Wada *et al.*, 2005). The holotype and sole name-bearing type of *Equulites leuciscus* (BMNH 1858.4.21.243, 104.9 mm SL) is an adult female, and therefore lacks the diagnostic external feature of the LOS, a large, translucent flank patch, used to identify species in this genus. Geometric morphometric shape analysis of individuals ascribed to *Equulites leuciscus*, a traditionally widespread, “catch-all” taxon, reveals two discrete shape groups. Based on the results presented below, members of one of these groups correspond to a morphological variant that represents the new species (*Equulites absconditus* Chakrabarty & Sparks) described herein, whereas the other group corresponds to traditional *E. leuciscus*. In addition, the taxonomic status of *Equula berbis* Valenciennes, to which many female and poorly preserved specimens of the new species have erroneously been attributed, is reviewed and *E. berbis* is concluded to be a nomen dubium of uncertain placement beyond the family level.

Key words: Indo-West Pacific, leiognathids, *Photoplagios*, taxonomy

Introduction

Equulites leuciscus Günther, 1860 was originally described from Ambon Island, Indonesia, and has historically been considered to be a geographically widespread species occurring throughout much of the Indo-West Pacific (from Madagascar and the Seychelles, to India, Sri Lanka, Indonesia and Australia; Woodland *et al.* 2001). Although this taxon has been considered to be one of the most widespread species of ponyfishes, there have been no comparative studies that have examined populations throughout its putative range. This is the first such study and it reveals the existence of geographically localized morphological variants. The female holotype of *Equulites leuciscus* (Fig. 1) has confounded taxonomic progress because it lacks the diagnostic LOS features typically associated with members of this genus (Sparks *et al.*, 2005; Sparks, 2006; Sparks and Chakrabarty, 2007; Chakrabarty and Sparks, 2008). In addition, much of its original pigmentation pattern has been lost in preservation. To remedy this taxonomic problem and begin to understand geographic variation within this taxon, we compare geographic populations spanning the range of putative *E. leuciscus*. We use geometric morphometric techniques to determine the existence of different morphotypes and possibly distinct species.