From the Amazonriver to the Amazon molly and back again

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Pseudolimia gen. nov., a new monotypic genus for *Limia heterandria* Regan, 1913  
(Teleostei: Poeciliidae)

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Abstract

A new genus is established for the South American *Limia heterandria* Regan, 1913. It is compared in an anatomical analysis with several nominal taxa of the tribe Poeciliini. Based on number and shape of the gonapophyses, *Pseudolimia* is assigned to the tribe Poeciliini.

Introduction

The taxonomical status of *Limia heterandria* Regan, 1913, a small species from Venezuela, is investigated. Regan (1913) assigned his species to *Limia* Poey, 1854 on account of the position of the dorsal fin and the unmodified segments on gonopodial ray 3. *Limia heterandria* was provisionally allocated to the subgenus *Pamphorichthys* by Rosen and Bailey (1963) based on the superficial resemblance of its gonopodium to the gonopodium of *P. minor* Regan, 1913 and *P. hasemani* Henn, 1916 and partly because of similarities of the pelvic fin found in *Acanthophacelus* Eigenmann, 1907 (formerly *Lebistes* non De Filippi, 1861 [including *Micropoecilia*], cf. Poeser and Isbrücker, 2002) and *Pamphorichthys*. Costa (1991) revalidated *Pamphorichthys* at generic level. He allocated *P. hollandi* Henn, 1916, *P. minor*, *P. hasemani*, *P. scalpridens* (Garman, 1895) and *P. araguaiensis* Costa, 1991 to *Pamphorichthys*, considering *Pamphoria* Regan, 1913 and *Parapoecilia* Hubbs, 1926 junior synonyms of *Pamphorichthys*. This taxon, *Limia heterandria*, has not been assigned to any presently known genus or subgenus since Costa (1991; cf. Breden et al., 1999) rejected its allocation in *Pamphorichthys*, but refrained from allocating this species.

To investigate the taxonomy of *L. heterandria*, the boundaries of the Poeciliini are reviewed based on phylogenetic data (Costa, 1991; Meyer, 1993; Rodriguez, 1997; Breden et al., 1999; Ghedotti, 2000) and the present redescription. This study, in which I erect a new genus, viz. *Pseudolimia* gen. nov., makes *Limia heterandria* Regan, 1913 available for a comprehensive phylogenetic analysis of the Poeciliini (Poeser, in prep.).

Methods

*Limia heterandria* from the UMMZ collection (= *Poecilia heterandria* cf. Rosen and Bailey, 1963) is examined. Melanophore pigmentation, gonopodial structures and gonapophyses are recorded. Several specimens had their bodies opened, clearly showing the position and shape of the gonapophyses. Anatomical features described in the present paper are excellently figured in Trewavas (1948), Rosen and Bailey (1963) and Rodriguez (1997). Meristic data follow Hubbs and Lagler (1947). Abbreviations: UMMZ = University of Michigan, museum of zoology.
Systematic section

From recent phylogenetic studies (Rodriguez, 1997; Breden et al., 1999), the genus *Poecilia* sensu Rosen and Bailey (1963) might best be regarded as a suprageneric assemblage of monophyletic groups, confirming *Limia* and *Pamphorichthys* as valid genera (Rivas, 1978; Costa, 1991). There remains, however, doubt on the status of *Acanthophacelus* and *Micropoecilia* (cf. Meyer, 1993; Rodriguez, 1997). I recognise *Poecilia*, *Limia* and *Pamphorichthys* as valid genera, joined in the tribe Poeciliini, based on two synapomorphies (Rodriguez, 1997):

- Two gonapophyses, both not perpendicular.
- Ligastyle reduced or missing. Rodriguez (1997) reported variation in this character in *Limia*, in which some species have retained a moderate ligastyle.

**Pseudolimia gen. nov.**

Type species: *Limia heterandria* Regan, 1913


Diagnosis. *Pseudolimia* is defined by the characters mentioned for the Poeciliini, with the addition of a simple gonopodium, with a broad membranous keel at the position where other Poeciliini have a well developed palp. It was this character that was decisive for Costa (1991) to reconsider the allocation of *P. heterandria*. The 3rd gonopodial ray is unmodified, as is ray 4a. Rays 4a and 3 meet at the tip and are of equal length. Gonopodial ray 4p has six to ten (average 8.3 in 10 males) unmodified terminal rays, followed by about seven to nine (average 7.7 in 10 males) segments with clearly developed dorsal serrae. Gonopodial ray 5 is unmodified, the division between 5a and 5p is barely visible (Figure 1). It should be noted that most of the mentioned differences are based on the lack of derived characters. When allowed, this characterisation would define the Poeciliini clade as a paraphyletic assemblage, despite the convincing derived internal anatomy. Therefore, the lack of a gonopodial palp should be considered as “secondary lost” as an apomorphy, a homoplasy shared with *P. elegans*. 
Comparisons. Based on internal anatomy, i.e., number and shape of gonapophyses and the lack of a ligastyle, *Pseudolimia* is part of the Poeciliini (Rosen and Bailey, 1963, but see Rosen, 1979; Rodriguez, 1997). It is, however, not closely related to *Pamphorichthys*, which has the gonapophyses parallel to the spinal cord, and in which all species have a gonopodial palp (Rosen and Bailey, 1963; Costa, 1991). Furthermore, the genera differ in the shape of the gonopodial ray 3, which is smooth in *Pseudolimia* and irregularly shaped in *Pamphorichthys* (Costa, 1991). The number and shape of the gonapophyses in *Limia* resemble these structures in *Pseudolimia*. However, all species of *Limia* have a gonopodial palp, and the gonopodium has a characteristic gonopodial ray 5, which is abruptly bent to ray 4, which is exaggerated by the presence of a typical structure in ray 5a (Rosen and Bailey, 1963; Chambers, 1987; Rodriguez, 1997). *Pseudolimia* shares an unmodified gonopodial ray 3 with *Limia*, a character that separates both genera from *Poecilia* (cf. Rosen and Bailey, 1963). Gonopodial ray 3 in *Poecilia* is always modified, usually having ventral, subdistal spine-like serrae (Figure 2). One species of *Poecilia*, viz., *P. elegans*, also lacks a gonopodial palp, like *Pseudolimia*. *Poecilia elegans*, however, shares a manifold of characters with the other species of *Poecilia*, i.e., gonopodial hooks on ray 3 and 5p, serrae on ray 3, as well as a ventral extrusion on ray 5a, connecting this ray with ray 4p (Figure 2). All these latter characters are missing in *Pseudolimia*.

Etymology. *Pseudolimia* (Pseudos, (Gr.): lie; here: superficially like, but not identical to; *Limia*: a genus of the Poeciliini) refers to the superficially shared characteristics with the genus *Limia*, to which *P. heterandria* was originally allocated. It is even molecularly similar to *Limia* (cf. Breden et al., 1999).

**Pseudolimia heterandria** (Regan, 1913)

This species is diagnosed by the following meristic characters: D. 7, A. 8, C. 14, CPS. 14 (rarely 16), LLS. 25 – 26. The body pigmentation expresses sexual dimorphism: males have two to four vertical stripes on the body and caudal peduncle, females have two horizontal
lines under the dorsal fin: one at the dark anal area (the ‘pregnancy spot’), the other at the lateral line (cf. Regan, 1913, Pl. CI, figs 3 and 4).

Description. Both sexes have a spot in the posterior part of the dorsal fin. The unpaired fins and the body have many melanophores, on the body a reticulate pattern of pigmentation is present. The morphology is like Poecilia, i.e., with a truncate body and the dorsal fin about midway from the head to the caudal base. Two forwardly bent gonapophyses; ligastyle absent. The pelvic fin has the second ray elongated, similar to the pelvic fin of P. mexicana (cf. Rosen and Bailey, 1963).

Remarks. The figured gonopodium in Rosen and Bailey (1963: 62, fig. 25C), recorded as P. elegans is of P. hispaniolana. This is based on the T-shaped serrae on ray 3 and the palp which covers the tip (cf. Rivas, 1978). The figured gonopodial suspensorium (Rosen and Bailey, 1963: 52, fig. 23D), based on the same material, is therefore also from P. hispaniolana.

Based on the possession of a gonopodial palp and the lack of a well developed ligastyle, Rosen (1979) allocated Alfaro Meek, 1912 to the Poeciliini. This allocation was rejected by Ghedotti (2000), who scored the ligastyle as “present”, although it is reduced to absent (Rosen and Bailey, 1963; Rodriguez, 1997). Nevertheless, based on the shape and number of the gonapophyses, and on a dorso-lateral compressed body (Rosen and Bailey, 1963; Rodriguez, 1997; Ghedotti, 2000), Alfaro is not considered closely related to Pseudolimia.

Summarising, Pseudolimia is allocated in the tribe Poeciliini based on the shape and number of the gonapophyses and the lack of a well developed ligastyle. Based on these characters, the genera Xiphophorus, Priapella and Alfaro are excluded from the Poeciliini (cf. Rosen, 1979; Ghedotti, 2000). Its gonopodial features and pigmentation pattern separate P. heterandria from all known genera in this tribe.

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References


