

Correspondence

***Stenostoma albifrons* WAGLER, 1824 (Squamata: Leptotyphlopidae):
a name with two neotypes?**ROBERTA R. PINTO^{1,2}, FRANCISCO L. FRANCO³ & MARINUS S. HOOGMOED⁴¹Laboratório de Diversidade de Anfíbios e Répteis, Museu de Arqueologia da Universidade Católica de Pernambuco, Rua Oliveira Lima, 824, Boa Vista, Recife, 50050-390, Pernambuco, Brazil²Universidade Federal do Rio de Janeiro, Museu Nacional, Quinta da Boa Vista, s/n, São Cristóvão, Rio de Janeiro, 20940-040, Rio de Janeiro, Brazil³Instituto Butantan, Av. Vital Brasil, 1500, Butantã, São Paulo, 05503-900 São Paulo, Brazil⁴Museu Paraense Emílio Goeldi, Campus de Pesquisa, Avenida Perimetral 1901, Terra Firme, Belém, 66077-830, Pará, Brazil

Corresponding author: ROBERTA R. PINTO, e-mail: robertarich@gmail.com; robertarich@unicap.br

Manuscript received: 5 February 2018

Accepted: 6 August 2018 by PHILIPP WAGNER

The difficulties of finding diagnostic characters and large samples of specimens in scientific collections are the main reason of taxonomic problems in Scolecophidia (e.g. WALLACH 2003, FRANCISCO et al. 2012, PINTO & CURCIO 2011, PINTO & FERNANDES 2017). Also, older species are often based on a single type or few specimens and descriptions generally are short and do not meet the standards used today. Because of this, several taxonomic revisions have been made in the present century, with the objective to secure the stability of specific names (PINTO et al. 2010, PINTO & CURCIO 2011, FRANCISCO et al., 2012, PINTO & FERNANDES 2012, PINTO & FERNANDES 2017). In this context, *Stenostoma albifrons* WAGLER, 1824 (= *Epictia albifrons*) was considered a nomen dubium by some authors (SMITH & LIST 1958, WILSON & HAHN 1973, FRANCO & PINTO 2009), or considered identical to *Epictia tenella* (KLAUBER, 1939), and therefore recognized as an older synonym by HOOGMOED & GRUBER (1983).

Until FRANCO & PINTO (2009), the name proposed by WAGLER (1824) according to some authors (SMITH & LIST 1958, WILSON & HAHN 1973) could not be assigned to a unique natural population, because (1) the original description was very succinct, (2) the illustration did not allow to access some diagnostic characters, (3) the holotype is lost (SMITH & LIST 1958, WILSON & HAHN 1973, HAHN 1980, HOOGMOED & GRUBER 1983, FRANZEN & GLAW 2007) and (4) the type locality was not very precise “habitat rarum in adjacentibus Urbis Para” (WAGLER 1824), making the identification of this population difficult. JAN (1859) analyzed WAGLER’s type but added no additional information. No subsequent authors analyzed the type in the

Munich collection until it was destroyed during the Second World War (HOOGMOED & GRUBER 1983, FRANZEN & GLAW 2007). Several researchers connected to the Museu Paraense Emilio Goeldi collected over a period of more than 100 years (CUNHA & NASCIMENTO 1978, 1993, FRANCO & PINTO 2009, ÁVILA-PIRES et al. 2010) in a wide continental region around Belém south of the Amazon river, and not a single specimen of this species was collected.

Several authors used the absence of supraocular–supralabial contact as a diagnostic character of *E. albifrons* to separate this species from other congeneric species (e.g. KLAUBER 1939, OREJAS-MIRANDA 1961, 1967, VANZOLINI 1996, ARREDONDO & ZAHER 2010). DUMÉRIL & BIBRON (1844) were the first to cite the absence of supraocular–supralabial contact, since no information was mentioned in *E. albifrons* original’s description. However, these authors did not analyze the holotype, and possibly based themselves on the D’ORBIGNY’s (1847) illustrations of specimens from Santa Cruz de la Sierra, Samaipata and San José de Chiquitos, Bolivia. These Bolivian specimens were recently attributed to *Epictia undecimstriatus* (SCHLEGEL, 1839) by ESQUEDA et al. (2015), therefore DUMÉRIL & BIBRON’s observation could not be attributed to *E. albifrons*. Since 1844, 41 populations from Mexico to Argentina have been assigned to *Epictia albifrons* according to WALLACH (2016) causing taxonomic confusion.

Leptotyphlops tenellus (= *Epictia tenella*) described by KLAUBER (1939) from Kartabo, British Guiana (= Guyana) was distinguished from *E. albifrons* especially by the presence of supraocular–supralabial contact. THOMAS (1965) suggested that *E. tenella* could be the same taxon as

E. albifrons, and was followed by some authors (OREJAS-MIRANDA 1967; VANZOLINI 1970) and it was considered as junior synonym of *L. albifrons* by HOOGMOED & GRUBER (1983). WALLACH (2016) recognized three different opinions among researchers, in which members of the “*tenella* school of thought” (SMITH & LIST 1958, WILSON & HAHN 1973, HAHN 1980, PÉREZ-SANTOS & MORENO 1990, FRANCO & PINTO 2009, FRAGA et al. 2013, STARACE 2013, KOCH et al. 2015) considered *Stenostoma albifrons* WAGLER, 1824 as nomen dubium and *Leptotyphlops tenellus* KLAUBER 1939 as a valid species as defined in the original description. Members of the “*albifrons-tenella* school of thought” (OREJAS-MIRANDA 1967, PETERS & OREJAS-MIRANDA 1970, ADALSTEINSSON et al. 2009, WALLACH et al. 2014, MCCRANIE & HEDGES 2016, WALLACH 2016, MURPHY et al. 2016) who considered both taxa as valid, and members of the “*albifrons* school of thought” (HOOGMOED & GRUBER 1983, PÉREZ-SANTOS & MORENO 1988, KORNACKER 1999, MCDIARMID et al. 1999, AVILA-PIRES et al. 2010, COLE et al. 2013) who believe that taxonomic stability is best served by conserving the oldest name *Stenostoma albifrons* and considering *E. tenella* as synonym.

NATERA-MUMAW et al. (2015) did not agree with the nomen dubium designation using as justification the existence of an indirect diagnostic character, in WAGLER's original description. According to NATERA-MUMAW et al. (2015) the presence of supraocular–supralabial contact al-

ways causes the eye shield (=ocular scale) to be pentagonal, as described by WAGLER (1824). In fact, WAGLER in the original description of *Stenostoma albifrons* mentioned “scuta ocularia magna, subquingula, vix subpunctata...” (= ocular scales large, subpentagonal, slightly spotted). This would help to recognize specimens of *E. albifrons* today as *E. tenella* for which this character is typical. NATERA-MUMAW et al. (2015) found two conditions in the ocular scale based on 25 *Epictia* species that they analyzed. The first condition shows a hexagonal ocular and direct contact with five (or six) cephalic shields + mouth and no contact between supraorbital and supraocular shields. The second condition shows a pentagonal ocular in direct contact with only four cephalic shields + mouth and with a suture between the first supraorbital and supraocular present. However, these authors did not cite which species have the first and which have the second condition.

NATERA-MUMAW et al. (2015) consider *Leptotyphlops tenella* (MCZ 2885), from Pará, Brazil, without specific location, as topotype of *S. albifrons* and designate this specimen as its neotype. We do not applaud this designation, since the State of Pará in the northern region of Brazil has about 1,250,000 km² and several different environments, so this specimen hardly can be considered as a “topotype” (ICZN, 1999; page 120). Also, the specimen is badly damaged, making some scale counts impossible, but it is still recognizable. Moreover, there are many well preserved specimens available from the same region, with detailed locality data. However, this is just our opinion and it does not invalidate the designation made by NATERA-MUMAW et al. (2015). WALLACH (2016) found 14 specimens in the BYU collection from Belém, Pará, Brazil collected between 1946 and 1953, but without any data about collector(s). These specimens would be, according to WALLACH (2016), topotypes of *Stenostoma albifrons*. Thus, he rejects the designation of NATERA-MUMAW et al. (2015) and proposes a new neotype (BYU 11490) for the species, arguing that NATERA-MUMAW et al. (2015) did not act in agreement with the ICZN (1999) code, especially Article 75.3.3, because the specimen indicated as neotype (MCZ 2885) is broken in two pieces. The specimen is badly preserved and it is not possible to obtain some scale counts. However, WALLACH (2016) himself acts against Article 75.4 of ICZN (1999), which decides that the first neotype designation published for a nominal species-group taxon is valid and no subsequent designation, except one made by the Commission under the plenary powers (Art. 78.1), has any validity. Thus, the subsequent designation of BYU 11490 as neotype of *E. albifrons* by WALLACH (2016) is not valid at all (see ICZN article 75.4. Priority on p. 85). MURPHY et al. (2016) seem to accept WALLACH's (2016) neotype designation (against ICZN rules and based on a different species (see below), and consider the *E. tenella-albifrons* matter settled by WALLACH's (2016) neotype indication. Unfortunately these same authors, in their Fig. 1 apparently have switched the names of the species they depict. In the text they correctly state that a characteristic of *E. tenella* is the contact between supraocular and first supraorbital, and that in *E. albifrons* this

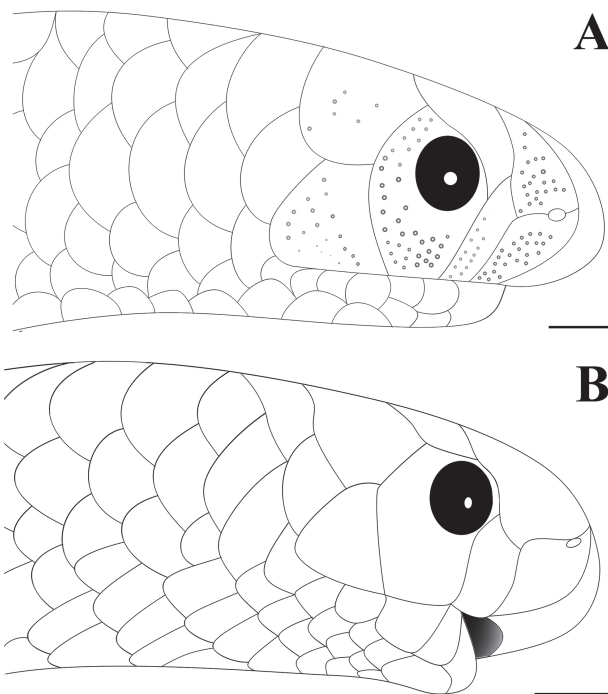


Figure 1. Scheme of ocular forms and supraocular-supralabial conditions. (A) Ocular pentagonal and presence of supraocular-supralabial contact in *Epictia albifrons* (AMNH 14269 – Holotype of *Epictia tenella*); and (B) ocular hexagonal and absence of supraocular-supralabial contact in *Epictia australis* (USNM 34599). Illustration by W. S. AZEVEDO. Scale = 1 mm.

contact is absent, but on which they base themselves here is not clear (probably WALLACH, 2016). However, in Fig. 1A a specimen with supraocular–first supralabial contact is shown and said to be *E. albifrons*, whereas Fig. 1B shows a specimen without such contact and is said to be *E. tenella*. Thus MURPHY et al. (2016) increase the confusion about the identity of the taxa here discussed. MURPHY et al. (2016) in the summary state that they have morphologically compared WALLACH's (2016) neotype (of *E. albifrons*) with their Trinidad specimens and come to the conclusion they are all *E. tenella*. However, in the text there is no discussion about morphology, and the only place where they make a morphological comparison is in Fig. 3, but the neotype of *E. albifrons* they show there is that of NATERA-MUMAW et al. (2016), not that of WALLACH (2016). Thus, MURPHY et al. (2016), despite the confusion they create, only show that *E. tenella* from Trinidad and specimens from Guyana belong to the same taxon (which already had been established) and should indeed be named *E. albifrons*.

Several authors did not mention the ocular shape and the presence or absence of a supraocular–supralabial contact (as cited in NATERA-MUMAW et al. 2015), but drawings show that in species with a hexagonal ocular there is no such contact, and inversely when the ocular is pentagonal there is contact between supraocular and infralabial (e.g. OREJAS-MIRANDA 1967, HOOGMOED 1977, PINTO et al. 2010, ARREDONDO & ZAHER, 2011, FRANCISCO et al. 2012, KOCH et al. 2015; Table 1; Fig. 1). WALLACH (2016) shows a relation of ocular shape and supraocular–supralabial contact in several *Epictia* species [*E. albifrons* (WAGLER, 1824), *E. goudotti* (DUMÉRIL & BIBRON, 1844), *E. phenops* (COPE, 1875), *E. bakewelli* (OLIVER, 1937), *E. columbi* (KLAUBER, 1939), *E. magnamaculata* (TAYLOR, 1940), *E. ater* (TAYLOR, 1940), *E. martinezi* WALLACH, 2016, *E. pauldwyeri* WALLACH, 2016, *E. resetari* WALLACH, 2016, *E. schneideri* WALLACH, 2016, *E. vindumi* WALLACH, 2016, *E. wynnii* WALLACH, 2016] which he considered to have a hexagonal ocular and a small to medium anterior supralabial not contacting the supraocular, whereas he shows that *E. tenella* has a pentagonal ocular and a large first supralabial in contact with the supraocular [Table 2 (a,b), page 222–223]. As an exception, FRANCISCO et al. (2012) described a subpentagonal or subhexagonal ocular (paratype condition) for *Epictia munoai* OREJAS-MIRANDA, 1961 from Southern Brazil, Uruguay and Argentina, but the species has no supraocular–supralabial contact.

WALLACH (2016) compared *E. albifrons* with all congeneric species, and separated *Epictia tenella* from *E. albifrons* on the basis of the presence/absence of the supraocular–first supralabial contact, present in *E. tenella*, absent in *E. albifrons*. Considering that WAGLER's (1824) diagnosis included a description of the pentagonal ocular shape and the recently postulated relation between ocular shape and the presence of the supralabial–supraocular contact proposed by NATERA-MUMAW et al. (2015), we agree that in fact the type of *Stenostoma albifrons* WAGLER, 1824 has such a contact. In northern Brazil, only *E. tenella* presents this character, so it is possible to relate it directly with *E. albifrons*.

FRANCO & PINTO (2009) proposed solving the nomenclatural problem with the designation of a new neotype. WALLACH (2016) agreed with FRANCO & PINTO (2009) that it is not possible to link the original description and illustration with diagnostic features of the species. However, WALLACH (2016) disagrees with the original description by stating that *S. albifrons* (based on the BYU material he studied) has a hexagonal ocular and no contact between the supraocular and anterior supralabial shields. WALLACH (2016) based the neotype designation and species variation on 14 specimens that according to WALLACH (2016) were collected on Mormon Missions (but that information seems to be based on a supposition of the author, as it is not present in the BYU collection and could not be verified with the Mormon administration in Provo, Utah, by the curator of BYU JACK SITES (pers. comm.) and thus remains very doubtful) between 1946 and 1953 in the vicinity of Belém, Pará, Brazil. We accept that the type of *S. albifrons* showed supraocular–supralabial contact and that the BYU material studied by WALLACH (2016) does not show any contact. Thus, the BYU material cannot be considered to belong to the same taxon as *Stenostoma albifrons*, as this character indeed shows very little variation (KOCH et al. 2016). The fact that *E. albifrons* (= *tenella*) has not been found in the area of Belém (its type locality) south of the Amazon river, could be explained by incorrect, or wrong, labeling by Johann Baptist von Spix of the type material (it happened several times). It is known that Spix has visited several localities more or less close to Belém on the north bank of the Amazon where *E. albifrons* (= *tenella*) is well known.

The specimens indicated as topotypes of *S. albifrons* by WALLACH (2016) were considered by ARREDONDO & ZAHER (2011) to be *Epictia munoai*, a cisandine species restricted to southern South America. However, based on the descriptions of WALLACH (2016) and photographs in his paper it was possible to verify that the BYU material is not *E. munoai*, which has three infralabials, while *E. albifrons* sensu WALLACH (2016) has four. For different reasons neither, ARREDONDO & ZAHER (op. cit) or we believe that these specimens are from the region near Belém, Pará, considering the history of intensive collections in the region of Belém, for over 100 years, without finding other specimens. Almost certainly the specimens cited by WALLACH (2016) and ARREDONDO & ZAHER (2010) correspond to an unnamed species, but not from Belém.

Summarizing, on the one hand we believe that the indication of MCZ 2885 as neotype of *S. albifrons* by NATERA-MUMAW et al. (2015) is valid, but unfortunately was not very adequate since the neotype is from a loosely defined area (whereas many well-preserved specimens from detailed localities are available in collections), and it is a badly preserved, fragile and fragmented specimen. NATERA-MUMAW et al. (2015) consider *Epictia tenella* a junior synonym of *E. albifrons*, as already suggested by HOOGMOED & GRUBER (1983). On the other hand, WALLACH's (2016) proposal for a new neotype for *S. albifrons* is not valid because of what is stated in ICZN article 75.4, and moreover it is based on a different species and therefore should be

Correspondence

Table 1. Relation of ocular shape and presence or absence of supraocular-supralabial (SO-SL) contact in *Epictia* species. *Considered synonym of *E. albifrons* in NATERA-MUMAW et al. 2015. ** Analyzed specimens: *E. australis*: ARGENTINA: Buenos Aires, Tandil: USNM 345499; *E. borapeliotes*: BRAZIL: Paraíba, Campina Grande: IBSP 87141-143; *E. melanura*: PERU: La Libertad: FMNH 34269 (Holotype); *E. rufidorsa*: PERU: Lima, Rimac Valley: USNM 49993 (Holotype); *E. signata*: COLOMBIA: Meta, La Macarena: ICN 1224. Meta, San Juan de Arama: ICN 6535; *E. striatula*: BOLIVIA, La Paz, Sur Yungas, Yanacachi, ca. 4 km from, Hacienda Livinoso: USNM 98889 (Holotype); *E. tenella* GUYANA: Cuyuni-Mazaruni, Bartica District, Kartabo: AMNH 14269 (Holotype); *E. tessellata*: PERU: No specific locality: FMNH 35097; *E. vellardi*: BRAZIL, Mato Grosso do Sul, Corumbá: IBSP 87530.

Species	Ocular Shape	SO-SL contact	Source
<i>E. albifrons</i> (WAGLER, 1824)	Pentagonal	Present	NATERA-MUMAW et al. 2015
<i>E. albipuncta</i> (BURMEISTER, 1861)	Hexagonal	Absent	KRETZSCHMAR 2006
<i>E. alfredschmidti</i> (LEHR, WALLACH, KÖHLER & AGUILAR, 2002)	Pentagonal	Present	LEHR et al. 2002
<i>E. amazonica</i> (OREJAS-MIRANDA, 1969)	Hexagonal	Absent	OREJAS-MIRANDA 1969, NATERA-MUMAW et al. 2015
<i>E. antoniogarciai</i> KOCH, VENEGAS & BÖHME, 2015	Pentagonal	Present	KOCH et al. 2015
<i>E. ater</i> (TAYLOR, 1940)	Hexagonal	Absent	TAYLOR 1940, WALLACH 2016
<i>E. australis</i> (FREIBERG & OREJAS-MIRANDA, 1968)	Hexagonal	Absent	CEI 1986, Our source (USNM 345499)**
<i>E. bakewelli</i> (OLIVER, 1937)	Hexagonal	Absent	WALLACH 2016
<i>E. borapeliotes</i> (VANZOLINI, 1996)	Hexagonal	Absent	VANZOLINI 1996, Our source (IBSP 87141-143)**
<i>E. clinorostris</i> ARREDONDO & ZAHER, 2010	Hexagonal	Absent	ARREDONDO & ZAHER 2010, FRANCISCO et al. 2012
<i>E. collaris</i> (HOOGMOED, 1977)	Hexagonal	Absent	HOOGMOED 1977
<i>E. columbi</i> (KLAUBER, 1939)	Hexagonal	Absent	KLAUBER 1939, WALLACH 2016
<i>E. diaplocia</i> (OREJAS-MIRANDA, 1969)	Hexagonal	Absent	OREJAS-MIRANDA 1969
<i>E. fallax</i> (PETERS, 1858)	Hexagonal	Absent	NATERA-MUMAW et al. 2015
<i>E. goudotti</i> (DUMÉRIL & BIBRON, 1844)	Hexagonal	Absent	PINTO et al. 2010, NATERA-MUMAW et al. 2015, WALLACH 2016
<i>E. hobartsmithi</i> ESQUEDA, SCHLÜTER, MACHADO, CASTELAÍN & NATERA-MUMAW, 2015	Pentagonal	Present	ESQUEDA et al. in NATERA-MUMAW 2015
<i>E. magnamaculata</i> (TAYLOR, 1940)	Hexagonal	Absent	TAYLOR 1940, PINTO et al. 2010, NATERA-MUMAW et al. 2015, WALLACH 2016
<i>E. martinezi</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016
<i>E. melanura</i> (SCHMIDT & WALKER, 1943)	Hexagonal	Absent	SCHMIDT & WALKER 1943; holotype photos in official website (FMNH 34269)**
<i>E. munoai</i> (OREJAS-MIRANDA, 1961)	Subhexagonal or Subpentagonal	Absent	OREJAS-MIRANDA 1961, FRANCISCO et al. 2012
<i>E. pauldwyeri</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016
<i>E. peruviana</i> (OREJAS-MIRANDA, 1969)	Hexagonal	Absent	OREJAS-MIRANDA 1969
<i>E. phenops</i> (COPE, 1875)	Hexagonal	Absent	WALLACH 2016
<i>E. resetari</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016
<i>E. rubrolineata</i> (WERNER, 1901)	?	?	
<i>E. rufidorsa</i> (TAYLOR, 1940)	Pentagonal	Present	TAYLOR 1940, SCHMIDT & WALKER 1943; holotype photos in official website (USNM 49993)
<i>E. schneideri</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016
<i>E. septemlineata</i> KOCH, VENEGAS & BÖHME, 2015	Pentagonal	Present	KOCH et al. 2015
<i>E. signata</i> (JAN, 1861)	Hexagonal and Subhexagonal	Absent	BOULENGER 1893, HAHN 1979, PINTO et al. 2010, NATERA-MUMAW et al. 2015, WALLACH 2016, Our source (ICN 1224, 6535)**
<i>E. striatula</i> (SMITH & LAUFE, 1945)	Hexagonal	Absent	SMITH & LAUFE 1945, holotype photos in official website (USNM 98889)**
<i>E. subcrotilla</i> (KLAUBER, 1939)	Hexagonal	Absent	KLAUBER 1939
<i>E. teaguei</i> (OREJAS-MIRANDA, 1964)	Pentagonal	Present	OREJAS-MIRANDA 1964
<i>E. tenella</i> (KLAUBER, 1939)*	Pentagonal	Present	HOOGMOED 1977, Our source (AMNH 14269)**
<i>E. tessellata</i> (Tschudi, 1845)	Pentagonal	Present	SCHMIDT & WALKER 1943, type photos in official website (FMNH 35097)**

Species	Ocular Shape	SO-SL contact	Source
<i>E. tricolor</i> (OREJAS-MIRANDA & ZUG, 1974)	Pentagonal	Present	OREJAS-MIRANDA & ZUG, 1974
<i>E. undecimstriata</i> (SCHLEGEL, 1839)	Hexagonal	Absent	NATERA-MUMAW et al. 2015
<i>E. unicolor</i> (WERNER, 1913)	Subquadrate/ Subocular present	Absent	BOUDY & WALLACH, 2008
<i>E. vanwallachi</i> KOCH, VENEGAS & BÖHME, 2015	Pentagonal	Present	KOCH et al. 2015
<i>E. vellardi</i> (LAURENT, 1984)	Hexagonal	Absent	LAURENT 1984, FRANCISCO et al. 2012, Our source (IBSP 87530)**
<i>E. venegasi</i> KOCH, SANTA CRUZ & CÁRDENAS, 2016	Pentagonal	Present	KOCH et al. 2016
<i>E. vindumi</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016
<i>E. vonmayi</i> KOCH, SANTA CRUZ & CÁRDENAS, 2016	Pentagonal	Present	KOCH et al. 2016
<i>E. wynti</i> WALLACH, 2016	Hexagonal	Absent	WALLACH 2016

neglected. We think that the best way would have been to indicate the holotype of *Leptotyphlops tenella* as the neotype for *S. albifrons*. In that way both names would be coupled forever and take away all doubts about the identity of the taxon.

Acknowledgements

We thank G. PUERTO (IBSP), K. DE QUEIROZ and R. WILSON (USNM) for permission and facilities to examine specimens under their care. We also thank W. S. AZEVEDO (IBSP) for schematic illustrations of *Epictia australis* and *E. tenella*.

References

- ADALSTEINSSON, S. A., W. R. BRANCH, S. TRAPE, L. J. VITT & S. B. HEDGES (2009): Molecular phylogeny, classification, and biogeography of snakes of the family Leptotyphlopidae (Reptilia, Squamata). – *Zootaxa*, **2244**: 1–50.
- ARREDONDO, J. C. & H. ZAHER (2010): A new species of *Epictia* (Serpentes: Leptotyphlopidae) from Central Brazil. – *South American Journal of Herpetology*, **5**: 189–198.
- ÁVILA-PIRES, T. C. S., M. S. HOOGMOED & W. A. ROCHA (2010): Notes on the vertebrates of northern Pará, Brasil: a forgotten part of the Guianan region, I. Herpetofauna. – *Boletim do Museu Paraense Emílio Goeldi (Ciências Naturais)*, **5**: 13–112.
- BOULENGER, G. A. (1893): Catalogue of the snakes in the British Museum (Natural History). Vol. 1. – Trustees of the British Museum, London, 448 pp.
- BOUDY, J. & V. WALLACH (2008): The identity of the leptotyphlopoid snake *Glauconia unicolor*, Werner, 1913 (Squamata: Serpentes: Leptotyphlopidae). – *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, **105**: 53–56.
- CEI, J. M. (1986): Reptiles del centro, centro-oeste y sur de la Argentina. Herpetofauna de las zonas áridas y semiáridas. – *Museo Regionale di Scienze Naturali*, **4**: 358–366.
- COLE, C. J., C. R. TOWNSEND, R. P. REYNOLDS, R. D. MACCULLOCH & A. LATHROP (2013): Amphibians and reptiles of Guyana, South America: illustrated Keys, annotated species accounts, and a biogeographic synopsis. – *Proceedings of the Biological Society of Washington*, **125**: 317–620.
- CUNHA, O. R. & F. P. NASCIMENTO (1978): Ofídios da Amazônia – X-As cobras da região leste do Pará. Vol. 3. – *Publicações avulsas do Museu Goeldi, Belém*, **31**: 1–218.
- CUNHA, O. R. & F. P. NASCIMENTO (1993): Ofídios da Amazônia – X-As cobras da região leste do Pará. – *Boletim do Museu Paraense Emílio Goeldi*, **9**: 1–191.
- D'ORBIGNY, A. (1847): Voyage dans l'Amérique Méridionale (le Brésil, la République orientale de l'Uruguay, la République Argentine, la Patagonie, la République du Chili, la République de Bolivie, la République du Pérou) exécuté pendant les années 1826, 1827, 1828, 1829, 1830, 1831, 1832 et 1833, par Alcides D'Orbigny. – Facsimile reprint by the SSAR, Athens, 1975.
- DUMÉRIL, A. M. C. & G. BIBRON (1844): *Erpetologie Générale ou Histoire Naturelle Complete des Reptiles*. Vol. 6. – *Libr. Encyclopédique Roret*, Paris.
- ESQUEDA, L. F., A. SCHLÜTER, C. MACHADO, M. CASTELAÍN & M. NATERA-MUMAW (2015): Una nueva especie de cieguita o serpiente de gusano (Serpentes: Leptotyphlopidae: *Epictia*) nativa del Tepui Guaiquinima, Provincia Pantepui en el escudo de Guyana, Venezuela. – pp. 414–433 in: NATERA-MUMAW, M., L. F. ESQUEDA GONZÁLEZ & M. CASTELAÍN FERNÁNDEZ (eds): *Atlas serpientes de Venezuela: una visión actual de su diversidad*. – Fundación Biogeos, Asociación Venezolana de Herpetología, Fundación Ecologica sin Fronteras y Serpentario.com, Venezuela.
- FRAGA, R., A. P. LIMA, A. L. C. PRUDENTE & W. E. MAGNUSON (2013): Guide to the snakes of the Manaus Region. Central Amazonia. Editora INPA, Manaus, 303 pp.
- FRANCISCO, B. C. S., R. R. PINTO & D. S. FERNANDES (2012): Taxonomy of *Epictia munoai* (Orejas-Miranda, 1961) (Squamata: Serpentes: Leptotyphlopidae). – *Zootaxa*, **3512**: 42–52.
- FRANCO, F. L. & R. R. PINTO (2009): *Stenostoma albifrons* Wagler in Spix, 1824 as nomen dubium and recognition of the name *Leptotyphlops tenellus* Klauber, 1939 (Serpentes: Leptotyphlopidae). – *Salamandra*, **45**: 239–244.
- FRANZEN, M. & F. GLAW (2007): Type catalogue of reptiles in the Zoologische Staatssammlung München. – *Spixiana*, **30**: 201–274.
- HAHN, D. E. (1979): The identity of the blind snake *Stenostoma signatum* Jan, 1861 (Serpentes: Leptotyphlopidae). – *Herpetologica*, **35**: 57–60.
- HAHN, D. E. (1980): Liste der rezenten Amphibien and Reptilien. Anomalepididae, Leptotyphlopidae, Typhlopidae. – *Das Tierreich*, **101**: 1–93.
- HOOGMOED, M. S. (1977): On a new species of *Leptotyphlops* from Surinam, with notes on the other Surinam species of the genus (Leptotyphlopidae, Serpentes). Notes on the herpetofauna of Surinam V. – *Zoologische Mededelingen*, **51**: 99–123.
- HOOGMOED, M. S. & U. GRUBER (1983): Spix and Wagler type specimens of reptiles and amphibians in the Natural History Museum

- in Munich (Germany) and Leiden (The Netherlands). – *Spixiana*, **9**: 319–415.
- ICZN (1999): International Code of Zoological Nomenclature. Ed. 4. – London: International Commission on Zoological Nomenclature.
- JAN, G. (1859): Spix' Serpentes Brasilienses beurtheilt nach Autopsie der Originalenplare und auf die Nomenclatur von Dumeril und Bibron zurückgeführt. – *Archiv für Naturgeschichte*, **25**: 272–276.
- KLAUBER, L. M. (1939): Three new worm snakes of the genus *Leptotyphlops*. – *Transactions of the San Diego Society of Natural History*, **9**: 59–65.
- KOCH, C., R. SANTA CRUZ & H. CÁRDENAS (2016): Two new endemic species of *Epictia* Gray, 1845 (Serpentes: Leptotyphlopidae) from Northern Peru. – *Zootaxa*, **4150**: 101–122.
- KOCH, C., P. J. VENEGAS & W. BÖHME (2015): Three new endemic species of *Epictia* Gray, 1845 (Serpentes: Leptotyphlopidae) from the dry forest of northwestern Peru. – *Zootaxa*, **3964**: 228–244.
- KORNACKER, P. M. (1999): Checklist and key to the snakes of Venezuela. Lista sistemática y clave para las serpientes de Venezuela. – Pako-Verlag, Rheinbach, 270 pp.
- KRETZSCHMAR, S. (2006): Revisión histórica y redescipción de *Leptotyphlops albipunctatus* (Serpentes: Leptotyphlopidae). – *Cuadernos de Herpetología*, **19**: 43–56.
- LAURENT, R. F. (1984): The Genus *Leptotyphlops* in the collection of the Fundación Miguel Lillo Argentina. – *Acta Zoologica Lilloana*, **38**: 29–34.
- LEHR, E., V. WALLACH, G. KÖHLER & C. AGUILAR (2002): New species of tricolor *Leptotyphlops* (Reptilia: Squamata: Leptotyphlopidae) from central Peru. – *Copeia*, **2002**: 131–136.
- MCCRANIE, J. R. & S. B. HEDGES (2016): Molecular phylogeny and taxonomy of the *Epictia goudotii* Species complex (Serpentes: Leptotyphlopidae: Epictinae) in Middle America and northern South America. – *PeerJ*, **4**: e1551; DOI 10.7717/peerj.1551.
- MCDIARMID, R. W., J. A. CAMPBELL & T. TOURÉ (1999): Snake species of the world. A taxonomic and geographic reference. Vol. 1. The Herpetologists' League, Washington DC, 512 pp.
- MURPHY, J. C., M. G. RUTHERFORD & M. J. JOWERS (2016): The threadsnake tangle: lack of genetic divergence in *Epictia tenella* (Squamata, Leptotyphlopidae): evidence for introductions or recent rafting to the West Indies. – *Studies on Neotropical Fauna and Environment*, **51**: 197–205.
- NATERA-MUMAW, M., L. F. ESQUEDA GONZÁLEZ & M. CASTELAÍN FERNÁNDEZ (2015): Atlas serpientes de Venezuela: una visión actual de su diversidad. – Fundación Biogeos, Asociación Venezolana de Herpetología, Fundación Ecológica sin Fronteras y Serpentario.com, Venezuela, 441 pp.
- OREJAS-MIRANDA, B. R. (1961): Una nueva especie de ofidio de la familia Leptotyphlopidae. – *Acta Biologica Venezuelica*, **3**: 83–97.
- OREJAS-MIRANDA, B. R. (1964): Dos nuevos Leptotyphlopidae de Sur America. – *Comunicaciones Zoológicas del Museo de Historia Natural de Montevideo*, **8**: 1–7.
- OREJAS-MIRANDA, B. R. (1967): El genero "*Leptotyphlops*" en la región Amazónica. – *Atas do Simpósio sobre a Biota Amazonica*, **5**: 421–442.
- OREJAS-MIRANDA, B. R. (1969): Tres nuevos *Leptotyphlops* (Reptilia: Serpentes). – *Comunicaciones Zoológicas del Museo de Historia Natural de Montevideo*, **10**: 1–11.
- OREJAS-MIRANDA, B. R. & G. R. ZUG (1974): A new tricolor *Leptotyphlops* (Reptilia: Serpentes) from Peru. – *Proceedings of the Biological Society of Washington*, **87**: 167–174.
- PÉREZ-SANTOS, C. & A. G. MORENO (1988): Ofidios de Colombia. Monografía 6. – Torino: Museo Regionale di Scienze Naturali, 517 PP.
- PETERS, J. A. & B. R. OREJAS-MIRANDA (1970): Catalogue of the Neotropical Squamata: Part 1. Snakes. – *Bulletin of the United States National Museum*, **297**: 1–347.
- PINTO, R. R. & F. CURCIO (2011): On the generic identity of *Siagonodon brasiliensis*, with the description of a new leptotyphlopoid from Central Brazil (Serpentes: Leptotyphlopidae). – *Copeia*, **2011**: 53–63.
- PINTO, R. R. & R. FERNANDES (2012): A new blind snake species of the genus *Tricheilostoma* from Espinhaço Range, Brazil and taxonomic status of *Rena dimidiata* (Jan, 1861) (Serpentes: Epictinae: Leptotyphlopidae). – *Copeia*, **2012**: 37–48.
- PINTO, R. R. & R. FERNANDES (2017): Morphological variation of *Trilepida macrolepis* (Peters 1857), with reappraisal of the taxonomic status of *Rena affinis* (Boulenger 1884) (Serpentes: Leptotyphlopidae: Epictinae). – *Zootaxa*, **4244**: 246–260.
- PINTO, R. R., P. PASSOS, J. R. C. PORTILLA, J. C. ARREDONDO & R. FERNANDES (2010): Taxonomy of the threadsnakes of the tribe Epictini (Squamata: Serpentes: Leptotyphlopidae) in Colombia. – *Zootaxa*, **2724**: 1–28.
- SCHMIDT, K. P. & W. F. WALKER (1943): Snakes of the Peruvian coastal region. – *Field Museum of Natural History, Zoological Series*, **24**: 297–324.
- SMITH, H. M. & L. E. LAUFE (1945): A new South American *Leptotyphlops*. – *Proceedings of the Biological Society of Washington*, **58**: 29–32.
- SMITH, H. M. & J. C. LIST (1958): Type of the blind snake *Stenostoma albifrons*. – *Herpetologica*, **13**: 271.
- STARACE, F. (2013): Serpents et Amphibènes de Guyane Française. – Ibis Rouge Éditions, Matoury, French Guiana, 608 pp.
- TAYLOR, E. H. (1940) [dated of 1939]: *Herpetological miscellany No. I*. – *University of Kansas Science Bulletin*, **26**: 489–571.
- VANZOLINI, P. E. (1970): *Zoologia sistemática, geografia e a origem das especies*. – Instituto Geografico São Paulo. Serie Teses e Monografias, **3**: 1–56.
- VANZOLINI, P. E. (1996): A new (and very old) species of *Leptotyphlops* from northeastern Brasil (Serpentes, Leptotyphlopidae). – *Papéis Avulsos de Zoologia (Sao Paulo)*, **39**: 281–291.
- WAGLER, J. (1824): *Serpentum Brasiliensium species novae, ou histoire naturelle des espèces nouvelles de serpens*. – Hübschmanni, Monaco, 75 pp.
- WALLACH, V. (2003) *Scolecophidia miscellanea*. – *Hamadryad*, **27**: 222–240.
- WALLACH, V. (2016): Morphological review and taxonomic status of the *Epictia phenops* species group of Mesoamerica, with description of six new species and discussion of South American *Epictia albifrons*, *E. goudotii*, and *E. tenella* (Serpentes: Leptotyphlopidae: Epictinae). – *Mesoamerican Herpetology*, **3**: 216–374.
- WALLACH, V., K. L. WILLIAMS & J. BOUNDY (2014): *Snakes of the World: a Catalogue of Living and Extinct Species*. – CRC Press, Boca Raton, Florida, United States, 1226 pp.
- WERNER, F. (1901): *Reptilien und Batrachier aus Peru und Bolivien*. – *Abhandlungen und Berichte des Königlichen Zoologischen Anthropologisch-ethnographischen Museums zu Dresden*, **9**: 1–14.
- WILSON, L. D. & D. E. HAHN (1973): *Herpetofauna of the Islas de la Bahía, Honduras*. – *Bulletin of the Florida State Museum, Biological Sciences*, **17**: 93–150.