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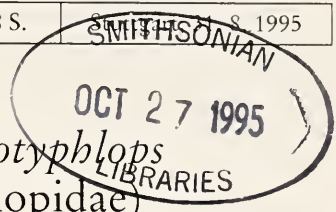
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A New Species of *Leptotyphlops* (Serpentes: Leptotyphlopidae) of the *longicaudus*-group from West Africa

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With 2 figures and 1 table

Summary

The Worm Snake *Leptotyphlops albiventer* n. sp. is described. It is a member of the *longicaudus*-group, and it is characterized within this group by the combination of a relative low number of total mid-dorsal scales (165–208) and a white belly. Hitherto, the species has only been found in the Comoé National Park, north-eastern Ivory Coast.

Key words: *Leptotyphlops albiventer* n. sp., *longicaudus*-group, Ivory Coast, West Africa.

Zusammenfassung

Die Schlankblindschlange *Leptotyphlops albiventer* n. sp. wird beschrieben. Sie gehört zur *longicaudus*-Gruppe. Die neue Art unterscheidet sich von allen anderen *Leptotyphlops*-Arten dieser Gruppe durch folgende Merkmalskombination: eine relativ geringe Anzahl der Dorsalia (165–208) und eine weiße Ventralseite. Bisher wurde die Art nur im Comoé-Nationalpark im Nordosten der Elfenbeinküste gefunden.

Sommaire

Le suivant est une description de serpent minute *Leptotyphlops albiventer* n. sp. Il appartient à la groupe de *longicaudus*. La nouvelle espèce se distingue de toutes les autres espèces de *Leptotyphlops* par la combinaison des caractéristiques suivantes: un nombre relativement basse des dorsales (165–208) et un ventre blanc. Jusqu' à présent, cette espèce à été trouvé seulement dans le Parc National de Comoé dans le Nord-Est de la Côte d'Ivoire.

1. Introduction

The Worm Snakes of the genus *Leptotyphlops* contain world-wide about 80 species including 23 African species (WELCH 1994). In their „Revision of the Worm Snakes“, BROADLEY & WATSON (1976) listed and redescribed all South-east African species. HAHN (1978) revised the North-east African and Asian species of the genus.

He distinguished three species groups: the *longicaudus*-, *macrorhynchus*-, and *blanfordi*-group. The *longicaudus*-group is characterized by having a relatively long tail with 10 scales around its middle, a prefrontal, and a rounded snout. The members of the *macrorhynchus*-group have a hooked snout, a prefrontal and an elongate body form. The strictly Asian *blanfordi*-group is characterized by having a rounded snout, a prefrontal, and 12 scales around the middle of the tail.

All species of *Leptotyphlops* are ground dwellers. Little is known about their mode of life, food, and reproduction.

In a recently published faunistic study on the snakes of the Comoé National Park, biological and ecological data were included for each species observed (RÖDEL et alii, 1995). Seven specimens of the genus *Leptotyphlops* were obtained and deposited in the collection of the Staatliches Museum für Naturkunde Stuttgart (SMNS). Two specimens belong to *Leptotyphlops bicolor*, the others, having a relatively long tail, a clear demarcation between the dorsal and ventral colouration, and a single anterior supralabial, were determined in the field as *L. aff. longicaudus*. A reexamination of the material and comparison with the holotype of *L. longicaudus* and other related species, and with literature data (VILLIERS 1975, BROADLY & WATSON 1976, ROUX-ESTÉVE 1979, MEIRTE 1992) confirmed that they belong to an undescribed species.

2. Methods, materials and acknowledgements

Methods and abbreviations

For each specimen of the type series of the new species and specimens of related species, the following data were recorded: number of mid-dorsal scales between rostral scale and caudal spine (= total dorsals), number of subcaudal scales in a median row between cloaca and caudal spine, scales around mid-body, scales around mid-tail, snout-vent length, tail length, body diameter at level of mid-body, number of infralabials. The ratios total length/tail length and total length/body diameter were calculated. The body scales were counted using a dissecting microscope. Measurements were made with a dial caliper to a tenth of a millimeter. The drawings were made with a camera lucida.

Abbreviations are as follows:

SVL snout-vent length;

TL total length.

The specimens examined are deposited in the following institutions:

BMNH The Natural History Museum, London [formerly British Museum (Natural History)];

MNHN Muséum National d'Histoire Naturelle, Paris;

SMNS Staatliches Museum für Naturkunde Stuttgart;

ZFMK Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn;

ZMB Zoologisches Museum der Humboldt Universität Berlin.

Materials

Leptotyphlops b. bicolor: MNHN 1908–167, 1916–119, 1916–119A, 1917–176, 1917–176A, (Sudan), 1933–151, 1933–152, 1933–153 (Burkina Faso), 1965–94, 1965–95, 1965–95A, 1965–95B (Mali), 1965–97, 1965–97A, 1992–4344, 1992–4345, 1992–4346, 1992–4347, 1992–4348, 1992–4349, 1992–4350 (Ivory Coast); SMNS 5164 (Ghana), 8453–1, 8453–2 (Ivory Coast); ZFMK 23387 (Ghana), 38–721, 38–722 (Burkina Faso); ZMB 10796, 21951, 21952, 25544, 53614 (Togo), 21479 (Kratschie).

L. brevicaudus: BMNH 1920.4.28:1 (Ghana).

L. emini: ZMB 24968, 24970, 24972, 53615, 53616 (Tanzania); ZMB 26847 (Morogoro, Tanzania).

L. longicaudus: MNHN 1923–118 (East Africa); ZMB 3882 (Insel Mosambique), ZMB 4827, holotype (Tete, Mosambique).

L. narirostris: BMNH 65.5.3.61 (W. Africa), BMNH 1922.10.12: 1–2 (Aburi, Ghana).

L. nigricans: SMNS 2518 (S. Africa); ZMB 9245, 53612, 53613 (Teita, Kenia).

L. perreti: BMNH 1908.5.30:7, paratype (Bitye, Cameroon).

L. sundevalli: ZMB 21954, 29557 (Togo); SMNS 2522 (W. Africa).

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3. *Leptotyphlops albiventer* new species (Figs. 1A–C, 2 A–B)

Material

Holotype: SMNS 8454–5: 128 mm SVL, Ivory Coast, Comoé National Park, 8°45'N, 3°47'W, 4 Sep. 1994, leg. M.-O. RÖDEL.

Paratypes: SMNS 8454–1–4, 4 specimens: same locality and collector as holotype; SMNS 8454–1: 92 mm SVL, 15 Aug. 1992; SMNS 8454–2: 84 mm SVL, 2 Sep. 1992; SMNS 8454–3: 62 mm SVL, 18 Apr. 1993; SMNS 8454–4: 116 mm SVL, 31 Aug. 1994.

Etymology

The species is named for its white ventral colouration; *albus* (Latin) = white; *venter* (Latin) = belly.

Diagnosis

A small *Leptotyphlops* belonging to the *longicaudus*-group, with a discrete prefrontal separating the rostral from the supraocular, one anterior and one posterior supralabial, 5 infralabials, temporal not enlarged, total mid-dorsal scales 165–208, tail long, with 10 scale rows and 26–30 subcaudals, and the colouration brown above, unpigmented white below.

Description

A small species with the largest specimen known only reaching 128 mm (holotype), tail relatively long (tail length in the holotype 20 mm). Tail length in TL 6.4 (6.1–8.8, \bar{x} = 7.18, n = 5); body diameter in TL 51.2 (41.3–51.2, \bar{x} = 45.38, n = 5).

Body cylindrical, head as wide as body. Snout rounded, projecting over the mouth. Rostral scale visible from above, rather small and subtriangular, apex rounded, not reaching to level of anterior margin of eyes. Supraoculars present, separated by the prefrontal from each other and from the rostral. Nasal horizontally divided by a suture transversing the nostril in a small infranasal which is bordering the lip, and in a supranasal that is twice as high as the infranasal (in lateral view). Two supralabials, the anterior situated between the infranasal and the ocular, the posterior behind the ocular, bordering the lip posteriorly. The infranasal is higher (in lateral view) than the anterior supralabial; both are nearly equal in width. The posterior supralabial is almost twice as wide as the anterior labial. Labial border of ocular

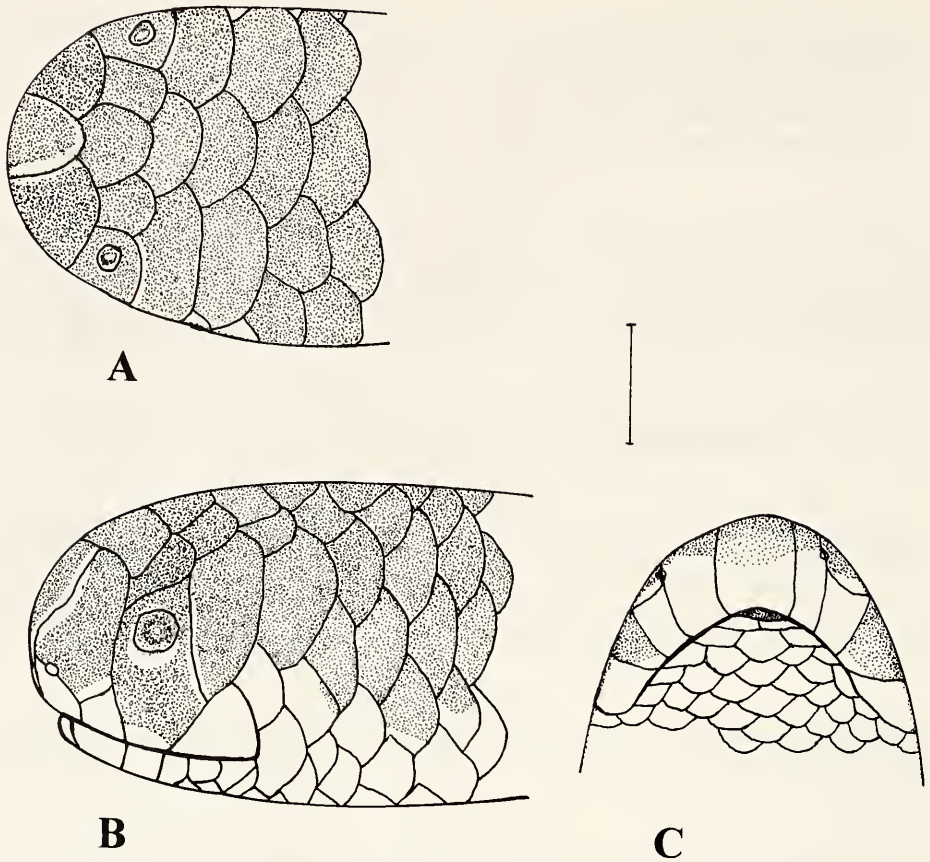


Fig. 1. *Leptotyphlops albiventer* n. sp., holotype, (SMNS 8454-5); head. - A. Dorsal view; - B. lateral view; - C. ventral view. - Scale bar: 1 mm.

subequal in width to posterior supralabial. Four median scales on head behind the rostral (prefrontal, frontal, interparietal, interoccipital). Prefrontal approximately as long as wide, the other scales wider than long. The ocular is the largest scale on the head, followed by the little smaller parietal and the occipital. Eyes clearly visible. The rather small temporal scale is situated in between posterior supralabial, parietal and occipital. The anterior head scales are loosely pitted. Five infralabials; mental absent.

Body scales cyclohexagonal on dorsum and venter, in 14 rows around the body. Total dorsals 208 (165-208, \bar{x} = 185.6, n = 5). A large undivided preanal scale covers the anus. Subcaudal scales 30 (26-30, \bar{x} = 28.04, n = 5). Subcaudals slightly wider and shorter than the surrounding scales. 10 scales rows around the mid-tail. Tip of tail covered by a sharply pointed conical scale. Dorsal tail scales identical to dorsals on body.

Colour in preserved species: There is a sharp demarcation between dorsum and venter. 7-8 of the dorsal scale rows are brown to light brown, and 6-7 ventral scale rows are white to dirty white. Each mid-dorsal scale with a darker basal area. Most head scales uniform brown, but lower part of the upper lip and area below the eye

white. A small unpigmented zone on both sides of the suture between rostral and nasal; suture between ocular and parietal also unpigmented.

Colour in life: brown to dark fleshy above, unpigmented (white) below.

Habitat

The specimens of the type series were found in a bush-tree savanna, and in a gallery forest at an altitude of at least 250 m above sea level. The holotype and the paratype SMNS 8454-4 were caught on the ground of the gallery forest. SMNS 8454-1 was found on a termite hill of *Macrotermes bellicosus*, SMNS 8454-2 besides the hill. SMNS 8454-3 was collected in a pitfall trap in the savanna near a temporary pond.

Range and distribution

The new species is as yet known from a few localities in an area of 60 km² at the south-eastern edge of the Comoé National Park, north-eastern Ivory Coast, West Africa. However, the range is probably not restricted to the Comoé National Park. Because of the hidden burying life of the species, it is rarely collected.

4. Comparison with related species (Tab. 1)

The *longicaudus*-group (sensu HAHN, 1978) contains the following species, which are all living in Africa: *Leptotyphlops boulengeri* (Boettger in Voelzkow, 1913), *L. cairi* (Duméril & Bibron, 1844), *L. longicaudus* (Peters, 1854), *L. narirostris* (Peters, 1867), *L. nigricans* (Schlegel, 1839) [including *L. emini* (Boulenger, 1890)], *L. perreti* Roux-Estève, 1979, *L. reticulatus* (Boulenger, 1906), and *L. wilsoni* Hahn, 1978. The group is characterized by a rounded snout, a discrete prefrontal separating the supraocular from the rostral, a long tail with 10 scale rows around its middle, a divided nasal, and one anterior supralabial. *Leptotyphlops albiventer* n. sp. is a member of this group and differs from the other species in the combination of a low number of total dorsals (165–208) and a white belly.

The East African species *Leptotyphlops longicaudus* differs from *L. albiventer* n. sp. in its higher number of total dorsals (265–325) and subcaudals (34–58).

Leptotyphlops narirostris from West Africa has a darker ventral colouration than *L. albiventer*, a large temporal that is as high as the ocular bordering the lip behind the posterior supralabial, six infralabials, and 194–231 total dorsals (authors' observations).

The South African *Leptotyphlops nigricans* differs from *L. albiventer* in its uniform brown to black colouration, a larger rostral and a supraocular that is as large as the prefrontal or larger, and 199–289 mid-dorsal scales (BROADLY & WATSON, 1976; authors' observations).

Leptotyphlops emini from Eastern and Central Africa resembles *L. nigricans* in most characters. Some authors synonymized *L. emini* with *L. nigricans* (BROADLY & WATSON 1976, HAHN 1978, ROUX-ESTÈVE 1979). We have studied a collection of *L. emini* from Tanzania (ZMB), and were not able to distinguish the two nominal species. In the examined *L. „emini“* the supraocular is not significantly larger than in *L. nigricans*. This would be the discriminating character in MEIRTE's key (MEIRTE 1992). The number of total dorsals (204–214) in *L. „emini“* from Tanzania (ZMB)

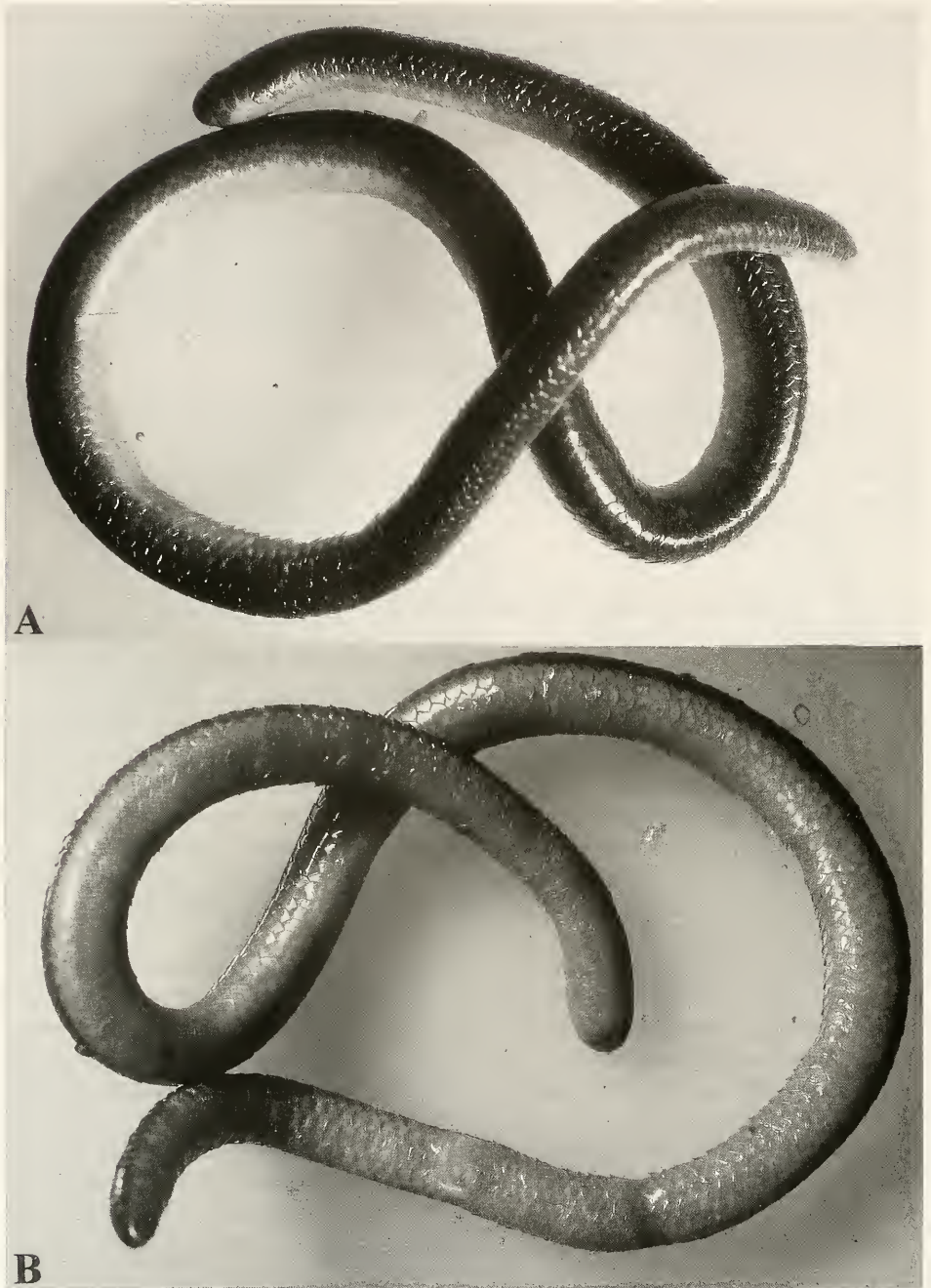


Fig. 2. *Leptotyphlops albiventer* n. sp., holotype, (SMNS 8454-5). – A. Dorsal view; – B. ventral view.

Table 1. Counts of body scales and measurements [in mm] of *Leptotyphlops* spp.

<i>Leptotyphlops</i> -species	total length	tail length	Tail in TL	total dorsals	sub-caudals	body diameter in TL	scales around midtail
<i>L. albiventer</i> SMNS 8454-5 (holotype)	128	20	6.4	208	30	51.2	10
<i>L. albiventer</i> SMNS 8454-1	92	12	7.6	194	28	46.0	10
<i>L. albiventer</i> SMNS 8454-2	84	12	7.0	166	26	42.0	10
<i>L. albiventer</i> SMNS 8454-3	62	7	8.8	165	30	41.3	10
<i>L. albiventer</i> SMNS 8454-4	116	19	6.1	195	28	46.4	10
<i>L. longicaudus</i> ZMB 4827 (holotype)	190	22	8.63	324	41	76	10
<i>L. longicaudus</i> ZMB 4827	135	12	11.25	270	38	75	10
<i>L. „longicaudus“ = L. nigricans</i> MNHN 19232-118	126	11	11.4	250	32	71.6	10
<i>L. narirostris</i> BMNH 65.53.61	193	21	9.1	231	27	48.2	10
<i>L. narirostris</i> BMNH 1922.10.12-1	62	10	6.2	194	30	41.3	10
<i>L. narirostris</i> BMNH 1922.10.12-2	63	7	9.0	208	9.0	45.0	10
<i>L. „nigricans“ = L. scutifrons</i> <i>merkeri</i> ZMB 9245	122	11	11.0	247	28	53.0	12
<i>L. „nigricans“ = L. scutifrons</i> <i>merkeri</i> ZMB 53613	171	14	12.2	231	27	60.0	12
<i>L. „nigricans“ = L. scutifrons</i> <i>merkeri</i> ZMB 53612	159	12	13.2	225	27	53.0	12
<i>L. nigricans</i> SMNS 2518	101	9	11.2	234	27	40.4	12
<i>L. „emini“</i> ZMB 24968	145	11	13.2	214	23	58.0	10
<i>L. „emini“</i> ZMB 24970	127	10	12.7	204	25	57.7	10
<i>L. „emini“</i> ZMB 24972	117	12	9.7	204	28	55.7	10
<i>L. „emini“</i> ZMB 53615	117	10	11.7	208	25	58.5	10
<i>L. „emini“</i> ZMB 53616	100	12	8.3	212	24	47.6	10
<i>L. „emini“ = L. scutifrons</i> ZMB 26847	92	9.5	9.7	205	25	57.5	10
<i>L. brevicaudus</i> BMNH 1929.4.28-1	166	5	33.2	277	18	72.2	10

are lower than in *L. nigricans* (234) from South Africa (authors' observations, but see the data of *L. nigricans* in BROADLEY & WATSON 1976). One specimen from East Africa, determined from the MNHN (Paris) as *L. longicaudus*, has all characters of *L. nigricans* (= *L. emini*): belly brown, total dorsals 250, subcaudals 32, rostral reaching level of anterior border of eye, supraocular as large as prefrontal. Tail shorter than in *L. longicaudus* (see table 1). We agree with BROADLEY & WATSON (1976), HAHN (1978), ROUX-ESTÉVE (1979), and WELCH (1994) that *L. nigricans* and *L. emini* are conspecific, and the former name has priority over the latter.

Leptotyphlops perreti from Cameroon has a higher number of total dorsals (291-302) and subcaudals (49-51) than *L. albiventer* n. sp.

The endemic *L. bouleengeri* from Manda and Lamu Islands (Kenia) is distinguished from *L. albiventer* by its stout body form (body diameter 29.9 in TL; 41.3-51.2 in TL in *albiventer*) (HAHN 1978).

Leptotyphlops cairi from northeastern Africa differs from *L. albiventer* in having divided occipitals, a larger rostral, and the first supralabial only reaching one quarter of the size of the second (HAHN 1978, MEIRTE 1992).

Leptotyphlops reticulatus from Somalia is distinguished from *L. albiventer* by having an anterior supralabial equal to or higher than the infranasal, and a discrete black and white reticular colour pattern (HAHN 1978, MEIRTE 1992).

Leptotyphlops wilsoni from Socotra Island has more total dorsals (287–300), more subcaudals (47–49), and a shorter tail than *L. albiventer* (HAHN 1978).

The West Africa species *Leptotyphlops bicolor* and *L. sundevalli* have two anterior supralabials. In the latter the second supralabial is very high, touching the supra-ocular.

Leptotyphlops brevicaudus has a very high tail in total length ratio of 33.2 (authors' observations). The tail reaches at most one fifth of the total length (MEIRTE 1992).

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