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The identity of *Stenorhabdium temporale* Werner, 1909 (Serpentes: Colubroidea)

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Abstract

Re-examination of the type material of *Ligonirostra Stuhlmanni* Pfeffer, 1893 (original spelling, now *Prosymna stuhlmanni*) and comparison with the sole type specimen of its synonym *Stenorhabdium temporale* Werner, 1909 revealed a number of significant morphological differences between these taxa. Detailed analyses of pholidosis and osteology of comparative material show that *S. temporale* is in fact a subjective junior synonym of *Pseudorabdion longiceps* (Cantor, 1847). A lectotype and a paralectotype of *Ligonirostra stuhlmanni* are designated and described.

Key words

Reptilia, Serpentes, Lamprophiidae, Colubridae, *Stenorhabdium temporale* new synonym, *Pseudorabdion longiceps*.

Introduction

In 1909 Franz Werner described from a single specimen the new monotypic genus and species *Stenorhabdium temporale*. According to the original description it is assumed that the holotype was collected in "Ostafrika" [East Africa] and was given by "Stud. Schwarzkopf" to the collection of the then "Königliches Naturalienkabinett in Stuttgart" [now Staatliches Museum für Naturkunde Stuttgart] where it is catalogued under inventory number SMNS 3204. Since its erection the name *Stenorhabdium temporale* has only been mentioned sporadically in the literature and can be found in Werner's synopses (1923, 1929), in encyclopedic catalogues of generic and subgeneric names (e.g. Schulze *et al.* 1937; Naeve 1940) as well as the Zoological Record (Boulenger 1911).

Loveridge (1957 p. 265; 1958 p. 127) assumed that the holotype of *S. temporale* was lost, and synonymized the taxon with *Prosymna ambigua stuhlmanni* (Pfeffer, 1893) (now *Prosymna stuhlmanni*, considered as specifically distinct from *P. ambigua* by Broadley (1992)) based on Werner's original description. Subsequently, this classification was followed by anyone who worked on the genus *Prosymna*, as well as by authors mentioning the genus name *Stenorhabdium* or the taxon *S. temporale* (e.g. Loveridge 1958; Broadley 1980; 1983; Williams & Wallach 1989; Schlüter & Hallermann 1997; Wallach *et al*. 2014). However, in 1997 Schlüter & Hallermann published the type catalogue of the herpetological collection of the Staatliches Museum für Naturkunde Stuttgart, which showed that Werner's holotype of *S. temporale* had actually not been lost. Nevertheless, a re-examination of the specimen to confirm the status of *S. temporale* was never conducted.

During examination of different species of the genus *Prosymna* Gray, 1849 we recently re-examined the holotype of *Stenorhabdium temporale* Werner, 1909. A direct comparison with one of the syntypes of *Ligonirostra stuhlmanni* Pfeffer, 1893 showed that by no means could *S. temporale* be considered conspecific with *L. stuhlmanni*, since the holotype of Werner's taxon shows a number of significant morphological differ-

ences that preclude its assignment to the genus *Prosymna*. In this paper, we discuss the present allocation of *S. temporale* as synonym of *P. stuhlmanni* and clarify its actual identity.

Material and Methods

This contribution is based on the study of selected preserved specimens of the genera *Stenorhabdium*, *Prosymna* and *Pseudorabdion* (see below), as well as information from the literature.

Dorsal scale rows were counted at three points along the trunk, i.e. at one head length posterior to the end of the head, at midbody, and at one head length anterior to the anal scute. Dorsal scale row reduction formulae are based on DOWLING (1951a). The reduction formulae for the supracaudal scales is used analogous to the dorsal scale row reduction scheme.

Head length is defined as the length from the tip of the snout to the end of the parietals. The midbody scale count was taken at half of the total number of ventral scales. Ventrals were counted according to DOWLING (1951b). The terminal scale is not included in the subcaudal count. Values for symmetric characters are given as left/right. Sex of specimens were determined by the presence or absence of hemipenes, inspected through a subcaudal incision at the tail base.

Colour descriptions are based on preserved specimens.

The heads of types of *Stenorhabdium temporale* and *Ligonirostra stuhlmanni* as well as comparative material of *Pseudorabdion* were subjected to micro-tomographic analysis at the Museum für Naturkunde Berlin, using a Phoenix nanotom X-ray|s tube at 70 kV and 150 or 200 µA, generating 1000 projections with 750 ms per scan. The different kV-settings depended on the respective specimen size. Effective voxel size, i.e. resolution in three-dimensional space, ranged from 4.2–10 µm. The cone beam reconstruction was performed using the datos|x-reconstruction software (GE Sensing & Inspection Technologies GMBH phoenix|x-ray datos|x 2.0) and the data were visualised in VG Studio Max 2.2.

Abbreviations and Acronyms

DSR Dorsal scale rows
MTD Senckenberg Naturhistorische Sammlungen Dresden, Museum für Tierkunde
SMNS Staatliches Museum für Naturkunde Stuttgart
ZMH CeNak (Center of Natural History), Zoologisches Museum, Universität Hamburg (former Zoologisches Museum Hamburg);
ZMB Museum für Naturkunde Berlin, Leibniz Institute for Evolution and Biodiversity Science (former Zoologisches Museum Berlin).

Material studied

Pseudorabdion eiselti – ZMB 4766: "Lahat, SW Sumatra", Indonesia; ZMB 5985: "Ostindien" [Indonesia].

Pseudorabdion longiceps – MTD 6318: "Sumatra", Indonesia; SMNS 3204: "Ostafrika" in error (holotype of *Stenorhabdium temporale*); ZMB 3026: "Malacca", Malaysia; ZMB 4423: "Bangkok", Thailand; ZMB 4966–4967: "Pontianak, Borneo", Indonesia; ZMB 7091: "Sarawak, Borneo", Malaysia; ZMB 13111 and ZMB 13024: "Java", Indonesia; ZMB 30780 and ZMB 31404: "Siboelangit, Sumatra", Indonesia; ZMB 38562: "? Borneo"; ZMB 80319–80322 and ZMB 80492: "Malacca", Malaysia.

Pseudorabdion oxycephalum – ZMB 1560: "Philippinen".

Prosymna stuhlmanni – ZMH R07910: "Usambaá", Tanzania (lectotype of *Ligonirostra stuhlmanni*, designated here); ZMB 11088: "Usambáa", Tanzania (paralectotype of *Ligonirostra stuhlmanni*, designated here); ZMB 16822: "Kilwa, Deutsch Ostafrika", Tansania; ZMB 20805: "Tendaguru", Tanzania; ZMB 22463: "British Ost Afrika", Kenia; ZMB 23575: "Likwaye oder Tendaguru", Tanzania; ZMB 48230: "Mazimbu, Morogoro", Tansania; ZMB 51434: "Deutsch Ostafrika", without exact locality; ZMB 78750: "Dar es Salaam", Tanzania.

Results

Between 1905 and 1908 various specimens of amphibians and reptiles from the zoological collection of the "Königliches Naturalienkabinett in Stuttgart" were sent to FRANZ WERNER in Vienna/Austria (assistant at the "Erstes Zoologisches Institut der Kaiserlich-Königlichen Universität" at the time) for determination by Prof. Dr. KURT LAMPERT, then senior teacher, chairman and curator of the Stuttgart zoological collection. Parts of this material, including *S. temporale*, were subsequently described by WERNER (1909). When the material was returned, enclosed with it was a handwritten letter by F. WERNER listing the determinations of the specimens, a copy of which was provided to us courtesy of A. KUPFER (SMNS). *Stenorhabdium temporale* is not mentioned in this list, and inventory number 3204 refers to "*Rappia* sp. (nahe *concolor* Hall.)" – a reed frog – with the comment that it is a single individual from "Ostafrika" [East Africa] provided by "SCHWARZKOPF 1895". The original jar containing the type of *S. temporale* also holds two handwritten labels, one stating "3204, Ostafrika. SCHWARZKOPF 1895" and a second one inscribed with "*Stenorhabdium temporale* WERNER. Type. Ostafrika" (pers. com. A. KUPFER, May 2015). At what time the holotype of *S. temporale* was associated with the inventory number originally assigned to an African reed frog as well as its locality and collector information cannot be ascertained. Furthermore, it remains unclear why WERNER (1909) changed the date "1895", which was obviously linked to the presumed collector, into 1905. Further investigations showed that "Stud. SCHWARZKOPF" refers to "Studiosus, Cand. Med. in Tübingen" EMIL SCHWARZKOPF from Asperg, later Dr. med., practicing physician in Stuttgart, since 1895 on record as donator and full member of the "Verein für vater-

ländische Naturkunde in Württemberg" (Lampert 1895, 1897; Anonymous 1901, 1906).

Today it is impossible to recover the original collector's data and inventory number in order to check if the specimen that became the holotype of *S. temporale* was already accessioned into the Stuttgart collection before it was sent to Werner, since the original catalogue of the herpetology collection got lost in September 1944 during World War II (Schlüter & Hallermann 1997; Schlüter 2001). However, there is also a chance that the specimen was never part of the Stuttgart collection and was misplaced while it was in the hands of Werner who then erroneously assigned it to the material he had borrowed from the Stuttgart Museum.

Loveridge (1957 p. 265) synonymized without further comments *Stenorhabdium temporale* with *Prosymna ambigua stuhlmanni*, but explained his decision one year later: "I suggest that its [*Stenorhabdium*] condition masked its true appearance and resulted in some erroneous interpretations of what may have been a slightly aberrant *stuhlmanni*. Twenty-five years ago when I wished to see the holotype, it could not be found". He further indicated that according to Werner (1909) the type of *S. temporale* shows some unusual pholidotic characters in comparison to *P. a. stuhlmanni*, e. g., parietal in contact with labial, internasal and prefrontal divided, but finally established: "In other respects his [Werner's] holotype, now lost I believe, conforms to a male *a. stuhlmanni* in its lepidosis and scale counts" (Loveridge 1958 p. 128, p. 163).

After World War II, the curators of the amphibian and reptile collection in Stuttgart Heinz Wermuth (since 1962) and Andreas Schlüter (since 1984) were devoted to the challenging task of reconstructing lost collection data. One result of their effort is the catalogue of type material of the herpetological collection in Stuttgart (Schlüter & Hallermann 1997), which clarifies the status of the thought to be lost (according to Loveridge (1957; 1958) holotype of *S. temporale* and confirms its conservation.

Due to the presumed synonymy of *Stenorhabdium temporale* with *Prosymna stuhlmanni* we attempted to re-determine the syntypes of *Ligonirostra stuhlmanni* for comparison.

Broadley (1980) erroneously presumed that the type material of *L. stuhlmanni* was destroyed during World War II, and Wallach *et al.* (2014 p. 582) stated that the description of *L. stuhlmanni* is based on three specimens. However, the type series actually comprises two specimens only, as unmistakably declared by Pfeffer's (1893 p. 79) indication of "Zwei Stücke" [two pieces]. Wallach *et al.* (l. c.) incorrectly interpret Pfeffer's "No. 521–522" as inventory numbers for the herpetological collection of the Zoologisches Museum Hamburg, and added one of the correct inventory numbers (ZMH R07910) to 521 and 522, which undoubtedly were the field numbers as assigned by the collector Franz Stuhlmann.

Our current inquiry revealed that in fact only this one (ZMH R07910, old No. 1646), of the two syntypes, still exists in the collection of the Zoologisches Museum Hamburg, the second type could not be found (pers. com. J. Hallermann, Feb. 2015). The original inventory number of the second syntype is unknown due to the fact that all original correspondence, catalogues, and type lists of the herpetological collection were destroyed during World War II (Hallermann 2006). During an inspection of the *Prosymna* material in the collection of the Museum für Naturkunde Berlin we found a specimen (ZMB 11008) determined as *Prosymna ambigua* and collected at "Usambáa" by F. Stuhlmann. Its re-examination, a comparison with Pfeffer's original description and the associated inventory catalogue entry revealed that it represents the apparently lost second syntype of *Ligonirostra stuhlmanni* Pfeffer, 1893. After its examination by Georg Pfeffer, and in agreement with the collector F. Stuhlmann, the specimen was sent from the Museum Hamburg along with 28 other East-African amphibian and reptile species from Stuhlmann's collection, including types of *Phrynopsis boulengeri* and *Megalixalus stuhlmanni* described by Pfeffer (1893), to the Zoological Museum Berlin in 1893 (Zool. Mus. Sign. S II "Museum Hamburg"; Sign. S II "Stuhlmann, F.").

A comparison of both syntypes of *L. stuhlmanni* with the specimen depicted in Pfeffer (1893) revealed unambiguous concordance with the syntype from Hamburg. In order to fix the status, we herein designate in accordance with Articles 74.1. and 74.7. of the Code (ICZN, 1999), specimen ZMH R07910 as lectotype of *Ligonirostra stuhlmanni* described by Pfeffer, 1893, depicted on plate 1, figure 8–10 of the original description.

Redescription of the holotype of *Stenorhabdium temporale*

Figs. 1; 7 I a–b; 8 I a–e

As already indicated in the original description and by Schlüter & Hallermann (1997), the type specimen is in bad condition, i.e. dried up. Our careful re-examination revealed, by comparing it to Werner's (1909) description, that the specimen is without doubt the holotype of *S. temporale*, but that it also showed some pholidotic characters which differ from Werner's description. Werner noted the difficulties of examination because of the bad condition of the specimen. Nonetheless, it is still possible to ascertain morphological data for a proper determination.

SMNS 3204 [in error]: leg. "Stud. Schwarzkopf 1895" [in error]. Type locality: "Ostafrika" [in error]. Differences between our data and Werner's (1919) original description are added in brackets […]:

Sex and pholidosis – adult male; total length 218 mm [215 mm]; tail length 29 mm [25 mm]; head length 6.1 mm; ratio of tail length/total length 0.133; head not distinct from body and pointed; original body and tail

Fig. 1. Holotype of *Stenorhabdium temporale* (SMNS 3204), dorsal view. Scale bar 10 mm.

shape difficult to determine because of the shrivelled condition; dorsal and supracaudal scales smooth and without apical pits, dorsals arranged in 15 scale rows throughout the body, outer dorsal scale row slightly enlarged.

Supracaudal scale reduction formula:

3+4(4) 3+4(18) 2+3(25)
(2)**8** -------- **6** ---------- **4** ---------- **2**(27).
3+4(4) 3+4(16) 2+3(25)

There were 131 [134] ventral scales with rounded outer margins countable; anal plate undivided; subcaudals divided, 26/27 [28] plus terminal scale; supralabials 5/5 [6], third and fourth entering orbit; eye small, with round pupil; rostral slightly higher than wide, its upper tip clearly visible from above; nasal small, undivided, in contact with internasal, first supralabial and prefrontal; naris in the anterior part of nasal; no loreal [a large loreal]; preoculars 1/1, not extending onto top of head; postoculars 1/1, in contact with parietal and fourth supralabial; no anterior temporals; internasals 2, wider than long, not in contact with supralabials; 2 large prefrontals, wider than long, about 3 times wider than internasals, in contact with second and third supralabial; frontal pentagonal in shape, longer than wide, longer than supraoculars, longer than distance between its anterior margin and tip of rostral; parietals 2, about three times longer than frontal; infralabials 5/5, first pair separated by anterior submaxillars; other conditions of throat scalation are not determinable because of bad preservation condition of the specimen; both hemipenes everted but shrivelled and without spines.

Dentition – 10/12 maxillary teeth, increasing in size posteriorly until position 8, from position 10 onwards slightly decreasing in size [7 maxillary teeth, the central ones being the tallest]. The tips of all teeth are distinctly recurved posteriorly (fide WRIGHT *et al.* 1979, fig. 1 A). The anterior 3 teeth are spaced closely together, the interspace between them is slightly increasing posteriorly until it is longer than the base of the longest tooth (base length of tooth 8 and 9: 0.16 mm; interspace between tooth 11 and 12: 0.19 mm). Medial to each maxillary tooth is a single replacement tooth at different growth stages. The posterior 22% of the maxilla are without teeth.

10/10 palatine teeth, slightly increasing in size posteriorly until position 6, the following slightly decreasing. The tips of all teeth are distinctly recurved posteriorly. Between the anterior 6 teeth there is an interspace of less than the base of the longest tooth (base length of tooth 6: 0.09 mm; interspace: 0.06–0.08 mm). Posterior to tooth 6, interspaces increase to 0.12–0.15 mm, being largest between teeth 7 through 9. Lateral to each palatine tooth is a single replacement tooth at different growth stages. The posterior 23% of the palatine bone are without teeth and articulate with the pterygoid.

21/22 pterygoid teeth, decreasing in size posteriorly. The tips of all teeth are distinctly recurved, whereas the angle of curvature decreases in posterior direction.

The interspace between the teeth decreases posteriorly, from being the length of approximately one tooth base (base length of tooth 1: 0.12 mm) to just about half of it. Lateral to each pterygoid tooth there is a single replacement tooth at different growth stages. The posterior 10% of the pterygoid bone are without teeth.

14/14 mandibular teeth, slightly increasing in size until tooth 5, and slightly decreasing thereafter. All teeth are recurved with increasing curvature in posterior direction. The anterior 2 teeth are closely spaced, whereas the interspaces between the following teeth increase posteriorly, and are less than the base of the longest tooth (base length of tooth 5: 0.13 mm; longest interspace between teeth: 0.10 mm). Medial to each mandibular tooth is a single replacement tooth in different growth stages.

Colouration – Dorsal and ventral ground colour of body and tail middle brown, head light-brown; supralabials, infralabials and throat cream-white; an oblique cream coloured mark from the border of parietals to angle of mouth; a thin, light beige collar occupying half of the fifth and sixth transversal dorsal scale row, extending laterally onto the first longitudinal dorsal scale row; edges of dorsal and supracaudal scales and posterior edges of ventral and subcaudal scales brightened.

Redescription of the lectotype of *Ligonirostra stuhlmanni*

Figs. 2–5; 7 II a–b; 8 II a–e

ZMH R07910 (old ZMH no. 1646; field label not extant): leg. Franz Stuhlmann, September 1888. Type locality: "Usambaá" [Usambara region, Tanzania]. Differences between our data and Pfeffer's (1893) original description are added in brackets […]:

Sex and pholidosis – subadult male; total length 196 mm [ca. 200 mm]; tail length 30 mm; head length 7.03 mm; ratio of tail length/total length 0.153; head only slightly distinct from body with a rounded tip of snout; body and tail rounded; dorsal scales smooth, arranged in 19/15/15 rows throughout the body, with single apical pits, outer dorsal scale row slightly enlarged; supracaudal scales smooth with paired apical pits.

Dorsal scale row reduction formula:

$$(10)\mathbf{19}\ \overset{3+4(11)}{\underset{3+4(11)}{\text{----------}}}\ \mathbf{17}\ \overset{3+4(28)}{\underset{3+4(27)}{\text{----------}}}\ \mathbf{15}(132).$$

Supracaudal scale row reduction formula:

$$(2)\mathbf{10}\ \overset{2+4(4)}{\underset{3+4(4)}{\text{---------}}}\ \mathbf{8}\ \overset{3+4(15)}{\underset{3+4(15)}{\text{----------}}}\ \mathbf{6}\ \overset{2+3(29)}{\underset{2+3(29)}{\text{----------}}}\ \mathbf{4}\ \overset{2+3(31)}{\underset{2+3(31)}{\text{----------}}}\ \mathbf{2}.$$

There are 2 preventrals and 132 ventral scales [133]; anal plate undivided; subcaudals divided, 31/31 plus terminal scale; supralabials 6/6, third and fourth entering orbit, sixth largest; eye small, with round pupil; rostral much wider than high, with an acutely angular horizontal edge, visible from above, extends far beyond the end of the lower jaw; nasal large, in contact with rostral, internasal, parietal, loreal, and first supralabial, partly divided by a horizontal suture from naris to anterior edge of loreal, naris small, situated in anterior part of nasal; loreal much longer than high; preoculars 1/1, not extending onto top of head, in contact with supraocular, prefrontal, loreal, second and third supralabial and orbit; postoculars 2/2, upper smaller; 1 anterior and 2+3 posterior temporals; internasal single, in contact with rostral, nasal and prefrontal; prefrontal single, 50% longer than internasal, in contact with internasal, nasal, loreal, preocular, supraocular and frontal; frontal pentagonal in shape, longer than wide, longer than supraoculars, longer than distance between its anterior margin and tip of rostral; parietals 2, a little shorter than frontal; infralabials 8/8, first pair in broad contact behind mental, first to third in contact with first submaxillar; first pair of submaxillars slightly longer and much wider than second pair; a single gular followed by a pair of gulars separating posterior part of anterior submaxillars and second pair.

Dentition – 9/11 maxillary teeth, the anterior 7/9 precranterian teeth are nearly equal in size (~0.3 mm) but are followed by 2/2 large cranterian teeth (~1 mm) without diastema. All precranterian teeth are curved posteriorly shortly above the base. Medial to the precranterian teeth 1, 3, 4, 6/2, 4, 5, 7 there is a single replacement tooth at different growth stages, respectively. The cranterian teeth are flattened, posteriorly not grooved, but edged, resulting in a blade-like appearance. The tips of these 2 teeth are distinctly bend posteriorly, similar to the precranterian teeth. One to 2 replacement teeth per cranterian tooth are found posteromedially to each tooth, showing different growth stages. No significant interspace exists between the different maxillary teeth. The anterior 6.3% and posterior 11.8% of the maxilla are without teeth.

5/6 palatine teeth, nearly equal in size. All are curved posteriorly shortly above the base. Lateral to teeth 2, 4/2, 4, 6 there is a single replacement tooth at different growth stages. No significant interspace exists between the different palatine teeth. The anterior 5.5% and posterior 33.3% of the palatine bone are without teeth.

The pterygoid bone is toothless.

9/9 mandibular teeth, nearly equal in size. All are slightly curved posteriorly shortly above the base. The anterior 3 teeth are spaced close together. Between the following posterior teeth the respective interspace increases until it is as long as the length of one tooth base. Medial to the mandibular teeth 1, 3, 7/2, 4, 6, 8 there is a single replacement tooth at different growth stages, respectively. The anterior 13.9% and posterior 7% of the mandibula are without teeth.

Colouration – Dorsal ground colour of head, body and tail dark brown [dark greyish-blue]; dorsal scales of body with a pale centre; rostral, nasal, loreal and lower parts of supralabial scales cream-white; dorsals with an indistinct series of paired paravertebral rows of whitish dots,

Fig. 2. Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910), dorsal view. Scale bar 5 mm.

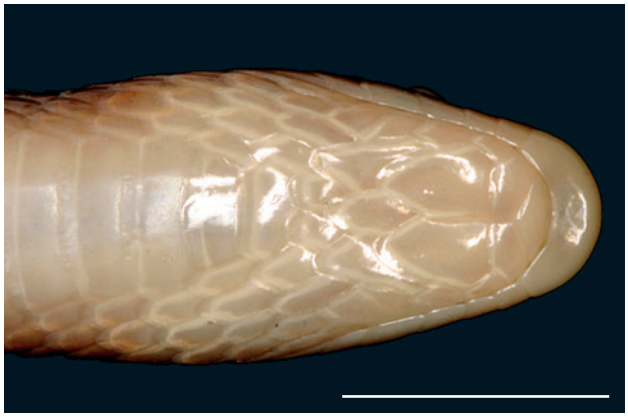

Fig. 3. Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910), head dorsal. Scale bar 5 mm.

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Fig. 4. Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910), head lateral right. Scale bar 5 mm.

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Fig. 5. Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910), head ventral. Scale bar 5 mm.

extending to near the base of the tail; ventrals and subcaudals whitish; ventrals with light brown outer edges; subcaudals with an indistinct thin light brown longitudinal stripe from third to last subcaudal scale.

Fig. 6. Paralectotype of *Ligonirostra stuhlmanni* (ZMB 11008). Scale bar 5 mm.

Redescription of the paralectotype of *Ligonirostra stuhlmanni*

Fig. 6

ZMB 11008 (field label completely bleached): leg. Franz Stuhlmann, September 1888. Locality: "Usambáa" [Usambara region, Tanzania]; transferred by the 'Hamburger Museum' in 1893. Differences between our data and Pfeffer's (1893) original description are added in brackets […]. This specimen generally corresponds with the lectotype (ZMH R07910) in pholidotic features, dentition, and colouration but shows the following differences:

Sex and pholidosis – adult male; total length 205 mm [ca. 200 mm]; tail length 32 mm [not mentioned]; head length 6.85 mm; ratio of tail length/total length 0.156.

Dorsal scale row reduction formula:

3+4(15) 3+4(34)
(10)**19** --------- **17** ---------- **15**(134).
3+4(13) 3+4(34)

Supracaudal scale row reduction formula:

4+5(4) 3+4(15) 2+3(27) 2+3(33)
(2)**10** -------- **8** --------- **6** ---------- **4** ---------- **2.**
3+4(4) 3+4(13) 2+3(27) 2+3(33)

There were 2 preventrals and 134 ventral scales [136]; subcaudals divided, 33/33 [32] plus terminal scale.

Dentition – 10/10 maxillary teeth, the anterior 8 nearly equal in size, but followed by 2/2 large and fang-like cranterian teeth without diastema. 5/5 palatine teeth and 10/9 mandibular teeth are nearly equal in size.

Colouration – The specimen is more or less bleached out to light brown colour dorsally, particular the forebody is bleached out to whitish-cream; head and ventrum uniformly whitish coloured.

Comparison

After comparing the type material of the two taxa, regarded as conspecific until now, it becomes clear that they obviously belong to different genera and cannot be considered synonyms any longer. The holotype of *Stenorhabdium temporale* is distinguished from the lecto- and paralectotype of *Ligonirostra stuhlmanni* by (1) loreal absent vs. loreal wider than high; (2) anterior temporals absent vs. 1+2+3 temporals; (3) lower number of dorsal scale rows at anterior third of body [15 vs. 19–17]; (4) apical pits missing vs. single apical pits on dorsal scales, 2–3 on supracaudal scales; (5) lower number of postoculars [1 vs. 2]; (6) two long prefrontals vs. a single slender shield; (7) divided internasals vs. a single narrow shield; (8) pointed rostral, only slightly higher than wide vs. very broad rostral extending to the lateral

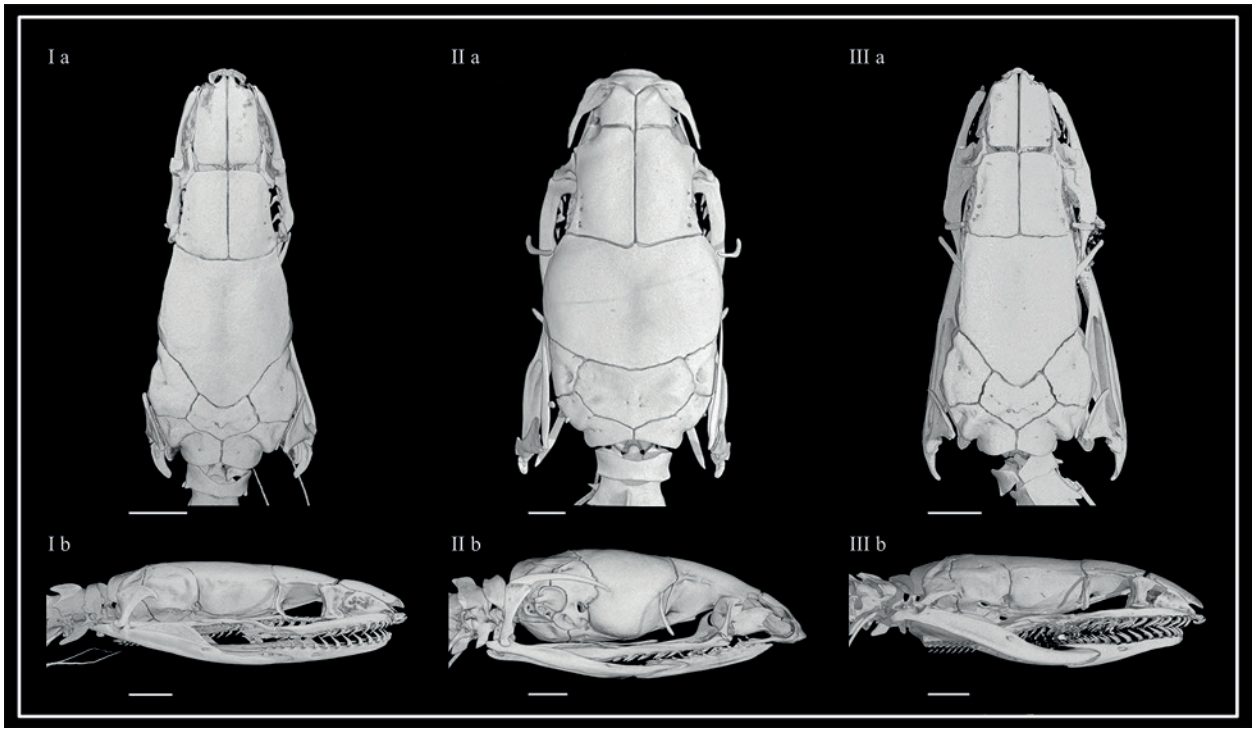

Fig. 7: Skulls of (I) Holotype of *Stenorhabdium temporale* (SMNS 3204), (II) Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910) and (III) *Pseudorabdion longiceps* (ZMB 13024, Java) in (a) dorsal and (b) lateral view. Scale bars 1 mm.

sides of mouth, with an acutely angular horizontal edge; (9) parietals much longer than frontal vs. parietals shorter than frontal; (10) first pair of infralabials separated by anterior submaxillars vs. first pair of infralabials in broad contact behind mental; (11) higher number of palatine teeth [10 vs. 5–6]; (12) the presence of pterygoid teeth [10 vs. no pterygoid teeth]; (13) higher number of mandibular teeth [14 vs. 9–10]; (14) posterior maxillar teeth not enlarged vs. last two considerably enlarged; and (15) by an oblique yellowish dot above the angle of the mouth vs. without such marking.

Further differences exist with respect to skull anatomy. *Stenorhabdium temporale* (Figs. 7 I a–b; 8 I a–e) shows in contrast to *P. stuhlmanni* (Figs. 7 II a–b; 8 II a–e), (1) short lateral extensions of the premaxilla vs. long lateral extensions of the premaxilla which are curved posteriorly and extend across the nasals; (2) nasals longer than frontals vs. nasals ~$^1/_3$ of length of the frontals; (3) parietal longer than broad vs. parietal shorter than broad; (4) posterior suture of parietal has a 'V'-shape vs. posterior suture of parietal which has a wide 'U'-shape; (5) suture of exoccipitals as long as the center of the supraoccipital vs. suture of exoccipitals distinctly shorter than the middle of the supraoccipital; (6) maxilla extend posteriorly until the middle of the parietal vs. maxilla extend posteriorly until the end of the prooticum; (7) maxillary palatine joint at the position of tooth 7 to 9 vs. maxillary palatine joint at the tip of the maxilla; (8) a maxillary nerve foramen in the lateral arm of the palatine vs. no maxillary nerve foramen, (9) the dorsal edge of the quadrate is long and sickle-shaped vs. short and spatulate; (10) stapes footplate inside braincase, ear opens at the exoccipitals with very small opening vs. stapes footplate part of outer braincase, ear opens at the suture of the prooticum and exoccipitals with very prominent opening; (11) supratemporal short and only attached to the exoccipitals vs. supratemporal long and slender and attached to parietal, prooticum and exoccipitals; (12) compound process (sensu Marx & Rabb 1972), i.e. two processes, medial larger vs. one compound process, lateral only; (13) pterygoid wing-like vs. pterygoid long and slender; and (14) Meckel's channel completely fused vs. Meckel's channel completely open until the tip of the dentary.

In addition, the collection locality was erroneously assigned, which is why we consulted character matrices and determination keys of several authors to resolve the true identity of the type specimen of *S. temporale* (BOULENGER 1893, 1894, 1896; CHAN-ARD *et al*. 2015; COGGER 1994; DAVID & VOGEL 1996; ROOIJ 1917; ERNST & ERNST 2003; LEVITON *et al.* 1992; MANTHEY & GROSSMANN 1997; MARX & RABB 1972; MCCRANIE 2011; MEIRTE 1992; O'SHEA 1996; PETERS & OREJAS-MIRANDA 1986; SMITH 1943; SMITH & TAYLOR 1945; SZCZERBAK 2003; TAYLOR 1922; ZHAO & ADLER 1993). Because of several characteristic pholidotic traits such as missing loreal and anterior temporal scales, prefrontals in contact with supralabials, 15 DSR without apical pits throughout the body as well as an aglyph dentition and lack of enlarged posterior teeth the specimen could exclusively be assigned to the genus *Pseudorabdion* JAN, 1862. Within the genus the traits match the best with those listed by various authors for *Pseudorabdion longiceps* (e.g. CANTOR 1847; DAVID & VOGEL 1996; BROWN *et al.* 1999; MALKMUS *et al*. 2002; DAS 2010, and DORIA & PETRI 2010).

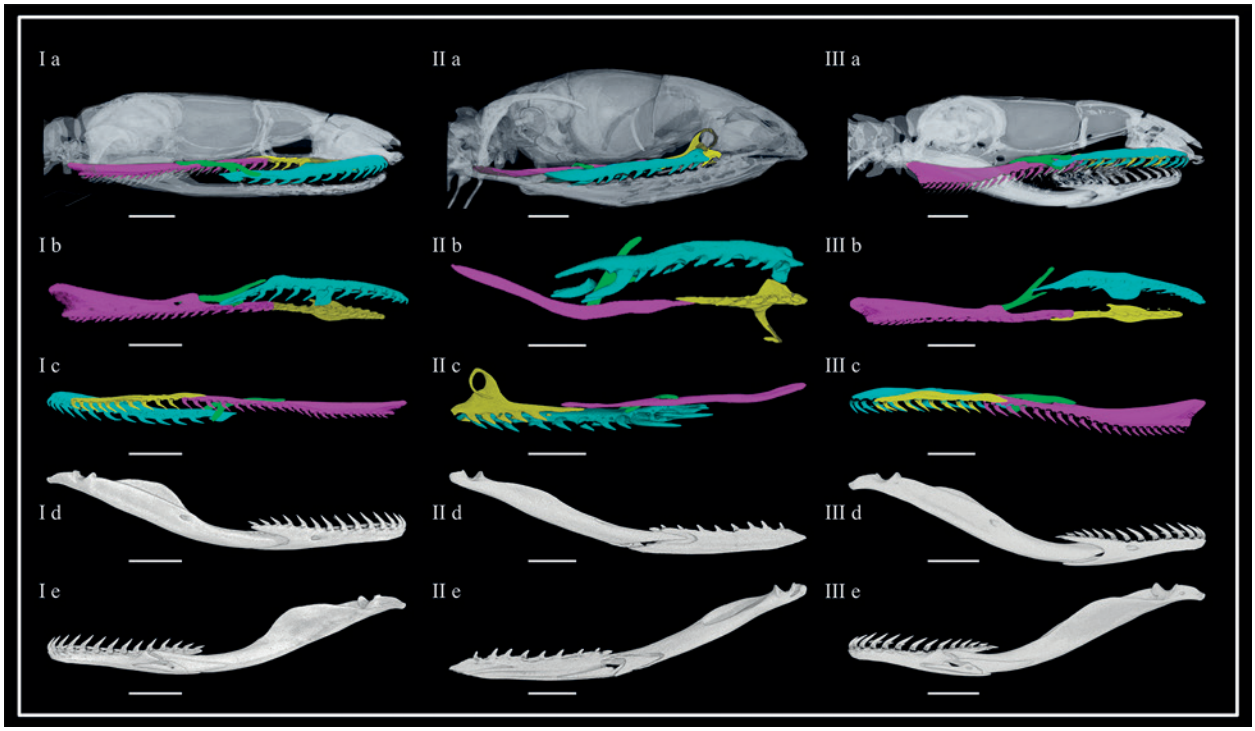

Fig. 8: Tooth bearing and connecting bones separated virtually of (I) Holotype of *Stenorhabdium temporale* (SMNS 3204), (II) Lectotype of *Ligonirostra stuhlmanni* (ZMH R07910) and (III) *Pseudorabdion longiceps* (ZMB 13024, Java). Maxilla (turquoise), ectopterygoid (green), palatinum (yellow), pterygoid (purple), in (a) lateral, (b) ventral and (c) medial view, (d) mandibula in lateral and (e) mandibula in medial view. Scale bars 1 mm.

We examined and compared the skull morphology of specimens of *Pseudorabdion longiceps* from Malacca, Sumatra, Java, Kalimantan and Sarawak. With regard to the following characters we found most similarities between the holotype of *S. temporale* and specimens from Java (ZMB 13111; ZMB 13024 see Figs. 7 III a–b; 8 III a–e), i.e. (1) nasals slightly longer than frontals vs. nasals shorter than frontals in ZMB 4966 from Kalimantan and in ZMB 7091 from Sarawak; (2) posterior border of frontals has a wide U-shape vs. posterior border of frontals has a soft W-shape in ZMB 31404 from Sumatra and ZMB 4966 from Kalimantan or a wide M-shape in ZMB 7091 from Sarawak; (3) suture between exoccipitals longer than length of the center of the supraoccipital vs. suture between exoccipitals shorter in ZMB 3026 from Malacca, ZMB 31404 from Sumatra, ZMB 4966 from Kalimantan and in ZMB 7091 from Sarawak; (4) higher number of mandibular teeth (13 or 14) vs. lower number, i.e. 10/10 in ZMB 31404 from Sumatra, 11/11 in ZMB 4966 from Kalimantan and 10/9 in ZMB 7091 from Sarawak; (5) largest interspace between teeth at the maxilla equal or slightly longer than socket of the longest tooth (equal–16% longer) vs. largest interspace distinctly longer (24%–47% longer) in ZMB 3026 from Malacca, ZMB 4966 from Kalimantan and in ZMB 7091 from Sarawak; (6) toothless posterior part of the maxilla less than 24% vs. toothless posterior part more than 25% in ZMB 31404 from Sumatra, ZMB 4966 from Kalimantan and in ZMB 7091 from Sarawak; and (7) medial limb of ectopterygoid almost half the length of lateral limb vs. medial limb distinctly longer in ZMB 3026 from Malacca and ZMB 4966 from Kalimantan.

Based on the morphological evidence at hand, we therefore remove *Stenorhabdium temporale* Werner, 1909 from the synonymy of *Prosymna stuhlmanni* (Peffer, 1893) and regard it as a subjective junior synonym of *Pseudorabdion longiceps* (Cantor, 1847); the generic name *Stenorhabdium* Werner, 1909 becomes a synonym of *Pseudorabdion* Jan, 1862.

Discussion

The bad condition of the holotype of *S. temporale* probably explains Werner's misjudgments particularly regarding characteristics of the head scalation, which in combination with the incorrect allocation of the collection locality misleadingly resulted in the description of a new genus and species. That Loveridge (1957) did not recognize the differences of the specimens and synonymized *S. temporale* with *P. stuhlmanni* is certainly due to the fact that the holotype was not accessible to him for re-examination and the collecting locality was not doubted. Nevertheless, it is surprising that Loveridge (1957, 1958) does not comment on the maxillary dentition, which Werner (1909) uses and defines in the genus diagnosis for *Stenorhabdium*. At least here doubts could have been raised concerning the assignment to *Prosymna stuhl-*

manni. WERNER (1909 p. 59) describes the maxillary dentition as follows: "Oberkiefer lang, mit 7 soliden Zähnen, die mittleren am längsten, doch nicht wesentlich länger als die übrigen" [Upper jaw long, with 7 solid teeth, the middle ones being the tallest, but not substantial longer than the remaining ones]. In contrast, *P. stuhlmanni* possesses toothless anterior parts of the maxilla and 8–10, rarely 11 maxillary teeth in total (this study and BROADLEY 1980). The anterior teeth increase in size evenly but slightly, and are followed without diastema by two distinctly enlarged and curved, at the basis broadened, laterally flattened teeth. They are posteriorly not grooved, but edged, resulting in a blade-like appearance. Some species of *Prosymna* are known to feed almost exclusively on reptile eggs (Serpentes and Gekkonidae) (BROADLEY 1979) just like species of the Asian genus *Oligodon* whose maxillary dentition in a similar way is characterised by enlarged blade-like posterior teeth which serve to slit open the egg shells (WALL 1923; TILLACK & GÜNTHER 2010; GREEN *et al.* 2010).

FRANZ WERNER's working mode, and in particular his ambition to describe as many taxa as possible, has been criticised by various authors (see comments in WETTSTEIN 1941; ADLER 1989; TILLACK 2008) and the number of synonyms produced by WERNER is high, both for species as well as genera. In 1927, MALCOLM SMITH had the opportunity to work in the collection of the Museum of Natural History Vienna and to re-examine a variety of type material of snake taxa described by WERNER. His work resulted in a list of not less than 11 generic names (*Adiastema, Argyrogena, Dakaria, Eminophis, Mike, Nerophidion, Pachyophis*, *Pseudouromacer*, *Sympeltophis, Triaenopholis* and *Wallia*) and 16 species names that were introduced by WERNER between 1923 and 1925 and were already then regarded as synonyms of previously described taxa (SMITH 1928). Of those, only the genus *Argyrogena* WERNER, 1924 is considered valid today (WILSON 1967; SCHÄTTI *et al.* 2014; WALLACH *et al.* 2014).

Similarly, in recent years various authors have reviewed and corrected the status of several taxa described by WERNER (PETERS & OREJAS-MIRANDA 1970; DAVID & VOGEL 1996; TILLACK 2008; TILLACK & GÜNTHER 2010 and COSTA *et al.* 2015).

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