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Description of a new genus of ponyfishes (Teleostei: Leiognathidae), with a review of the current generic-level composition of the family

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Abstract

In order to recognize a monophyletic taxonomy for Leiognathidae based on unique features of the bacterially mediated light-organ system, we describe a new sexually-dimorphic genus of elongate, shallow-bodied ponyfishes within the tribe Equulitini, which itself is recovered within the subfamily Gazzinae. *Photolateralis*, new genus, is unique among ponyfishes in possessing a translucent mid-lateral flank stripe, which depending on the species, may be either a composite “stripe” comprised of numerous independent translucent windows (*P. stercorarius* and *P. moretoniensis*), or a continuous translucent lateral stripe (*P. antongil*). This translucent lateral stripe is either lacking entirely in females, or is considerably less well developed. In contrast, males in its sister taxon, *Equulites*, are characterized by the presence of an expansive, triangular, translucent lateral flank patch that also exhibits species-specific morphology. Internally, in *Photolateralis* the light organ system is characterized by a moderately enlarged, donut-shaped, and conspicuously spotted light organ in males that extends only slightly posteriorly into the gas bladder. In contrast, in members of *Equulites* the dorsolateral lobes of the light organ in males are greatly enlarged, heavily pigmented, and extend posteriorly well into the gas bladder. In addition, internally male members of *Photolateralis* exhibit lateral clearing of the silvery gas bladder lining posteriorly, corresponding in extent to the external translucent lateral stripe or windows on the flank. Including the new genus described herein, we now recognize 10 monophyletic genera of extant ponyfishes.

Key words: bioluminescence, Equulitini, Gazzinae, light organ, new genus, *Photolateralis*, ponyfish

Introduction

Several recent family-level phylogenetic hypotheses have been generated for Leiognathidae, each building on the previous hypothesis of relationships as taxonomic sampling and molecular and morphological data collection has progressed. These phylogenetic hypotheses and faunal surveys have greatly increased our knowledge of leiognathid diversity, and have resolved both intrafamilial and intrageneric relationships (Sparks and Dunlap, 2004; Sparks *et al.*, 2005; Chakrabarty *et al.*, 2011a, 2011b). As a result, based on whether internal and external features of the bacterially-mediated light-organ system (LOS) are sexually dimorphic or not, we now recognize two monophyletic genera that are not sexually dimorphic, *Aurigequula* and *Leiognathus*, and the subfamily Gazzinae, comprising eight monophyletic genera whose members all exhibit a sexually-dimorphic LOS (Fig. 1).

To achieve a monophyletic taxonomy for Leiognathidae in light of these new phylogenetic hypotheses, and as a result of extensive Indo-Pacific faunal surveys (e.g., Chakrabarty *et al.*, 2009, 2010a) conducted by our group that have resulted in the discovery and description of several new species (Sparks, 2006a, 2006b; Sparks and Chakrabarty, 2007; Chakrabarty and Sparks, 2007; Chakrabarty *et al.*, 2010b; Baldwin and Sparks, 2011), a number of new ponyfish genera have recently been described or resurrected from synonymy with the historically poorly diagnosed, catch-all genus *Leiognathus*. Herein we discuss the current generic-level composition of Leiognathidae and describe a new genus on the basis of apomorphic features of the sexually-dimorphic light-organ

237147. *Photopectoralis hataii*: UMMZ uncat. *Photopectoralis cf. hataii*: AMNH 89922. *Photopectoralis panayensis*: UMMZ 240300, holotype; UMMZ 240301, paratypes, 4 ex.; UMMZ 240302, paratypes, 5 ex.; UMMZ 240303, paratypes, 8 ex.; UMMZ 240304, paratypes, 16 ex.; UMMZ 240137; UMMZ uncat.

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