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REVISION OF THE AFRICAN SNAKES OF THE GENERA
DROMOPHIS AND PSAMMOPHIS

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*Revision of the African Snakes of the Genera Dromophis
and Psammophis*

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During the past forty-five years, numerous authors have commented on the urgent need for revision of the African members of the genus *Psammophis*. Nevertheless the task has not been undertaken, partly on account of the large number of alleged species to be dealt with, but chiefly because of the formidable extent of the bibliography to be examined.

References to the genus have been found in 470 books and papers cited in this paper and the involved synonymy straightened out to the best of my ability. Even though a quarter of the present contribution is devoted to such synonymy, it appears worth while to publish the result, for it covers nearly half-a-century in which confusion of racial characters has led to the repeated recording of forms and species in regional check lists for areas remote from their true range. Take for example the name *sibilans* which has, at one time or another, been applied to 11 of the 21 species recognized in the two genera. The citations for *sibilans* (*sensu strictu*) alone number over 250. Every reference has been looked up and the resultant data, after careful scrutiny, embodied in this paper, which, in effect, purports to be a digest of our knowledge of each species up to the end of 1939.

All the material in the Field Museum of Natural History and the Museum of Comparative Zoölogy has been studied. The latter collection contains fifteen of the eighteen forms of *Psammophis* recognized. As a result I have been enabled to extend the range of variation and recast the descriptions furnished by the late Dr. G. A. Boulenger in his monumental "Catalogue of the Snakes in the British Museum" (1896d, 3, pp. 155-171). Unfortunately two of the key characters employed by that author have subsequently proved to be so variable as to possess only a relative value, I refer to the breadth of a rostral in relation to its height, and the width of the frontal in relation to that of a supraocular.

This study has brought to light several interesting facts, chief among which appears to be that members of the genus *Psammophis* which have suffered mutilation of the tail, have the ability to regenerate a terminal point on the truncated tip! When the amputated portion was not very great, or the injury occurred early in life, the loss is not

obvious; indeed many workers, including myself (1929h, p. 32), have assumed, or stated, that tails were intact, which, in reality, were not so. As a result, the range in number of subcaudals has from time to time been augmented by the inclusion of counts from specimens exhibiting a terminal point which, however, may have lost many subcaudals. It transpires that the sum total variation in ventral counts of both sexes of a given species or race, is in a fairly definite ratio to the sum total variation of subcaudals in the same species or race. This will be appreciated best by reference to, and comparison of, columns 1 and 2 of Table II. Where the subcaudal range was greatly in excess of the ventral range, reference to the specimens furnishing the lowest subcaudal counts almost invariably revealed injured tails with regenerated tips. In this way many errors have been eliminated.

It also became obvious that a range of from 20 to 25 appeared normal, but that forms like *schokari* and *sibilans* (*sensu strictu*) which enjoy an extensive distribution, have a much greater range of ventral counts than forms occupying a more restricted area. In the case of *schokari* it seems possible that further division of the form will be recognised as its range is from Mauretania, in West Africa, to Afghanistan and Sind. No Asiatic material being available to me I have left this question untouched.

In the case of *sibilans sibilans*, ranging from Egypt to Natal, a definite reduction in the subcaudal count from north to south is observable, this is of such a gradual nature, however, that recognition of *brevicestris* as a southern race appears unreasonable. The latter was referred to the synonymy of the former by Hewitt in 1912. In this connection it might be remarked that the character of a frontal being narrower or equal to the breadth of a supraocular has little significance in those forms where a large series of snakes have been available for study. This is shown in Table II, column 8.

The problem which caused me to undertake this revision at the present time, still remains in an unsatisfactory state. I refer to the question of how best to distinguish typical *P. s. sibilans* in East Africa from the snake which almost everyone has been calling *subtaeniatus*. True *subtaeniatus*, however, occurring south of the Zambesi is readily distinguishable from its yellow and stripe-bellied counterpart in East Africa north of the Zambesi. For this northern form I believe that Werner's name *P. subtaeniatus sudanensis* is available. In scalation the latter is practically identical with *P. s. sibilans*, but cannot be regarded as a race of *sibilans* as both occur together in the same localities though not in the same habitats. The heavier and much

larger *sibilans* is a snake of the cultivated lands, river banks, and swamps; the more elegant and slender *sudanensis* inhabits dry bush and scrub country which may be but a few hundred yards removed from the river banks where *sibilans* occurs. One has but to take two adult snakes of similar length and lay them side by side to note how much more slender is *sudanensis*. They do not represent different sexes for I have removed eggs from snakes of both types. The pair of black lines on the belly of *sudanensis* are diagnostic in many localities but not so in French West Africa or western Tanganyika.

It seems possible that *schokari* is the oldest African form having entered the continent from Arabia and spread westward to Mauritania. In Egypt or the Sudan it gave rise to two types, the slender semi-deserticolous species rather like itself which I call *subtaeniatus sudanensis*, and the heavier built *sibilans sibilans*. These two so-closely related species are, as indicated above, often difficult to distinguish in the Nile and Rift Valley regions but become more readily separable as they spread east and south. In the vicinity of Pretoria, Transvaal, typical *sibilans* gives off a western race *trinasalis* (*furcatus* auct.), which, in turn, gives off *notostictus* in Cape Province and South-West Africa and *leightoni* on the Cape Peninsula. In the forested areas of northwest Africa *sibilans* has given rise to the race *phillipsii*.

Whether *elegans* and *punctulatus* were derived from *schokari* or both from some older stock is less certain. They show close affinity, however, and *punctulatus* spreading southwards gave rise to *p. trivirgatus* and apparently *b. biseriatus* and *b. tanganicus*.

The southern group consisting of *jallae*, *crucifer* and *angolensis* appear to be more closely related to the *sibilans* stock while it is difficult to place the little-known *trigrammus* of southern Angola and South-West Africa until more is known of its range of variation.

The principal taxonomic changes resulting from this work—apart from the description of a new race of *biseriatus*—are the revival from synonymy of:

P. punctulatus trivirgatus Peters from synonymy of *punctulatus* Duméril & Bibron.

P. sibilans phillipsii (Hallowell) from synonymy of *sibilans* (Linné).

P. sibilans leightoni Boulenger from synonymy of *furcatus* Peters.

P. jallae Peracca from synonymy of *crucifer* (Daudin).

while the undermentioned are considered synonyms:

P. regularis Sternfeld = *P. s. phillipsii* (Hallowell)

P. sibilans occidentalis Werner = *P. s. phillipsii* (Hallowell)

<i>P. moniliger furcatus</i> Peters (not Bianconi)	= <i>P. s. trinasis</i> (Werner)
<i>P. ansorgii</i> Boulenger	= <i>P. jallae</i> Peracca
<i>P. rohani</i> Angel	= <i>P. jallae</i> Peracca
<i>P. longirostris</i> V. FitzSimons	= <i>P. jallae</i> Peracca
<i>Psammophis sibilans tumbensis</i> Schenkel	} = <i>Dromophis lineatus</i> (Duméril & Bibron)
<i>Psammophis brevirostris temporalis</i> Werner	

Dromophis has been included in this paper with the purpose of inviting attention to its close relationship to *Psammophis sibilans* as evidenced by its synonymy, and the references to *P. sibilans* which should properly be referred to *D. lineatus*. The two genera are readily separable by the following characters:

Maxillary teeth forming an uninterrupted series of 10 or 11 anteriorly, followed by an interspace then by a pair of enlarged grooved fangs situated beneath the posterior border of the eye *Dromophis*
(p. 7.)

Maxillary teeth interrupted below the *anterior* border of the eye by two greatly enlarged fang-like teeth, separated before and behind by an interspace, followed by more small maxillary teeth then by a pair of enlarged grooved fangs situated beneath the posterior border of the eye *Psammophis*
(p. 12.)

Owing to the refined discriminations of modern herpetology, it has been found impossible to construct a *Synoptical Key* comprising clear-cut distinctions. Particularly in regions where two races meet, individuals are found which exhibit an admixture of characters proclaiming their intermediate status. The *Synoptical Key* should, therefore, *be used with the greatest caution* and its conclusions checked by reference to Tables I and II; in doubtful cases the distributional range and locality records should afford assistance.

In describing characters that are variable the commoner type is given first; in the Tables this is expressed by placing the rarer variation in parenthesis, where a variation is extremely rare or somewhat questionable it is usually given as a footnote.

I take this opportunity of thanking numerous colleagues for their friendly coöperation in answering questions regarding specimens in

their care, or for the loan of material. Among these are Mons. F. Angel (Paris), Prof. O. Arcangeli (Turin), Dr. E. R. Dunn (Philadelphia), H. W. Parker (London), the late J. Roux (Bâle), G. Scortecci (Milan), R. H. Smithers (Capetown) and L. Stejneger (Washington).

Genus DROMOPHIS

1869d. *Dromophis* Peters, Monatsb. Akad. Wiss. Berlin, p. 447 (type *praeornatus* Schlegel).

Synonymy. The two members of this genus have been referred to *Dryophylax*, *Chrysopeleo*, *Philodryas* and *Psammophis* by various authors. Citations for these will be found in Boulenger, 1896d, Catalogue of Snakes, 3, p. 149.

Maxillary teeth 10 or 11, unequal in size, median longest, decreasing in size both anteriorly and posteriorly, followed, after a short interspace, by a pair of large grooved fangs situated below the posterior border of the eye; anterior mandibular teeth longest. Head distinct from neck; eye moderate, with round pupil. Body cylindrical; scales smooth, more or less oblique, with apical pits, in 15 or 17 rows at mid-body; ventrals rounded. Tail long; subcaudals in two rows.

Range. Tropical West and central southeast Africa.

Synopsis of the Species

1. Midbody scales in 17 rows; ventrals 138–159; subcaudals 83–105. *lineatus* (p. 7.)
Midbody scales in 15 rows. 2
2. Ventrals 161–186; subcaudals 109–122; upper labials 8, fourth and fifth entering orbit; temporals 1 + 2; dorsal stripe slightly more than 1 scale in width; range Senegal to Nigeria. *p. praeornatus* (p. 10.)
Ventrals 168–190; subcaudals 126–133; upper labials 9–10, fifth and sixth or sixth and seventh entering orbit; temporals 2 + 2 or 2 + 3; dorsal stripe more than 2 scales in width; range Nigeria to French Equatorial Africa. *p. gribinguiensis* (p. 11.)

DROMOPHIS LINEATUS (Duméril & Bibron)

1854. *Dryophylax lineatus* Duméril & Bibron, Erpét. Gén., 7, p. 1124: White Nile, Anglo-Egyptian Sudan.
- 1858c. *Psammophis sibilans* Günther (part, not Linné), Cat. Snakes Brit. Mus., p. 136.
- 1887b. Mocquard (part), Bull. Soc. Philom. Paris (7), 11, p. 78.

1863. *Philodryas lineatus* Jan, Elenco Sist. Ofidi, p. 83.
- 1884a. Rochebrune, Faune Senegambie. Reptiles, p. 170.
- 1895f. *Dromophis lineatus* Boulenger, Ann. Mag. Nat. Hist. (6), **16**, p. 33.
- 1896d. Boulenger, Cat. Snakes, Brit. Mus., **3**, p. 149.
- 1897b. Boulenger, Ann. Mag. Nat. Hist. (6), **19**, p. 279.
- 1897e. Boulenger, Proc. Zool. Soc. London, p. 801.
1898. Johnston, British Cent. Africa, p. 361a.
- 1906i. Boulenger, Ann. Mus. Genova (3), **2**, p. 214.
- 1908b. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, pp. 217, 232.
1908. Werner, 1907, Sitz. Akad. Wiss. Wien, **116**, **1**, p. 1877.
- 1910a. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. i, p. 29.
- 1910d. Sternfeld, Mitt. Zool. Mus. Berlin, **5**, p. 64.
- 1911c. Boulenger, Ann. Mus. Genova (3), **5**, p. 166.
1911. Sternfeld & Nieden, Mitt. Zool. Mus. Berlin, **5**, p. 385.
- 1915a. Boulenger, Proc. Zool. Soc. London, p. 212.
- 1915c. Boulenger, Proc. Zool. Soc. London, p. 630.
- 1915d. Boulenger, Proc. Zool. Soc. London, p. 653.
- 1916f. Chabanaud, Bull. Mus. Paris, **22**, p. 376.
- 1917b. Chabanaud, Bull. Mus. Paris, **23**, p. 12.
- 1919b. Boulenger, Proc. Zool. Soc. London, p. 289.
- 1921a. Chabanaud, Bull. Com. Etudes Afrique Occ. Franç., p. 470.
- 1921b. Chabanaud, Bull. Mus. Paris, **27**, p. 524.
- 1922a. Angel, Bull. Mus. Paris, **28**, p. 40.
1923. Schmidt, Bull. Ann. Mus. Nat. Hist., **49**, p. 110, pl. xiii.
- 1924b. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., Suppl. 3, p. 6.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 137.
- 1929h. Loveridge, Bull. U. S. Nat. Mus. 151, p. 32.
- 1933f. Angel, Les Serpens Afrique Occ. Française, p. 154.
- 1933h. Loveridge, Bull. Mus. Comp. Zoöl., **74**, p. 254.
- 1933m. Witte, Ann. Mus. Congo Belge Zool. (1), **3**, p. 93.
1934. Pitman, Rep. Faunal Survey N. Rhodesia, p. 296.
- 1936h. Loveridge, Field Mus. Nat. Hist. Zool. Ser., **22**, p. 254.
- 1937f. Loveridge, Bull. Mus. Comp. Zoöl., **79**, p. 496.
1937. Pitman, Uganda Journ., **4**, p. 227, pl. x, fig. 3, pl. J, fig. 4.
- 1939c. Scorteccei, Gli Ofidi Velenosi dell' Africa Italiana, p. 140, figs. 76-77.
1901. *Psammophis sibilans tumbensis* Schenkel, Verh. Naturf. Ges. Basel, **13**, p. 172: Tumbo Island, French Guinea.
- 1902a. *Psammophis brevirostris temporalis* Werner, Verh. Zool. Bot. Ges. Wien, **52**, p. 335: Coja, Togo.

Names. *Isakani* (Nyakusa, Tanganyika Territory, but applied to *Psammophis* also).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a third to once and two thirds as long as the

eye; internasals one third to one half as long as the prefrontals; frontal, in the middle, narrower than, as broad as, or slightly broader than a supraocular, as long as or slightly shorter than a parietal, as long as or slightly longer or slightly shorter than its distance from the end of the snout; nostril between 2 shields; loreal once and a third to once and two thirds as long as deep; preocular 1, separated from the frontal; postoculars 2, rarely 1 or 3; temporals 1 + 1 or 1 + 2 or 1 + 3, very rarely 2 + 2 or 2 + 3; upper labials 8, fourth and fifth entering the orbit; 4, rarely 5, lower labials in contact with the anterior sublinguals which are slightly shorter than or as long as the posterior. Midbody scales in 17 rows; ventrals 138-159; anal divided; subcaudals 83-105¹.

Coloration. Above, olive; head of young with light transverse bars on the occiput and nape, these markings sometimes disappearing in the adults, pre- and postoculars and lips greenish yellow, some of the labials with black sutures; dorsal scales mostly black-edged; three greenish-yellow longitudinal lines, one on the vertebral row of scales, the others on the fourth and fifth rows; outer scale-row greenish yellow bordered above with black. Below, belly and tail greenish yellow or pale green, uniform or with a series of black dots or short transverse lines on the outer ends of the ventrals.

Measurements. Largest recorded measures 1090 (760 + 330) mm. (Boulenger, 1896d, p. 150).

Breeding. On May 29 at Ujiji 6 eggs measuring 15 x 6 mm. in a ♀ (Loveridge).

Diet. A frog (*Rana m. mascareniensis*) at Ujiji. (Loveridge).

Enemies. A young example taken from the mouth of a file snake (*Mehelya riggenbachi*) at Ubao (Sternfeld).

Habitat. In Central Africa at least, to judge by the numerous lakeside records, it has some such association, perhaps on account of its diet of which nothing but the above record appears to be known.

Localities. **Anglo-Egyptian Sudan:** White Nile. **Uganda:** Bussu; Gulu, Acholi; Lado Enclave; Nile Camp; Rhino Camp. **Tanganyika Territory:** Ipiana; Mwaya; Tukuyu (Langenburg); Ujiji. **Nyasaland:** Karonga's to Kondowe; Nyika Plateau. **Northern Rhodesia:** Kabinda in Lukulu River delta, Lake Bangweulu; Nyamkolo. **Belgian Congo:** Chuapa River; Faradje; Gandu; Katobwe; Kunungu; Mahagi Port; Tembwe. **French Equatorial Africa:** Diele, Alima River; Kati nr. Beldongou. **French Cameroon:** Ubao. **Nigeria:** Asaba;

¹ 78-105 according to Boulenger (1896d, p. 149), I have examined the snake with 78 and consider that the terminal point may be regenerated.

Niger River. **Dahomey:** Agouagou. **Togoland:** Coja; Kete; Misahohe; Sausane Mangu; Sokode. **Liberia.** **French Guinea:** Dixine; Kerouane; Tumbo Island. **Portuguese Guinea:** Bissau; Rio Cassine.

Distribution. Portuguese Guinea east to the Nile, south through the countries immediately bordering the Great Lakes to Nyasaland (i.e. Lake Nyasa). Boulenger's record of Coast of Zanzibar is considered definitely erroneous. Calabresi's (1916, p. 40) Bardera, Italian Somaliland snake, repeated by Scortecci, is, I imagine, a *Hemirhagerhis kelleri*.

DROMOPHIS PRAEORNATUS PRAEORNATUS (Schlegel)

1837. *Dendrophis praeornata* Schlegel, Essai Phys. Serp., **2**, p. 236: Walo, Senegal.
1854. *Oxyrhopus praeornatus* Duméril & Bibron, Erpét. Gén., **7**, p. 1039.
- 1858c. *Chrysopelea praeornata* Günther, Cat. Snakes Brit. Mus., p. 147.
1865. Günther, Ann. Mag. Nat. Hist. (3), **15**, p. 95.
1869. Jan, Icon. Gén. Ophid. pl. ii, fig. 2.
- 1884a. Rochebrune, Faune Senegambie. Reptiles, p. 176.
- 1885d. Müller, Verh. Naturf. Ges. Basel, **7**, p. 687.
- 1887a. Boettger, Ber. Senckenberg. Ges., p. 60.
- 1869d. *Dromophis praeornatus* Peters, Ofv. Kongl. Vet. Akad. Förh., p. 447.
1870. Steindachner, Sitz. Akad. Wiss. Wien, **62**, p. 333.
- 1890b. Müller, Verh. Naturf. Ges. Basel, **8**, p. 694.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 150.
1898. Boettger, Kat. Rept.-Samm. Mus. Senckenberg. II, p. 102.
- 1902b. Mocquard, Bull. Mus. Paris, **8**, p. 415.
- 1908b. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, pp. 218, 232.
- 1916f. Chabanaud, Bull. Mus. Paris, **22**, p. 376.
- 1917b. Chabanaud, Bull. Mus. Paris, **23**, p. 12.
- 1918b. Chabanaud, Bull. Mus. Paris, **24**, p. 165.
- 1919b. Boulenger, Proc. Zool. Soc. London, p. 289.
- 1921a. Chabanaud, Bull. Com. Etudes Afrique Occ. Franç., p. 470.
- 1921b. Chabanaud, Bull. Mus. Paris, **27**, p. 525.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 138.
- 1933f. Angel, Les Serpens Afrique Occ. Française, p. 156, fig. 59.

Synonymy. After having been referred to the genera *Oxyrhopus* and *Chrysopelea*, *praeornatus* became the genotype of *Dromophis* as proposed by Peters in 1869. The score of references since that date all refer to the typical form with the exception of Sternfeld's (1917, p. 477) which is applicable to the eastern race described by Angel in 1921.

Description. Rostral slightly broader than deep, visible from above; snout once and a half to once and two thirds the diameter of the eye; internasals¹ slightly more than half the length of the prefrontals; frontal, in the middle, nearly as broad as a supraocular, shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 shields; loreal once and a half to once and two thirds as long as deep, in contact with or narrowly separated from the frontal; postoculars 2; temporals 1 + 2; upper labials 8, fourth and fifth entering the orbit; 4 or 5 lower labials in contact with the anterior sublinguals, which are as long as the posterior. Midbody scales in 15 rows; ventrals 161-186; anal divided; subcaudals 109-122.

Coloration. Above, pale olive, with black transverse bands anteriorly; most regular on the head; dorsum with a red vertebral stripe slightly more than one scale in width in the middle and a dorso-lateral series of black spots; three black stripes posteriorly. Below, uniform white.

Measurements. Largest recorded measures 550 (375 + 175) mm. (Boulenger, 1896d, p. 150).

Diet. A lizard (*Eremias* sp.) in a Togo snake (Sternfeld).

Habitat. Sternfeld (1908b, p. 218) remarks that in contrast to *lineatus*, in Togoland this species occurs only in the north of the colony. Elsewhere (1917, p. 477) he states that both are snakes of the steppe.

Localities. **Nigeria:** Niger River. **Togo:** Mangu. **Gold Coast:** Accra. **Ivory Coast:** Lahou or Lahu. **French Guinea:** Kerouane; Kerroussa. **Senegal:** Dakar; Sangaleam; Satadougou; Taoue; Wallo.

Distribution. West Africa from Senegal to Nigeria.

DROMOPHIS PRAEORNATUS GRIBINGUIENSIS Angel

1917. *Dromophis praeornatus* Sternfeld (not Schlegel), Zweit. Deutschen Zent.-Afrika-Exped., **1**, pp. 409, 477.
- 1921b. *Dromophis praeornatus* var. *Gribinguiensis* Angel, Bull. Mus. Paris, **27**, p. 141: Gribingui region, French Equatorial Africa.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 141.
- 1933f. Angel, Les Serpens Afrique Occ. Française, p. 156, footnote.
1933. Parker, Ann. Mag. Nat. Hist. (10), **12**, p. 544.

Description. Differs from the typical form in the more numerous ventrals, subcaudals, upper labials and temporals, viz. Postoculars 2-3; temporals 2 + 2 or 2 + 3; upper labials 9-10, fifth and sixth or

¹ Fused to form a single plate in a Sangaleam snake, *vide* Chabanaud (1918b, p. 165).

sixth and seventh entering the orbit. Midbody scales in 15 rows; ventrals 168-190; subcaudals 126-133.

Coloration. Above, pale olive; a small black spot on each internasal; on the prefrontals a transverse black band, interrupted on the median suture, extends through the loreal to the third and fourth labials; a second band between the eyes reappears as a spot on the suture between the fifth and sixth labials; a third band crosses the posterior end of the frontal and supraoculars and the anterior ends of the parietals, the anterior temporals, and terminates on the suture between the seventh and eighth labials; a fourth and last band crosses the posterior half of the parietals and without contraction reaches almost to the commissure of the mouth, along the parietal suture these last two bands give off converging projections between which lies a paired yellow spot as is found in the genus *Psammophis*. Anterior two thirds of the dorsum largely uniform except for a broad brownish-red vertebral band and a lateral series of black spots upon a light ground, the darkening and contracting of the band together with a convergence of the lateral spots accompanied by a darkening of the ground colour gives rise to the three characteristic black longitudinal stripes on the posterior part of the body. Below, uniform yellowish white except for black spots on the outer ends of the ventrals which tend to form longitudinal lines in the preanal region and upon the tail.

Measurements. Largest recorded measures 547 (365 + 182) mm. from ? Logone region (Sternfeld).

Localities. **French Equatorial Africa:** Gribingui River region. **French Cameroon:** Logone (River) region? **Nigeria:** Jos.

Distribution. West Africa from Nigeria to French Equatorial Africa.

Remarks. Sternfeld (1917, p. 477) first described this snake in great detail from a specimen with doubtful locality, supposedly from Logone region south of Lake Chad, he referred it to *pracornatus* of which he rightly said it was the most easterly example known. Later it was named by Angel. More recently Parker (1933, p. 544) received two specimens from Jos. As I have no material the above description is based on the statements of these three authors. The color translated and adapted from Sternfeld's detailed description.

GENUS PSAMMOPHIS

1827. *Psammophis* Boie, part, in Oken, Isis, **20**, col. 521 (type *sibilans* Linné).

1868. *Phayrea* Theobald, Cat. Rept. Asiatic Soc. Mus., p. 51 (type *isabellina* = *condanarus* Merrem).

1872. *Amphiophis* Bocage, Jorn. Sci. Lisboa, **4**, p. 81 (type *angolensis* Bocage).

Synonymy. For further references to the genus *Psammophis* see Boulenger, 1896d, Catalogue of Snakes, 3, p. 152.

Maxillary teeth 10 to 13, one or two in the middle much enlarged, fang-like, preceded and followed by an interspace, also the last or last two much enlarged, grooved, and situated below the posterior border of the eye; anterior mandibular teeth very strongly enlarged. Head distinct from neck; eye moderate or large, with round pupil. Body cylindrical; more or less oblique (scarcely so in *crucifer* and *angolensis*), with apical pits, in 11 to 19 rows at midbody; ventrals rounded. Tail long; subcaudals in two rows.

Range. Africa and southern Asia.

Synopsis of the Species

1. Midbody scales in 17 (very rarely 19) rows 2
Midbody scales in 15 (very rarely 17¹) rows 14
2. Upper labials usually 9 (rarely 8 or 10); usually 5 (rarely 4 or 6) lower labials in contact with the anterior sublinguals 3
Upper labials usually 8 (rarely 7 or 9); usually 4 (rarely 5) lower labials in contact with the anterior sublinguals 8
3. Snout twice to twice and a half as long as the eye (see below for *trigrammus* also) *elegans*
(p. 17.)
Snout less than twice as long as the eye 4
4. Subcaudals more than 130 pairs 5
Subcaudals less than 130 pairs 13
5. Belly finely punctate, the spots arranged transversely not linearly 6
Belly markings, when present, consisting of a median band with or without linearly arranged dashes or spots; subcaudals less than 150 7
6. A dark vertebral stripe, no dorsolateral ones; subcaudals 158-173
p. punctulatus
(p. 19.)
A dark vertebral and a pair of dorsolateral stripes; subcaudals 143-163
p. trivirgatus
(p. 21.)

¹A single example of *P. crucifer* with 17 scale-rows has been recorded by Hewitt.

7. Preoculars 2, not in contact with frontal; temporals 1 + 1 or 1 + 2, rarely 2 + 1 or 2 + 2; range southern Angola and South-West Africa.
trigrammus
 (p. 23.)
- Preoculars 1, in contact with frontal, rarely 2, not in contact with frontal; temporals 2 + 2 or 2 + 3, rarely 1 + 2; range North Africa.*schokari*
 (p. 24.)
8. Anal entire, very rarely divided. 9
 Anal divided, very rarely entire. 10
9. Preocular 1, not in contact with frontal; nostril between 2, rarely 3 shields; range virgin forest regions from Sierra Leone to Gaboon.*phillipsi*
 (p. 41.)
- Preoculars 2, in contact with frontal, rarely 1, not in contact with frontal; nostril between 3, rarely 2 shields; range more arid regions of Angola, South-West Africa and Cape Province.*notostictus*
 (p. 44.)
10. Preocular 1, usually in contact with frontal; very rarely 2, rarely not in contact with frontal. 11
 Preocular 1, not in contact with frontal, very rarely 2, very rarely in contact with frontal. 12
11. Longitudinal light lines on rear of head and side of neck; range Transvaal to South-West Africa.*trinassalis*
 (p. 46.)
- Transverse light bars on rear of head and side of neck; range Little Namaqualand and Peninsula.*leightoni*
 (p. 49.)
12. Habit stout; belly usually uniform white or plumbeous in adult, rarely with lateral lines though young often with lateral series of dusky spots; subcaudals 78-116; range from Mauretania to Egypt south to Natal exclusive of areas occupied by the foregoing races.*sibilans*
 (p. 30.)
- Habit slender; belly always with a pair of sharply distinct parallel longitudinal lines; subcaudals 92-114; range from southern Sudan through Kenya and Tanganyika to northern Mozambique.*sub. sudanensis*
 (p. 50.)

13. Ventrals 159-174; subcaudals 109-127; upper labials usually 9, fourth, fifth and sixth entering the orbit, rarely 8 or 10 with fourth and fifth or fifth, sixth and seventh entering; range from southern Mozambique to Angola and South-west Africa *sub. subtaeniatus*
(p. 55.)
14. Midbody scales in 15 rows 15
Midbody scales in 13 rows or less 18
15. Upper labials usually 9, very rarely 8 or 10; 5 (rarely 4) lower labials in contact with the anterior sublinguals; frontal, in the middle, narrower than a supraocular; range East Africa. 16 Upper labials 8 or 7; 4 lower labials in contact with the anterior sublinguals; frontal, in the middle, usually broader than a supraocular; range southern Congo and Angola southwards 17
16. Two labials, usually the fifth and sixth, entering the orbit; range eastern Kenya Colony north to Italian Somaliland and south to Tanganyika Territory in vicinity of Kilimanjaro *b. biseriatus*
(p. 60.)
- Three labials, usually the fourth, fifth and sixth, entering the orbit; southern Libya east to Somaliland, south in the Central Lakes region to Tanganyika Territory *b. tanganicus*
(p. 57.)
17. Ventrals 153-177; subcaudals 97-109; upper labials 7, third and fourth entering the orbit *jallae*
(p. 62.)
- Ventrals 136-158; subcaudals 62-86; upper labials usually 8, fourth and fifth entering the orbit, rarely 7, third and fourth entering *crucifer*
(p. 64.)
18. Midbody scales in 13 rows; subcaudals 108; range Ethiopia (known only from the type) *pulcher*
(p. 67.)
- Midbody scales in 11 rows; subcaudals 57-82; range Tanganyika south to Mozambique, west to Angola *angolensis*
(p. 68.)

TABLE 1
 VARIATION OF SCALATION IN THE GENUS PSAMMOPHIS

Species or race	Midbody scale-rows	Ventral range	Anal divided or entire	Subcaudal range	Preocular range	Postocular range	Number of upper labials, those entering the orbit in parenthesis
<i>elegans</i>	17	183-203	2	152-172	1	2 (3)	9 (5, 6)
<i>p. punctulatus</i>	17	176-196	2	158-178	1	2	9 (5, 6) 9 (3, 4, 5) 8 (4, 5)
<i>p. trivirgatus</i>	17	177-197	2	143-163	1	2	9 (5, 6) 9 (3, 4, 5) 8 (4, 5)
<i>trigrammus</i>	17	182-197	2	132-150	2	2	9 (5, 6) 9 (5, 6)
<i>s. schokari</i>	17 (19)	156-205	2	93-149	1 (2)	2 (3)	10 (6, 7) 8 (4, 5) 7 (3, 4)
<i>s. sibilans</i>	17	151-186	2 (1)	*78-121	1 (2)	2 (3)	8 (4, 5) 9 (5, 6)
<i>s. phillipsii</i>	17	162-182	1	89-109	1	2 (3)	8 (4, 5) 8 (4, 5)
<i>s. notostictus</i>	17	157-184	1 (2)	81-106	2 (1)	2 (3)	8 (4, 5) rarely 9 (4, 5, 6)
<i>s. trinasalis</i>	17	152-180	2	85-117	1 (2)	2 (3)	8 (4, 5)
<i>s. leightoni</i>	17	156-176	2	84-110	1	2	8 (4, 5)
<i>s. sudanensis</i>	17	148-169	2	92-114	1 (2)	2	8 (4, 5) 9 (4, 5, 6)
<i>s. subtaeniatus</i>	17	159-174	2	†109-127	1-2	2	8 (4, 5) 10 (5, 6, 7) 8 (3, 4, 5)
<i>b. tanganicus</i>	15	142-168	2	97-117	1 (2)	2	9 (4, 5, 6) 10 (4, 5, 6) 9 (5, 6)
<i>b. biseriatus</i>	15	138-156	2 (1)	100-130	1 (2)	2	9 (4, 5, 6) 8 (4, 5)
<i>jallae</i>	15	153-177	2	‡97-109	1	2 (1)	7 (3, 4)
<i>crucifer</i>	15 (17)	136-158	2	‡62- 86	1	2	8 (4, 5) 7 (3, 4)
<i>pulcher</i>	13	144	2	108	2	2	8 (4, 5)
<i>angolensis</i>	11	141-156	2	57-82	1	2 (3)	8 (4, 5) 7 (4, 5)

* 71 fide Bocage.

† 77 fide Boulenger.

‡ 77 fide Boulenger & H. W. P. but see note.

TABLE 2

VARIATION, AND PROPORTIONS OF HEAD SHIELDS IN THE GENUS PSAMMOPHIS

Species or races	Variation in number of Ventrals	Variation in number of Subcaudals	Number of times diameter of eye is included in length of snout	Number of times that the loreal is longer than it is deep	Number of shields surrounding the nostril	B—Rostral broader than deep E—Rostral as broad as deep	Internasal length in relation to Prefrontal. M—much shorter.	Frontal, in middle, narrower (N), equal (E) or broader (B) than a Supraocular	Length of Frontal longer than (L), equal to (E), or shorter than (S) that of a Parietal shield	Length of Frontal longer than (L), equal to (E), or shorter than (S) its distance from end of the snout
<i>elegans</i>	24	28	2-2 ¹ / ₂	3-4	2	B-E	M	N	E-S	E-S
<i>p. punctulatus</i>	20	20	1 ¹ / ₂ -1	2-2 ¹ / ₂	2-3	B-E	M	N	E-S	E-L
<i>p. trivirgatus</i>	20	17	1 ¹ / ₂ -1	2-3	2-3	B-E	M	N	E-S	E-L
<i>trigrammus</i>	15	18	1 ¹ / ₂ -2	2 ¹ / ₂ -3	3	B	M	N	E-S	E-L
<i>s. schokari</i>	49	56	1 ¹ / ₂ -1	1 ¹ / ₂ -4	2-3	B	M	N	E	E-L
<i>s. sibilans</i>	35	38	1 ¹ / ₂ -1	1 ¹ / ₂ -2 ¹ / ₂	2-3	B-E	M	N-E	L-E-S	E-L
<i>s. phillipsii</i>	20	20	1 ¹ / ₂ -1	1 ¹ / ₂ -2 ¹ / ₂	2-3	B-E	M	N-E	L-E-S	L
<i>s. notostictus</i>	27	25	1 ¹ / ₂ -1	1 ¹ / ₂ -2	2-3	B	M	N	E-S	L
<i>s. trinasalis</i>	20	32	1 ¹ / ₂ -1	1 ¹ / ₂ -2	2-3	B-E	M	N	L-E	L
<i>s. leightoni</i>	20	26	1 ¹ / ₂ -1	2	2-3	B-E	M	N	S	L
<i>s. sudanensis</i>	21	22	1 ¹ / ₂ -1	2-2 ¹ / ₂	2-3	B-E	M	N-E	L-E-S	E-L
<i>s. subtaeniatus</i>	15	18	1 ¹ / ₂ -1	2-2 ¹ / ₂	2-3	B-E	M	N-E	L-E-S	L
<i>b. tanganicus</i>	16	17	1 ¹ / ₂ -1	2-3 ¹ / ₂	2	B-E	M	N	E-S	L
<i>b. biseriatus</i>	18	33	1 ¹ / ₂ -1	2-3	2	B	M	N	E-S	L
<i>jallae</i>	24	33	1 ¹ / ₂ -1	1 ¹ / ₂ -2	2-3	B-E	M	B	L-E	L
<i>crucifer</i>	22	24	1 ¹ / ₂ -1	1 ¹ / ₂	2	B	M	E-B	E-S	L
<i>pulcher</i>	1 ¹ / ₂	1	2	B	M	N	S	L
<i>angolensis</i>	15	25	1 ¹ / ₂ -1 ¹ / ₂	1 ¹ / ₂ -2	2	B	M	N-B	L-S	L

* Boulenger gives twice but this appears extremely doubtful.

† Boulenger gives up to four times which must be rare indeed.

PSAMMOPHIS ELEGANS (Shaw)

- 1735. *Serpens Catenata* Seba, *Rerum Nat. Thesauri*, **2**, p. 59, pl. lx, fig. 1: "Nova Hispania."
- 1802. *Coluber Elegans* Shaw, *Gen. Zool.*, **3**, p. 536: "South America" (according to Seba).
- 1819. *Macrosoma elegans* Leach, in Bowdich, *Mission Ashanti Africa*, p. 493.
- 1825. *Natrix elegans* Wagler, *Amphib. Serp.*, p. lxii.
- 1827. *Psammophis elegans* Boie, in Oken, *Isis*, **20**, col. 533, 548.
- 1837. Schlegel, *Essai Phys. Serp.*, **2**, p. 216.

1844. Schlegel, *Abbild. Amphib.*, p. 130, pl. xliii, figs. 15-16.
 1854. Duméril & Bibron, *Erpét. Gén.*, **7**, pt. 1, p. 894.
 1858c. Günther, *Cat. Snakes Brit. Mus.*, p. 138.
 1860. Duméril, A., *Arch. Mus. Paris*, **10**, p. 208, pl. xvii, figs. 10-10a.
 1866a. Bocage, *Jorn. Sci. Lisboa*, **1**, p. 49.
 1867a. Bocage (part), *Jorn. Sci. Lisboa*, **1**, p. 226.
 1870. Steindachner, *Sitz. Akad. Wiss. Wien*, **62**, p. 333.
 1881b. Boettger, *Abh. Senckenberg. Naturf. Ges.*, **12**, p. 395.
 1882. Müller, *Verh. Naturf. Ges. Basel*, **7**, p. 170.
 1884a. Rochebrune, *Faune Senegambie. Reptiles*, p. 166.
 1885d. Müller, *Verh. Naturf. Ges. Basel*, **7**, p. 687.
 1892a. Bocage, *Jorn. Sci. Lisboa (2)*, **2**, p. 183.
 1893c. Matschie, *Mitt. Fors. Gel. Deutsch Schutz.*, **6**, p. 212.
 1895b. Boulenger, *Proc. Zool. Soc. London*, p. 539.
 1896a. Bocage, *Jorn. Sci. Lisboa (2)*, **4**, p. 78.
 1896d. Boulenger, *Cat. Snakes Brit. Mus.*, **3**, p. 167.
 1898. Boettger, *Kat. Rept.-Samm. Mus. Senckenberg. II*, p. 104.
 1899a. Werner, *Verh. Zool. Bot. Ges. Wien*, **49**, p. 148.
 1902a. Werner, *Verh. Zool. Bot. Ges. Wien*, **52**, p. 338.
 1906i. Boulenger, *Ann. Mus. Genova (3)*, **2**, p. 214.
 1908b. Sternfeld, *Mitt. Zool. Mus. Berlin*, **4**, pp. 218, 233.
 1917. Sternfeld, *Zweit. Deutschen Zent.-Afrika-Exp.*, **1**, pp. 409, 480.
 1918b. Chabanaud, *Bull. Mus. Paris*, **24**, p. 166.
 1919b. Boulenger, *Proc. Zool. Soc. London*, p. 290.
 1919d. Chabanaud, *Bull. Mus. Paris*, **25**, p. 567.
 1921a. Chabanaud, *Bull. Com. Études Afrique Occ. Franç.*, p. 470.
 1922. Aylmer, *Sierra Leone Studies*, **5**, p. 15.
 1925b. Flower, *Proc. Zool. Soc. London*, p. 971.
 1925. Werner, 1924, *Arch. Naturg.*, **90**, Abt. A, p. 141.
 1933b. Angel, *Bull. Mus. Paris (2)*, **5**, p. 69.
 1933f. Angel, *Les Serpens Afrique Occ. Française*, p. 158, figs. 60-60b.
 1884a. *Psammophis trigrammus* Rochebrune (not Günther), *loc. cit.*, p. 167.
 1896c. Mocquard, *Bull. Mus. Paris*, **2**, p. 59.
 1922a. *Psammophis schokari* Angel (not Forskäl), *Bull. Mus. Paris*, **28**, p. 40.

Synonymy. Individuals of this species have been referred to *trigrammus* by both Rochebrune (1884a) and Mocquard (1896c), also to *schokari* by Angel (1922a), the latter has kindly reexamined both his and Mocquard's material and agrees with my allocation. Some of the snakes identified as *elegans* by Bocage (1867a) are undoubtedly *sibilans*.

Names. Elegant Sand-Snake (English); *baloui* (French Guinea); *sabondo* (Habbe).

Description. Rostral broader than or as broad as deep, scarcely visible from above; snout twice to twice and a half as long as the eye;

internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as or slightly shorter than a parietal, as long as or slightly shorter than its distance from the end of the snout; nostril between 2 shields; loreal three or four times as long as deep; preocular 1, usually separated from the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 9, fifth and sixth entering the orbit; 5, rarely 6, lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows; ventrals¹ 183-203; anal divided; subcaudals² 152-172.

Coloration. Above yellow or pale olive, head olive finely punctate or vermiculated with black; three longitudinal bands formed by black-edged scales between black lines, the median band five scales wide but narrowing anteriorly, the lateral narrower and extending to the end of the snout after passing through the eye; upper lip and sides of belly yellow, rest of belly and under tail, grayish or olive lineolated with black.

Measurements. Largest recorded measured 1750 (1060 + 690) mm. (Angel).

Longevity. 1 year, 11 months, 10 days in London zoo (Flower).

Diets. *Agama* (Werner, 1899a), (Sternfeld, 1908b); *Mabuya* (Sternfeld, 1908b).

Localities. **French Equatorial Africa:** Bandiagara; Dire; Kati near Bammako. **Nigeria:** Lagos. **Dahomey:** Widah. **Togoland:** Atakpame; Bismarckburg; Kete; Misahohe; Pame. **Gold Coast:** Ashanti; Fantee; Odumasi; Tumbo Island. **French Guinea:** Dixine. **Portuguese Guinea:** Bissau; Bolama. **Senegal:** Dagana in Cayor; Mpal near Saint Louis.

Distribution. West Africa from the French Sudan and Nigeria to Senegal, but not reported from Liberia, Sierra Leone, and Gambia.

PSAMMOPHIS PUNCTULATUS PUNCTULATUS Duméril & Bibron

1854. *Psammophis punctulatus* Duméril & Bibron, *Erpét. Gén.*, **7**, p. 897: Arabia. (Locality doubtful.)
- 1882a. Peters (part), *Reise nach Mossambique*, **3**, p. 123.
1895. Prato, *Atti. Soc. Ital. Sci. Nat.*, **35**, p. 25.
1896. Anderson, *Contr. Herpet. Arabia*, p. 83.
- 1896a. Boulenger, *Ann. Mus. Genova* (2), **16**, p. 553.
- ?1896b. Boulenger, *Ann. Mus. Genova* (2), **17**, p. 13.

¹ Boulenger's specimen with allegedly 179 ventrals, I find has 184.

² Boulenger's records of 144 and 149 subcaudals have regenerated tails.

- 1896d. Boulenger (part), Cat. Snakes Brit. Mus., **3**, p. 159.
 1898. Boettger, Kat. Rept.-Samm. Mus. Senckenberg. II, p. 104.
 ?1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 241.
 1915c. Boulenger (part), Proc. Zool. Soc. London, p. 630.
 1915d. Boulenger (part), Proc. Zool. Soc. London, p. 653.
 1919. Werner, Denks. Akad. Wiss. Wien, **96**, p. 506.
 1925. Werner (part), 1924, Arch. Naturg., **90**, Abt. A, p. 140.
 1927. Calabresi (part), Atti. Soc. Ital. Sci. Nat., **66**, p. 55.
 1928b. Scortecchi, Atti. Soc. Ital. Sci. Nat., **67**, p. 305.
 1930a. Scortecchi, Atti. Soc. Ital. Sci. Nat., **69**, pp. 203, 213.
 1930b. Zavattari, in Bono, Miss. Sci. Eritrea, p. 194.
 1931a. Vinciguerra, Ann. Mus. Genova, **55**, p. 101, pl. i.
 1935a. Corkhill, Sudan Govt. Mus. Publ. No. 3, p. 21.
 1939c. Scortecchi (part), Gli Ofidi Velenosi dell' Africa Italiana, p. 151.
 1859. *Dendrophis furcata* Bianconi, Mem. Accad. Sci. Bologna, p. 500 pl. xxv; reprinted in Spec. Zool. Mossambicana, p. 276, pl. xiii: Mozambique. (Locality doubted.)

Synonymy. This distinctive species does not appear to have been confounded with any other, the majority of references to it in the literature, however, apply to the southern form.

Name. Northern Speckled Sand-Snake (English).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, much narrower than a supraocular, as long as or slightly shorter than a parietal, as long as or usually longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal nearly twice to twice and a half as long as deep; preocular 1, in contact with, rarely separated from, the frontal; postoculars 2; temporals 2 + 2 or 2 + 3; upper labials 9, rarely 8, fifth and sixth, rarely fourth and fifth or third, fourth and fifth, entering the orbit; 5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows; ventrals 176-196; anal divided; subcaudals¹ 158-178.

Coloration. Above, yellow or white, head and nape olive-gray, buff, or reddish, uniform or speckled with black; a single black vertebral stripe along the body turning to reddish brown on tail, bifurcating anteriorly, each branch, as a black or brown streak, sometimes extending through the eye to the end of the snout; sides, belly, and underside of tail, grayish or greenish heavily speckled with black.

¹Vinciguerra (1931a, p. 101) states that Pellegrin has reexamined Duméril & Bibron's type and finds that the low number of 130 subcaudals results from the fact that the tip of the tail is missing.

Measurements. Largest recorded measures 1440 (850 + 590) mm., from Danakil, Ethiopia. (Vinciguerra.)

Habitat. Coastal plain to arid thorn-bush uplands.

Localities. **Anglo-Egyptian Sudan:** Butana, Kasala Province; Gebel Moya, lower Blue Nile. **Eritrea:** Agordat; Barentu; Ghinda; Monte Dongallo; Saati; Tessenei. **Ethiopia:** Gaarre, Dankali; Harrar es Saghir.

Distribution. Arabia (?) and Anglo-Egyptian Sudan south through Eritrea to northeastern Ethiopia.

Remarks. Doubts have been expressed as to whether the type actually came from Arabia, the only second record being that of Sternfeld (1908c, p. 241) from Haith al hin, Lahaj (as Lahadj), a doubtful identification in view of its being stated to have only 171 ventrals and 40 subcaudals.

Much more doubtful to me is that no second example has come from Mozambique since Bianconi described *furcata*. Peters' (1882a, p. 123) reference to a specimen from Inhambane in the Bologna Museum, presumably refers to the type of *furcata*. As the type had a single vertebral stripe, should it really have come from Mozambique, then my recognition of a southern race is rendered doubtful.

PSAMMOPHIS PUNCTULATUS TRIVIRGATUS Peters

- 1878a. *Psammophis punctulatus* var. *trivirgatus* Peters, Monatsb. Akad. Wiss. Berlin, p. 206: Teita, Kenya Colony.
- 1884a. Fischer, Jahr. Hamburg. Wiss. Anst., **1**, p. 12.
- 1882a. *Psammophis punctulatus* Peters (part, not Duméril & Bibron), Reise nach Mossambique, **3**, p. 123.
- 1893b. Boettger, Zool. Anz., **16**, pp. 119, 123.
- 1895b. Boulenger, Proc. Zool. Soc. London, p. 537.
- 1895i. Boulenger, Ann. Mus. Genova (2), **15**, p. 14, pl. iv, fig. 1.
- 1896b. Boulenger, Ann. Mus. Genova (2), **17**, p. 13.
- 1896c. Boulenger, Ann. Mus. Genova (2), **17**, p. 21.
- 1896d. Boulenger (part), Cat. Snakes Brit. Mus., **3**, p. 159.
- 1896e. Boulenger, Proc. Zool. Soc. London, p. 216.
1896. Tornier, Kriechthiere Deutsch-Ost-Afrikas, p. 82.
- 1897g. Boulenger, Ann. Mus. Genova (2), **17**, p. 279.
1897. Tornier, Arch. Naturg., **63**, **1**, p. 65.
- 1898a. Boulenger, Ann. Mus. Genova (2), **18**, p. 721.
- 1902d. Boulenger, in Johnston, Uganda Protectorate, **1**, p. 447.
- ?1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 241.
- 1910a. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. i, p. 30, fig. 32.
- 1912b. Boulenger, Ann. Mus. Genova (2), **5**, p. 332.

1912. Hobley, Journ. E. A. Uganda Nat. Hist. Soc., **3**, p. 51.
 1915c. Boulenger (part), Proc. Zool. Soc. London, p. 630.
 1915d. Boulenger (part), Proc. Zool. Soc. London, p. 653.
 1924b. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., Suppl. 3, p. 6.
 1925. Werner (part), 1924, Arch. Naturg., **90**, Abt. A, p. 140.
 1927. Calabresi (part), Atti. Soc. Ital. Sci. Nat., **66**, p. 55.
 1931c. Scortecchi, Atti. Soc. Ital. Sci. Nat., **70**, p. 210.
 1932b. Parker, Proc. Zool. Soc. London, p. 364.
 1934a. Scortecchi, Natura (Milano), **25**, p. 58, fig. 23.
 1936j. Loveridge, Bull. Mus. Comp. Zoöl., **79**, p. 265.
 1936e. Parker, Ann. Mag. Nat. Hist. (10), **18**, p. 608.
 1937c. Loveridge, Proc. Acad. Nat. Sci. Philadelphia, **89**, p. 277.
 1937f. Loveridge, Bull. Mus. Comp. Zoöl., **79**, pp. 493, 496.
 1937. Pitman, Uganda Journ., **4**, p. 229, pl. xi, fig. 1, pl. K, fig. 1.
 1938a. Pitman, Uganda Journ., **5**, p. 214.
 1939a. Scortecchi, Ann. Mus. Genova **63**, p. 280.
 1939c. Scortecchi (part), Gli Ofidi Velenosi dell' Africa Italiana, p. 151, figs. 82-83.

Synonymy. Heretofore always confounded with the typical northern race, appearing as *punctulatus* in the entire literature with the exception of Peters' reference above and that of Fischer (1884a, p. 12).

Name. Southern Speckled Sand-Snake (English).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, much narrower than a supraocular, as long as or slightly shorter than a parietal, as long as or usually longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal twice to thrice as long as deep; preocular 1, in contact with, rarely separated from, the frontal; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 9, rarely 8, fifth and sixth, rarely fourth and fifth or third, fourth and fifth, entering the orbit; 5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows; ventrals 177-197; anal divided; subcaudals¹ 143-163.

Coloration. Above, yellow or white, head and nape olive-gray, buff, or reddish, uniform, or speckled with black; three black stripes along the body, the vertebral broadest and bifurcating anteriorly, each

¹ The specimens with 136, recorded by Boulenger (1896d, p. 159), and 137, recorded by Scortecchi (1939a, p. 281), probably possess regenerated tails, as is certainly the case with those of 105, 110, and 118, recorded by Parker and myself.

branch, as a black or brown streak, sometimes extending through the eye to the end of the snout; sides, belly, and underside of tail, grayish or greenish heavily speckled with black.

Measurements. Largest ♂ measures 1660 (1080 + 580) mm. from Ogaden (Boulenger). Largest ♀ measures 1532 (972 + 560) mm. from Athi River, Kenya Colony (Loveridge).

Diet. Lizard (*Latastia l. revoili*) on Mt. Mbololo (Loveridge).

Habitat. Coastal plain to arid thorn-bush uplands.

Localities. **British Somaliland:** Nogal Valley; Ogaden. **Italian Somaliland:** Belat Amin; Dolo; Lugh; Villaggio Duca degli Abruzzi. **Uganda:** (see *Remarks* below). **Kenya Colony:** Athi River crossing; Guaso Nyiro; Kaliokwell; Lake Rudolf; Lodwar; Loiyangallani; Mbololo Mountain; Teita. **Tanganyika Territory:** Arusha.

Distribution. Northeastern Ethiopia south through drier regions of Kenya and Italian Somaliland to extreme northern Tanganyika Territory.

Remarks. The inclusion of this species in the Uganda list by Boulenger (1902d, p. 447) was, as pointed out by Pitman (1937, p. 229), based in all probability on material obtained extralimitally to the present boundaries of the Protectorate. It may, however, have been included on the strength of Tornier's (1896, p. 82) record of Victoria Nyanza, repeated by Sternfeld (1910a, p. 30), which I reject as being either misidentified or else with faulty data.

PSAMMOPHIS TRIGRAMMUS Günther

1865. *Psammophis trigrammus* Günther, Ann. Mag. Nat. Hist. (3), **15**, p. 95, pl. ii, fig. E: Rio Sao Nicolao, Mossamedes Bay, Angola.
- 1887a. Bocage, Journ. Sci. Lisboa, **11**, p. 206.
- 1895b. Boulenger, Proc. Zool. Soc. London, p. 538.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 159.
- 1910b. Boulenger, Ann. S. African Mus., **5**, p. 513.
- 1910b. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. 1, p. 26, fig. 30.
- 1910c. Sternfeld, Mitt. Zool. Mus. Berlin, **5**, p. 56.
1911. Lampe, Jahrb. Nassau Verh. Naturk. Wiesbaden, **64**, p. 201.
1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 124.
- 1915c. Werner, in Michaelsen, Beitr. Kennt. D.-Südwestafrikas, p. 364.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.

Synonymy. This rare species does not appear to have been confounded with others, but the references to its occurrence in Senegal by Rochebrune, and French Guinea by Mocquard, might be attributed to *elegans* if they were based on actual misidentified material.

Description. Rostral broader than deep, visible from above; snout once and a half to twice¹ as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supra-ocular, as long as or a little shorter than a parietal, as long as or longer than its distance from the end of the snout; nostril between 3 shields; loreal two and a quarter to thrice as long as deep; preoculars 2, in contact with or just separated from the frontal; postoculars 2; temporals 1 + 1 or 1 + 2, rarely 2 + 1 or 2 + 2; upper labials 9, fifth and sixth entering the orbit; 5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows; ventrals 182-197; anal divided; subcaudals 132-150.

Coloration. Above, pale olive or grayish brown, yellowish posteriorly; upper lip, pre- and postoculars yellowish; dorsum uniform or the scales on the vertebral line black-edged, forming a stripe posteriorly; an indistinct dark lateral stripe or series of black dashes along the outer scale-row. Below, as well as lower half of outer scale-row, white or yellowish with a well-defined median band of olive or light gray; chin and throat pure white.

Measurements. The type, a ♂ and largest known specimen, measures 1180 (750 + 430) mm.

Localities. **Angola:** Rio Sao Nicolao. **South-West Africa:** Kuibis; Omaruru; Rehbock; Seafontein.

Distribution. Southern Angola and South-West Africa.

Remarks. The type locality is *not* in Namaqualand, the correction was made by Bocage (1887a, p. 206) but has had little attention.

PSAMMOPHIS SIBILANS SCHOKARI (Forskål)

1735. *Serpens Africana* Seba, "Rerum Nat. Thesauri," 2, p. 57, pl. lvi, fig. 4: Hippo, *i.e.* Bone, Algeria.
1755. *Coluber hipponensis* Klein, Tentam Herpet. Unzeri, pp. 38, 117: Hippo (Based on Seba's figure).
1775. *Coluber schokari* Forskål, Descript. Animal., p. 14: Yemen, Arabia.
1825. *Natrix schokari* Wagler, Amphib. Serp., p. lxii.
1834. *Coluber lacrymans* Reuss, Mus. Senckenberg., 1, p. 139: Tor district, Arabia, *i.e.* Tor, Sinai Peninsula, Egypt.
1854. *Psammophis moniliger* Duméril & Bibron (part, not Daudin), Erpét. Gén., 7, p. 891.
1854. *Psammophis punctatus* Duméril & Bibron, Erpét. Gén., 7, p. 896, pl. lxxvii, fig. 2: Levant; Egypt; Arabia; Red Sea coasts.

¹ Type examined for this character A. L.

1857. Gervais, Mém. Acad. Sci. Montpellier, **3**, p. 512, pl. vb, figs 3-3a..
- 1862b. Peters, Monatsb. Akad. Wiss. Berlin, p. 274, pl. -, fig. 2.
- 1862b. Strauch, Mém. Acad. Imp. Sci. Pétersbourg (7), **4**, p. 66.
- 1858c. *Psammodphis sibilans* Günther (part, not Linné), Cat. Snakes Brit. Mus., p. 136.
- 1862b. Strauch, Mém. Acad. Imp. Sci. Pétersbourg (7), **4**, p. 66.
1875. Schreiber (part), Herpet. Europaea, p. 217.
- 1880d. Peters, Monatsb. Akad. Wiss. Berlin, p.308.
- 1881a. Peters, in Rohlf's, Kufra, p. 369.
- 1885d. Müller, Verh. Naturf. Ges. Basel, **7**, p. 686.
- 1891c. Boulenger, Trans. Zool. Soc. London, p. 150.
1892. Anderson, Proc. Zool. Soc. London, p. 19.
1894. Oliver, Mém. Soc. Zool. France, **7**, p. 121.
1896. Doumergue, Ass. Franc. Compte Rendu 25th Sess. Carthage, p. 478.
- 1896a. Oliver, Assoc. Franc. Compte Rendu 25th Sess. Carthage, p. 474.
- 1896b. Oliver, Revue Sci. Bourbonnais France, **9**, p. 125.
1903. Mayet, in Explor. Sci. Tunisie, p. 24.
1904. Chaignon, Bull. Soc. Hist. Nat. Autun, **17**, p. 24.
1916. Andersson (part), Meddel. Göteb. Musei Zool. Afdel., No. 9, p. 36.
- 1920c. Chabanaud, Bull. Mus. Paris, **26**, p. 462.
1863. *Psammodphis sibilans* var. *hierosolimitana* Jan, Elenco Sist. Ofidi, p. 90: Jerusalem, Palestine.
1870. Jan, Icon. Gén. Ophid., livr. 34, pl. iii, fig. 2.
1872. *Psammodphis sindanus* Stoliczka, Proc. Asiatic Soc. Bengal, p. 83: Sind and Cutch (as Katch), northwest India. (*non vidi.*)
- 1885b. *Psammodphis sibilans* var. *punctata* Boettger, in Kobelt, Reise. Algerien Tunis. p. 462.
- 1891c. Boulenger, Trans. Zool. Soc. London, p. 97.
1892. König, Sitz. Nied. Ges. Natur. Bonn, p. 23.
- 1896a. Boulenger, Ann. Mus. Genova (2), **16**, p. 553.
- 1896d. *Psammodphis schokari* Boulenger, Cat. Snakes Brit. Mus., **3**, p. 157.
1896. Anderson, Contr. Herpet. Arabia, pp. 53, 82, 108.
- 1897b. Werner, Verh. Zool. Bot. Ges. Wien, **47**, p. 407.
1898. Anderson, Zool. Egypt. **1**, Rept. Batr., p. 295, pls. xli-xlii.
1898. Boettger, Kat. Rept.-Samm. Mus. Senckenberg. II, p. 103.
1900. Anderson, Ann. Mag. Nat. Hist. (7), **6**, p. 425.
- 1901a. Doumergue, Soc. Geog. Arch. Oran, **20**, p. 61.
1901. Schenkel, Verh. Naturf. Ges. Basel, **13**, p. 172.
1901. Steindachner, Denks. Akad. Wiss. Wien, **69**, p. 334.
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1903. Steindachner, Sitz. Akad. Wiss. Wien, **112**, **1**, p. 10.
1904. Chaignon, Bull. Soc. Hist. Nat. Autun, **17**, p. 24.
1904. Peracca, Bull. Mus. Zool. Torino, **19**, No. 467, p. 4.
- 1905g. Boulenger, Novit. Zool., **12**, p. 77.

- 1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 241.
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 1909b. Werner, Third Rep. Wellcome Res. Lab. Khartoun, pp. 622, 631.
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 1913. Ghigi, Mem. Accad. Sci. Inst. Bologna (6), **10**, p. 284.
 1913. Hartert, Novit. Zool., **20**, p. 83.
 1913a. Werner, in Brehm, Tierleben, **4**, ed. 4, p. 400.
 1914. Barbour, Proc. New Eng. Zoöl. Club, **4**, p. 91.
 1914. Fowler, Copeia, p. 1.
 1914b. Werner, Sitz. Akad. Wiss. Wien, **123**, **1**, pp. 346, 354.
 1915d. Boulenger, Proc. Zool. Soc. London, p. 653.
 1915e. Boulenger, Proc. Zool. Soc. London, p. 80.
 1916c. Chabanaud, Bull. Mus. Paris, **22**, p. 79.
 1919b. Boulenger, Proc. Zool. Soc. London, p. 290.
 1919c. Boulenger, Proc. Zool. Soc. London, p. 305.
 1922a. Angel, Bull. Mus. Paris, **28**, p. 40.
 1922. Foley, Bull. Soc. Hist. Nat. Afrique Nord, **13**, p. 75.
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 1926b. Mertens, Zool. Anz., **68**, p. 326.
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 1926a. Pellegrin, 1925, Bull. Soc. Sci. Nat. Maroc., **5**, p. 319.
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 1928b. Scortecchi, Atti. Soc. Ital. Sci. Nat., **67**, p. 305.
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 1930a. Scortecchi, Atti. Soc. Ital. Sci. Nat., **69**, pp. 203, 213.
 1930a. Zavattari, Arch. Zool. Ital. Torino, **14**, p. 279.
 1930b. Zavattari, in Bono, Miss. Sci. Eritrea, p. 194.
 1931. Gestro & Vinciguerra, Result. Sci. Miss. Oasi Giarabub, p. 538.
 1931b. Vinciguerra, Ann. Mus. Genova, **55**, p. 257.
 1931c. Werner, Sitz. Akad. Wiss. Wien, **140**, **1**, p. 301.
 1932. Angel, Bull. Mus. Paris (2), **4**, p. 387.
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 1933. Flower, Proc. Zool. Soc. London, p. 823.
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 1934a. Scortecchi, Natura (Milano), **25**, p. 57, fig. 22.
 1935a. Corkhill, Sudan Govt. Mus. Publ. No. 3, p. 21.

1935. Foley, Bull. Soc. Hist. Nat. Afrique Nord, **26**, p. 54.
1935. Hediger, Verh. Naturf. Ges. Basel, **46**, p. 27.
1935. Laurent, Bull. Soc. Hist. Nat. Afrique Nord, **26**, p. 347.
1935d. Scortecci, Atti. Soc. Ital. Sci. Nat., **74**, p. 194.
1935e. Scortecci, Atti. Soc. Ital. Sci. Nat., **74**, p. 189.
1937. Zavattari, in Festschrift Geburt Embrik Strand, **2**, p. 532.
1938b. Angel, Bull. Mus. Paris (2)., **10**, p. 487.
1938. Angel & Lhote, Bull. Com. Études Afrique Occ. Franç., **21**, p. 367.
1939c. Scortecci, Gli Ofidi Velenosi dell' Africa Italiana, p. 154, figs. 84-85.

Synonymy. Except for citations of new species, the above synonymy is restricted to African references, some few earlier ones will be found in Duméril & Bibron (1854).

Boulenger referred Seba's figure to *sibilans*, to which it certainly has a more general resemblance than to *schokari*, though some examples of the latter exhibit temporal blotches, as figured by Seba, which are more characteristic of the typical form. The locality, however, assuming that it is correct, definitely places the specimen as representing the race *schokari*. Klein's name *hipponensis*, being preLinnaean, is inadmissible.

The confusion of this form with typical *sibilans* has been extensive, so that many references to *sibilans* are referable to *schokari*, though only a few of the latter are relegated to the synonymy of *P. s. sibilans*. Chabanaud's (1916f) record from Dahomey, which later he (1917b) corrected to Timbuktu on the Niger, as well as Angel's (1922a) from Kati, near Bamako on the Niger, are referred to *elegans*. A disposition with which Mons. Angel concurs.

Names. Schokari Sand-Snake (English); *zeurig* (Arabic, Algeria); *kebeli* (Arabic, Tunisia); *abu el suyur* (*i.e.* father of stripes, Arabic, Egypt); *abu far*, *abu sa aifa*, *um sot*, *zerrag* (Arabic, Sudan); *schokari* (Arabic, Arabia); *kung* (Nubas of Karko). Mostly after Corkhill.

Description. Rostral broader than deep, visible from above; snout once and a third to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as a parietal, as long as or slightly longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal once and two thirds to four times as long as deep; preocular 1, rarely 2, in contact with, rarely separated from, the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 9, rarely 8 or 10, fifth and sixth, rarely fourth and fifth or sixth and seventh, entering the orbit; 5, rarely 4 or 6, lower labials in contact

with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17, rarely 19, rows; ventrals 156–205; anal divided; subcaudals 93–149.¹

Coloration. Very variable. Above, reddish, yellowish, grayish, or pale olive; usually a dark streak on each side of the head passing through the eye; lips with or without dark spots; body striped or spotted with darker, sometimes uniform. Below, uniform or spotted with darker, laterally with or without one or two rows of more or less distinct dark lines or series of dashes, sometimes enclosing a central, ribbon-like grayish streak.

Doumergue (1901a) describes seven colour phases from Algeria, and states that all may be present in a single locality! More recently Mertens (1926b) has discussed dichromatism in this race.

Measurements. Largest ♂ measures 1480 (1145 + 335) mm. Presumably from Egypt (Anderson, 1898, p. 297).

Longevity. Record for thirty-five snakes at Giza zoo was 11 months and 24 days (Flower, 1925b, p. 971).

Diet. Chiefly lizards, but bird in mouth of one (Corkhill, 1935a, p. 21); lizard (*Acanthodactylus s. aureus*) at Port Etienne (Chabanaud, 1924a, p. 55); skink (*Chalcides ocellatus*) at Ain Sefra (Werner, 1914b, p. 346). Captive snakes took lizards (*Lacerta muralis* and *L. vivipara*) (Mosauer, 1934, p. 58), but refused gerbils.

Parasites. Hemogregarines in 2 out of 5 Algerian snakes (Foley, 1922, p. 75).

Temperament. Inoffensive (Doumergue, 1901a, p. 61) and placid (Corkhill, 1935a, p. 21), though natives very much afraid of them (Werner, 1913a, p. 400).

Venom. Captive examples observed to swallow lizards instantly without attempting to poison or constrict them (Mosauer, 1934, p. 58).

Habitat. In Algeria this species is deserticolous, being found beneath stones or among the scrubby vegetation of the dunes (Doumergue, 1901a, p. 61). In Egypt in dry areas, never in the moist alluvial soil of the fields (Anderson, 1898, p. 297), it is widespread though "not found in the Nile Delta, nor in cultivated or marshy land, it inhabits dry deserts, especially tracts with a certain amount of scattered vegetation. It appears to be diurnal . . ." (see Flower, 1933, p. 823). Its tracks are figured by Mosauer and Wallis (1928, fig. 10).

¹ This count of 149 is from Aden and has been checked by me, other high counts—141 and 140—are also from Arabian localities, yet some Arabian specimens in the Mus. Comp. Zoöl. have as few as 115 and 116 subcaudals. Asiatic material tends to be higher for the largest count for an African snake is that of 131 (checked as 128, but tip now missing) for a Brit. Mus. snake said to be from Donirat, Tunisia.

Localities. **French West Africa:** Ajoujt (Akjoujt); Port Etienne. **Rio de Oro. French Morocco:** Berguent; Dar Kaid Embarek; Djebel Guelis; Marrakesh; Mogador; Tamarouft (Tamaruth) Valley; Taourit. **Algeria:** Ain Oumach; Ain Sefra; Amsel; Arba Tahtani; *Banion (? Beni Ounif); Beni Mzab; Beni Ounif de Figuig; Bled el Ahmar; Biskra; Bone; *Bou Guelfaia (? Guelatia); Bou Saada; El Abiod Sidi Cheikh; Figuig; In Salah; Ksar el Ahmar; Laghouat; Messad; Mzab; Oued Mya; Reggan; Sefissifa (Sfissifa); Tuggurt; *Zaatcha. **Tunisia:** Bled Thala; *Bordj Gonifla; Bou Grara; Djebel Domeur; Djebel Meda; Douirat; El Hamma (Hamman) des Beni Zib; *Fratis; Gabes (Cabes); Gafsa; Mejerda (Madjoura); Metamer; *Nebech el Dib; *Raz el Wed (? Ras el Oued, Algeria); Shott el Djerid (Jerid); *Taferma; Tamezret (Tamesred); Tozeur (Toser). **Libya:** Agial; Ain Ghazal nr. Auenat; Bir Milrha to Giofra (Kufra); Archenu to Auenat; El Auenat; *El Foga (Fogha); El Tag; Gebel Nari (Neri); Gialo; Giarabub; Giarabub to Porto Bardia; Giofra; Hofra; Misurata; Oasi Bzema; Rebiiana; Tripoli; Uadi el Abiad. **Egypt:** Abbasa (Abbasiyeh); *Abu Roash; Abu Shah; Ain Musa; Aswan (Assuan); Beris (Berys); Cairo; Emerald Mines; Etsa district; Giza; Ismailia; Kantara; Kharga Oases; Libyan Desert; Mariut; Mersa (Marsa) Matruh; Ras Gharib; Salhia Desert; Sennures district; Shadwan Island; Shaluf; Suez; Wadi Feiran; Wadi Halfa; Wadi Hebran; Wadi Hellal; Wadi Natrun; Wadi Um Tundeba (Tundeb). **Anglo-Egyptian Sudan:** Dongola; Durur; Fung; Khartoum; Sennar; Suakin; Tokar. **Eritrea:** Asmara; Cheren; Cheren to Massaua; Monte Dangollo nr. Ghinda; Saati (Sahiti); Tessenei. **British Somaliland:** Buran; Warabod (Warabot). **Italian Somaliland:** Carim (Carin).

Distribution. Arid areas bordering the Sahara, from French West Africa adjacent to Rio de Oro, west to Egypt (also Arabia; Syria; Palestine; Mesopotamia; Persia; Baluchistan; Afghanistan and Sind), south along the Red Sea coast to Italian Somaliland.

In British Somaliland it has been recorded from 600 to 3,000 feet (Parker, 1932b, p. 364), in Sinai up to 5,300 feet.

It will be noted that this race, as well as typical *P. s. sibilans*, have been recorded from Cairo and its environs—Abbasa (Abbasiyeh), Abu Roash and Giza—as well as from Aswan, Egypt; Khartoum and Sennar in the Sudan; and Cheren in Eritrea. This is not so incomprehensible in view of the marked habitat differences which have been em-

¹ Localities marked with an asterisk have not been located on any map, all others on this page have been found, preference being given to spelling in atlas, that of herpetologist following in parenthesis.

phasized by both Anderson and Flower. Habitat preferences which are paralleled in East Africa by *P. s. sibilans* along the rivers and *P. subtaeniatus sudanensis* in the arid bush a few hundred yards removed from such rivers or swamps.

I wish that someone with abundant Egyptian or Eritrean material would make a critical study of all the records of both *sibilans* and *schokari* in those countries and see if they are correlated with the physical features suggested.

Remarks. The fullest discussion on variation in this race will be found in Anderson (1898, pp. 295-302) who suggests that *schokari* differs from *sibilans* in displaying a less marked disparity in size as between the scales of the first and fourth lateral rows, while in *sibilans* the fourth row is only about half the size of that of the first, or lowest.

PSAMMOPHIS SIBILANS SIBILANS (Linné)

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 1827a. *Coluber auritus* Geoffroy Saint-Hilaire, Descr. Egypte, 1, Hist. Nat., Rept., pp. 147, 151, pl. viii, fig. 4: Egypt.
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 1827. *Psammophis sibilans* Boie, in Oken, Isis, 20, col. 547.
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 1884a. Rochebrune, Faune Senegambie. Rept., p. 165.
 1885d. Müller (part), Verh. Naturf. Ges. Basel, 7, p. 78.

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 1887h. Boulenger, Zoologist (3), **11**, p. 176.
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 1888a. Günther, Proc. Zool. Soc. London, p. 51.
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 1891b. Steindachner, Sitz. Akad. Wiss. Wien, **100**, **1**, p. 314.
 1892a. Bocage, Jorn. Sci. Lisboa (2), **2**, p. 183.
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 1894a. Günther, 1893, Proc. Zool. Soc. London, p. 618.
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 1896e. Bocage, Jorn. Sci. Lisboa (2), **4**, p. 177.
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 1898. Werner, 1896-7, Jahrb. Abh. Natur. Magdeburg, p. 145.

1898. Werner, Verh. Zool. Bot. Ges. Wien, **48**, p. 212.
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Synonymy. Linné's type of *sibilans*, still in existence in Upsala Museum, has been figured by Anderson (1898, p. 306, fig. 12) and its identity well established.

In addition to the synonyms listed above, typical *sibilans* has been recorded as *elegans* (not Shaw), *punctatus* (not Duméril & Bibron), *furcatus* (not Peters), and *subtaeniatus* (not Peters).

On the other hand, references to *sibilans* in the literature are referred by me to every one of its subspecies as recognized here, as well as to both forms of *subtaeniatus* and to *bitaeniatus tanganicus*. Linné himself, by his reference to Seba, confused it with *crucifer*.

The findings of Hewitt (1912, p. 272), who adduced good evidence for the synonymizing of *brevisrostris* with *sibilans* appear to have been overlooked or disregarded by later workers who have continued to record *brevisrostris* from Togo, Cameroon, Congo, and elsewhere. My own references (1916a, 1917h, 1918a) to *brevisrostris* as occurring near Nairobi are referable to the snake which I later described as *Trimerorhinus tritaeniatus multisquamis*. Though there is a very slight average difference in the subcaudal counts of *sibilans* from Egypt and Natal, it is insufficient to warrant recognition of a southeastern race. Werner's *P. brevisrostris temporalis* is referred to *Dromophis lineatus*.

Names. Neither of the English names for this snake are very fortunate, that of Beauty Snake, proposed by Flower (1933) is inappropriate for the olive or dun coloured reptiles of East Africa, while the generic term Sand-Snake is less applicable to the typical race than to its more deserticolous congeners like *schokari* and *notostictus*.

Hissing Sand-Snake or African Beauty Snake (English). In the central Sudan it is not distinguished from the preceding race, being, according to Corkhill, called *abu far*, *abu feiran*, *abu sa aifa*, *um sot* and *zerrag* (Arabic, Sudan); *mayitt* and *tomai* (Hadendoa, Sudan, for uniform and striped varieties respectively); *burusam* (Nubas of Tindia); *achel* (Tourareg, French Sudan); *danesnona* (Peulh, French Sudan); *sabondo* (Habbe, French Sudan); *sadie* (Bambara, French Sudan); *enyneropi* (Teso, Uganda); *sebusaru* (Toro, Uganda); *karwekarwe* or *kalwekalwe* (Ganda, Uganda); *namasanurugi* (Gishu, Uganda); *aerenet* (Elgonyi Masai, Kenya); *ndasiangombe* (Teita, Kenya); *jukaa* or *paa* (Pokomo, Kenya); *yamuwe* (Nyamwezi, Tanganyika); *nyalwinzi* or *nyulsenga* (Yeye, Tanganyika); *nne* (Sandawi, Tanganyika); *nyamkando* (Gogo, Tanganyika); *mlalu* (Rungu, Tanganyika); *ngaruka* (Nyakusa, Tanganyika); *nachungu* (Makonde and Yao, Tanganyika); *swaga* (Swahili, Tanganyika); *musaluhe* (Mozambique); *surira* (Chisena, Mozambique); *sucla* (Benguela, Angola); *blaas zand-slang* (Afrikaans, Transvaal).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a third to twice¹ as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than or equal to a supraocular, as long as or slightly longer or shorter than a parietal, as long as or slightly longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal once and a half to twice and a half as long as deep; preocular 1, rarely 2, usually sepa-

¹ Twice according to Boulenger; once and two thirds my longest. A. L.

rated from, rarely in contact with, the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3, rarely 2 + 1, 1 + 1, 1 + 2, or 3 + 3; upper labials 8, rarely 7 or 9, fourth and fifth, rarely third and fourth, fifth and sixth, or fourth, fifth and sixth,¹ entering the orbit; 4, rarely 5, lower labials in contact with the anterior sublinguals, which are shorter than or as long as the posterior. Midbody scales in 17 rows; ventrals 151-186²; anal divided, rarely entire; subcaudals³ 78-121.

Coloration. Very variable. Boulenger (1896d) furnishes descriptions of six color forms, and the literature teems with variants of these.

Above, olive, brown, or yellowish; head of young usually with yellow, black-edged longitudinal streaks anteriorly and transverse ones posteriorly, these markings usually disappearing in the adults; lips yellowish white with, or without, dark spots; body usually uniform or with a narrow yellow vertebral line and a yellow band along each side of the back. Below, plumbeous gray or yellowish white, uniform, or young with a series of dusky lateral dashes longitudinally arranged, or adults (in Central Lake Region and Sudan) with a faint brown lateral line, rarely distinct as in *subtaeniatus*; some Angolan specimens exhibit short horizontal dashes corresponding with each ventral as in *Dromophis lineatus*. The pigmentation of the iris, arrangement of vessels and circular pupil are described by Mann (1931).

Measurements. Largest ♂ measures 1500 mm. from Belgian Congo (Schmidt); largest ♂ for Tanganyika measures 1482 (1120 + 362) mm., and largest ♀ measures 1504 (1100 + 404) mm., both from Morogoro (Loveridge); largest Egyptian example measures 1445 mm. (Flower).

Breeding. In Northern Rhodesia Pitman observed a mating pair in the Luangwa Valley, July 20; while a recently hatched brood were encountered at Broken Hill on September 24.

On November 29 at Butiaba ? eggs measuring 17x11 mm. in a ♀.

On December 13 at Sipi 4 eggs measuring 13x 6 mm. in a ♀.

On December 21 at Bundibugyo 9 eggs measuring 15x 9 mm. in a ♀.

On January 18 at Butandiga 10 eggs measuring 27x10 mm. in a ♀.

On January 18 at Butandiga 7 eggs measuring 38x19 mm. in a ♀.

These last were ready for deposition. All four localities are in Uganda (Loveridge).

Longevity. 10 years, 4 months, and 2 days in Giza zoo (Flower).

Dict. Young snakes live on frogs and lizards, adults on mammals,

¹ On one side in a Paderburn snake recorded by FitzSimons (1938).

² 198 recorded for a Zanzibar snake by Boulenger, rechecked as 168.

³ 41 of Monard (1937b) and 71 of Bocage, probably regenerated tails.

and occasionally birds if Fleck's (1894) record of a titmouse (*Parus afer*) is accepted. For detailed account of feeding habits, see Loveridge (1928g) from whom the following records are taken.

Frog (*Rana m. mascareniensis*) at Nyamkolo, and (*Arthroleptis minutus*) at Mwaya; geckos (*Hemidactylus mabouia*) at Morogoro; tree agama (*Agama atricollis*) at Bukori; lizards (*Nucras b. boulengeri*) in Unyanganyi, (*Eremias s. spekii*) at Mangasini; yellow-throated lizard (*Gerrhosaurus f. flavigularis*) in captivity at Morogoro; skink (*Mabuya maculilabris*) at Mwaya; account of skink (*M. v. varia*) being chased at Mbanja; tail of skink (*Riopa sundevalli*) at Nchingidi.

Shrews (*Crociodura t. zaodon*) at Kitala; rat (*Rattus r. kijabius*) at Mangasini; rat (*Oenomys b. editus*) at Kaimosi; striped mouse (*Lemniscomys s. massaicus*) at Butandiga; pigmy mouse (*Leggada b. bella*) at Morogoro.

Parasites. Tick (*Aponomma falsolaeve*) at Morogoro (Bequaert). Nematodes (*Kalicephalus* sp) on White Nile (Leiper) and at Kitala, Mwanza and Mwaya; (*Physaloptera paradoxa*) at Kaimosi and Mwaya; (*Polydelphis quadricornis*) at Lumbo; (*Spiuroidea* ♀) at Mangasini and on Ukerewe Island. For account of snake dying from heavy infestation, see Loveridge (1923e, p. 887). Hemogregarines (*H. brendae*) at Entebbe (Pitman).

Enemies. Taken by a fishing eagle (*Haliaeetus v. vocifer*) in Sudan (Werner, 1908 (1907)); detailed account of the seizing of a sand-snake by another species of eagle at Morogoro, given by Loveridge (1928g); twice recovered from the stomachs of black-breasted harrier-eagles (*Circaetus g. pectoralis*), once from a common harrier-eagle (*C. cinereus*) and once from a cobra (*Naja n. nigricollis*) in Loveridge (1923e, etc.).

Habitat. In Egypt found only along the Nile and places irrigated by the Nile, as the Fayum and Delta, according to Flower (1933) whose paper should be consulted for details. Both in Egypt and in the Sudan he encountered it in gardens and cultivated areas.

In East Africa it is a species of the coastal plain to upland savanna (sea level to 7,000 feet), showing a preference for bush along water courses rather than for the eroded desert-like areas frequented by *P. subtaeniatus sudanensis*. On the other hand it avoids rain forest though it may be encountered on the outskirts.

Localities. **Algeria** (extreme south): Amguid; Atakor-n-Ahaggar; Djanet; Ideles, north of Hoggar; Tigen Davuo; Tirahart (Tigharghart) plateau; Tamrit. **Egypt**: Abbasa (Abbasiyeh); Abu Roash nr. Giza; Aswan (Assuan); Beltim; Cairo; Fayum; Giza; Luxor; Mehallet el Kebir (Mekalla el Kobra); Minia; Tel el Amarna. **Anglo-Egyptian**

Sudan: Barboi; Fazogli; Gabt el Meghahid; Gebel Debrî; Kadugli; Khartoum; Khor Attar; Lul; Magangani; Sennar; Sururu; Tonga; Uma River to Khor River (Uma Khor); Um Orug; Wau. **Eritrea:** Adi Ugri; Anseba Valley; Barentu; *Chenafena; Cheren; Elaghim (Elaghin); Ghinda; Mai Mafeles (Mabellis); Maldî; Saganeita. **Ethiopia:** Arusi; Ado (Audo) Mountains; Daro Takle (Tacle); Gondar; Hawash (as Haccash); Sheik Hussein. **British Somaliland:** Inland of Berbera (Boulenger, 1896d); Las Gore, Warsingali (Ouarsangueilis. **Italian Somaliland:** Abdallah; Belet Amin; Duca degli Abruzzi; Kismayu and Mofi. **Uganda:** Ankole; Budongo Forest; Bundibugyo; Bussu; Butandiga; Butiaba; Entebbe; Gulu, Acholi; Jinja; Kampala; Katebo; Katunguru; Katwe; Kitala; Lake Kioga; Lira, Lango; Mount Debasien; Mount Elgon at 6,800 feet; Mabira Forest; Matema; Ongino; Rhino Camp; Semliki Valley; Serere; Sese (Ussi) Islands; Sipi; Ungora; Wadelai. **Kenya Colony:** Bissel; Bukori; Bura; Chyulu Hills; Eldoret; Fort Hall; Golbanti; Jilore; Juja Farm; Kaimosi; Kedong Valley; Kibwezi; Kilifi; Kitui; Kyambu; Machakos; Malindi; Mazeras; Mombasa; Mount Elgon; Mount Mbololo; Muddo Erelle (Pozzi Meddo Erelle); Nairobi; Nakuru; Ndi; Ngatana; Njoro; Peccetoni; Sokoki Forest; Taveta; Teita; Uasin Gishu; Voi; Witu. **Tanganyika Territory:** Amani; Amboni near Tanga; Arusha; Bagamoyo; Bukoba; Chanzuru; Dar es Salaam; Igale; Kagehi; Kerogwe; Kibwezi; Kidudu on Lungo River; Kilosa; Kitaya; Magasini; Matete Bach; Mbanja; Mikindani; Moshi; Mount Kilimanjaro; Mserere; Mwaya; Nchingidi; Pangani Falls; Pentambili; Sanya; Saranda; Shinyanga; Tanga; Tukuyu; Ujiji, Ukerewe Island; Unyanganyi; Wembere. **Zanzibar:** Kumbuni; Zanzibar. **Mozambique:** Beira; Boror; Cabaceira; Charre; Inhambane; Inhaminga; Matlale; Mbusi; Mesuril; Mgaza; Mozambique Island; Querimba Island; Quilimane; Rikatla; Tete; Xa Matlale. **Nyasaland:** Karonga to Kondowe; Masuku Mountains; Nkata Bay to Ruarwe; Shire Highlands; Zomba. **Northern Rhodesia:** Broken Hill; Feira district; Ikombo; Kazungula; Lealui (Lialui); Luangwa Valley; Mumbwa district; Munyamadzi River; Namwala district; Nyamkolo; Zom Store. **Southern Rhodesia:** Bulawayo; Gwamayaya River; Kafue River; Mashonaland; Mazoe; Salisbury; Swena's. **Bechuanaland Protectorate:** Gemsbok; Kabulabula; Kaotwe; Linokana; Makarikari; Maun; Mmoouve; Serowe; Shaleshonto; Shorobe. **Transvaal:** Comati and Crocodile Rivers; Irene; Kaapmuiden; Ley'sdorp; Louw's Creek; Lydenburg district; Mphome; Pretoria; Rustenburg district; Selati; Shilowane; Wonderboom. **Zululand:** Kosi Bay; Mseleni.

Natal: Durban (Port Natal); Greenwood Park; Lower Illovo; Pietermaritzburg; Pinetown; Umzumbe Valley. **Orange Free State:** Kroonstadt. **Cape Province:** Tulbagh. (Port Elizabeth record rejected). **South-West Africa:** Erongo Mountains; Gobabis; Hantam; Kamanyab; Luderitz Bay; Oshikango; Otjimbingue; Paderburn Farm. **Angola:** Ambriz; Caconda; Catumbela; Cazengo; Chitau; Cubal; Cuma; Duque de Braganca; Ebanga; Galanga; Hanha; Huila; Kalukembe (Caluquembe); Kakindo (Caquindo); Katenge (Catengue); Kayundo; Kuvanga; Loanda Island; Mossamedes; Mupa; Mupanda; Port Alexander; Pungo Adungo (Andongo); Quilengues; Quissangues; Rio Cuce; San Antonio; Vila da Ponte. **Cabinda:** Cabinda; Chinchoxo; Chingo. **Belgian Congo:** Abimoa; Albertville; Arebi; Avakubi; Banana; Banziville; Baudouinville; Beni; Boma; Bukama; Dika; Dilolo; Djalasinda; Dramba; Duma; Elisabethville; Faradje; Gabiro; Gandu; Garamba; Gatsibu; Kansenia; Kapiri; Kikondja; Kunungu; Lukafu; Mahagi Port; Mauda; Moanda; Monbuttu; Niagara; Nyonga; Povo Nemlao; Povo Netonna; Tembwe; Zambi. **French Equatorial Africa:** Abiras; Cape Lopez; Cette Cama (Sette Kama); Fernand Vaz; Fort Archimbault; Kuseri near Fort Lamy. **Nigeria:** Asaba; Lagos; Niger River mouth; Yola. **Dahomey:** Abomey; Agouagou; Cotonou. **Togoland:** Bismarckburg; Kantindi; Kete. **Gold Coast:** Ashanti; Oudmose; Peki. **French Guinea:** Kouroussa. **Portuguese Guinea:** Bissau; Bolama; Cacheu; Rio Cassini (Cassine). **Gambia:** MacCarthy Island. **Senegal:** Bakel; Dakar; Guenoto; Matam to Kaidi (Kaedi); Niani (Nianing); Rufisque. **French West Africa:** Bandiagara; Kati near Bamako; Mopti; Timbuktu.

Distribution. The typical form is found in suitable localities (see above) from Egypt to Natal on the east, while on the west it occurs from Mauretania to the Anglo-Egyptian Sudan (outside the forested areas occupied by *P. s. phillipsii*) south through the French and Belgian Congo to northern South-West Africa where it encounters several other races.

PSAMMOPHIS SIBILANS PHILLIPSII (Hallowell)

- 1844a. *Coluber Phillipsii* Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 169: Liberia.
- 1854a. *Psammophis Phillipsii* Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 100.
1857. Hallowell, Proc. Acad. Nat. Sci. Philadelphia, p. 69.
1860. Cope, Proc. Acad. Nat. Sci. Philadelphia, p. 554.

- 1885d. *Psammophis* sp. (*Phillipsii* Hall. ?) Müller, Verh. Naturf. Ges. Basel, **7**, p. 686.
- 1887b. *Psammophis sibilans* Mocquard (part, not Linné), Bull. Soc. Philom. Paris (7), **11**, p. 78.
1890. Buttikofer, Reisebilder aus Liberia, **2**, p. 478.
1901. Schenkel, Verh. Naturf. Ges. Basel, **13**, p. 172.
- 1902b. Mocquard, Bull. Mus. Paris, **8**, p. 415.
- 1902a. Werner, Verh. Zool. Bot. Ges. Wien, **52**, p. 338.
1906. Johnston, Liberia, **2**, p. 832.
1909. Gendré, Extr. Compt. Rendus in Actes Soc. Linn. Bordeaux, **63**, p. cvi.
1913. Klaptocz, Zool. Jahrb. Syst., **34**, p. 286.
1917. Sternfeld, Zweit. Deutschen Zent.-Afrika-Exped., **1**, pp. 409, 478.
- 1921a. Chabanaud, Bull. Com. Études Afrique Occ. Franç., p. 470.
- 1921b. Chabanaud, Bull. Mus. Paris, **27**, p. 525.
1922. Aylmer (part ?), Sierra Leone Studies, **5**, pp. 15, 21.
1925. Werner (part), 1924, Arch. Naturg., **90**, Abt. A, p. 140.
- 1930a. Barbour & Loveridge, in Strong, Rep. Harvard-Afr. Exped. Liberia . . Congo, **2**, p. 773.
- 1893c. *Psammophis notosticta* Matschie (not Peters), Mitt. Fors. Gel. Deutsch Schutzgeb., **6**, p. 212.
- 1908a. *Psammophis regularis* Sternfeld, Mitt. Zool. Mus. Berlin, **3**, p. 412: Cameroon and Togo.
- 1908b. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, pp. 218, 233.
- 1909b. Sternfeld, Die Fauna Deutschen Kol., **1**, pt. 1, p. 21.
- 1916f. Chabanaud, Bull. Mus. Paris, **22**, p. 377.
- 1917b. Chabanaud, Bull. Mus. Paris, **23**, p. 12.
- 1921b. Angel (part), Bull. Mus. Paris, **27**, p. 141.
1919. *Psammophis sibilans* var. *occidentalis* Werner, Denks. Akad. Wiss. Wien, **96**, p. 504: Togo to Congo.
- 1938d. *Psammophis sibilans phillipsii* Loveridge, Proc. New Eng. Zoöl. Club, **17**, p. 59.

Synonymy. As Hallowell, in his original description of *phillipsii*, made no mention of the single anal, Boulenger (1896d, p. 161) very naturally placed it in the synonymy of *sibilans*, to which species most authors have referred their material though commenting on the single anal. It was this character which led Matschie (1893c, p. 212) to relegate a Togo specimen to *notostictus*. I now refer *regularis* and *occidentalis* to the synonymy of *phillipsii* though some doubt is entertained regarding this disposition of *occidentalis* as no type was designated, the name being proposed for a color form, and the author stating that he considered a single or divided anal of no taxonomic importance in this genus, which remark makes it appear possible that he included some typical *sibilans* material.

For further comments on the distribution of this race see *Remarks*.
Name. *Joppaguri* (Temne, Sierra Leone).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a quarter to once and a half as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than or equal to a supraocular, as long as or slightly longer or shorter than a parietal, much longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal once and two thirds to twice and a half as long as deep; preocular 1, separated from the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3 (3 + 2 *vide* F. Müller, 1885d, p. 686); upper labials 8, fourth and fifth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are as long as or shorter than the posterior. Midbody scales in 17 rows; ventrals 162-182; anal entire; subcaudals 89-109.

Coloration. Above, greenish olive or brown, uniform, or each scale edged with darker, rarely a vertebral line faintly indicated; head of young with pattern of typical *sibilans*, head of adults with conspicuous scattered black spots. Below, greenish or yellowish white, chin and throat spotted with black; belly uniform or punctate with each ventral shield transversely barred with black across its basal portion; tail uniform or each subcaudal shield with a black spot in its centre.

Sternfeld (1908b, p. 218) states that all eleven Togo snakes were uniform brown above and without stripes. Both uniform and speckled forms occur in Liberia.

Measurements. Largest ♂ measures 1350 (935 + 415) mm. from Monrovia, Liberia (M.C.Z. 913). Sternfeld's largest entire example measured 1320 (930 + 390) mm. and was from Togo.

Diet. Rodents (Sternfeld and Werner).

Habitat. Sternfeld's (1908a, p. 412) suggestion that *regularis* had a coastal distribution in Cameroon and Togo while typical *sibilans* occupied the hinterland, is applicable to *phillipsii* only to the extent that the latter's distribution coincides with that of the rain forest which is largely a broad belt from the French Congo to Liberia along the coast except for the area from Lagos to Accra where the dry conditions of the interior extend to the coast.

Localities. **French Equatorial Africa:** Fort Archambault; Gribingui region; Shari River. **French Congo:** Brazzaville. **French Cameroon:** Bipindi. **Dahomey:** Agouagou. **Togo:** Atakpame; Kete; Misahohe. **Ivory Coast.** **Liberia:** Ganta; Du River Plantation No. 3; Monrovia. **Sierra Leone.** **French Guinea:** Beyla;

Dieke; Dixine Foulah; Dubreka; Kerouane; Labe; Los Island; Macenta; Nzebela; Nzerekore.

Distribution. Rain-forest region from French Equatorial Africa to southern Nigeria, again from Dahomey to Sierra Leone where it meets with *P. s. sibilans* as at other points all along its northern limits. This apparently strange distribution can best be understood by reference to Meunier's map of Afrique Occidentale Française, 1925, showing the forested areas.

Remarks. It will be noted that this race as well as typical *P. s. sibilans* occur in the Gribingui region (Angel, 1921b, p. 141) as well as at Nzebela for one of the nine snakes from this locality had a divided anal. Though this was the only snake out of twenty-three which he collected in French Guinea that had a divided anal, Chabanaud (1921b, p. 525) referred all to *sibilans* (*sensu strictu*), and decided to synonymize *regularis* with *sibilans*!

Sternfeld's (1910a, p. 29) record of *regularis* as occurring at Amani, Usambara Mountains, Tanganyika Territory, while interesting, is referred to *P. s. sibilans*, the snake being regarded as aberrant.

PSAMMOPHIS SIBILANS NOTOSTICTUS Peters

- 1858c. *Psammophis sibilans* Günther (part, not Linné), Cat. Snakes Brit. Mus., p. 136.
- 1887b. Boettger, Ber. Senckenberg. Ges., p. 159.
- 1867b. *Psammophis moniliger* var. *notostictus* Peters, Monatsb. Akad. Wiss. Berlin, p. 237: Otjimbingue, South-West Africa.
- 1869b. Peters, Ofver. Kongl. Vetensk.-Akad. Förh., p. 661.
1878. *Psammophis* sp. Müller, Verh. Naturf. Ges. Basel, 6, pp. 610, 679.
- 1887a. *Psammophis sibilans* var. *stenocephalus* Bocage, Journ. Sci. Lisboa, 11, p. 205: Interior of Mossamedes, Angola.
- 1895a. Bocage, Herp. Angola Congo, p. 116.
- 1888b. *Psammophis sibilans* var. *notostictus* Fischer, Jahrb. Hamburg. Wiss. Anst., 5, p. 12.
- 1894a. Boettger, Ber. Senckenberg. Ges., p. 91.
- 1895b. *Psammophis notostictus* Boulenger, Proc. Zool. Soc. London, p. 538.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., 3, p. 156.
1898. Selater, Ann. S. African Mus., 1, p. 100.
1901. Schenkel, Verh. Naturf. Ges. Basel, 13, p. 172.
- 1903e. Boulenger, Ann. Mag. Nat. Hist. (7), 12, p. 217.
- 1907c. Roux, Zool. Jahrb. Syst., 25, p. 736.
- 1910b. Boulenger, Ann. S. African Mus., 5, p. 513.
- 1910b. Sternfeld, Die Fauna Deutschen Kol., 4, pt. 1, p. 26, fig. 29.
- 1910c. Sternfeld, Mitt. Zool. Mus. Berlin, 5, p. 56.

- 1910a. Werner, Denks. Med. Nat. Ges. Jena, **16**, p. 360.
 1911. Lampe, Jahrb. Nassau Verh. Naturk. Wiesbaden, **55**, p. 200.
 1912. FitzSimons, F. W., Snakes of S. Africa, pp. 122, 123.
 1912. Hewitt, Rec. Albany Mus., **2**, pp. 268, 270.
 1913. Hewitt & Power, Trans. Roy. Soc. S. Africa, **3**, p. 163.
 1914b. Methuen & Hewitt, Ann. Transvaal Mus., **4**, p. 144.
 1915c. Werner, in Michaelsen, Beitr. Kennt. D.-Südwestafrikas, p. 364.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.
 1929. Rose, Veld & Vlei, p. 163.
 1935a. FitzSimons, V., Ann. Transvaal Mus., **15**, p. 522.
 1935. Power, Proc. Zool. Soc. London, p. 334.
 1936c. Parker, Novit. Zool., **40**, p. 125.
 1937e. Hewitt, Guide Vert. Fauna E. Cape Prov., S. A. II, p. 63, fig. 1.
 1937b. Monard, Arqu. Museu Bocage, Lisboa, **8**, p. 128.
 1938. FitzSimons, V., Ann. Transvaal Mus., **19**, p. 158.
 1915c. *Psammophis Leightoni* Werner (not Boulenger), in Michaelsen, Beitr. Kennt. D.-Südwestafrikas, p. 365, fig. 3 (but anal divided).

Synonymy. In addition to *stenocephalus*, the synonymy includes references to typical *sibilans* and Werner's (1915c, p. 365) Swakopmund snake with a divided anal which he referred to *leightoni*.

References to *notostictus* which are transferred elsewhere, include Matschie's (1893c, p. 212) Togo *P. s. phillipsii*; Sternfeld's (1910a, p. 29) Bagamoyo and Langenburg snakes; Loveridge's (1916a, p. 25 and 1924b, p. 6) to a skin without locality; Witte's (1933m, p. 93) from Albertville, etc., all of which are regarded as aberrant individuals of *P. s. sibilans*.

Names. Whip-Snake (English, South-West Africa, *vide* Hewitt).

Description. Rostral broader than deep, visible from above; snout once and a third to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as or slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal once and a half to twice and a half as long as deep; preoculars 2, rarely 1, in contact with, rarely separated from, the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3, rarely 1 + 2 or 1 + 1; upper labials 8¹, fourth and fifth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are much shorter than the posterior. Midbody scales in 17 rows; ventrals 157-179; anal entire, rarely divided; subcaudals 81-106.

¹ Parker's (1936c, p. 125) Maltahöhe record with 9 upper labials, fourth, fifth and sixth entering the orbit, is aberrant and apparently not *sub. subtaeniatus*.

Coloration. Above, olive or pale sandy brown; head uniform or with light-centered dark spots in centre of each scale, pre- and post-oculars yellowish white as are also the upper labials of which the anterior are usually spotted with black; usually a black spot or pair of spots in the centre of each vertebral scale which is otherwise light colored and frequently forming a distinct, though fine, vertebral line; rarely an obsolescent indistinct light lateral stripe, with or without small black spots along its upper edge. Below, as well as the lower half of outer scale-row, white, yellowish, or olive, sometimes a well defined median yellow band down the centre; chin, throat and anterior ventrals often flecked with bluish gray or black.

Measurements. Largest ♂ measures 1366 (960 + 406) mm. from Namib Desert (M.C.Z. 43425); largest ♀ measures 865 (577 + 288) mm. from Luderitz Bay (Werner).

Diet. Lizards.

Habitat. Shows a preference for sandy soil; climbs trees to some extent (Hewitt). Uncommon on the Cape Peninsula where it is confined to the mountain apparently (Rose).

Localities. **Orange Free State:** Orange River; Smithfield. **Cape Province:** Alicedale; Beaufort West; Brakkloof; Burghersdorp; Caledon; Capetown; Ceres; Cradock; De Aar; Deelfontein; Driekoppen; Fairesmith; Fort Brown; Graff Reinet; near, but not at, Grahamstown; Hanover; Kakamas; Kleinpoort; Kuruman; Malmsbury division; Middleburg; O'okiep; 20 miles east of Port Nolloth; Robertson; Steinkop; Stellenbosch; Tafelberg; Touw's River; Victoria West. **South-West Africa:** Aus; Gobabis; Groendoorn; Hoffnung; Karas Mountains; Konya, Kalahari; Kubot; Kubub; Kuibis; Luderitz Bay; Maltahohe; Namib Desert; Narudas Sud; Okahandja; Orange River; Otjimbingue; Outgo; Prince of Wales Bay; Rietmond; Sandpund; Seeheim; Swakopmund; Tsaobis; Warmbad; Wasserfall. **Angola:** Mossamedes—interior; Rio Coroca; Rio San Nicolao.

Distribution. Southern Angola and South-West Africa to Cape Province. Records from Belgian Congo, Kenya, Tanganyika and Natal, are, as indicated under *Synonymy*, based on isolated, aberrant examples of *sibilans* possessing a single anal.

PSAMMOPHIS SIBILANS TRINASALIS Werner

1867b. *Psammophis moniliger* var. *furcatus* Peters (not Bianconi), Monatsb.

Akad. Wiss. Berlin, p. 236: Otjimbingue, South-West Africa.

1869b. Peters, Ofver. Kongl. Vetensk.-Akad. Förh., p. 661.

1886. *Psammophis sibilans* Boettger (not Linné), Ber. Senckenberg. Ges., p. 5.

- 1910b. Sternfeld (part), Die Fauna Deutschen Kol., **4**, pt. 1, p. 27, fig. 32.
 1910c. Sternfeld (part), Mitt. Zool. Mus. Berlin, **5**, p. 56.
 1888b. *Psammophis sibilans* var. *furcatus* Fischer (not Bianconi), Jahrb. Hamburg. Wiss. Anst., **5**, p. 12.
 1894a. Boettger, Ber. Senckenberg. Ges., p. 91.
 1937e. Mertens, Ver. Deutschen Kol.-Übersee Mus. Bremen, **2**, p. 15.
 1895b. *Psammophis furcatus* Boulenger (not Bianconi), Proc. Zool. Soc. London, p. 538.
 1896d. Boulenger (part), Cat. Snakes, Brit. Mus., **3**, p. 164.
 1898. Sclater, Ann. S. African Mus., **1**, p. 100.
 1902. Lampe & Lindholm, Jahrb. Nassau Verh. Naturk. Wiesbaden, **55**, p. 59.
 1908. Gough, Ann. Transvaal Mus., **1**, p. 29.
 1909d. Werner, Jahrb. Hamburg. Wiss. Anst., **26**, p. 247.
 1910b. Boulenger (part), Ann. S. African Mus., **5**, p. 513.
 1910a. Hewitt, Ann. Transvaal Mus., **2**, p. 57.
 1910a. Werner (part), Denks. Med. Nat. Ges. Jena, **16**, p. 361.
 1911. Lampe, Jahrb. Nassau Verh. Naturk. Wiesbaden, **64**, p. 201.
 1912. FitzSimons, F. W., Snakes of S. Africa, pp. 122, 123.
 1912. Hewitt (part), Rec. Albany Mus., **2**, p. 269.
 1913. Hewitt & Power, Trans. Roy. Soc. S. Africa, **3**, p. 163.
 1915c. Werner, in Michaelsen, Beitr. Kennt. D.-Südwestafrikas, p. 365.
 1918. Power, S. African Journ. Sci., **14**, p. 268.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A., p. 141.
 1935b. FitzSimons, V., Ann. Transvaal Mus., **16**, p. 316.
 1938. FitzSimons, V. (part), Ann. Transvaal Mus., **19**, p. 157.
 1902a. *Psammophis sibilans trinasis* Werner, Verh. Zool. Bot. Ges. Wien, **52**, p. 340: Windhuk, South-West Africa.
 1903. *Psammophis trinasis* Werner, Abh. Bayer. Akad. Wiss., **22**, p. 381

Synonymy. In addition to references to *sibilans*, the majority applicable to this form have appeared under the name of *furcatus* Peters, raised to specific rank by Boulenger (1896d, p. 538). Most unfortunately, however, this name is preoccupied by *Dendrophis furcata* Bianconi, 1859, which is a synonym of *Psammophis punctulatus punctulatus* Duméril & Bibron.

The next name available is that of *trinasis* Werner, raised to specific rank by its author in 1903. Actually all western forms of *sibilans* exhibit a distinct tendency towards the possession of three nasal shields as opposed to the two normally found in typical *sibilans* on the eastern side of the continent; the character is far too variable to have much value.

Chabanaud's (1918b and 1921a) "*trinasis*" from Senegal are referred to *P. s. schokari*.

Description. Rostral broader than or as broad as deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as or longer than a parietal, longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal once and a quarter to twice as long as deep; preocular 1, rarely 2, broadly in contact with, rarely separated from¹, the frontal; postoculars 2, rarely 3; temporals 2 + 2 or 2 + 3; upper labials 8, fourth and fifth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 17 rows; ventrals 152-180; anal divided; subcaudals 85-117.

Coloration. Above, olive or pale brown, each scale edged or tipped with black; head with a light line from the rostral to the frontal and a pair of light lines extending along the fronto-supraocular suture posteriorly across the parietals, pre- and postoculars yellowish white as are also the upper labials; a transverse black spot or pair of spots in the centre of each vertebral scale which is otherwise light colored and frequently forming a distinct, though fine, vertebral line; a distinct light lateral stripe, edged above, and sometimes below also, with black. Below, as well as lower half of outer scale-row, white, yellowish, or olive; sometimes a well defined median yellow band down the centre; chin, throat, and anterior ventrals often flecked or streaked with bluish gray or black, the latter sometimes forming a pair of longitudinal lines which unite upon the throat.

Measurements. Largest ♀ measures 1030 (690 + 340) mm. from Erongo Mountain plateau, South-West Africa (M.C.Z. 43423).

Diet. A gecko (*Ptenopus garrulus*), agama (*Agama h. aculeata*), lizards (*Eremias lugubris*, *Scapteira depressa*) and skink (*Mabuya* sp.) have been recorded by Werner.

Parasites. Nematodes.

Habitat. Sometimes found in thorn trees (*Acacia horrida*) and hibernating in abandoned termitaria.

Localities. **Transvaal:** Daspoort; Pretoria. **Bechuanaland Protectorate:** Kaotwe; Kuke; Sunnyside to Gemsbok. ²**Cape Province:** Aughrabies; Burghersdorp; Gordonia; Kimberly; Kgokong to Kong; Madibi; Nosob River; Rietfontein; Springbok Vlei; Vryburg. **South-**

¹ Separated in a Pretoria snake *vide* Hewitt (1912, p. 269).

² Hewitt (1912, p. 269) rightly rejects the Port Elizabeth record of F. W. FitzSimons as erroneous; if correctly identified then the possibility of its being an escaped individual should be considered.

West Africa: Areb near Maltahohe; Aus to Bethanien; Berseba; Gibeon; Kalahari; Keetmanshoop; Kraaiwater; Kubub-Sinclair Mine; Luderitz Bay; Namib Desert; Okahandja; Okosongomingo Farm; Ovamboland; Omaruru; Onambeke; Otjikondo; Otjimbingue; Rehoboth; Rietmond; Rooibank; Windhuk.

Distribution. Transvaal, Bechuanaland Protectorate, and adjacent northeastern Cape Province to South-West Africa.

PSAMMOPHIS SIBILANS LEIGHTONI Boulenger

- 1887b. *Psammophis sibilans* Boettger (part, not Linné), Ber. Senckenberg. Ges., p. 159.
- 1902a. *Psammophis leightoni* Boulenger, Proc. Zool. Soc. London, **1**, p. 126, pl. xii: Eerste River Station, Cape Province, Union of S. Africa.
1908. Gough, Ann. Transvaal Mus., **1**, p. 29.
- 1907c. *Psammophis furcatus* Roux (not Bianconi), Zool. Jahrb. Syst., **25**, p. 738.
- 1910b. Boulenger (part), Ann. S. African Mus., **5**, p. 513.
- 1910a. Werner (part), Denks. Med. Nat. Ges. Jena, **16**, p. 361.
1912. Hewitt (part), Rec. Albany Mus., **2**, p. 269.
- 1936h. Loveridge, Field Mus. Nat. Hist. Zool. Ser., **22**, p. 38.
1938. FitzSimons, V. (part), Ann. Transvaal Mus., **19**, p. 157.

Synonymy. This extreme southern race has been confused with *sibilans* and with *furcatus* Peters (not of Bianconi), here called *P. s. trinasis*, from which it differs solely in the light transverse, instead of longitudinal, lines upon the head, and probably in a lower average ventral count.

Should the differences in marking prove untenable, then *leightoni* would take precedence over *trinasis* and the two have to be merged. Recognition of *leightoni* appears logical in view of what we already know of the differentiation of forms in the Cape Peninsula and adjacent region.

Werner's (1915c, p. 365, pl. vii, figs. 3-3a) Swakopmund snake which he refers to *leightoni* has the coloring of *notostictus* with the divided anal of *trinasis*, I tentatively refer it to the former which occasionally may have a divided anal.

Description. As in *P. s. trinasis* except for two unimportant variations, *i.e.* the frontal is slightly shorter than a parietal, the loreal twice as long as deep. Scale-counts are: nostril between 2 or 3 shields; preocular 1; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 8, fourth and fifth entering the orbit; 4 lower labials in

contact with the anterior sublinguals. Midbody scales in 17 rows; ventrals 156-176; anal divided; subcaudals 84-110.

Coloration. Above, dark brown; rostral and labials yellow spotted with black, a light (yellow) line from the rostral to the frontal, a pair of light lines along the fronto-supraocular sutures, two pairs of light spots on the parietals, four yellow bars on each side of the head, the first on the preocular, the second on the postoculars, the third extending to the upper surface of the head to unite, or nearly unite, with its fellow on the occiput, sides of neck with dark ocelli edged with bright yellow.

Body coloring substantially similar to that described for *trinasalis* and excellently figured on Boulenger's plate xii.

Measurements. Largest ♀ measures 1065 (700 + 365) mm. Steinkop, Little Namaqualand (Werner).

Localities. **Cape Province:** Capetown; Eerste River Station; Jakalswater to Orange River; Kleinzee; Malmsbury; Port Nolloth and 20 miles north; Steinkop; Stellenbosch.

Distribution. Cape Province from western Little Namaqualand to the Cape Peninsula.

PSAMMOPHIS SUBTAENIATUS SUDANENSIS Werner

- 1884a. *Psammophis sibilans subtaeniata* Fischer (not Peters), Jahr. Hamburg. Wiss. Anst., **1**, p. 12.
- 1891a. Boulenger, Proc. Zool. Soc. London, p. 307.
1888. *Psammophis sibilans* Mocquard (not Linné), Mém. Soc. Philom. Cent. Paris, p. 130.
- 1893b. Stejneger, Proc. U. S. Nat. Mus., **16**, p. 731.
1910. Meek, Field Mus. Nat. Hist. Zool. Ser., **7**, p. 405.
- 1895b. *Psammophis subtaeniatus* Boulenger (part), Proc. Zool. Soc. London, p. 538.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 160.
1896. Tornier, Kriechthiere Deutsch-Ost-Afrikas, p. 82.
- 1897e. Boulenger, Proc. Zool. Soc. London, p. 801.
1897. Tornier, Arch. Naturg., **63**, **1**, p. 65.
1898. Johnston, British Cent. Africa, p. 361a.
1898. Tornier, in Werther, Mitt. Höch. Deutsch-Ost-Afrika, p. 297.
- 1902b. Mocquard, Bull. Mus. Paris, **8**, p. 406.
1907. Lönnberg, in Sjöstedt, Wiss. Ergeb. Zool. Exped. Kiliman., p. 16.
- 1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, pp. 241, 244.
- 1908a. Werner, Third Rep. Wellcome Res. Lab. Khartoum, p. 171.
- 1910a. Sternfeld, Die Fauna Deutschen Kol., **3**, pt. 2, p. 30, fig. 33.
- 1911a. Sternfeld, Sitz. Ges. Naturf. Freunde Berlin, p. 250.

1913. Boettger, in Voeltzkow, Reise in Ostafrika, **3**, p. 364.
- 1915c. Boulenger, Proc. Zool. Soc. London, p. 631.
- 1916a. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., **5**, p. 85.
- ?1918. ¹Calabresi, Mon. Zool. Ital. Firenze, **29**, p. 124.
- 1918a. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., No. 13, p. 327.
1919. Werner, Denks. Akad. Wiss. Wien, **96**, p. 504.
- 1923e. Loveridge, Proc. Zool. Soc. London, p. 884.
- 1924b. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc. Supp. 3, p. 6.
- 1925a. Angel, in Voyage Alluaud et Jeannel Afrique Orient., **2**, p. 35.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.
- 1928d. Loveridge, Proc. U. S. Nat. Mus., **73**, Art. 17, p. 55.
- 1928g. Loveridge, Bull. Antivenin Inst. America, **2**, p. 36.
- 1929h. Loveridge, Bull. U. S. Nat. Mus. No. 151, p. 32.
- 1933h. Loveridge (part), Bull. Mus. Comp. Zoöl., **74**, p. 254.
- 1935a. Corkhill, Sudan Govt. Mus. Publ. No. 3, p. 22.
1935. Cunha, Mem. Estudos Mus. Zool. Univ. Coimbra (1), No. 83, p. 9.
- 1936h. Loveridge, Field Mus. Nat. Hist. Zool. Ser. **22**, p. 38.
- 1936j. Loveridge, Bull. Mus. Comp. Zoöl., **79**, p. 263.
1936. Roux, in Jeannel, Miss. Scient. de l'Omo, **3**, p. 177.
- 1937f. Loveridge, Bull. Mus. Comp. Zoöl., **79**, pp. 493, 496.
1937. Pitman (part), Uganda Journ., **4**, p. 230, pl. xi, fig. 2, col. pl. K, fig. 2.
1937. Uthmöller, Temminckia, **11**, p. 119.
1938. Pitman (part), Uganda Journ., **5**, pp. 215, 233.
- 1939c. Scortecci, Gli Ofidi Velenosi dell' Africa Italiana, p. 150.
1919. *Psammophis subtaeniatus* var. *sudanensis* Werner, Denks. Akad. Wiss. Wien, **96**, p. 504: Kadugli, Anglo-Egyptian Sudan (designated).

Synonymy. As explained under the typical form, *P. subtaeniatus* of Boulenger's Catalogue (1896d, p. 160) is a composite of two forms, typical *subtaeniatus* with 9 upper labials of which the fourth, fifth and sixth enter the orbit, ranging south of the Zambesi, and the present race occurring from Zambezia to the southern Sudan. The latter is constant in having only 8 upper labials of which the fourth and fifth only enter the orbit. Heretofore this common East African snake has been almost consistently designated *subtaeniatus*.

This is really the reptile which Mertens (1937b, p. 14) had in mind when he decided to synonymize *subtaeniatus* with *sibilans*. I have the deepest sympathy with such action in view of the fact that there are no scale characters on which I have been able to separate *sudanensis* from typical *sibilans*. Neither can one treat *sudanensis* as a race of *sibilans* for they occur together in many localities in East Africa the

¹ Data omitted as apparently a misidentification.

more slender *sudanensis* favouring arid localities and the more robust *sibilans* the river banks and cultivated lands adjacent to the eroded areas.

Werner (1919, p. 504) endeavours to distinguish between Sudanese (*sudanensis*) and East African specimens (which he calls *subtaeniatus*), but this does not appear possible. Under the circumstances his name *sudanensis* becomes available for both. As no type was designated, the Kadugli snake, which he describes in some detail, is to be regarded as the type.

Names. Northern Stripe-bellied Sand-Snake (English); according to Corkhill, *abu sa aifa* (Arabic, Sudan, also applied to *P. sibilans schokari*); *dowa* (Nubas of Um Gabrallah); *inimaro* (Nubas of Toitcho); *kalingi* (Nubas of Turun); *narangi* (Nubas of Tira Luman; *peritoro* (Nubas of Acheron); *rungu* (Nubas of Kinderma); according to Loveridge, *mbalama* (Yeye, Shinyanga); *iruwassi* (Nyamwezi, Tabora); *mlalu* (Gogo, Dodoma); *sangaraza* (Kami, Morogoro and Swahili, Coast); *mchezawanawake* (Amu, Lamu); *naru* (Makonde and Mahiwa).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than or equal to a supraocular, as long as or slightly longer or slightly shorter than a parietal, as long as or usually longer than its distance from the end of the snout; nostril between 2, very rarely 3, shields; loreal twice to twice and a half as long as deep; preocular 1, rarely 2, separated from, rarely in contact with, the frontal; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 8, fourth and fifth entering the orbit; 4, very rarely 5, lower labials in contact with the anterior sublinguals, which are as long as or shorter than the posterior. Midbody scales in 17 rows; ventrals 148-169; anal divided; subcaudals 92-114.

Coloration. Above brown or olive; a light vertical line from the tip of the snout across the rostral to the posterior end of the frontal where it meets with the first of three light transverse stripes of which the hindmost is just behind the parietals; a black line across the rostral is continued along the upper border of the upper labials which are yellowish, with or without black spots; dorsum with or without a fine yellow vertebral line, usually the seven middle dorsal scale-rows darker, edged with black, and separated from the sides by a pair of more or less distinct pale longitudinal stripes. Below, a band of bright yellow down the centre of the ventrals flanked on either side by a sharply defined black line which separates it from the usually paler

or white band occupying the outer edges of the ventrals and the lower half of the outer scale-row, this coloration continued at least on to anterior part of tail.

Measurements. Largest ♀ measures 1300 (938 + 362) mm. from Budongo Forest, Uganda (Pitman). Largest ♂ measures 1263 (863 + 400) mm. and ♀ measures 1161 (777 + 384) mm., both from Morogoro, Tanganyika Territory (Loveridge).

Breeding. For a possible courtship practice, see Loveridge (1928g, p. 36).

Oviducts of a series of Morogoro snakes were examined and appeared to support the assumption that the number of eggs produced is governed to some extent by the dimensions of the mother. Thus

- on September 23rd 10 eggs were found in a 45-inch female,
- on October 22nd 8 eggs were found in a 39-inch female,
- on October 22nd 7 eggs were found in a 27-inch female,
- on October 22nd 6 eggs were found in a 28-inch female.

On the same day, October 22nd, 6 eggs, measuring 32 x 13 mm. were laid by yet another *sudanensis*.

On December 10th and January 1st sixteen newly hatched young were caught. One of these was in a heap of rubbish; in their convulsive efforts to escape two of these snakelings actually *leapt off the ground*.

Dict. Detailed accounts of feeding habits have been given (Loveridge, 1928g, p. 36) and an incident recorded where a stripe-bellied sand-snake was apparently lying in wait for small weaver birds (*Lagnosticta*). That they will take small birds such as a warbler (*Prinia m. tenella*) in captivity is certain, though their principal food is undoubtedly lizards such as geckos (*Hemidactylus mabouia*) and striped skinks (*Mabuya striata*) at Morogoro, a variable skink (*M. v. varia*) at Mikindani, and a frog (*Rana edulis*) at Mkonumbi; frogs (*Arthroleptis s. stenodactylus*) at Mikindani. According to Uthmüller, mice and chameleons are also taken.

Parasites. Worms of many species (*Ascaris* sp., *Oochoristia crassiceps*, *Ophidascaris mombassica*, *Physaloptera affinis*) have been recovered from the alimentary tracts.

Enemies. Five from stomachs of eagles (*Circæetus cinereus*) at Amboni and Mikindani.

Temperament. Bite freely when first captured though not as savagely as does the hissing sand-snake.

Venom. The bite is apparently harmless to man as I have been bitten several times without any ill effects. See also account of native being bitten (Loveridge, 1928g, p. 37).

Habitat. The northern stripe-bellied sand-snake shows a preference for dry savanna with scattered bush; being an adept climber it suns itself among the twigs and in such a situation is difficult to detect as it harmonises so well with its environment. A snake disturbed in thorn-bush country, flashed across the path and was twenty feet up in the topmost twigs of a stunted tree in a matter of moments. Several were taken in the thatches of native huts where they had gone in search of lizards.

Localities. **Anglo-Egyptian Sudan:** Jebel Moro; Kadugli; Mnyouri Jardin; Wau. **Ethiopia:** Bodessa. **Uganda:** Katwe; Mount Debasien. **Kenya Colony:** Athi Plains; Bura; Changamwe; Frere Town; Guaso Nyiro; Kibwezi; Lamu Island; Lolokwi Mountain; Mkonumbi; Mombasa; Nanoropus; Lake Rudolf; Takaungu; Tana River; Ulukenya Hills; Voi; Wange; Witu. **Tanganyika Territory:** Amboni near Tanga; Arusha; Chanzuru; Dakawa; Dar es Salaam; Dodoma; Gomberi; Ilonga; Kideti; Kilimanjaro Mountain; Kilosa; Kimamba; Kitaya; Kitopeni; Lalago; Lukigura; Marungu; Masai nyika; Mavene; Mbanja; Mikindani; Mkata Station; Mkindo; Moshi; Mtali's village; Mwanza; Nchingidi; Ngare na nyuki; Njiri swamp; Nyambita; Pangani; Sagayo; Sanga; Sekenke; Suna; Tabora; Tukuyu; Ubamba Bay; Usandawi; Ushora; Wembere. **Zanzibar:** Zanzibar. **Mozambique:** Lumbo; Massangulo. **Nyasaland:** Cape McClear; Lake Nyasa; Masuku Mountains; Nkata Bay to Ruarwe; Nyika Plateau; Zomba.

Distribution. Drier regions of the southern Sudan and Uganda east through southern Ethiopia and northern Kenya, south through Tanganyika to Nyasaland and northern Mozambique. It occurs from sea level allegedly to 6,000 feet in Nyasaland according to Boulenger.

Remarks. Mocquard's (1896, p. 45) record from Abiras, upper Ubangi, is probably a stripe-bellied example of *sibilans* such as are not uncommon in the French Sudan.

The single record of *subtaeniatus* from Italian Somaliland (Calabresi, 1918, p. 124) based on a young snake measuring 230 (170 + 60) mm. with only 143 ventrals and 70 subcaudals, is rejected pending confirmation, and these counts omitted from the range given in the description.

Sternfeld's (1912c, p. 273) Ukerewe Island record, as well as those of Loveridge (1933h, p. 254) from this and other localities, with the exception of Mwanza and part of the Usandawi series, listed in that paper, are now considered to be stripe-bellied *sibilans* and their length and dietic records in this reference are transferred to *P. s. sibilans*.

Werner (1925(1924), p. 140) includes Katanga in the range of "*subtaeniatus*" but I have failed to trace the record of any material on which the extension in range is based.

PSAMMOPHIS SUBTAENIATUS SUBTAENIATUS Peters

1854. *Psammophis moniliger* Peters (part, not Daudin), Monatsb. Akad. Wiss. Berlin, p. 623.
1855. Peters, Arch. Naturg., **21**, **1**, p. 53.
- 1881b. *Psammophis brevirostris* Peters (part), Sitz. Ges. Naturf. Freunde Berlin, p. 89.
- 1882a. *Psammophis sibilans* var. *subtaeniata* Peters, Reise nach Mossambique, **3**, p. 121: Borer and Tete, Mozambique.
- 1895a. Bocage, Herp. Angola Congo, p. 116.
- 1887b. *Psammophis sibilans* Boettger (part, not Linné), Ber. Senckenberg. Ges., p. 159.
- 1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 246.
1931. Power (part), Trans. Roy. Soc. S. Africa, **20**, p. 43.
- 1937b. Mertens, Abh. Senckenberg. Naturf. Ges. No. 435, p. 14.
- 1895b. *Psammophis subtaeniatus* Boulenger (part), Proc. Zool. Soc. London, p. 538.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 160.
- 1896a. Bocage, Jorn. Sci. Lisboa (2), **4**, p. 93.
- 1902a. Werner, Verh. Zool. Bot. Ges. Wien, **52**, p. 340.
1909. Chubb, Proc. Zool. Soc. London, p. 596.
1912. Hewitt, Rec. Albany Mus., **2**, p. 273.
1913. Hewitt & Power, Trans. Roy. Soc. S. Africa, **3**, p. 164.
- 1915c. Boulenger (part), Proc. Zool. Soc. London, p. 631.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.
- 1927c. Power, Trans. Roy. Soc. S. Africa, **14**, p. 409.
1928. Cott, Proc. Zool. Soc. London, p. 953.
1931. Power, Trans. Roy. Soc. S. Africa, **20**, p. 48.
1935. Cott, 1934, Proc. Zool. Soc. London, p. 968.
- 1935b. FitzSimons, V., Ann. Transvaal Mus., **16**, p. 317.
- 1939b. FitzSimons, V., Ann. Transvaal Mus., **20**, p. 23.
- 1895b. *Psammophis bocagii* Boulenger, Proc. Zool. Soc. London, p. 538: Angola (Later stated to be Benguela, Angola).
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 161, pl. viii, fig. 1.
- 1897a. Bocage, Jorn. Sci. Lisboa (2), **4**, p. 201.
- 1910b. Boulenger, Ann. S. African Mus., **5**, p. 514.
- 1910b. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. 1, p. 27, fig. 31.
- 1910c. Sternfeld, Mitt. Zool. Mus. Berlin, **5**, p. 56.
1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 124.
1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.
- 1936c. Parker, Novit. Zool., **40**, p. 126.

- 1937b. Monard, Arqu. Museu Bocage, Lisboa, **8**, pp. 128, 131.
 1938. FitzSimons, V., Ann. Transvaal Mus., **19**, p. 157.
 1908. *Psammodphis transvaalensis* Gough, Ann. Transvaal Mus., **1**, p. 31, figs.: Louw's Creek, Transvaal.
 1910b. Boulenger, Ann. S. African Mus., **5**, p. 513.
 1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 124.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 140.

Synonymy. It appears probable that part of the material on which Peters' (1881b, p. 89) based his *brevirrostris* is referable to *subtaeniatus*. The typical form has also been listed under *moniliger* and *sibilans*, while a few of the references to *subtaeniatus* in the literature really refer to *sibilans*.

Names. Southern Stripe-bellied Sand Snake (English); according to Peters, *nemoviri* (at Boror); *njammaramba* or *njamudsaramba* (at Tete); according to Bocage, *bandangila* (at Caconda), *lubis* (on Rio Bengo).

Description. Rostral broader than or as broad as deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than or equal to a supraocular, as long as or slightly longer or slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 or 3 shields; loreal twice to twice and a half as long as deep; preocular 1 or 2, separated from or in contact with the frontal; postoculars 2, rarely 3¹; temporals 2 + 2 or 2 + 3, rarely 1 + 2; upper labials 9, rarely 8 or 10, fourth, fifth, and sixth, rarely fourth and fifth or fifth, sixth and seventh, entering the orbit; 4, very rarely 5, lower labials in contact with the anterior sublinguals, which are as long as or shorter than the posterior. Midbody scales in 17 rows; ventrals 159-174; anal² divided; subcaudals 109-127 (Peter's type with 54 must have had a truncated tail).

Coloration. Above, olive to olive brown, paler posteriorly, the seven middle dorsal rows dark-edged and forming a broad black-edged dorsal band, separated from the sides by a more or less distinct creamy or yellowish brown stripe on the posterior four-fifths of body and continued on tail; sides brown, usually a black lateral streak along the middle of the outer row of scales; upper labials yellowish with or without black dots, a black line along their upper border which is continued across the rostral; head with markings of the eastern race more or less faintly visible. Below, chalky yellow, a sharply distinct fine black line

¹ Fide FitzSimons, 1938, p. 157.

² Rarely entire, i.e. in Maltahohe snake in British Museum.

along each side of the belly and anterior part of tail separating the yellow centre from the white outer portion of the ventrals.

Measurements. Largest ♂ measures 1110 (735 + 375) mm.; largest ♀ measures 995 (625 + 350) mm. Both from Bechuanaland Protectorate (FitzSimons, 1935b, p. 317). Largest unsexed specimen 1470 (1080 + 390) mm. from Mupanda, Angola (Monard, 1937b, p. 132).

Diet. Lizard (*Agama h. armata*) *vide* Cott; and a frog, according to Power.

Localities. **Mozambique:** Boror; Caia; Fambani; Inhaminga; Mgaza; Tete; Xa Matlale. **Southern Rhodesia:** Birchenough Bridge; Bulawayo; Matopos; Victoria Falls. **Bechuanaland Protectorate:** Francistown; Gemsbok to Sunnyside; Lobatsi; Lupani; Mabeleapudi; Makarikari; Maun; Moove. **Transvaal:** Louw's Creek; Nelspruit; Njelele River. **South West Africa:** Gobabis; Grootfontein; Namib Desert; Oshikango; Waterberg; Otjosangombe; Outgo; Windhoek. **Angola:** Benguela; Bibala; Catumbela; Cunene; Forte Roçadas; Humbe; Maconjo; Mulondo; Mapa; Mupanda; Rio Bengo.

Distribution. Drier regions of southern Mozambique west to South-West Africa and southern Angola.

Remarks. One of Peters' (1881b, p. 89) types of *brevirostris* had 9 upper labials, the fourth, fifth and sixth entering the orbit, characteristic of *subtaeniatus* (*sensu strictu*) and so is transferred here.

The *Psammophis subtaeniatus* of Boulenger's (1896d, p. 160) Catalogue is a composite of true *subtaeniatus* and a form found north of the Zambesi to which all his material apparently belonged. The northern race is characterised by having, like *sibilans*, only 8 upper labials, fourth and fifth entering the orbit, for this form Werner's name of *P. subtaeniatus sudanensis* is the first available.

Hewitt (1912, p. 273) was the first to point out that *bocagii* and *transvaaliensis* were synonymous with *subtaeniatus* of Peters, but did not realise that *subtaeniatus* of Boulenger was a composite.

PSAMMOPHIS BISERIATUS TANGANICUS subsp. nov.

1888. *Psammophis biseriatus* Mocquard (not Peters), Mém. Soc. Philom. Cent. Paris, p. 130.
 1890b. Boulenger, Ann. Mag. Nat. Hist. (6), 6, p. 93.
 1892. Boulenger, 1891, Ann. Mus. Genova (2), 12, p. 15.
 1893b. Boettger, Zool. Anz., 16, pp. 119, 123.
 1895b. Boulenger, Proc. Zool. Soc. London, p. 537.

- 1895g. Boulenger, Ann. Mag. Nat. Hist. (6), **16**, p. 168.
 1896b. Boulenger, Ann. Mus. Genova (2), **17**, p. 13.
 1896d. Boulenger (part), Cat. Snakes Brit. Mus., **3**, p. 168.
 1896e. Boulenger, Proc. Zool. Soc. London, p. 216.
 1896. Tornier (part), Kriechthiere Deutsch-Ost-Afrikas, p. 82.
 1897g. Boulenger, Ann. Mus. Genova (2), **17**, p. 279.
 1897. Tornier (part), Arch. Naturg., **63**, **1**, p. 65.
 1898. Tornier (part), in Werther, Mitt. Höch. D.-Ost-Afrikas, p. 297.
 1901a. Boulenger, Proc. Zool. Soc. London, p. 49.
 1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 241.
 1908. Werner, 1907, Sitz. Akad. Wiss. Wien, **116**, **1**, p. 1878.
 1909c. Boulenger, Ann. Mus. Genova (3), **4**, p. 309.
 1909d. Boulenger, Ann. Mus. Genova (3), **4**, p. 311.
 1912b. Boulenger, Ann. Mus. Genova (3), **5**, p. 332.
 1912b. Sternfeld, Sitz. Ges. Naturf. Freunde Berlin, p. 385.
 1913. Lönnberg & Andersson, Ark. Zool., **8**, No. 20, p. 4.
 1915c. Boulenger (part), Proc. Zool. Soc. London, p. 631.
 1915d. Boulenger (part), Proc. Zool. Soc. London, p. 653.
 1916. Calabresi, Mon. Zool. Ital. Firenze, **27**, p. 41.
 1923e. Loveridge, Proc. Zool. Soc. London, p. 887.
 1924b. Loveridge (part), Journ. E. A. Uga. Nat. Hist. Soc. Supp. **3**, p. 6.
 1925. Werner (part), 1924, Arch. Naturg., **96**, Abt. A, p. 141.
 1927. Calabresi, Atti. Soc. Ital. Sci. Nat., **66**, pp. 33, 55.
 1928d. Loveridge, Proc. U. S. Nat. Mus., **73**, Art. 17, p. 56.
 1928g. Loveridge (part), Bull. Antivenin Inst. America, **2**, p. 40.
 1929c. Scorteccei, Atti. Soc. Ital. Sci. Nat., **68**, p. 278.
 1930a. Scorteccei, Atti. Soc. Ital. Sci. Nat., **69**, p. 213.
 1930. Vinciguerra, Ann. Mus. Genova, **50**, p. 41.
 1930b. Zavattari, in Bono, Miss. Sci. Eritrea, p. 194.
 1931c. Scorteccei, Atti. Soc. Ital. Sci. Nat., **70**, p. 210.
 1932. Gestro & Vinciguerra, in Abruzzi, Esplor.-Uebi Scebeli, p. 500.
 1932b. Parker, Proc. Zool. Soc. London, p. 364.
 1933h. Loveridge, Bull. Mus. Comp. Zoöl., **74**, p. 256.
 1934a. Scorteccei, Natura (Milano), **25**, p. 62, fig. 25.
 1935a. Corkhill, Sudan Govt. Mus. Publ. No. 3, p. 21.
 1936h. Loveridge (part), Field Mus. Nat. Hist. Zool. Ser., **22**, p. 39.
 1937f. Loveridge (part), Bull. Mus. Comp. Zoöl., **79**, pp. 493, 496.
 1937. Pitman (part), Uganda Journ., **4**, p. 240, pl. xi, fig. 3, pl. K, fig. 3.
 1937a. Scorteccei, Atti. Soc. Ital. Sci. Nat., **76**, p. 174, pl. v, fig. 4.
 1937. Zavattari, in Festschrift Geburt Embrik Strand, **2**, p. 532.
 1939a. Scorteccei (part), Ann. Mus. Genova, **63**, p. 281 (Hafun only).
 1939c. Scorteccei (part), Gli Ofidi Velenosi dell'Africa Italiana, p. 145, figs. 78-79.
 1897. *Psammophis sibilans* Meek (not Linné), Field Mus. Nat. Hist. Zool. Ser., **1**, p. 179.

Synonymy. The majority of the references to the typical form in the literature refer to this race.

Names. Link-marked Sand-Snake or Two-striped Sand-Snake (English); *subhainyu* (Somali); *kitlaku* (Sandawi); *zokaluqwagu* (Gogo).

Type. Museum of Comparative Zoölogy, No. 30380, A half-grown ♀ from Mangasini, Usandawi, central Tanganyika Territory, collected by Arthur Loveridge, December 12, 1929.

Paratypes. Twenty specimens in the Museum of Comparative Zoölogy from Dodoma, Ikikuyu, Kikuyu, Kilimatinde, Mangasini and Usandawi, all in the Central Province, Tanganyika Territory.

Description of type. Midbody scales in 15 rows; ventrals 151; anal divided; subcaudals 114; preocular 1; postoculars 2; labials 9, the fourth, fifth and sixth entering the orbit. It is this last character alone which separates this form from the typical race.

Description. Rostral broader¹ than deep, visible from above; snout once and a third to once and two thirds² as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as or slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 shields; loreal twice to thrice³ as long as deep; preocular 1, rarely 2, broadly, rarely narrowly, in contact with the frontal; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2 or 1 + 3; upper labials 9, rarely 8 or 10, fourth, fifth and sixth, rarely third, fourth and fifth, entering the orbit; 5 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 15 rows; ventrals 142-168; anal divided; subcaudals 97-117.

Coloration. As in the typical form.

Measurements. Largest ♀ measures 865 (565 + 300) mm. from Mangasini, Tanganyika Territory (Loveridge).

Breeding. Young snakes 300 mm. in length or just over, are to be found in central Tanganyika during December.

Diet. Lizards (*Nucras b. boulengeri* and *Philochortus hardeggeri*), and skinks (*Riopa m. modestum*) recovered from stomachs (Loveridge).

Parasites. A ♀ ascarid in a Mangasini snake.

Habitat. Coastal plain to arid thorn-bush uplands *circa* 4000 feet. So abundant was this species at Saranda during the month of July, that scarcely a day passed without one or two being disturbed as they

¹ As broad as deep in a Sudan specimen according to Werner.

² Or twice, presumably for this race, according to Boulenger.

³ Or four times, presumably this race, according to Boulenger.

basked among the fallen leaves at the base of shrubs, into which they vanished with great celerity. It was then necessary to remain perfectly still and scrutinize the bush until the snake was detected, either lying along a branch to whose surface it has applied its entire length, or else with the anterior third of its body stiffened and projecting into space like a twig.

Localities. **Libya:** Gat, Fezzan. **Anglo-Egyptian Sudan:** Bara, Kordofan; Erkowit; Nahud, Kordofan. **Eritrea:** Beilul near Assab. **Ethiopia:** Abdallah; Dabanah; Harrar (Harari Uen); Hinna (Imi region), Uebi Scebeli; Magala, Umberto Island; Ogaden; Sammane; San Kural; Uebi Mana. **British Somaliland:** Adi Haliss; Berbera to Obbia; Buran district; Gan Lebar; Haud; Hudin; Jifa Uri; Sheik, Golis Mountains; Warabod. **Italian Somaliland:** Bender Beila; Dolo; Gardo and Hafun, Migiurtina; Nogal; Rahanuin country; Uebi Scebeli. **Uganda:** Ngora, Lake Kioga. **Tanganyika Territory:** Dodoma; Ikikuyu; Kikuyu; Kilimatinde; Lake Manka; Lake Victoria—south end; Mangasini; Saranda; Unyanganyi.

Distribution. Southern Libya (*vide* Scortecchi and Zavattari), south-east through the Sudan to Eritrea, Ethiopia and Italian Somaliland north of the Nogal River, and south through the Sudan to Uganda and central Tanganyika. It meets with the typical form at Lake Manka in northeastern Tanganyika Territory and along the border between Ethiopia and Italian Somaliland.

PSAMMOPHIS BISERIATUS BISERIATUS Peters

- 1881b. *Psammophis biseriatus* Peters, Sitz. Ges. Naturf. Freunde Berlin, p. 88: Teita, Kenya Colony.
- 1884a. Fischer, Jahrb. Hamburg. Wiss. Anst., **1**, p. 13, pl. i, figs. 4a-4f.
- 1893b. Stejneger, Proc. U. S. Nat. Mus., **16**, p. 731.
1894. Günther, Proc. Zool. Soc. London, p. 88.
- 1896c. Boulenger, Ann. Mus. Genova (2), **17**, p. 21.
- 1896d. Boulenger (part), Cat. Snakes Brit. Mus., **3**, p. 168.
1896. Tornier (part), Kriechthiere Deutsch-Ost-Afrikas, p. 82.
1897. Tornier (part), Arch. Naturg., **63**, **1**, p. 65.
- 1898a. Boulenger, Ann. Mus. Genova (2), **18**, p. 721.
1898. Tornier (part), in Werther, Mitt. Höch. D.-Ost-Afrikas, p. 297.
- 1910a. Sternfeld (part), Die Fauna Deutschen Kol., **4**, pt. 1, p. 31.
1911. Lönnberg, Svenska. Vetensk.-Akad. Handl., **47**, No. 6, p. 23.
1912. Hopley, Journ. E. A. Uganda Nat. Hist. Soc., **3**, p. 52.
- 1912c. Sternfeld, Wiss. Deutschen Zent.-Afrika Exped., **4**, p. 274.
1913. Boettger, in Voeltzkow, Reise in Ostafrika, **3**, p. 362.

- 1915c. Boulenger (part), Proc. Zool. Soc. London, p. 631.
 1915d. Boulenger (part), Proc. Zool. Soc. London, p. 653.
 1916a. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., **5**, p. 86.
 1918a. Loveridge, Journ. E. A. Uganda Nat. Hist. Soc., No. 13, p. 330.
 1923b. Calabresi, Atti. Soc. Ital. Sci. Nat., **62**, p. 162.
 1924b. Loveridge (part), Journ. E. A. Uga. Nat. Hist. Soc. Supp. 3, p. 6.
 1925. Werner (part), 1924, Arch. Naturg., **90**, Abt. A, p. 141.
 1928g. Loveridge (part), Bull. Antivenin Inst. America, **2**, p. 40.
 1929h. Loveridge, Bull. U. S. Nat. Mus., No. 151, p. 33.
 1932a. Parker, Journ. Linn. Soc. London, Zool., **38**, p. 221.
 1936h. Loveridge (part), Field Mus. Nat. Hist. Zool. Ser., **22**, p. 39.
 1936j. Loveridge, Bull. Mus. Comp. Zoöl., **79**, p. 265.
 1936e. Parker, Ann. Mag. Nat. Hist. (10), **18**, p. 608.
 1937f. Loveridge (part), Bull. Mus. Comp. Zoöl., **79**, pp. 493, 496.
 1937. Pitman (part), Uganda Journ., **4**, p. 240, pl. xi, fig. 3, pl. K, fig. 3.
 1938a. Pitman, Uganda Journ., **5**, p. 216.
 1939a. Scortecci (part), Ann. Mus. Genova, **63**, p. 281.
 1939c. Scortecci (part), Gli Ofidi Velenosi dell' Africa Italiana, p. 145.
 1913. *Psammodphis bitaeniatus* Peters (sic) Boettger, in Voeltzkow, Reise in Ostafrika, **3**, p. 355 (misprint).

Synonymy. The typical form does not appear to have been confounded with any other species, many of the references to *biseriatus* in the literature refer to the encircling race just described.

Names. Link-marked Sand-Snake, or Two-striped Sand-Snake (English); *mararinga* (Teita).

Description. Rostral broader than deep, visible from above; snout once and a half to once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle, narrower than a supraocular, as long as or slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 shields; loreal twice to thrice as long as deep; preocular 1, rarely 2, broadly, rarely narrowly, in contact with the frontal; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2 or 1 + 3; upper labials 9, very rarely 8, fifth and sixth, or very rarely fourth and fifth, fourth, fifth and sixth, or sixth and seventh entering the orbit; $\bar{5}$, rarely 4, lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 15 rows; ventrals¹ 138-156; anal divided, very rarely entire; subcaudals² 100-130.

¹ 138 for a Somaliland snake (Scortecci, 1931c, p. 210); he has kindly checked this count for me, June 1938. The previous low number was 143.

² All figures below 100 have proved on examination to be truncated with regenerated terminal point. Those of the type, said to be 133, have been recounted by Dr. Abl and found to be 123.

Coloration. Above, grayish or pale brown, head uniform or with dark brown or reddish-brown, black-edged spots, and usually a dark cross-band on the occiput; a dark streak on each side of the head, passing through the eye; lips white with black or brown spots; a more or less interrupted cream-colored vertebral line down the centre of a dark dorsal band that is flanked by reddish-brown, black-edged spots. Below, belly grayish, speckled with black and white.

Measurements. Largest recorded measures 1050 (650 + 400) mm. (Boulenger). Largest sexed ♀ measures 1020 (660 + 360 + tip) mm. from Mount Mbololo, Kenya Colony (Loveridge).

Diets. Lizards (*Latastia l. revoili*), a skink (*Mabuya planifrons*), and chameleons (*Chamaeleo d. roperi*) recovered from stomachs (Loveridge).

Temperament. Disinclined to bite when captured.

Habitat. Coastal plain to arid thorn-bush uplands *circa* 3000 feet. One has but to examine the markings of one of these snakes to appreciate how remarkably well their cryptic coloring and slender habit simulate the twigs among which they take refuge.

Localities. **Italian Somaliland:** Afghedud; Afgoi; Belet Amin; Biomal; Caaio to Andurgab; Chisimaio (Kismayu); Dargali to Magghiolo; Garoe; Giuba (Juba) River; Gumbo (Jumbo); Lugh; Mahaddei Uen; Martis or Dinsai; Mofi; Mogadiscio; Neghelli; Oddur; Ted; Tobungab; Turfa; Uebi Scebeli; Urandi. **Kenya Colony:** Archer's Post; Bulessa; Guaso Nyiro; Kaliokwell River; Karawa; Kipini; Lodwar; Malindi; Mbololo Mountain; Njoro; Patta Island; Sirima, Lake Rudolf; Tana River; Taveta; Teita; Tsavo; Voi. **Tanganyika Territory:** Arusha; Kahe; Kilimanjaro Mountain; Lake Manka; Pentambili; Tanga.

Distribution. Italian Somaliland south of the Nogal River, through the drier regions of Kenya to extreme northeastern Tanganyika Territory near Kilimanjaro Mountain.

PSAMMOPHIS JALLAE Peracca

1896. *Psammophis jallae* Peracca, Boll. Mus. Zool. Torino, **11**, No. 255, p. 2, figs.: Kazungula to Bulawayo, Southern Rhodesia.
 1898. Selater, Ann. S. African Mus., **1**, p. 100.
 1910b. Boulenger, Ann. S. African Mus., **5**, p. 514.
 1910b. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. 1, p. 28.
 1910a. Werner, Denks, Med. Nat. Ges. Jena, **16**, p. 363.
 1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 125.
 1912. Hewitt, Rec. Albany Mus., **2**, p. 275.

- 1913e. Hewitt, Ann. Natal Mus., **2**, p. 481.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 141.
 1934. Pitman, Rep. Faunal Survey N. Rhodesia, p. 297.
 1905c. *Psammophis Ansorgii* Boulenger, Ann. Mag. Nat. Hist. (7), **16**, p. 113, pl. iv, fig. 4: Benguela to Bihe, Angola.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 141.
 1933m. Witte, Ann. Mus. Congo Belge, Zool. (1), **3**, p. 93.
 1937b. Monard, Arqu. Museu Bocage, Lisboa, **8**, p. 128.
 1921d. *Psammophis Rohani* Angel, Bull. Soc. Zool. France, **46**, p. 116, fig.: Near Loengoue, Lumuna River, affluent of Luiana River and tributary of the Kwando River, Angola.
 1923d. Angel, in Miss. Rohan-Chabot Angola Rhodesia, **4**, p. 166, figs. 10-12, pl. —, fig. 2.
 1937b. Monard, Arqu. Museu Bocage, Lisboa, **8**, p. 128.
 1932. *Psammophis longirostris* FitzSimons, V., Ann. Transvaal Mus., **15**, p. 38: Gomodimo Pan, C. Kalahari, Bechuanaland Protectorate.
 1935b. FitzSimons, V., Ann. Transvaal Mus., **16**, p. 318, figs. 2-3.

Synonymy. Apparently recorded only under the above names.

Description. Rostral broader than or as broad as deep, visible from above; snout once and a quarter to once and a half as long as the eye; internasals half to two thirds the length of the prefrontals; frontal, in the middle, much broader than a supraocular, as long as or longer than a parietal, much longer than its distance from the end of the snout; nostril between 3, rarely ²₁, shields; loreal once and a half to twice as long as deep; preocular 1, semidivided, broadly in contact with the frontal; postoculars 2, rarely 1; temporals 2 + 2, rarely 1 + 2; upper labials 7, third and fourth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 15 rows; ventrals 153-177; anal divided; subcaudals ²₉₇₋₁₀₉.

Coloration. Above, pale gray or grayish brown; snout and supraoculars pale brown, some black-edged yellow (white) spots form a pattern on head of young including a pair of light spots on the suture between the parietal shields; pre- and postoculars yellow (white); a black-edged streak crossing rostral, upper labials and side of head; back uniform or passing to pale brown posteriorly, or a dark, black-

¹ Two on one side only of the type of *ansorgii*.

² Seventy-six, recounted as 77/77+1 by Mr. Parker, in type of *ansorgii*, which I have examined and think is probably regenerated though open to question, said to be approximately 153 in type of *jallae* but tail macerated and fragmentary. Prof. Arcangeli, with customary kindness, has reexamined the type and entirely agrees with my suggestion that 153 is a misprint for 103; owing to its fragmentary condition an exact count is impossible.

edged, dorsal band, five scales wide, not extending to the head; sometimes a vertebral series of elongate yellow (white) spots anteriorly, black posteriorly, forming an interrupted vertebral line; on each side of the body a more or less distinct reddish brown band bordered below by a white streak on the lower half of the outer scale-row and the upper ends of the ventrals. Below, chin and throat spotted with black to form a pattern, midventral region yellow (white).

Measurements. Largest ♀ measures 915 (620 + 295) mm., from Lookaneng (Werner, 1910a, p. 363).

Localities. **Southern Rhodesia:** Importuni district; Kazungula to Bulawayo; Springvale near Matopos. **Bechuanaland Protectorate:** Gomodimo Pan; Lookaneng to Severelela. **Angola:** Benguela to Bihe; Bingondo; near Loengoue. **Belgian Congo:** Kansenia.

Distribution. Southern Rhodesia northeast through Bechuanaland to Angola and the southern Belgian Congo.

Remarks. The description and coloration of this species is a composite based on the description of four species, three of which I refer to the synonymy of *jallae*, the latter being rescued from the synonymy of *crucifer* where it was placed by Boulenger. Known from less than ten specimens in all, the type of *ansorgii* has been the only one which I have been able to examine.

PSAMMOPHIS CRUCIFER (Daudin)

1758. *Coluber sibilans* Linné (part), Syst. Nat. ed. 10, 1, p. 222.
 1766. Linné (part), Syst. Nat. ed. 12, 1, p. 383.
 1803. *Coluber crucifer* Daudin, Hist. Nat. Rept., 7, p. 189: "Indes orientales."
 1827. *Psammophis crucifer* Boie, in Oken, Isis, 20, cols. 525, 547.
 1854. Duméril & Bibron, Erpét, Gén., 7, p. 892.
 1858c. Günther, Cat. Snakes Brit. Mus., p. 135.
 1867a. Steindachner, in Reise Oesterreich. Freg. Novara, Zool., 1, p. 69.
 1870. Jan, Icon. Gén. Ophid., livr. 34, pl. iv, fig. 3.
 1883b. Boettger, Ber. Offenbach. Ver. Naturk., p. 156.
 1884a. Rochebrune, Faune Senegambie. Rept., p. 166 (error).
 1887b. Boettger, Ber. Senckenberg. Ges., p. 160.
 1887h. Boulenger, Zoologist (3), 11, p. 176.
 1887. Symonds, Proc. Zool. Soc. London, p. 487.
 1891a. Matschie, Zool. Jahrb. Syst., 5, p. 610.
 1895b. Boulenger, Proc. Zool. Soc. London, p. 539.
 1896d. Boulenger, Cat. Snakes Brit. Mus., 3, p. 169.
 1897. Bateman, The Vivarium, p. 285.
 1898. Boettger, Kat. Rept.-Samm., Mus. Senckenberg. II, p. 104.

1898. Jeude, Notes Leyden Mus., **16**, p. 38.
 1898. Slater, Ann. S. African Mus., **1**, p. 100.
 1898. Werner, 1896-7, Jahrb. Abh. Natur. Magdeburg, p. 145.
 1901. Schenkel, Verh. Naturf. Ges. Basel, **13**, p. 172.
 1902. Lampe & Lindholm, Jahrb. Nassau Ver. Nat. Wiesbaden, **55**, p. 34.
 1908b. Boulenger, Ann. Natal Govt. Mus., **1**, p. 229.
 1908. Gough, Ann. Transvaal Mus., **1**, p. 29.
 1910b. Boulenger, Ann. S. African Mus., **5**, p. 514.
 1910b. Sternfeld, Die Fauna Deutschen Kol., **4**, pt. 1, p. 28.
 1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 126.
 1912. Hewitt, Rec. Albany Mus., **2**, p. 270.
 1914a. Hewitt, S. African Journ. Sci., **10**, p. 246.
 1916. Andersson, Meddel. Göteb. Musei Zool. Afdel., No. 9, p. 36.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 141.
 1927b. Hewitt, S. African Journ. Sci., **24**, p. 455.
 1929. Rose, Veld & Vlei, p. 162, fig. 106.
 1935a. FitzSimons, V., Ann. Transvaal Mus., **15**, p. 522.
 1936h. Loveridge, Field Mus. Nat. Hist. Zool. Ser., **22** p. 39.
 1937e. Hewitt, Guide Vert. Fauna E. Cape Prov., S. A. II, p. 63, fig. 2.
 1837. *Psammophis moniliger* Schlegel (part), Essai Phys. Serp., **2**, p. 209, pl. viii, figs. 6-7.
 1883. ¹*Sauropphis crucifer* Fisk, Proc. Zool. Soc. London, p. 32.
 1892. *Psammophis sibilans* Müller (not Linné), Verh. Naturf. Ges. Basel, **10**, p. 205.

Synonymy. This distinctive species has been confused only with *sibilans* and its synonym *moniliger*, and that but rarely.

Names. Crossed Grass-Snake (English); *kruis gras-slang* and *streep-slang* (Dutch); *intlangu* and *u-nombatamb' ezantsi* (Kaffir).

Description. Rostral broader than deep, visible from above; snout once and a third to once and a half as long as the eye; internasals half to two thirds as long as the prefrontals; frontal, in the middle, as broad as or broader than a supraocular, as long as or slightly shorter than a parietal, much longer than its distance from the end of the snout; nostril between 2 shields; loreal about once and a half as long as deep; preocular 1, not or but very rarely² in contact with the frontal; postoculars 2; temporals 2 + 2 or 2 + 3; upper labials 8, rarely 7, fourth and fifth, rarely third and fourth, entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are as long as or

¹ Lapsus for *Psammophis*, as *Sauropphis* was proposed for a skink.

² One of five Kingwilliamstown snakes exhibited this frontal condition according to Hewitt (1912, p. 270).

shorter than the posterior. Midbody scales in 15, very rarely 17¹, rows; ventrals 136-158; anal divided; subcaudals 62-81².

Coloration. Above, pale olive or brownish; head with a light spot or streak on the suture between the parietal shields; pre- and postoculars yellowish; sides of head with large dark blotches; on the back a black-edged dorsal band, three scales wide, usually giving off one or two transverse bars or blotches on the nape; on each side of the body a more or less distinct dark band bordered below by a white streak on the lower half of the outer scale-row and the upper ends of the ventrals. Below, orange or yellow, uniform or finely speckled with blackish or orange-brown markings and a dusky streak or series of small spots along each side. (For a detailed description of a fresh Namaqualand example, see FitzSimons, 1935a, p. 522, and an almost uniform variant from Port Alfred, Hewitt, 1937e, p. 63).

Measurements. Largest example measures 673 (614 + 159) mm. from Kroonstadt (Symonds, 1887, p. 487).

Breeding. Lays from four (Fiske, 1883, p. 32) to half-a-dozen eggs (Rose, 1929, p. 162), *circa* 18 mm. long.

Diet. Gecko (*Phyllodactylus lineatus*) lizards, and frogs.

Enemies. A snake, 470 mm. in length, was found dead in the mouth of a bullfrog (*Rana adspersa*) *vide* Symonds. See Fiske (1883, p. 32) for a strange account of a snake (? *Pseudaspis cana*) eating the eggs and attacking an ovipositing crossed snake.

Habitat. This species does not appear to have spread far inland in Cape Province, but does reach the high veld at Doornkop, according to Hewitt (1912, p. 270) in a discussion of locality records. Common in coastal and grassy country inland at least to Lady Frere (Hewitt, 1937e, p. 63).

Localities. **Southern Rhodesia:** Matabeleland. **Transvaal:** Barberton; Johannesburg; Krugersdorp; Lydenburg; Mphome; Smithfield. **Natal:** Hilton Road; Vryheid. **Orange Free State:** Kroonstadt. **Basutoland:** Morija. **Cape Province:** Bathurst district; Beaconsfield; Beaufort West; Brakkloof; Burghersdorp; Capetown; Doornkop; East London; Fransche Kraal; Gaus Bay; Grahamstown; Hondeklip Bay; Irene; Kingwilliamstown; Kleinzee; Lady Frere; Malmsbury; Namaqualand; Port Alfred; Port Elizabeth; Simonstown; Steinkopf; Stellenbosch; Tokai.

¹ One snake examined by Hewitt (1912, p. 270) had 17 rows.

² A snake without locality possessed 86 subcaudals according to Andersson (1916, p. 36); its identification requires checking.

Remarks. Hewitt (1912, p. 270) has pointed out that *crucifer* agrees with *sibilans* in lacking a definite backward prolongation of the posterior nasal, such as is found in *notostictus* and '*furcatus*' i.e. *P. sibilans trinasalis*.

PSAMMOPHIS PULCHER Boulenger

- 1895b. *Psammophis pulcher* Boulenger, Proc. Zool. Soc. London, p. 537, pl. xxx, figs. 3-3a: Webi Shebeli, Ethiopia.
 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 170.
 1897g. Boulenger, Ann. Mus. Genova (2), **17**, p. 279.
 1915d. Boulenger, Proc. Zool. Soc. London, p. 654.
 1925. Werner, 1924, Arch. Naturg., **90**, Abt. A, p. 141.
 1927. Calabresi, Atti. Soc. Ital. Sci. Nat., **66**, p. 55.
 1934a. Scortecci, Natura (Milano), **25**, p. 63, fig. 26.
 1939c. Scortecci, Gli Ofidi Velenosi dell' Africa Italiana (Milano), p. 144.

Name. Beautiful Sand-Snake (English).

Description. Rostral broader than deep, visible from above; snout once and two thirds as long as the eye; internasals much shorter than the prefrontals; frontal, in the middle slightly narrower than a supraocular, slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 shields; loreal once and two thirds as long as deep; preoculars 2, separated from the frontal; postoculars 2; temporals 1 + 2; upper labials 8, fourth and fifth entering the orbit; 4 lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 13¹ rows; ventrals 144; anal divided; subcaudals 108.

Coloration. Above, pale brownish, with an orange black-edged vertebral stripe, a black lateral streak along the second scale-row passes through the eye and reaches the rostral; upper lip, outer scale-row, and outer ends of ventrals white. Below, ventrals yellow in the middle with an orange line on either side.

Measurements. The ♀ holotype measures 435 (275 + 160) mm.

Remarks. Known only from the type from Ethiopia, *not* Italian Somaliland, as may be seen on reference to Donaldson Smith's maps showing the point at which he crossed the Shebeli River.

Localities. **Ethiopia:** Webi Shebeli south of Harar.

Distribution. Southeastern Ethiopia.

¹ Checked and found correct. A. L.

PSAMMOPHIS ANGOLENSIS (Bocage)

1872. *Amphiophis angolensis* Bocage, Journ. Sci. Lisboa, **4**, p. 82: Donda, *i. e.* Dondo, Loanda, Angola.
- 1881d. Peters, Sitz. Ges. Naturf. Freunde Berlin, p. 149.
- 1895a. Bocage, Herp. Angola Congo, p. 113, pl. xi, figs. 3a-3f.
- 1896a. Bocage, Journ. Sci. Lisboa (2), **4**, p. 103.
1896. Tornier, Kriechthiere Deutsch-Ost-Afrikas, p. 82.
- 1897a. Bocage, Journ. Sci. Lisboa (2), **4**, p. 201.
- 1877c. *Ablabes Homeyeri* Peters, Monatsb. Akad. Wiss. Berlin, p. 620: Pungo Adungo (Ndungo), Angola.
- 1888a. *Dromophis Angolensis* Boettger, Ber. Senckenberg. Ges., p. 55.
- 1890b. Boulenger, Ann. Mag. Nat. Hist. (6), **6**, p. 93.
- 1891a. *Psammophis angolensis* Boulenger, Proc. Zool. Soc. London, p. 307.
- 1895b. Boulenger, Proc. Zool. Soc. London, p. 539.
- 1896d. Boulenger, Cat. Snakes Brit. Mus., **3**, p. 170.
- 1897e. Boulenger, Proc. Zool. Soc. London, p. 801.
1897. Tornier, Arch. Naturg., **63**, p. 65.
1898. Boettger, Kat. Rept.-Samm. Mus. Senckenberg. II, p. 104.
1898. Johnston, British Cent. Africa, p. 361a.
- 1908c. Sternfeld, Mitt. Zool. Mus. Berlin, **4**, p. 246.
- 1910b. Boulenger, Ann. S. African Mus., **5**, p. 514.
1910. Peracca, Boll. Mus. Zool. Torino, **25**, No. 624, p. 4.
- 1910a. Sternfeld, Die Fauna Deutschen Kol., **3**, pt. 2, p. 31.
1912. FitzSimons, F. W., Snakes of S. Africa, pp. 123, 125.
1912. Hewitt, Rec. Albany Mus., **2**, p. 275.
- 1915a. Boulenger, Proc. Zool. Soc. London, p. 213.
- 1915c. Boulenger, Proc. Zool. Soc. London, p. 631.
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- 1937f. Loveridge, Bull. Mus. Comp. Zoöl., **79**, pp. 493, 496.
- 1937b. Monard, Arqu. Museu Bocage, Lisboa, **8**, p. 128.

Synonymy. Peters (1881d, p. 149) himself referred *homeyeri* to the synonymy of *angolensis*, a species which does not appear to have been confused with any other.

Name. Pigmy Sand-Snake (English).

Description. Rostral broader than deep, visible from above; snout

once and a quarter to once and a half as long as the eye; internasals half to two thirds as long as the prefrontals; frontal, in the middle, slightly narrower or broader than a supraocular, as long as or slightly shorter than a parietal, longer than its distance from the end of the snout; nostril between 2 shields; loreal once and a half to twice as long as deep; preocular 1, separated from, rarely in contact with, the frontal; postoculars 2, rarely 3; temporals 1 + 2, rarely 2 + 2; upper labials 8, rarely 7, fourth and fifth entering the orbit; 4, rarely 5, lower labials in contact with the anterior sublinguals, which are shorter than the posterior. Midbody scales in 11 rows; ventrals 141-156; anal divided; subcaudals 57-82.

Coloration. Above, pale or dark olive; head dark olive anteriorly, blackish posteriorly, with three yellow transverse lines, the first across the frontal, the second across the parietals, the third behind the parietals; two black crossbands, separated by a yellowish interspace, may be present on neck; labials yellowish white; a dark olive or blackish vertebral stripe, mostly three scales wide, and finely edged with black on dorsum and tail; one or two more or less distinct dark lines or series of dots along each side. Below, white, a fine lateral line on either side of the ventrals, present or absent.

Measurements. Largest recorded measures 417 (306 + 111) mm. from Morogoro, Tanganyika Territory (Loveridge).

Temperament. Makes no attempt to bite when captured.

Habitat. Upland savanna to coastal plain. I have taken this species in a dried-up swamp, on a path, and ensconced in the grass wall of a hut at a height of five feet from the ground.

Localities. **Zanzibar:** Zanzibar. **Tanganyika Territory:** Bagamoyo; Dar es Salaam; Izikisia; Kilosa; Morogoro; Lake Tanganyika; Lake Victoria—south shore; Unyanganyi. **Mozambique:** Tschimbo. **Nyasaland:** Cape McClear; Fort Hill, Masuka district; Fort Johnston. **Northern Rhodesia:** Lealui; Munyamadzi River; Zambesi (upper). **Belgian Congo:** Albertville; Kansenia; Kahiri; Katanga; Kiambi to Baudouinville; Lukafu. **Angola:** Ambrizette; Caconda; Dondo; Humbe; Malange (Malanji); Novo Redondo; Pungo Adungo (Ndongo) Quindumbo.

Distribution. Tropical Africa from Zanzibar, Tanganyika Territory, and Mozambique west through Nyasaland, Northern Rhodesia and the Belgian Congo to Angola.

Remarks. Hewitt (1912, p. 275) justifiably questions Boulenger's (1910b, p. 515) inclusion of the Orange Free State in the range of *angolensis*, hence its omission from the above distribution.

