On the Identity of *Sphaenorhynchus platycephalus* (Werner, 1894) (Anura: Hylidae)

Author(s): Katyuscia Araujo-Vieira, Ulisses Caramaschi, Heinz Grillitsch, Taran Grant and Julián Faivovich

Source: South American Journal of Herpetology, 13(1):73-84.
Published By: Brazilian Society of Herpetology

https://doi.org/10.2994/SAJH-D-17-00053.1

URL: http://www.bioone.org/doi/full/10.2994/SAJH-D-17-00053.1
On the Identity of Sphaenorhynchus platycephalus (Werner, 1894) (Anura: Hylidae)

Katyuscia Araujo-Vieira¹, Ulisses Caramaschi², Heinz Grillitsch³, Taran Grant⁴, Julián Faivovich¹,⁵,*

¹ División Herpetología, Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” – Consejo Nacional de Investigaciones Científicas y Técnicas, Angel Gallardo 470, C1405DJR, Buenos Aires, Argentina.
² Universidade Federal do Rio de Janeiro, Museu Nacional, Departamento de Vertebrados, Quinta da Boa Vista, São Cristóvão, CEP 20940-040, Rio de Janeiro, RJ, Brazil.
³ Natural History Museum Vienna, First Zoological Department, Herpetological Collection, Burgring 7, 1010, Vienna, Austria.
⁴ Departamento de Zoologia, Instituto de Biotecências, Universidade de São Paulo, CEP 05508–090 São Paulo, São Paulo, Brazil.
⁵ Departamento de Biodiversidade y Biología Experimental, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Buenos Aires, Argentina.

* Corresponding author. Email: julian@mncn.gov.ar

Abstract. Sphaenorhynchus platycephalus was briefly described on the basis of a single specimen, with only “S‑Amerika” as its locality. Although it has been regarded as a distinct species, compelling evidence is lacking. A comparison of all currently described species of Sphaenorhynchus, including type specimens of several species, allowed us to provide morphological evidence that S. platycephalus and S. orophilus are conspecific, with S. orophilus being a junior synonym of S. platycephalus.

Keywords. Hatchet-faced treefrog; Morphology; Southeastern Brazil; Synonym; Taxonomy.

INTRODUCTION

Hylopis platycephalus was described by Werner (1894) on the basis of a single specimen, giving only “S‑Amerika” as its locality and has since had a rather convoluted taxonomic history (Lynch, 1971, 1981; Villa, 1984; McDairmid and Savage, 1984). Much of the confusion stemmed from the assumption that the holotype had been lost or destroyed, forcing researchers to associate it with known populations on the basis of interpretations of the brief original description.

Franz Werner was a professor at the Institut für Zoologie der Universität Wien (Institute of Zoology of the University of Vienna, Austria) from 1909–1933, when he retired. After his death in 1939, his private collection was transferred to the Naturhistorisches Museum Wien (Natural History Museum of Vienna); however, parts of Werner’s collection stored at the Zoological Institute of the University of Vienna, including some valuable herpetological objects of real or potential type status, were not considered to be his private property. As such, this material was not included in the inheritance and were not accessioned by the museum. One of these valuable specimens was the holotype of Hylopis platycephalus (IZUW 90), located in 1982 and redescribed by Harding (1991). In 1993, the Herpetological Collection at the Natural History Museum of Vienna acquired the type specimen of H. platycephalus, which is currently catalogued as NMW 33142.

Harding (1991) concluded that the female holotype (snout-vent length [SVL] 33.0 mm, labeled IZUW 90) of Hylopis platycephalus was assignable to the hylid genus Sphaenorhynchus, 1838. Consequently, he considered Hylopis Werner, 1894 to be a junior synonym of Sphaenorhynchus Tschudi, 1838 and established the new combination Sphaenorhynchus platycephalus (Werner, 1894). Harding (1991:417) also provided evidence to distinguish S. platycephalus from the 10 congenic species recognized at that time, including S. bromelicola Bokermann, 1966, S. carneus (Cope, 1868), S. dorsiae (Goin, 1957), S. lacteus (Daudin, 1800), S. palustris Bokermann, 1966, S. pauloalvini Bokermann, 1973, S. planicola (Lutz and Lutz, 1938), S. praesus Bokermann, 1973, S. orophius (Lutz and Lutz, 1938), and S. surdus (Cochran, 1953), but noted that ”Sphaenorhynchus is in need of a complete revision”.

Since 1991, five species of Sphaenorhynchus have been described (S. botocudo Caramaschi et al., 2009; S. cammaeus Roberto et al., 2017; S. canga Araujo-Vieira et al., 2015; S. caramaschii Toledo et al., 2007; and S. mirim Caramaschi et al., 2009) and additional material of most species has accumulated in collections. A comparison of these species and type specimens of several species allowed us to discover that S. platycephalus (Werner, 1894) and S. orophilus (Lutz and Lutz, 1938) are indistinguishable, leading us to conclude that they are conspecific.

How to cite this article: Araujo-Vieira K., Caramaschi U., Grillitsch H., Grant T., Faivovich J. On the identity of Sphaenorhynchus platycephalus (Werner, 1894) (Anura: Hylidae). South American Journal of Herpetology 13:73–84. doi:10.2994/SAJH-D-17-00053.1
MATERIALS AND METHODS

Our observations are based on an extensive list of preserved specimens of *Sphaenorhynchus* (see Appendix) supplemented with descriptions by Lutz and Lutz (1938), Bokermann (1966), Kenny (1969), Bokermann (1973), Heyer et al. (1990), Harding (1991), Toledo et al. (2007), Caramaschi et al. (2009), Araujo-Vieira et al. (2015), and Roberto et al. (2017). Although it is generally possible to see vomerine, premaxillary, and maxillary teeth under high magnification in species of *Sphaenorhynchus*, when we possibly corroborated their presence and number in cleared and double-stained specimens (Taylor and Van Dyke, 1985).

We follow Heyer et al. (1990) for terminology describing snout profile. Osteological data on the holotype of *Sphaenorhynchus platycephalus* (NMW 33142) were taken from radiographs produced with a Portable X-ray apparatus “PARDUS-R” (ELTECH-Med, St. Petersburg, Russia). The definition of the tympanic membrane follows Wever (1985), who defined it as an area of modified skin (where the subcutaneous layers are missing) that is much thinner than the surrounding skin, has a softer texture and different pigmentation, and, in many cases, is more or less translucent. The expansion of the transverse process of Presacral Vertebra III was measured as the ratio of the width of the tip of the transverse process (without associated cartilage) to the width of its base. Institutional abbreviations are those of Sabaj (2016).

RESULTS AND DISCUSSION

Taxonomy

The holotype of *Sphaenorhynchus platycephalus* (Fig. 1A–C) is a species of *Sphaenorhynchus* based on (1) the snout being slightly flattened and protruding in lateral view; (2) the *intermandibularis* muscle possessing an apical supplementary element (Harding, 1991:416); (3) the maxilla and quadratojugal lacking contact due to reduction of the postorbital process of maxilla; and (4) presence of a white parietal peritoneum. Character states 2–4 are possible synapomorphies of *Sphaenorhynchus* (Duellman and Wiens, 1992; Faivovich et al., 2005).

Harding (1991) provided a diagnosis and adequate redescriptions of the holotype of *Sphaenorhynchus platycephalus*, including some osteological and myological characters. Our observations on the holotype of *S. platycephalus* (NMW 33142) agree with Harding’s redescription with the exception of two characters. First, Harding (1991) reported the absence of dermal fringes on limbs, but we observed a discrete, slightly crenulated dermal fold on the ventrolateral margin of the left forearm of the holotype (Fig. 1C). Second, Harding (1991) reported that vomerine, premaxillary, and maxillary teeth were “indiscernible under the dissecting microscope,” but we found those teeth to be present and visible (albeit inconspicuous) under high magnification.

Two additional characters merit clarification. First, Harding (1991) described the tympanum as being indiscernible. More specifically, the tympanic membrane is absent, but the tympanic ring and the columella are present (Harding, 1991). Second, we agree with Harding (1991) that the cloacal fold is absent, but many enlarged tubercles are present in the subcloacal region, as is a pair of larger tubercles (twice as large as others) on the ventral region immediately below the cloaca (Fig. 2A–B).

The holotype of *Sphaenorhynchus platycephalus* differs from most species of the genus in the following character states: (1) large size (33.0 mm SVL); (2) snout round in dorsal view, protruding in lateral view; (3) loreal region flat; (4) tympanic membrane absent; (5) ventrolateral margin of tarsus lacking dermal fold or tubercles; (6) elbow and heel lacking dermal appendages; (7) many subcloacal tubercles present, enlarged, not forming dermal fold; and (8) vomerine, premaxilla, and maxillar teeth present, extremely small.

The large size (33.0 mm SVL) of the adult female holotype distinguishes *Sphaenorhynchus platycephalus* from *S. bromelica* (20.0–28.0 mm in females, n = 7), *S. caramaschii* (26.4–28.9 mm in females, n = 2; Toledo et al., 2007), *S. carneus* (19.0–22.5 mm in females, n = 3; Duellman, 1974), and *S. pauloalvini* (21.0–24.0 mm in females, n = 10). The snout being round in dorsal view and protruding in lateral view discriminates *S. platycephalus* from *S. caramaschii* and *S. surdus* (truncate, mucronate or slightly mucronate in dorsal view), *S. lacteus* (pointed in dorsal view), and *S. pauloalvini*, *S. planicola*, and *S. prasinus* (truncate in lateral view). A flat loreal region and a generally wider forearm distinguish *S. platycephalus* from *S. canga* (slender forearm and loreal region slightly convex in *S. canga*; see also Araujo-Vieira et al., 2015: fig. 4A). The absence of the tympanic membrane differentiates *S. platycephalus* from *S. lacteus* and *S. pauloalvini* (tympanic membrane present; see also Araujo-Vieira et al., 2015: fig. 3B). The absence of dermal folds or tubercles on the ventrolateral margin of the tarsus distinguishes *S. platycephalus* from *S. botocudo*, *S. bromelica*, *S. cammæus*, *S. caramaschii*, *S. palustris*, and *S. surdus* (row of tubercles or crenulated dermal fold on the ventrolateral surface of tarsus; Caramaschi et al., 2009; Roberto et al., 2017) and *S. doriseae*, *S. lacteus*, *S. planicola*, and *S. prasinus* (well developed and smooth dermal fold on tarsus). The lack of dermal appendages on the elbow and heel also separates *S. platycephalus* from *S. botocudo*, *S. bromelica*, *S. cammæus*, *S. caramaschii*, *S. palustris*, and *S. surdus* (tubercles or crenulated dermal fold on heel; Caramaschi et al., 2009; Roberto et al., 2017), *S. doriseae* (dermal fold on elbow and triangular calcar appendage present), and
Figure 1. (A) Dorsal, (B) ventral, and (C) lateral views of the holotype of *Sphaenorhynchus platycephalus* (SVL 33.0 mm, female, NMW 33142). (D) Dorsal, (E) ventral, and (F) lateral views of the holotype of *S. orophilus* (SVL 35.0 mm, male, AL-MN 3309). (G) Dorsal, (H) ventral, and (I) lateral views of the paratype of *S. orophilus* (34.0 mm SVL, female, AL-MN 1566). (J) Dorsal, (L) ventral, and (M) lateral views of the topotype of *S. orophilus* (SVL 33.0 mm, female, AL-MN 3861). Scale bars = 5 mm.
S. mirim, S. planicola, and S. prasinus (dermal fold on elbow and round calcar appendage).

Additionally, the presence of many enlarged tubercles in the subcloacal region, not forming a dermal fold, differentiates Sphaenorhynchus platycephalus from S. botocudo, S. bromelicola, S. cammaeus, S. canga, S. caramaschii, S. palustris, and S. surdus (dermal fold on the subcloacal region; Bokermann, 1966; Caramaschi et al., 2009; Araujo-Vieira et al., 2015: fig. 5A–B; Roberto et al., 2017: fig. 3A–B), S. dorisae (dermal flap with triangular lateral margins), and S. lacteus, S. mirim, S. planicola, and S. prasinus (dermal flap with round lateral margins).

**Figure 2.** Subcloacal ornamentation. (A) Posterior and (B) ventral views of the holotype of Sphaenorhynchus platycephalus (NMW 33142). (C) Posterior and (D) ventral views of the holotype of S. orophilus (AL-MN 3309). (E) Posterior and (F) ventral views of the paratype of S. orophilus (AL-MN 1566). (G) Posterior and (H) ventral views of the topotype of S. orophilus (AL-MN 3861). Scale bars = 2 mm.
Sphaenorhynchus platycephalus also differs from \textit{S. dorisae}, \textit{S. mirim}, and \textit{S. planicola} by the presence of maxillary and premaxillary teeth (absent in these species); and from \textit{S. carneus} by the presence of vomerine, maxillary, and premaxillary teeth (absent in \textit{S. carneus}).

Nevertheless, we were unable to distinguish the holotype of \textit{Sphaenorhynchus platycephalus} from the type series and topotypes of \textit{S. orophilus} (Figs. 1–2). Harding (1991) tentatively differentiated \textit{S. platycephalus} from \textit{S. orophilus} on the basis of the absence of a cloacal fold (referred to as an “anal fold”) and the indiscernible vomerine teeth (cloacal fold present and prominent vomerine teeth in \textit{S. orophilus}; Lutz and Lutz, 1938; Harding, 1991). However, as detailed below, these characters are insufficient to differentiate \textit{S. platycephalus} from \textit{S. orophilus}.

We agree with Harding (1991) that there is no cloacal fold in the holotype of \textit{Sphaenorhynchus platycephalus}, as mentioned earlier; however, the structure of subcloacal ornamentation in both the type series and topotypes of \textit{S. orophilus} is morphologically similar to that of \textit{S. platycephalus}, comprising many enlarged tubercles in the subcloacal region and a pair of greatly enlarged tubercles (twice as large as the others) on the ventral region immediately below the cloaca (Fig. 2; see also Lutz and Lutz, 1938).

Vomerine teeth are present, even if polymorphically, in all species of \textit{Sphaenorhynchus} except \textit{S. carneus} (which lacks the dentigerous process of the vomer as well). Moreover, the disposition, number, and development of the vomerine teeth on the dentigerous process are also singular in all \textit{Sphaenorhynchus} which present vomerine teeth, except for \textit{S. pauloalvini}. The teeth are small, few, nonpedicellate, and irregularly disposed on the dentigerous process (Fig. 3). Also, there are many teeth with only the top of the dental germ calcified. These incomplete teeth are weakly attached to the dentigerous processes and can be easily removed when individuals are handled. These conditions are clear in the specimens of \textit{S. orophilus} MNRJ 31731 and MZUSP 53465 (Fig. 3E). Lutz and Lutz (1938) reported the presence of vomerine teeth in the type series of \textit{S. orophilus}; however, in both type series of \textit{S. orophilus} and the holotype of \textit{S. platycephalus} we observed a poorly developed dentigerous process with extremely small vomerine teeth, difficult to see even under high magnification. Therefore, counter to Harding’s (1991) findings, vomerine teeth do not differentiate \textit{S. platycephalus} from \textit{S. orophilus}.

Another two observations by Harding (1991) in \textit{Sphaenorhynchus platycephalus} deserve comment: (1) transverse processes of Presacral Vertebra III not
expanded, and (2) premaxillary and maxillary teeth indiscernible. The transverse processes of Presacral Vertebra III is expanded in all species of Sphaenorhynchus; however, the degree of expansion varies intra- and interspecifically, with S. mirim (MACN-He 46462; transverse process 0.2–0.3 times wider at the tip than at the base) and S. palustris (MNJ 42656, 54982; transverse process 0.9–1.0 times wider at the tip than at the base) representing the two extremes (Fig. 4A, C). We were unable to study skeletons of the type series of S. orophilus, but we studied two cleared and double-stained specimens collected ca. 22 km ENE from the type locality (MNJ 31731, MZUSP 53465). The transverse processes of Presacral Vertebra III are 0.5–0.7 times wider at the tip than at the base in S. orophilus (Fig. 4B) and 0.5 times wider at the tip than at the base in S. platycepalus (NMW 33142; Fig. 5A–B). As such, this character does not differentiate the two species.

Premaxillary and maxillary teeth are absent in Sphaenorhynchus carneus, S. dorisae, S. mirim, and S. planicolus but are visible under high magnification in almost all adults of all other species of Sphaenorhynchus except S. canga (Araujo-Vieira et al., 2015). Furthermore, similar to the vomerine teeth, the maxillary and premaxillary teeth are small and few and nonpedicellate and pedicellate teeth coexist in the toothed species of Sphaenorhynchus except S. pauloalvini, and in some teeth only the top of the dental germ is calcified. Harding (1991) reported that the premaxillary and maxillary teeth are indiscernible under dissecting microscope in the holotype of S. platycepalus. However, although they are small and difficult to observe, premaxillary and maxillary teeth are present and exhibit the same characteristics as the those of the type series of S. orophilus.

A few characters of Harding’s (1991) redescription do not agree with the description of Sphaenorhynchus orophilus by Lutz and Lutz (1938): (1) tongue cordiform (round in S. orophilus); (2) loreal region vertical (loreal region round in S. orophilus); (3) subarticular tubercles round on feet, inner metatarsal tubercle ovoid, outer small (subarticular tubercles very indistinct, inner metatarsal tubercle minute, outer large in S. orophilus); and (4) coloration in preservative grayish, bleached (presence of dorsal dark pigmentation and canthal and dorsolateral lines in S. orophilus). However, our examination of the type series of S. orophilus revealed that Lutz and Lutz’s (1938) description of these characters does not withstand scrutiny, as follows: (1) We agree with Lutz and Lutz (1938) that the tongue is large, thick, and round in almost all individuals of the type series of S. orophilus; however, paratypes AL-MN 2129 and 2699 have cordiform tongues. Similarly, Cochran (1953) also described a cordiform tongue for five male S. orophilus from Bonito, Serra da Bocaina, State of São Paulo, Brazil, the same locality of the paratypes of Lutz and Lutz (1938), indicating that tongue shape is either intraspecifically variable or depends on methods used to euthanize and fix specimens. (2) The loreal region of the holotype of S. orophilus is slightly rounded (AL-MN 3309), but it varies in the paratypes from flat (AL-MN 1566) to slightly rounded (AL-MN 2129–2130, 2698–2699). Cochran (1953) also reported a flat loreal region (described as vertical) in the specimens from Bonito. (3) The subarticular tubercles on feet of all specimens of the type series of S. orophilus are round and very small, and the inner metatarsal tubercle is ovoid and larger than the outer metatarsal tubercle. (4) Lutz and Lutz (1938) described the dorsal coloration in S. orophilus as mostly uniform green, varying from conspicuously to finely spotted black or dark brown, with golden and black or dark brown canthal and dorsolateral lines. Currently, the holotype and paratypes of S. orophilus have faded to become almost completely whitish yellow without any green and golden coloration (Figs. 1D–I, 2C–F), and the dark canthal and dorsolateral lines are either faintly pigmented (paratypes: AL-MN 2130, 2698–2699) or inconspicuous (i.e., a few dark spots occur in the canthal and dorsolateral regions but lines are not discernible; holotype AL-MN 3309).

Figure 4. Anterior portion of vertebral column showing variation in the transverse processes of Presacral Vertebra III in (A) Sphaenorhynchus mirim (MACN-He 46462), (B) S. orophilus (MNJ 31731), and (C) S. palustris (MNJ 43656). Scale bars = 1 mm.
and paratypes AL-MN 1566 and 2129), suggesting that these pigments disappear when the specimens are stored in 70% ethanol. We assume that Werner did not see a recently collected specimen, but one stored in alcohol or formalin; consequently, we assume that all original coloration of the holotype of *S. platycephalus* would have already vanished when Werner (1894) made his observations and wrote “Färbung und Zeichnung? (ausgebleicht)” [“Color pattern? (bleached)’].

Also, our observations of the type series of *Spaenorhynchus orophilus* showed that two characters deserve attention; the snout outline in dorsal view and the dermal ornamentation on forearm and tarsus. Regarding the former, Lutz and Lutz (1938) described the snout of *S. orophilus* as round in dorsal view. However, we observed that the outline of the snout in dorsal view varies intraspecifically in *S. orophilus*: the snout in dorsal view can be truncate (e.g., AL-MN 3157–3158, MNRJ 4383), slightly truncate (e.g., paratypes: AL-MN 1566, 2129, 2698–2699, and MNRJ 4359, 4384), round (e.g., holotype: AL-MN 3309, paratype: AL-MN 2130, and MNRJ 3130, 4385, 4387, 31732–31733, 31737, ZUEC 4096), or round-mucronate (e.g., AL-MN 3962, MNRJ 31731). Cochran (1953) described the snout as truncate in dorsal view for the specimens from Bonito, and Heyer et al. (1990) described it as pointed or truncate-subovoid in dorsal view in five males from Estação Biológica de Boracéia, State of São Paulo, Brazil.
(ca. 570 km WNW from the type locality of *S. orophilus*). The snout of the holotype of *S. platycephalus* is round in dorsal view, thereby falling within the variation observed in *S. orophilus*.

Lutz and Lutz (1938) did not mention any dermal ornamentation on the limbs of *Sphaenorhynchus orophilus*; however, our observations showed that these dermal ornamentations are absent in the holotype AL-MN 3309 and indiscernible in paratypes AL-MN 2129–2131, 2698–2699 (fore- and hind limbs are deformed due to past dessication), but a slightly crenulated dermal fold on the ventrolateral margin of the forearms is present in the paratype AL-MN 1566. The remaining specimens of *S. orophilus* also present this dermal fold along the ventrolateral margin of the tarsus and/or forearm (e.g., forearm only in CFBH 10573; tarsus and forearm in AL-MN 3859–3862, MNRJ 4383–4385, 4359, 31734–31735, 31737, MZUSP 60228–60230, 37668, ZUEC 4096; Fig. 1J–M). Moreover, some individuals present a dermal fold on the internal margin of the tarsus from the tibio-tarsal articulation to a point adjacent to the inner metatarsal tubercle (e.g., AL-MN 3379–3380, CFBH 10573, MNRJ 4385). Cochran (1953) also reported a slightly crenulated dermal fold along the ventrolateral margin of the tarsus in the specimens from Bonito, and Heyer et al. (1990) described a poorly developed dermal fold on the ventrolateral margin of forearm and tarsus, and a dermal fold on the internal margin of the tarsus in some specimens from Estação Biológica de Boracéia. Dermal folds are absent on the tarsi of *S. platycephalus*, but we observed a discrete, slightly crenulated dermal fold on the ventrolateral margin of the left forearm of the holotype of *S. platycephalus* similar to that observed in *S. orophilus*.

Given the absence of morphological characters that differentiate *Sphaenorhynchus platycephalus* from *S. orophilus*, we consider these taxa to be conspecific, with *S. orophilus* (Lutz and Lutz, 1938) being a junior synonym of *S. platycephalus* (Werner, 1894), with the complete synonymy as follows:

**Sphaenorhynchus platycephalus** (Werner, 1894)

*Hyloplus platycephalus* Werner, 1894. Original description.

*Hyla (Sphoenohyla) orophila* Lutz and Lutz, 1938. New Synonym.

*Sphoenohyla orophila*—Goin, 1957. Recognition of generic status of *Sphoenohyla* Lutz and Lutz, 1938.

*Dryomelictes orophila*—Goin, 1961. First combination with *Dryomelictes* Cope, 1865 a junior synonym of *Sphaenorhynchus* (Myers and Leviton, 1961).

*Sphaenorhynchus orophilus*—Bokermann, 1966. First combination with *Sphaenorhynchus*.

*Hyla orophila*—Kenny, 1969. Missidentified specimens of *Sphaenorhynchus lacteus* from Trinidad.

*Sphaenorhynchus platycephalus*—Harding, 1991. First combination with *Sphaenorhynchus*.

---

Figure 6. Premaxillary and maxillary teeth of (A) *Sphaenorhynchus canga* (MNRJ 56335), (B) *S. orophilus* (MNRJ 31731), (C) *S. palustris* (MNRJ 43656), (D) *S. lacteus* (ZUEC 5429), (E) *S. caramaschii* (CFBH 6933), and (F) *S. prasinus* (MZUESC 6861). Scale bars = 2 mm.

---

On the Identity of *Sphaenorhynchus platycephalus* (Werner, 1894) (Anura: Hylidae)
Katyuscia Araujo-Vieira, Ulisses Caramaschi, Heinz Grillitsch, Taran Grant, Julián Faivovich

80

South American Journal of Herpetology, 13(1), 2018, 73–84
Type locality and geographic distribution

The only available information about the type locality is “S‑Amerika” as labeled in the original glass jar and “Süd‑Amerika” in Werner’s (1894) description of Sphaenorrhynchus platycephalus (Werner, 1894; Harding, 1991).

There is no additional information about the collector or possible itineraries, but on the basis of the information provided below, the type specimen of the species must have been collected somewhere in the Serra do Mar in the states of São Paulo or Rio de Janeiro, Brazil.

Sphaenorhynchus platycephalus is known from Serra do Mar in the Brazilian localities of Nova Friburgo, Petrópolis, Rio de Janeiro, and Teresópolis in the State of Rio de Janeiro and Bairro Alto, Serra da Bocaina, and Estação Biológica de Boracéia. The yellow circle indicates the Serra da Mantiqueira’s population of Sphaenorrhynchus sp. (Parque Estadual Serra do Ibitipoca, State of Minas Gerais). ES = Espírito Santo; MG = Minas Gerais; RJ = Rio de Janeiro; and SP = São Paulo.

ACKNOWLEDGMENTS

For access to collections and institutional loans of specimens we thank Célio F.B. Haddad (CFBH), Santiago Castroviejo‑Fisher and Glaucia M.F. Pontes (MCP), Júlio César M. Leite and Magno V. Segalla (MHNCS), José P. Pombal Jr. (MNRJ), Mirco Solé (MZUESC), Marcelo F. Napoli (MZUFBA), Renato N. Feio (MZUFV), Hussam Zaher (MIZUSP), Paulo C.A. Garcia (UFMG), Laura Verrastro (UFRGS), Helio Ricardo da Silva (UFRRJ), and Luis Felipe Toledo (ZUEC). We also thank Alice Schumacher (NMW) for the photographs of the holotype of Sphaenorrhynchus platycephalus, Georg Gassner (NMW) who prepared the specimen for radiography and photography, and Roberta A.M. Fonseca for the photographs of the topotype of S. orophilus (AL‑MN 3861) with the equipment for capturing images from the Setor de Herpetologia do Museu Nacional – Universidade Federal do Rio de Janeiro. We thank Paulo D.P. Pinheiro for his comments on earlier drafts of the manuscript. Financial support and fellowships were provided by the São Paulo Research Foundation (FAPESP Procs. 2012/10000‑5, 2013/50741‑7), Consejo Nacional de Investigaciones Científicas y Técnicas (PICT 404/2013, 820/2015), Organización de los Estados Americanos (OEA), and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).
REFERENCES

Araujo-Vieira K., Lacerda J.V.A., Pezzuti T.L., Leite F.S., Assis C.L., Cruz C.A.G. 2015. A new species of hatchet-faced treefrog Sphaenohynchus Tschudi (Anura, Hylidae) from Quadrilátero Ferrisso, Minas Gerais, southeastern Brazil. Zootaxa 4059:96–114. DOI

Bokermann W.C.A. 1966. Duas novas espécies de “Sphaenohynchus” (Amphibia, Hylidae). Revista Brasileira de Biologia 26:15–21.

Bokermann W.C.A. 1973. Duas novas espécies de Sphaenohynchus da Bahia (Anura, Hylidae). Revista Brasileira de Biologia 33:589–594.

Caramaschi U., Almeida A.P., Gasparini J.L. 2009. Description of two new species of Sphaenohynchus (Anura, Hylidae) from the State of Espírito Santo, Southeastern Brazil. Zootaxa 2115:34–46. DOI

Cochran D.M. 1953. Three new Brazilian frogs. Herpetologica 8:111–115.

Cope E.D. 1865. Description of a new species of Hylidae, with a synopsis of the genera of neotropical hylid frogs. Occasional Papers of the Museum of Natural History, University of Kansas 15:1–23.

Cope E.D. 1868. An examination of the Reptilia and Batrachia obtained by the Orton Expedition to Equador and the Upper Amazon, with notes on other species. Proceedings of the Academy of Natural Sciences of Philadelphia 20:96–140.

Cruz C.A.G., Peixoto O.L. 1980. Notas sobre o girino de Sphaenohynchus orophilus (Lutz & Lutz, 1938) (Amphibia, Anura, Hylidae). Revista Brasileira de Biologia 40:383–386.

Cruz, C.A.G., Feio R.N., Caramaschi U., Murta R. 2009. Anfíbios do Ibitipoca. Bicho do Mato, Belo Horizonte.

Daudin F.M. 1802. Histoire Naturelle des Quadrupèdes Ovipares. Livraison 2. Marchant et Cie, Paris.

Daudin F.M. 1802. Histoire Naturelle des Rainettes, des Grenouilles, et des Crapauds. Bertrandert, Libraire Levrault, Paris. DOI

Duellman W.E. 1974. The status of the hylid frog genus Sphaenohynchus. Drymolictes, and Sphaenorhynchus. Herpetologica 30:61–62.

Duellman W.E., Wiens J.J. 1992. A reassessment of the taxonomic status of some neotropical hylid frogs. Occasional Papers of the Museum of Natural History, University of Kansas 27:1–27.

Duellman W.E., Wiens J.J. 1992. The status of the hyloid frog genus Ologsyn and the recognition of Scinax Wagler, 1830. Occasional Papers of the Museum of Natural History, University of Kansas 15:1–23.

Faivovich F., Haddad C.F.B., Garcia P.C.A., Frost D.R., Campbell J.A., Wheeler W.C. 2005. Systematic review of the frog family Hylidae, with special reference to Hylinae: Phylogenetic analysis and taxonomic revision. Bulletin of the American Museum of Natural History 294:240pp. DOI

Goin C.J. 1961. Synopsis of the genera of hylid frogs. Annals of the Carnegie Museum 36:5–18.

Harding K.A. 1991. The taxonomic status of Hylopsis platycerophalus Werner, 1894 and Centrolenella Noble, 1920. Amphibia: Anura. Zoological Journal of the Linnean Society 103:413–418. DOI

Heyer W.R., Rand A.S., Cruz C.A.G., Peixoto O.L., Nelson C.E. 1990. Frogs of Boracéia. Arquivos de Zoologia 31:231–410.

Kenny J.S. 1969. The Amphibia of Trinidad. Studies on the Fauna Curaçao and other Caribbean Islands 108:1–78.

Lutz A., Lutz B. 1938. I. On Hyla aurantiaea Daudin and Sphaenohynchus Tschudi and on two allied Hyla from south-eastern Brazil. Anais da Academia Brasileira de Ciências 10:175–194.

Lynch J.D. 1971. Evolutionary relationships, osteology, and zoogeography of leptodactylid frogs. Miscellaneous Publications of the Museum of Natural History, University of Kansas 53:1–238.

Lynch J.D. 1981. The identity of Hylopsis platycerophalus Werner, a centrolenid frog from northern Colombia. Journal of Herpetology 15:283–291.

McDiarmid R.W., Savage J.M. 1984. Taxonomic status of the frog genus Centrolenella Noble (Anura: Centrolenidae). Journal of Herpetology 18:213–214.

Myers G.S., Leviton A.E. 1961. The South American hylid frog names Sphaenohynchus, Drymolictes, and Sphaenorhynchus. Herpetologica 17:61–62.

Roberto I.J., Araujo-Vieira K., Carvalho-e-Silva S.P., Ávila R.W. 2017. A new species of Sphaenohynchus (Anura: Hylidae) from northeastern Brazil. Herpetologica 73:148–161. DOI

Sabaj M.H. (Ed.). 2016. Standard symbolic codes for institutional resource collections in herpetology and ichthyology: an online reference. Version 6.5 (16 August 2016). Accessible at: www.asih.org.

Taylor W.R., Van Dyke G.C. 1985. Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. Cytium 9:107–119.

Tschiu J.J. von. 1838. Classification der Batrachier mit Berücksichtung der fossilen Thiere dieser Abtheilung der Reptilien. Petitpierre, Neuchâtel.

Toledo L.F., García P.C.A., Lingnau R., Haddad C.F.B. 2007. A new species of Sphaenohynchus (Anura; Hylidae) from Brazil. Zootaxa 1658:57–68. DOI

Villa J. 1984. Biology of a neotropical glass frog, Centrolenella fleischmanni (Boettger), with special reference to its frogfly associates. Milwaukee Public Museum Contributions in Biology and Geology 55:1–60.

Werner F. 1894. Über einige Novitäten der herpetologischen Sammlung des Wiener zooog. vergl. anatom. Instituts. Zoologischer Anzeiger 17:155–157.

Wever E.G. 1985. The Amphibian Ear. Princeton University Press, Princeton.

APPENDIX: SPECIMENS EXAMINED

Sphaenohynchus botocudo (n = 10): BRAZIL: Espírito Santo: Murucui: Fazenda Matutina, MACN-He 46458–46459 (cleared and double stained adult female), MNRJ 50625–50626 (paratypes), MNRJ 50629–50631 (paratypes), MNRJ 50635–50636, 50639 (paratypes).

Sphaenohynchus bromelicola (n = 58): BRAZIL: Bahia: Maracás: MZUSP 99475–99499, MZUSP 101507–101515, 101517, 101518 (cleared and double stained adult male), MZUSP 101519, MZUSP 126109, ZUCF 2789; Fazenda Santo Onofre - 10 km E Maracás, MZUSP 73754 (holotype), MZUSP 73806–73813 (paratypes), MZUSP 73831–73840 (paratypes); Fazenda Canabrava, MNRJ 4289–4290, 4292.

Sphaenohynchus cammaeus (n = 21): BRAZIL: Alagoas: Quebrangulo: Reserva Biológica de Pedra Talhada: Lagoa do Junco, URCA-H 9293 (holotype), URCA-H 6313–6321, 9285, 9286–9292, 9294 (paratypes), MACN-He 48851–48852.

On the Identity of Sphaenohynchus platycerophalus (Werner, 1894) (Anura: Hylidae) Katyuscia Araujo-Vieira, Ulisses Caramaschi, Heinz Grillitsch, Taran Grant, Julián Faivovich
Sphaenorhynchus canga (n = 25): BRAZIL: Minas Gerais: Mariana: Chapada de Canga, UFMG-A 5715 (holotype), MNRJ 56337–56346 (paratypes), MNRJ 5716–5717 (paratypes), MNRJ 56335 (cleared and double stained adult male); 1.5 km W MG-129, UFMG-A 7192, 7194, 7205, 7207–7208 (paratypes), MUZUF 11912–11915 (paratypes), UFMG-A 7209 (cleared and double stained adult male); 5.2 km S MG-129, UFMG-A 11732, 11738–11739 (paratypes).

Sphaenorhynchus caramaschii (n = 32): BRAZIL: Santa Catarina: Treviso: CFBH 9854, 10325, MZUSP 84589, 134045, 134047; São Paulo: Ribeirão Branco: Fazenda São Luiz, CFBH 2285–2294, 6934–6936 (paratypes), CFBH 6933 (cleared and double stained adult female, paratype), CFBH 6937 (cleared and double stained adult male, paratype), MNRJ 19373–19377; Iporanga: Parque Estadual Turístico do Alto Ribeira–Núcleo Ouro Grosso, CFBH 6320–6323; Ribeirão Grande: CFBH 15581, 15583; Pilar do Sul: CFBH 8289.

Sphaenorhynchus carneas (n = 36): BRAZIL: Acre: Cruzeiro do Sul: Fazenda São Geraldo, ZUEC 3527; Porto Walter: ZUEC 8429, 8431; Tarauacá: Flooded places near the church, ZUEC 5555 (cleared and double stained adult male); Amazonas: Capim Flutuante–Rio Solimões, CFBH 4984–4985; Seringal América–Rio Purus, MZUSP 50408, 504010; Lago Pacatuba, MZUSP 53710, 53712, 53714–53715; Lago Amaná, MZUSP 58469, 58471–58472, 58474; Tabatinga: MZUSP 111240. COLOMBIA: Caquetá: Alicangaros, MZUSP 99341–99343, 99436, 99440, 99446, 99448, 99453, 99456, 99458–99459, 99461–99462, 99464–99466, 99468–99469, 99471, 99472.

Sphaenorhynchus dorisae (n = 30): BRAZIL: Acre: Rio Tejo, ZUEC 11091, 11095, 11096 (cleared and double stained adult female), ZUEC 11097, 11098, 11100, 11103, 11106; Cruzeiro do Sul: TG 2835 (cleared and double stained adult male; TG: Taran Grant field number deposited in MCP), MCP 10591–10595; Porto Walter: ZUEC 8426–8427; Rodrigues Alves: Igarapé Croa–Alto do Juruá, CFBH 15721, 15723; Amazonas: Rio Solimões, Igarapé Belém, MZUSP 34669, 34677, 34676, 34680, 34672, 34674; Boca do Parânato do Catito, MZUSP 33190; Seringal América, Rio Purus, MZUSP 50413, 50415; Lago Janauari, MZUSP 53723, 53720; Beruri: MZUSP 50552. PERU: Loreto: Estirón: Rio Ampiyacu, MZUSP 32808, 32810.

Sphaenorhynchus lacteus (n = 123): BRAZIL: Acre: Cruzeiro do Sul: MCP 10570–10590, TG 2524, 2546 (cleared and double stained adult males; TG: Taran Grant field number deposited in MCP), Vila Militar, ZUEC 4689; Humaitá do Moa, ZUEC 5570; Parque Zootômático UPAC, ZUEC 5570; Kapuri: route to Vila Boa Vista, ZUEC 5705; Mâncio Lima: Lagoa da Cobra, ZUEC 5853; Tarauacá: MZUSP 99335, 99337, 99339, 99340; Amazonas: Rio Solimões, Igarapé Belém, MZUSP 32814, 32817, 32821, 32835, 32837, 32841, 32845, 32846; Lago Janauari, MZUSP 53726, 53730; Manaus: URCA-H 3495–3499; Lago Amaná, MZUSP 58469, 58471–58472, 58474; Tabatinga: MZUSP 111240. COLOMBIA: Caquetá: Alicangaros, MZUSP 99335, 99337, 99339, 99340; Boca do Acre: MZUSP 50413, 50415; Lago Janauari, MZUSP 53723, 53720; Beruri: MZUSP 50552. PERU: Loreto: Estirón: Rio Ampiyacu, MZUSP 32808, 32810.

Sphaenorhynchus mirim (n = 11): BRAZIL: Espírito Santo: Murici: Fazenda Matutina, MACN-He 46460–46462, MNRJ 50648–50650 (paratypes), MNRJ 50652–50653 (paratypes). MACN-He 46460, 46461, 46462 (cleared and double stained adult female).

Sphaenorhynchus palustris (n = 21): BRAZIL: Bahia: Porto Seguro: Reserva Particular de Proteção Natural (RPPN) Estação Veracel, MZUSP 127834, 127831, 127835, MNRJ 42649–42655, 42656 (cleared and double stained adult female), MNRJ 42657; Espírito Santo: Refugio Sooretama, MZUSP 73758 (holotype), MZUSP 73770–73772 (paratypes); Conceição da Barra: Vila de Itaúnas, MNRJ 54979–54980; Rio Preto National Forest, MNRJ 54981, 54982 (cleared and double stained adult male), MNRJ 54693.

Sphaenorhynchus pauloalvini (n = 49): BRAZIL: Bahia: Ilhéus: Centro de Pesquisas do Cacau (CEPEC), MZUSP 73751 (holotype), MZUSP 73773–73776 (paratypes), MZUSP 73791–73803 (paratypes), MZUSP 73841–73850 (paratypes); Una:
Sphaenorhynchus planicola (n = 51): BRAZIL: Bahia: Trancoso: MNRJ 47811, 47812; between Barra de Caravelas and Ponta de Areia: MNRJ 4366–4368, 4370, 4372–4374, 4377, 4378; Espírito Santo: Fundão: CFBH 1586; Linhares: CFBH 1575, MNRJ 4331–4332; Serra: CFBH 1439, 1440; São Mateus: MNRJ 18417, 18418; Marataizes: Distrito de Gomes: Fazenda Sr. Roberto da Roseira, Marsh near Guaraniako lake, MNRJ 35025–35027; Anchieta: MNRJ 25335; Minas Gerais: Iperó: Fazenda Ipanema, MNRJ 32824–32827; Rio de Janeiro: Magé: Campos dos Escoteiros: Citrolândia, MNRJ 54803–54807, 54808 (cleared and double stained adult male), MNRJ 54809–54811; Guapimirim: Vila das Pedrinhas, MNRJ 36265, 4361, 4364; São João da Barra: MNRJ 6716, 6718–6725, 6728 (cleared and double stained adult female); Maricá: MNRJ 39704; Rio de Janeiro: Barra da Tijuca, MNRJ 26880; Sernambetiba: Recreio dos Bandeirantes, MNRJ 3520, MNRJ 2084; Campos: Fazenda Barra Seca, MNRJ 41573–41583; Campos dos Goytacazes: Lagos de Cima, Marsh near the lake, MNRJ 54353–54359; Itaguai: Old route Rio–São Paulo - km 39, ZUEC 3808; Macaé: lake near the city access, ZUEC 8572.

Sphaenorhynchus platycephalus (n = 27): BRAZIL: Rio de Janeiro: Serra do Mar: 4 km outside Petrópolis: in a canal leading to the dam at Quitandinha, AL–MN 3309 (holotype of S. orophilus); Petrópolis: MZUSP 680–681; Quintandinha, MNRJ 3130, AL–MN 3156–3160, 3379–3385, 3387–3389, 3391–3409, 3859–3862, 3881–3882, 3944–3994, 4162; Teresópolis: Alto do Soverbo, MZUSP 53464, 53465 (cleared and double stained adult male); Açude da Granja Comary, MNRJ 4381–4382; Parque Nacional da Serra dos Órgãos, MNRJ 4359, 4387; Represa do Guinle, MNRJ 31731 (cleared and double stained adult male), MNRJ 31732, 31734–31735, 31737, ZUEC 4096; Nova Friburgo: Duas Pedras, MNRJ 2698, 2699 (paratypes of S. orophilus); Rio de Janeiro: MNRJ 126; Recreio dos Bandeirantes, MNRJ 2040; São Paulo: Bananal: MNRJ 4390; Estação Biológica de Boracéia, MZUSP 60228–60230, 37668; Serra da Bocaina, Fazenda do Bonito, AL–MN 1566, 2129–2131 (paratypes of S. orophilus), AL–MN 956–958 MNRJ 4385; Mata do Segredinho, MNRJ 4383, 4384; São José do Barreiro: Rio Ponte Alta, MNRJ 4386; Bairro Alto: Hotel Fazenda Santa Rita, CFBH 10573.

Sphaenorhynchus prasinus (n = 57): BRAZIL: Alagoas: Rio Largo: MNRJ 38680–38683; Quebrangulo: Pedra Talhad Biological Reserve, URCAH 9295; Maceió: Área de Proteção Ambiental Coteló, MUFAL 12247; Bahia: Ilhéus: CEPEC, MZUSP 73749 (holotype), MZUSP 73750, 73761, 73762 (paratypes), MZUSP 73781–73787 (paratypes), MZUESC 6533, 6534, 6861 (cleared and double stained adult male), MZUESC 6862, 6863; Mata de São João: MZUFBA 7357, 4344–4346, 2962, 2969–2973; Itagibá: Fazenda Pedra Branca, MNRJ 4295–4297, 56348, 56349; Teixeira de Freitas: Fazenda Alcopa, MNRJ 2962–29668; Espírito Santo: Linhares: MZUSP 75641, 75643; EI 59 (cleared and double stained adult male; EI: Eugenio Izeckson Collection deposited in UFRRJ); Minas Gerais: Teófilo Otoni: MZUSP 99512, 99513; Almenara: Fazenda Limoeiro, MZUFV 4152, 5938, 5939; Marliéria: Rio Doce State Park, MZUFV 2631, 2633, MNRJ 20874; Aimorés: Tenópolis: CFBH 1439, 1440; São Mateus: MNRJ 18417, 18418; Marataízes: Distrito de Gomes: Fazenda Sr. de Areia: MNRJ 4366–4368, 4370, 4372–4374, 4377, 4378; ESPírito Santo: Fundão: CFBH 1586; Linhares: CFBH 1575, MNRJ 36265, 4361, 4364; São João da Barra: MNRJ 6716, 6718–6725, 6728 (cleared and double stained adult female); Maricá: MNRJ 39704; Rio de Janeiro: Barra da Tijuca, MNRJ 26880; Sernambetiba: Recreio dos Bandeirantes, MNRJ 3520, MNRJ 2084; Campos: Fazenda Barra Seca, MNRJ 41573–41583; Campos dos Goytacazes: Lagos de Cima, Marsh near the lake, MNRJ 54353–54359; Itaguai: Old route Rio–São Paulo - km 39, ZUEC 3808; Macaé: lake near the city access, ZUEC 8572.

Sphaenorhynchus surdus (n = 123): BRAZIL: Paraná: Estrada Graciosa, Alto da Serra: Rio Taquari: MNRJ 4744–4747, 4751, 5750; Castro: Caçambú Forest Park, MHNCI 199, 221, 315–317, 319; São José dos Pinhais: Cambui Forest Reserve, MHNCI 852; Quatro Barras: Estrada Graciosa, Corvo, MHNCI 1738–1747; Pinheiros Grael Azul: Chácara São Francisco de Assis, MHNCI 3657, 3658; Piraquara: MCP 8324 (cleared and double stained adult male), MCP 8325; Manacais da Serra: MHNCI 1855, 2858, 2973, 2983, 5402, 5403; Campina Grande do Sul: Cedro, MHNCI 4603–4607; Telêmaco Borba: Ribeirão Anta Brava, MHNCI 4896; Taboão da Vila Preta, MHNCI 4965; Lagoa do Gaúcho, MHNCI 4965; Adriano: Rocha Church’s Dike, MHNCI 5401; Tijucas do Sul, DZSR 8656, 8788, 8789, 9049; Pirai do Sul: CFBH 8223; Rio Grande do Sul: Vacaria: UFRGS 2488–2491, 2507, 2788; Bom Jesus: UFRGS 2797, 2893, 2894, 2898, 2900, 2902–2910, 3075, 3076, 3082, 3100, 3102–3104, 3108, 3109, 3112, 3121, 3135, 3136, 3138, 3139, 3145; São José dos Ausentes: MCP 4618–4622; Santa Catarina: Rio Vermelho: MZUSP 99510; São Bento do Sul: MZUSP 99508; near São Bento do Sul, MNRJ 4402–4404, 4406, 4407, 4410, 4412 (cleared and double stained adult male), MNRJ 4415; Campo Belo do Sul: UFRGS 2787, 2895–2897, 2899, 2901, 2911, 3089, 3137, MCP 8422; Ponte Serrada: CFBH 15752; Lages: CFBH 8546; Lontras: MCP 1300–1302 (cleared and double stained adult male), MCP 1303–1305; Lébon Régis: MCP 8811; Campos Novos: MCP 9324; São Paulo: São Paulo: Conchas, MZUSP 99521, MNRJ 4333; Apiaí: MZUSP 101466; Guapiara: MNRJ 4335; Sorocaba: Fazenda Iperó, MNRJ 18249.