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The identity of *Hyla leucotaenia* Burmeister, 1861 (Anura: Hylidae)

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The German naturalist Carl Hermann Conrad Burmeister (1807–1892) had a prolific scientific career, spanning multiple taxa from diverse insect groups and trilobites to temnospondyls, birds, and extant and fossil mammals (see Berg, 1895). His contributions to anuran taxonomy are concentrated in two books, “*Erläuterungen zur Fauna Brasiliensis...*” (Burmeister, 1856) and “*Reise durch die La Plata-Staaten...*” (Burmeister, 1861). The latter is an account of his travels in Argentina and Uruguay from 1857–1860 and includes descriptions of three new species of frogs: *Leiuperus nebulosus*, *Cystignathus mystacinus*, and *Hyla leucotaenia*. While the first two names currently designate valid species, with the combinations *Pleurodema nebulosum* and *Leptodactylus mystacinus* respectively, the last name has had a more complex taxonomic history. It involves confusions involving a homonym, its consideration as a junior synonym of *Hypsiboas pulchellus* (Duméril & Bibron, 1841)—a widely distributed species in eastern Argentina, southeastern Brazil, and Uruguay (Frost, 2014)—and its actual identity corresponding to another widespread species in the same geographic area, with which it has never before been associated: *Scinax squalirostris* (A. Lutz, 1925). All these issues are discussed in this paper.

Burmeister (1861) described *Hyla leucotaenia*, from “Paraná”, at that time the capital of Argentina and since 1883 the capital of the province of Entre Ríos, on the eastern bank of the Rio Paraná. Subsequently, on the basis of a single specimen, Günther (1868) described a homonym from “Rio Grande”, referring to Rio Grande do Sul, Brazil. The fact that *Hyla leucotaenia* Günther, 1868 was preoccupied by *Hyla leucotaenia* Burmeister, 1861 was noticed by Boulenger (1886), who coined the replacement name *Hyla guentheri* for the former. Langone (1997) provided a detailed account of the taxonomic history of *Hyla guentheri* Boulenger, 1886 (now with the combination *Hypsiboas guentheri*). *Hyla leucotaenia* Burmeister was treated as a valid species, without comment, by Weyenberg (1876) and Avé-Lallemant (1895).

Berg (1896) considered *Hyla leucotaenia* Burmeister to be a junior synonym of *Hyla raddiana* Fitzinger, 1826. After describing variation in adults and juveniles, Berg (1896) states that “Probably *Hyla leucotaenia* Burm. was established in presence of equally young specimens” (translated from the Spanish). This proposal was followed by subsequent authors (Nieden, 1923; Miranda-Ribeiro, 1926; Barrio, 1965; Lutz, 1973; Gorham, 1974; Duellman, 1977; Cei, 1980; Klappenbach & Langone, 1992; Lavilla, 1992) who included that name as a junior synonym of *Hyla raddiana* Fitzinger, 1826 or *Hyla pulchella* Duméril & Bibron, 1841, after Bokermann (1966) demonstrated that the latter name was the correct one to be applied for that species. The only comment on the synonymy, subsequent to Berg (1896), was by Lutz (1973) who stated that “*Hyla leucotaenia* Burmeister (1861) seems to be correctly interpreted by most authors as the juvenile of *Hyla pulchella*”.

The brief description by Burmeister (1861: p. 531–532) states that:

“Of the look and size of the *H. leucophyllata* (D. B. VIII, 607), but more slender; the head sharper with a rounded and truncated snout overhanging the mouth. – Vomer teeth on two little round knobs between the

choanae backwards; tongue at the back not notched, but free; the tympanum small, but clearly visible. The color of the little animal with a snout vent length of 1 Zoll [= 2.54 cm], whose long, thin legs possess distinct calves, is dorsally a light reddish brown, which becomes darker towards the sides, taking there a silvery white stripe that extends from the nostril, through the eye to the angle of the thigh, which is accompanied on each side by a brown band. The ventral surface plays into a grey-white coloration. As I am not able to find the species of this small treefrog anywhere, I allocate to him a new name assuming that the small animal does not grow larger as my specimens are all the same size.” (translated from the German).

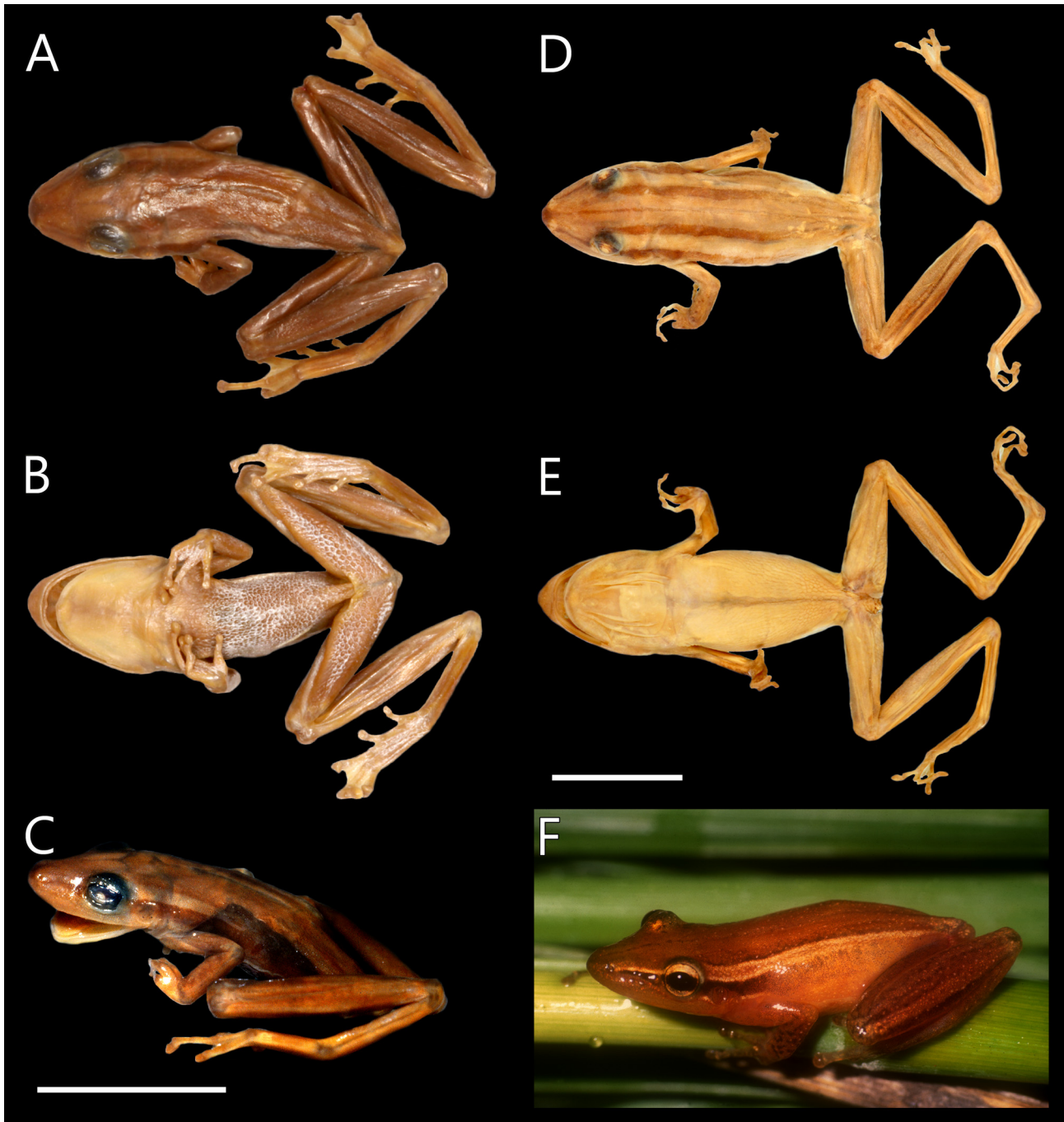


FIGURE 1. A–C: Syntype of *Hyla leucotaenia* Burmeister, 1861, ZMB 7376, here designated lectotype. D–E: Syntype of *Scinax squalirostris* (Lutz, 1925), AL-MN 954. F: adult male; MACN 38248, from Basavilbaso, Entre Rios, Argentina, 170 KM SE of Paraná, Entre Rios, the type locality of *Hyla leucotaenia*. Scale bars 10 mm. Photos: A and B: Frank Tillack; C: Axel Kwet; D and E: Marcos Bilate; F: Boris L. Blotto.

Several aspects of this description, like the “rounded and truncated snout overhanging the mouth” or the “silvery white stripe that extends from the nostril, through the eye to the angle of the thigh, which is accompanied

on each side by a brown band” are definitely not characters of juveniles of *Hypsiboas pulchellus* (voucher specimens MACN-HE 14953–963; See Appendix below).

While Burmeister (1861) makes no reference to type material of *Hyla leucotaenia*, he refers to the existence of at least two, but possibly more, specimens in his description, which, therefore, must be considered as syntypes. However, Duellman (1977) and Lavilla (1992) list ZMB (Museum für Naturkunde, Berlin) 7376 as the “holotype” specimen. Given the original description clearly states that it was based on more than one specimen, according to Art. 74.5 of the ICZN, Duellman’s (1977) mere use of the term holotype does not constitute a valid lectotype designation. Besides the ZMB, amphibians described by Burmeister are housed in the Zoological collections of the University of Halle, where a recent survey yielded no specimens that could be considered syntypes of *Hyla leucotaenia* (Grosse et al., in press; Grosse pers. com. to A. Kwet, June 14, 2014).

ZMB 7376 (Figs. 1A–C) is the only known specimen used in the description of *Hyla leucotaenia* Burmeister. Furthermore, in the original type catalogue, ZMB 7376 is clearly marked as a type specimen by an asterisk (handwritten by Wilhelm Peters; Tillack pers. com. to A. Kwet, June 24, 2014) and a red underline. Additionally, a red spot, which is normally used for type material in the ZMB collection, is on the jar, and an asterisk is noted on the jar label. A photograph of this specimen is also available on-line at <http://www.biologie.uni-ulm.de/systax/>. As we are not aware of the current housing of the additional type specimens, we designate ZMB 7376 as the lectotype of *Hyla leucotaenia* Burmeister, 1861.

The information provided by Burmeister (1861) is suggestive, and the syntype specimen evacuates any doubt, that *Hyla leucotaenia* is not a junior synonym of *Hypsiboas pulchellus*, but designates the same species known today as *Scinax squalirostris* (A. Lutz, 1925; Fig. 1D–F). Supporting its placement in *Scinax*, ZMB 7376 presents the two adult external morphological synapomorphies that support the genus: truncated adhesive disks of the hand, and the webbing between Toes I and II that does not extend beyond the subarticular tubercle of Toe I (Faivovich, 2002). Among the 112 described species of *Scinax* (Frost, 2014), *S. squalirostris* is unique by its elongated snout. The presence of this character together with a dorso-lateral silvery white stripe promptly distinguishes ZMB 7376 from any other species of the genus.

As ZMB 7376 corresponds with *Scinax squalirostris* and there is no possible confusion with any other described species, we consider *Hyla leucotaenia* Burmeister, 1861 a senior synonym of *Scinax squalirostris* (Lutz, 1925). Having established that, the usage of these names needs to be sorted out.

Article 23.9.1 of the ICZN states that prevailing usage should be maintained when (Art. 23.9.1.1) the senior synonym has not been used as a valid name after 1899, and (Art. 23.9.1.2) the junior synonym or homonym has been used, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of no less than 10 years. Both conditions are met in this case. *Hyla leucotaenia* has been considered a junior synonym of *Hyla pulchella* Dumeril & Bibrón, 1841 since Berg (1896) and to our knowledge was never employed as a valid name since that time. The junior synonym *Hyla squalirostris* A. Lutz 1925, or the combinations *Oloolygon squalirostris* (A. Lutz, 1925) or *Scinax squalirostris* (A. Lutz, 1925), have been used in many more than 25 publications, from numerous authors, between 1965 and 2014: Bokermann (1966; 1967); Pyburn & Fouquette (1971); Lutz (1973); Duellman (1977); Fouquette & Delahoussaye (1977); Cei (1980); Prigioni & Langone (1984); Gallardo (1982; 1987); Gayer *et al.* (1988); Haddad *et al.* (1988); Basso (1990); Carvalho e Silva & Peixoto (1991); Klappenbach & Langone (1992); Lavilla (1992); Langone (1994); Pombal *et al.* (1995); Vega & Bellagamba (1996); Brandão *et al.* (1997); De la Riva *et al.* (2000); Natale *et al.* (2000); Lavilla & Cei (2001); Maneyro & Langone (2001); Faivovich (2002); Achaval & Olmos (2003); Alcalde & Rosset (2003); Cacciali (2004); Costa *et al.* (2004); Núñez *et al.* (2004); Alcalde (2005); Faivovich *et al.* (2005); Kwet (2005); Brusquetti & Lavilla (2006); Caramaschi & Cardoso (2006); Canelas & Bertoluci (2007); Leite *et al.* (2008); Borteiro *et al.* (2009); Motte *et al.* (2009); Silva & Toledo (2010); Cardozo *et al.* (2011); Pombal *et al.* (2011); Fonte & Volkmer (2013); Attademo *et al.* (2014); and Brusquetti *et al.* (2014).

These conditions establish the prevailing usage of *Hyla squalirostris* A. Lutz, 1925 over *Hyla leucotaenia* Burmeister, 1861, in accordance with Art. 23.9.1 and its precedence over its senior synonym. As such, *Hyla squalirostris* A. Lutz, 1925 is a *nomen protectum*, and *Hyla leucotaenia* Burmeister, 1861 a *nomen oblitum*.

Scinax squalirostris (A. Lutz, 1925) is a highly variable, broadly distributed species, that occurs in southeastern, southern and central Brazil; northern La Paz in Bolivia; southern, central and eastern Paraguay; Uruguay; and central and northeastern Argentina (Frost, 2014). If a taxonomic revision of this species were to show that populations in its southern range are a distinct species from those from the vicinity of the type locality (Fazenda do Bonito, Serra da Bocaina, São José do Barreiro, São Paulo, Brazil), the name *Hyla leucotaenia*

Burmeister, 1861 is available for them, following Art. 23.9.2 of the ICZN, as are the names *Hyla lindneri* Müller & Hellmich, 1936 and *Hyla evelynae* Schmidt, 1944.

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APPENDIX. Examined specimens

- Hyla leucotaenia*—ARGENTINA: ENTRE RÍOS: Paraná (ZMB 7376 [Museum für Naturkunde, Berlin]).
- Hypsiboas pulchellus*—ARGENTINA: CORRIENTES: Manatales (MACN-HE 14953–963, juveniles [Herpetological Collection of Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires]).
- Scinax squalirostris*—BRAZIL: SÃO PAULO: Bonito, Serra da Bocaina (AL-MN 954 [Adolfo Lutz Collection, Museu Nacional, Rio de Janeiro]); ARGENTINA: ENTRE RÍOS: Basavilbaso (MACN-HE 38248 [Herpetological Collection of Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires]).