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PSEUDOLIMIA N. GEN., A NEW MONOTYPIC GENUS FOR *LIMIA HETERANDRIA* REGAN, 1913 (TELEOSTEI: POECILIIDAE)

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ABSTRACT

A new genus, *Pseudolimia* n. gen. 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* n. gen. 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 & 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 *Acanthophaelus* Eigenmann, 1907 (formerly *Lebistes* non De Filippi, 1861 [including *Micropoecilia*], cf. Poeser & Isbrücker, 2002) and *Pamphorichthys*. Costa (1991) revalidated *Pamphorichthys* at generic level. He allocated *P. araguaensis* Costa, 1991, *P. hasemani*, *P. hollandi* Henn, 1916, *P. minor* and *P. scalpridens* (Garman, 1895) to *Pamphorichthys*, considering *Pamphoria*

Regan, 1913 and *Parapoecilia* Hubbs, 1926 junior synonyms of *Pamphorichthys*. *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* n. gen., makes *Limia heterandria* Regan, 1913 available for a comprehensive phylogenetic analysis of the Poeciliini (Poeser, in prep.).

METHODS

Limia heterandria (= *Poecilia heterandria* cf. Rosen & Bailey, 1963) from the UMMZ collection 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).

UMMZ = University of Michigan, Museum of Zoology.

SYSTEMATIC SECTION

From recent phylogenetic studies (Rodriguez, 1997; Breden et al., 1999), the genus *Poecilia* sensu Rosen & 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 *Acanthophaelus* 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): 1, two gonapophyses, both not perpendicular; 2, ligastyle reduced or missing. Rodriguez (1997) reported variation in this character in *Limia*, in which some species have retained a moderate ligastyle.

***Pseudolimia* n. gen.**

TYPE SPECIES. - *Limia heterandria* Regan, 1913

DIAGNOSIS. - *Pseudolimia* n. gen. 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 (Fig. 1). It should be noted that most of the mentioned dif-

ferences 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* n. gen. is part of the Poeciliini (Rosen & 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 & Bailey, 1963; Costa, 1991). Furthermore, the genera differ in the shape of the gonopodial ray 3, which is smooth in *Pseudolimia* n. gen. and irregularly shaped in *Pamphorichthys* (Costa, 1991). The number and shape of the gonapophyses in *Limia* resemble these structures in *Pseudolimia* n. gen. 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 & Bailey, 1963; Chambers, 1987; Rodriguez, 1997). *Pseudolimia* n. gen. shares an unmodified gonopodial ray 3 with *Limia*, a character that separates both genera from *Poecilia* (cf. Rosen & Bailey, 1963). Gonopodial ray 3 in *Poecilia* is always modified, usually having ventral, subdistal spine-like serrae (Fig. 2). One species of *Poecilia*, viz., *P. elegans*, also lacks a gonopodial palp, like *Pseudolimia* n. gen. *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 the ventral extrusion on ray 5a, connecting this ray with ray 4p (Fig. 2). All these latter characters are missing in *Pseudolimia* n. gen.

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).

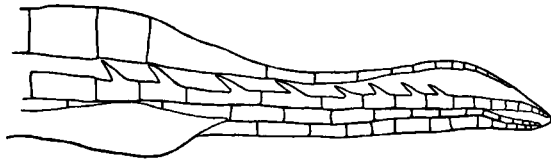


Fig. 1. Gonopodium of *Pseudolimnia heterandria* (Regan, 1913).

***Pseudolimnia heterandria* (Regan, 1913)**

Fig. 1

Limnia heterandria Regan, 1913.

MATERIAL. - VENEZUELA. - UMMZ 186920 (30 of 221) Venezuela, 3 km E of Puerto Cabello at Ganango, Rio Borburata, coll. F.F. Bond, 15-I-1938; UMMZ 186921 (7) Venezuela, 30 km S of Valencia, Rio Noguera at Noguera, coll. F.F. Bond, 13-I-1938; UMMZ 186923 (30 of 228) Venezuela, 2 km NW of Ocumare, near mouth of Rio Comboto, coll. F.F. Bond, 05-I-1938; UMMZ 186924 (34) Venezuela, 25 km W of Puerto Cabello, 5 km of Moron, Rio Alpagaton, coll. F. F. Bond, 28-I-1938; UMMZ 186925 (24) Venezuela, 60 km NW of Puerto Cabello, Lagoons Tucacas, coll. F.F. Bond, 29-I-1938; UMMZ 186926 (1) Venezuela, Puerto Cabello, Bajo Seco, coll. F.F. Bond, 26-I-1938; UMMZ 186927 (30 of 1802) Venezuela, 45 km NW of Puerto Cabello, 1 km of Aroa, Boca de Aroa, coll. F.F. Bond, 29-I-1938.

DIAGNOSIS. - 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 & Bailey, 1963).

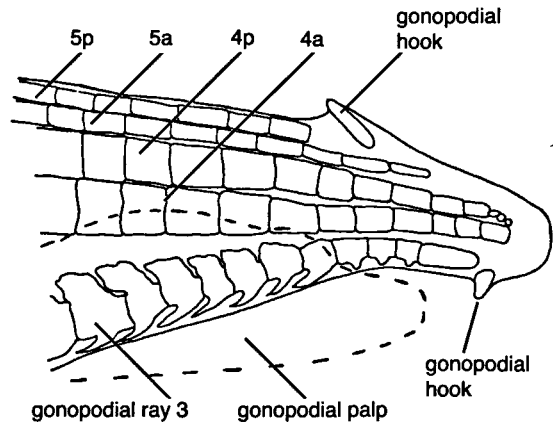


Fig. 2. Gonopodium of *Poecilia boesemani* Poeser, in press, after Poeser (in press). All gonopodial rays are indicated, as well as gonopodial hooks and the palp.

REMARKS

The figured gonopodium in Rosen & 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 & 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 & Bailey, 1963; Rodriguez, 1997). Nevertheless, based on the shape and number of the gonapophyses, and on a dorso-lateral compressed body (Rosen & Bailey, 1963; Rodriguez, 1997; Ghedotti, 2000), *Alfaro* is not considered closely related to *Pseudolimnia* n. gen.

Summarising, *Pseudolimnia* n. gen. 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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