

Original article

A review of the species of *Psammophis* Boie found south of Latitude 12° S (Serpentes: Psammophiinae)

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Abstract.—The status, relationships and zoogeography of the 14 taxa of *Psammophis* found south of Latitude 12° S are reviewed and the following taxonomic changes are proposed:

1. *Psammophis trinasalis* and *P. namibensis*, previously treated as subspecies of *P. leightoni*, are recognised as good evolutionary species which show ecological differences.

2. *Psammophis orientalis*, previously regarded as a subspecies of *P. subtaeniatus*, differs from the latter in a suite of characters and is parapatric with it in Zimbabwe, so it is now recognised as an evolutionary species.

3. *Psammophis brevirostris* and *P. leopardinus*, previously regarded as subspecies of *P. sibilans* (Linnaeus), are recognised as relict evolutionary species. The Zambian populations previously assigned to *P. leopardinus* have been described as a new species (Hughes & Wade, in press).

Key words.—*Psammophis*, morphology, taxonomy, zoogeography, southern Africa

Since the last review of the genus *Psammophis* in southern Africa (Broadley 1977), a revision of the whole genus was the subject of a thesis by Frank Brandstätter (1995), which was subsequently published in summary form (Brandstätter 1996). The resulting confusion with regard to the northern forms of the *P. sibilans* complex has been discussed by Hughes (1999). In southern Africa, Brandstätter (1995) recognised three subspecies of *P. brevirostris*, but the ranges of *brevirostris* and *leopardinus* are inaccurately shown on his distribution maps, while that for “*P. brevirostris tettensis*” is not mapped at all. *Psammophis sibilans* var. *tettensis* Peters 1882 is actually a synonym of *P. sibilans* var. *mossambicus* Peters 1882 [treated as a synonym of *P. brevirostris* by Brandstätter], which has paragraph priority and is represented by three syntypes (ZMB 2468), whereas no material of *P. sibilans* var. *tettensis* was found in the Berlin collection. The name *Psammophis*

mossambicus has subsequently been applied to this eastern sister taxon of *P. phillipsii* (Hallowell) by Branch (1998) and Hughes (1999).

MATERIALS AND METHODS

The database for this study includes that used for the review of *P. notostictus* and the *P. leightoni* complex (Broadley 1975) and much of the material available in American, European and southern African museums (see Appendix), totalling nearly 3 000 specimens. No attempt has been made to provide complete synonymies, as these are to a large extent available in earlier publications (Broadley 1966, 1983) and there has been much confusion with regard to identifications of taxa in the *P. notostictus* and *P. sibilans* complexes. Some specimens in the Transvaal and Port Elizabeth Museums (mainly *P. notostictus*, *P. brevi-*

rostris, *P. mossambicus* and *P. crucifer*) were not examined personally, but were identified by Niels Jacobsen, Wulf Haacke or Bill Branch: these are listed in the Appendix and shown by open symbols on the distribution maps.

In addition to the usual data on head shields and scale counts, dentition was recorded from an extensive collection of prepared skulls. Brandstätter (1995) produced scanning electron micrographs (SEM) for dorsal scales of many southern African taxa from specimens in the Natural History Museum of Zimbabwe.

Institutional acronyms follow Leviton *et al.* (1985), except that NMWN is used for the National Museum of Namibia (formerly the State Museum, SMWN), TM is used for the former Transvaal Museum (= Northern Flagship Institution, Pretoria), while AJL = A.J. Lambiris Collection Hillcrest, HF = Helmut Finkelday Collection, Windhoek (now incorporated into the NMWN); JDV = John Visser collection, Durbanville, JPT = J.P. Tello Collection (? destroyed), LR = L. Raw Collection, Merrivale, and NDRS = Namib Desert Research Station, Gobabeb. A figure in parentheses indicates number of specimens under that catalogue number if more than one, and an asterisk indicates skull prepared.

RESULTS AND DISCUSSION

CHARACTER ANALYSIS

1. Head shields: The posterior nasal may be horizontally divided, the upper portion with a pronounced posterior prolongation (in the first five species under consideration) or entire, with little or no upper posterior prolongation (the remainder). There are normally two preoculars in *P. trigrammus* and *P. notostictus*, usually a single preocular in the rest. The simplest temporal formula is 2+2+3, but fusions take a variety of forms and $\frac{1}{2}$ +3 is the commonest result.

Only *P. angolensis* normally has 1+2 temporals.

Psammophis trigrammus is the only southern African species with 9 supralabials, the fifth and sixth entering orbit, but this arrangement is usual in the north African species of the *P. schokari* group. *Psammophis subtaeniatus* is the only species that normally has a 9 (4,5,6) supralabial formula, most of the other species usually have 8 (4,5), exceptions being *P. jallae* and *P. ansorgii* with 7 (3,4).

In northern Africa there are usually 11 infralabials, the first five in contact with anterior sublinguals, but in southern Africa this formula is only found in *P. trigrammus*. Most other species normally have 10 (4), exceptions being *P. jallae*, *P. crucifer* and *P. ansorgii* with 9 (4) and *P. angolensis* with 8 (4).

2. Dorsal scale row formula: Most species have 17 scale rows one head length behind the head and at midbody, reducing to 13 rows one head length before the vent, but *P. trigrammus* may have 17-17-11. *Psammophis jallae* may have 15-15-13 or 15-15-11, *P. crucifer* and *P. ansorgii* have 15-15-13 and *P. angolensis* has 11 rows throughout.

3. Number of ventrals (Table 1): This count was taken using the Dowling (1951) system and there appears to be no sexual dimorphism. In southern Africa the highest ventral counts are found in *P. trigrammus* and *P. namibensis* on the west coast, while the lowest are found in the dwarfed *P. angolensis* of the eastern savannas.

Ventral counts are often useful in separating sympatric taxa of the *P. sibilans* complex from *P. mossambicus*, but hybrids occur in some areas. The range of ventrals is about 25 in most wide-ranging species, with maxima of 30 in *P. mossambicus* and 31 in *P. crucifer*.

Table 1. *Psammophis* in southern Africa: scale counts and maximum snout - vent lengths.

Species	Ventrals					Subcaudals					Max. SVL
	N	Range	Mean	S.D.	S.E.	N	Range	Mean	S.D.	S.E.	
<i>trigrammus</i>	43	182-201	191.23	4.44	1.36	29	132-156	146.38	5.69	1.45	885
<i>notostictus</i>	232	155-183	169.46	4.9	0.64	149	76-107	92.98	5.86	0.96	680
<i>trinasalis</i>	297	150-175	161.38	4.59	0.53	201	84-128	104.15	7.04	0.99	758
<i>leightoni</i>	24	155-169	162.04	4.77	1.99	13	92-112	99.08	6.41	3.7	740
<i>namibensis</i>	108	167-188	177.26	4.24	0.82	77	90-116	103.94	6.08	1.38	960
<i>jallae</i>	84	154-175	164.27	4.47	0.98	57	84-112	99.3	6.16	1.64	780
<i>subtaeniatus</i>	532	155-181	166.83	4.14	0.36	307	106-132	117	5.19	0.59	900
<i>orientalis</i>	127	146-170	157.87	5.23	0.93	75	91-118	105.95	5.41	1.26	830
<i>leopardinus</i>	131	149-174	160.38	5.08	0.89	78	86-110	98.66	5.79	1.32	985
<i>brevirostris</i>	203	146-167	156.93	4.17	0.6	146	79-108	91.53	5.44	0.9	780
<i>mossambicus</i>	676	150-180	167.66	4.97	0.38	423	82-121	97.86	4.48	0.43	1415
<i>crucifer</i>	78	134-165*	150.27	8.04	1.84	71	61-82*	68.81	4.93	1.38	510
<i>ansorgii</i>	8	153-160				8	70-78				555
<i>angolensis</i>	155	133-157	144.55	4.75	0.76	130	58-80	71.11	4.72	0.83	352

* TM 22368, a female from Nyamaziwa, Zimbabwe, had only 117 ventrals & 47 subcaudals.

4. Cloacal (anal) shield: In southern Africa, *P. notostictus* is the only species which normally has an entire cloacal shield.

5. Number of subcaudals (Table 1): Although every effort was made to reject counts for specimens that lacked a terminal spine, regenerated tail tips are very hard to detect if the tail is truncated early in life. There appears to be no sexual dimorphism in subcaudal counts. *Psammophis trigrammus* has by far the highest counts and *P. angolensis* the lowest.

6. Microornamentation of dorsal scales: Brandstätter (1995) demonstrated a fundamental difference between the patterns found in the *schokari* group inhabiting arid regions and those of the *sibilans* group occupying more mesic habitats. In the former, the wide valleys between the peak ridges are divided by membranes into box-like spaces, which are widest in *P. namibensis*, which lives in the most extreme desert environment, and narrowest in *P. notostictus*, which inhabits scrub. In the *sibilans* group, the spaces between the peaks are filled with vermiculate structures, which tend

to form chevrons, these are very acute and closely spaced in *P. angolensis*.

7. Colour pattern: The usual dorsal head pattern in the *leightoni* and *sibilans* complexes consists of longitudinal pale stripes anteriorly and pale transverse markings on the back of the head (Broadley 1977, Figs. 3 & 4). An exception is *P. trinasalis*, where a pale lateral stripe extends across the temporals and continues as a dorso-lateral stripe on the body. A pattern of pale transverse bars on the back of the head is best developed in *P. angolensis*.

A body pattern of pale dorsolateral stripes on rows 4 and 5 is widespread in *Psammophis*, the only southern African species which have completely lost it are *P. mossambicus* and *P. ansorgii*. *Psammophis trigrammus*, *P. notostictus* and *P. namibensis* usually lack stripes, but they are retained in some populations or individuals (but *P. trigrammus* has the stripes on rows 5 & 6). *Psammophis jallae*, *P. trinasalis*, *P. leopardinus* and *P. crucifer* are usually striped (the latter with broad stripes covering rows 4, 5 & 6), but also have uniform grey-brown phases. *Psammophis leightoni* and *P.*

Table 2. Dentition in southern African *Psammophis*. Figures in parentheses indicate rare variations. Maxillary formula: small anterior + 2 enlarged + small posterior + 2 grooved fangs.

Species	N	Maxillary	Palatine	Pterygoid	Dentary
<i>trigrammus</i>	1	4 + 2 + 6 + II	13	20	4 + 21-22
<i>notostictus</i>	2*	4 + 2 + 5-6 + II	12	18-20	4 + 21-22
<i>trinassalis</i>	4	4 + 2 + 4-6 + II	9-13	18-21	4 + 18-21
<i>leightoni</i>	2	4 + 2 + 5 + II	12	17	4 + 18-20
<i>namibensis</i>	2	4 + 2 + 4-5 + II	10	13	4 + 17-21
<i>jallae</i>	3	4 + 2 + 4 + II	9-11	14-16	4 + 18-22
<i>subtaeniatus</i>	11	4 + 2 + 5-7 + II	10-13	20-27	4 + 23-28
<i>orientalis</i>	6	4 + 2 + 4(5) + II	10-12	17-24	4 + 20-24
<i>leopardinus</i>	3*	4 + 2 + 4-5 + II	10-11	20-21	4 + 20-25
<i>brevirostris</i>	3*	4 + 2 + 3-4 + II	8-11	15-16	4 + 16-18
<i>mossambicus</i>	14*	4 + 2 + (2)3(4) + II	8-10	13-19	4 + 14- 17
<i>crucifer</i>	3	4 + 2 + 3-4 - II	8-10	12-17	4 + 17-19
<i>ansorgii</i>	0	No data available			
<i>angolensis</i>	2	3 + 2 + 3 + II	7	10	4 + 13

* Additional maxillary tooth counts included for 2 *P. notostictus*, 1 *P. subtaeniatus*, 3 *P. leopardinus*, 1 *P. brevirostris* & 5 *P. mossambicus* (Bogert, 1940 & pers. comm.).

namibensis may have ragged lateral stripes on rows 2 & 3 or 3 & 4.

Kark *et al.* (1997) investigated polymorphism in *P. schokari* in Israel and Sinai and found that the striped phase was found mainly in the northern, more mesic, parts of Israel, whereas the non-striped phase was mainly in the Negev and Sinai deserts. In southern Africa, the species inhabiting the Namib desert (*P. trigrammus*, *P. notostictus* and *P. namibensis*) are usually uniform grey or speckled, but on the other hand the uniform brown species *P. mossambicus* and *P. ansorgii* inhabit mesic regions.

8. Size (Table 1): Snout-vent lengths (SVL) were tabulated, because most large specimens have truncated tails. *Psammophis mossambicus* is by far the largest species, with about 20% of specimens exceeding one metre. The only other southern African species known to exceed 800 mm in snout-vent length are *P. trigrammus*, *P. namibensis*, *P. subtaeniatus*, *P. orientalis*, *P. leopardinus* and *P. brevirostris*. *Psammophis angolensis* is by far the smallest species.

9. Dentition (Table 2): The northern taxa seem to have the most maxillary teeth, a specimen of *P. aegyptius* (NMZB-UM 12392) has 5+2+7+II [+ = diastema, II = fangs] and in southern Africa *P. trigrammus* and *P. notostictus* (Bogert 1940, Fig. 15D) have 4+2+6+II and *P. subtaeniatus* 4+2+4 to 7+II (Bogert 1940, Fig. 15 F). The lowest counts are 4+2+3+II in most *P. mossambicus* (Bogert 1940, Fig. 15H) and 3+2+3+II in *P. angolensis*. Counts for other dentigerous bones show similar trends, except that *P. subtaeniatus* has the highest counts for pterygoid and dentary teeth.

SYSTEMATIC ACCOUNT

PSAMMOPHIS TRIGRAMMUS Günther WESTERN WHIP SNAKE

Psammophis trigrammus Günther 1865, Ann. Mag. nat. Hist. 15: 95, Pl. ii, Fig. E. Type locality: Rio São Nicolau, Mossamedes, Angola. Type: BMNH 1946.1.8.12.

Description.—(46 specimens examined). Nostril pierced between 3 nasals, the upper posteri-

or with a posterior prolongation; preoculars 2 (rarely 1; 3 on one side of TM 33060), the upper usually in point contact with frontal, sometimes well separated; postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 9, fifth & sixth entering orbit, rarely 8 (4 & 5), 10 (6 & 7) on one side of SMF 45662 and TM 2765; infralabials 10-11, the first 5 (rarely 4) in contact with anterior sublinguals; dorsal scales in 17-17-13 or 17-17-11 rows; ventrals 182-201; cloacal shield divided; subcaudals 132-156. Brandstätter (1995, Fig. 78, 79) has published SEM micrographs of a dorsal scale from NMZB 6017 from Khan River, Namibia.

Dorsum pale grey to grey-brown (sometimes reddish posteriorly), uniform, or with a dark

vertebral line posteriorly, or with a pair of pale dorsolateral stripes on scale rows 4 & 5. Ventrums yellow, uniform or with a dark grey median band.

Size.—Largest (NMWN/R. 1735 - Warmquelle, Namibia) 885 + 495 = 1380 mm.

Habitat.—Arid scrub.

Distribution.—Southwestern Angola and western Namibia, reaching its southern limit in the extreme north of the Richtersveld, South Africa (Bauer & Branch, in press; Fig. 1).

PSAMMOPHIS NOTOSTICTUS Peters
KAROO WHIP SNAKE

Psammophis moniliger var. *notostictus* Peters 1867, Mber. Akad. Wiss. Berl.: 237. Type locality: Otjimbingue [Namibia]. Syntypes: ZMB 5756 A/B.

Psammophis sibilans var. *stenocephalus* Bocage 1887, Journ. Sci. math. phys. nat. 11: 208. Type locality: "Interior of Mossamedes" [= Rio Coroca], Angola. Type destroyed in the Museu Bocage.

Description.—(237 specimens examined). Nostril pierced between 3 nasals, the upper posterior with a posterior prolongation; preoculars 2 (rarely 1), usually in contact with frontal; postoculars 2 (very rarely 3); temporals basically 2+2+3, but with frequent fusions; supralabials 8 (very rarely 7 or 9), the fourth & fifth (rarely third & fourth) entering orbit; infralabials 9-12 (usually 10), the first 4 (rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 155-183; cloacal shield entire; subcaudals 76-107. Brandstätter (1995, Fig. 54, 55) has published SEM micrographs of a dorsal scale from NMZB 5483 from the Eastern Cape Province.

Light grey to dark brown above, often paler laterally, uniform or with a pale stripe or series of spots on the vertebral scale row and a pale stripe on row 4, these stripes may be bordered by black flecks. The head shields may have

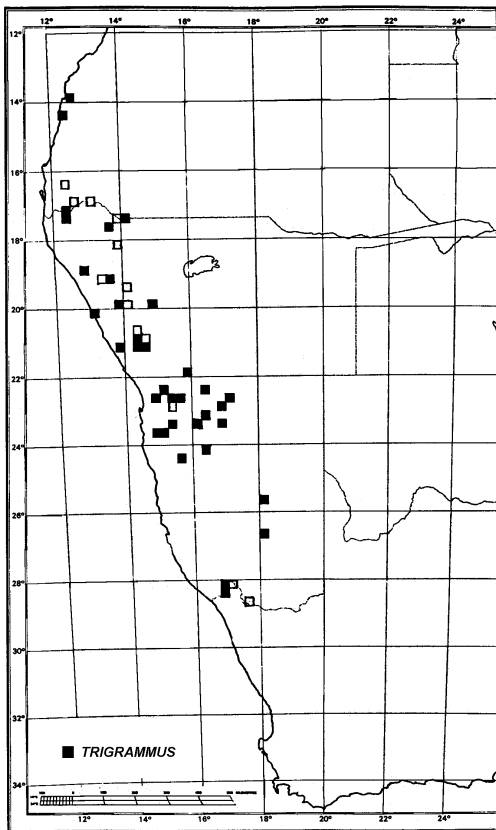


Figure 1. Distribution of *P. trigrammus*.

pale margins, with a pair of pale blotches on the parietals. A white ventrolateral stripe covers the lower half of the outer scale row and ends of the ventrals, extending forward onto the labials, pre- and post-oculars. Chin and throat white with grey or black spots and streaks. Venter yellowish, more or less infuscated with grey and with a grey line bordering the white ventrolateral stripe.

Size.—Largest (NMWN/R. 1695 - Neisip Farm, Namibia) 680 + 300+ = 980+ mm (tail truncated).

Habitat.—Karoo bushveld and Fynbos.

Distribution.—Southwestern Angola (Mossamedes Desert), south through Namibia to the

Cape Peninsula, eastwards through the Karoo to the Eastern Cape Province (Albany District), (Fig. 2).

PSAMMOPHIS TRINASALIS Werner
KALAHARI SAND SNAKE

Psammophis moniliger var. *furcatus* (not Bianconi)
Peters 1867, Mber. Akad. Wiss. Berl.: 236. Type locality: Otjimbingue [Namibia]. Syntypes: ZMB 5757 A/B.

Psammophis sibilans trinasalis Werner 1902, Verh. zool.-bot. Ges. Wien, 52: 340. Type locality: Windhoek [Namibia]. Lectotype ZFMK 30503.

Description.—(311 specimens examined). Nostril pierced between 3 nasals, upper posterior with a posterior prolongation; preocular 1 (rarely 2), in broad contact with frontal (very

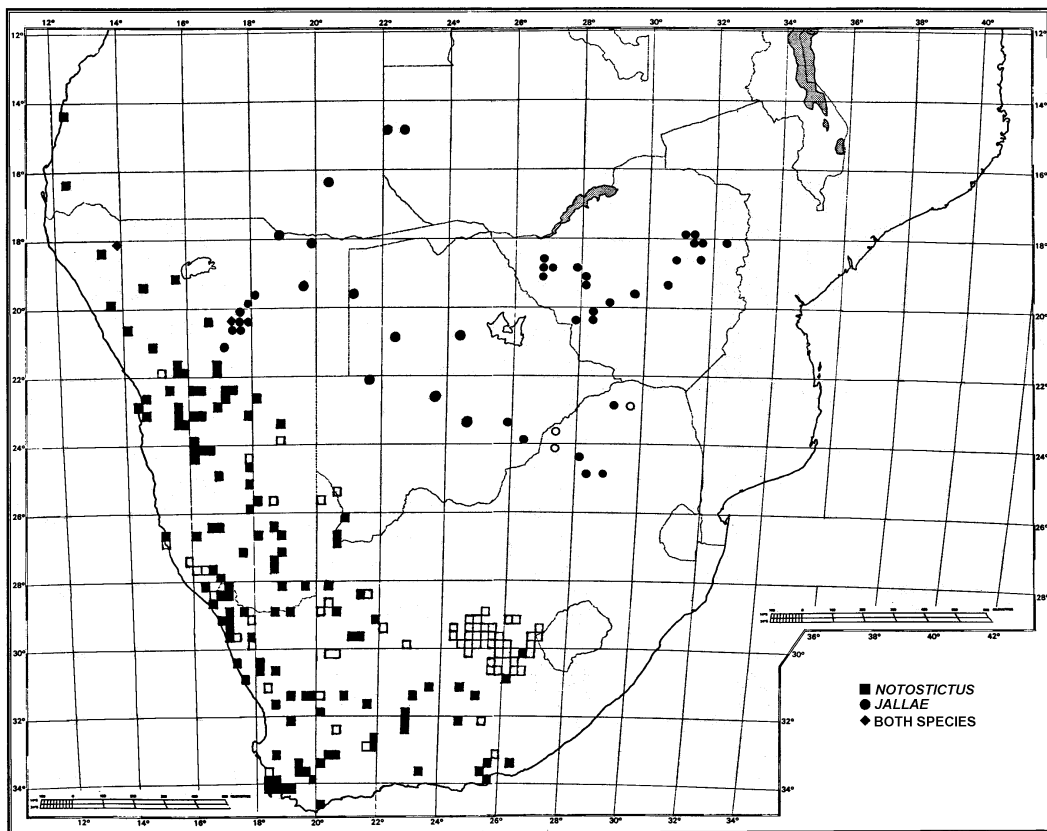


Figure 2. Distribution of *P. notostictus* and *P. jallae*.

rarely separated); postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 8 (very rarely 7 or 9), fourth & fifth (very rarely third & fourth or fifth & sixth) entering orbit; infralabials 10 (rarely 9 or 11), the first 4 (very rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 150-175; cloacal shield divided; subcaudals 84-128. Brandstätter (1995, Fig. 46, 47) has published SEM micrographs of a dorsal scale from NMZB 22482 from Botswana.

The lectotype has been illustrated by Van den Elzen (1980) and another Namibian specimen by Buys & Buys (1983, pl. 88). Brown above, a fine yellow vertebral line bifurcates just behind the parietals and a pair of yellow streaks extend forward over the parietals and supraoc-

ulars; a median yellow streak passes along the prefrontal/internasal sutures. A yellow dorso-lateral stripe covers scale row 4 and lower half of scale row 5, the upper half being black, this stripe extends forward across the temporal region to the postoculars. The flanks are paler than the back. The labials, lower half of outer dorsal scale row and ends of ventrals are white; there is a yellow median ventral band, this may be bordered by series of grey streaks and the chin and throat usually have a pattern of sparse grey or black blotches and streaks. Eastern specimens have a dark brown dorsum, whereas those from the arid western regions are light grey-brown above and many specimens from the Etosha National Park lack dorsal markings.

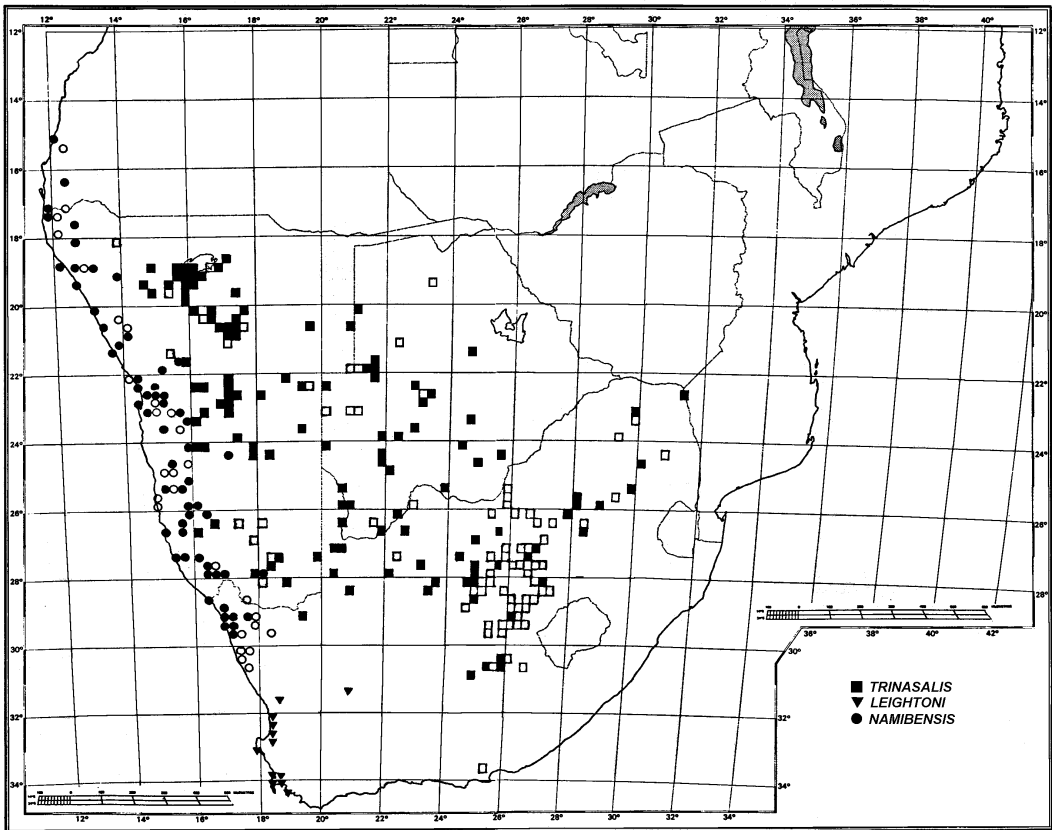


Figure 3. Distribution of the *P. leightoni* complex.

Size.—Largest (SMF 45665 - Okahandja, Namibia) 758 + 306+ = 1064+ mm (tail truncated).

Habitat.—Kalahari thornveld, marginal in mixed savannas and grassland.

Distribution.—Namibian plateau, Botswana and the northern provinces of South Africa, usually above 800 metres, reaching its eastern limit in the sandveld of the northern Kruger National Park (Fig. 3).

PSAMMOPHIS LEIGHTONI Boulenger
CAPE WHIP SNAKE

Psammophis leightoni Boulenger, 1902, Proc. zool. Soc. Lond. 1: 126, Pl. xii. Type locality: Eerste River Station [Western Cape Province, South

Africa], type BMNH 1946.1.8.27.

Description.—(24 specimens examined). Nostril pierced between 3 nasals, upper posterior with a posterior prolongation; preocular 1, in broad contact with frontal; postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 8, fourth & fifth entering orbit; infralabials 10 (rarely 9), the first 4 in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 155-169; cloacal shield divided; subcaudals 92-112. Brandstätter (1995, Fig. 45) has published a SEM micrograph of a dorsal scale from NMZB 3570 from the Cape Flats.

Dark brown above, top of head with a yellow stripe along the internasal/prefrontal sutures,

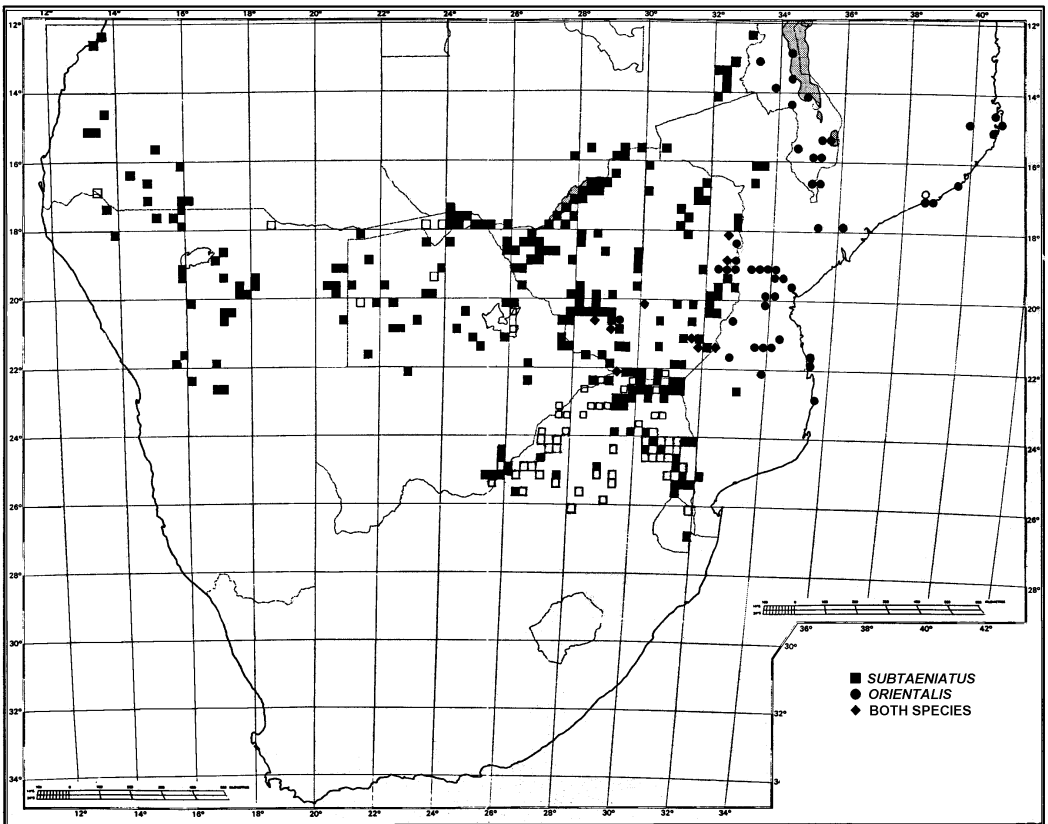


Figure 4. Distribution of the *P. subtaeniatus* complex.

most of supralabials, pre- and post-oculars yellow, two yellow bars across back of head. Vertebral scale row with a fine yellow line (often broken up), a yellow lateral stripe passes through scale rows 3 & 4 or fourth only, scales in outer row white at base (Broadley 1983, Fig. 84). The “chain pattern” on the side of the neck is illustrated by Boulenger (1902, pl. xii). Chin with a pattern of black streaks, ventrals with a mottled grey median band, widened at the free edge of each ventral and fading posteriorly.

Size.—Largest (PEM/R. 6368 - Berg River, Western Cape Province) 725 + 335 = 1060 mm, but PEM/R. 994 - Philadelphia has a snout-vent length of 740 mm.

Habitat.—West Coast Rhenosterveld and Sand Plain Fynbos.

Distribution.—Western Cape Province, South Africa (Fig. 3).

PSAMMOPHIS NAMIBENSIS Broadley
NAMIB SAND SNAKE

Psammophis leightoni namibensis Broadley 1975, *Arnoldia* Rhod. 7, No. 13: 9, Pl. 1. Type locality: Harus, Uri-Hauchab Mountains, Diamond Area No. 2, Namibia. Holotype: TM 37093.

Description.—(118 specimens examined). Nostril pierced between 3 nasals, the upper posterior with a posterior prolongation; preocular 1, in broad contact with frontal; postoculars 2; temporals basically 2+2+3, but with fre-

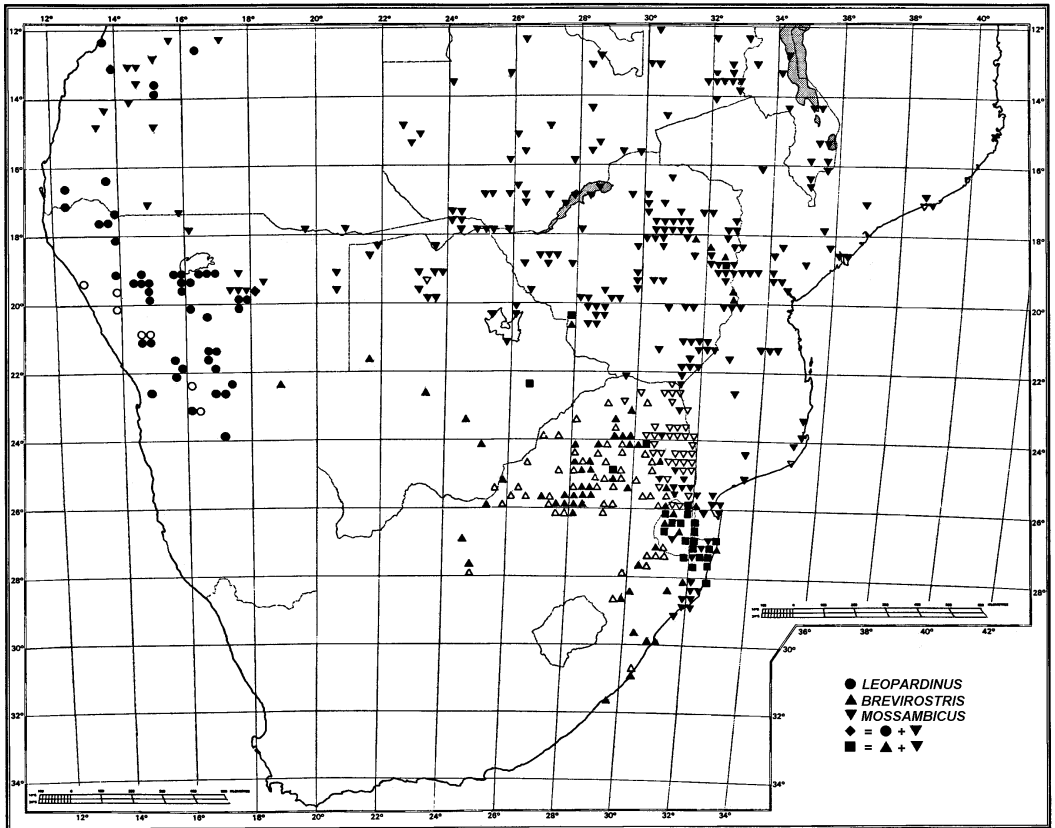


Figure 5. Distribution of *P. leopardinus*, *P. breviostris* and *P. mossambicus*.

quent fusions; supralabials 8, fourth & fifth entering orbit; infralabials 10 (rarely 9 or 11), the first 4 (rarely 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 167-188; cloacal shield divided; subcaudals 90-116. Brandstätter (1995, Fig. 48, 49) has published SEM micrographs of a dorsal scale from NMZB 22778 from Namibia, which differs considerably from those of other members of this group.

Colour pattern similar to that of *P. leightoni* in the south, but this breaks up into a black and yellow speckled pattern further north (Werner 1915, Pl. vii, Fig. 3, 3a [as *P. leightoni*]; Mertens 1955, Pl. 15, Fig. 69 [as *P. notostictus*]; Broadley 1983, Fig. 83).

Size.—Largest (MCZ 43425 - Namib Desert) 960 + 406 = 1366 mm.

Habitat.—The Namib Desert, and succulent Karoo in the south.

Distribution.—The Namib Desert and environs, from southwestern Angola south to Hondeklipbaai, usually below 1500 metres (Fig. 3).

PSAMMOPHIS JALLAE Peracca
JALLA'S SAND SNAKE

Psammophis jallae Peracca 1896, Boll. Musei Zool. Anat. comp. R. Univ. Torino 11 (255): 2, Figs. Type locality: Road from Kazangula to Bulawayo [Zimbabwe]. Syntypes MZUT R1633, 1871 (formerly 1823).

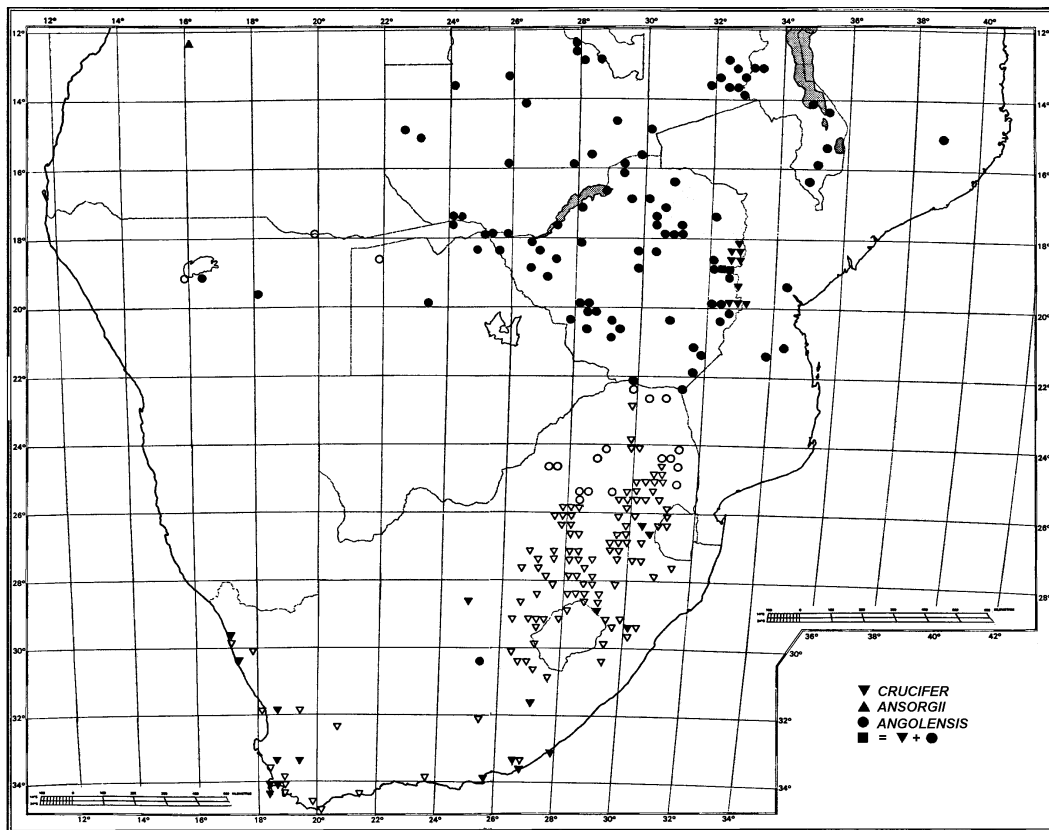


Figure 6. Distribution of *P. crucifer*, *P. ansorgii* and *P. angolensis*.

Psammophis Rohani Angel 1921, Bull. Soc. zool. Fr. 46: 116. Type locality: Lumuna River, tributary of the Luina and Kwando Rivers [southeast Angola]. Type: MNHN 20-198.

Psammophis longirostris FitzSimons V., 1932, Ann. Transv. Mus. 15: 38. Type locality: Gomodimo Pan [Botswana]. Type: TM 14716.

Description.—(108 specimens examined) Nostril pierced between 3 (rarely 2) nasals, upper posterior with a posterior prolongation; preocular 1, in broad contact with frontal; postoculars 2; temporals $\frac{1}{2}+3$, 2+2 or 2+3; supralabials 7 (rarely 6 or 8), third & fourth (rarely fourth & fifth) entering orbit; infralabials 9 (rarely 8 or 10), the first 4 (very rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 15-15-13 rows; ventrals 154-175; cloacal shield divided; subcaudals 84-112. Brandstätter (1995, Fig. 44) has published a SEM micrograph of a dorsal scale from NMZB 7531 from Zimbabwe.

Dark brown to light grey-brown above, uniform, or with the snout and supraoculars paler brown and a pair of pale dorsolateral stripes on scale rows 4 and 5, bordered with black above, there may be a vertebral series of pale spots at the base of each scale; lateral scales usually with pale red-brown to chestnut centres. Supralabials, outer scale row and ventrum white or yellow; anterior infralabials, sublinguals and gulars usually suffused with blue-grey mesially, forming a symmetrical pattern, this dark suffusion may extend onto the throat, which is often suffused with brick red mesially.

Size.—Largest (TM 33817 - Okanjindi Farm, Grootfontein, Namibia) 730 + 360 = 1090 mm, but TM 30896 from Dobe, Botswana, has a snout-vent length of 780 mm.

Remarks.—One natural hybrid between this species and *P. subtaeniatus* (TM 24392 Dete, Hwange District, Zimbabwe) has been recorded (Broadley 1977: 13).

Habitat.—Grasslands and open woodlands, especially on Kalahari sand, usually between 750 and 1500 metres in altitude.

Distribution.—Southeastern Angola, western Zambia, northeastern Namibia, Botswana, western and central Zimbabwe and the Northern Province of South Africa (Fig. 2). Brandstätter (1995 Map 8) shows the range extending too far north in Angola and Zambia.

PSAMMOPHIS SUBTAENIATUS Peters
WESTERN STRIPE-BELLIED SAND SNAKE

Psammophis moniliger var. *bilineatus* Peters 1867, Mber. Akad. Wiss. Berl.: 237. Type locality: Otjimbingue [Namibia]. Type ZMB 5758. [This name was suppressed in 1982 by Opinion 1210 of the I.C.Z.N.]

Psammophis sibilans var. *subtaeniata* Peters 1882, Reise nach Mossambique ... 3: 121 (part, lectotype ZMB 9992A from Tete, nominated by Broadley 1977: 13).

Psammophis bocagii Boulenger 1895, Proc. Zool. Soc. Lond.: 538. Type locality: "Angola" (later given as Benguela). Syntype: BMNH 67.7.23.22.

Psammophis transvaaliensis Gough 1908, Ann. Transv. Mus., 1: 31, Figs. Type locality: Louws Creek, Transvaal, South Africa. Type: TM 10117.

Description.—(595 specimens examined) Nostril pierced between 2 nasals; preocular 1 (very rarely 2), in short contact with or separated from frontal; postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 9, the fourth, fifth & sixth entering orbit, rarely 8 (4 & 5), 8 (3,4,5), 9 (5 & 6), 10 (5,6,7) or 10 (4,5,6,7); infralabials usually 10 (rarely 9 or 11), the first 4 (rarely 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 155-181; cloacal shield divided; subcaudals 106-132. Brandstätter (1995, Fig. 72, 73) has published SEM micrographs of a dorsal scale of NMZB 13164 from Hwange District, Zimbabwe.

Head brown above, uniform, or more often with largely transverse grey markings which may be present only posteriorly, continuing

onto the neck as a series of faint crossbars; supralabials, chin and throat white, yellow or vermilion, usually heavily speckled with black; 7 mid-dorsal scale rows brown, sometimes each scale bordered with black; a yellow or white dorsolateral stripe on scale rows 4 and 5 is black-edged above and below and followed by a chestnut to brown lateral band, the lower half of outer scale row (scale row 1) and ends of ventrals white, separated by a pair of black ventral hair lines from a yellow mid-ventral band.

A more or less uniform colour morph, with both dorsal and ventral stripes vestigial or completely absent, is not uncommon in the Middle Zambezi Valley, these specimens have previously been considered hybrids between *P. subtaeniatus* and *P. phillipsii* (Broadley 1977, 1983).

Size.—Largest (NMZB 3832 - Binga, Kariba Lake, Zimbabwe) 900 + 470 = 1370 mm.

Habitat.—Dry savannas, especially mopane and Acacia, at altitudes between 100 and 1500 metres, also common on rock outcrops. Very common in the Zambezi and Limpopo valleys and along their tributaries.

Distribution.—Southern Angola and northern Namibia, east through Botswana to southern Zambia, Zimbabwe, parts of western Mozambique, the northeastern provinces of South Africa and eastern Swaziland. Sympatric with *P. orientalis* in parts of southern Zimbabwe (Fig. 4).

PSAMMOPHIS ORIENTALIS Broadley
EASTERN STRIPE-BELLIED SAND SNAKE

Psammophis subtaeniatus orientalis Broadley 1977, Arnoldia Rhod. 8, No. 12: 17. Type locality: Morogoro, Tanzania. Holotype: MCZ 146965.

Description.—(139 specimens examined) Nostril pierced between 2 nasals; preocular 1

(very rarely 2), in short contact with or separated from frontal; postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 8 (rarely 7 or 9), the fourth & fifth (rarely third & fourth, fourth, fifth & sixth or fifth & sixth) entering orbit; infralabials usually 10 (rarely 9 or 11), the first 4 (rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 146-170; cloacal shield divided; subcaudals 91-118. Brandstätter (1995, Fig. 74, 75) has published SEM micrographs of a dorsal scale of NMZB 23336 from Mutare, Zimbabwe.

Dorsum dark brown, top of head uniform; each scale in vertebral row paler at base, an ill-defined pale dorsolateral stripe on scale row 4 and adjacent halves of rows 3 and 5; a dark stripe across rostral, anterior nasal and upper portions of supralabials 1-4; labials white speckled with black; lower half of outer scale row and ends of ventrals white, separated by a pair of well defined black ventral lines from a yellow mid-ventral band. Some large specimens from Bazaruto Island (NMZB 12029), Benguerua Island (NMZB 11378) and Pomene (NMZB-UM 28275-6) show progressive dark grey infuscation of the upper and lower labials, chin, throat and outer edges of the ventrals.

Size.—Largest (MCZ 51220 - Chitala River, Malawi) 820 + 400 = 1220 mm, but NMZB 11378 from Benguera Island, Mozambique, has a snout-vent length of 830 mm (tail truncated).

Remarks.—This form was originally assigned to *P. subtaeniatus sudanensis* (Loveridge 1940; Broadley 1966), but was later described from Morogoro, Tanzania, where it is sympatric with *P. sibilans*.

Habitat.—Dry savannas on the Mozambique plain, extending into the Limpopo basin below 1000 metres, where it is sometimes sympatric with *P. subtaeniatus* (Fig. 4).

Distribution.—East Africa from southern Kenya, south through Tanzania, Malawi, eastern Zimbabwe and Mozambique to the Bazaruto archipelago and adjacent mainland (Fig. 4). A small series from Pomene on the coast a little further south shows some divergence in the supralabial formula, with 9 (5,6) on four sides, 9 (4,5,6) on one and 8 (4,5) on one.

PSAMMOPHIS LEOPARDINUS Bocage
LEOPARD WHIP SNAKE

Psammophis sibilans var. *leopardinus* Bocage 1887, *Jorn. Sci. math. phys. nat.* (1) 11: 206. Lectotype MBL 1798 from Catumbela, Angola (Broadley 1977), destroyed by fire.

Description.—(140 specimens examined) Nostril pierced between 2 (rarely 3) nasals; preocular 1 usually separated from frontal; postoculars 2; temporals basically 2+2+3, but with frequent fusions; supralabials 8, fourth & fifth entering orbit; infralabials usually 10 (rarely 8, 9 or 11), the first 4 (rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 149-174; cloacal shield divided; subcaudals 79-108.

Dorsum light red-brown, grey-brown or olive, a pale black-edged median stripe extends from rostral to frontal, where it forks and passes down each side, another pale black-edged stripe extends from the rostral along the canthus rostralis to the upper postocular, where it meets a pale band which crosses the posterior end of the frontal and passes through the postoculars to the lip, two more pale bars cross the back of the head and there may be faint crossbands on the neck. The well developed head pattern of ZFMK 29476 from Omandumba West, Erongo, has been illustrated by Van den Elzen (1980, Fig. 4). The vertebral scale row usually has a pale median stripe, the scales being margined with black, a pair of pale dorsolateral stripes on scale rows 4 and 5, edged with black above; anteriorly the pale stripes are

linked by crossbands to form a chain-like pattern (Broadley 1977, Pl. ii; Buys & Buys 1983, Pl. 89), or the pale vertebral line may be suppressed to give a ladder-like dorsal pattern (Mertens 1955, Pl. 15, Fig. 68). Many specimens, particularly from Etosha National Park and environs, lack the typical *leopardinus* dorsal pattern and are uniform grey above, sometimes retaining head markings. The chin and throat may have grey blotches on each scale, forming a symmetrical pattern, there may be one or two pairs of lateral broken lines on the ventrals, sometimes with grey spots or streaks between them (patterns similar to those found in *P. schokari*).

Size.—Largest (AMNH 50613 - Lobito Bay, Angola) 985 + 423+ (tail truncated).

Habitat.—Dry savanna and semi-desert regions below 1500 metres.

Distribution.—Southwestern Angola and northwestern Namibia as far east as Grootfontein (Fig. 5). Brandstätter (1995, Map 5) errs in showing the range extending into southern Namibia. The populations from northern Zambia and adjacent Katanga, previously assigned to *P. brevirostris leopardinus*, have been described as a new species (Hughes & Wade, in press).

PSAMMOPHIS BREVIROSTRIS Peters
SHORT-SNOUDED WHIP SNAKE

Psammophis brevirostris Peters 1881, *Sber. Ges. naturf. Freunde Berl.*: 89. Type locality: Matlale Mission [near Pietersburg, Northern Province, South Africa]. Lectotype: ZMB 7256A.

Description.—(207 specimens examined) Nostril pierced between 2 nasals; preocular 1, usually widely separated from frontal; postoculars 2; temporals usually 1/2+3; supralabials 8 (very rarely 7 or 9), the fourth & fifth (rarely third & fourth, fourth only or fifth & sixth) entering orbit; infralabials usually 10 (rarely 9

or 11), the first 4 (rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 146-167; cloacal shield divided; subcaudals 79-108. Brandstätter (1995) has published SEM micrographs of dorsal scales of NMZB 11723 from Mutare, Zimbabwe (Fig. 37, 38), and ZSSB 6-7 from South Africa (Fig. 124).

Dorsum olive brown, vertebral scale row usually with a pale median line, seven mid-dorsal scale rows often black-edged, forming narrow black lines; pale or with traces of pale transverse bars posteriorly and often faint cross-bands on neck. Labials uniform yellow or white, sometimes with faint brown infuscation. Ventrums uniform white or with lateral series of black dots, a pair situated near the free edge of each ventral.

Size.—Largest (TM 5582 - Pretoria, Gauteng, South Africa) 780 + 360 = 1140 mm.

Remarks.—Brandstätter (1995) proposed the reinstatement of *P. brevirostris* as a full species, rather than a subspecies of *P. sibilans*, with *leopardinus* treated as a subspecies of it. It is now evident that the latter is also a good evolutionary species.

Habitat.—In South Africa this species occurs on the highveld up to 2000 metres, but descends to sea level in KwaZulu-Natal and the Transkei in association with coastal grasslands. In Zimbabwe it is found in grasslands along the main watershed between Harare and Mutare, and on the eastern highlands between 1500 and 1700 m (in true montane grassland it is replaced by *P. crucifer*). NMZB-UM 9703 from Empandeni Mission, near Plumtree, comes from dry savanna, like material from southeastern Botswana and the Northern Province of South Africa.

Distribution.—Widespread in the northeastern provinces of South Africa and in Swaziland,

with apparently relict populations in Zimbabwe, Botswana, and eastern Namibia at Gobabis (Fig. 5). In some areas of Zimbabwe and KwaZulu-Natal this species and *P. mossambicus* are sympatric and remain reproductively isolated, but there appears to be extensive hybridisation elsewhere in the latter province. Brandstätter (1995, Map 4) errs in showing a blanket distribution covering most of Botswana and northeastern Namibia; he also omits the relict populations in eastern Zimbabwe.

PSAMMOPHIS MOSSAMBICUS Peters
OLIVE WHIP SNAKE

Psammophis sibilans var. *mossambica* Peters 1882, Reise nach Mossambique...3: 122. Type locality: Mozambique Island. Lectotype: ZMB 2468A.

Psammophis sibilans var. *tettensis* Peters 1882, Reise nach Mossambique...3: 122. Type locality: Tete, Mozambique.

Psammophis thomasi Gough 1908, Ann. Transv. Mus. 1: 30, Fig. Type locality: Salisbury (Hunyani on label) [= Harare, Zimbabwe].

Description.—(760 specimens examined) Nostril pierced between 2 (rarely 3) nasals; preocular 1, usually widely separated from frontal; postoculars 2; temporals usually 1/2+3; supralabials 8 (very rarely 6, 7 or 9), the fourth & fifth (rarely third & fourth or fifth & sixth) entering orbit; infralabials usually 10 (rarely 9 or 11), the first 4 (very rarely 5) in contact with anterior sublinguals; dorsal scales in 17-17-13 rows; ventrals 150-180; cloacal shield divided; subcaudals 82-121.

Dorsum olive brown, often yellowish posteriorly, uniform, or with black-edged mid-dorsal scales forming black lines, or with irregularly scattered black scales on the neck. NMZB from Livingstone, Zambia, has 50% of the dorsal scales black and NMZB 13697 from the Haroni/Rusitu confluence on the Zimbabwe/Mozambique border has 90% of the dorsum black and about 60% of the ventrum. I encountered what appeared to be an all black *P.*

mossambicus on the road between Victoria Falls and Kazungula. Head uniform or with indications of a pattern like *P. subtaeniatus*, usually in chestnut. Each labial and sublingual is adorned with a dark spot with a pale centre. Ventrums yellow or white, uniform or with lateral rows of black spots or short streaks or irregular black speckling.

Size.—Largest (NMZB 16031 - Ndau School, Western Province, Zambia) 1260 + 500 = 1760 mm, but NMZB 3893 from Norton, Zimbabwe, has a snout-vent length of 1415 mm (tail truncated).

Remarks.—I have previously (Broadley 1977, 1983) assigned this species to *P. phillipsii* (Hallowell), but Brandstätter (1995) and Hughes (1999) consider *P. phillipsii*, a uniform olive form with an entire cloacal shield, to be restricted to West Africa, where it occupies forest clearings and moist savanna. Branch (1998) used the name *P. mossambicus* Peters: I selected a lectotype in Berlin and this name is certainly applicable to the big Olive Whip Snake, but the first available name for this species may actually be *P. irregularis* Fischer, 1856, based on a specimen from Peki in eastern Ghana with a divided cloacal shield, which has extensive black dorsal patches on the anterior third of the body, decreasing posteriorly.

Habitat.—Moist savannas and grasslands, especially riparian habitats, swamps, reedbeds and cultivated areas from sea level to 1500 metres.

Distribution.—Savannas of the central Sudan, south to Angola, northeastern Namibia, northern Botswana, Zimbabwe and the Northern, Mpumalanga and KwaZulu-Natal Provinces of South Africa and Swaziland (Fig. 5).

PSAMMOPHIS CRUCIFER (Daudin)
CROSSED WHIP SNAKE

Coluber crucifer Daudin 1803, Hist. Rept. Nat., 7: 189.

Type locality: "Indes orientales" [= South Africa].

Description.—(80 specimens examined) Nostril pierced between 2 nasals; preocular 1, widely separated from frontal; postoculars 2 (very rarely 3); temporals basically 2+2+3, but with frequent fusions; supralabials 8 (rarely 7 or 9), the fourth & fifth (rarely third & fourth or fifth & sixth) entering orbit; infralabials 9 (rarely 10), the first 4 (rarely 5) in contact with anterior sublinguals; dorsal scales in 15-15-13 rows; ventrals 134-165; cloacal shield divided; subcaudals 68-91. TM 22369, an aberrant female from the Nyanga highlands, Zimbabwe, has only 117 ventrals and 47 subcaudals.

Head grey, with a dark red-brown black-edged stripe extending from the snout, dividing on the frontal and again on the parietals, in each case enclosing a grey centre, continuing on the body as a black-bordered three scale wide dorsal stripe, this is separated by a thin white line from a grey dorsolateral stripe on scale rows 4, 5 and 6. A dark grey-brown lateral stripe covers scale rows 2 and 3 and the upper half of the outer row, the lower half being white. Pre- and post-oculars white, supralabials, chin and throat white, blotched or speckled with black. Ventrums orange with a broken black lateral line. South African specimens usually have one or two dark crossbars intersecting the vertebral stripe on the nape to form the "cross" from which the species derives its name, these crossbars are missing in specimens from Zimbabwe and KwaZulu-Natal. Some South African specimens are uniform grey above and pinkish white below.

Size.—Largest (CM 61108 - 5km SE of Amsterdam, Mpumalanga, South Africa) 510 + 147 = 657 mm.

Habitat.—Fynbos and grassland from sea level to montane grassland at 2300 m in South Africa, montane grassland in Zimbabwe.

Distribution.—Widespread in temperate regions of South Africa. A series of relict populations occur on the eastern highlands of Zimbabwe, extending onto the Mozambique sector of the Chimanimani Mountains (Fig. 6). Brandstätter (1995, Map 6) is at fault in showing a continuous distribution across the Limpopo basin.

PSAMMOPHIS ANSORGII Boulenger
ANSORGE'S WHIP SNAKE

Psammophis Ansongii Boulenger 1905, Ann. Mag. nat. Hist. (7) 16: 113, Pl. iv, Fig. 4. Type locality: Benguela to Bihe, Angola.

Description.—(Type examined, additional data from Hellmich 1957) Nostril pierced between 2 or 3 nasals; preocular 1, usually separated from frontal; postoculars 2; temporals usually 2+2+3; supralabials 7, the third & fourth entering orbit; infralabials 9, the first 4 in contact with anterior sublinguals; dorsal scales in 15-15-13 rows; ventrals 153-160; cloacal shield divided; subcaudals 70-78.

Dorsum uniform light grey-brown, pre- And post-oculars yellow, a black-edged yellow stripe on supralabials. Ventrums uniform yellowish-white.

Size.—Largest (Hellmich 1957 - Bela-Vista, Angola) 555 + 195 = 750 mm.

Habitat.—Montane grassland at 1800 metres.

Distribution.—Endemic to the central highlands of Angola, the only precise locality being Bela-Vista, Sanguenge at 12° 22' S: 16° 12' E (Fig. 6; Hellmich 1957).

PSAMMOPHIS ANGOLENSIS (Bocage)
DWARF WHIP SNAKE

Amphiophis angolensis Bocage 1872, Journ. Sci. math. phys. nat., 4: 82. Type locality: Dondo, Angola. Type destroyed in the Museu Bocage.

Ablebes Homeyeri Peters 1877, Mber. Akad. Wiss. Berl., 620. Type locality: Pungo Andongo, Angola.

Description.—(155 specimens examined) Nostril pierced between 2 nasals; preocular 1, usually widely separated from frontal; postoculars 2; temporals usually 1+2; supralabials 8 (rarely 6, 7 or 9), the fourth & fifth (rarely third & fourth, fourth only or fifth & sixth) entering orbit; infralabials 8 (rarely 7 or 9), the first 4 (rarely 3 or 5) in contact with anterior sublinguals; dorsal scales in 11-11-11 rows (9 in NMZB 1075 only); ventrals 133-157; cloacal shield divided; subcaudals 58-80. Brandstätter (1995, Fig. 34, 35) has published SEM micrographs of a dorsal scale from ZFMK 51261.

Head dark brown, three narrow yellow transverse bands posteriorly, supralabials white; neck dark brown with one or two grey crossbands which broaden laterally, a dark brown black-edged dorsal band three scales wide, greyish or yellowish laterally, sometimes with black hairlines through the outer two scale rows. Ventrums and lower half of outer scale row white or yellow, uniform or with an ill defined lateral series of dark flecks, sometimes a midventral pale orange band present.

Size.—Largest (NMZB-UM 16148 - Harare, Zimbabwe) 352 + 148 = 500 mm.

Habitat.—Widespread in savannas from sea level to 1500 metres.

Distribution.—Angola, east through the Katanga Province of the D.R.C., Zambia, and Malawi to Mozambique, north to Tanzania, with an apparently relict population in Ethiopia (Noble 1966), south through Zimbabwe to the northeastern provinces of South Africa (Fig. 6). Loveridge (1940) questioned the authenticity of BMNH 1909.9.3.6. from Philippolis in the Free State: I have examined the specimen and it has been illustrated by Noble (1966, Fig. 1).

- A KEY TO THE SPECIES OF *PSAMMOPHIS*
SOUTH OF LATITUDE 12° S
- 1a. Dorsal scales in 17 rows at midbody.....2
 - 1b. Dorsal scales in less than 17 rows at mid-body.....11
 - 2a. Supralabials 9, fifth & sixth entering orbit; 5 infralabials in contact with anterior sublinguals; ventrals 182-201; subcaudals 132-156.....*trigrammus*
 - 2b. Supralabials usually 8 or 9, fourth & fifth or fourth, fifth & sixth entering orbit; usually 4 infralabials in contact with anterior sublinguals; subcaudals less than 132.....3
 - 3a. Usually two preoculars; cloacal shield entire.....*notostictus*
 - 3b. Usually one preocular; cloacal shield usually divided.....4
 - 4a. Posterior nasal divided, upper portion with a long posterior extension; preocular in broad contact with frontal.....5
 - 4b. Posterior nasal usually entire, without a long posterior extension; preocular separated from frontal or in short contact7
 - 5a. Back of head with pale stripes, those across parietals fusing on nape to form a vertebral line; a stripe from upper postocular across temporal region continues as a dorsolateral stripe on scale rows 4 & 5, edged with black above; or dorsum uniform grey [Etosha region]; ventrals 150-175.....*trinasalis*
 - 5b. Back of head with pale transverse bars; a vague lateral chain pattern anteriorly may be replaced by a ragged pale lateral stripe on scale rows 3 & 4 or 2 & 3, or broken up into a black and yellow speckled pattern [*P. namibensis*].....6
 - 6a. Ventrals 155-169; range - Western Cape Province.....*leightoni*
 - 6b. Ventrals 167-188; range - Little Namaqualand, north through the Namib Desert to southwestern Angola.....*namibensis*
 - 7a. Ventrals with a pair of well defined black lateral lines, yellow between them and ends of ventrals white.....8
 - 7b. Ventrals without continuous black lines, a pair of grey lines may be present.....9
 - 8a. Supralabials usually 9, the fourth, fifth & sixth entering orbit; subcaudals 106-132.....*subtaeniatus*
 - 8b. Supralabials 8, fourth & fifth entering orbit; subcaudals 91-118.....*orientalis*
 - 9a. Dorsum olive to yellow-brown, uniform or with black-edged scales forming narrow black longitudinal lines, or with scattered black scales [rarely largely black]; ventrum yellow or white, uniform or with rows of black lateral spots or irregular black speckling; ventrals usually more than 164; build robust; maximum length about 1900 mm.....*mossambicus*
 - 9b. Dorsum olive brown to light grey with pale dorsolateral stripes, sometimes with a pale chain pattern anteriorly [dorsum may be uniform grey in northeast Namibia]; ventrum uniform white or with lines of grey flecks; ventrals usually less than 164; maximum length about 1100 mm.....10
 - 10a. Dorsum olive brown with a pair of pale dorsolateral stripes; ventrum white; range - east of Longitude 18° E.....*brevirostris*
 - 10b. Colour pattern variable or absent; a pale dorsal chain pattern usually changes posteriorly to paired dorsolateral stripes; pale transverse markings often present on back

- of head; chin and throat speckled and sometimes bands of grey flecking on ventrum; range - west of Longitude 18° E in southern Angola and northern Namibia...*leopardinus*
- 11a. Dorsal scales in 15 rows at midbody.....12
- 11b. Dorsal scales in 11 (very rarely 9) rows at midbody.....*angolensis*
- 12a. Posterior nasal usually divided, the upper portion with a distinct posterior extension; preocular in broad contact with frontal; subcaudals 84-112.....*jallae*
- 12b. Posterior nasal entire, without a distinct posterior extension; preocular separated from frontal or in short contact; subcaudals less than 84.....13
- 13a. Supralabials 8, fourth & fifth entering orbit.....*crucifer*
- 13b. Supralabials 7, third & fourth entering orbit.....*ansorgii*

DISCUSSION

One southern species, *P. trigrammus*, is a member of the Afro-Asian *P. schokari* group, including the north African species *aegyptius*, *schokari*, *punctulatus* and *elegans* (Broadley 1977). On the basis of immunological data, Cadle (1994) associated *P. biseriatus* with this group, but this form (and its sister species *P. tanganicus*) is more derived and shows convergence towards the more arboreal genus *Hemirhagerrhis* (Broadley & Hughes 2000). All members of this group inhabit arid regions, and *P. trigrammus* must have reached south-west Africa via the transient 'arid corridor' (Balinsky 1962).

The *P. notostictus* complex was probably also derived from the *schokari* group at an earlier time. *Psammophis notostictus*, *P. trinasalis*, *P.*

leightoni and *P. namibensis* differ in having reduced numbers of labials, ventrals and subcaudals. *Psammophis jallae*, with fewer dorsal scale rows and labials, appears more derived. Four species inhabit arid regions (especially the Namib Desert and Kalahari), but *P. leightoni* is restricted to the Fynbos.

The derived *P. sibilans* complex (Cadle 1994) apparently evolved in East Africa and occupies more mesic habitats than the previous two groups, while its members differ consistently in dorsal scale microstructure (Brandstätter, 1995). The basal species seems to be *P. subtaeniatus*, with high tooth counts on all dentigerous bones, high counts for supralabials, ventrals and subcaudals, and a striped pattern both dorsally and ventrally. *Psammophis orientalis* and *P. leopardinus* have reduced counts for teeth, supralabials, ventrals and subcaudals, while *P. brevirostris* continues this trend still further. The most derived form in the complex appears to be *P. mossambicus*, the largest species in the genus, which has fewer (but larger) teeth and completely lacks pale dorsolateral stripes.

Psammophis crucifer and *P. ansorgii* appear to be peripheral derivatives of the *P. sibilans* complex, *P. ansorgii* on the Angolan plateau and *P. crucifer* in the Cape lowlands, extending northwards onto the interior plateau regions of South Africa, with relict populations on the eastern highlands of Zimbabwe.

Brandstätter (1995) proposed revival of *Amphiophis* Bocage as a monotypic subgenus for the dwarfed species *P. angolensis*, with only 11 dorsal scale rows, but it may have affinities with *P. pulcher* of northeast Africa, the only species in the genus with 13 scale rows.

ACKNOWLEDGEMENTS

I am greatly indebted to Mathilda Awases for facilities granted at the National Museum of

Namibia in Windhoek and Mike Griffin for depositing there the long series of *Psammophis* specimens, which enabled me to sort out the taxonomy of the western forms. I am also grateful to the following curators and collection managers who facilitated examination of material in their care: R.L. Bezy (LACM), W.R. Branch (PEM), R.C. Drewes (CAS), D. Drinkow (SAM), A.G.C. Grandison (BMNH), J. Eiselt (NMW), F.L. Farquaharson (AM), J. Guibé (MNH), W.D. Haacke (TM), K. Klemmer (SMF), A. Kluge (UMMZ), C.J. McCoy, Jr. (CM), E.V. Malnate (ANSP), H. Marx & A. Resetar (FMNH), G. Peters & R. Günther (ZMB), J. Pringle (NMP), J. Rosado (MCZ), J. Sacarrão (MB), B. Wilson (MMK), G.R. Zug (USNM) and R.G. Zweifel (AMNH). Wulf Haacke also provided catalogue numbers of more recently accessioned material in the TM, in particular the long series collected in the former Transvaal Province by Niels Jacobsen and colleagues (Jacobsen 1989).

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Received: 15 November 2002;

Final acceptance: 20 November 2002.

APPENDIX

Material examined by the author, plus some material in the Transvaal and Port Elizabeth Museums identified by N.H.G. Jacobsen, W.D. Haacke or W.R. Branch.

PSAMMOPHIS TRIGRAMMUS: ANGOLA. Catara River TM 41231; Iona Reserve, 7 km to Oncóua TM 40753; Rio Coroca TM 40540; Rio San Nicolau BMNH 1946.1.8.12. NAMIBIA. Anachankirab Game Res. 3 TM 32108; Arandisberg NMWN 3934; Blässkranz TM 48418; Bloedkoppie, Namib Desert Park TM 50119; Boabab Cave NMWN 9292; Brandberg West Mine NMWN 2433; Büllsport, Maltahöhe NMWN 9566; Djab 26, Rehoboth NMWN 2430; Doros Crater TM 33059; Epupa Falls TM 47719; Fish/Orange River Confl. TM 35444; Gananub River, 4 km from Hoonib River TM 56906; Gobabeb TM 30461, 32590; Goedgenoeg TM 57692; Hamob NMWN 3409; Horebis Nord 61, Karibib TM 33653; Huab Lodge NMZB 16895; Humor Farm TM 52788; Khan River, nr Rössing Mine NMZB 6017; TM 51907; Karibib AM 8236; TM 20744; Keetmanshoop MVZ 65366; Kuiseb Canyon, Namib Desert Park TM 37161; Kwartel NMWN 9743; Mount Brukkaros USNM 84938; Nangola Flats, Kaokoveld TM 24302; Noordoewer 15 km N, TM 41898; Numas Gorge, Brandberg NMWN 3198; Ohopoho 2 km W, TM 47605; Okahandja SMF 45662-3; Okandukaseibe NMWN 1751; Otjiningua NMWN 1494; Overwinning, Namib Desert Park NMWN 4340; Palmwag 702 NMWN 5644; Purros NMWN 2765; Rössing Mine TM 52755; Ruacana Falls TM 38651; Sesfontein MCZ 38553; southeast Kaokoland TM 63148; Swakop River, Karibib NMWN 9469; Swartbooisdrift, Kunene River TM 42308, 46930; Torra Bay TM 33060; Tsissab Valley, Omaruru NMWN 2388, 2432; Twyfelfontein 534 TM 42219; Ugab River 35 km from coast NMWN 7089; Valencia 42, Rehoboth NMWN 2431; Warmquelle NMWN 1735; Windhoek NMWN 2389. SOUTH AFRICA. Annisfontein 13 km N, TM 42448; Kuboes PEM/R 9222; Oenna Mine 13km E CAS 201907; Sendelingsdrif, 13km E CAS 193603, & 23km ESE (Kouams River) CAS 193372.

PSAMMOPHIS NOTOSTICTUS: ANGOLA. Rio Coroca MBL -; Rio San Nicolau BMNH 64.7.11.2-3. NAMIBIA. Abbabis, Maltahöhe NMWN 1729,

8236, 9509; Ariamsvlei 16 km W, Warmbad TM 37387; Aurusberg, Diamond Area 1 PEM 7448; TM 45055-6, 50120; Berseba USNM 84892; Büllsport NMWN 9550; Damaraland SAM 14074, 14085, 14088; Damaraland Coast SAM 447; Daweb-Süd ZFMK 29482; De Waal TM 28152, 32584, 34627; Elizabeth Bay TM 53186; Erongo Mtn BMNH 1937.12.3.165; MCZ 43426; Esselen 5 TM 76505, 76527; Felseneck 124, Maltahöhe NMWN 1686(2), 6745; Fish River Canyon TM 28278; Fish River Mouth TM 35436; Frauenstein ZFMK 22056, 29483; Gamis NMWN 9757; Garies FMNH 206364; Gibeon FMNH 71872; SAM 17129; Gobabis, west of NMWN 5703; Gobabis 120 km S, TM 28143; Gorob Mine, Namib Desert Park LACM 127500; Great Karas Mts MCZ 21313; PEM 998; Greylingshof 107, Windhoek NMWN 4320; Grundorn, Klein Karas Mts TM 5501; Grundorn to Wasserfall, Gt. Karas Mts TM 5500; Haruchas TM 39703, 28386; Heioub Mtn, southern Spergebied PEM 7515, 7527; Helmeringhausen 50 km S, TM 28386; Hoffnung BMNH 1936.8.1.720; Kalkfontein South SAM 16152, 17026; Kaokoveld AMNH 73857; Karibib 10 km W, NMZB 9306; Keetmanshoop SAM 17307; TM 5507; USNM 84903; Keima NMWN 9227; Kiries West SAM 17570; Kleinspitzkoppe TM 52153; Klinghardsberge, Diamond Area 1 TM 45569; Kochena 74 NMWN 1593; Leybank 172, Keetmanshoop TM 47600; Lüderitz AMNH 50527; NMWN 1595, 1730; TM 28306, 55450-1, 71252; Maltahöhe BMNH 1936.8.1.721; Mittag, 50 km N of Orangemund TM 27886; Mount Brukkaros USNM 84932-7; Namib Desert Park MCZ 43424; NDRS 117; NMWN 3275; Namuskluft 88, Lüderitz NMWN 2434; Narudas Süd BMNH 1914.2.28.20; MCZ 14219; TM 5503; Naukluft NMWN 1694; Neisip 34 NMWN 1695; Nordenburg 76, Karibib NMWN 2725, 6746; Ohopoho NMWN 1728; Okahandja FMNH 64485-6, 65867; SAM 19817; Okojombo 72 km E, NMWN 2663; Omongongua ZFMK 23085-6; Otjimbingue ZMB 5756(2); Otjivasandu, Etosha NMWN 9728; Otjiwarongo SAM 15713; NMWN 1692; Rooibank 20 km SE, Walvis Bay HF 12; Rosh Pinah Mine TM 44601; Sandmund, Gt. Karas Mts TM 5498; Schadeck, Mariental TM 33656; Scheidhof 293, Windhoek NMWN 1829; Signalberg in Auros Mts TM 27749; Southern Kaokoveld FMNH 75064; Sprokiewoud, Etosha NMWN 9609; Swakopmund TM 33502-3; Tantus 30, Rehoboth NMWN 2410; Twyfelfontein,

Outjo NMWN 1691; Uis NMWN 1689; Urub107, Gibeon TM 49787; Usakos TM 25802; Valencia, Rehoboth TM 25022, 36076, 37984; Walvis Bay SAM 19897; Wilhelmstal 47 km S, Karibib LACM 77657-9; Windhoek NMWN 1687-8,1690, 8257; Witputs Farm, Lüderitz TM 39465; Zebra Pan 15km NE, Namib Desert Park NDRS 40. BOTSWANA. Bokspits NMZB-UM 15488. SOUTH AFRICA. No locality BMNH 1930.12.3.18-9; Aberdeen, E. Cape PEM 4430; Andries Vosloo Kudu Res., Fort Brown PEM 9352, 11375, 13680; Anniesfontein 10 km SW, Richtersveld TM 27799, 34090-1; Anysberg Nat. Reserve PEM 5087, 7160, 13723; Aughrabies Falls Nat. Park TM 54693, 56226; Barrydale, 5 km E, PEM 7093; Beaufort West to Nelspoort SAM 1003; Bergkwagga Nat. Park TM 52070; Bitterfontein, Van Rhynsdorp TM 54047, 54154; Bloeddrif, 15 km NW of Anniesfontein, Richtersveld TM 27806; Bosluispoort PEM 8785; Bosrug Forestry Stn, Baviaanskloof PEM 11378; Brandvlei 27 km N, Calvinia TM 51360; Brandvlei 72 km N, Kenhardt TM 82668; Britstown PEM 11372; Brown's Pass, Richtersveld Nat. Park PEM 12422; Burghersdorp SAM 1692, 10365, 11145; Calvinia 6 km E, CM 67255; Cape Division SAM 8072; Cape Town PEM 1013; SAM 1753; Ceres SAM 1256; Cliffs, Port Nolloth NMZB-UM 6390; Clifton SAM 43353; Constantia Nek FMNH 187144; Cradock PEM 3837; Dabenoris SAM 3513; De Doorns SAM 7695, 9500; De Hoek Farm, N. Cape PEM 11221; De Hoop, Bredasdorp NMZB 3435; De Wet TM 19593; NMZB-UM 17512; Deelfontein BMNH 1903.4.27.58; Doornkloof Nature Res. PEM 7744; Doornpoort to Geligwerkberg, Richtersveld TM 24195; Driehoeksfontein MVZ 69419; Drocboom 72, Kenhardt TM 56160; Dunbrody NMPSR 5483-4; Edgemead, Melkbosstrand TM 54025; Faure Station SAM 3935; Fort Brown PEM 3725, 3905; Frazerburg 80 km S, NMZB-UM 10996; Gamka Mountain Nat. Res. PEM 8716; Gamka Poort Nature Res. at Dwyka PEM 7332; Garies MVZ 65367; Glenconnor, E. Cape PEM 999; Gletwyn cottage, nr Groothoogberg PEM 1763; Goedverwachting, Williston TM 36228; Gouritz River, W. Cape PEM 4297; Graaf-Reinet AM 579; PEM 1002, 1005; Grahamstown MCZ 21343; PEM 11368; SAM 3177; Grassridge Dam Farm, 53 km SE of Middelburg PEM 11369; Hanover SAM 5050, 5267, 6039-40; Helskloof, Richtersveld Nat. Park PEM 7320-1; TM 42449; Hingae, Baviaanskloof PEM 9341; Hondeklip Bay SAM 1790; Houwhoek SAM 4665; Janfrederickskolk 705, Calvinia TM 6013; Joubertskop Farm, E of Anyberg Nat. Res. PEM 7159; Kalahari Gemsbok Nat. Park TM 44827; Kalkfontein 5 km N, Richtersveld TM 27917; Kakamas TM 15897; Kammanansie Nature Res. PEM 13496; Kannikwavlakte, 20 km E of Port Nolloth TM 54045; Karoo SAM 1604; Karoo National Park PEM 4365-6; Karoo Nature Res. PEM 7717, 7729-30; Karos, Gordononia TM 50340; Keikamspoor 71, Prieska TM 49909; Kenhardt 45 km SSW, CM 67271; Klaver TM 5505, 5509; Kleinsee TM 56401-2, 69148, 78776; SAM 18541; Kliprand 5 km E, Vanrhynsdorp TM 35145; Kouga Range PEM 3676, 13702; Kraanvoël Pan, 5 km SE, Kenhardt TM 27621; Kuboos, Richtersveld SAM 11338; TM 15891; KwaNcunca River, Glenmore PEM 11129; Laingsburg to Beaufort West NMZB-UM 10999; Langhoogte, near Kleinsee TM 62883, 80284; Leeugamka 29 km N, Merweville PEM 7673; Lekkering, Richtersveld SAM 18542; TM 27913; Leliehof Farm, Calitzdorp PEM 8625; Lions Head, Cape Town BMNH 88.2.29.2; Llandudno SAM 43204; Lutzputs to Nakop NMZB-UM 10909; Marydale, Prieska TM 54433; Matjesfontein SAM 13973; TM 19542; Matjesfontein to Touws River NMZB-UM 17511; Menz Lake PEM 11516; Middelburg SAM 2572, 2574, 43203; Middeldrift PEM 4194; Middelpoort 5 km SE, TM 35117; Molopo River SAM 17367; Mooresburg NMZBUM 5238; Namaqualand AM 755; NMZB 1109; SAM 756, 762, 764, 3160; Mountain Zebra Nat. Park PEM 3112; Narap Farm, Namaqualand TM 50326; Naroop, Namaqualand SAM 2808; Nieuwoudville, Calvinia SAM 3091; TM 54030, 54052; Nossob Camp, Kalahari Gemsbok Nat. Park TM 26093, 54683-4; New Brighton PEM 1006; Ograbis SAM 9157-9; O'Okiep TM 42371; Oviston Nature Reserve PEM 5090; Oviston Research Stn PEM 11374; Packhuis Berg, Clanwilliam SAM 2371, 2866-7, 3060; Paradyskloof, Richtersveld Nat. Park PEM 12418; Pearston PEM 13794; Ploegberg, Richtersveld Nat. Park PEM 9234; Pluto's Valley, 15 km NE of Grahamstown PEM 11376; Port Elizabeth PEM 1007, 1009; USNM 63572; Port Nolloth, Namaqualand TM 18032, 27710, 57084; Prince Albert PEM 10, 1008; Prince Albert Road TM 41609; Putsonderwater TM 25134; Puttersvlei, Karoo Nat. Park PEM 4915; Quaggasfontein Farm, 15km N of Fraserburg TM 36208; Richtersveld PEM 1004; Robertson SAM 4965; Rooiberg Valley,

Richtersveld TM 49580; Rooilepel-Orange River PEM 1905; Salem, Grahamstown PEM 11377; Salt River Vlei Farm, Beaufort West NMZB-UM 10998, 11003; Sam Knott Nature Res. PEM 6483; Sir Lowrys Pass AM 4675; Smithfield SAM 11073; Sneeberg 20 km N, PEM 4290; Springbok TM 25169; Springbok 10 km E, TM 57586; Steytlerville PEM 6499; Stinkfontein 25km E, Richtersveld TM 34190; Strathern Farm, Bloemfontein TM 55990; Summerstrand PEM 1011; Suurberg TM 57318; Table Farm, 12 km NW of Grahamstown PEM 11370; Table Mountain SAM 5277, USNM 165079; Touwsfontein PEM 13469; Touwsrivier SAM 1610, 8641, 8643; Twee Rivieren, Kalahari Gemsbok Nat. Park TM 33606; Tweefontein 101, Sutherland TM 80285; Uitenhage NMZB-UM 11000; SAM 14002; Uniondale SAM 17642; Upington NE of, SAM 15698; Vane's Estate PEM 6438; Venterstad PEM 11371, 11373; Victoria West BMNH 1910.8.5.5; CAS 115892; TM 55542; Vlakteplaas, Oudtschoorn PEM 1000, 1003, 1012; Vondeling, Clanwilliam PEM 1010; Wagenaar's Kraal, Victoria West SAM 2633; Welgemoed, Bellville NMZB-UM 10994-5; Western Province SAM 2370; Willowmore 25 km NW PEM 11367; Wolfhok 5 km E of, Namaqualand TM 35181; Worcester TM 37189.

PSAMMOPHIS TRINASALIS: NAMIBIA. No locality FMNH 64686; Aminuis SAM 18653-4; Anderson Gate 2 km S, NMWN 9622; Aus NMZB 1108; Binsenheim SMF 45665; Brakwater 48, Windhoek NMWN 1673; Bullspoot, Naukluft TM 28263; Chuosib SMF 20080; NMWN 1674; Colorado Oost TM 67269; Damaraland SAM 14090; Davignab ZFMK 29479; Dei Gratia 389 NMWN 7891-2, 7903; Driekameelbaum 118, Warmbad TM 44111; Eava 383 NMWN 1667; Erongo Plateau MCZ 43423; Etosha Nat Park NMWN 7952, 8164, 9393, 9401, 9464, 9466; Florida, Keetmanshoop TM 56620; Geluksputs, Otjiwarongo NMWN 1675; Gemsbokvlakte, Etosha Nat. Park NMWN 9632-3; Gobabis 56 km E, TM 28136; Grootfontein - Omatako Canal NMWN 4912-4; Halali to Namutoni TM 45752; Hamakari 285 NMWN 7760; Hazeldene 237 NMWN 1681; Hereroland NMWN 6767; Hlau Plains, Etosha Nat. Park NMWN 9631; Kalkfontein (South) SAM 16132, 16142; Kalkrand, 30 km N, NMWN 1734; Kamanjab NMWN 1676, 1679; Kaokoveld, E border to S border of Etosha Pan FMNH 77617; Karasburg 65 km NW, ZFMK 29478; Keetmanhoop 20 km N, TM 50640; Klein Hamakari 286 NMWN 7900, 7890, 7909; Klein Kasasberg NMWN 9576; Leeubron, Etosha Nat. Park NMZB 16896; NMWN 9555, 9732; Louwshoop, Warmbad TM 51357; Namutoni TM 5506; Namutoni 30 km W, NMWN 9621; Neisip 34 NMWN 1733; Neudam, Windhoek NMWN 1664, 1669; Nuruchas PEM 10556; Okahandja MCZ 21013; SMF 20081, 45554-5; NMWN 1668; Okakarara NMWN 6561, 9719; Okambahe, Omaruru TM 50924; Okambokonde West (ENWC) NMWN 7889, 7893, 7896, 7899, 9756; Okamiparara 335 (ENWC) NMWN 8133; Okamumbonde 332 (ENWC) NMWN 8138; Okandjindi 970 (ENWC) NMWN 8111, 8127; Okakarara NMWN 6873; Okaukuejo NMWN 9370, 9517, 9539, 9551, 9578, 9604, 9609, 9667, 9598, 9723, 9729, 9742, 9754; Okaukuejo 80 km S, NMWN 9612; Okondeka NMWN 9487; Okosongomingo, Waterberg TM 16929; Okouli, Etosha Nat. Park NMWN 9535; Okuzauna 370 (ENWC) NMWN 7898; Olifantsbad, Etosha Nat. Park NMWN 9618; Olifantsrus, Etosha Nat Park NMWN 7719; Omatako NMWN 7501; Omatjenne TM 16175; Ombika, Etosha Nat. Park NMWN 9579, 9603; Ondiri 379 (ENWC) NMWN 7897, 9755; Onguma, Etosha Pan BMNH 1937.1.2.30; Opuwo TM 69274; Osterode, S of Stampriet TM 30500; Otavi TM 31325; Otjimbingue SMF 45666; ZMB 5757; Otjiwarongo NMWN 1666, 1670, 1693; Otjiwarongo 31 km S, NMWN 9611; Otjosongombe ZFMK 23084; Penwood 385 (ENWC) NMWN 7894, 7905; Plass 339 NMWN 5609; Rehoboth to Windhoek NMZB-UM 10908; Rietfontein 867, Gobabis TM 41410; Rietfontein 2 km SW, Etosha Nat. Park NMWN 9635; Rooiboklaagte NMWN 6791-2; Rosh Pinah TM 42329; Seeheim Wes TM 53220; Sprokieswoud, Etosha Nat. Park NMWN 8165, 9605, 9714; Swakop River, 47 km S of Wilhelmstal LACM 77660-1; Tashoni Inn, 45 km S of Ombika Gate NMWN 9564; Teufelsbach FMNH 81625; Twilight, Mariental NMWN 1531, 1680; Valencia Farm, Hakos Mts TM 25023; Wagnog 384 (ENWC) NMWN 7895, 7906; Wasserfal, Great Karas Mts TM 5502; Waterberg Section ENWC NMWN 7565; Windhoek NMW 19104, 23455; NMWN 1665, 1671-2, 1677-8, 1736, 8242, 8245, 8271; ZFMK 30503; Windhoek 110 km E, LACM 77463; Windhoek to Okahandja NMZB-UM 10914; Windpoort Farm, Outjo NMWN 9513; Zais - Naukluft (6), Maltahohe NMWN 4331.

BOTSWANA. Gemsbok to Sunnyside

- FMNH17690; Ghanzi BMNH 1933.9.9.55-6; NMZB-UM 11333; Ghanzi 40 km W, USNM 163399; Ghanzi 55 km S, USNM 163400-2; Jwaneng NMZB 7831; Kana 49 km E, TM 52133; Kang NMZB-UM 11334-5; USNM 160839-42; Kangyane Pan NMZB-UM 16190; Kgaotwe Pan FMNH 17691-3; TM 14714-5; Khuis NMZB-UM 13175-84, 15611-3, 15712-5, 15810-1; USNM 192947-50, 164359-60; Khutse Pan TM 14713; Kokong, nr Lehututu BMNH 1910.5.30.57-8; Konkwe Pan TM 45925; Lake Xau NMZB 278; Lekuru Pan NMZB-UM 22482; Maboane 15 km W, USNM 160844; Mabuasehube Pan 22 km N, NMZB-UM 22642-4; Mamuno NMZB-UM 11336, 14100; USNM 160843; Molepolole NMZB 8747; Moremi Game Res. TM 66665; Nguia, 24 km SE of KaiKai TM 26922; Otshwe Pan TM 45887-90; Tierputs, 64 km SW of Ghanzi TM 27042; Tsabong 11 km S, LACM 84188-93; Tshane 40 km S, NMZB-UM 22317-8; Tshane 55 km S, NMZB-UM 22397-402; Tshane 190 km W, TM 27115; Twee Riveren 10 km NE, LACM 84184-7; Vloorskop (Nossob River) NMZB-UM 13162, 15253; Werda 50 km E, NMZB-UM 20812; Xade Pan 25 km E, NMZB-UM 12946; USNM 163403-4; Xade Pan 25 km W, NMZB-UM 11315. SOUTH AFRICA. No locality BMNH 1930.12.3.15-17; MCZ 44094; Abe Bailey Nature Res., Thabazimbi TM 62170; Aliwal North to Burgersdorp TM 78782; Allanridge, Odendaarus TM 54432; Amsterdam 116, Soutpansberg TM 43851; Andalusia PEM 983; Angra Pequena Farm, Bothville TM 5511, 5518; Aurora PEM 6384; Balmoral BMNH 1907.7.22.2; Bandolierkop TM 5516; Barberspan Nature Res. TM 37634, 62179; Berg River PEM 6368; Bloemfontein NMBO 20, 53-4; Bloemhof TM 13351; Boschrand, Wolmaransstad TM 62169, 62171; Bultfontein, Marico TM 62181; Cape Colony BMNH 1910.8.5.9; Cape Flats AM 7579; MCZ 159174; NMZB 3570; Cape of Good Hope MNHN 6546; Cape Peninsula FMNH 205819; Colesburg to Hanover NMZB-UM 11004; Danielskuil AMNH 31663; Daspoort TM 5513; Deelfontein, Bethulie NMBO 19; Delftzyl, Potgietersrus TM 82436; De Putten, Marico TM 62173-4; Dinokana 4 km W, TM 62186; Doornkop, nr Belfast AM 1577; Durban BMNH 62.8.28.32; Eerste River BMNH 1946.1.8.27; Elandsbaai NMZB-UM 28135; PEM 6369; Fourteen Streams TM 13344; Gordononia NW MCZ 21342; Houtheeldoorns, Lichtenburg TM 62185; Houtkop, Lichtenburg TM 62180; Inkbosch Pan, Gordononia TM 37848; Irene, Pretoria TM 36515; Kameelsleep, Kalahari Gemsbok Nat. Park LACM 84178-80; Kareefontein, Bloemhof TM 62175; Keyterskloof, Suikerbosrand TM 30158; Kimberley AM 1188, 1225; PEM 968; TM 5514, 5517; Klipfontein, Waterberg TM 62114; Kliprivier, Soutpansberg TM 62113; Koopan North, Gordononia KNP. X; Krugersdorp CM 59032; Kuruman River, 7 km SE of Aansluit LACM 84183; Lamberts Bay NMZB 12132; PEM 6367; Leeudril, Kalahari Gemsbok Nat. Park TM 37744; Little Namaqualand BMNH 1910.8.5.6-7; Magersfontein, Kimberley TM 58000, 67806; Matjesspruit, Klerksdorp TM 62172; Matlebes, Lichtenburg TM 62182; Moilwas, Marico TM 62183; Molopo Nature Res., Vryburg TM 81722-3, 82538-40, 82547, 82679; Noeniput 45 km S, AMNH 116314; Nossop Camp TM 33424, 54685; Nyandu, Kruger Nat. Park KNP 164; Ottery, Cape Flats NMZB-UM 10991-2; Oviston Nature Res. PEM 7041, 8699, 10940; Philadelphia PEM 994; Pofadder CM 69233; Postmasburg TM 56237; Pretoria MCZ 21246; NMZB 2764; TM 5510, 5515, 12627; 36515, 37888; Prospect, Christiana TM 62168; Saldanha Bay FMNH 217409; Sekukuni Mts, Lydenburg BMNH 1908.5.20.10; Sekwats, Kalahari Gemsbok Nat. Park TM 68056; Sishen CM 69234; Somerset West TM 68129; Syfergat, Wolmeranstad TM 62167, 62178; Taung BMNH 98.2.4.5; Tweepad Farm N of Kleinsee, Namaqualand TM 69950; Twee Riveren, Kalahari Gemsbok National Park TM 32757; Uitenhage SAM 13954; Uitkijk, Barkly West AMNH 31664; Upington to Lutzputs NMZB-UM 10911; Upington 75 km NE, LACM 84181; Vanrhynsdorp SAM 2409; Ventersdorp TM 50975; Verwoed Dam Wall 10 km W, TM 37985; Viljoenskroon NMZB-UM 12457; Vryburg to Kuruman NMZB-UM 10912; Vuurfontein, Bloemhof TM 62177; Warrendale, Griqualand West AMNH 31601-2; Welkom TM 50331; Willem Pretorius Res. TM 27270; Williston AM 2510; Witkoms 20 km SE, LACM 84182; Zaailand, Pietersburg TM 62184; Zandbult, Waterberg TM 62112; Zwartkop, Pretoria TM 62176. LESOTHO. No locality BMNH 1920.1.20.284.
- PSAMMOPHIS LEIGHTONI*: SOUTH AFRICA. No locality BMNH 1930.12.3.15-17; NMW 19103 ("Egypt"); Aurora PEM 6384; Berg River PEM 6368; Cape Colony BMNH 1910.8.5.9; Cape Flats AM 7579; MCZ 159174; NMZB 3570; Cape of

Good Hope MNHN 6546; Cape Peninsula FMNH 205819; Cape Town AM -; Eerste Rivier BMNH 1946.1.8.27 (type); Elandsbaai NMZB-UM 28135; PEM 6369; Lamberts Bay NMZB 21232; PEM 6367; Ottery, Cape Flats NMZB-UM 10991-2; Philadelphia PEM 994; Saldanha Bay FMNH 217409; Somerset West TM 68129; Vanrhynsdorp SAM 2409; near Williston AM 2510.

PSAMMOPHIS NAMIBENSIS: ANGOLA. Cunene Forde 15km NE, Iona Res. TM 40708; Foz do Cunene TM 39933; Mossamedes MBL 1809; Pico de Acevedo TM 41078; Rio Coroca MBL 1810. NAMIBIA. No locality NMWN 9214; Agate Beach, Lüderitz NMWN 1684; Amicha Mtn Game Reserve TM 32125; Anachankirab 15km SW, TM 32101; Arandis NMWN 3868, 4066; Aurusberg NMWN 9721; Atlantic Coast FMNH 80074-5; Aurus to Klinghardtberge TM 27770; Awasib Mtn, Diamond Area 2 TM 53274, 53372; Awasib to Guinassib Mts, Diamond Area 2 TM 50079; Bloedkoppie, Namib Nat. Park NMWN 1512; Bogenfels TM 22077; west of Klinghardtberge, Diamond Area 1 TM 50540; Cape Fria NMWN/CR 3993; Cunene River Mouth 3 km E, NMWN 7878; Daberas in Holgat River TM 33788; Diamond area 1, 82 km S B4 NMWN 7138; Diamond area, borehole 3, Luderitz NMWN 6888; Erongo Mountain BMNH 1937.12.3.164; Estcourt 402, Rehoboth NMWN 1682; Gaias NMWN 8237; Ganab 15km from, Namib Desert Nat. Park NMWN 4368; Giribes, Kaokoland NMWN 7710; Gobabeb, Namib Desert Nat. Park NDRS 116; NMWN 1683; TM 25018-9, 30459, 31207, 37182, 50118; Granau 15 km W, PEM 1906; Grieserau, Swakopmund TM 53545; Hauchab 5 km E, TM 53371; Harus in Uri-Hauchab Mts TM 37093; Heareb Berg S of, Kaukas NMWN/CR 3893; Helmeringhausen 77 km W, Luderitz LACM 77106-7; Hentiesbaai HF 10; SMF 45667-8; Hentiesbaai 10 km NE, TM 52115; Kanaän Farm, Lüderitz CM 67277-8; Kaokoland at 17° 16'S: 12° 07'E TM 63316, 63334, 63497; Kleinsee FMNH 16041-2; MCZ 34928; TM 28199; Koichab Pan, Lüderitz NMWN 1685; Koichab River TM 51359; Kuiseb River delta AMNH 116315; Kunene River, Kaokoland TM 63272; Kunene River, 8 km from mouth TM 68379; Leylandsdrift North Valley, Skeleton Coast Park NMWN 9457; Lüderitz SMF 20065, 32641-2; NMWN 9190; TM 79430; Lüderitz 50 km NE, TM 28359; Möwe Bay NMWN 3197; TM 63498; Namib Desert MCZ 43425; Namib Desert near

Swakopmund BMNH 1937.12.3.162-3; Namib Desert SW of Sossusvlei TM 49687; Namib Garten 30km E of Swakopmund NMWN 5751; Namib Naukluft Park TM 44831, 55898; Noordoewer 18 km NE, Karasburg TM 79569; Nordhuk Spencer Bay, Diamond Area 2 TM 44275, 44280-1; Omaruru River nr Hentiesbaai NMWN 1732; Onhandja, Kaokoland NMWN 7721; Orangemund NMWN 7137; TM 20911, 20947, 20954, 20987, 54824; Orupembe 15 km SW, Kaokoveld TM 39018; Purros, Kaokoveld TM 53373; Rechenberge 6 km E, Diamond area 1 TM 54490; Robbies Rus, Diamond area 2 NMWN 7175, 7188; Rössingberge SMF 46340; NMWN/CR 3846; Rooibank, Kuiseb River HF 11; TM 28783, 32036; Rosh Pinah TM 34756, 43917; Rote Kamma, south Sperrgebiet PEM 7464; Roter Kamm NMWN 9217; Saddle Hill, Diamond area 2 TM 51358; Sand River, Namib Desert Park NMWN 3284; Schadeck Farm, Mariental TM 33655; Schierilatz, 10 km E of Swakopmund TM 33638; Sesrien Canyon TM 56680; Sossusvlei SMF 51546; Sperrgebiet, Ubib Dunes NMWN 9751; Spitzkoppe SMF 20084; TM 51909; Swakopmund BMNH 1938.4.7.21; PEM 985; SMF 20085; NMWN/CR 3834; NMWN 3481, 8067; TM 11128, 33674, 44129; ZFMK 23087; Swakopmund 12 km E, TM 52541, 53251; Sylvia Hill 29 km S, Diamond area 2 TM 50671; Terrace Bay 10 km S, Skeleton Coast Park NMWN 4366; Torra Bay 75 E of, NMWN 7194; Tumas Mtn, Namib Desert Park TM 47084; Tumasberg 8 km E, TM 44832; Ugab River Mouth, Skeleton Coast Park NMWN 2403, 8246; Ugab River Mouth 16 km N, NMWN 8251; Ugab to Huab River TM 57605; Uri Hauchab 5 km NW, TM 55199; Walvis Bay SAM 19897; Walvis Bay 160 km E, NMZB-UM 22778; Weissenborn Farm, Lüderitz TM 37109; Welwitschia Plains, Namib Park NMWN 4427; Wereldsend Farm, Damaraland TM 57693-4; Witberg, Diamond area 2 TM 53292; Witputs Suid TM 45057; Wolwedans 144, Maltahöhe NMWN 7886; Wolwefontein, 102 km S of Sesreim PEM 6405. SOUTH AFRICA. Alexander Bay TM 52074; Anenus Pass TM 35491; Ausrabies Wes PEM 15811; Cliffs, btwn Port Nolloth & Alexander Bay NMZB-UM 5239-42; Gembokule Farm TM 62944; Hondeklipbaai TM 65290; Hunites farm btn Springbok & Pofadder TM 47236; Kleinsee FMNH 16041-2; MCZ 34928; TM 82199; Koiingnaas TM 71219; Langbaai, Kleinsee TM 76563; Langhoogte TM 81973; Little Namaqualand BMNH 1910.8.5.8; Ograbis SAM

9161; Oubeeb Farm TM 68138; Port Nolloth PEM 993; SAM 11440; TM 35252; Port Nolloth 10 km E, NMWN 6926; Port Nolloth 25 km E, TM 27714; Port Nolloth 30 km E, TM 19157; Port Nolloth 55 km E, SAM 11335; Soebatsfontein TM 65291; Springbok 42 km N, TM 56626; Steinkopf 23 km N, TM 46116.

PSAMMOPHIS JALLAE: NAMIBIA. Biesiepan 971 (ENWC) PEM 10399; NMWN 8123; Diepwater 975 (ENWC) PEM 10400; NMWN 8117, 8130; Grootfontein/Omatako Canal NMWN 4908-9; Leo 979 (ENWC) NMWN 8122; Ohopho NMWN 2391; Okamumbande 332 (ENWC) NMWN 8136; Okanjindi 970 (ENWC) NMWN 8116; TM 33817; Okatjikona 334 (ENWC) NMWN 8134; Olympia Farm PEM 10397; Omombonde Ost NMWN 9746; Onjoka 333 (ENWC) PEM 10398; NMWN 7835, 9374, 9546; Otjirukaku 42 (ENWC) NMWN 9752; Rundu 20 km S, TM 57627; Salzbrunnen (ENWC) NMWN 9753; Schonhausen (ENWC) NMWN 9750; Tondoro Mission NMWN 2390; Tsumkwe 100 km W, NMWN 3579; Waterberg BMNH 1937.12.3.158; NMWN 4859; Waterberg Section, Eastern National Water Carrier NMWN 7566-9, 7585, 7626. ZAMBIA. Kalabo NMZB-UM 20991; Liuwa Plain FMNH 142800. BOTSWANA. Dibete NMZB-UM 10319; Dobe, Ngamiland TM 30896; Ghanzi 55km S, USNM 163398; Gomodimo Pan TM 14716; Khutse NMZB-UM 28224; Lephepe NMZB-UM 9783; Mabeleapudi FMNH 17689; Sukwane NMZB-UM 24110. ZIMBABWE. No locality AM 1781; Beatrice 27 km S AJL 953; Bembesi NMZB 2297, 2820; Bromley NMZB 12055; NMZB-UM 20046, 21409; Dom Pan, Hwange Nat. Park NMZB 6606; Driefontein AM 7624; Figtree NMZB-UM 21606; Harare BMNH 1910.8.5.10; NMZB-UM 32645, 32656; Headlands NMZB-UM 28156; Hwange Nat. Park NMZB-UM 29626; Kenmaur NMZB-UM 20350; Kenmaur 10km SE, NMZB 7531; Lavingi Pan, Hwange Nat. Park NMZB-UM 29195; Lupane 15 km E, NMZB 3967; Main Camp, Hwange Nat. Park NMZB 11610, NMZB-UM 25751-2; Makwa Pan, Hwange Nat. Park NMZB 14549; Manga 2 Pan 3 km SE, Hwange Nat. Park NMZB 13160; Marondera NMZB 4946; Melfort AJL 226; NMZB-UM 10697, 19932; Plumtree NMZB-UM 9702, 20569; Ruwa NMZB-UM 10698; Somabhula NMZB-UM 5375-6; Somabhula 10 km W, NMZB 7414; Springvale NMZB 881; Wedza NMZB 3978, 4017, 4019, 4062.

SOUTH AFRICA. Kliprivier, Soutsansberg TM 62113; Klipfontein, Waterberg TM 62114; Vaalwater TM 32726; Vygeboompoort, Waterberg TM 5542-3; Waterberg TM 20982; Waterpoort TM 21492; Zandbult, Waterberg TM 62112.

PSAMMOPHIS SUBTAENIATUS: ANGOLA. Benguela BMNH 67.7.23.22; Bibala MBL 1793; Cahama 5 km SE, CAS 85950; Capangombe MBL 1769; Catumbela MBL 1807; Cunene MBL 1801; Chao da Chela IICA 26; Dongwenna, Mossamedes BMNH 1907.6.29.44-5; Humbe MBL 1796; Maconjo MBL 1770-1; NMW19097; Mulondo (Monard 1937:131); Mupa (Monard 1937:131); Mupanda (Monard 1937:131); Pen Pen NMWN 9575; Rio Bengo MBL 1772; Roçadas (Monard 1937:131). ZAMBIA. Balmoral Farm, Chilanga NMZB-QVM 441; Chikowa MCZ 69046; NMZB 2854; Chipangali NMZB-UM 3113, 3367-8, 17336; Kadende NMZB-UM 17334; Kalichero NMZB 4438-40; NMZB-UM 2855, 17333; Katete NMZB-UM 2856; Livingstone NMZB 1928, 1996, 3121; NMZL 199; Lundazi NMZB-UM 2852-3; Mazabuka DM 1344; Nahunwe, Kariba Lake NMZB 3122-4; NMZB-UM 8353; Sayiri NMZB 17335. NAMIBIA: Andara, Okavango River NMWN 2418, 2423; TM 38432; Balelwa, East Caprivi NMWN 7087; Crib, Tsumkwe NMWN 9661; Daan Viljoen Game Res NMWN 2427; Damaraland SAM 14073; Endola NMWN 1701; Erongo West 83, Omaruru NMWN 2724; Eros, Windhoek NMWN 9726; Gauscha Pan USNM 132520-3; Geluksputs, Otjiwarongo NMWN 4175; Grootfontein North SAM 15923, SAM 19906(2); Grootfontein/Omatako Canal NMWN 4911; Reitfontein 344 (ENWC) NMWN 5332; Grootokire NMWN 9610; Guneb NMWN 9529; Hobatere, Khorikas NMWN 6634; Hochkamp (ENWC) NMWN 9637; Huttenhof 425, Otavi TM 33657; Kalizo Lodge, Zambezi River NMWN 9572; Kaokoveld NMWN 2713; Kaokoveld E border to Etosha Pan FMNH 77614; Klein Dube, Bushmanland NMWN 9552; Klein Waterberg, Okawaka TM 39517; Kombat TM 32725; Liambezi Lake 13 km E NMWN 9486; Mata, Ovamboland SAM 16593(2); Namib Desert MCZ 43159; Namutoni, Etosha Nat. Park NMWN 9574; Okahandja FMNH 64567, 65869, 81626; MCZ 21012; SMF 45660-1; NMWN 2415(2); Olifantsfontein 9, Grootfontein NMWN 2424; Ombika NMWN 9617, 9636; Ondangwa 10 km NW,

Ovambo TM 45753; Onguma, Etosha Pan BMNH 1937.1.2.29, 1937.12.3.101; Oshikango, Ovamboland; MVZ 65368-70; TM 17114, 21946; Otjikoto NMWN 1500; Otjimbingue ZMB 5758 (type of *P. sibilans* var. *bilineatus* Peters); Otjinjera fountain, ESE of Ohapaho, Kaokoveld TM 45839; Otjosongombe, Waterberg BMNH 1936.8.1.722, 1936.9.4.67; MCZ 39931; Outjo 15 km S, NMWN 9463; Ovamboland NMWN 7729; Rooiboklaagte, Eiseb NMWN 6789; Salzbrunnen (ENWC) NMWN 9613; Schonhausen (ENWC) NMWN 9620, 9628, 9670; Sikerete, Noma Omuramba USNM 133714; Sommera, Grootfontein NMWN 6531; Tsumkwe, Bushmanland NMWN 4313-4, 4373, 9171, 9659; TM 38380; Tsumkwe 6 km E, NMWN 9589; Urupupa (ENWC) NMWN 9624; Usakos TM 25801; Waterberg BMNH 1937.1.2.29; MCZ 39903; Windhoek NMW19106; SAM 15937; SMF 51090; NMWN 1480,1498, 2393-5, 2417, 2419-20, 2421-2, 2425-6, 3440, 3470, 4387, 5365, 9392, 9405, 9462; Zabis 153 (ENWC) NMWN 8125, 9615.

BOTSWANA: Aha Hills 15 km N, USNM 164995; Akiles farm, 8 km N of Bainsdrift TM 42887-8; Dobe, Ngamiland; TM 30887-9, 30891-4; Francistown NMZB-UM 8668, 11952; Francistown 20 km S, NMZB-UM 8677; Gabane ZFMK 41729; Gaborone 10 km W, NMZB-UM 11273,11275; USNM 160846-7; Gemsbok-Sunnyside FMNH 17688; Goha Pan, Mababe Flats NMZB-UM 13346; Kasane NMZB-UM 13343-4,16371; Katima Mulilo 15 km WSW, NMZB-UM 22813-5; Katima Mulilo NMZB-UM 24206; TM 46325-7; Kgwebe Hills BMNH 99.3.20.9-10; TM 31123; Khumaga, Boteti River NMZB-UM16135; Khwai Camp, Moremi Game Reserve NMZB-UM 25447, 28215; Kobi Pan, 128 km SE of Ghanzi TM 26963; Lekgalo NMZB-UM 29184-6; Lobatse MMK -, NMZB-UM 11089; USNM 160848-9; Lobatse 30 km NW, TM 35618-9; Mabeleapodi FMNH 17685; TM 14716; Magogaphate Game Camp USNM 160850; Makgadikgadi Pan TM 14717; Maladiepe Hill NMZB 7834, 7841; Matsibe River NMZB-UM 12460; Matsiloje NMZB-UM 8673; Maun FMNH 17687; NMZB-UM 12464, 16176, 18081-3, 18167, 20170, 20756; TM 14718; Moeding College NMZB 7809, 7833, 7838, 8402; Molepolole 20 km E, NMZB 8588; M'mouve, 65 km N of Serowe AM 413; Mosu NMZB-UM 20565; Mosu 20 km W, NMZB-UM 11606; USNM 163405; Mukayo, Lake Liambezi TM 43703; Nata NMZB 1375,1381; NMZB-UM 11555; Nguihaba Hills, 40 km SE of Nxai Nxai TM 26895; Nokaneng TM 30634; Orapa NMZB 8959; Otse NMZB 7837; Platjan on Limpopo River TM 46851, 47505; Ramatamusa Pan, 32 km N of Nata NMZB-UM 7400; Serondela NMZB-UM 91; Serowe AM 650; ZMK 63830; Shorobe NMZB-UM 4659; Sokwane NMZB-UM 24108; Tamotamoga NMZB-UM 13329; Tsau TM 30575-6, 30632; Tsessebe AM 1627; Tsodilo Hills TM 31016. ZIMBABWE: Beitbridge NMZB 465, 6592; NMZB-UM 5644; Bengi Spring, Gonarezhou Nat. Park NMZB-UM 2568; Bikita NMZB-UM 28642-3; Binga NMZB 3832-3; Birchenough Bridge NMZB-UM 25693, 27017; TM 18726; Boss Longone Pan, Hwange Nat. Park NMZB 12794; Bromley NMZB 12054; Buffalo Range NMZB-UM 31900; Bulawayo NMZB 861-2, 869, 8580, 9359, 9417, 9614, 11601, 11753, 11844, 13905,15652; NMZB-UM 8919, 13144, 21600, 31538, 32949; SAM 20532; Bulawayo 15 km SE, NMZB 389; Bumboosie Ruins, Hwange Nat. Park NMZB 7786, 12875; Cashel NMZB-UM 29331; Chamabonda Vlei, Victoria Falls Nat. Park NMZB-UM 31935; Charama Escarpment, Gokwe NMZB-UM 8891; Chashakwe Ranch, Bikita NMZB 15760-1; Chete Gorge, Binga NMZB 5767-8; Chewore Safari Area, Ntunbe River NMZB 7856; Chimwara Ranch, Lupane NMZB 10339; Chingele Borehole, Matibi II C.L. NMZB-UM 32388; Chipinda Pools NMZB-UM 1672, 2567, 6938; Chiredzi NMZB-UM 13410, 27947, 28108; Chishawasha NMZB-UM 23776; Chitza, Sabi-Lundi Confl. NMZB-UM 18598; Chomuruvati, Chibi NMZB-UM 23676; Dete NMZB-UM 12024; Dete 15 km NE, NMZB 10384-5; Devure Bridge NMZB-UM 28291-2; Dina Pan 6 km S, Hwange Nat. Park NMZB 13070; Doddieburn Ranch NMZB 8010; Elim Mission, Nyanga NMZB-UM 31657; Empandene AM 4897(2); Esigodini NMZB 1082, 10309; Fishan, Gonarezhou Nat. Park NMZB-UM 3841-2; Gado, Kwekwe TM 24395; Gladys Farm, Matobo NMZB 13772-3; Gumtree, Bulawayo NMZB 5834; Gwanda MVZ 176482; NMZB-UM 5738, 5932; Hope Fountain NMZB 867; Hot Springs, Chimamimani NMZB-UM 11569, 20283-4, 20290; Humani Ranch NMZB-UM 23931; Hwange 8 km W NMZB-UM 389; Hwange Nat. Park NMZB-UM 29591; Insiza NMZB-UM 13069; Inyathi NMZB 286; Inyokene, Nyamandhlovu NMZB13946,13952,14508-9; Irisvale MCZ 56923-4; Jabalissa 2 km SW of, Gwayi Valley NMZB 13164; Kapami, Hwange NMZB 8389; NMZB-UM 459; Kapami 15 km SE, Hwange NMZB-UM 842;

Kariba MMK -; NMZB 4107, 5148; NMZB-UM 2746-50, 4942, 11286-7, 23096, 24152-3; Kariba Lake FMNH 134653-4; MCZ 58413, 67046-8; Kariba Lake - Sanyati Basin AJL 1452; NMZB 2955-6, 3239; Kariyangwe NMZB 2063; Karna Block, Lupane NMZB15506-8; Kasamba Jesse, Mana Pools Nat. Park NMZB 7715; Katombora Rapids NMZB 6839; Kove River, Sengwa NMZB-UM 19697; Kwekwe NMZB-UM 11985, 31640; SPQ 86; Kyle Dam, Masvingo NMZB-UM 1789; Lone Star Ranche, Chiredzi NMZB-UM 31824; Lower Odzani Bridge, Mutare NMZB-UM 2537; Lumane NMZB1474; Lupane FMNH 17686; Lutombe, 30 km NE of Beitbridge NMZB-UM 18948; Mabalauta Field Stn, Gonarezhou NMZB-UM 19527; Magunje, Uzumba NMZB 11455; Majoda NMZB 7959, 8769, 9363; Makumbi AM 7960; Makuti NMZB-UM 9147,18254; Maleme Dam, Matobo Nat. Park NMZB-UM 26867; Malimbasingi, Gokwe NMZB-UM 8911; Malonga River Bridge, Hwange NMZB-UM 401, 571-2; Mana Pools NMZB 7695; Manzituba, Chizarira Nat.Park NMZB-UM 21749; Marivalle Ranch, Kwekwe NMZB 16444; Marula NMZB-UM 31528; Marungudsi NMZB 3016; Mateke Hills TM 27339; Matetsi NMZB-UM 33143; Matopos NMZB 865; TM 5610; Matusadona Nat. Park NMZB-UM 3068, 5385; Mayfair Dam NMZB 10251; Mazowe Citrus Estate NMZB-UM 18264; Mbalabala BMNH 1914.10.24.2; NMZB 473; Mount Darwin AJL 59; Murewa 50 km N, NMZB-UM 20129; Muromo Farm, Mutare NMZB-UM 31435; Mutare NMZB-UM 6436; Mwenda Confl., Kariba Lake NMZB-UM 7825, 31990; Mwenezi NMZB-UM 1973, 20253; Namembere Island, Kariba Lake NMZB-UM 26787; Ndali, Chipinda Pools NMZB-UM 10987; Nyadekese Dam, Darwin NMZB-UM 23839; Nyamaropa NMZB1749; Nyanyadzi, Chimanimani NMZB-UM 23071; Odzani Bridge, Mutare NMZB-UM 5859; Old Mutare NMZB-UM 5304, 5394; Pesu River, Chikwarakwara NMZB 10948; Plumtree NMZB 3006, 3058, 12175; Razi, Chibi NMZB-UM 23575, 23600, 23602, 23643; Redcliff, Kwekwe TM 24656; Riverside Ranch, Hwange NMZB 16802-3; Rugare, Nyanga C.L. NMZB-UM 30396, 30400; Rukomeshe Research Station NMZB-UM 4943; Runde C.L. NMZB-UM 26709; Rupisi Hot Springs, Chipinge NMZB-UM 13420; Ruware, Ndanga NMZB-UM 5836-7; Sabi Valley Research Stn PH 9; Salatar Farm, Mhangura NMZB 15833; Samalema Gorge, Gonarezhou Nat. Park NMZB-UM 19606; TM 172; Save-Runde Confl. NMZB-UM 3843; Save-Macheke Confl. NMZB-UM 9630, 9680; Sawmills, Umguza NMZB 866; Sentinel Ranch, Beitbridge NMZB 11701-2; NMZB-UM 13378-80,14539; Shakwanki, Hwange Nat. Park NMZB 13530; Shapi Pan, Hwange Nat. Park NMZB-UM 28187; Shashe-Shashani Confl. NMZB-UM 5305, 5708, 5789, 10813; Shiloh NMZB 860; Shurugwi NMZB 2192; NMZB-UM 6060; Siyanje, Beitbridge NMZB-UM 18949-50; Tamasanka Pan 4 km SW, Hwange Nat. Park NMZB 13449; Tashinga Camp, Matusadona Nat. Park NMZB 9668-9; Tod's Hotel, West Nicholson NMZB 597; Triangle NMZB-UM 8508; Tsholotsho NMZB-UM 21607-8; Tuli NMZB 10245, 10278; Upper Tshowe River, Hwange NMZB 9456; Victoria Falls CM 69242; NMZB 10107-8; NMZB-UM 28076; SAM 8070; VFNP/H 13; Watsomba 8 km N, NMZB-UM 11346; Wengezi Bridge, Mutare NMZB-UM 2653; Westwood, Hwange AM 7174; NMZB 12822; Zambezi-Chewore Confl. NMZB-UM 5182; Zambezi-Matetsi Confl. NMZB-UM 444; Zambezi-Sebungwe Confl. NMZB 902; Zambezi-Sengwe Confl. 20 km S NMZB 3606. MOZAMBIQUE. Boroma NMW 19116; Kasumbadedza, Tete MCZ 51209-18; Matchova JPT 1375, 1379, 1383; NMZB-UM 28674-5; Nyamurombwe, Zumbo NMZB-UM 10160, 10166; Ponta da Barra Falsa TM 45621; Tete ZMB 9992 (2 syntypes); Viola (Mazowe Bridge) NMZB 3986, 4001. SOUTH AFRICA. Boulders PEM 996; Crocodile Bridge Road, Kruger Nat. Park NKW 98; Dongola NKW 21797, 21939; Drinkpan Farm 301, Thabazimbi TM 41333; Fundusi Lake, Soutpansberg TM 13985; Griffin Mine, Leydsdorp TM 5605; Groot Marico TM 24716; Hectorspruit TM 5608-9; Houtboschrievier, Waterberg TM 26809; Houtbosdorp TM 36578; Kalkheuwel 454 TM 43088, 48164; Karoobult 126, Thabazimbi TM 41674; Klippan, Thabazimbi PEM 6930, 6995; Komatipoort PEM 995, 12092; TM 1434; Lilliput Station TM 5607; Louws Creek TM 10117; Madimba Camp, Messina TM 47100-1; Madrid Farm, Brak River TM 12916; Madzimu to Bvumunyundu KNP 289; Makalali Farm, Selati River TM 32678; Mara PEM 1462/59, 1467/20; Mariah Farm PEM 11803; Mashatu Lodge PEM 7758; Matukwane, Kruger Nat. Park KNP 51; Messina TM 36066, 44875; Mooketsi TM 7402; Mopane Station TM 14159, 36363; Newington, Komatipoort AM 1497; Njelele River TM 5603; MCZ 21314; Olifants Camp, Kruger Nat. Park KNP

124; Olifants River Falls, Kruger Nat. Park KNP 28; Pafuri TM 24122; Penge, Lydenburg TM 42417; Pietersburg NMZB-UM 10989; Punda Milia, Kruger Nat. Park KNP 199; Rhodesdrift, Limpopo TM 29993; Rochdale 700 TM 39968; Sabie Poort, Kruger Nat. Park KNP 4; Sibasa 40 km NE, TM 41566; Skelm/Malta Farms, Leydsdorp TM 13241; Skukuza, Kruger Nat. Park KNP 14, 263, 331; Sohebele Farm, Timbavati Res. TM 33818; Sun City PEM 4431; Trevenna 119, Soutpansberg TM 35722; Vivo, Waterpoort CM 69241; Weipe 47 TM 40017; Wyliespoort TM 27426. SWAZILAND. Big Bend NMZB 5886, 5894, 5898, 5984.

PSAMMOPHIS ORIENTALIS: MALAWI. Cape Maclear BMNH 77.7.2.13-14; Chibotela AMNH 67784; Chikonje, Chiromo BMNH 1959.1.3.35; Chiromo NMZB-UM 4187; Chitala River, nr Salima MCZ 51220-3; Kasungu AMNH 67780; Lilongwe NMZB-UM 24937; Mangochi BMNH 1926.5.8.47-8; NMZB-UM 844; TM 13460; Mpatamanga Gorge TM 55543; Mtimbuka MCZ 51219; Mudi River, Blantyre TM 55691; Mulanje Mtn AMNH 67760; Nchisi Island, Lake Chilwa BMNH 1937.7.26.4-5; Nkhotakhota AMNH 67794-5; "Nyasa Lake" BMNH 88.7.14.1, 91.12.17.3; Shire River BMNH 1934.4.6.28; Tengani NMZB-UM 4186; Zomba BMNH 93.10.26.56, 94.2.13.13; NMZB-UM 4185. MOZAMBIQUE. Alves De Lima 10 km N, JPT 1156; Amamba NMZB-UM 29462; Banamana JPT 266, 1815; Bazaruto Island NMP -, NMZB 10282; 11424-5, 12028-9; Benguerua Island NMZB 11378, 11604; Boror ZMB 2470; Cabaceira Peninsula NMW 19110; Caia BMNH 1934.4.6.29; Chemezi, Manica NMZB-UM 1093; Chimoio 10 km NW, NMZB-UM 11573; Dondo NMZB-UM 6005; Moloque River PEM 13407; Grudja NMZB-UM 8558; Inchope NMZB-UM 6205; Lower Revue Bridge NMZB-UM 27582; Lumbo AMNH 16894; MCZ 18464, 146969; UMMZ 61235; Machipanda NMZB-UM 16349; Maforga NMZB-UM 7200-2; Manica NMZB-UM 6204, 6413-4; Maringa NMZB-UM 8748; Massangena TM 29215; Miquia, Parque Nac. Zinave NMZB-UM 30675; Mkurumbana JPT 1644-5; Moabase PEM 13233, 13315-7; Muda-Lamego NMZB-UM 6431-2, 7062-5, 7218; Nacala NMZB 13843; Namialo NMZB-UM 8208; Paulo JPT 1153; Pomene NMZB-UM 28275-7; Tupuiko PEM 15585, 15662; Ungodje JPT 1198,1203; Vila Machado NMZB 13849; Xiluvo NMZB-UM 7168, 7171, 7183; Zinave JPT 1147, 1161, 1228, 1245,

1247, 1267, 1667; NMZB-UM 28676, 30673-4. ZIMBABWE. Bazeley Bridge, Mutare NMZB-UM 26992; Chiredzi NMZB-UM 34757; Eastlands, Mutare NMZB-UM 11722; Esigodini NMZB 7121, 11183; Filabusi NMZB 864; Gwanda NMZB 6059; Inyangani Tea Estates NMZB-UM 33644; Mahenya C.L., Chipinge NMZB-UM 18712, 18842; Maleme Camp, Matobo Nat. Park NMZB 11060; Mutare NMZB-UM 11572, 23336, 23294, 28350, 31410, 33804; Ndali, Chipinda Pools NMZB-UM 10988; Rugare, Nyanga C.L. NMZB-UM 30396; Runde C.L. NMZB-UM 26708; Shashi Irrigation Scheme NMZB 5644; Vumba Mtn NMZB-UM 20513.

PSAMMOPHIS LEOPARDINUS: ANGOLA. Bella Vista (Missao di Dondi) MCZ 32473-4; Caconda MBL 1780(2), 1781, 1791(5); Capelongo AMNH 50624-9; Catumbela MBL 1798 (lectotype of *P. sibilans* var. *leopardina* Bocage); Catengue, Benguela SMF 21594-5; Cuanza MBL 1802; Iona TM 40752; Kalukembe (Monard, 1937: 133); Lobito Bay AMNH 50612-5, 50617-20; NMZB-UM 5100; Luanda USNM 20132; Oncocua 37 km NE, TM 40797; Vila da Ponte (Monard, 1937: 133). NAMIBIA. No locality FMNH 64568; Agab Junction, Etosha Nat. Park NMWN 9519; Ambikalo 12 km S, NMWN 9582; Bergweide (ENWC) NMZB 16898; Brandberg ZFMK 23088; Daan Viljoen Game Res. NMWN 1697; Diepwater (ENWC) NMWN 9465; Djab, SW of Windhoek SMF 51048, 51755; Elandsdraai, Etosha Nat. Park NMZB 16899; Epembe, Kaokoveld TM 42306, 46872; Erongo Plateau MCZ 43427; Etosha Nat. Park NMZB 16901; NMWN 9525; Gemsbokpan (ENWC) NMWN 9724; Glynberg 326 NMWN 2613; Grootfontein Section ENWC NMWN 7513; Halali, Etosha Nat. Park NMZB 16900; NMWN 9404, 9488, 9607, 9715, 9718, 9733, 9744-5; Halali 5 km E, NMWN 9717; Hawab 2 km S, Etosha Nat. Park NMWN 9599; Hazeldene 237, Outjo NMWN 2428; Hoas 273 TM 39912; Hobatere Lodge NMWN 9534; Hochkamp (ENWC) NMZB 16897; Horebis Nord 61, Karibib TM 33654; Horob Junction 1.7km W, NMWN 9601; Kamanyab, Kaokoveld TM 17286; Kamanyab 40 km N, NMWN 9530; Kaoko Otavi SAM 17480; Kaokoveld AMNH 73856; SAM 73855; Kaokoveld to Etosha Pan FMNH 77615-6; Kaokoveld (northern) TM 22349-50; Kaokoveld (southern) FMNH 74063; Karossfontein NMWN 9616; Namib Desert MCZ 43160; Namutoni NMWN 9518; Neudamn Farm, Windhoek TM

33841; Nimmerrus Farm, Outjo NMWN 938; Nuames, Etosha Nat. Park NMWN 9500; Okahandja FMNH 65868, 81627; SMF 45659, 50625; NMWN 2416; Okahandja 35 km N NMWN 6568; Okandjindi (ENWC) NMWN 9587; Okaukuejo NMWN 2396-7, 7948, 9396, 9398, 9458, 9468, 9532, 9541, 9573, 9627, 9653, 9716; Olifantsbad, Etosha Nat. Park NMWN 9531, 9536; Omandumba-West ZFMK 29476; Ombika Gate, Etosha Nat. Park NMWN 9504, 9506, 9606; Ombika 10 km S, NMWN 9647; Ombika 45 km S, NMWN 9600; Ongombeanavita SMF 51724; Otjinungwa, Cunene NMWN 7774; Otjivasandu, Etosha Nat. Park NMWN 1700, 9625; Otjiwarongo NMWN 2398; Outjo SAM 17503; Paderburn, Kaokoveld TM 17316; Rhenostervlei 3 km W, Etosha Nat. Park NMWN 9650; Rietfontein, Etosha Nat. Park NMWN 9460; Rustig Farm, 30 km NNW of Kamanjab TM 46113, 48194; Salzbrunnen (ENWC) NMWN 9668; Sprokieswound NMWN 9741; Swakop-Tal, Namib Desert BMNH 1937.12.3.166; Swartbooisdrift, Kaokoveld TM 42307; Tsissabsschlucht, Brandberg SMF 46578; Uis Tin Mine NMWN 2402; Urupupa (ENWC) NMWN 9498; Usakos TM 25803-4, 29926; Valencia Farm 42, Rehoboth TM 38193, 39434; Warmbad SAM 17274; Windhoek AMNH 1696; JDV 5451; SMF 43336, 45673, 49904, 52964, 57580, 59667; NMWN 1698-9, 1702, 2406-8; ZFMK 2392.

PSAMMOPHIS BREVIROSTRIS: NAMIBIA. Gobabis NMWN 9471. BOTSWANA. Gemsbok FMNH 17695; Kaotwe FMNH 17694; Khutse Pan TM 41773; Letlhakeng 15 km SE, USNM 160845; Otse NMZB 11330; Serowe ZMK 63829. ZIMBABWE. Baddeley, Makoni NMZB-UM 10667, 28157; Chimanimani - Outward Bound School OBS5; Dunblane, Chimanimani NMZB-UM 24038, 29085; Empandene NMZB-UM 9703; Kukwanisa, Mutare NMZB-UM 32003; Marondera NMZB-UM 8895, 23882; Matinidza, Makoni NMZB-UM 33403; Mutare NMZB-UM 6661, 8379, 9163, 10345, 11723, 11955, 33799; Odzani NMZB-UM 17531; Plumtree NMZB-UM 13494; Selborne, Nyanga NMZB-UM 16086; The Corner, Chimanimani NMZB-UM 29333; Watsomba, Mutasa NMZB-UM 28838. SOUTH AFRICA. Amsterdam Farm, Soutpansberg TM 39459; Babanango NMZB-UM 32095; Ballengeich Farm, Newcastle TM 63920; Barberton CAS 115893; TM 26088; Boekenhoutskloof TM 45620, 47025, 48018; Bokfontein

Farm, 15 km SW of Brits CAS 125690-1; Broederstroom, Pretoria TM 42695; Chelmsford Resort, Newcastle TM 57986; Crocodile River, Rustenburg TM 5588; Danville TM 49548; De Kroon, Rustenburg TM 5570, 5575, 5586, 5589, 5596; Derdepoort, Pretoria TM 5600; Doornkop NMP 310; Durban AMNH 57637; BMNH 62.3.14.2; DM 68-9, 80; LR 485, 771, 773, 776-82; NMZB-UM 32093, 32094; Gillitts LR 184; Gladysvale Farm, 30 km NNE of Krugersdorp MVZ 65375; Glentig, Waterberg AM 6447; Groblersdal PEM 1464/70; Gwaliweni Forest TM 27208-9; Hammanskraal LR 617-20; TM 28789, TM 34901; Hartebeeshoek Dam TM 46230; Hartebeestpoort Dam TM 33360, 36100; Hillary, Durban CM 69240; Hlobane TM 47415; Hornsneen TM 46129; Ingwavuma TM 15314; Johannesburg NMZB-UM 4545; Kambuladraai 691 TM 82015; Kloof NMZB-UM 32092; Kosi Bay TM 43233; Kronsberg NMP 381; La Lucia LR121; Ladysmith FMNH 220237; Ladysmith 40 km N (FitzSimons:1957.39); Lekgalameetse Nature Res, Letaba NMZB 11089; Louis Trichard TM 28737; Magaliesberg TM 45610, 47862; Mahlabatini TM 20626; Malta Farm NMZB-UM 32554; Manzengwenya Forest Stn, Sibaya TM 43891, 44231, 44760-1, 46007, 46817; Marble Hall TM 36596; Mariannahill DM 140; Mariepskop TM 12320, 12345, 12506; Mbazwane TM 45711; Metlepetsi River TM 5577; Molopo, nr Lichtenburg TM 46995; Montana Estate, Pretoria TM 39958; Murrayfield, Pretoria TM 49546; "Natal" BMNH 89.3.21.2; DM 72; FMNH 206260; MNHN 8487; NW 19090; Num Num Farm BMNH 1936.6.13.7; Oribi Gorge Nat. Res, Port Shepstone TM 65228; Pelindaba TM 43016, 44296; Pietermaritzburg NMP 392-3, 420-1, 513; TM 5583, 79002; Pietersburg TM 21696; Plastron USNM 165105; Pongola 24 km E, TM 46004; Pongola 50 km WNW, TM 32748; Port St. Johns SAM 6024, 6026-7; Potgietersrus TM 32758-9; Pretoria BMNH 90.12.16.11; MCZ 41959; NMZB-UM 7125; TM 5582, 5584, 5591-2, 5594-5, 5598-9, 5601, 6328-9, 14436, 16177, 19270, 19398, 25335, 29830, 35686, 37376, 39528, 39849, 43548, 49515; Pretoria 25 km SW, TM 34968; Rietvlei Dam, Pretoria TM 45593; Roodeplaats Dam TM 42940; Rustenburg TM 5597; Zandfontein 315 TM 36516, 44172, 47008; Shilowane TM 5581; Sibaya Lake TM 44087, 47691; Silverton TM 5574; Swartkops, Pretoria TM 42822; Taung MVZ 65373; NMZB-UM 31673-4; Tewate, Lake St. Lucia TM 45811; Trafalgar, Margate NMZB-UM 32730;

“Transvaal” MCZ 41958; NMZB-UM 10993; Tuinplaats 678 TM 41754; Ubombo LR 774; TM 13681,13683, 19348, 44045; Ubombo Mtn Range, FMNH 220250-1; Umfolozi Game Res. TM 47414; Vaalwater TM 32749; Vasa Pan, Manzengwenya TM 48299-300; Vygeboompoort, Waterberg TM 5572, 5779; Waterkloof Airport, Pretoria TM 41552; Windsor Dam, Ladysmith FMNH 212980; Wolhuterskop 452, Rustenburg TM 5602; Xa Matlale, nr Pietersburg ZMB 7256 (3, including lectotype of *P. brevirostris* Peters). SWAZILAND. Mambane NMZB 5897; Mambane 15 km N, TM 71799; Mlilwane TM 47434. MOZAMBIQUE. Estatuane NMZB-UM 30669; Namaacha 8 km E, NMZB-UM 2224.

PSAMMOPHIS MOSSAMBICUS: ANGOLA.

Ambriz BMNH 51.1.19.26; Capaia to Cubal, Benguella TM 47796; Capelongo AMNH 50621-3, 50632-3; Cascalada 6 km NW, TM 46426; Chipipa 13 km N, Huambo TM 5375; Chitau, Bihe CM 5905; Cubal SMF 25460-3; Cuma FMNH 15354-5, 15357-60; MCZ 34927; Duque de Braganca BMNH 1904.5.2.78; Hanha CM 1805; Ilha do Loanda CM 1804; Marimo 10 km W of, Machado TM 45343; Mulondo, Luanda Res., Malanje TM 47798; Negola 6 km S, Huila TM 4662; Pungo Andongo BMNH 1904.5.2.75; Quicamba Park TM 45751; Tala Kilau, Mossamedes BMNH 1907.6.29.46-7; Tchiuinguira, Huila TM 47797. ZAMBIA. Chezia Confl., Kariba Lake NMZB 3281-2; Chikowa NMZB-UM 2935; Chilanga, Lusaka NMZB 692; NMZB-UM 1698; Chimikumbe BMNH 1932.9.9.132- 3; Chipangali NMZB-UM 3107-10, 17330-2; Chipata FMNH 134648; NMZB 1598-9, 1862-3; Chunga, Kafue Nat. Park NMZB-UM 4931, 30054; Dundumwensi NMZB-UM 20841; Kabinda, Mpika BMNH 1932.9.9.130; Kabompo NMZB 3325-6, 3403, 4327-30, 4460, 4980-1; Kabwe BMNH 1932.5.3.95-100, 1932.9.9.134-8; NMZB-UM 9655; USNM 54094; Kacholola NMZB-UM 2931; Kalabo FMNH 133050, 134242; NMZB-UM 10101, 20926, 20963, 20989-90; Kalichero FMNH 134643-7; MCZ 69025; NMZB-UM 2764-8, 2780, 2933-4; Kalomo NMZB 3279; Kasempa NMZB 3005, 4220; Kasusu, Kalomo NMZB 2565, 3120, 3785-6, 3789-90, 3794; Katanda, Sichifula, Kalomo NMZB 3787-8; Katete NMZB-UM 3111; Lealui MNHP 20-104, 21-533; Livingstone NMZB 1995, 4263-5; Luanshya 8 km W, MVZ 65371; Lulongwe Confl., Kariba Lake NMZB 3280; Lundazi NMZB-UM 3112; Lusaka

100 km SW, ZFMK18904; Lusaka 50 km E, NMZB-UM 4521; Machile Forest Stn, Kalomo NMZB 3793, 4262; Maskie's, Namwala BMNH 1932.5.3.101; Mazabuka DM 1341; Mazabuka NMZB 1074; Mchinji nr FMNH 134649-51; NMZB-UM 2932; Mkanda NMZB-UM 17328-9; Msoro NMZB-UM 17326; Mulanga, Kalomo NMZB3283-5, 3791-2; Mutanda NMZB 1622; Nansai Farm, Choma NMZB 13360; Nchelenge, Luangwa Valley BMNH 1932.12.13.231; Ndau School NMZB 16031, 16046; Ndola NMZB 1073, 1297, 2705-6; Ndola/Mufulira Road NMZB-UM 684; Ngoma, Kafue Nat. Park NMZB-UM 19887, 20842, 23384, 23391; Sayiri NMZB-UM 17327; Serenje BMNH1953.1.2.13-16; Yakobe, Luangwa Valley LACM 136143-8. MALAWI. Chiromo BMNH 1959.1.3.37; Chiromo 20km N, AMNH 73214; Dedza NMZB-UM 23878; Kasungu AMNH 67774; Likabula River, Mt. Mulanje MCZ 51195-6; Limbe NMZB 4093; Makanga BMNH 1959.1.3.38; Mangochi BMNH 1926.5.8.49; Mchenga, Lake Chilwa NMZB-UM 4177, 25391; Mtimbuka MCZ 51197-200; Mulanje Mtn AMNH 67759; Mulanje River AMNH 44320, 44328; Nchisi Mtn AMNH 67749-50; MCZ 51193-4; Nkhotakhota BMNH 96.12.12.19; Zomba BMNH 93.10.26.57, 94.2.13.12. NAMIBIA. Eastern Caprivi TM 57575, 58019; Grootfontein TM 38308; Grootfontein 30 km NW, NMZB 16902; Harasib 317, Grootfontein NMWN 2409; Ihaha, Chobe River, E. Caprivi NMWN 4124; Kapaku, Okavango NMWN 2404, 2413(2); Kabuta, Caprivi TM 22610; Katima Mulilo NMZB 16903; NMWN 6554, 9395, 9397, 9571, 9581, 9583, 9608; Kombat TM 32724; Liambezi Lake, Caprivi NMZB-UM 1880; Linyati, Caprivi TM 22609; Mabili Reserve, E. Caprivi NMWN 8290; Maningimanyi, E. Caprivi NMWN 6562; Mpalela Island, E. Caprivi TM 57145; Mukayo, Liambezi Lake, Caprivi TM 43702, 47163; Nkasa Island, E. Caprivi NMWN 6585; Shankara, Okavango NMWN 9520; Tamsu on Kaudum, Omaramba, Kungveld TM 38396; Tsotsana 18 km W, NMWN 1528; Tsumeb NMWN 2411; Tsumkwe NMWN 7948; Uitkomst (ENWC) NMWN 9538, 9634, 9648; WENELA base, Caprivi TM 67950. BOTSWANA. Boro River, Okavango TM 42960; Crocodile Camp nr Maun TM 46188; Delta Noga Camp TM 54361; Four Rivers Camp, Okavango NMZB-UM 29578; Gweta 30 km S, NMZB-UM 14713; Kabulubula TM 14721; Kasane NMZB-UM 16372; Katima Mulilo, Caprivi TM 46336-7, 47853;

- Katima Mulilo 15 km WSW, NMZB-UM 20277, 22837-9; Khwai Camp, Moremi Game Res. NMZB-UM 25444-6, 25460, 28196-7; Makgadikgadi TM 14722; Maun FMNH 17697; NMZB-UM 18080, 18093, 20754-5, 22737; Mohembo NMZB 2552, 3338; Mosu NMZB-UM 20550; Nata NMZB 1380; TM 31127; Nyaraga Lediba, Okavango NMZB 9681; Old Sangwali, E. Caprivi TM 39195, 39198-9; Oshikango TM 17117; Shakawe USNM 165002-3; Shakawe 80 km WSW, NMZB-UM 16201; Shaleshonto FMNH 17696; Shorobe TM 14720; Simwanza NMZB-UM 16385; Third bridge Camp, Moremi Game Res. TM 66319. ZIMBABWE. Bari, Chikwaka C.L. NMZB-UM 33267; Bezwe River, Mwenezi TM 5585; Bikita NMZB-UM 28640-1; Bonisa Farm, Redbank NMZB 6723; Bromley NMZB-UM 10676, 12056, 23371; Buckland Estate, Harare NMZB-UM 26582; Bulawayo NMZB 360, 496, 871-2, 874, 1028, 1251, 1475-6, 1827, 1885, 5146, 5153, 5156, 5832, 5841, 5929, 6102, 6334, 9371, 15564, 16864; NMZB-UM 7351, 8918, 8923, 29073, 31543, 31862; Bulawayo 40 km NNW, NMZB 6586; Bumi Confl., Kariba Lake NMZB 3598; Calgary Farm, Harare NMZB-UM 32419-20; Chegutu NMZB 6206, NMZB-UM 20347; Chegutu 27 km E, AJL 1031; Chesa Forest Res., Nyamandhlovu NMZB 6307; Chinhoyi Caves NMZB 4007; Chipangali, Bulawayo NMZB 11765; Chipinda Pools NMZB-UM 1671; Chipinge NMZB-UM 32298; Chipinge 10 km N, NMZB-UM 32143; Chiredzi NMZB 9471, 10933; NMZB-UM 17829-31, 27944; Chivero Lake NMZB-UM 1726; Christian Bank NMZB 6979; NMZB-UM 28165; Crosby Farm, 40 km N of Bulawayo NMZB 461; Dete, Hwange NMZB-UM 1469, 16350; Elim Mission, Nyanga NMZB-UM 31411; Esigodini NMZB 478, 909-10, 10940, 11197; TM 66465; Fatima Mission NMZB 803, 10941; Fern Valley, Mutare NMZB-UM 32142; Fishan, Gonarezhou Nat. Park NMZB-UM 12090; Gorhwana Pan, Gonarezhou Nat. Park NMZB-UM 12342; Guluene South, Gonarezhou Nat. Park NMZB-UM 19567; Gwai River Hotel NMZB 12441; Gweru 5 km SE, NMPZ 7428; Harare NMZB 6976; NMZB-UM 847, 18252-3, 27050, 29329, 30246, 33268-70; NMZB-QVM 34, 569, 590; TM 22002, 22187; Haroni-Rusitu Confl. NMZB 13697; Hazeldene Farm, Odzi NMZB-UM 32988; Heany NMZB 836; Hippo Mine, Chipinge NMZB-UM 28137; Holdenby (E) C.L., Mutasa NMZB-UM 20288; Hunyani TM 10119; Hwange Safari Lodge NMZB 11226; Imbezu Park NMZB 2715; Inkomo NMZB 7734; NMZB-UM 29469; Inyati NMZB 287; Inyokene, Nyamandhlovu NMZB 9773, 14510; Irene, Mutare NMZB-UM 16150, 26756, 28155; Ivory Lodge, Hwange NMZB 12117; Kadoma NMZB-UM 32659; Kariba Lake MCZ 67040-1; Karoi NMZB-UM 21419-20; Katiyo Tea Estate NMZB 14400, 14343-4; Katombora Rapids NMZB 6840; Kennedy 1, Hwange Nat. Park NMZB 12585; Killridge Farm NMZB-UM 32315; Kutama Mission AM 6435, 6929; Kwekwe NMZB 5326; Little Dzivanini Pan, Hwange Nat. Park NMZB 13483; Lone Star Ranch NMZB 14296; Lower Haroni River, Chimanimani NMZB-UM 9347; Lupane NMZB 5149; Mabalauta Field Station, Gonarezhou Nat. Park NMZB-UM 19526, 29992; Magunje, Uzumba NMZB 11456; Mahenya C.L., Chipinge NMZB-UM 18776; Main Camp, Hwange Nat. Park NMZB 11609; NMZB-UM 29596, 29601; Makore Farm, Mutare NMZB-UM 9071, 20813; Maleme Dam, Matobo Nat. Park NMZB 11004; Malipati 5 km NW, AJL 867; Mana Pools NMZB 7686, 7705-6; Maristvale, Nyanga NMZB-UM 23913-4; Masvingo NMZB-UM 2813; TM 24327; NMZB-UM 18261; Matobo Nat. Park NMZB 7142; Matobo Dam NMZB 16190; Mazowe BMNH 1902.2.12.96-7; Mazowe 10 km N, UMMZ 126979; Mhangura NMZB-UM 12566, 23183; Melfort NMZB-UM 10675, 13064; Mondoro NMZB-UM 29507; Mount Hampden NMZB-QVM 32-3; Msitwe River, Mutorashanga NMZB-QVM 582; Mtsheli Valley, Matobo Nat. Park MVZ 176483; Munene Farm, Mutare NMZB 7235; Mutare NMZB-UM 3176, 5265, 5405, 5863, 16116, 17802, 23107, 23250, 23764, 23819, 26744, 27051-2, 30238, 31315, 31367, 32384; Mutare 15 km WNW, NMZB-UM 855; Mutare 50 km S, NMZB-UM 2513, 17985; Mutoko 5 km W, NMZB 4910; Mvuma NMZB 2643; Mvuma 23km W, NMZB 13910; Mzarabani C.L. (E) NMZB 11134; New Years Gift, Chipinge NMZB-UM 7570; Ngorima C.L. (E) NMZB-UM 10384, 16939-40; Norton NMZB 3893, 3982; NMZB-QVM 72; Nottingham Ranch, Beitbridge NMZB-UM 13381; Nuanetsi NMZB-UM 1596; Nyamaropa C.L., Nyanga NMZB-UM 21691; Nyamandhlovu 15 km SE, NMZB 11768; Nyamandhlovu 20 km ENE, NMZB 12561; Nyamugwe Pan, Gonarezhou Nat. Park NMZB 7149; Nyanga Tea Estates NMZB-UM 8358, 10722; Nyazura NMZB-UM 28349; Odzi NMZB 423; NMZB-UM 10, 7930, 9176, 10375, 10464, 17801, 17810, 26601, 29138, 30288; Old Mutare

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PSAMMOPHIS CRUCIFER: ZIMBABWE. Bundi Valley, Chimanimani Nat. Park NMZB-UM 3406, 3814, 4736; Chisengu F.R., Chimanimani NMZB-UM 20816; Dragons Tooth, Chimanimani Nat. Park NMZB-UM 11483; Erin, Nyanga NMZB 13987; Gwendingwe Estate, Chimanimani NMZB-UM 31507; Lake Alexander, Mutare NMZB-UM 29412; Nyamaziwa, Nyanga TM 22369; Nyanga Nat. Park NMZB-UM 11842-4, 28087; Odzani NMZB-UM 25696; Odzani Falls NMZB 620; Odzi NMZB 1192; Punch Rock, Nyanga NMZB 11629, 11764; Selborne, Nyanga NMZB-UM 11371-2, 12437, 16060; Silverstreams, Chimanimani NMZB-UM 7376; Stapleford, Mutasa NMZB-UM 11920; Troutbeck, Nyanga NMZB-UM 8979; Tsetsera, Mutare NMZB 3045, 4083-4. MOZAMBIQUE. Martins Falls, Chimanimani Mts NMZB-UM 27431. SOUTH AFRICA. Addo Elephant Nat. Park PEM 3634; Amsterdam 5 km SE, CM 61108; Andies Vosloo Kudu Res, PEM 8178; Anysberg Nat. Res. PEM 7158; Arnot TM 14090; Baakens River Valley, Port Elizabeth PEM 10683; Barberton TM 5549; Bathurst District MCZ 21344; Bedford PEM 8746; Bergkwagga Nat. Park, Cradock TM 52071; Bergplaat Farm 2, Baviaanskloof, E. Cape Prov. PEM 11406; Betty's Bay, Caledon TM 67955; Blaney PEM 4112; Blauwboschkraal, Lydenburg TM 5560; Blesberg, W. Cape Prov. PEM 7858; Blyde River Nat. Res. TM 62204; Boschhoek Farm, Lydenburg TM 62228; Botterkloof Pass, Calvinia TM 81515; Buffalo Kloof, 17 km SE of Grahamstown PEM 11403; Cape Agulhas TM 19849-50; "Cape Colony" TM 5550; Cape Flats FMNH 205810; Cape of Good Hope ANSP 5115; MCZ 2235; Cape of Good Hope Nat. Res. PEM 4975, 4979, 5001; Cape Peninsula CAS 111676; MCZ 21428; Carolina TM 5558, 38232; Cathedral Peak, Drakensberg NMP 1098; TM 50172, 32738, 50172; Coldstream nr Grahamstown TM 19288; Coleford Nat. Res., Underberg TM 63928; Crocodile River nr Pretoria TM 32717; De Kuilen Farm, Lydenburg TM 62212; De Roodepoort Farm, Ermelo TM 62221; Desire Farm, Pilgrims Rest TM 62213, 62215; Diep River, W. Cape Prov PEM 3447; Doornkop, Witpoort TM 5544; Doringbaai, Vredenburg TM 56066; Downs Nat. Res., Letaba TM 63848; Dycedale Farm, Barberton TM 62198, 62214; East London MCZ 14198; MNHN 96-409-12; NMZB-UM 11001; TM 5546, 5553, 5556, 5612, 30160, 32695; Edgemead, Melkbosstrand TM 54033; Elands River, Die Eiland PEM 979;

Elandsfontein, Belfast TM 62225; Elandsfontein, Roodepoort TM 62199; Elandsjagd Dam PEM 4919; Ermelo TM 5559; Fairholm Farm, Grahamstown PEM 11404; Fernie Farm, Ermelo TM 62201; Forest Hill-Glenanda TM 64045; Fraser's Camp, 35 km E of Grahamstown PEM 11402; Generaalsdraai Farm, Belfast TM 62229; Glenanda, Johannesburg TM 47528; Goedgedacht Farm, Standerton TM 62219; Gordon's Bay, Strand TM 63993; Graaff-Reinet PEM 973; Grahamstown M CZ 21345, 29044-5; TM 5554, 5564-5, 5568, 71118, 71127; PEM 11395, 11401, 11405; Groen River Mouth, West Coast PEM 7201; Grootgeelhoutboom Farm, Lions River TM 63975; Halfgewonnen Farm, Bethal TM 62217; Harnham Farm, Soutpansberg TM 62209; Hartebeesvlakte 163, Pilgrims Rest TM 45005; Hoedspruit Farm, Middelburg TM 62226; Hoekop, Joubertina PEM 13704; , Hondeklipbaai, Little Namaqualand FMNH 205818; TM 15783, 71134; Honeydew PEM 11800; Hout Bay FMNH 205811, 205813-7, 206365-7; Injasuti, Giants Castle Game Res. TM 63962; Irene, Pretoria TM 5562-3; Itala Game Res., Ngotshe TM 55411, 56475; Johannesburg TM 47530; Jonkershoek TM 32732; Kaapsche Hoop Farm, Nelspruit TM 62208, 62224; Kafferskraal, Amersfort TM 62206; Kamberg Nat. Res., Mooi River TM 63009; Kamieskroon TM 42450; Kammanasieberg PEM 3589, 11032; Kareevlakte PEM14555; Karoo Nat. Park PEM 4318; Kastrol Nek, Wakkerstroom TM 11206; Kempton Park, Johannesburg NMZB-UM 12459; Kenton-on-Sea 25 km NW, PEM 11396; King Williams Town PEM 4154; Klawer USNM 159330; Klawerlei Farm, Harrismith TM 56536; Kleinsee FMNH 16035; TM 68174, 71164; Kliphuisvlei, Groot Swartberg PEM 8197; Kommetjie USNM 159331-2, 165090; Koudouw, Outeniquaberg PEM 12913-5; Kraai River, Barkly East TM 47488; Krantzview, Carolina TM 5547; Kromdraai Farm 274, Barkly East TM 49610; Lady Frere, nr Queenstown FMNH 15549; Lamberts Bay PEM 1901; Leeuklip Farm, Middelburg TM 62197; Leiden Farm, Wakkerstroom TM 62223; Lisabon Farm 262, Lydenburg TM 55797; Lothair, Ermelo CM 69239; TM 54758; Lusthof 1456, Kroonstad TM 36667; Lydenburg TM 5566; MacDougals Bay, 8 km S of Port Nolloth PEM 6127; Malmesbury CM 69232; Manchsberg, Lydenburg TM 56691; Mooi River TM 52309, 54783; Mooikloof PEM 7884; Mooimeisiefontein Farm, Volksrust TM 62220; Morgenzon 107, Wakkerstroom TM 37635; Mouchsberg, Lydenburg TM 56831, 56833-7; Mphome, Pietersburg TM 62238; Mt Currie Nat. Res. TM 63020; Niewefontein, Garies PEM 992; Noordhoek FMNH 205812; Ohrigstad Dam Nature Res., Lydenburg TM 62218, 62227, 62239; Olifantfontein, Pretoria TM 22731, 52132; Oorlogskloof Nature Res. PEM 4988; Op die Rivier Farm, Ficksburg TM 37372; Oshoek Farm, Lydenburg TM 57460; Ottery, Cape Flats NMZB-UM 10997; Outeniqua Nature Res. PEM 8705; Paardekraal Farm, 10 km SE of Grahamstown PEM 11397; Paardeplaats Farm, Lydenburg TM 62234; Pilgrims Rest TM 28531; Plumstead, Cape Town TM 47241, 47269-70; Port Alfred TM 46109-11, 37377-8, 42696; Port Elizabeth PEM 971-2, 974-5, 977-8, 6439, USNM 63538, 63605; Pretoria TM 5551, 5611, 12626; Randfontein TM 5567; Redhouse, Port Elizabeth TM 65717; Rietvlei Dam, Pretoria TM 45594; Rolfontein, Amersfort TM 62202, 62231; Rooivlei 327, Namaqualand TM 63516; Rustfontein 1030, Pietersburg TM 43939; Sabie TM 5552; Shafton Grange, Karkloof NMP 1266; Silversdale Farm, 17 km SE of Grahamstown PEM 11398-9; Skurweberge NMWN 5881; Solomon's Temple Farm, 16 km S of Alicedale PEM 11400; Souda Forest Nature Res., Kwazulu/Natal TM 56727; Spoeg River Mouth 10 km S, West Coast PEM 7205; Steynsburg PEM 8229; Stillbay, Riversdale TM 20068-9; Suikerbosrand Nature Res., Heidelberg TM 42444, 62205, 62207, 62216; Summerstrand PEM 1376; Suuranysberge, N of Kareedouw PEM 13669; Suurberg PEM 965-6, 3455; Swartberg Pass PEM 1609, 4823; Swartberg Pass 11 km E, PEM 6603; Tafelkop, Ermelo TM 62222; Tafelkop, Wakkerstroom TM 62196; The Downs, Letaba TM 62232; Thomas Baines Nature Res., Settlers Dam PEM 5088; Tokai TM 5557; Tweefontein, Ermelo TM 62235; Tweefontein 101, Sutherland TM 78676; Tweeling, Frankfort TM 47102; Tynandini, 8 km E of Herschel TM 29799; Uitenhage 20 km N of, PEM 4406; Verkyk, Volksrust TM 62233; Vlakspruit, Standerton TM 62211; Vryheid TM 5545; Wakkerstroom TM 5555; Walmer PEM 976, 6412; Wanhoop, Lydenburg TM 62230, 62236-7; Waterval, Volksrust TM 62200; Waterval, Pietersburg TM 62203; Welbedacht, Standerton TM 62210; Welgevonder 969, Lions River TM 53486; Witteklip PEM 7941; Zoetendal's Vallei, Bredasdorp TM 19811; Zuurfontein, Johannesburg TM 5548. SWAZILAND. Droxford

Estates, nr Oshoek TM 49792; Forbes Reef 2 km S TM 71836; Malolotja Nature Res. TM 69360, 69379-80, 69382, 71839, 80789; Mbabane TM 47447; Motshane TM 78897. LESOTHO. Mamathes TM 24683.

PSAMMOPHIS ANSORGII: ANGOLA. Benguela to Bihé BMNH 1946.1.8.49 (type).

PSAMMOPHIS ANGOLENSIS: ANGOLA. Dondo MBL 1822. ZAMBIA. Bancroft NMZB 4295; Chikondwe, Luangwa Valley BMNH 1932.12.13.230; Chikowa NMZB-UM 2773, 2779; Chilanga, Lusaka NMZB-UM 698; Chipangali NMZB-UM 3114-5, 17337; Chipata NMZB 97-8, 1600; Chizombo Lodge, Mfuwe NMZB 16911; Kabompo NMZB 1057; Kalabo FMNH 134245; NMZB-UM 20994, 21006; Kalichero NMZB-UM 2771-2, 2883; Kasempa NMZB 1315; Kaungashi River, Kasempa NMZB-UM 2984, 4522; Kitwe NMZB 3305; Lealui MNHP 1920.103; Livingstone NMZL 295; Luambe Game Res. NMZB-UM 3117; Luangwa Valley USNM 166753; Luano Valley, Chisorwe BMNH 1932.10.11.3; Mazabuka DM 1331- 2; Mchinji nr NMZB-UM 2769; Msoro NMZB-UM 2770; Musenga, 15 km SE of Chingola PEM 7132; Ndola NMZB-UM 681; Ngoma, Kafue Nat. Park NMZB-UM 1988; Rukuzi Dam NMZB-UM 3116; Yacobi Village, Luangwa Valley LACM 136149. MALAWI. Blantyre TM 52530, 54072; Cape Maclear, Lake Nyasa BMNH 77.7.2.11-2; Mangochi BMNH 95.12.12.12; Kasungu AMNH 67772 Lifupa Camp, Kasungu Nat. Park NMZB-UM 24872; Namiwawa, Blantyre TM 54072; Sucoma Sugar Estates TM 54071; Zomba BMNH 1934.2.1.31. NAMIBIA. Eastern National Water Carrier NMWN 9660; Grootfontein NMWN 7787; Halali, Etosha Nat. Park NMWN 9747; Katima Mulilo NMZB-UM 24207; NMWN 9580; TM 46338; Katima Mulilo 15 km WSW, NMZB-UM 21278; Makamba on Okavango River TM 38517; Okaukuejo, Etosha Nat. Park SMF 66270; Rundu TM 54766. BOTSWANA. Kasane NMZB-UM 13326; Maun NMZB-UM 12461, 18168 ; Ngwezumba Bridge NMZB-UM 16158; Okavango Delta TM 45959; Tsodilo Hills 25 km NE, TM 8044. ZIMBABWE. Beitbridge AJL 864; Binga TM 26206; Buffels Drift, Chipinge NMZB-UM 6135; Bulawayo NMZB 1056, 5150, 14303, NMZB-UM 671, 5306-7, 5386, 13145, 20317, 21612, 32221; Bulawayo 20 km NNW, NMZB-UM 138; Bulawayo

40 km NNW, NMZB 3931; Cement, Bulawayo NMZB-UM 8921; Chinhoyi NMZB 4009; NMZB-UM 5463; Chipinda Pools NMZB-UM 1626; Chiredzi FMNH 205808; NMZB-UM 22122, 27367; Chishawasha NMZB-UM 20528; Deka-Zambezi Confl. NMZB 15416; Devure River Bridge NMZB-UM 8659; Dumella, Nuanetsi NMZB-QVM 166; Featherstone NMZB-UM 18295; Fern Valley, Mutare NMZB-UM 8632; Great Zimbabwe NMZB 13226; Gwanda NMZB 6064; Harare NMZB-UM 6852, 10139, 16148, 20604, 32653; NMZB-QVM 417; Holderness Farm, Muriel Mine NMZB 4008; Humani Ranch NMZB-UM 23932; Hwange Nat. Park NMZB-UM 29590; Inyankuni Dam NMZB-UM 32903; Inyokene, Nyamandhlovu NMZB 13932,14511; Kadoma NMZB-UM 31366; Kapami, Hwange NMZB-UM 753; Kariba NMZB 3611; NMZB-UM 2751- 2, 11288, 11746; Kariba Lake FMNH 187143; Kariba Lake - Sengwa Mouth NMZB-UM 33141; Kariba Lake nr Binga TM 26206; Karna Block, Lupane NMZB 15509; Karoi NMZB-UM 21421; Kasamba Jesse, Mana Pools Nat. Park NMZB 7602; Kasetsheti River, Hwange NMZB 9135; Katombora Rapids, Hwange NMZB 8398; Kazuma Depression, Hwange NMZB 9178; Kwekwe SPQ 69; Matopos Nat. Park NMZB-UM 31847; Mutare NMZB-UM 14515, 22728, 23332, 28043, 33623; Mwizilume Dam, Matopos Nat. Park NMZB-UM 27535; Mzarabani C.L., Centenary NMZB 9392; Norton NMZB-UM 32652; Ntabambomvu Hills, Gonarezhou Nat. Park NMZB-UM 29746; Nyakasikana, Mana Pools Nat. Park NMZB 10979; Nyamandhlovu NMZB 13983; Nyanyadzi, Chimanimani NMZB-UM 23072; Odzi NMZB-UM 31403; Old Mutare NMZB-UM 5372; Penhalonga, Mutasa NMZB-UM 1799; Plumtree NMZB-UM 8449; Riversdale Estate, Filabusi NMZB 11370; Rudy Farm, Bulawayo NMZB 6649; Rukute Farm, Doma NMZB-UM 12554; Rusape NMZB-UM 16; Sengwa Wildlife Res. Area NMZB 8356; Shapi Pan, Hwange Nat. Park NMZB-UM 29589; Sonavundla/Linquasa Vlei, Hwange Nat. Park NMZB 11841; Sutswe, Mutoko NMZB-UM 29244; Trelawney TM 21654-5; Victoria Falls VFPN 14; Zambezi-Chewore Confl. NMZB-UM 5678. MOZAMBIQUE. Moebase PEM 13321; Muda-Lamego NMZB-UM 7066; Nagonha River Valley, Zambezia PEM 3213; Nampula 50 km W, NMZB-UM 24056; Tshimbo ZMB 27509; Ungodje JPT 1023; Zinave NMZB-UM 30670, 30676. SOUTH AFRICA. Albatros, Manyeleti Game Res.

PEM 6574; TM 67024; Argyle Farm TM 62071; Paddafontein 375, Thabazimbi TM 50048; Percy Bulfontein TM 71131; Doorndraai Farm TM 62077; Fyfe Nat. Park TM 62076; Phalaborwa TM 36081; Doornlaagte Farm PEM 9020; Gumela, Venda TM Philippolis BMNH 1909.9.3.6; Pretoriuskop, Kruger 62074; Hoedspruit TM 62072; Hoedspruit Nature Nat. Park TM 62075; Rietfontein Farm TM 62078; Res. TM 82544; Kromdraai Farm TM 56659; Rustenburg TM 26184; Sand River, Messina PEM Loskop Dam Rest Camp TM 26209; Loskop Dam 3457; Sesalandonga Spruit - Pafuri TM 28878-9; TM 26209, 79798, 80575; Main Camp, Manyeleti Tshidze Hill, Venda TM 62073; Zandriverspoort Game Res. TM 67738; Messina TM 56282; TM 62079.

