Genus *Amblyodipsas* Peters, 1856

Amblyodipsas Peters, 1856, *Monatsb. Akad. Wiss. Berlin*, p. 592 and 1882, *Reise n Mossamb.*, 3, p. 109. Type: *Calamaria microphthalma* Bianconi.

Small to medium sized fossorial snakes rarely seen except in the rainy season when they may move across open ground. Cylindrical bodied snakes with a depressed rounded snout and head almost indistinct from neck and rest of body. Eyes small to very small with a rounded pupil; nasal entire or divided. Two enlarged, grooved fangs below the eye on the maxilla.
Dorsal scales smooth, imbricate and in 15 to 21 (rarely 23) rows at midbody; ventrals smooth; anal scale divided; tail short and ending in a rounded or obtuse tip. Subcaudals in two rows. Oviparous.
Three species and one subspecies occur in the Transvaal. These snakes are found in various habitats including forest and montane grassland (*concolor*), sandy bushveld (*polylepis*), deep alluvial sands (*microphthalma*) and sandy soil along the Soutpansberg mountains (*nigra*). Some species are very rare and very little is known of their ecological requirements, while others are more frequently encountered but still little understood.

Key to the Transvaal species.

1. Upper labials usually 7, 5th largest;
   two pairs chin shields ..... *A. concolor*
   Upper labials 4 to 6, 3rd or 4th largest;
   a single pair of chin shields 2

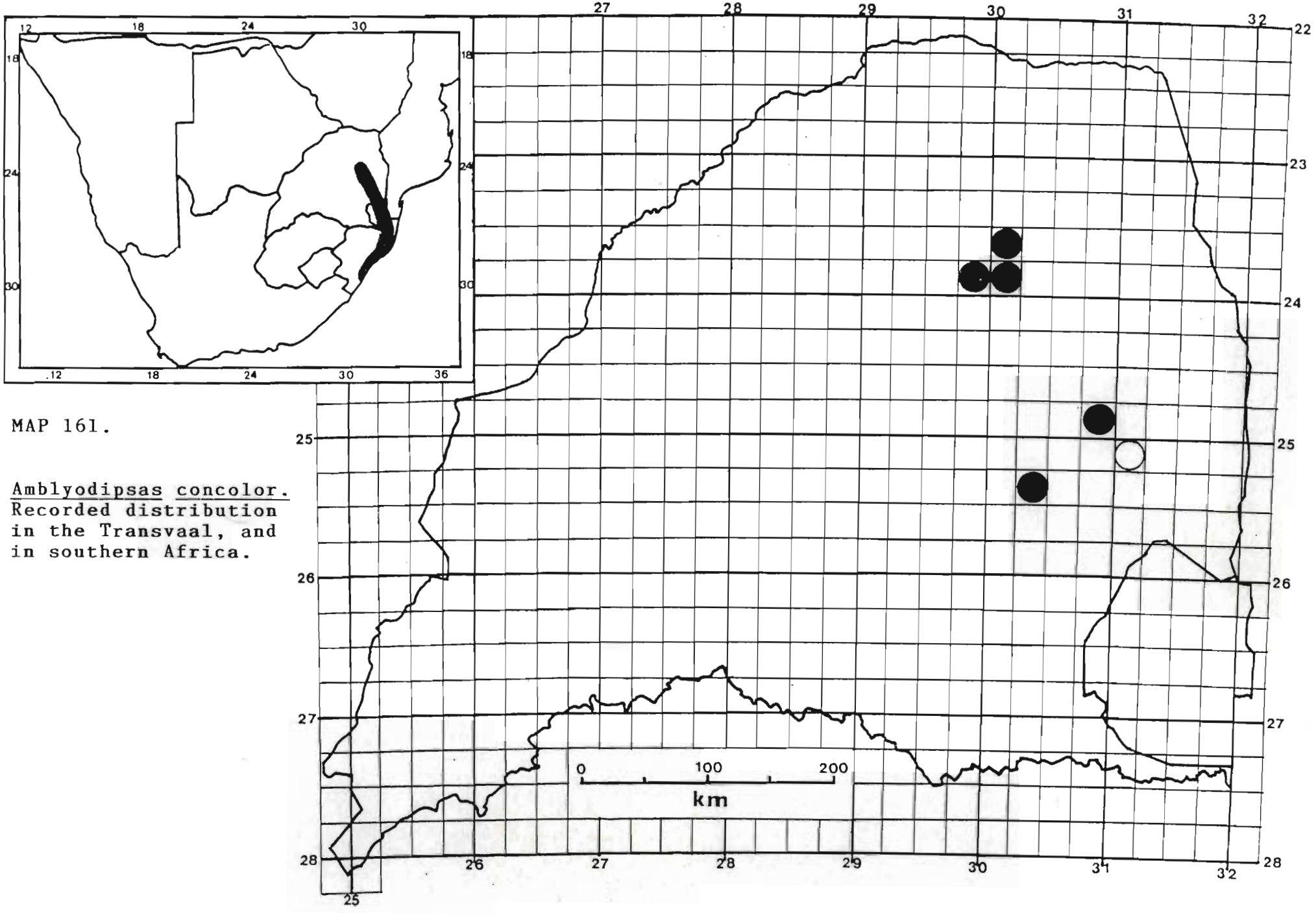
2. Internasals fused with prefrontals 3
   Internasals not fused with prefrontals ... *A. polylepis polylepis*

3. Uniform black above and below ..... A. microphthalma nigra
Uniform black above and bright
yellow below. Upper labials yellow .... A. microphthalma microphthalma

Amblyodipsas concolor (A. Smith, 1849)

Choristodon concolor A. Smith, 1849, Ill. Zool. S. Afr., Rept., App., p. 18. Type locality: Kaffirland to eastward of Cape Colony, i.e. Natal, fide FitzSimons 1962.
Choristocalamus concolor (A. Smith). FitzSimons 1962, p. 247, 1966, p. 67, 1970, p. 147.
Amblyodipsas concolor (A. Smith). Broadley, 1971 b, p. 642; FitzSimons, 1974, p. 147; Pienaar, 1978, p. 180, pls. 82 & 82A; Jacobsen & Haacke, 1980, p. 56; Welch 1982, p. 137; Broadley, 1983, p. 159, figs. 103 & 104; Pienaar et al, 1983, p. 170, pls. 74; Branch 1988a, p. 78, pl. 38, 1988b, p. 12.

Diagnosis: 6 Specimens examined.
Colour: A uniform, glossy dark brown or black above with a purplish sheen. Underparts a little paler than above, with ventral scales pale-edged along their posterior borders (Broadley, 1983).
Lepidosis: A stocky snake with a depressed shovel-shaped head indistinct from the neck. Tail short, tapered and bluntly pointed. Rostral much broader than deep; nasals usually completely divided in adults (often semi divided in immatures); nostril pierced in upper posterior corner of anterior scale; internasals broader than long; loreal absent; supraocular reduced; eyes small; postocular small (occasionally fused with supraocular);



MAP 161.

Amblyodipsas concolor.
Recorded distribution in the Transvaal, and in southern Africa.

UL 7 with 3rd and 4th entering orbit, 5th largest; LL 7 (rarely 6), 1st in contact with its fellow behind the mental. Body covered with smooth, imbricate scales, in 17 rows at midbody; ventrals 133-147 in males and 148-157 in females; anal scale divided; subcaudals 30-39 in males and 28-36 in females.

Size: Broadley (1983) records adults as averaging 350,0 mm in total length. The largest male (Natal) had a SVL of 367,0 mm. Douglas (1982a) recorded a female (TM 56371 - Schoemanskloof) with a SVL of 749,0 mm and a total length of 850,0 mm. Length of tail is contained in total length 4,6 to 6,1 times in males and 6,5 to 9 times in females, (Douglas, 1982a, Broadley, 1983).

Distribution

Natal to the northern Transvaal.

Distribution in the Transvaal (Map 161).

Broederstroom, Haenertsburg; Deelkraal 412LT; Graskop 564KT; Politsi; Schoemanskloof; Woodbush.

Literature Records

Phaben, (Broadley, 1971b).

Habitat and Ecology

Very little is known of this rare snake which is found in veld types 8, 9 and 10 at altitudes ranging from 400-1500 m a.s.l. Appears to inhabit well wooded or forested regions being found under rocks and rotting logs. Douglas (1982d) recorded that a specimen consumed other snakes including *Lamprophis fuliginosus*, *Psammophylax*

tritaeniatus, Aparallactus capensis and Typhlops sp., indicating a preference for the first named species in captivity. This same specimen refused mice even after a year without food. Bourquin (1970) reported on a clutch of 12 eggs, 10 of which had hatched, the hatchlings measured on average 185,0 mm in total length. The eggs had been deposited 10 cm under the soil at the edge of closed coastal forest. The eggs measured 30,0 x 18,0 mm. Broadley (1983) records that a label on a Politsi specimen indicated that it gave birth to 12 young during March.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A very rare snake which may have occurred more widely, prior to the afforestation of a large part of the south-eastern escarpment zone. More intensive surveys are needed to establish its abundance, distribution and habitat, data which are needed for greater conservation effort. Currently considered vulnerable.

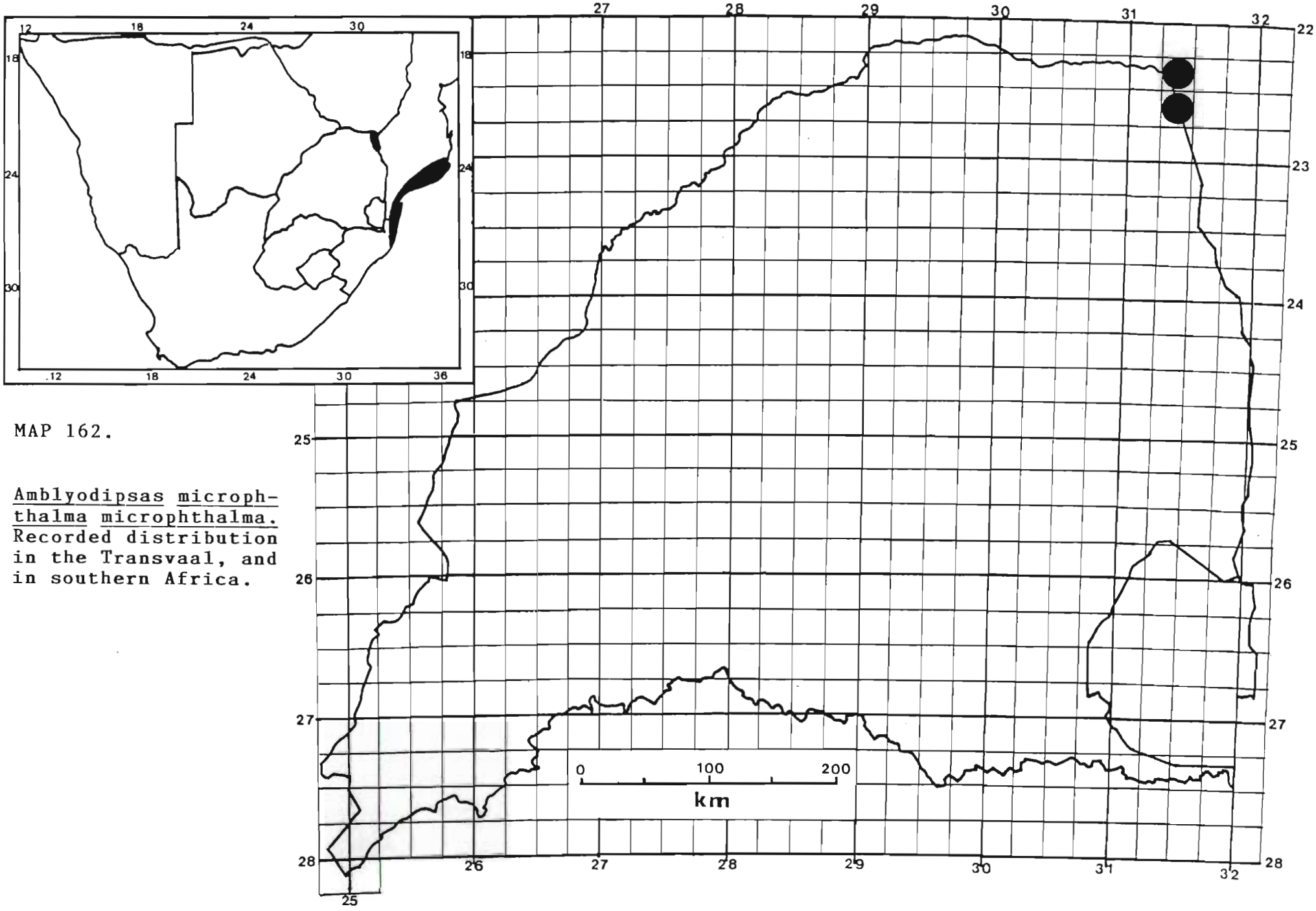
Remarks

Broadley (1971b) reports on the variability within the genus and species of Amblyodipsas. This is supported by Douglas (1982a) in a discussion of a specimen from Schoemanskloof (TM 56371) which has a depressed snout, as well as upper interlabials and irregular lower labial scalation, a feature which as he put it, is fairly common within the genus Amblyodipsas.

Amblyodipsas microphthalma microphthalma (Bianconi, 1850)

Calamaria microphthalma Bianconi, 1850, Spec. Zool. Mossamb, p. 94, pl. xii, fig. 1. Type locality: Inhambane, Mozambique.
Amblyodipsas microphthalma (Bianconi). FitzSimons, 1962, p. 248, fig. 69, 1966, p. 64, 1970/74, p. 147, pl. 19, fig. 1; Pienaar 1966, p. 194, pl. 87; Broadley 1971 b (part), p. 644; Pienaar, 1978 (part), p. 178, pl. 81; Jacobsen & Haacke, 1980 (part), p. 57; Welch 1982, p. 138; Broadley 1983, (part), p. 201, fig. 105, pl. 37; Pienaar et al, 1983 (part), p. 172, pl. 75.
Amblyodipsas microphthalma microphthalma (Bianconi). Jacobsen, 1986, p. 123; Branch, 1988a, p. 78, pl. 24, 1988b, p. 12.

Diagnosis. 11 Specimens examined.
Colour: Dark brown to blackish above with a purplish gloss or sheen. Upper-lip and along the sides pale yellow. Under surface of body white to yellow, but with a dark longitudinal stripe or band along middle of belly.
Lepidosis: A small, moderately slender snake with a depressed head as wide as the neck and a short tail, rounded at the tip. Snout rounded; nasal entire; internasals fused with prefrontals; postocular 1; UL 5, 2nd and 3rd in contact with the orbit; LL 6 (rarely 5), the first four in contact with the sublinguals. Dorsal scales smooth and imbricate and in 15 rows at midbody; Scales between parietals and tail tip 162 to 180; ventrals 120-153 (mostly 135-144, lowest count referring to a St. Lucia specimen), Broadley (1983) records that males range from 127-135 and females 142-155; anal scale divided; subcaudals 18-28, males 24-28 and females 18-22.
Size: A small species not exceeding 450,0 mm in total length. Largest male SVL = 263,0 mm (NKW 379 - north of



MAP 162.

Amblyodipsas microphthalma microphthalma. Recorded distribution in the Transvaal, and in southern Africa.

the Cabora Bassa line); Largest female SVL = 305,0 mm (NKW 277 - Pafuri to Saselondonga); Mean male SVL = 233,29 mm ± 22,84 (1SD), n = 7; Mean female SVL = 289,33 mm ± 23,76 (1SD), n = 3. Tail short, contained from 8 to 12 times into total length.

Distribution

Southern Mozambique, north-eastern Transvaal and northern KwaZulu.

Distribution in the Transvaal (Map 162).

Between Nwambiya and Mahlaguza; Cabora Bassa Line to end of Sandveld; North of Cabora Bassa Line; Nyandu Bush, Wambiya Sandveld; Nyandu Bush - Beacon; Pafuri to Saselandonga; Saselandongaspruit.

Literature Records

Eastern boundary opposite Nwambiya pan; between Mathlakuza pan and Shimuhene pan; eastern boundary in sandveld north and south of Saselandonga gorge; between Nyandu sandveld and beacon 9; sandveld north of Cabora Bassa power lines (Pienaar et al, 1983).

Habitat and Ecology

Usually found under stones and rotting logs in veld types 15 at an altitude of 200 m a.s.l. A fossorial species, it inhabits areas of deep aeolian sands and coastal alluvium, foraging for fossorial limbless skinks such as Typhlosaurus aurantiacus and possibly even amphisbaenians such as Zygaspis spp (Broadley, 1983). Little is known of this rare snake.

Conservation Status (RDB 1988, peripheral).

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A rare snake whose total distribution in the Transvaal is limited to the northern Kruger National Park. The species is therefore secure.

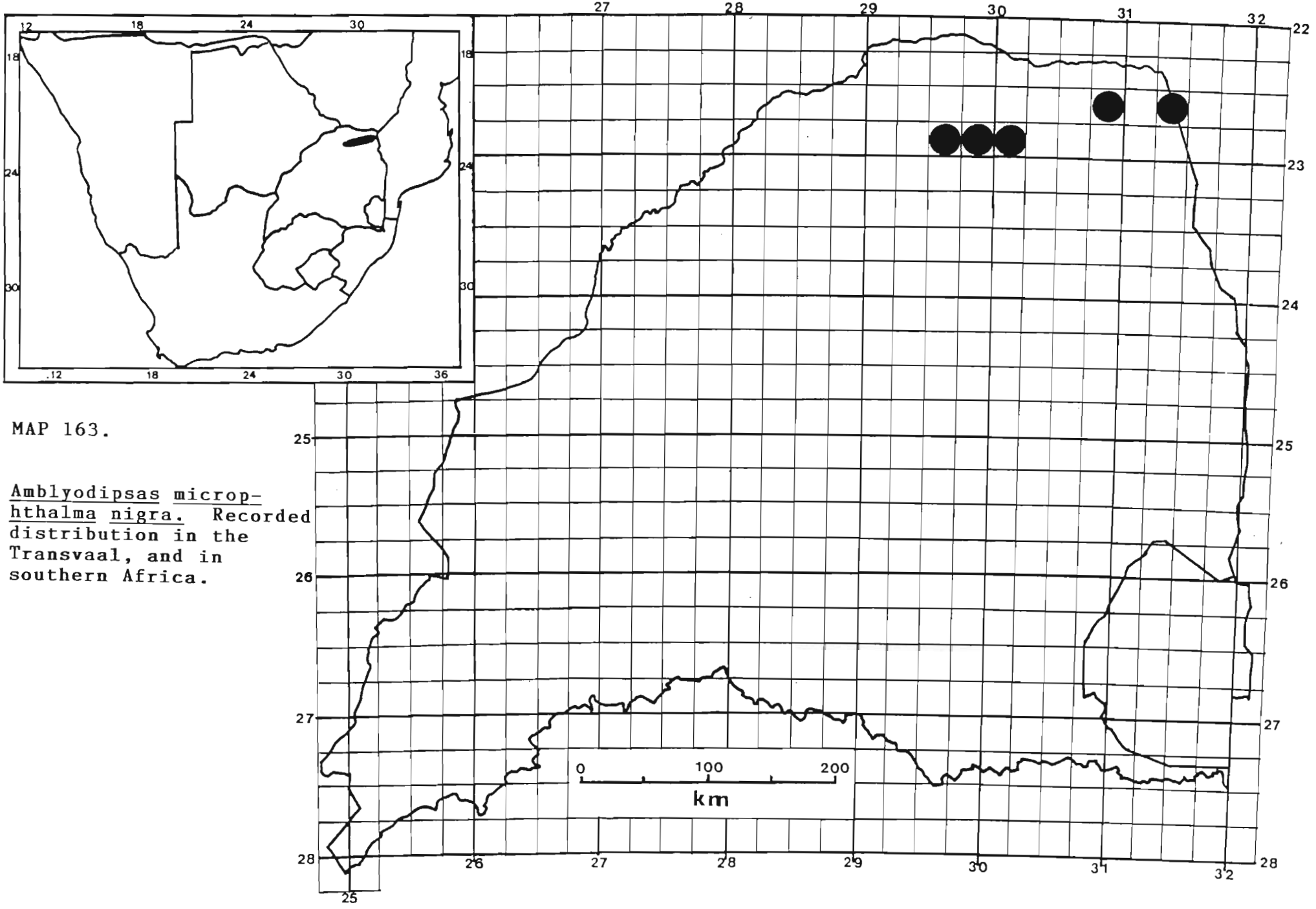
Remarks

The melanistic individuals originally described under this species (Broadley, 1983, Pienaar et al, 1983) have been found to warrant at least subspecific status and have been named nigra (Jacobsen, 1986).

Amblyodipsas microphthalma nigra Jacobsen, 1986.

Amblyodipsas microphthalma nigra Jacobsen, 1986, Ann. Tvl. Mus. 34(5), p. 123. Type locality: Farm Harnham 793MS, Soutpansberg dist., Transvaal. Branch 1988a, p. 78, 1988b, p. 12.
Amblyodipsas microphthalma (not Bianconi, (part). FitzSimons 1962, p. 248, 1966, p. 64; 1970/74, p. 645; Pienaar 1966, p. 194; 1978; p. 178 (part); Broadley, 1971(b), p. 644; Jacobsen & Haacke, 1980, p. 57; Welch, 1982, p. 138; Broadley, 1983, p. 201; Pienaar et al, 1983, p. 172, pl. 75A.

Diagnosis: 8 Specimens examined.
Colour: Uniform black above and below. The edges of each scale are pale edged giving the snake a checkered appearance (see pl. 75A, Pienaar et al, 1983).
Lepidosis: A small, slender snake with a depressed head,



MAP 163.

Amblyodipsas microphthalma nigra. Recorded distribution in the Transvaal, and in southern Africa.

cylindrical body and short, round tipped tail. Snout rounded; nasal entire; internasals fused with prefrontals; postocular 1; UL 5, 2nd and 3rd entering orbit; LL 6 (rarely 5), the first 4 in contact with the sublinguals. Dorsal scales smooth and overlapping, midbody scales in 15 rows; middorsal scales from behind head to tail tip 174-192; ventrals 146-168, with males 146-155 and females 164-168; anal scale divided; subcaudals 20-24 with males apparently 22-24 and females 20-21.

Size: Largest male SVL = 320,0 mm (TM 58428 - Harnnam 793MS), mass = 10,0 g (TM 58428); Largest female SVL = 313,0 mm; Mean male SVL (>150,0 mm) = 233,75 mm ± 58,06 (1SD), n = 4; Mean female SVL (>150,0 mm) = 233,5 mm ± 112,43 (1SD), n = 2. The tail is short and in males contained in total length 10,45-11 times and in females 12,38 to 13,83 times.

Distribution

Endemic to the Transvaal.

Distribution in the Transvaal (Map 163).

Crewe 771MS; Dongadziba; Entabeni 251MT; Harnham 793MS; Saselandonga Gorge; Vhuswinzhe; Between Tsumanene and Madziringwe turnoff.

Habitat and Ecology

Restricted to rocky outcrops and along the Soutpansberg mountain range in veld types 8, 9, 18, 19 and 20 at altitudes of 300-1600 m a.s.l. Usually found under rocks on soil but occasional specimens have been collected while traversing open areas between outcrops. Very little is known of this very rare species.

Conservation Status (RDB 1988, restricted).

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. The species is known to occur in the northern Kruger National Park and possibly in the Happy Rest nature reserve. Intensive surveys are needed in the Soutpansberg to establish its abundance. However on account of its habitat preference it is secure.

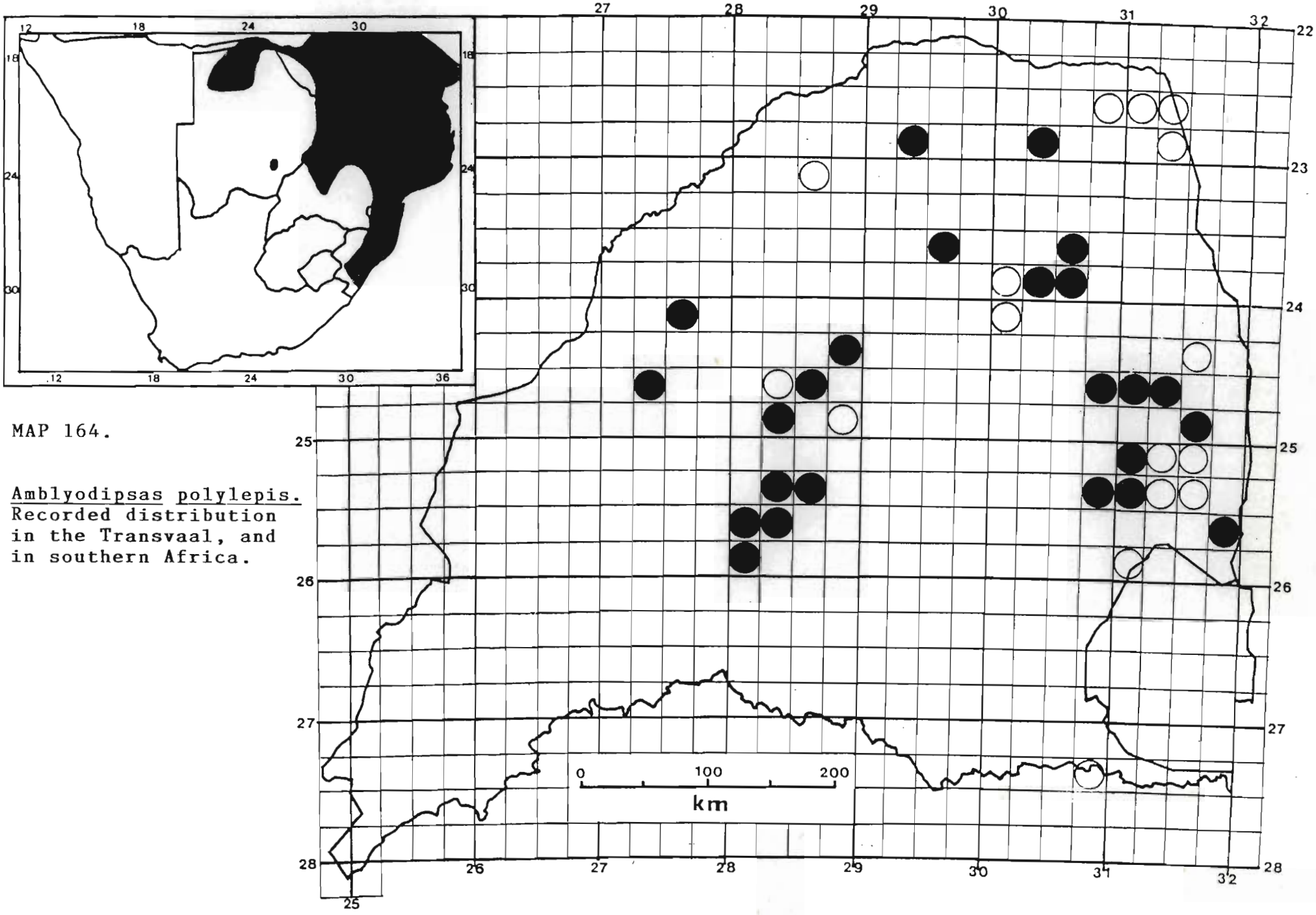
Remarks

As for the nominate race and in Jacobsen (1986).

Amblyodipsas polylepis polylepis (Bocage), 1873

Calamelaps polylepis Bocage, 1873, Jorn. Sci. Lisboa (1), 4, p. 216. Type locality: Dondo = Dundo, Angola.
Calamelaps unicolor miolepis Gunther 1888. FitzSimons 1962, p. 242, 1966, p. 66, 1970, p. 143, pl. 18, fig. 2; Pienaar 1966, p. 193, pl. 86.
Amblyodipsas polylepis polylepis (Bocage). Broadley, 1971 b, p. 649, fig. 7; FitzSimons, 1974, p. 146, pl. 18, fig. 2; Pienaar, 1978, p. 176, pls. 80 & 80A; Jacobsen & Haacke, 1980, p. 55; Welch, 1982, p. 138; Broadley, 1983, p. 202, fig. 106, pl. 38; Pienaar et al, 1983, p. 174, pl. 76; Auerbach, 1987, p. 173; Branch, 1988a, p. 78, pl. 38, 1988b, p. 12.
Amblyodipsas polylepis (Bocage). Jacobsen 1977, p. 34.

Diagnosis: 30 Specimens examined.
Colour: A uniform glossy black with a purplish sheen dorsally and ventrally. Becomes an opaque bluish grey, just prior to shedding the skin. Tail blunt and rounded.



MAP 164.

Amblyodipsas polylepis.
Recorded distribution in the Transvaal, and in southern Africa.

Lepidosis: A small stout snake with a depressed head and short, round tipped tail. Snout broadly rounded; nasal entire, nostril pierced anteriorly; internasals broader than long in contact with prefrontals; supraocular 1; postocular 1; UL 6 (rarely 5), 3rd and 4th in contact with the orbit; LL 7 (rarely 6 or 8), the first four in contact with sublinguals. Dorsal scales smooth and imbricate and in 19 or 21 (rarely 23) rows at midbody (usually 19 in males and 21 in females), Broadley (1983). Ventrals 154-215, not exceeding 180 in males or less than 185 in females; anal scale divided; subcaudals 17-28, males ranging from 25-28 and females 17-22 in the Transvaal.

Size: Broadley (1983) records the largest male SVL = 495,0 mm (NMZ 411 - Essexvale, Zimbabwe) and the largest female SVL = 1050,0 mm (UM31301 - Penhalonga, Zimbabwe). The largest Transvaal live measurement is 542,0 mm SVL. A 370,0 mm SVL male had a mass of 23,0 g. Tail is contained in total length 9 to 17,5 times, males ranging 9,5-10,5 and females 13,5 to 17,5.

Distribution

Widespread in Southern Africa from Angola in the west through Zaire, Zambia, Malawi to Mozambique, south to northern South West Africa/Namibia, Botswana, Transvaal, Swaziland and Natal (Broadley, 1983).

Distribution in the Transvaal, (Map 164).

Acornhoek; Bellevue C 518JT; Boekenhoutkloof 129JR; Brakvallei 347KQ; Buffelshoek 340KU; Derdepoort 327JR; Drummondlea; Farnel 473MS; Gravelotte 783LT; Halfway House; Hans Merensky Nature Reserve; Kameeldrift 298JR; Kiepersol; Letaba; Malmaniesrivier 236KQ; Manyeleti

Game Reserve, Main Camp; Nelspruit; Nylsvley Nature Reserve; Palmary Ville 254MT; Pretoria, Iscor/Police College; Primkop 116JU; Rietfontein 214JR; Skukuza; Solomondale; Vaalwater; Vygeboompoort 456KR.

Literature Records

Barberton; Commondale; Hectorspruit; Nylstroom; Pretoriuskop; Punda Milia; Saltmere; Tuinplaats (FitzSimons, 1962). 1 km. S. of Duiwelskloof (Lambiris, 1988). Between Sand River and Mutlumubi drift on main road to Tshokwane; Malonga spring; Phalaborwa, western boundary; Mcosene, near Numbi gate; between Mahembane and Magovane; Voortrekker windmill; just north-west of Shirimantanga; Nyandu sandveld; between beacon 7 and Nyandu sandveld; Satara ranger's quarters (Pienaar et al, 1983). The Downs 34KT (NMZB).

Habitat and Ecology

A fossorial species widespread in Transvaal in veld types 9, 10, 11, 14, 15, 18, 19 and 20 at altitudes ranging from 250-1300 m a.s.l. Seldom seen above ground except after rain has fallen and it is sluggish, being unable to move fast.
According to Broadley (1966c) Zimbabwe specimens fed largely on Typhlops and Leptotyphlops spp. A specimen had fed on a Nucras sp. and one snake consumed a Lycophidion c. capense. Ophiophagy seems to be prevalent in the species. When disturbed, it will hide its head in its coils and raise the tip of its tail, which is then moved about to distract attention from the vulnerable head.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread, occurring in the Kruger National Park and several provincial nature reserves, the species is secure. The only threat is large - scale habitat destruction.

Remarks

Broadley (1983) discusses reasons for separation from *A. unicolor* on the basis of hemipenal morphology, once again emphasising the importance of these organs in separating morphologically close species.

Genus *Xenocalamus* Günther, 1868

Xenocalamus Günther, 1868, *Ann. Mag. nat. Hist.* (4) 1, p. 414. Type: *Xenocalamus bicolor* Günther.

Thin slender, elongated but small snakes, easily recognised by a depressed head, the elongate narrow, pointed snout and very small eyes with a round pupil. The rostral is very large and the mouth inferior. Two enlarged grooved fangs are found on the maxilla, lying below the middle or posterior half of the eye.
Body cylindrical and slender, with dorsals smooth, imbricate and in 17 (exceptionally 21) rows at midbody; Ventrals smooth; anal scale devided. Tail very short and contained in total length from 9-14 times. Males have longer tails than females. Two species and two subspecies occur in the Transvaal, one of which (*transvaalensis*) is only known from two specimens which exhibit a different colour pattern to others of the species in Natal and should be investigated as more material becomes available. The genus as a whole is poorly known, exhibiting pronounced variations in colour pattern within a species from region to region.

Key to the Transvaal species.

1. Upper labials 5, 2nd and 3rd entering orbit;
   3-4 palatine teeth present ..... *X. transvaalensis*
   Upper labials 5 or 6, 3rd and 4th or 3rd
   only, entering the orbit; no palatine teeth
   present 2

2. Upper labials 5, 3rd entering orbit;
   ventrals 186-198 in males, 205-216 in
   females ..... *X. bicolor anstralis*

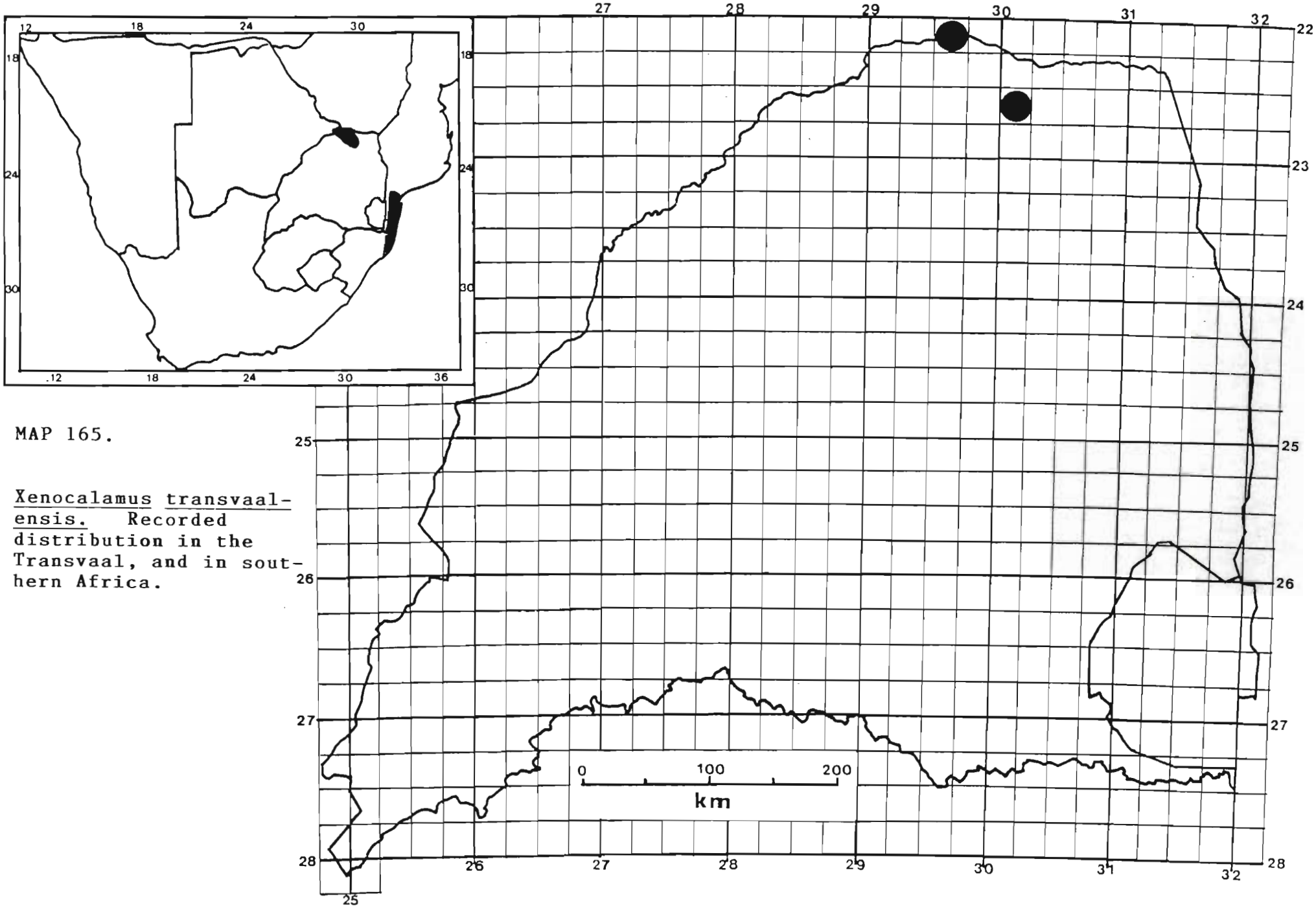
Upper labials 6, 3rd and 4th entering orbit; ventrals 196-230 in males, 216-250 in females 3

3. Head very strongly depressed, at least twice as long as wide; a black dorsal band 3-12 scales wide; yellow laterally, ventrum white ..... X. bicolor lineatus
Head less strongly depressed and not more than twice as long as broad; Coloration usually black above, white below in the Transvaal ..... X. bicolor bicolor

Xenocalamus transvaalensis Methuen, 1919

Xenocalamus transvaalensis Methuen, 1919, Proc. Zool. Soc. London, p. 350, fig. 1B. Type locality: near Ingelel (i.e. Nzhelele river within 40 kilometres of the Limpopo river, N. Transvaal). FitzSimons, 1962, p. 250, 1966, p. 65, 1970/74, p. 148; Broadley 1971b, p. 672; Jacobsen & Haacke, 1980, p. 58; Welch 1982, p. 144; Broadley, 1983, p. 205, fig. 108; Auerbach 1987, p. 174. Branch, 1988a, p. 81, p. 12.

Diagnosis: 2 Specimens examined.
Colour: Two colour forms present. Those in the Transvaal are blue black above. Underparts uniformly creamy white or with irregular dark brown transverse markings on the ventrals. Sometimes a dusky median streak from vent to end of tail. Throat, lower jaw and upper lip almost entirely white.
Those from KwaZulu are black to blotched brown above and yellow below. The dorsal scales are yellow edged giving the snake a checkered appearance (see Jacobsen & Haacke, 1980, p. 58).



MAP 165.

Xenocalamus transvaalensis. Recorded distribution in the Transvaal, and in southern Africa.

Lepidosis: A small slender snake with a cylindrical body, elongate, depressed head and a short spike tipped tail. Snout depressed and prominent, rostral obtusely pointed; nostril pierced in a single large nasal; internasals large; prefrontal elongate, in contact with nasal and internasal; supraocular small and separated from the prefrontal; a single minute pentagonal postocular; UL 5, 2nd and 3rd entering orbit; LL 5 or 6, first three in contact with small chin shields. Dorsal scales smooth, imbricate and in 17 rows at midbody; ventrals 183-192; anal scale divided; subcaudals 30-32 in males and 23-27 in females.
Size: Largest male SVL = 370,0 mm (TM 10121 - Njelele R. 25 km. S. of the Limpopo R.); Largest female SVL = 315,0 mm (TM 28772 - Ndumu Game Reserve) (Broadley, 1983).

Distribution

Extreme eastern Botswana, northern Transvaal east to southern Mozambique and northern Kwa Zulu.

Distribution in the Transvaal (Map 165).

Njelele River; Weipe 47MS.

Habitat and Ecology

Very little is known concerning the habits of the species. Only known from two localities in the Transvaal in veld type 15 at an altitude of 500 m a.s.l. Probably only inhabits areas with deep sand and feeds on amphisbaenians.
Oviparous, two eggs are laid in early summer.

Conservation Status (RDB 1988, rare).

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. On account of its scarcity it is little known and cannot be assessed until more specific surveys to establish distribution and abundance have been undertaken. Status is therefore indeterminate but unlikely to be threatened as the land use practice is still the raising of livestock over most of the region.

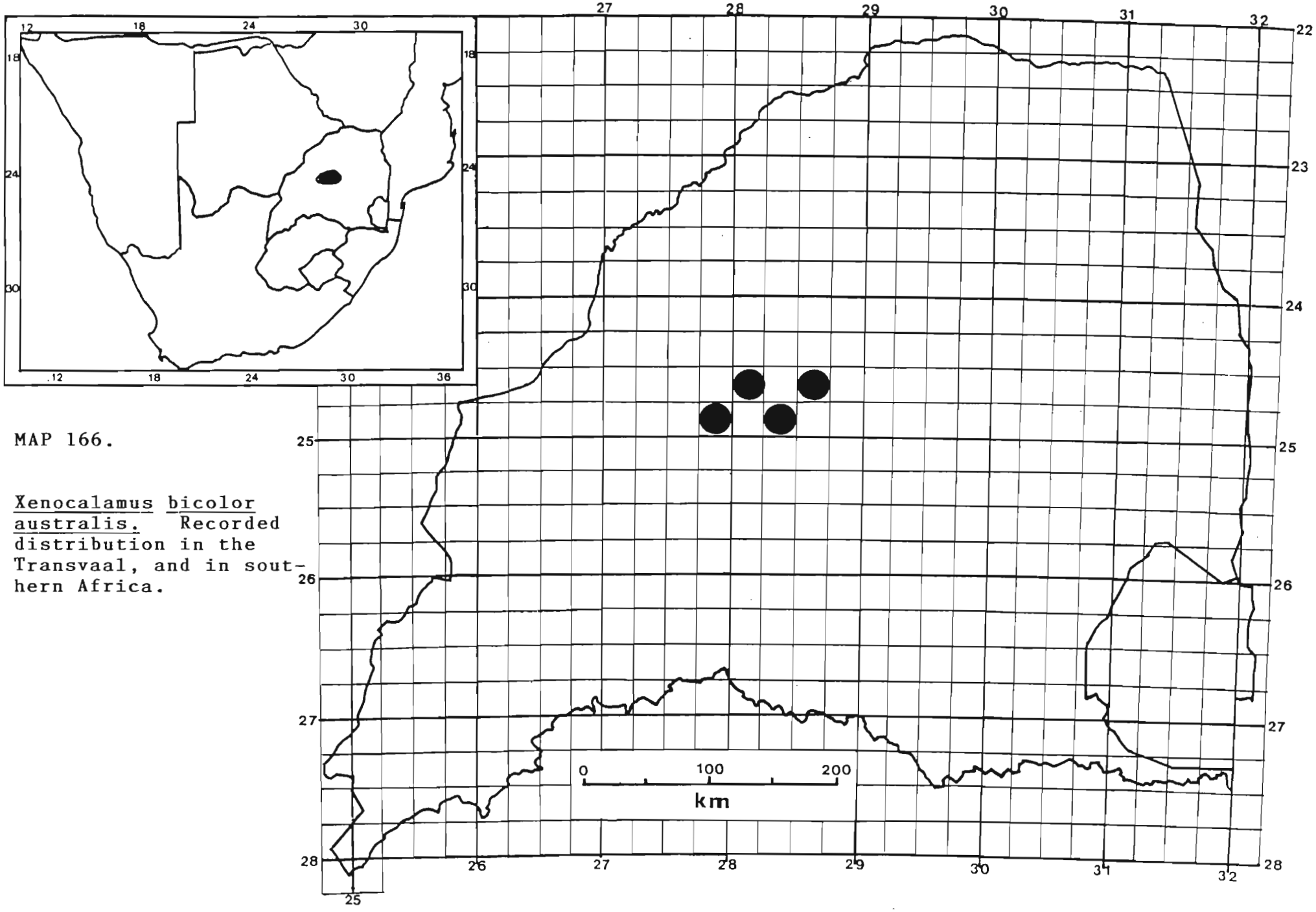
Remarks

TM 43150 - Weipe 47MS is atypical as the postocular on the righthand side has fused with the supraocular. The limited material available makes it difficult to analyse the amount of variation in this species. Broadley (1971b) made a very comprehensive analysis, but this was based on very few specimens. More specimens are needed.

Xenocalamus bicolor australis FitzSimons, 1946

Xenocalamus bicolor australis FitzSimons, 1946b, Ann. Tvl. Mus. 20, p. 386, figs. 9-11. Type locality: Farm Rechuit = Reguit 530KQ, Warmbaths dist., Transvaal. FitzSimons, 1962, p. 253, 1966, p. 65, 1970/74, p. 149; Broadley 1971b, p. 675; Jacobsen 1977, p. 34; Jacobsen & Haacke, 1980, p. 59 (part); Welch, 1982, p. 144; Broadley, 1983, p. 207, fig. 111; Branch, 1988, p. 81.

Diagnosis: 8 Specimens examined.
Colour: Dark slate to purplish-brown above; underparts and two outer scale rows on either side creamy to yellowish white. Lower half of upper labials similar to underparts.



MAP 166.

<u>Xenocalamus bicolor australis.</u> Recorded distribution in the Transvaal, and in southern Africa.

Lepidosis: A slender, cylindrical snake with an elongate pointed, depressed head and a short spine tipped tail. Head narrower than to as broad as neck. Rostral large and obtusely pointed; nasal completely divided; nostril pierced in suture between nasals; postnasal larger than nasal; internasals large, in contact behind rostral; prefrontal large and elongate; supraocular small; postocular minute; UL 5 (rarely 6), usually 3rd only in contact with orbit; LL 5, first three in contact with sublinguals. Dorsals smooth and imbricate and in 17 rows at midbody; ventrals 186-216 (186-198 in males and 205-216 in females); anal scale divided; subcaudals 28-31 in males and 23-27 in females.
Size: Largest male SVL = 382,0 mm (TM6272 - Vygeboom, nr Nylstroom); Largest female SVL = 493,0 mm (TM 20900 - Kralingen 392KR), (Broadley, 1983). Length of tail from 8-9 times into total length in males and 11,4-12,5 times in females.

Distribution

Endemic to the Waterberg, Transvaal.

Distribution in the Transvaal (Map 166).

Kralingen 392KR; Nylsvley Nature Reserve; Reguit 530KQ; Vygeboom; Vygeboomspoort 456KR.

Habitat and Ecology

A subspecies with a limited distribution, only known from the southern Waterberg and environs. The species is found in veld types 18, 19 and 20 at altitudes of 1100-1400 m a.s.l. Uncommon, the species emerges and moves about above ground only after a heavy downpour of

rain. Appears to be limited to areas of deep sand such as the Burkea africana woodland on the Nylsvley nature reserve. Appears to live at very low densities. Feeds on amphisbaenians such as Monopeltis capensis, also a specie which inhabits the same habitat. Probably oviparous as is X. b. lineatus Roux.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. The species is known to occur on the Nylsvley nature reserve, but apparently in very low numbers as in four years only three specimens were found. More detailed surveys are needed to establish the complete distribution of the subspecies and also details of density and habitat requirements.

Remarks

Broadley (1983) has remarked on the variability of the upper labials, although two specimens additional to those he examined exhibit UL 3 in contact with the orbit. Additional specimens are needed to establish its taxanomic status.

Xenocalamus bicolor lineatus Roux, 1907

Xenocalamus bicolor lineatus Roux, 1907b, Rev. Suisse Zool., 15, p. 79. Type locality: Rikatla, S. Mozambique. FitzSimons, 1962, p. 255, fig. 74, 1966, p. 65, 1970, p. 149, 1974, p. 150, pl. 19, fig. 2; Broadley 1971b, p. 681, fig. 19; Pienaar, 1978, p. 181, pl. 83; Jacobsen & Haacke 1980, p. 59; Welch 1932, p. 144;

Broadley, 1983, p. 210, fig. 113, pl. 41; Pienaar et al, 1983, p. 175, pls. 77 & 77A; Branch, 1988a, p. 78, pl. 24, 1988b, p. 12.

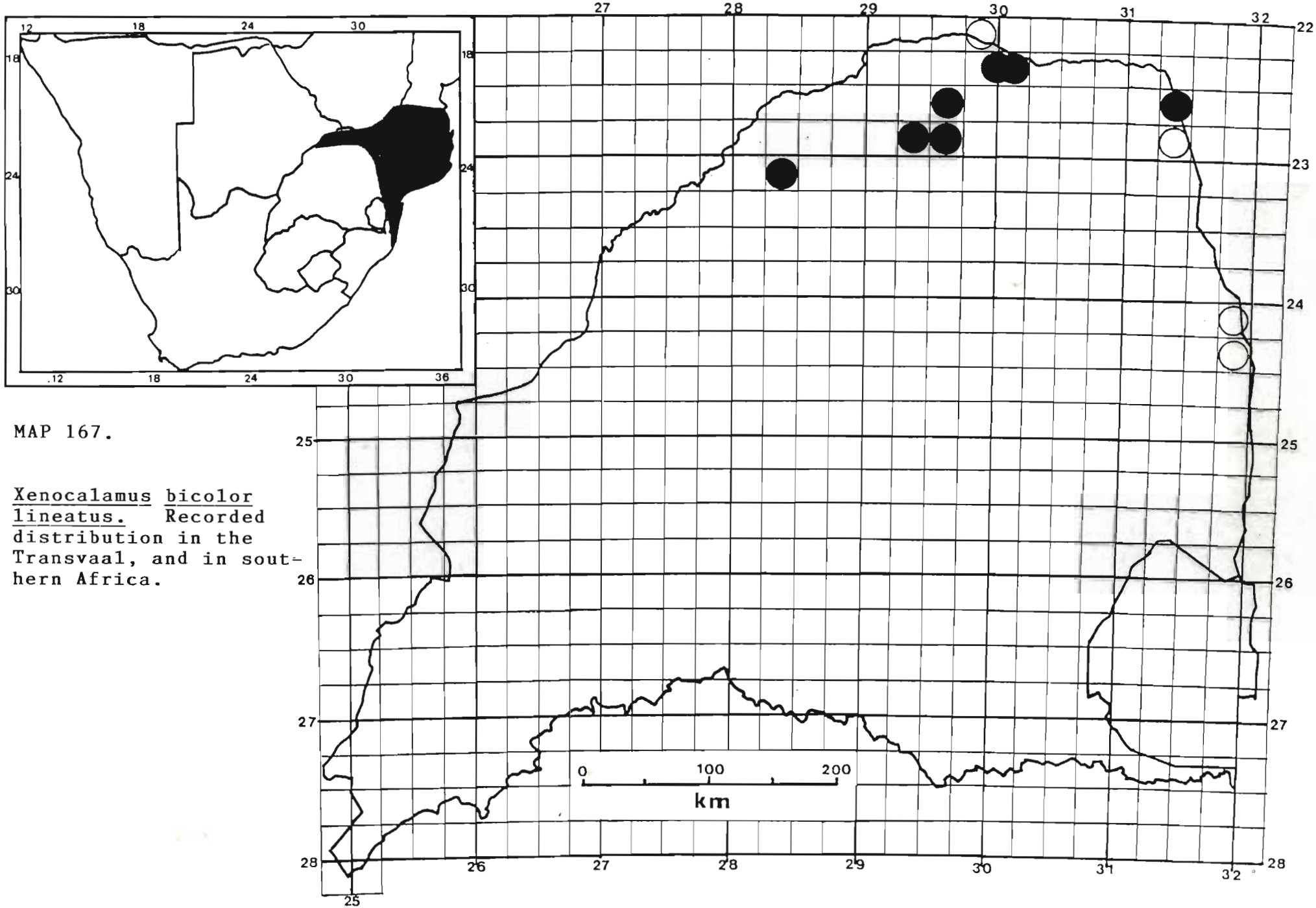
Xenocalamus bicolor bicolor (not Günther). FitzSimons 1962, p. 254, fig. 73, 1966, p. 65 (part); Pienaar 1966, p. 195, pl. 88; FitzSimons, 1970, p. 149 (part), pl. 19, fig. 2.

Diagnosis: 8 Specimens examined.

Colour: Uniform black, tinged with purplish above. Underparts together with two or three rows of scales on either side and also upper lip uniformly creamy white. Similar to preceding species but its very long thin body and long, pointed snout, on which the popular name is based is distinctive.

Lepidosis: A small slender snake with a narrow pointed head and spine tipped tail. Rostral pointed and flattened; nasal divided, nostril pierced in suture between nasals; postnasal larger than nasal; supraocular very small; postocular very small; prefrontal narrow and elongate; UL 6, 3rd and 4th entering orbit; LL 5, first three in contact with sublinguals; frontal excluded from the orbit by supraocular. Dorsal scales smooth and imbricate, in 17 rows at midbody; ventrals 201-232 in males and 216-248 in females; anal scale divided; subcaudals 30-37 in males and 24-30 in females.

Size: A Transvaal specimen measured 430,0 mm SVL (J1496 - Kalkfontein 84LR) with a mass of 7,65 g. Broadley (1983) recorded a male SVL = 430,0 mm (UM 29068 - Mapinhane, Mozambique) and a female SVL = 535,0 mm (UM 28500 - Maphinhane, Mozambique). Tail tip bluntly rounded, tail contained in total length 14 times in females.



MAP 167.

Xenocalamus bicolor lineatus. Recorded distribution in the Transvaal, and in southern Africa.

Distribution

South-eastern Zimbabwe, northern Transvaal, southern Mozambique and Kwa Zulu.

Distribution in the Transvaal (Map 167).

Celine 547MS; Kalkfontein 84LR; Montrose 408MS: Munnichshausen 151MS; Nyandu Bush, Wambiya Sandveld; Vetfontein 360MS.

Literature Records

Eastern bounday sandveld between Nwambiya and Mathlakuza; eastern boundary between Mathlakuza pan and Saselandonga gorge; between Mathlakuza pan and Shimuhene pan; Pumbe sandveld; sandveld north of Cabora Bassa powerlines; between Nyandu sandveld and beacons 7, 8 and 9; Malonga spring area (Pienaar et al, 1983). Beit Bridge (NMZB).

Habitat and Ecology

Restricted in the Transvaal to the arid north and northwest where it occupies veld types 11, 14, 15 and 18 at altitudes of 200-1100 m a.s.l. Usually associated with aeolian sands, occasionally being found under rocks but are mostly fossorial. Feed on amphisbaenians including Monopeltis capensis. Branch & Patterson (1976) recorded egg-laying in this subspecies, a female laying from 3-4 eggs measuring 40-47,0 mm x ± 15,0 mm which when incubated at between 30-32°C hatched in 55-57 days. A sex ratio of the young was 1:1. The hatchlings measured 181,0-185,0 mm in SVL with a mass of 2,23-2,45 g.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A rare subspecies known from less than 10 specimens in the Transvaal. It does occur in the Kruger National Park and may occur in one or two provincial nature reserves. However on account of its rarity its status remains indeterminate. Additional surveys are needed specifically for this and related species.

Remarks

Broadley (1971) discusses the range of variability of scale counts in this subspecies, relating the differences on a clinal basis. Further observations on this variability were presented by Branch & Patterson (1976) where ventral counts in two females approached that of X. b. australis. J1496 - Kalkfontein 84LR, a female, resembles X. b. bicolor in the shape and size of the head, and in number of ventrals (216), is a borderline case with X. b. australis. However the 3rd and 4th upper labials are in contact with the orbit and not only the 3rd as in australis.

Xenocalamus bicolor bicolor Günther, 1868.

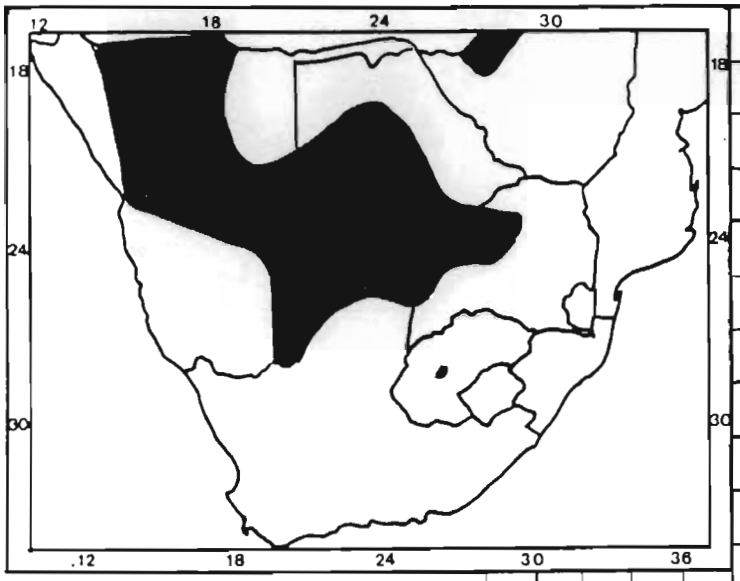
Xenocalamus bicolor, Günther, 1868, Ann. Mag. Nat. Hist. (4) 1, p. 415, pl. xix, fig. A. Type locality: "Zambeze" in error, corrected to Damaraland by Broadley, 1971b.

Xenocalamus bicolor maculatus FitzSimons, 1932.

FitzSimons, 1962, p. 256, fig. 75, 1966, p. 65, 1970, p. 150.

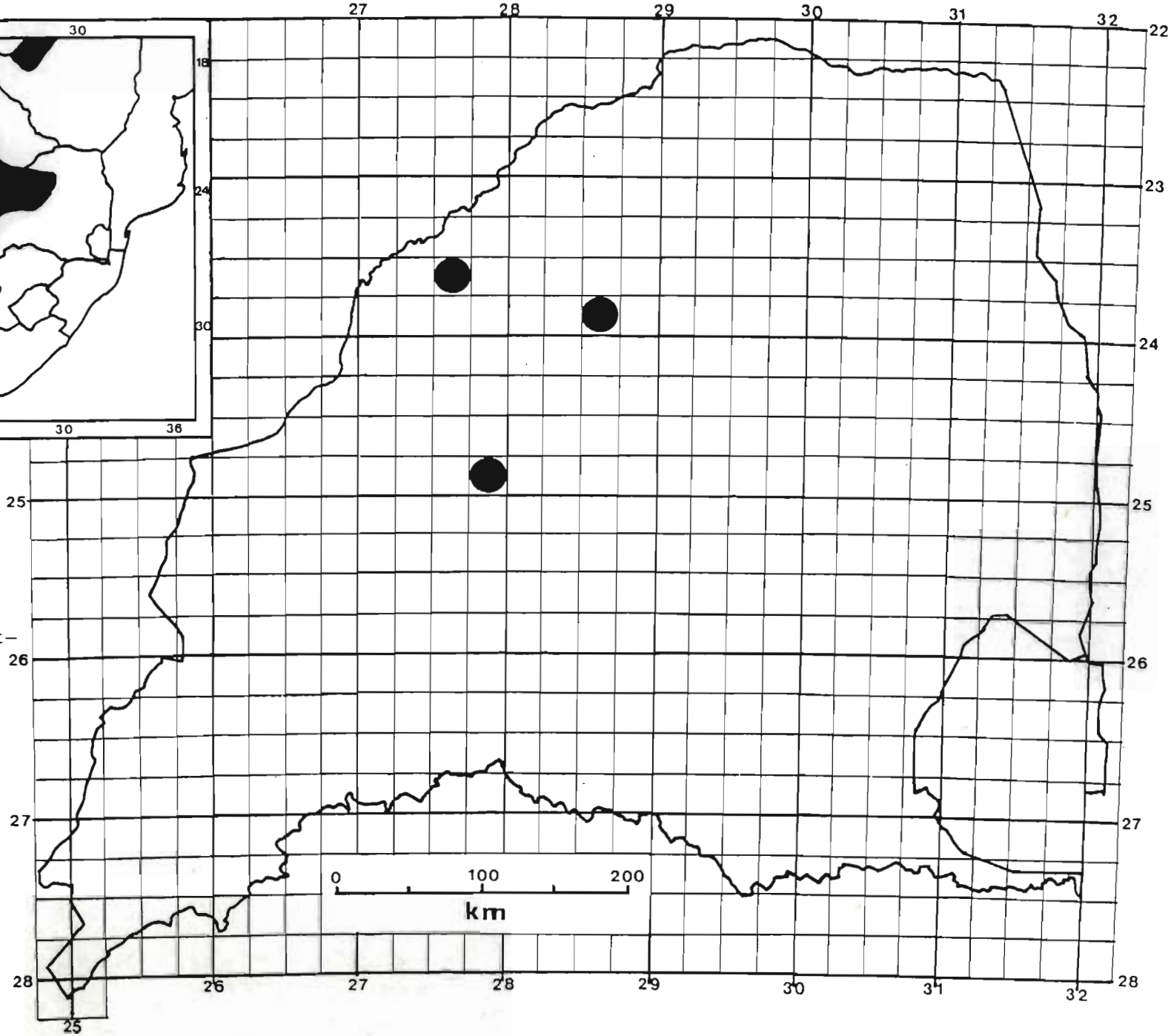
Xenocalamus bicolor concavo-rostralis Hoffman, 1940b, p. 111, figs. 1-2. FitzSimons, 1962, p. 258, fig. 77, 1966, p. 66, 1970, p. 151.
Xenocalamus bicolor pernasutus FitzSimons, 1946, p. 380, figs. 15.17. FitzSimons, 1962, p. 257, fig. 76, 1966, p. 66, 1970, p. 150.
Xenocalamus bicolor bicolor Günther. FitzSimons 1962, p. 254 (part); Broadley, 1971b, p. 675, fig. 17, pl. iv; FitzSimons, 1974, p. 149; De Waal, 1978, p. 112; Welch, 1982, p. 144; Broadley 1983, p. 208, fig. 112, pl. 40; Auerbach, 1987, 1987, p. 174; Branch 1988a, p. 81, pl. 18, 1988b, p. 12.

Diagnosis: 3 Specimens examined.
Colour: Variable, but those from the Transvaal are uniform black above, with the outer 1-3 scale rows and ventrum white, sometimes with dark blotches or infuscations.
Lepidosis: A small slender snake with a depressed elongate head and snout. Tail short and bluntly rounded. Snout acutely pointed, supraocular moderate, postocular larger than in australis, rarely fused with supraocular; UL 6, 3rd and 4th in contact with orbit; LL 5 (very rarely 4), the first three in contact with the chin shields. Dorsal scales smooth and imbricate, in 17 rows at midbody; ventrals 196-234 in males and 212-256 in females; anal scale divided; subcaudals 28-36 in males and 20-29 in females.
Size: A single male had a SVL = 323,0 mm (N2665 - Galakwyns Stroom 745LR) with a mass of 7,6 g. Broadley (1983) recorded a male from Mozambique with a SVL of 530,0 mm and a female from South West Africa/Namibia with a SVL of 674,0 mm. In one male the tail is contained in total length 9,07 times.



MAP 168.

<u>Xenocalamus bicolor bicolor.</u> Recorded distribution in the Transvaal, and in southern Africa.



Distribution

South West Africa/Namibia eastwards to northern Zimbabwe and Mozambique south to the northern Cape Province, Orange Free State and north western Transvaal.

Distribution in the Transvaal (Map 168).

Ellisras; Galakwyns Stroom 745LR; Kalkheuwel 493JQ; Morgenzon 533KQ.

Habitat and Ecology

An inhabitant of kalahari sand in veld types 18 at altitudes of 1000-1200 m a.s.l., the subspecies occurs marginally in the Transvaal. It also feeds on amphisbaenians such as Monopeltis sphenorhynchus and is no doubt oviparous.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Only three specimens from the Transvaal are known, none of which are from a provincial nature reserve. Very secretive and rare, its status is indeterminate. More surveys needed to establish its distribution and status.

Remarks

As for the preceding taxa, the status of this subspecies is unclear. Two males TM 47683 - Ellisras and N2665 - Galakwyns Stroom 745LR are typical bicolor. A female, TM 39596 - Morgenzon 533KQ, has a low ventral count associated with australis but has 6 upper labials with

the 3rd and 4th in contact with the orbit, more typical of bicolor. Geographically it could be either. As an intermediate between bicolor and australis it indicates a breakdown in the validity of the subspecies, a feature also evident in the other subspecies. More specimens are needed from the Transvaal to clarify the situation.

Genus Homoroselaps Jan, 1858

Homoroselaps Jan, 1858, Rev. Mag. Zool., (2 Ser), 10, p. 518. Type: Elaps hygieae Merrem = Coluber lacteus Linnaeus.

Small, slender snakes whose systematic position has varied from the Elapidae to the Colubridae. They are characterised by a pair of enlarged poison fangs found on the maxilla. The head is small, indistinct from the neck; eyes small with a round pupil. The body is cylindrical covered with smooth, overlapping scales, dorsally in 15 rows at midbody. Ventrals smooth; anal scale divided; tail short, with two rows of subcaudals. Broadley (1983) gives a detailed account of the most recent decisions regarding the affinities of these snakes and has accepted that these snakes should be placed in the Colubridae rather than the Elapidae, echoing Branch (1979). Endemic to South Africa the two species occur in the Transvaal. Terrestrial to partly fossorial one species dorsalis is rare and has a more restricted distribution than lacteus. The various colour phases of the latter appear to be geographical as both Transvaal and Orange Free State specimens have a similar pattern differing markedly from those of the Cape Province.
The ecology of members of the genus is very poorly known and likely to remain so for the forseeable future.

Key to the Transvaal species.

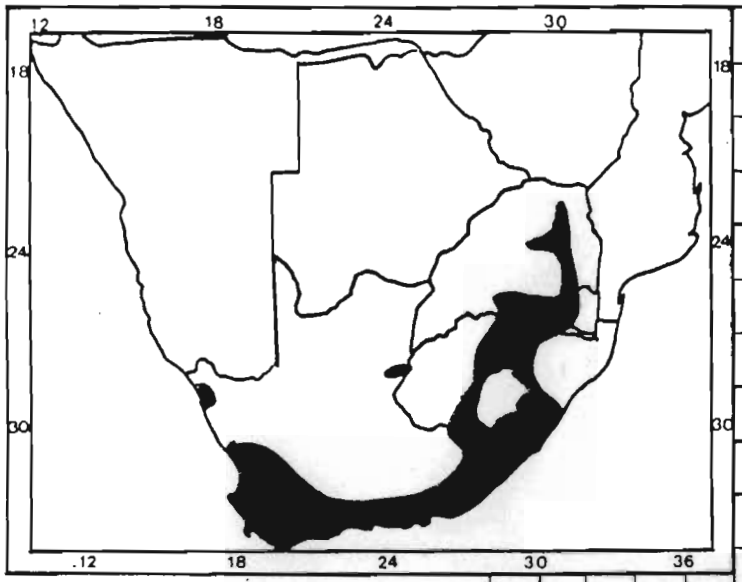
1. Ventrals 160-215; moderately stout in build; black above with a yellow vertebral stripe from occiput to end of tail. Dorsal scales with a yellow spot near anterior margin.

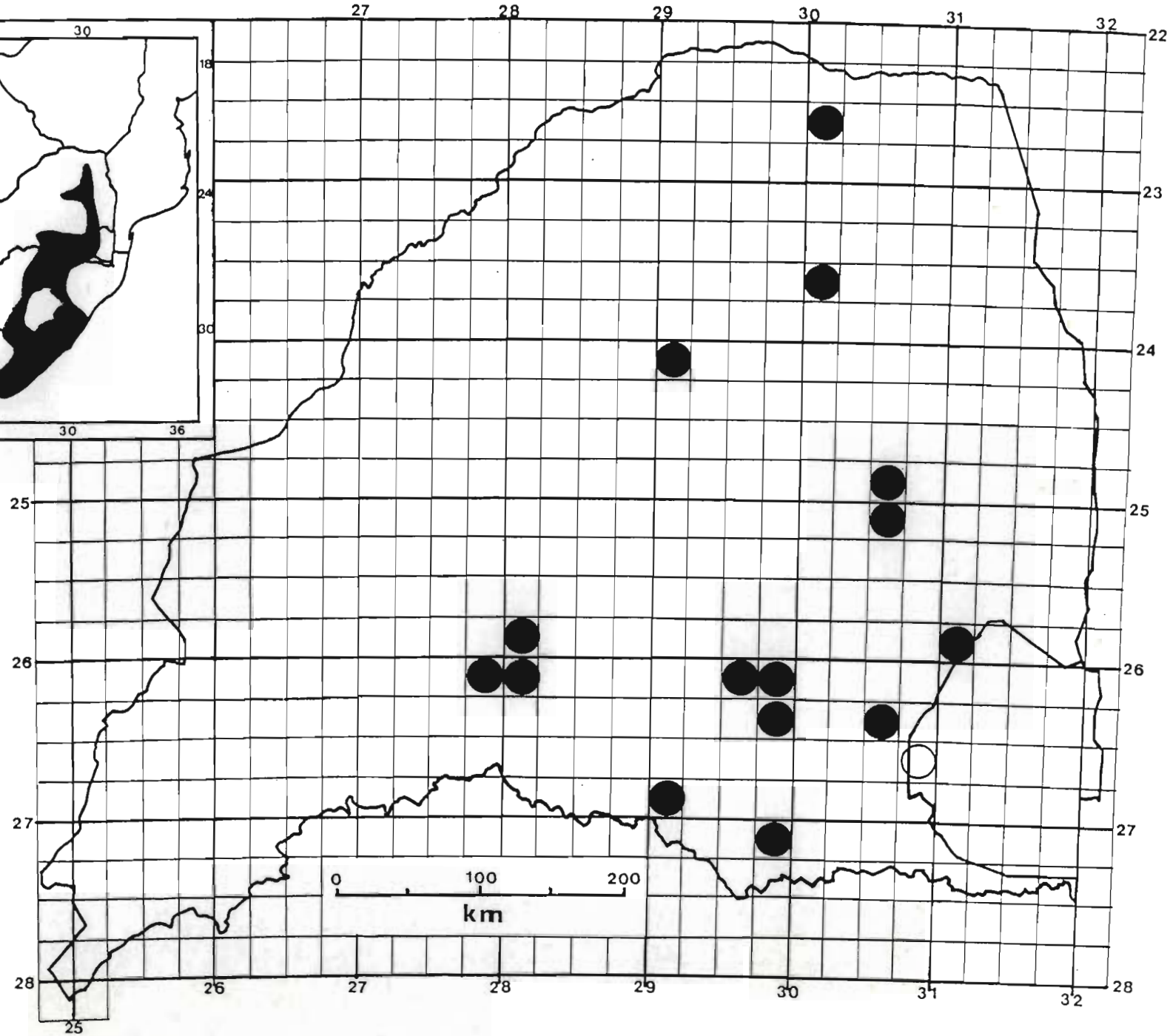
Ventrals white and dark edged ..... H. lacteus
Ventrals 215-240; very slender; black above with a single yellow vertebral stripe from tip of snout to end of tail. Ventrally yellow white ..... H. dorsalis.

Homoroselaps lacteus (Linnaeus, 1754)

Coluber lacteus Linnaeus, 1754, Mus. Adolph. Frid., p. 28, pl. xxviii, fig. 1, 1758, Syst. Nat., ed. 10, 1, p. 220 and 1766, ed. 12, 1, p. 381. Type locality: 'In Indiis' i.e. South Africa.
Elaps lacteus (Linnaeus). FitzSimons, 1962, p. 283, 1966, p. 71, 1970/74, p. 179/178; Kochva & Wollberg, 1970, p. 221, pl. 2F & 4C-E; De Waal, 1978, p. 118.
Homoroselaps lacteus (Linnaeus). Welch, 1982, p. 141; Broadley, 1983, p. 215, figs. 118 & 119, pl. 43; Branch, 1988a, p. 80, pl. 19, 1988, p. 12.

Diagnosis: 18 Specimens examined.
Colour: In the Transvaal one basic colour phase is prevalent. Above black, each scale with a yellow spot; yellow vertebral stripe; three outer rows of dorsal scales on sides of body whitish-yellow and black edged; Upper labials alternating yellowish and black; a transverse black band is found on each side of the nape; Ventrals yellowish-white with a blackish posterior margin to each scale.
Lepidosis: A small slender snake with the head as wide or slightly narrower than the neck. Tail tapered but relatively short. Snout rounded, preocular 1; postocular 1; UL 6, 3rd and 4th entering orbit; LL 6 or 7 (exceptionally 5), the first three in contact with the anterior sublinguals. Dorsal scales in 15 rows at





MAP 169.

Homoroselaps lacteus. Recorded distribution in the Transvaal, and in southern Africa.

midbody; ventrals 169-211, males 169-187, females 182-211; anal scale divided; subcaudals 36-43 in males and 24 to 30 in females.

Size: Largest male SVL = 252,0 mm (P10390 - Maryvale 248IT), mass = 4,95 g (P10390); Largest female SVL = 299,0 mm (10421 - Morgenzon 525KT), mass = 5,75 g (N9738 - Tafelkop 270IS). Mean male SVL = 209,60 mm ± 52,95 (1SD), n = 5, mass = 3,09 g ± 1,49 (1SD), n = 4; Mean female SVL = 218,75 mm ± 73,56 (1SD), n = 4, mass = 2,79 g ± 2,04 (1SD), n = 4. Tail length is contained in total length 6,60-7,35 times in males and 10,07-11,71 times in females.

Distribution

From the south-western and southern Cape Province northwards along the eastern half of South Africa to the Transvaal.

Distribution in the Transvaal (Map 169).

Barberton; De Kuilen 205JT; Johannesburg, Edenvale; Johannesburg, Uncle Charlies; Krabbefontein; Maryvale 248IT; Morgenzon 525KT; Morgenzon State Forest; Percy Fyfe Nature Reserve; Randfontein; Rietpoort 405IS; Rietpoort 83HS; Roodekrans 457IS; Sonskyn Spa, Messina; Swartkop 383JR; Tafelkop 270IS; Welgemeend 206IS.

Literature Records

Ermelo (FitzSimons, 1962).

Habitat and Ecology

A highveld grassland species found in veld types 8, 9, 20, 52, 53, 54, 57 and 61 at altitudes ranging from 1500-1800 m a.s.l. Widespread, solitary and probably

nocturnal, it spends most of its time underground, under rocks on soil or in moribund termitaria. Very inoffensive, only exceptionally attempting to bite. It appears to feed mainly on snakes such as worm snakes (Leptotyphlops) and blind snakes (Typhlops) but also other species. Broadley (1983) records it as being oviparous, laying up to six eggs in midsummer.

Conservation Status

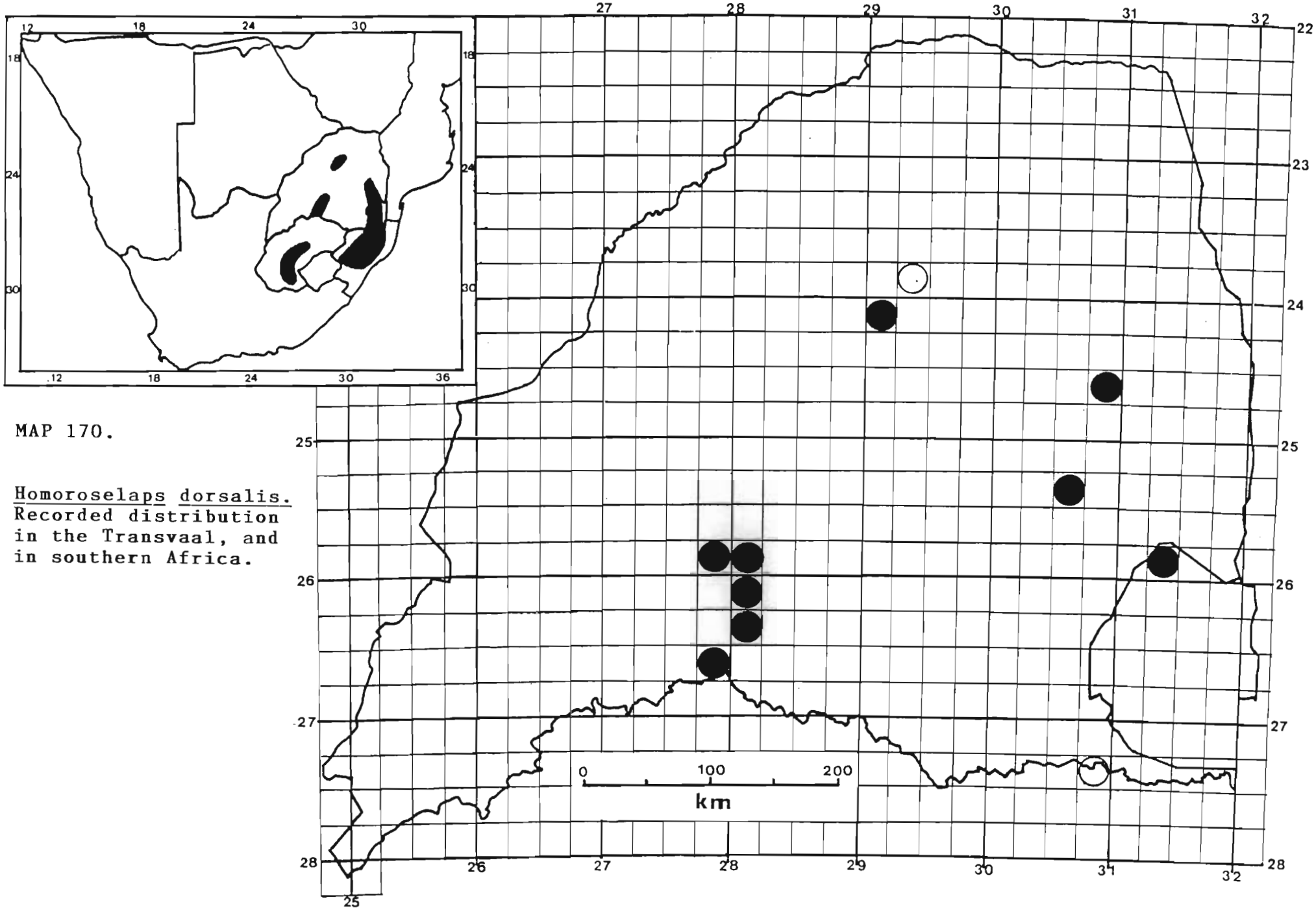
Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Uncommon over most of its range it is usually found singly in any one shelter. It occurs on a few nature reserves but in what densities is not known. Details of abundance are needed. Vulnerable to habitat destruction but currently considered secure.

Remarks

The Transvaal and Orange Free State share a similarly coloured form very much different from those of the Cape Province. The record from the Sonskyn Spa, Messina appears atypical and must be circumspectly viewed taking the ecology of the species into consideration.

Homoroselaps dorsalis (A. Smith, 1849)

Elaps dorsalis A. Smith, 1849, Ill. Zool. S. Afr. Rept., App., p. 21. Type locality: "Kaffirland and the country towards Natal". FitzSimons, 1962, p. 286, 1966, p. 71, 1970/74, p. 180/179; De Waal, 1978, p. 119.
Homoroselaps dorsalis (A. Smith). Welch, 1982, p. 141; Broadley, 1983, p. 217, fig. 120, pl. 44; Branch 1988a, p. 80, pl. 24, 1988b, p. 12.



MAP 170.

Homoroselaps dorsalis. Recorded distribution in the Transvaal, and in southern Africa.

Diagnosis: 17 Specimens examined.

Colour: A broad black band extends down the back. Head black; a narrow yellow vertebral stripe extends from the snout to the tip of the tail; three outer rows of dorsal scales on either side of the body as well as the supralabials and the ventrals white.

Lepidosis: A very small slender snake, with the head as small as, to smaller than the neck. Tail tapered and relatively short. Snout rounded, preocular 1, postocular 1; UL 6, 3rd and 4th entering the orbit; LL 5 (rarely 6), the first three in contact with the anterior sublinguals. Dorsal scales smooth and imbricate in 15 rows at midbody; ventrals 210-239, 210-223 in males and 225-239 in females; anal scale divided; subcaudals 29 to 35 in males and 22 to 28 in females.

Size: Largest male SVL = 258,0 mm (N7806 - Duurstede 361JU), mass = 2,65 g (N7806); Largest female = 248,0 mm (8431 - Rooihuiskraal), mass = 1,9 g (8431). De Waal (1978), recorded a female SVL = 286,0 mm from Bloemfontein. Tail contained in total length from 8-9 times in males and 10,5-11,5 times in females.

Distribution

Endemic to South Africa and Swaziland, occurring in the Orange Free State, Natal and Transvaal.

Distribution in the Transvaal (Map 170).

5 km N. of Alberton; Alberton; Blyde River Nature Reserve; De Deur 539IQ; Duurstede 361JU; Hennopsrivier 489JQ; Modderfontein 35IR; Percy Fyfe Nature Reserve; Pretoria, Leper Asylum; Rietfontein 255JT; Rolf Quarry, Halfway House; Rooihuiskraal; Suikerbosrand Nature Reserve; Swartkop 383JR; S.E. of Johannesburg.

Literature Records

Commondale; Johannesburg, Edenvale; Pietersburg (Broadley, 1983).

Habitat and Ecology

A very rare snake, mainly associated with highveld and montane grassland in veld types 8, 9, 20, 48, 57, 61 and 67 at altitudes ranging from 1500-1800 m a.s.l. Usually found in moribund termitaria. Otherwise little is known of this species.

Conservation Status (RDB 1988, rare).

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A very rare species restricted to a series of apparently disjunct populations, one of which is threatened by continued urban expansion in the PWV area. The species is vulnerable and there is a need for more intensive surveys to assess abundance. However this could lead to greater destruction of moribund termitaria and an alternative method may have be worked out.

Remarks

A distinct species with a small degree of morphological variation which is no doubt of clinal origin. The disjunct distribution could be the result of habitat fragmentation but this needs further investigation.

Genus *Atractaspis* A. Smith, 1849

Atractaspis A. Smith, 1849, *Ill. Zool. S. Afr., Rept.*, pl. lxxi, ftn. *Type*: *Atractaspis bibronii* A. Smith.

A group of slender to moderately slender, semifossorial to fossorial snakes. The head is depressed with a rounded margin to the rostral, and indistinct from the neck and body. Two pairs of large fangs, hollow and well developed are located on the maxilla. Mouth inferior and relatively small preventing the erection of the fangs which lie horizontal on either side of the upper jaw. Eyes small, with a rounded pupil. The cylindrical body is a necessity for a burrowing existance; dorsal scale smooth, imbricate and mostly shiny, in 17-37 rows at midbody; ventrals smooth; anal scale entire; tail short terminating in a spiny tip. Subcaudals in single or paired rows. Oviparous.
Two species are found in the Transvaal one of which '*duerdeni*' is highly sporadic and rare, inspite of occurring in the vicinity of Pretoria.

Key to the Transvaal species.

1. Snout depressed with rounded edge to rostral; temporals 1 + 2 ..... *A. bibronii*
   Snout short and rounded; temporals 1 + 3 or more ..... *A. duerdeni*

Atractaspis bibronii A. Smith, 1849

Atractaspis bibronii A. Smith, 1849, *Ill. Zool. S. Afr., Rept.*, pl. lxxi. Type locality: "eastern districts of

the Cape Colony. Broadley, 1968(a), pp. 416 & 432; Rippey et al, 1976, p. 1874; De Waal, 1978, p. 123; Pienaar, 1978, p. 200, pl. 92; Visser & Chapman, 1978, p. 39, pl. 15, figs. 2 & 3; Welch, 1982, p. 145; Broadley, 1983, p. 219, figs. 121 & 122, pl. 45; Pienaar et al, 1983, p. 177, pl. 78; Auerbach, 1987, p. 179, pl. 16, fig. 7, Branch 1988a, p. 75, pl. 38, 1988b, p. 12.

Atractaspis bibronii bibronii A. Smith. FitzSimons 1962, p. 319, 1966, p. 75, 1970/74, p. 184, pl. 28, fig. 1; Pienaar, 1966, p. 214, pl. 98; Visser, 1966, p. 17, pl. 13; Jacobsen, 1977, p. 35.

Diagnosis: 97 Specimens examined.

Colour: Uniform purplish-brown to black above, often with a purplish sheen; Ventrally creamy-white to blotched with purplish brown to completely purplish brown. Appear highly variable.

Lepidosis: A slender attenuated snake with a depressed shovel-shaped head and short, spine tipped tail. Snout prominent; one small preocular; postocular 1; supraocular 1; UL 5, the 3rd and 4th entering the orbit; LL 5 or 6, the first three in contact with the anterior sublinguals. Dorsal scales smooth and imbricate, in 21-23 (rarely 19 or 25) rows at midbody; ventrals 196-260; anal scale entire; subcaudals entire, 19-25, in males 22-25 and in females 19-23. Tail very short ending in a distinct horny spike.

Size: Largest male SVL = 430,0 mm (N3289 - Engeland 183KP), mass = 26,0 g (N5600 - Ceylon 53KU); Largest female SVL = 442,0 mm (Elandsfontein 315KQ), mass = 20,5 g (J1401 - Rudolph 17LS). Mean male SVL = 366,37 mm ± 57,90 (1SD), n = 8, mass = 16,1 g ± 6,79 (1SD), n = 6; Mean female SVL = 361,86 mm ± 92,67 (1SD), n = 7, mass = 11,74 g ± 6,93 (1SD), n = 6. Tail very short and contained in total length from 12,7 to 16 times in males

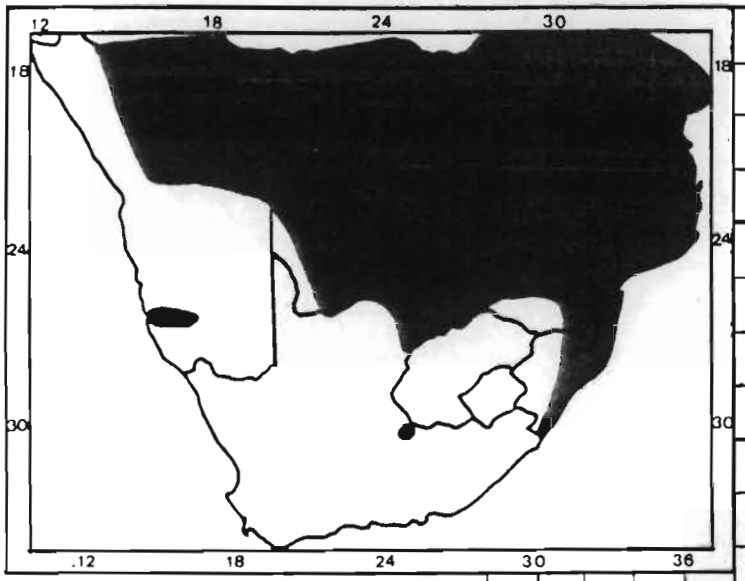
and 16,5-19,0 times in females (Broadley, 1983). Fifteen Transvaal specimens ranged from 13,79-18,3 (13,79-15,83 and 16,61 - 18,30 respectively).

Distribution

Kenya, south to Natal west to the northern Cape Province, South West Africa/Namibia and Angola.

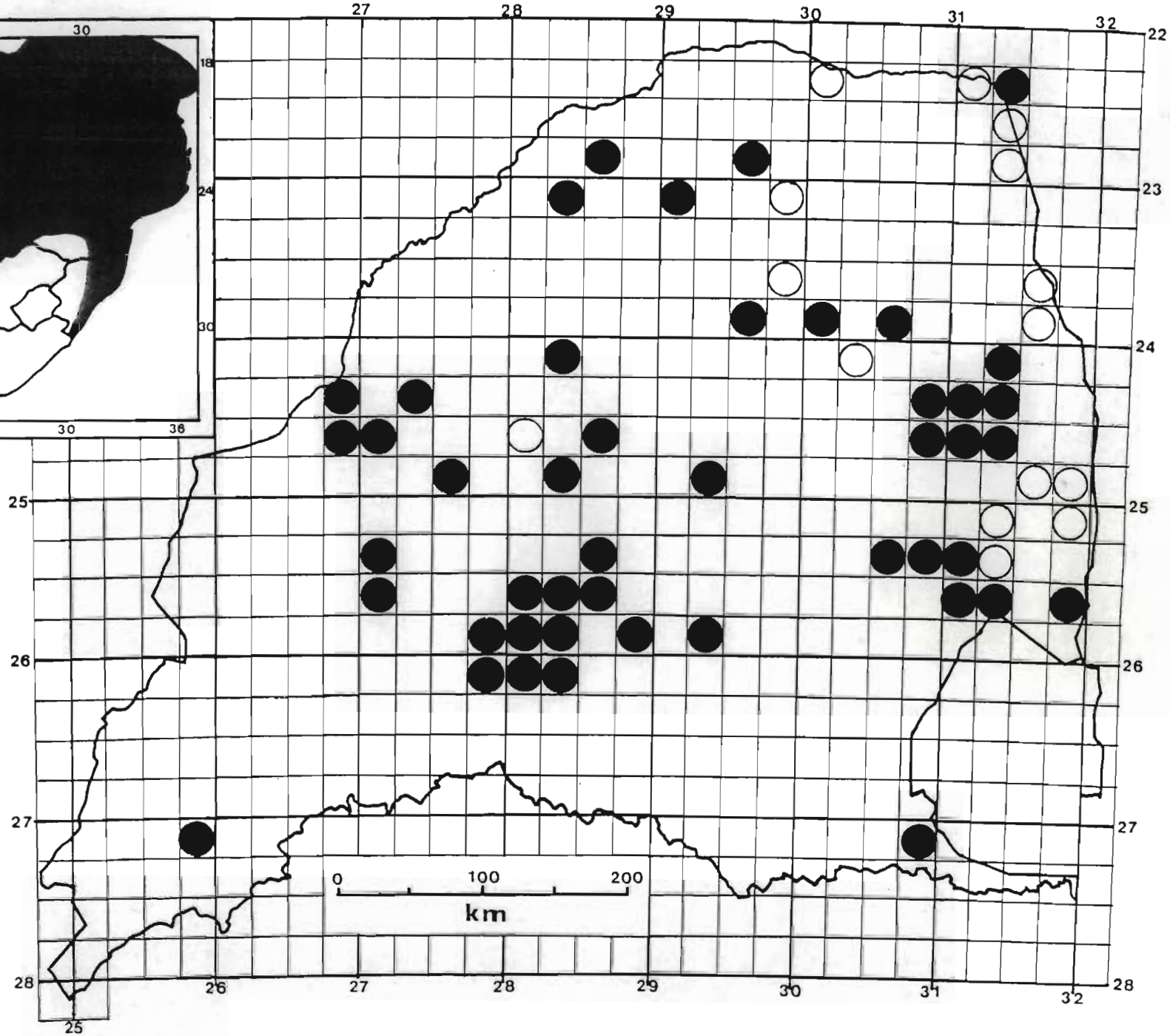
Distribution in the Transvaal (Map 171).

Andover 210KU; Barberton Townlands 369JU; Bellevue 298MR; Benoni; Boekenhoutskloofdrift 286JR; Boksburg; Boschjeskop 250JT; Boschrand 158HO; Ceylon 53KU; Dansfontein 40LR; De Hoop 203JU; Donald 37KP; Eerste Geluk, 14 km S. Nelspruit; Elandsfontein 335KQ; Engeland 183KP; Fletcher, Nelspruit; Fleur-de-Lys 194KU; Friedenheim 282JT; Garstfontein 374JR; Germiston; Grootvlei 272JR; Hectorspruit 164JU; Hoedspruit; Hoedspruit Air Base; Houwater 54JQ; Irene; Jakkalsfontein 528JR; Jakkalsdans 243JR; Johannesburg, Bryanston; Johannesburg, Honeydew area; Kalkfontein 100LS; Kalkheuwel 493JQ; Leeuwfontein 299JR; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Moira; Marble Hall 29JS; Middelburg Town and Townlands 287JS; Naauwpoort 106KR; Nelspruit; Nil Desperandum 419JU; Nylsvley Nature Reserve; Olievenbosch 506KQ; Onderstepoort 266JR; Pafuri; Piet Retief; Pinedene; Pretoria; Pretoria District; Pretoria North; Pretoria, Brooklyn; Pretoria, Clubview East; Pretoria, Constantia Park; Pretoria, Les Marais; Pretoria, Lynnwood Glen; Pretoria, Mooiplaats; Pretoria, Pienaarsrivier Dam; Pretoria, Rietondale; Pretoria, Riviera; Pretoria, Silverton; Pretoria, Waterkloof Air Base; Pretoria, Willow Glen; Pretoria, Zoological Gardens; Radon, 20 km



MAP 171.

<u>Atractaspis bibronii.</u> Recorded distribution in the Transvaal, and in southern Africa.



S. of Pretoria; Rainpan 60KQ; Rietfontein 214JR; Rietfontein 255JT; Rietvlei Dam, Pretoria; Ross 55KU; Rudolph 17LS; Rustenburg Nature Reserve; Sandton; Schoemansdal 333JU; Shlaralumi; Swadini Dam; Swartkop 383JR; Tzaneen 538LT; Vlamboom Stn, Nelspruit Dist.; Vygeboomspoort 456KR; Waterpoort; Willie 787LT; Zandfontein 317JR; Zoutpansberg.

Literature Records

Andalusia; Brondal; Letaba Camp; Loubad; Louis Trichardt; Mataffin; Messina; Munnik; Plaston; Shiluvane; Skeerpoort; Tshokwane; Waterberg (FitzSimons, 1962). W.N.L.A. quarters, Pafuri; Tshokwane ranger's quarters; Skukuza staff village; Hape pan area, Pafuri; north bank of the Sabie river 6,4 km east of Skukuza; eastern boundary 3,2 km south of W.N.L.A. quarters, Pafuri; Lower Sabie road 34 km east of Skukuza; eastern boundary between Tabaglovu and N'chindo beacons; Malelane; new tarred road north of Luvuvhu river 10-12 km and 12-17 km; sandveld north of Saselandonga gorge; eastern boundary between beacon 7 and Nyandu sandveld; Nyandu sandveld; 19 km on Nahpe road; Shingomene (Pienaar et al, 1983). 15 km ESE of Mopane (NMZB).

Habitat and Ecology

Widespread throughout most of the Transvaal, it is found in veld types 10, 11, 14, 15, 16, 18, 19, 20, 48, 50, 61 and 67 at altitudes ranging from 200 - 1600 m a.s.l. On the highveld frequently found in termitaria, elsewhere found under and in rotting logs and under rocks on soil, in crevices at ground level or under debris. Usually only active on the surface after a heavy downpour of

rain, although one specimen was trapped after rain had passed close to the farm but had not actually rained on the farm itself.
Feeds mostly on other snakes including Leptotyphlops distantii (Jacobsen, 1977), Typhlops bibronii, Xenocalamus sp. while a Nucras intertexta was found dead close to a bibronii. Also said to consume young rats and mice. Oviparous, laying about 6 eggs measuring 35,0x 12,0 mm (Auerbach 1987).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Occurs in several provincial nature reserves and in the Kruger National Park. As it is difficult to determine abundance, it is only possible to assess status according to the degree of habitat destruction over its range. On this basis it can be considered secure.

Remarks

Broadley (In prep) is currently reviewing the southern forms of Atractaspis including the status of the melanistic colour morph of bibronii.
Although usually considered poisonous, this aspect of the species is puzzling. Many bites are very painful causing considerable clinical symptoms, as can be seen in Visser & Chapman (1978) and Branch (1982). However I have been the recipient of two bites by an extremely irate snake with no apparent after - effects except for a slight sensitivity to the finger. Similarly, on two seperate occasions during this survey, two black assistants were bitten while removing the snakes from traps. Apart from some pain in one instance no other symptoms were evident, and no treatment of any kind was given.

Atractaspis duerdeni Gough, 1907

Atractaspis duerdeni Gough, 1907, Rec. Alb. Mus., 2, pp. 178-179, fig. Type locality: Serowe, Botswana. Auerbach, 1987, p. 180, pl. 16, fig. 8; Branch, 1988a, p. 75, pl. 38, 1988b, p. 12.
Atractaspis bibronii bibronii (part). FitzSimons 1962, p. 319, 1966, p. 75, 1970/74, p. 184.
Atractaspis bibronii (part). Broadley 1983, p. 219.

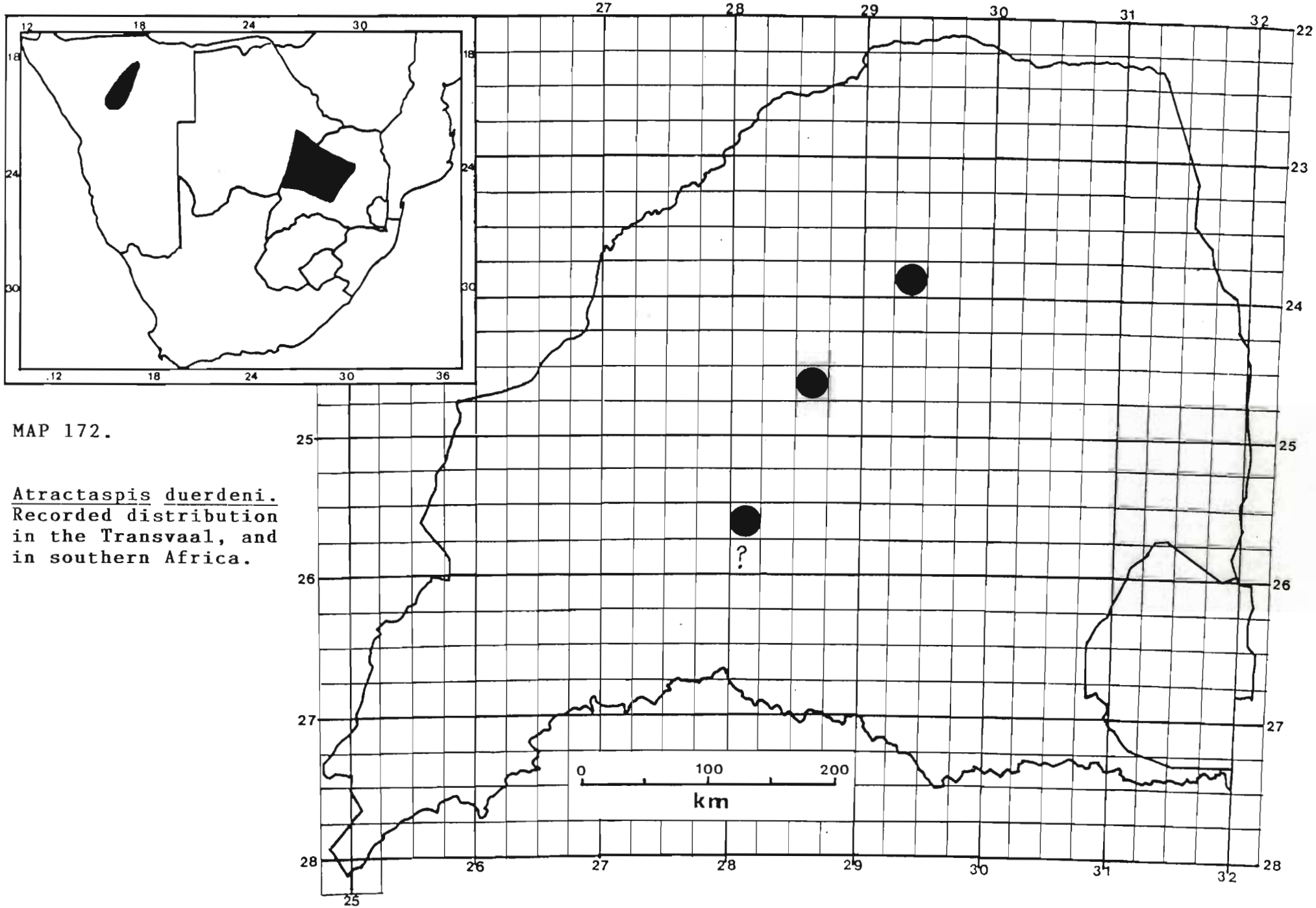
Diagnosis. 5 Specimens examined.
Colour: Glossy blackish-brown to black above and white below extending ventrolaterally and onto the lips.
Lepidosis: A small relatively stocky snake with the head merging into the neck. The short round head of this snake is diagnostic and the snout has a prominent horizontal angle at the tip. Tail armed with a terminal spine. Snout rounded; preocular 1; postocular 1; supraocular 1; UL 5, 3rd and 4th entering orbit; LL 5 or 6, the first three in contact with the anterior sublinguals. Dorsal scales smooth, imbricate and in 23-25 scale rows at midbody; ventrals 195-228; anal scale entire; subcaudals 21-27, entire.
Size: Small, reaching a maximum total length of 480,0 mm (Branch, 1988).

Distribution

Eastern Botswana, central and western Transvaal and a disjunct population in northern South West Africa/Namibia which represents a new subspecies.

Distribution in the Transvaal (Map 172).

Halfway House; Num Num 568KR; Pietersburg; Pretoria; Pretoria, Doornpoort, Wonderboom.



MAP 172.

<u>Atractaspis duerdeni.</u> Recorded distribution in the Transvaal, and in southern Africa.

Habitat and Ecology

Little is known of its habits except that it is usually found in sandy soil in thorn and broadleaved savanna. Occurs in veld types 18, 19 and 67 at altitudes of 1250-1500 m a.s.l.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A very rare and unknown species. More details of its distribution and habitat requirements are needed, including more intensive surveys. Status indeterminate.

Remarks

FitzSimons (1962) synonymised duerdeni with bibronii indicating that the low ventral scale counts which appeared throughout the bibronii distribution range was insufficient justification for the retention of duerdeni. However no mention was made of the rounded snout of duerdeni which is highly diagnostic. Recent developments have led to the resurrection of duerdeni as a full species, (Broadley In Prep.).
The specimen from Halfway House (Snake Park) TM 27576 should be accepted with caution as it appears to be outside the normal climatic and habitat range of the species.

Genus *Prosymna* Gray, 1849

Prosymna Gray, 1849, *Cat. Snakes. Brit. Mus.*, p. 80.
Type: *Calamaria meleagris* Reinhardt.

Head not distinct from the neck and snout strongly depressed, projecting and with a sharp horizontal edge. Rostral variable but broad, sometimes upturned at the tip. The eyes are small with a round to vertically elliptic pupil; internasals single or paired. No enlarged fangs, only small teeth increasing in size posteriorly on the maxilla. Body short and cylindrical with smooth or keeled, imbricate scales dorsally and in 15 to 21 rows at midbody; anal scale entire, tail short but longer in males than females and terminated in a spiny scale. Subcaudals paired. Oviparous.
Three species and one subspecies are found in the Transvaal occupying most of the province from highveld to lowveld and Kalahari to bushveld. Unusual snakes, apparently specialising on feeding on reptile eggs, occupying a niche which has largely been left open but requiring special adaptations to locate the eggs. It needs to be established whether random movement or a specific search tactic achieves this; a great deal of the biology of the genus still needs to be investigated.

Key to the Transvaal species.

1. Internasals paired 2
   Internasals band-like and single .... *P. ambigua stuhlmannii*

2. Internasals in contact or narrowly separated; dorsal pattern a series of dark spots or irregular light and dark flecks; Ventrals 131-158 in males, 141-170 in females 3

Internasals well separated; dorsal pattern a pale broken dorsal stripe and a pair of dark dorsolateral stripes; ventrals 154-169 in males, 162-180 in females ... P. bivittata

3. Internasals usually separated; dorsal pattern, a paired series of dark spots and often a pale vertebral line; subcaudals 26-34 in males, 20-26 in females .... P. sundevallii sundevallii

Internasals in contact; dorsal pattern a vertebral series of dark blotches or scattered light and dark streaks or uniform grey to grey-black above with pale margin to each scale. Ventrally white. Subcaudals 20-27 in males, 17-23 in females ..... P. sundevallii lineata

Prosymna sundevallii sundevallii (A. Smith, 1849)

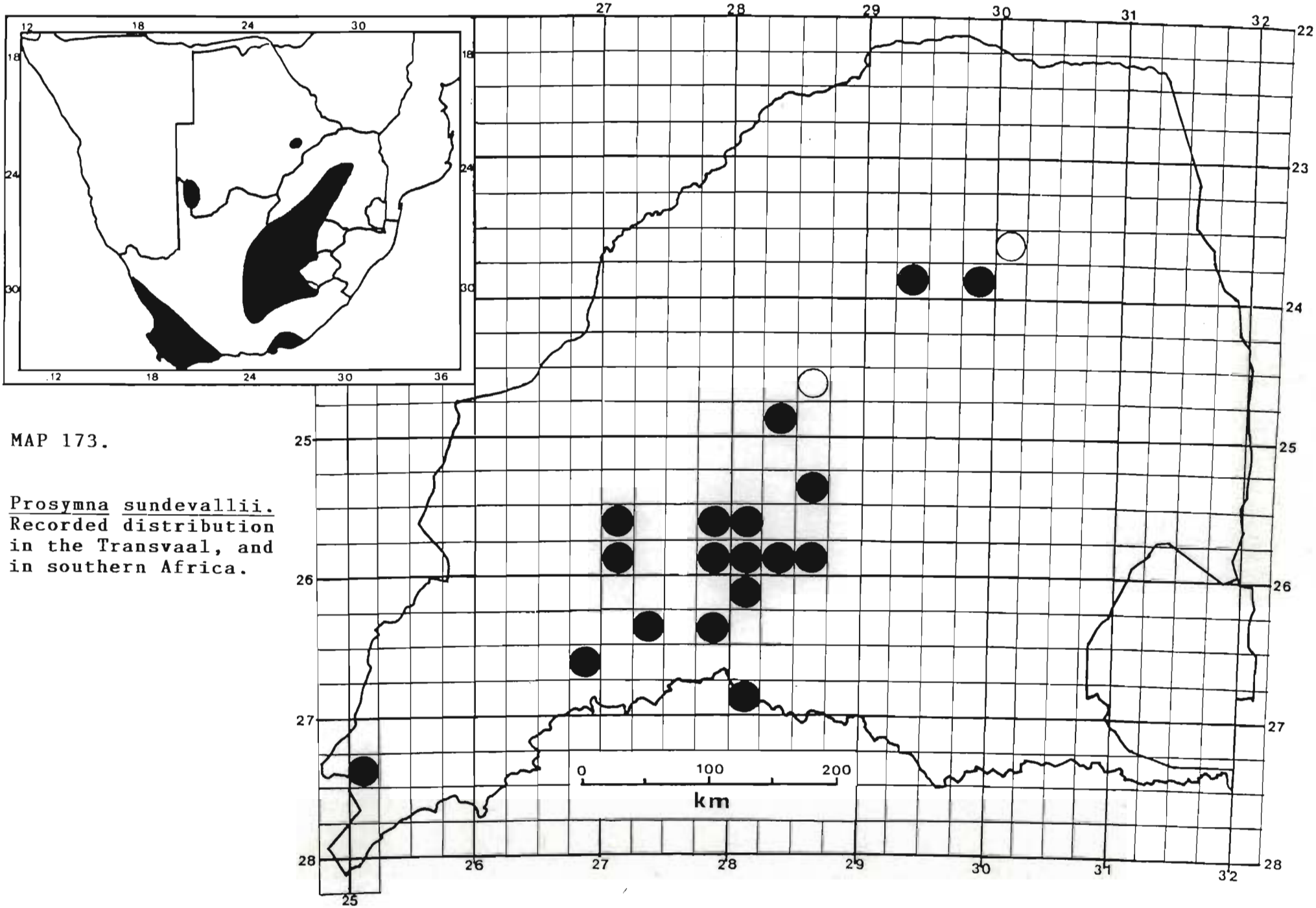
Temnorhynchus sundevallii A. Smith, 1849, Ill. Zool. S. Afr., Rept., App., p. 17. Type locality: "Kaffirland, eastward of Cape Colony" i.e. Natal.
Prosymna sundevallii sundevallii (A. Smith). FitzSimons 1962, p. 153 (part), fig. 40, 1966, p. 53, 1970/74, p. 102/103, pl. 10, fig. 2; Broadley, 1965a, p. 5; De Waal, 1978, p. 94; Broadley, 1980a, p. 503; Jacobsen & Haacke, 1980, p. 34; Welch, 1982, p. 181; Broadley, 1983, p. 224, figs. 125 & 126, pl. 46; Auerbach, 1984, p. 176; Branch 1988a, p. 66, pl. 16, 1988b, p. 13.

Diagnosis. 38 Specimens examined.

Colour: Variable from yellowish to light reddish or greyish brown above. Scales often dark-edged. Two, or occasionally four rows of brown to blackish brown spots over back and tail. Head brown to dark brown sometimes uniform but more usually with a pale yellowish to russet patch on the crown. Tip of snout consists of a horizontal, sharp cutting edge, dirty yellowish to horn colour. Occasionally a blotched or spotted vertebral line may be present. Underparts creamy to yellowish white, uniform or sometimes with dusky blotches and a median streak along the tail.

Lepidosis: A small stout snake with the head merging into the neck. Tail short and sharply pointed. Rostral broad and depressed with a sharp horizontal edge; internasals in narrow contact (15,78%) to narrowly separated (84,21%) behind rostral; prefrontal single (rarely divided) and bandlike; preocular 1 (exceptionally 2); postoculars 2 (rarely 1 or 3); UL 6 (rarely 5 or 7), 3rd and 4th (rarely 2nd, 3rd & 4th or 4th & 5th) entering the orbit; LL 7 or 8, first three in contact with the single pair of chin shields. Body scales smooth and imbricate, in 15 scale rows at midbody; ventrals 139-165, males 139-155 and females 160-165; anal scale entire; subcaudals 21-32, males 26-32, females 21-25.

Size: De Waal (1978) recorded a male (NMB 3661 - Patrysdraai) with SVL = 238,0 mm and a female (NMB 1956 - Klipfontein, O.F.S.) SVL of 285,0 mm. Two specimens from the Transvaal had a SVL of 218,0 mm (J6278 - Italie 126HO) and 263,0 mm (J6279 - Italie 126HO). The former a male, had a mass of 6,6 g and the latter a female had a mass of 9,45 g. The tail is very short and in males contained 7-9 times into total length and in females 9,5-12 times. Two Transvaal males ranged from 7,44-7,61 and two females 10,17-10,74.



MAP 173.

Prosymna sundevallii. Recorded distribution in the Transvaal, and in southern Africa.

Distribution

From the Cape Province through the Orange Free State and Lesotho to Botswana and Transvaal.

Distribution in the Transvaal (Map 173).

Abe Bailey Nature Reserve; Aloe Fjord Holiday Resort Vaaldam; Brits; Bronkhorstspruit; Bulskop 226IP; Eikenhof 323IQ (Lido Hotel); Elandsfontein, 16 km. W. of Pretoria; Halfway House; Hartebeespoort; Irene; Italie 123HO; Johannesburg, Buccleugh; Magaliesberg, Pretoria Dist.; Magalieskruin 323JR; Melrose Estate 541IR; Murrayfield 343JR; Pretoria; Pretoria, Iscor Headquarters; Pretoria, Les Marais; Pretoria, Waterkloof Agricultural Holdings; Pretoria, West End; Pretoria, Wonderboom; Randburg; Rietfontein 214JR; Rietfontein 301IQ; Rustenburg; Schaapplaats 664LS; Schilderkrans 1041LS; Verwoerdburg, The Reeds; Vygeboomspoort 456KR; Zandfontein, Rustenburg Dist.; Zevenfontein 407JR.

Literature Records

Krabbefontein; Magaliesberg; Middelfontein; Pretoria, Meintjieskop; Pretoria, Murrayfield; Pinedene; Vaal Dam (Broadley 1980).

Habitat and Ecology

Mostly confined to the highveld in the Transvaal this subspecies is found in veld types 16, 48, 52, 55, 61 and 67 at altitudes of 1500-1800 m a.s.l. Usually found in moribund termitaria in grassland but also under rock on rock or rock on soil. According to Broadley (1979b) they

feed largely on reptile eggs although also known to consume small lizards such as Panaspis wahlbergii. Oviparous, the female lays 3-4 eggs at a time measuring 28,0x9,0 mm (Broadley, 1983). A female from the farm Rietfontein 214JR (No. 8698) contained two well developed ova in late December. Exhibits a ritualised defensive behaviour when molested. The body suddenly contracts into a tight spiral and as suddenly uncoils like a watchspring.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Although widespread in South Africa, in the Transvaal appears to be most common on the highveld. Although not recorded from a provincial nature reserve, it is likely to occur on several. Rare, more surveys are needed to establish its status. Vulnerable to large scale habitat destruction through urbanisation, agriculture and mining.

Remarks

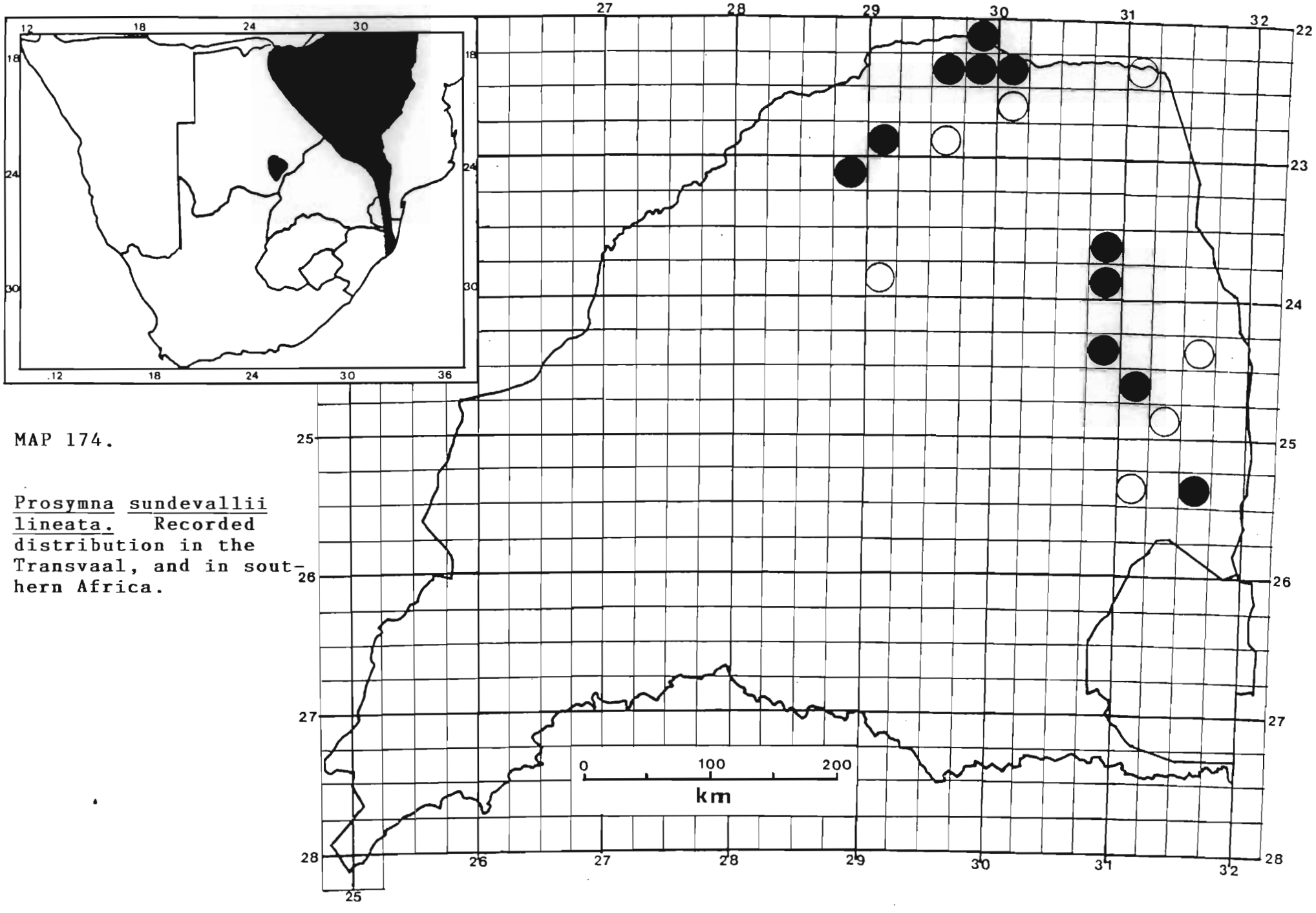
The variability of the internasals renders the key difficult to apply unless comparative material of both sundevallii and lineata is on hand. Internasals in lineata should be in very broad contact, whereas in sundevallii they are mostly separate to narrowly in contact (rarely in broad contact). The internasals range from being separate on the highveld to separate or just in contact (Pretoria and Johannesburg), and to being separate to narrowly in contact, rarely in moderately broad contact (Pretoria to Rustenburg and north to Pietersburg and Woodbush). Two specimens from the farm Rietfontein 214JR (8698 & 8699) had internasals in moderately broad to narrow contact respectively. Of 42

Transvaal specimens examined, 23,81% have internasals from just in contact to well in contact. Colour appears to be more significant, and specimens of lineata appear larger and more stocky. A slight reduction in number of ventrals is found between Transvaal and Orange Free State populations. De Waal (1978) recorded males ranging from 146 to 153 in males (139-155 in Transvaal) and 159-169 in females (160-165 in Transvaal). Broadley (1983) records 131-170 for the total range of the species with males not exceeding 158 and females not less than 154.

Prosymna sundevalli lineata (Peters, 1871)

Temnorhynchus lineatus Peters, 1871, Monatsb. Akad. Wiss. Berlin., p. 568. Type locality: Matlale, near Pietersburg, N. Transvaal.
Prosymna lineata (Peters). FitzSimons, 1962, p. 152.
Prosymna sundevalli lineatus (Peters). Broadley, 1965a, p. 5; FitzSimons, 1966, p. 53, 1970/74, p. 102; Pienaar 1978, p. 147, pls. 65 & 65A; Broadley, 1980a, p. 508, pl. iv; Jacobsen & Haacke, 1980, p. 34; Welch, 1982, p. 181, Broadley, 1983, p. 225, fig. 127; Pienaar et al, 1983, p. 183, pls. 81 & 81A; Auerbach, 1987, p. 176, pl. 17, fig. 1; Branch, 1988a, p. 66, pl. 29, 1988b, p. 13.

Diagnosis. 12 Specimens examined.
Colour: Variable grey to black or dark brown and dark spotted or blotched above, white below, the latter extending ventrolaterally. Juvenile specimens may have a pale patch on the crown of the head. A thin pale vertebral stripe may be present.
Lepidosis: A small but stocky snake with a short head indistinct from neck. Tail short and terminates in a spiny scale. Rostral variable, broad and slightly upturned. Internasals in broad to very broad contact



MAP 174.

Prosymna sundevallii lineata. Recorded distribution in the Transvaal, and in southern Africa.

behind rostral; preocular 1; postoculars 2 (rarely 1 or 3); UL 6 (rarely 5), usually 3rd and 4th entering orbit; LL 8 (rarely 6, 7 or 9), the first 3 (rarely 4) in contact with the sublinguals. Dorsal scales smooth and overlapping, in 15 rows at midbody; ventral scales 143-164, males 143-154, females 156-164; anal scale entire; subcaudals 20-28, males 21-28, females 20-23.
Size: Largest male SVL = 262,0 mm (TM 21796 - Dongola) Broadley (1983), mass = 9,4 g (J4987 - Antioch 240KT); Largest female SVL = 312,0 mm (N653 - Doreen 108MT), mass = 22,0 g (N7200 - Rolle 235KU). Mean SVL = 286,0 mm ± 25,39 (1SD), n = 4, mass = 14,97 g ± 5,40 (1SD), n = 4. The tail is contained in total length in males 8,44 times and in females 10,37-11,25 times.

Distribution

Northern and eastern Transvaal, eastern Botswana, north to Zimbabwe, central Mozambique and south to Kwa Zulu.

Distribution in the Transvaal (Map 174).

Antioch 240KT; Buffelshoek 261LR; Dongola; Doreen 108MT; Hectorspruit 164JU; Langjan Nature Reserve 370MS; Masalal 722LT; River 141MS; Rolle 235KU; Swadini Snake Park; Woodbush.

Literature Records

Matlala; Newington; Umbabat Game Reserve; Waterpoort; White River (Broadley, 1980). The Nwarivake beacon just north of the Orpen-Satara road near the Timbavati river and in the northern sandveld along the Limpopo river near Spokonyolo (Pienaar et al, 1983). Serala 5KT (Snyders, 1987). Tshipise (NMZB).

Habitat and Ecology

Appears to be restricted to low lying country in the north and east of the province in veld types 10, 11, 14, 15 and 18 at altitudes of 300-1400 m a.s.l. Usually found under rock on rock, rock on soil or under rotting logs; sometimes even piles of bricks may suffice. Nocturnal, they are found singly but a pair may inhabit an area. They feed mostly on reptile eggs including those of Agama sp. and Lygodactylus capensis as well as hatchlings of the latter species (Broadley, 1983). Oviparous, Broadley (1980a), recorded 5 eggs in a female from Zimbabwe.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Rare the species is occurs in the Kruger National Park and also in a provincial nature reserve. As much of its habitat is still relatively unspoilt its survival appears to be secure.

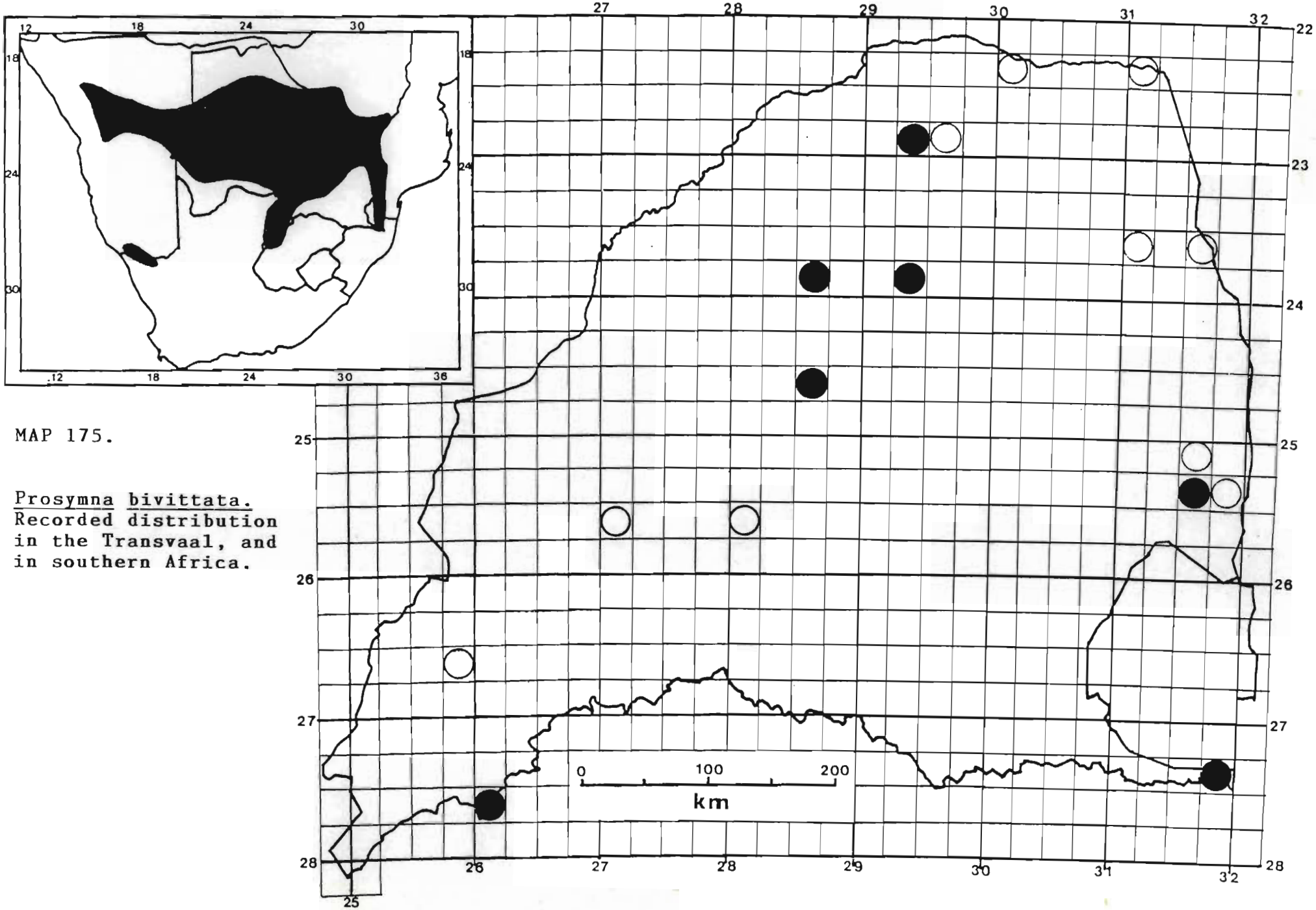
Remarks

The difficulty of separating this subspecies from sundevallii has already been mentioned.

Prosymna bivittata Werner, 1903

Prosymna sundevallii var. bivittata Werner, 1903, Abhandl. bayer. Akad. Wiss., 22(2), p. 381. Type locality: "Deutsch Südwest Afrika.
Prosymna sundevallii bivittata Werner. FitzSimons 1962, p. 155.
Prosymna sundevallii sundevallii (not A. Smith). FitzSimons 1962, p. 153 (part), pl. xix.
Prosymna bivittata Werner. Broadley, 1965a, p. 3; FitzSimons, 1966, p. 52, 1970/74, p. 103/104; Pienaar, 1966, p. 104, pl. 69, 1978, p. 146, pl. 64; De Waal, 1978, p. 95; Broadley 1980a, p. 510, fig. 4; Jacobsen & Haacke, 1980, p. 35; Welch, 1982, p. 181; Broadley, 1983, p. 226, figs 128 & 129; Pienaar et al, 1983, p. 184, pl. 82; Auerbach 1987, p. 177; Branch, 1988, p. 66, pl. 19.

Diagnosis. 8 Specimens examined.
Colour: Variable, from yellowish to light or greyish brown, or dirty white above. Sometimes two parallel brown lines or streaks along middle of back or two dorsolateral series of dark spots, which sometimes form two dark dorsolateral bands. In between these parallel lines the scales are sparsely flecked with darker spots, or a vertebral series of dark or black spots. The head with dark brown to blackish spots above each eye, or plain yellowish with a brown band across the snout. It may be pale with brown on the snout. Underparts uniformly cream to white.
Lepidosis: A small slender to moderately stout species with the head merging into the neck. Tail short and spine tipped. Rostral fairly broad but not as broad as that of sundevallii and little to not at all curved upwards; internasals narrowly to widely separated behind the rostral; preocular 1; postoculars 2 (rarely 1); loreal 1, as broad as deep to deeper than broad; UL 6



MAP 175.

Prosymna bivittata.
Recorded distribution in the Transvaal, and in southern Africa.

(rarely 5), 3rd and 4th entering orbit; LL 8 (rarely 7), the first three in contact with the chin shields. Dorsal smooth and overlapping in 15 rows at midbody; ventrals 151-179 (151-169 in males, 167-179 in females), anal scale entire; subcaudals 23-30, (males 25-30, females 23-25).

Size: Largest male SVL = 231,0 mm (P11009 - Pongola Nature Reserve), mass = 9,5 g (P1109); Largest female SVL = 285,0 mm (N2691 - Galakwyns Stroom 745LR).

Distribution

South West Africa/Namibia, southern Zimbabwe, northern Cape Province, north-western Orange Free State, Transvaal and probably southern Mozambique.

Distribution in the Transvaal (Map 175).

Galakwyns Stroom 745LR; Hectorspruit 164JU; Mosdene; Nylsvley Nature Reserve; Pietersburg; Pretoria District; Pongola Nature Reserve; Rustkraal 129HP; Vetfontein 360MS.

Literature Records

Komati/Crocodile R. Confluence; Messina; Naboomspruit; Vermaas (Broadley, 1980a). Mahlangene; eastern boundary between Tabaglovu and Nchindo beacons; Hectorspruit; Komatipoort; Skukuza; Nahpe road near Skukuza; road between Luvuvhu and Limpopo rivers 12-17 km (Pienaar et al, 1983). Waterpoort (NMZB). Rustenburg (KNP Records).

Habitat and Ecology

A widespread species in the Transvaal it inhabits veld types 10, 11, 12, 14, 15, 16, 18 and 20 at altitudes of

200-1400 m a.s.l. Usually found under rocks on soil or under logs. Broadley (1980a) mentions that the range is restricted to Acacia Savanna with an annual rainfall of 250-600 mm. Broadley (1983) reported on the species in captivity feeding on Aparallactus capensis and Nucras intertexta eggs.
The species is oviparous a specimen (NMSR 2551) in the National Museum of Zimbabwe containing 4 eggs measuring 27,0 x 7,0 mm (Broadley, 1980a).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A rare species it is widespread occurring in the Kruger National Park and in at least one provincial nature reserve. However its scarcity is indicative of a low density in any one area. As the species occurs throughout the KNP and over much of the Transvaal its status can be considered secure.

Remarks

The variability of the internasals in the sundevallii group has already been discussed, and bivittata is no exception. Several sundevallii specimens have the internasals widely separated, characteristic of bivittata. Several bivittata (J8677 - Nylsvley Nature Reserve; P11009 - Pongola Nature Reserve) have narrowly separated internasals while N2691 - Galakwyns Stroom 745LR actually has the internasals, narrowly in contact behind the rostral.
While there is no doubt that bivittata is a valid species, the key character is uncertain and the characterstic colour pattern seems more of value than a morphological analysis.

Prosymna ambigua stuhlmannii (Pfeffer, 1893)

Ligonirostra Stuhlmannii Pfeffer, 1893, Jahrb. Hamburg Wiss. Anst. 10, p. 78, pl. i, figs. 8-10. Type locality: Usambara, Tanzania.
Prosymna ambigua stuhlmannii (Pfeffer). FitzSimons, 1962, p. 157, 1966, p. 53, 1970/74, p. 104/105; Pienaar 1966, p. 165, pl. 70, 1978, p. 149, pl. 66; Broadley, 1980a, p. 538, fig. 16, Jacobsen & Haacke, 1980, p. 36; Welch, 1982, p. 180; Broadley, 1983, p. 230, fig. 132; Pienaar et al, 1983, p. 186, pl. 83; Branch 1988a, p. 67, pl. 29, 1988b, p. 13.

Diagnosis. 23 Specimens examined.
Colour: Varying from dark brown to metallic black above, uniform, or each scale with a greyish green to bluish grey centre, or with a series or irregularly spaced small, whitish specks or spots, which form indistinct, longitudinal rows on either side of the vertebral line. Snout brown, becoming paler towards the tip in adults. Juveniles have pale patches on the snout. Underparts white to yellowish or brownish white, rarely brown or black uniform throughout, or with a dusky to dark median band or stripe from vent to tip of tail. Some specimens from the northern Transvaal have olive green heads, this, more pronounced in younger specimens.
Lepidosis: A small slender snake with the head not distinct from the neck and with a short tail. Rostral large with a horizontal cutting edge; a single band like internasal; prefrontal 1, band-like, separated (rarely in contact with) orbit; preocular 1 (rarely 0 or 2); postoculars 2 (56,25%) sometimes 1, (43,75%); UL 6 (very rarely 5 or 7), 3rd and 4th (rarely 2nd & 3rd or 2nd, 3rd & 4th) entering orbit; LL 8 (rarely 7 or 9), the first three or four in contact with a pair of chin shields.

Body covered with smooth, overlapping scales in 15-17 rows at midbody; ventral scales 140-161 (males 140-145, females 142-161); anal scale entire; subcaudals 23-36, males 27-36, females 23-30.

Size: Largest male SVL = 223,0 mm (N7811 - Duurstede 361JU), mass = 5,6 g (N7811); Largest female SVL = 251,0 mm (N5625 - Rolle 235KU), mass = 10,0 g (N5625). Broadley (1983) recorded a female from Hectorspruit with a SVL of 255,0 mm. Mean male SVL = 204,67 mm ± 30,04 (1SD), n = 3, mass = 4,23 g ± 1,52 (1SD), n = 3; Mean female SVL = 203,0 mm ± 46,90 (1SD), n = 4; mass = 5,19 g ± 3,61 (1SD), n = 4. Tail contained in total length 6,26-8,56 times in males and 7,81 - 9,37 times in females.

Distribution

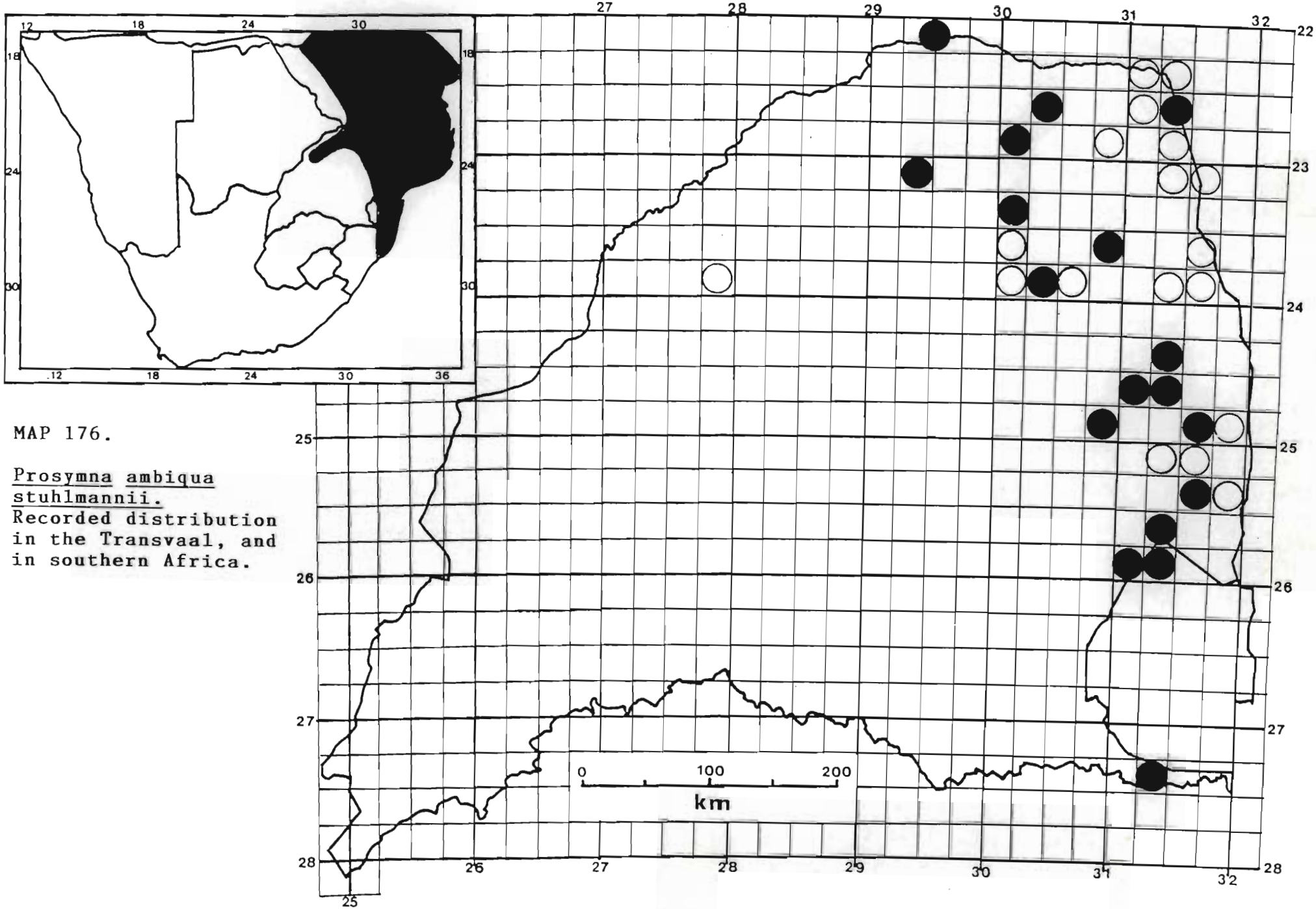
From southern Somalia south to Kwa Zulu and westwards to the Transvaal; Zimbabwe and eastern Zambia.

Distribution in the Transvaal (Map 176).

10 km Skukuza to Tshokwane; Barberton Townlands 369JU; Bergfontein 32LS; Between Saselandonga Spruit & Pafuri; Duurstede 361JU; Dycedale 368JU; Hans Hoheisen Research Station; Hectorspruit 164JU; Ka Khayi; Letaba; Letsitele 652LT; Malelane; Manyeleti Game Reserve, Main Camp; Paardekraal 135LT; Rolle 235KU; Rosendal 32HU; Trevenna 119MT; Vhuswinzhe; Waterhoutboom 567KT; Weipe 47MS.

Literature Records

Bergfontein 574LQ; Leydsdorp; Meidingen; Tzaneen (Broadley, 1980a). 1,6 km east of Mtsawu drift on the Hippo pool road; Skukuza; Tshokwane ranger's quarters; Shingwedzi (aberrant specimen with only one postocular);



MAP 176.

Prosymna ambiqua stuhlmannii.
Recorded distribution in the Transvaal, and in southern Africa.

Hlamalala north windmill; Hlanganine sandstone reef, Letaba section; near confluence of Sabie and Sand rivers; between Mathlakuza pan and Shimuhene pan; eastern boundary between Saselandonga gorge and Mathlakuza pan; Pafuri (W.N.L.A. quarters); drift through Letaba en route to Mala-Mala; eastern boundary between Nchindo and Tabaglovu beacons; between Bvumunyundu and Mapangudrift (western boundary); Pafuri ranger's quarters; Kolwane windmill; between beacons 1 and 3; between beacon 8 and Nyandu; Malonga spring; new tarred road north of Luvuvhu 7-10 km; Dakamila; Rhino camp, Pretoriuskop; Olifants camp; Beacon A area, Lebombos (Pienaar et al, 1983).

Habitat and Ecology

Mostly restricted to the north-east and eastern Transvaal in veld types 9, 10, 11, 15, 18 and 20 at altitudes of 395-1400 m a.s.l., the species is uncommon and more or less fossorial. Usually found under rotting logs and stones, it moves abroad at night and especially on a rainy night after the passing of a downpour.
P. a. stuhlmannii feeds mostly on reptile eggs including those of Agamids, Gekkonids and elongated snake eggs of Leptotyphlops and Aparallactus species (Broadley 1979b). Oviparous, 3 or 4 eggs measuring 19,0-30,0 x 7,0 - 8,0 mm are laid during midsummer. Mating has been observed at the end of July (Pienaar et al, 1983).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in the Kruger National Park this uncommon species is secure. Large scale habitat destruction in parts of the Lowveld is likely to be detrimental to the species.

Remarks

Broadley (1980a, 1983) discussed the taxonomy of the group as a whole, resurrecting stuhlmannii to subspecific level after initially synonymising it (Broadley, 1966). Although very similar to ambigua, stuhlmannii can be recognised by the more rounded profile with a brown to blue grey or black dorsum and subcaudals 27-39 in males, 17-30 in females. The large number of colour morphs or ecotypes can be misleading.

Genus *Meizodon* Fischer, 1856

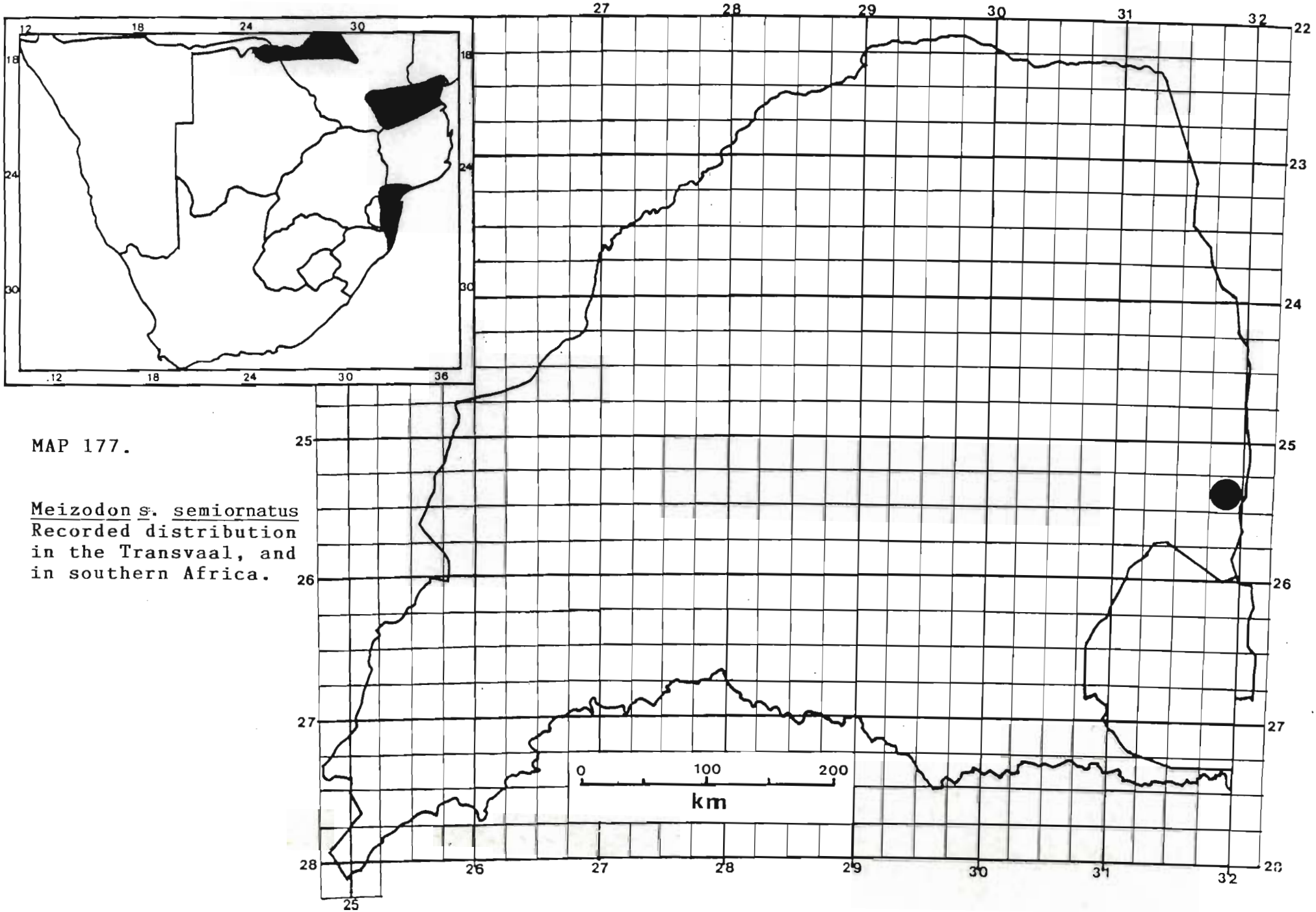
Meizodon Fischer, 1856, *Abhandl. Bay. Ver. Hamburg*, 3, p. 112. Type: *Meizodon regularis* Fischer = *Calamaria coronata* Schlegel.

A small almost exclusively African genus with a small head, more or less distinct from the neck and a little flattened; eye moderate in size with a rounded pupil; no large fangs, the small solid teeth crowded on the maxilla. Body cylindrical and covered with smooth, overlapping scales in 19 or 21 rows at midbody; anal scale divided; subcaudals paired. Oviparous. Only represented by a single species in southern Africa which just enters the Lowveld in the southern Kruger National Park. Although long expected to occur, it was only very recently (1986) that a specimen was found D.O.R. by G. Haagner.

Meizodon semiornatus semiornatus (Peters, 1854)

Coronella semiornata Peters, 1854, *Monatsb. Akad. Wiss. Berlin*, p. 622. Type locality: Tete, Mozambique.
Meizodon semiornatus (Peters). FitzSimons, 1966, p. 50; Welch, 1982, p. 156; Broadley, 1983, p. 232, figs. 133 & 134; Auerbach, 1987, p. 181; Branch 1988a, p. 82, pl. 26.
Meizodon semiornatus semiornatus (Peters). FitzSimons, 1962, p. 138, 1970/74, p. 96/97; Jacobsen & Haacke 1980, p. 30; Branch 1988b, p. 12.

Diagnosis. 1 Specimen examined.
Colour: Olive to olive brown above with dark cross bars on anterior half of back (pronounced in juveniles) which



MAP 177.

Meizodon s. semiornatus
Recorded distribution in the Transvaal, and in southern Africa.

may disappear with age. Scales on upper-lip usually darkened. Underparts white to yellowish white, uniform or more often darkened towards the sides becoming very dark in older specimens.

Lepidosis: A small slender snake, with a head moderately broader than neck. Tail long, slender and tapered. Rostral broader than deep; internasals in broad contact behind rostral; nostril pierced near upper margin of nasal; prefrontals paired; preocular 1 (exceptionally 2); loreal 1, small; postoculars 2 (rarely 1); UL 8, 4th and 5th entering orbit; LL 9-10, the first 5 in contact with the anterior sublinguals. Body cylindrical with smooth, imbricate scales in 21 rows at midbody; ventrals 167-196; anal scale divided; Subcaudals 66-91 (Broadley, 1983).

Size: Broadley (1983) reports on a female (LMM 5755 - Maputo) with a SVL = 509,0 mm. Length of tail from 21,0 to 24,25% of total length.

Distribution

Uganda, Kenya and Tanzania southwards to north-eastern Botswana, Zimbabwe, Mozambique and Kwa-Zulu, westwards to eastern Swaziland and marginally in the eastern Transvaal.

Distribution in the Transvaal (Map 177).

Crocodile Bridge.

Habitat and Ecology

Little is known of this species except that it inhabits marshy areas particularly close to water. Only known in the Transvaal to date from a single specimen collected

D.O.R. at Crocodile Bridge. This is in veld type 10 at an altitude of 200 m a.s.l. According to Broadley (1983) the species feeds primarily on skinks and geckos but also consumes frogs. Oviparous, 2-3 ova measuring 29,0-40,0 x 8,0-10,0 mm are laid in Midsummer.

Conservation Status (RDB 1988, peripheral).

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. The species occurs marginally in South Africa and is very uncommon. Large tracts of its habitat are being destroying and planted over with sugar cane. Further surveys are urgently needed to establish the total distribution of the species in the Transvaal. Status is indeterminate but seemingly vulnerable.

Genus Philothamnus A. Smith, 1840

Philothamnus A. Smith, 1840, Ill. Zool. S. Afr., Rept. footnote to text for pl. lix. Type: Dendrophis (Philothamnus) semivariegata A. Smith.

A large, entirely African genus. Head very distinct from the neck, and moderate to large, well developed eyes with rounded pupils. Teeth mostly arranged on the maxilla but also on the mandibular. The body is slender and elongate ranging from small to medium sized snakes. Dorsals smooth and in 11 to 15 rows at midbody. Ventrals smooth to keeled being notched along the line of keel. Anal scale single or divided; tail long to very long and slender, tapering gradually to a fine point. Subcaudals in two rows, smooth to ventrolaterally keeled and notched. Oviparous. Three species and one subspecies occur in the Transvaal, widespread, especially semivariegatus, or more restricted to rivers, streams and vleis, natalensis and hoplogaster; but mostly excluded from the highveld. Mostly arboreal, fewer are terrestrial and some are intermediate and even semi-aquatic.

Key to the Transvaal species.

1. Usually a single anterior temporal;
   subcaudals smooth or moderately angular .... P. hoplogaster
   Usually two anterior temporals;
   subcaudals smooth to strongly keeled 2

2. Usually three upper labials entering orbit;
   ventrals and subcaudals sharply angular,
   distinctly keeled and notched laterally
   ..... P. semivariegatus semivariegatus

Usually two upper labials entering orbit; ventrals feebly keeled laterally; subcaudals smooth to strongly keeled laterally 3

3. Subcaudals keeled; upper labials usually 9, with the 5th and 6th entering the orbit ..... P. natalensis natalensis

Subcaudals smooth; upper labials usually 8 with 4th and 5th entering orbit ..... P. natalensis occidentalis

Philothamnus hoplogaster (Günther, 1863b)

Ahaetulla hoplogaster Günther, 1836b, Ann. Mag. Nat. Hist., (3), 11, pp. 284 & 286. Type locality: Port Natal i.e. Durban.

Philothamnus hoplogaster (Günther). FitzSimons 1962, p. 147, 1966, p. 49, 1970/74, p. 98/99; Pienaar 1966, p. 161, pl. 68, 1978, p. 143, pl. 62; Jacobsen 1977, p. 29; Jacobsen & Haacke, 1980, p. 32; Welch, 1982, p. 167; Broadley, 1983, p. 234, fig. 135, pl. 50; Pienaar et al, 1983, p. 188, pl. 84; Auerbach, 1987, p. 181 ; Branch, 1988a, p. 83, pl. 30, 1988b, p. 13.

Diagnosis. 50 Specimens examined.

Colour: Uniform bluish to bright grass green or olive green above, insterstitial skin black, underparts a uniform bluish white to yellowish green, usually slightly paler green below than above with chin and throat yellowish green. Iris of eye usually greyish.

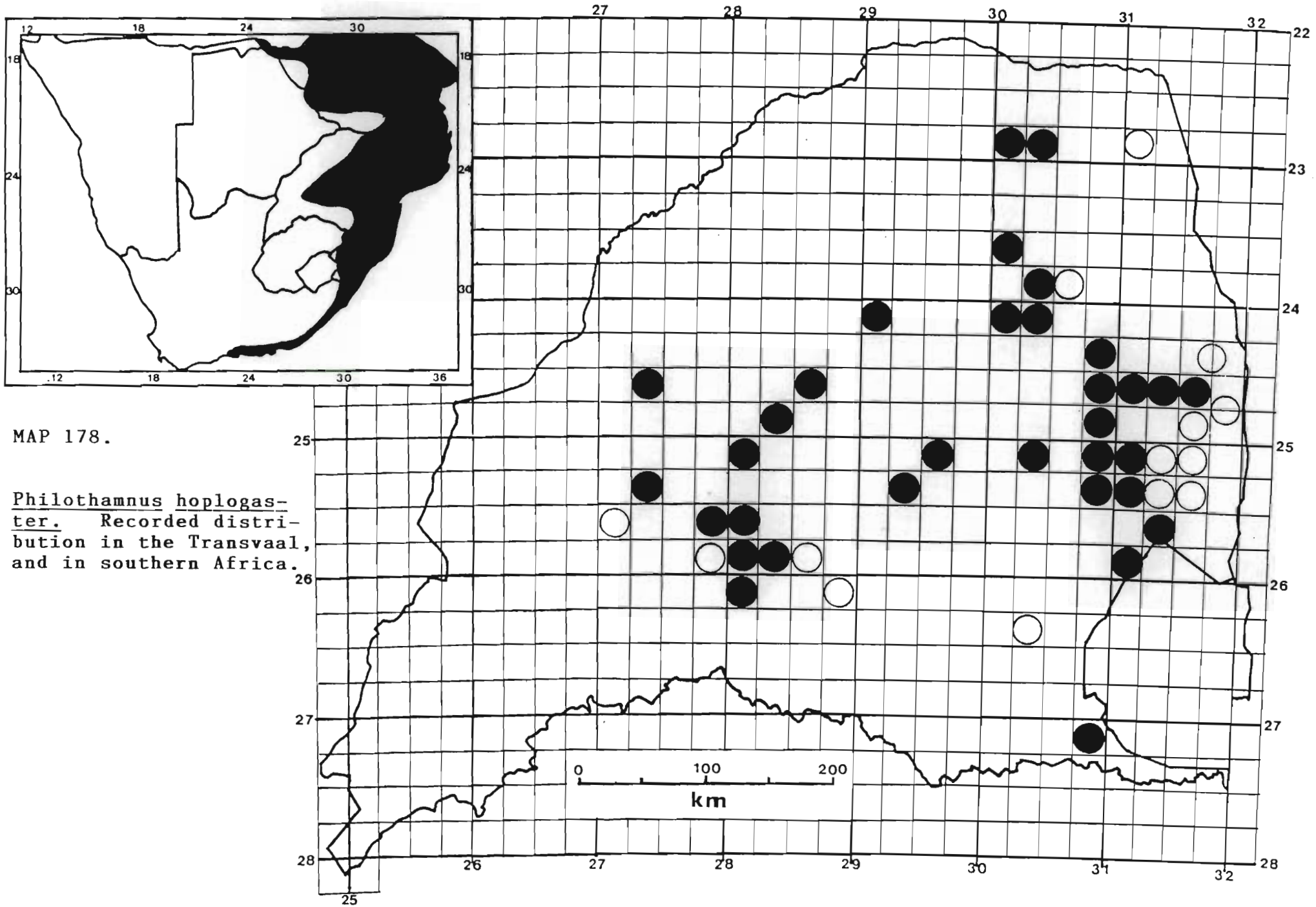
Lepidosis: A small, slender snake, with a head moderately distinct from the neck and a long tapering tail. Rostral broader than deep; internasals in broad contact behind rostral; a single preocular (exceptionally 2); loreal elongate; postocular 2 (very rarely 3); temporals 1 + 1, occasionally 1 + 2, rarely 0 + 1 or 1 + 0; UL 8 (rarely 7 or 9), 4th and 5th (rarely 3rd and 4th, 3rd, 4th & 5th, 4th, 5th & 6th or 5th & 6th) entering the orbit; LL 9-11, the first 5 (occasionally 4 or 6) in contact with anterior sublinguals. Body covered in smooth, imbricate scales, in 15 rows at midbody; ventrals not keeled to faintly keeled ventrolaterally, from 140-165; anal scale divided; subcaudals 73-106 but only exceeding 100 in Southern Africa.
Size: Broadley (1983) recorded the largest male SVL = 662,0 mm (TM 5521 - E. Transvaal). Mean SVL = 315,0 mm ± 45,56 (ISD), n = 4, mass = 11,05 g ± 3,34 (ISD), n = 4. The length of the tail is contained in total length 3,0-3,4 times in males and 3,3-3,8 times in females.

Distribution

From East Africa south to the eastern and south-eastern Cape Province including most of the Transvaal.

Distribution in the Transvaal (Map 178).

Blyde River Nature Reserve; Carpediem 76KT; De Kroon, Brits; De Rust 12JU; Engelbrechtshoop 55JU; Entabeni 251MT; Garstfontein 374JR; Goedehoop 152JS; Jukskei River, Johannesburg; Kaapmuiden 212JU; Klaserie Siding; Klipplaatdrift 43JR; Letsitele 652LT; Loskopdam Nature Reserve; Lunsklip Farm; Lydenburg; Manyeleti Game Reserve; Buffelshoek 340KU; Manyeleti Game Reserve, Main Camp; Mariepskop 420KT; Matlapitsi River;



MAP 178.

Philothamnus hoplogaster. Recorded distribution in the Transvaal, and in southern Africa.

Moolman, Piet Retief; Nelspruit; Nelspruit Citrus Research Station; Noordkaap, Nelspruit Dist.; Nylsvley Nature Reserve; Onderhoek 595LT; Pilgrim's Rest Nature Reserve; Pinedene; Pretoria; Pretoria, The Willows; Rietspruit 83JQ; Sabie; Sekororo; Swadini Snake Park; Thabazimbi; Warmbaths.

Literature Records

Barberton; Bronkhorstspruit; Kendal; Leydsdorp; Lothair; Nahpe Pan; Oliewenhoutpoort; Piet Retief; Rustenburg; Tshokwane; Tzaneen (FitzSimons, 1962).
Gondweni water-hole, Phugwane; Hlangulene water-hole, near western boundary; main road near Numbi gate; Nwatindlopfu windmill; north bank of Sabie river, 6,4 km east of Skukuza; near Nwanedzi West windmill; Stolznek dam; Faai-spruit, Rhino camp; Mlambane spruit (Pienaar et al, 1983).

Habitat and Ecology

A diurnal species usually found in association with water or marshy habitats. On the Nylsvley nature reserve it has been recorded from most habitats but prefers low-lying moister habitats (Jacobsen, 1977). It is found in veld types 8, 9, 11, 16, 18 and 57 at altitudes of 400 - 1750 m a.s.l. Very versatile, hoplogaster is active and expert at climbing, swimming and diving as well as traversing over ground. Feeds almost exclusively on frogs but apparently also includes toads, lizards and small fish.
Oviparous, 3-8 (usually 5 to 6) eggs measuring 25,0-34,0 x 8,0-12,0 mm are laid in early summer. Hatchlings range from 150,0-200,0 mm in total length. Caudal autotomy occurs in this species.

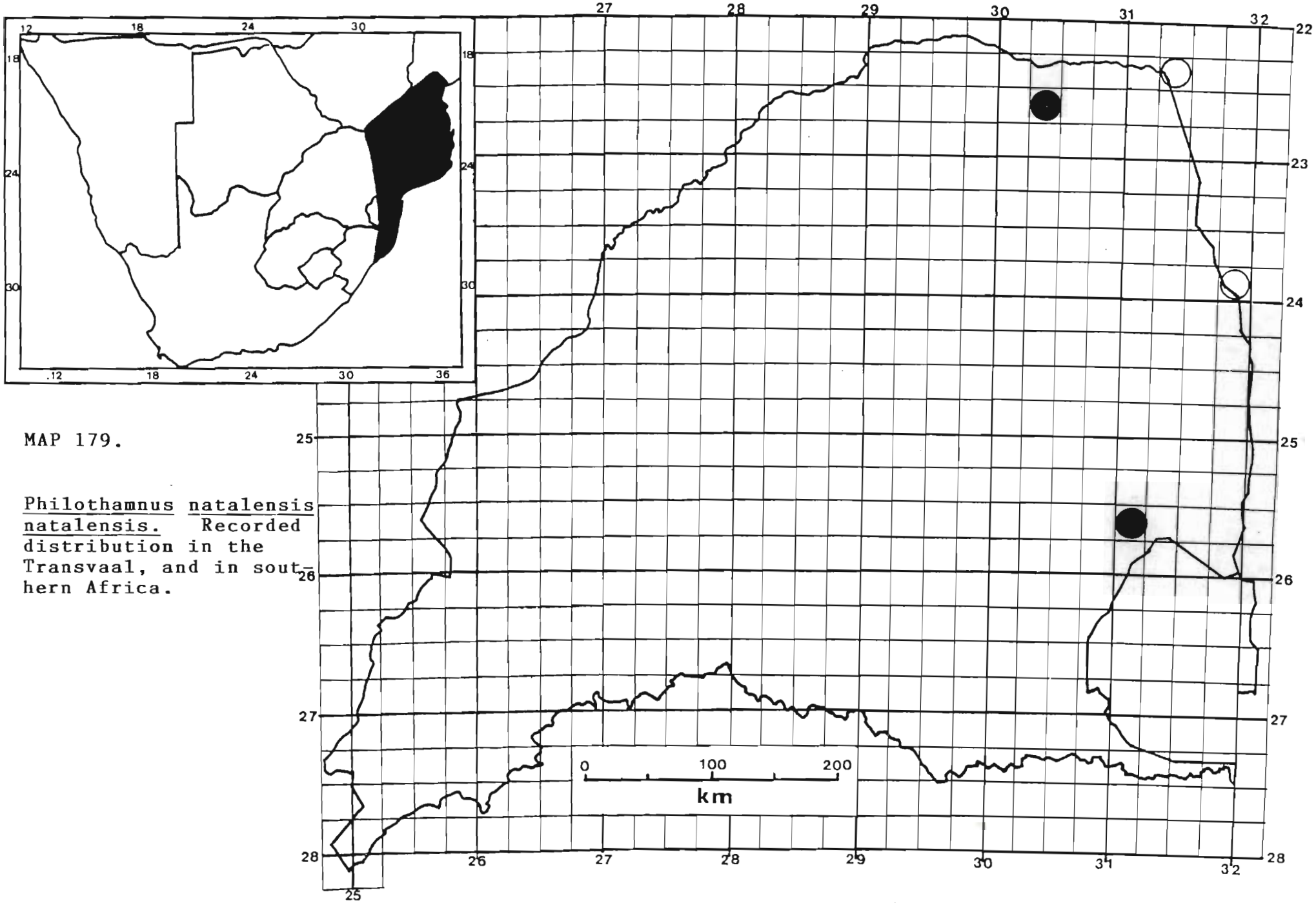
Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Although widespread in the Transvaal, it does not appear to be common anywhere. It is found in the Kruger National Park and several provincial nature reserves. In the latter, densities appear low and they probably do not house a viable population. Density determinations are needed on the nature reserves.

Philothamnus natalensis natalensis (A. Smith, 1848).

Dendrophis (Philothamnus) natalensis A. Smith, 1848, Ill., Zool. S. Afr., Rept., pl. lxiv, figs. 1-2. Type locality: "Port Natal", i.e. Durban.
Philothamnus natalensis (A. Smith). FitzSimons, 1962, p. 144 (part).
Philopthamnus natalensis natalensis (A. Smith). Broadley, 1966, p. 418; Pienaar, 1966, p. 162, pl. 67, 1978, p. 144, pl. 63; Jacobsen & Haacke, 1980, p. 33; Broadley, 1983, p. 239, fig. 135, pl. 50; Pienaar et al, 1983, p. 189, pl. 85; Branch, 1988a, p. 83, 1988b, p. 13.
Philothamnus natalensis (A. Smith) (part) Welch, 1982, p. 167. FitzSimons, 1962, p. 144.

Diagnosis. 2 Specimens examined.
Colour: Bright grass green to blue green above turning olive green when about to shed old skin. Uniform or with scattered scales bearing white to bluish white spots on their anterior margins. Head usually a little darker than back. Underparts usually greenish white to light



MAP 179.

Philothamnus natalensis natalensis. Recorded distribution in the Transvaal, and in southern Africa.

yellowish green but sometimes almost as green as above, with chin and throat paler. Juveniles may have black crossbands on the neck, causing confusion with semivariegatus.

Lepidosis: A medium sized snake with a head distinct from the neck and a long tapered tail. Rostral broader than deep; internasals in broad contact behind rostral; nostril pierced in suture between two nasal scales; loreal longer than high; preocular 1, not in contact with frontal; postoculars 2 (rarely 3); temporals 2 + 2, rarely 1 + 2 or 2 + 1; UL 8 or 9, 4th and 5th or 5th and 6th (rarely 4th, 5th and 6th) entering orbit; LL 10 or 11 (rarely 9 or 12), the first five (exceptionally 4 or 6) in contact with the anterior sublinguals. Dorsals scales smooth to very feebly keeled posteriorly and imbricate, in 15 rows at midbody; ventrals 159-178 in males and 156-182 in females and feebly keeled laterally; anal scale divided; subcaudals strongly keeled 116-130 in males and 108-120 in females.

Size: Broadley (1983) records a male (TM 29436 - Mapulanguene, Mozambique) with a SVL = 645,0 mm and a female SVL = 760,0 mm (KNP 70 - Bangu Gorge).

Distribution

Central and southern Mozambique, eastern Zimbabwe, north-eastern Transvaal, KwaZulu and Natal.

Distribution in the Transvaal (Map 179).

Ehlatini, Nelspruit; Trevenna 119MT.

Literature Records

Bargu Gorge; Limpopo-Levhuvhu confluence (Pienaar et al 1983).

Habitat and Ecology

Mostly related to areas close to water although specimens from Zimbabwe and central Mozambique were found in dry forest and miombo woodland. Occurs in veld types 10, 11 and 15 at altitudes of 200-700 m a.s.l. Apparently similar in habits to occidentalis in being more arboreal. Feeds on geckos including Hemidactylus sp. (Broadley, 1983) but no doubt also feeds on frogs. Oviparous, Broadley (1983) recorded a female with 4 eggs from Mozambique. The eggs in situ measured 23,0x 8,0 mm.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A marginal subspecies only entering our limits in the east. It occurs in the Kruger National Park but is everywhere sparsely distributed. Status is secure.

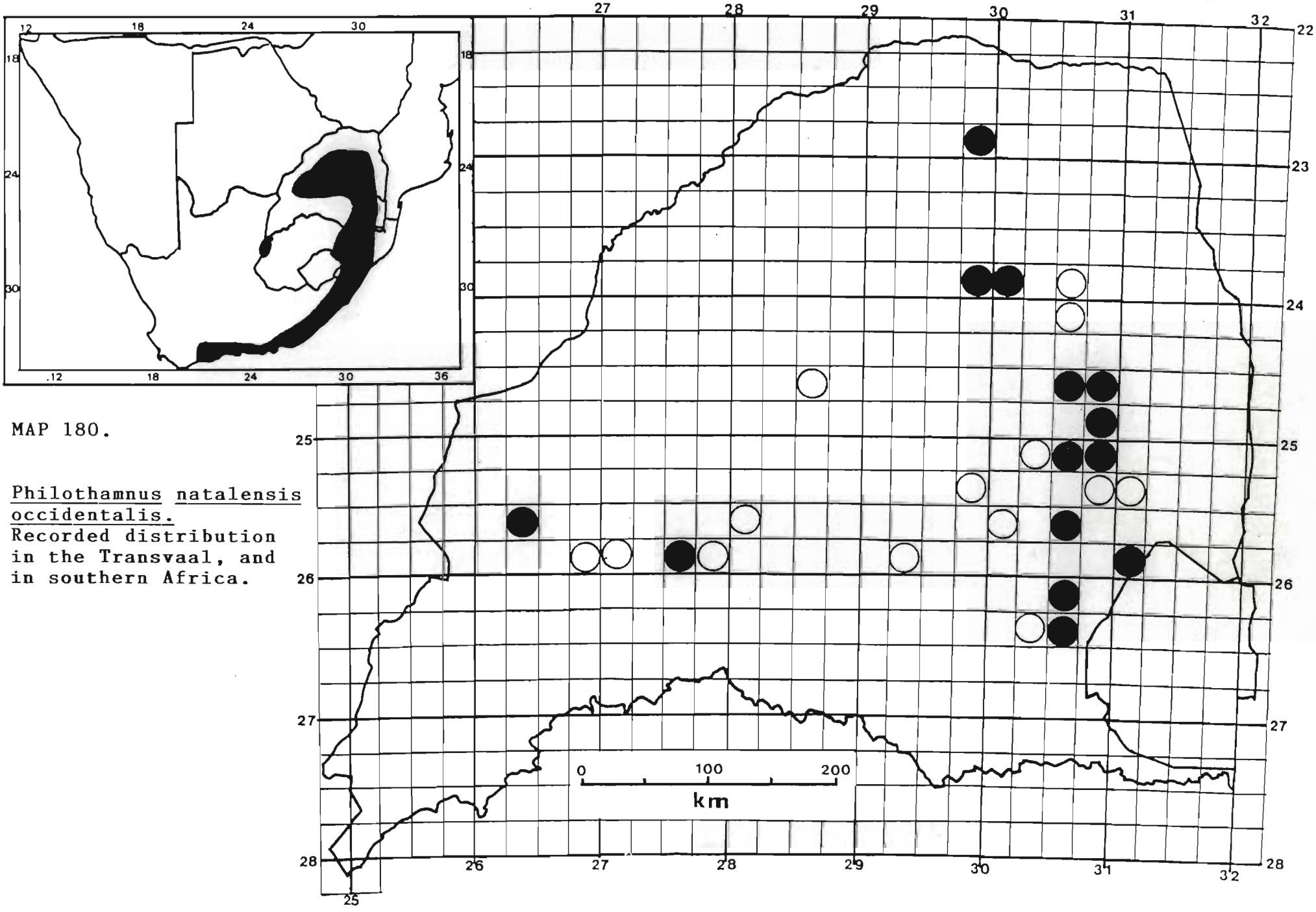
Remarks

Broadley (1983) recognises intergrades at one locality. He overlooked the specimens from Nelspruit and the farm Trevenna 119MT, housed in the Transvaal Museum which advance the distribution of the subspecies further west. The edge of the Transvaal Drakensberg is expected to show transitional specimens, should intergradation take place, between occidentalis and natalensis.

Philothamnus natalensis occidentalis Broadley, 1966.

Philothamnus natalensis occidentalis Broadley, 1966, Ann. Natal Mus. 18, p. 419. Type locality: Camperdown, Natal. FitzSimons, 1974, p. 102; De Waal, 1978, p. 93; Jacobsen & Haacke, 1980, p. 33; Broadley, 1983, p. 240, fig. 137; Branch, 1988a, p. 83, pl. 30, 1988b, p. 13.
Philothamnus natalensis (A. Smith), part. FitzSimons 1962, p. 144; Welch, 1982, p. 167.

Diagnosis. 59 Specimens examined.
Colour: Emerald - to olive green dorsally, uniform or some scales with a white spot; interstial skin black. Underparts yellow-green to greenish white. The chin is usually whitish to whitish green.
Lepidosis: A small to medium sized, moderately slender snake, with the head larger and distinct from the neck. Tail long and slender. Very similar to natalensis. Snout rounded with rostral broader than high; nostril pierced along suture between two nasals; internasals in broad contact behind rostral; preocular 1 (rarely 2); postoculars 2 (exceptionally 3); temporals 2 + 2 (rarely 1 + 1, 1 + 2, 2 + 1 or 2 + 3); UL 8 (occasionally 9), 4th and 5th (rarely 5th and 6th or 4th, 5th and 6th) entering the orbit; LL 10 (range 8-11), the first five (range 3-6) in contact with the anterior sublinguals. Dorsal scales smooth, imbricate and in 15 rows at midbody; ventrals keeled laterally and are 154-167 in males and 158-177 in females; anal scale divided; subcaudals smooth, 119-135 in males and 111-123 in females.
Size: Largest male SVL = 590,0 mm (N8379 - Nooitgedacht 471JQ9, mass = 35,0 g (N8379); Largest female SVL = 652,0 mm (J4998 - Mariepskop), mass = 42,9 g (J4998). Broadley (1983) recorded a male SVL = 615,0 mm (SAM 2010



MAP 180.

Philothamnus natalensis occidentalis.
Recorded distribution in the Transvaal, and in southern Africa.

- Transkei) and a female SVL = 776,0 mm (NMB 1432 - Oever, Orange Free State). The tail is contained in total length 3,26-3,41 times.

Distribution

The south-eastern Cape Province north through Natal to the Transvaal with isolated records from the Orange Free State and Zimbabwe.

Distribution in the Transvaal (Map 180).

2 km from Lone Creek; 7 km N. of Louis Trichardt; Barberton Townlands 369JU; Berlyn 506KT; Devils Knuckles, Long Tom Pass; Graskop 564KT; Iron Crown, Wolkberg; Jessievale 200IT; Magoebaskloof; Mariepskop 420KT; Mount Denny 223IT; Ngodwana; Nooitgedacht 471JQ; Ohrigstad 443KT; Onderhoek 595LT; Pilgrim's Rest; Rondavelskraal 290JP; Sabie.

Literature Records

Belfast; Haenertsburg; Hennops River; Karino; Kosterfontein; Leydsdorp; Lothair; Lydenburg; Mataffin; Middelburg; Middelfontein; Pretoria; Rayton; The Brook; Zandfontein, Rustenburg (FitzSimons, 1962. Doornkop; Woodbush; Selati; Sabie River (Broadley, 1966).

Habitat and Ecology

Usually found in shrubs and trees close to water. Found in veld types 8, 9, 10, 13, 18, 19 and 20 at altitudes of 1000-2000 m a.s.l. Uncommon and local, the species feeds mostly on frogs. Oviparous, a female from

Mariepskop (J4998) laid 9 eggs measuring 27,5-32,0 x 11,4-12,3 mm during October. Caudal autotomy occurs in the species, 2/59 (3,39%) of tails truncated.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. An uncommon and local species found mostly in moister habitats especially stream banks in montane and hilly areas. Occurs in the Rustenburg Nature Reserve and probably others scattered along the escarpment. Habitat destruction by afforestation probably the greatest threat. However, the species would appear to be secure, but density surveys in suitable habitat are needed.

Philothamnus semivariegatus semivariegarietus (A. Smith, 1840)

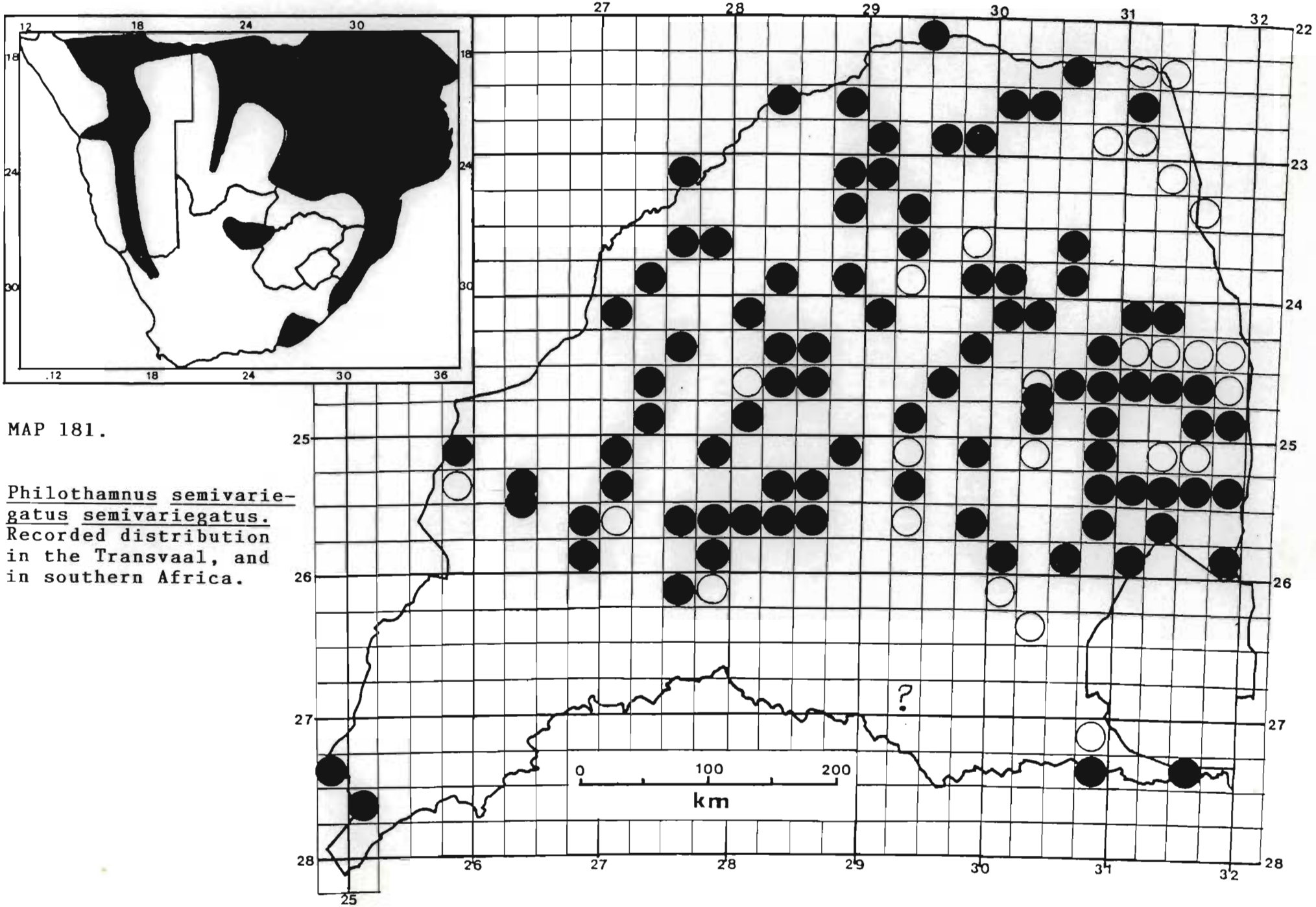
Dendrophis (Philothamnus) semivariegata A. Smith, 1840, Ill. Zool. S. Afr., Rept., pls. lix, lxiv, figs. 1a-b. Type Locality: "Bushman flat", Cape Province - restricted by Bogart, 1940.
Philothamnus semivariegatus semivariegatus (A. Smith). FitzSimons, 1962, p. 140, 1966, p. 48, 1970/74, p. 96/97; Pienaar, 1966, p. 159, pl. 66, 1978, p. 141, pl. 61; Jacobsen 1977, p. 29; Jacobsen & Haacke, 1980, p. 31; Welch, 1982, p. 167; Broadley, 1983, p. 241, fig. 138, pl. 51; Pienaar et al, 1983, p. 191, pl. 86; Auerbach, 1987, p. 183, pl. 17, fig. 4; Branch 1988a, p. 82, pl. 30, 1988b, p. 13.

Diagnosis. 143 Specimens examined.
Colour: Bright green to green, rarely uniform, normally with black spots or crossbars on anterior half to two

thirds of the body. Some scales, especially anteriorly, with white spot on each. Northern specimens tend to be more blue green anteriorly, slowly becoming bronzy green and finally bronze posteriorly. Underparts mainly yellow or greenish yellow anteriorly but becoming pale olive to bronze posteriorly. Ventral scales and subcaudals with a well developed keel on each side of body. Iris golden to deep yellow and tongue bluish green basally and black distally.

Lepidosis: A medium slender snake, with a well developed head wider than neck. Tail very long, slender and tapered. Rostral broader than deep; internasals in broad contact behind rostral; nostril pierced in suture between two nasals; preocular 1, narrowly separated from to narrowly in contact with frontal; postoculars 2; temporals variable but usually 2 + 2; UL 8-12 (usually 9), 4th, 5th and 6th (rarely 4th and 5th, 5th and 6th, 3rd, 4th and 5th or 5th, 6th and 7th) entering the orbit; LL 9-12, the first five (rarely four or six) in contact with the anterior chin shields. Body scales smooth and imbricate, in 15 rows at midbody. Ventrals 175-204 strongly keeled and notched laterally. Anal scale divided. Subcaudals 122-166.

Size: Largest male SVL = 664,0 mm (N5200 - Mohlaletsi), mass = 52,5 g (N5200); Largest female SVL = 755,0 mm (N5137 - Maleshwane), mass = 120,0 g (N5137). Mean male SVL (>400,0 mm) = 553,47 mm ± 51,20 (1SD), n = 15, mass = 32,63 g ± 9,26 (1SD), n = 15; Mean female SVL (>400,0 mm) = 550,62 mm ± 101,69 (1SD), n = 16, mass = 41,27 g ± 29,43 (1SD), n = 15. Tail contained in total length from 2,85 to 3,72 times with juveniles having shorter tails than adults.



MAP 181.

Philothamnus semivariegatus semivariegatus. Recorded distribution in the Transvaal, and in southern Africa.

Distribution

From the eastern Cape Province north to Natal/KwaZulu and Mozambique and further north. Westwards the species occurs in Zimbabwe, Transvaal, northern Cape Proince, Botswana and northern South West Africa/Namibia.

Distribution in the Transvaal (Map 181).

10 km N. Rosslyn; 35 km S.W. Tshipise on Njelele R. Acornhoek 212KU; Amsterdam 116LS; Barberton Townlands 369JU; Beauley 260LR; Bendor 211HT; Bezuidenhoutkraal; Blouberg; Blyde River Nature Reserve; Bokfontein 448JQ; Brandwag - 25 km N. Vaalwater; Brits; Broederstroom 481JQ; Buffelshoek 340KU, Manyeleti Game Reserve; Bulhoek 389JP; Canterbury 254MR; Crocodile River, Rustenburg; Dambale Hills; De Bad 396KT; Die Hoekie, Brits Dist.; Dycedale 368JU; Elandsfontein 440JQ; Elandskop; Ellisras; Goevernements Plaats 417KQ; Griffin Mine, Leydsdorp; Groot Denteren 533LR; Groot Marico Dam; Groothoek 278KQ; Hans Merensky Nature Reserve; Happyland 241KT; Hartshoogte 17HN; Hectorspruit 164JU; Houwater 54JQ; Inhambane 802LR; Italie 123HO; Kaapmuiden 212JU; Kaapsche Hoop 483JT; Kafferskraal 43JQ; Kalkheuwel 493JQ; Kameelspruit 29KQ; Ketting 368LR; Kingston Vale 125JU; Klipfontein 429JR; Klipfontein 9JO; Klipvoor 159JQ; Komatipoort Townlands 182JU; Langjan Nature Reserve 370MS; Leeupan KNP; Leeuwfontein 188JR; Leeuwklip 363JS; Leeuwpoort 373KR; Leydsdorp Dorpsgronde 779LT; Loskopdam Nature Reserve; Louws Creek 271JU; Lunsklip; Luphisi; Lydenburg; Malamala 359KU; Malelane 289JU; Maleshwane; Malta 65KT; Mananga; Manyeleti Game Reserve; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp; Marble Hall 29JS; Matubula; Mohlaletsi; Moletsi

Location; Naauwpoort 363LQ; Naboomspruit 348KR; Nelspruit; Niklaas 148MT; Nylsvley Nature Reserve; Pienaarsriver 83JR; Pilgrim's Rest; Pretoria; Pretoria, Mountain View; Pretoria, Sinoville; Pretoria, The Willows; Punda Milia; Rietfontein 214JR; Rietspruit 412KR; Rissik PNR, 8 km E. Warmbaths; Rochdale 700MS; Roodeplaat Dam Area, Pretoria; Rooibok 707KS; Rooibokkop 744KS; Sabie; Sabie Game Reserve; Scherp Arabie 743KS; Schuinsdrift 75JP; Shilowane; Shlaralumi; Spekboom River; Standerton; Sterkfontein 173IQ; Steynsdrift 145JS; Strydfontein 442KT; Sunnyside 532LQ; Thabazimbi; The Curlews 103JU; Trehowel 133KR; Trevenna 119MT; Tweefontein 523JQ; Tzaneen 538LT; Uitspan 65LQ; Uitzoek 63KR; Umzinto 36MR; Vaalwater 162LT; Venice 40KU; Vergeval 64HU; Vygeboom 619JT; Weipe 47MS; Witrand 457JP; Zandfontein 317JR; Zebediela Estates 101KS; Zwartkloof 60HU.

Literature Records

Boekenhout; Botschabelo; Brak R; Brondal; Burgersfort; Carolina; Crocodile Bridge; Damwal; Groblersdal; Kingfisherspruit; Komati/Crocodile R. Junction; Kralingen; Krugersdorp; Linokana; Lothair; Mapongole; Mataffin; Munnik; Nylstroom; Panamaria; Pietersburg; Piet Retief; Plaston; Pongola; Punda Milia; Roossenekal; Rustenburg; Satara; Shingwedzi; Skukuza; Zeerust (FitzSimons, 1962). Serala 5KT (Snyders, 1987). Panama dam area; Mbyamiti experimental plots; Skukuza; Punda Maria; Shingwedzi quarters; Satara camp; Rabelais dam; Gaisenga waterhole, Bume; Kingfisherspruit; Mbomene waterhole, Mphongole; near confluence of Luvuvhu and Limpopo rivers, Pafuri; Nahpe road 4,8 km west of Skukuza; Letaba camp; Pretoriuskop ranger's quarters; Pafuri

ranger's quarters; Nwanedzi; Shilowa; Sweni river; Tshokwane; Mabyeni hill (Pienaar et al, 1983). 5 km E. of Lydenburg (NMZB).

Habitat and Ecology

A widespread species occurring in most veld types in the Transvaal with the exception of the southern and south-eastern highveld. Recorded from veld types 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 57, 61, 63, 64 and 67 at altitudes of 300-2000 m a.s.l. An agile, swift-moving diurnal snake, it takes refuge in trees and is frequently found on rocky outcrops occupying crevices between and under rocks. Also occupies holes in trees, in large termitaria, under the bark of dead trees and often around houses. The keeled ventrals permit it to climb the boles of rough barked trees and the brick walls of houses. Very active in pursuit of prey and will leap two metres to the ground after prey. Appears to tackle large grey tree frogs Chiromantis xerampelina frequently. Also feeds on other frogs such as Rana angolensis and lizards like Mabuya quinquetaeniata margaritifer. Broadley (1983) mentions lizards, particularly geckos, and chamaeleous and tree frogs as their main diet, as well as feeding on other ranids. Oviparous, 3-7 eggs (Broadley, 1983 - 6 to 12 eggs) are laid from November to January. These measure 23,5 - 33,2 x 10,5-14,2 mm (Broadley, 1883, 28-30x8 mm to 41x 12 mm). The eggs hatch out in mid to late summer i.e. February/March. The smallest specimens found had a SVL of 185,0-215,0 mm.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread occurring in many provincial nature reserves and throughout the Kruger National Park. The species is currently secure.

Genus Crotaphopeltis Fitzinger, 1843

Crotaphopeltis Fitzinger, 1843, Syst. Rept., p. 27. Type: Coronella rufescens Schlegel = Coronella hotamboeia Laurenti.

A small genus of African snakes of approximately six species. The snakes are small and relatively slender to robust. Head short, flattened and distinctly broader than the neck; eye moderately developed with a vertically elliptic pupil; teeth found on the maxilla including posteriorly, two large, grooved fangs and a small non-grooved tooth just behind posterior margin of eye. Mandibular teeth also present but only slightly enlarged. The body is moderately compressed to subtriangular and dorsals smooth or faintly keeled posteriorly, in 17 to 21 scale rows at midbody. Ventrals smooth; anal scale entire; tail moderately long to short; subcaudals in two rows. Oviparous. Only one species occurs in the Transvaal which is widespread in the province although rare in the north-west. The genus as a whole prefers moister situations in keeping with their mostly amphibian diet.

Crotaphopeltis hotamboeia (Laurenti), 1768

Coronella hotamboeia Laurenti, 1768, Syn. Rept., p. 85. Type locality: 'India oriental', i.e. Africa.
Crotaphopeltis hotamboeia (Laurenti). De Waal, 1978, p. 102; Welch, 1982, p. 148; Broadley, 1983, p. 243, fig. 139, pls. 52 & 53; Pienaar et al, 1983, p. 194, pl. 88; Auerbach 1987, p. 183, pl. 17, fig. 4, Branch, 1988a, p. 85, pl. 33, 1988b, p. 12.

Crotaphopeltis hotamboeia hotamboeia (Laurenti). FitzSimons 1962, p. 187, 1966, p. 171, 1970/74, p. 118/119; Pienaar 1966, p. 171, pl. 74, 1978, p. 155, pl. 69; Jacobsen 1977, p. 31; Jacobsen & Haacke, 1980, p. 42.

Diagnosis. 322 Specimens examined.
Colour: Brown to greyish or olive-brown, olive to greyish green or blackish above. Uniform or with scattered whitish specks which may form fine transverse bars. A distinct bluish- to purplish-black patch on the temporal side of the head. Upper-lips usually bright orange-red, although paler in the more northern and southern populations. Underparts uniformly white to creamy white. Iris of eye greyish olive or reddish.
Lepidosis: A small relatively thick bodied snake. Head distinct from neck, and a relatively short tail; Rostral broader than deep; internasals in broad contact behind rostral; nostril pierced in suture between 2 nasals; loreal 1 as deep as long to slightly longer than deep; preocular 1 (rarely 2); postoculars 2 (rarely 3); temporals 1 +2, rarely 1 + 1; UL 8 (occasionally 7 or 9), 3rd, 4th and 5th entering orbit; LL 9-10 (rarely 11) the first 4 or 5 in contact with the large anterior sublinguals. Body scales mostly smooth but may be bluntly keeled posteriorly and in 19 rows at midbody (exceptionally 18 or 21); ventrals 139-174; anal scale entire; subcaudals 24-47.
Size: Largest male SVL = 450,0 mm (N5993 - Kranskloof 554KT), mass = 41,0 g (N5993); Largest female SVL = 452,0 mm (N9554 - Bendor 211HT), mass = 45,0 g (N8652 - Zwartkoppies 364JR). Mean male SVL (>250,0 mm) = 347,10 mm ± 53,06 (1SD), n = 24, mass = 19,56 g ± 9,12 (1SD), n = 25. Mean female SVL (>250,0 mm) = 327,32 mm ± 53,50 (1SD), n = 22, mass = 19,09 g ± 9,46 (1SD), n = 22. Tail

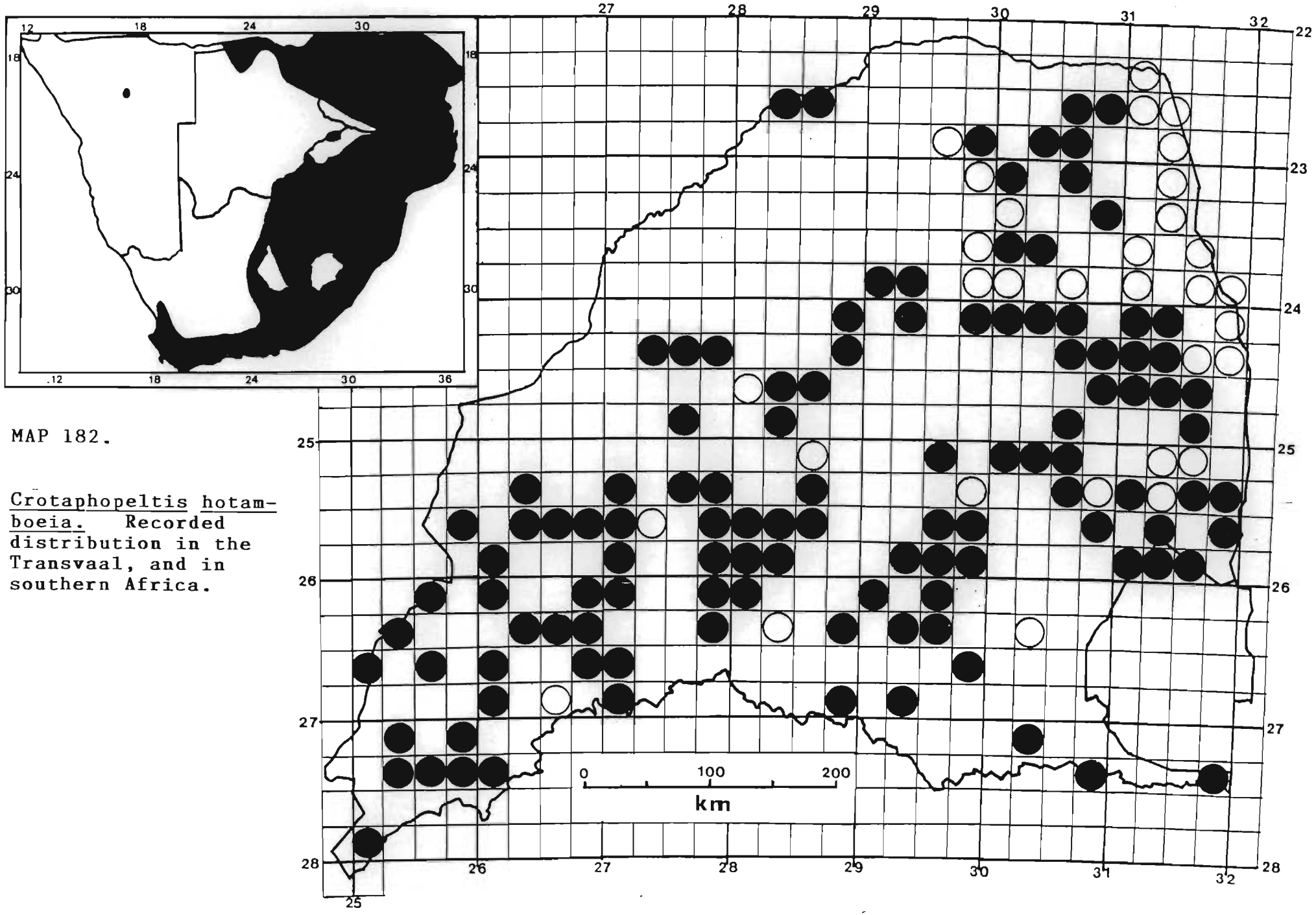
contained in total length 5,17 - 8,91 times. No clear differentiation between sexes takes place in tail length although males range from 5,17 - 7,87 and females 6,66 - 8,91.

Distribution

Tropical Africa excluding rainforest areas, south over the eastern half of southern Africa to the western Cape Province.

Distribution in the Transvaal (Map 182).

2,5 km past Pretoria, Lynnwood Drive-In; 15 km E. Krugersdorp; Aden 1KT; Antioch 240KT; Barberspan Nature Reserve; Barberton Townlands 369JU; Bendor 211HT; Bergfontein 277KQ; Between Acornhoek & Ohrigstad; Biltong 434JU; Blauwkrans 80KS; Blyde River Nature Reserve; Boekenhoutskloofdrift 286JR; Braksloot 734LS; Buffelshoek 340KU, Manyeleti Game Reserve; Buffelspoort 421KR; Christiana 325HO; Donkerhoek 365JR; Doornbult 624LS; Doorndraai 282KR; Driefontein, Johannesburg; Eersteling 63HP; Ehlatini, Nelspruit; Elandsfontein 308IQ; Elandsfontein 352JR; Garstfontein 374JR; Geluk 235IP; Goedehoop 152JS; Gollel 73HU; Graspan 230HO; Groenfontein 429JP; Groenkloof 358JR; Grootfontein 47LT; Halfway House; Hartebeeshoek Provincial Nursery; Hartebeespoortdam, NW area of; Hectorspruit 164JU; Hoedspruit 346JS; Hoedspruit Air Base; Holworth 783MS; Houthaaldoorns 2IP; Houwater 54JQ; Illovo 187MR; Irene; Jerome 287MT; Johannesburg; Johannesburg, Honeydew; Kaalplaats 193IO; Kaapsche Hoop 483JT; Kelvin, Randburg; Klerkskraal 65IQ; Klipkuil 352JP; Kliprivier 73JT; Komatipoort Townlands 182JU; Krabbefontein; Kranskloof 554KT;



MAP 182.

Crotaphopeltis hotamboeia. Recorded distribution in the Transvaal, and in southern Africa.

Krausville, Uitsicht 314JR; Kromdraai 352IP; Krugersdorp; Kunana Location 4IO; Leeuwklip 363JS; Lindleyspoort 220JP; Lisbon State Forest; Lot 19 20HO; Lydenburg; Mabopane; Magaliesberg, Pretoria Dist.; Magalieskop, 19 km. W. Klaserie; Makokskraal 203IP; Malamala 359KU; Malemetsa; Manyeleti Game Reserve; Manyeleti Game Reserve, Dixie Camp; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Moira; Mariepskop 420KT; Medfordt Park 52JP; Middelburg Town and Townlands 287JS; Modderfontein 35IR; Moilwas Location; Mooimeisjesfontein; Mooimeisjesfontein, Waterberg Dist.; Morgendal 216KS; Newgate 802MS; Nkungwini; Nsama River; Nylsvley Nature Reserve; Olievenbosch 506KQ; Onderhoek 595LT; Paardeplaats 101HT; Paardeplaats 154JT; Paris 206KT; Pelindaba; Pietersburg; Potchefstroom Town and Townlands 435IQ; Pretoria; Pretoria District; Pretoria North; Pretoria West; Pretoria West, Drive-In; Pretoria, Ashlea Gardens; Pretoria, Capital Park; Pretoria, Claremont; Pretoria, Dely Road, Hazelwood; Pretoria, Eldoraigne; Pretoria, Eloffsdal; Pretoria, Fountains; Pretoria, Groenkloof; Pretoria, Lynnwood Glen; Pretoria, Lynnwood Ridge; Pretoria, Maroelana; Pretoria, Meintjieskop; Pretoria, Menlo Park; Pretoria, Monavoni; Pretoria, Monument Park; Pretoria, Mountain View; Pretoria, Olympus; Pretoria, Pienaarsrivierdam; Pretoria, Rissik Street; Pretoria, Riviera; Pretoria, Roseville; Pretoria, Silverton; Pretoria, The Willows; Pretoria, Val de Grace; Pretoria, Valhalla; Pretoria, Victoria Bridge, Sunnyside; Pretoria, Waterkloof; Pretoria, Waterkloof Glen; Pretoria, Waterkloof Park; Pretoria, Waterkloof Ridge; Pretoria, Wingate Park; Pretoria, Zoological Gardens; Rainpan 60KQ; Randfontein; Rhenosterfontein 494JP; Rietfontein 214JR; Rietfontein 313IR; Rietfontein 62IO; Rietkuil 491JS; Rietvalei

285IP; Rietvlei 433IS; Rolle 235KU; Rondavelskraal 290JP; Roodekraal 454IQ; Roodepoort 598IR; Rooipoortje 453IQ; Ross 55KU; Rustenburg; Rustenburg Nature Reserve; Sabie; Schoemansdal 333JU; Sekororo; Selati Ranch 143KT; Sesmylspruit - Hennops River; Shingwidzi Agricultural Station; Shipudze 7-8 mls W. of Punda Milia; Shiyalongubo Dam; Shlaralumi; Shylock 256JQ; Sibasa; Speculatie 483JS; Spion Kop 252IS; Spitzkopjes, Lydenburg Dist.; Steiltes, Nelspruit; Sterkfontein 299IS; Stilfontein, Klerksdorp Dist.; Swadini Dam; The Curlews 103JU; The Willows 197KT; Tiergerpoort 371JR; Tshamavhudzi Peak, Northeast slopes of; Turffontein 126IQ; Tweerivier 197 JQ; Umzinto 36MR; Vaalbank 110IP; Vaalbschfontein 188HO; Ventersdorp Dorpsgebied; Vierfontein 61IS;Vuurfontein 117HO; Vygeboomspruit 456KR; Waterval 220JQ; Welgevonden 312IO; Weltevreden 193IS; Witrand 103IS; Wolmaransstad Town and Townlands 184HO; Zaailand 662LS; Zandfontein, Rustenburg Dist.; Zandspruit 287KR; Zeekoegat 12KU; Zwartkoppies 364JR.

Literature Records

Brondal; Crocodile/Komati R. Junction; Doispan; Goudplaats; Hennops River; Kaapmuiden; Karino; Klerksdorp; Kralingen; Letaba Camp; Leydsdorp; Lothair; Loubad; Louis Trichardt; Mahlangene; Malopene; Marikana; Mataffin; Middelfontein; Mokeetsi; Mooimeisiesfontein; Mooirivier; Mphome; Munnik; Oliewenhoutpoort; Olifantsfontein; Olifants Camp; Orpen Camp; Pinedene; Politsi; Pretoriuskop; Punda Milia; Ratomba; Rust der Winter; Satara; Shiluvane; Shingwedzi; Skukuza; Springs; Tonteldoos; Verlief; Waterpoort; Witbank; Worderfontein (FitzSimons, 1962). Serala 5KT (Snyders, 1987).

Letaba camp; Orpen camp; Malopene gate; Komapite windmill; Nwambiya pan; Punda Maria camp; Pretoriuskop ranger's quarters; Dzombo west windmill; Satara camp; Shipudze ridge, Punda Maria; Nsemane windmill; Nyatene dam, Shaben; Tsende experimental plots; Randspruit road 6,4 km north of the windmill; between Sabie and Sand river; near Numbi experimental plots on road to gate; north bank of Sabie river about 4,8 km east of Skukuza; main road near Numbi gate; near Stolznek; Mala-Mala ranger's quarters; Pumbe sandveld; Malelane; Shingomene (Pienaar et al, 1983). 8 km NE of Carolina (NMZB).

Habitat and Ecology

One of the most widespread snakes in the Transvaal, occupying virtually most habitats with perhaps a preference for the moister areas. Found in veld types 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 48, 50, 52, 55, 57, 61, 64 and 67 at altitudes ranging from 200-2000 m a.s.l. Nocturnal, the snake rests up by day under any available cover but usually a rock on soil and particularly, on the highveld, in moribund termitaria. One of two or three snakes which have adapted well to an urban environment, it is common in cities.
Feeds mostly on toads and frogs, taking what is available. Broadley (1983) also records lizards and small rodents in their diet but this must be considered exceptional. Oviparous, 6-12 eggs are laid at a time, measuring 27,0-35,0 x 8,0 - 12,0 mm (Broadley, 1983). A clutch of 9 eggs were found under a slab of concrete on the banks of the Klein Letaba river. These ova measured 20,6 - 22,8 x 10,9 - 14,6 mm of which 8 had a total mass of 17,4 g or 2,17 g per egg. A hatchling measured 123,0 mm SVL, 17,0 mm tail and had a mass of 1,05 g. The

smallest individuals captured measured 111,0 - 118,0 mm which is considerably different from the 80,0 mm total length reported on by Broadley (1983). Dyer (1982) recorded a clutch of eight eggs measuring 25,0 - 30,5 x 11,0 - 13,0 mm which hatched after an incubation of 61-64 days at temperatures of 23,0 - 29,0°C. Hatchlings measured 170,0-183,0 mm in total length with a masses of 2,0 - 2,4 g. Hatchlings appear from mid- to late summer.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Occurs widely in many provincial nature reserves and the Kruger National Park and throughout the province. Can be considered secure.

Genus *Dipsadoboa* Günther, 1858

Disadoboa Günther, 1858 (part), *Cat. Snakes Brit. Mus.*, p. 182. Type: *D. unicolor* Günther.

An African genus of six species and several subspecies. Moderately small snakes the head is distinctly wider than the neck, with a large eye and a vertically elliptic pupil. Head slightly flattened very similar to that of *Telescopus*. Maxillary teeth present, increasing in size posteriorly, culminating after a small gap, in a pair of enlarged grooved fangs followed by a small solid tooth. Palatine teeth, pterygoid teeth and dentary teeth present. Duvernoy's gland very large. Body slightly compressed with dorsal scales smooth and in 17 to 19 rows at midbody; ventrals smooth to slightly keeled, 169-237; anal scale entire; tail moderately long with two rows of subcaudals numbering 54 to 113. Only one species enters the Transvaal in the eastern lowveld.

Dipsadoboa aulica (Günther, 1864)

Chamaetortus aulicus Günther, 1864, *Proc. Zool. Soc. London*, p. 310, pl. xxvi, fig. 2. Type locality: 'Zambesi'.

Chamaetortus aulicus aulicus Günther. FitzSimons, 1962, p. 191, 1966, p. 57, 1970/74, p. 119/120; Pienaar 1966, p. 173 pl. 75 & front cover, 1978, p. 157, pl. 70; Jacobsen & Haacke, 1980, p. 43.

Dipsadoboa aulicus aulicus (Günther). Welch, 1982, p. 148.

Dipsadoboa aulica aulica (Günther). Broadley, 1983. p. 247, figs. 140 & 141, pl. 54; Pienaar et al, 1983, p. 192, pl. 87; Branch, 1988a, p. 86, pl. 31, 1988b, p. 12.

Dipsadoboa aulica (Günther). Rasmussen 1989, p. 35.

Diagnosis. 12 Specimens examined.

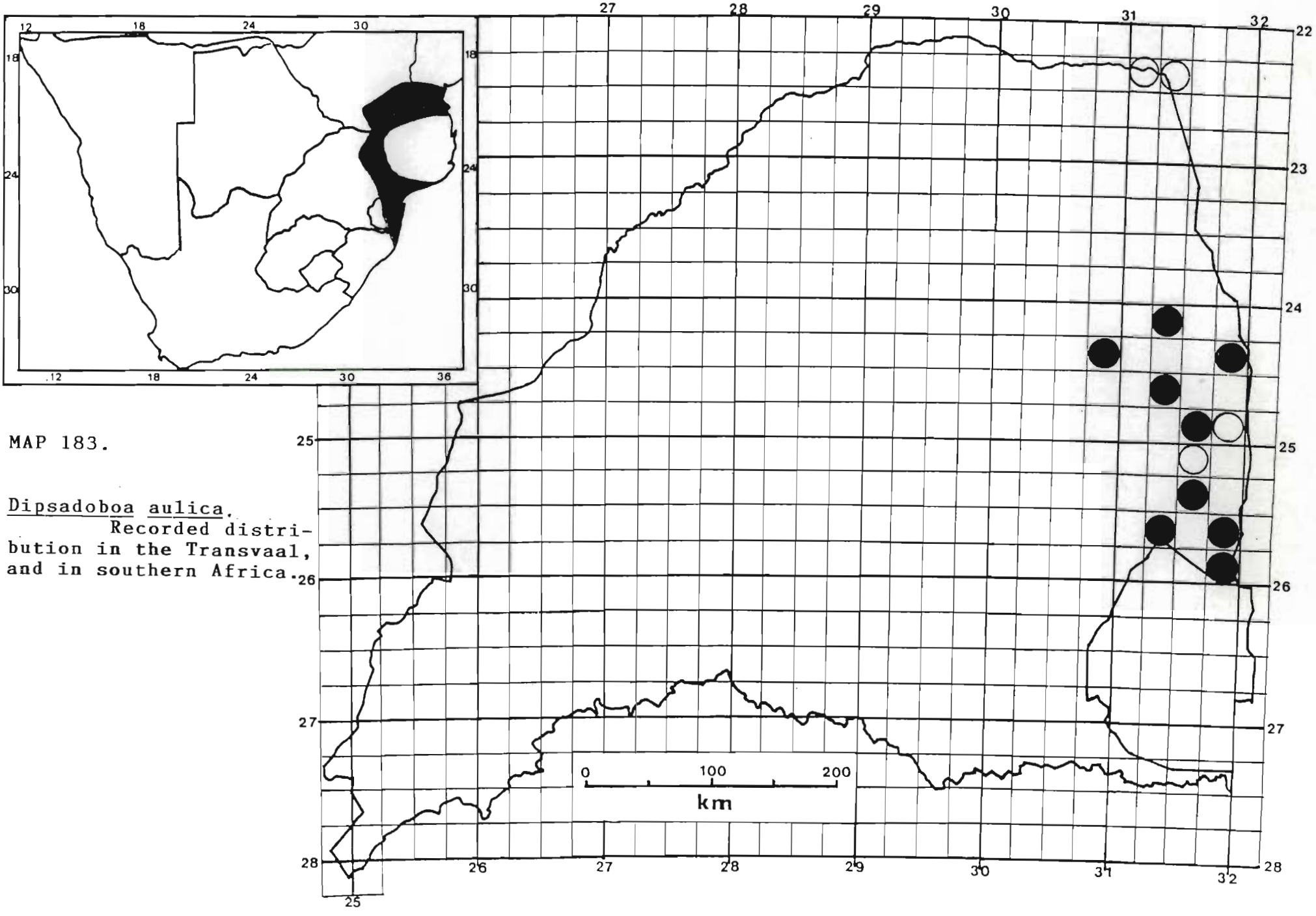
Colour: Brown or light brown above, with numerous whitish, dark-edged, regular or broken-up diagonal crossbars on the back, or more or less uniformly brown with scattered white-edged scales on neck. Tail light brown. Head paler than body, densely and symmetrically spotted or marbled with darker brown, or brown with irregular whitish vermiculations. A brown streak is present on either side of head. Underparts creamy white, uniform or posteriorly with dusky, light brown spots in varying degree. Tongue tip white. Iris of eye a clear lemon green.

Lepidosis: A small relatively slender snake, with a head distinct from the neck and a long tail. Head depressed; rostral much broader than deep; internasals in broad contact; nostril pierced in suture between two nasals; loreal longer than deep and in contact with the orbit; preocular 1 and small; postoculars 2; temporals 1 + 1 + 2; UL 8 (rarely 7), 3rd, 4th and 5th (rarely only 3rd and 4th or 4th and 5th) entering orbit; LL 10 (rarely 9) with the first five (rarely four) in contact with the anterior sublingual scales. Dorsal scales smooth and in 17 rows at midbody; ventrals 172-197; anal scale entire; subcaudals 75-100.

Size: Broadley (1983) records a male SVL = 660,0 mm (UM 31457 - Tshaneni, Swaziland) and a female SVL of 535,0 mm (JPT 1261 - Zinave, Mozambique). A 280,0 mm SVL female had a mass of 4,15 g.

Distribution

South-eastern Kenya, south through Tanzania and Mozambique to KwaZulu and inland to south-eastern Zimbabwe, eastern Transvaal and Swaziland (Broadley, 1983).



MAP 183.

Dipsadoboa aulica.
Recorded distribution in the Transvaal, and in southern Africa.

Distribution in the Transvaal (Map 183).

Amsterdam 208KT; Border Gate, Barberton Dist.; Hectorspruit 164JU; Kaapmuiden 212JU; Keerom 449JU; Manyeleti Game Reserve, Main Camp; Satara; Shlaralumi; Skukuza; Wilderne Ranch 176JU; Between Ngwenyeni & Kangwane.

Literature Records

Tshokwane; WNLA, Pafuri; Malelane, (Pienaar et al, 1983).

Habitat and Ecology

A rare nocturnal snake, secretive and poorly known. Broadley (1983) reports that in Zimbabwe the species is more or less restricted to riparian forest along large lowveld rivers. This also appears to be the case in the Transvaal, although also found at some distance from such rivers. It is found in veld types 10, 11 and 15 at altitudes of 200-300 m a.s.l. Appear to take refuge in debris, and in East Africa were collected in bamboo and palm thickets. Often found around camps and homesteads. According to Broadley (1983) they feed mostly on arboreal geckos and reed frogs. Marais (1981) reported on a clutch of seven eggs from a Swaziland female, measuring 23,0 - 28,6 x 12,7 - 13,4 mm (mean 25,6 x 13,1 mm).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Rare and peripheral the species is restricted to the lowveld, in Transvaal. Much of its habitat along the rivers is or has been destroyed by agricultural activities. It does however occur throughout the Kruger National Park and can be considered secure.

Genus Telescopus Wagler, 1830

Telescopus Wagler, 1830, Nat. Syst. Amphib., p. 182. Type: Coluber on pl. v. figs. 11 to 13 in Savigny's Supple. to Geoffroy, 1812, Descr. Egipte.

An essentially african genus although extending to Yemen and the Arabian Peninsula, as well as southern Europe, six species and several subspecies are recognised. Head broad and somewhat flattened, much broader than neck with well developed eyes and a vertically elliptic pupil. Maxillary teeth present, with a pair of enlarged grooved fangs which lie just below the posterior margin of the eye; mandibular teeth present. Body scales smooth and arranged in 19 to 25 rows at midbody. Body cylindrical or slightly compressed. Ventrals smooth; anal scale single or divided; tail moderately short; Subcaudals in two rows. Oviparous. Only one species occurs in the Transvaal, widespread excluding only the highveld. Unconfirmed reports of T. beetzii (Barbour) have been received from the south western Transvaal.

Telescopus semiannulatus semiannulatus A. Smith, 1849

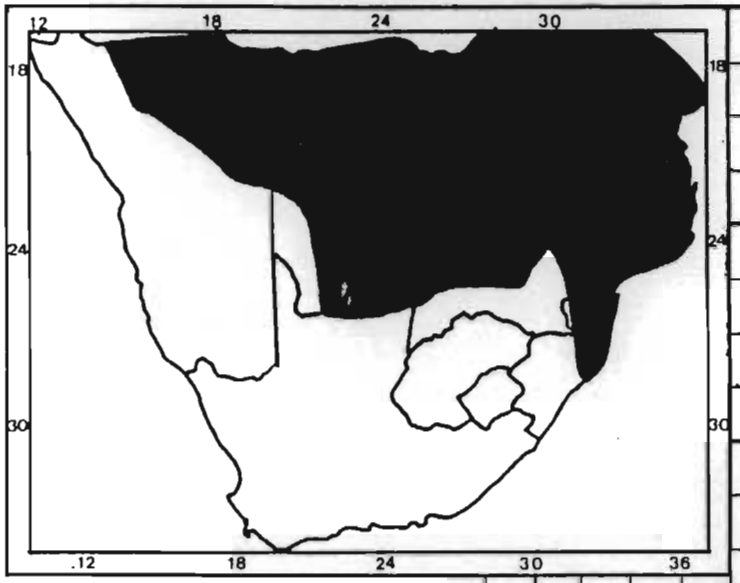
Telescopus semiannulatus A. Smith, 1849, Ill. Zool. S. Afr., Rept., pl. lXXii. Type locality: none given, but by inference, South Africa.
Telescopus semiannulatus semiannulatus A. Smith. FitzSimons, 1962, p. 184, 1966, p. 56, 1970/74, p. 116/117; Pienaar 1966, p. 70, 1978, p. 153; Jacobsen 1977, p. 30; Jacobsen & Haacke, 1980, p. 41; Welch, 1982, p. 150; Broadley, 1983, p. 250, fig. 142, pl. 56; Pienaar et al, 1983, p. 195, pl. 89; Auerbach, 1987, p. 185, pl. 17, fig. 7, Branch, 1988a, p. 86, pl. 19, 1988b, p. 12.

Diagnosis. 96 Specimens examined.

Colour: Pinkish buff to dull salmon, chesnut to russet, yellowish, reddish or cinnamon-brown above, with from 22 to 52 dark brown to black transverse rhomboidal spots, crossbars or bands on the back extending down the tail to the tip. Below paler than above and usually yellowish, often with an orange to salmon pink tinge. Eye yellowish to cinnamon brown.

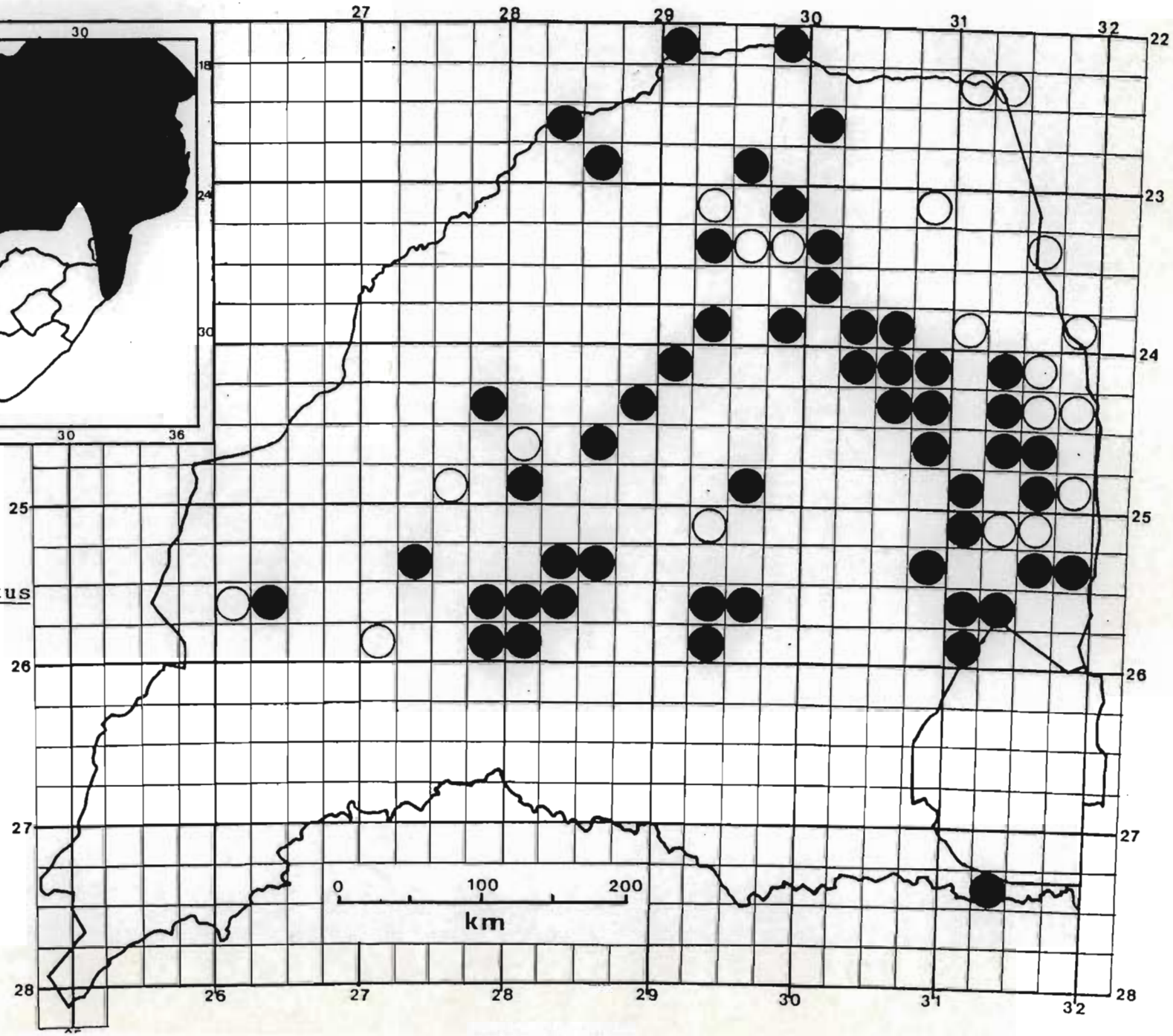
Lepidosis: A small slender snake with a broad head, distinct from the neck and moderately short tapered tail. Rostral much broader than deep; nostril pierced along suture between two nasals; internasals in broad contact; loreal longer than deep; preocular 1, usually separated from frontal; postoculars 2; temporals usually 2 + 2 or 2 + 3, rarely 1 + 2, 1 + 3, 3 + 3 or 3 + 4; UL 8 or 9 (rarely 7 or 10), 3rd, 4th and 5th entering the orbit; sometimes 4th to 6th, rarely 3rd and 4th or 4th and 5th; LL 11 or 12 (rarely 10 or 13) of which the first 3 to 5 are in contact with the anterior sublabials. Dorsal body scales smooth, inbricate and in 19 rows at midbody; ventrals 190-244; anal scale divided, occasionally entire; subcaudals 51-83, usually 53-75 in Southern Africa.

Size: Largest male SVL = 498,0 mm (P10606 - Mooifontein 285JS), mass = 350,0 g; Largest female SVL = 670,0 mm (8436 - Rhenosterpoort 283KQ), mass = 65,0 g (N7598 - Bristol 760MS) although a gravid female of SVL 597,0 mm had a mass of 78,5 g. Broadley (1983) reports on a male SVL of 624,0 mm (TM 5993 - Pretoria) and a female SVL = 880,0 mm (UM 33659 - Mutare, Zimbabwe). Mean male SVL (> 250,0 mm) = 428,0 mm ± 42,31 (1SD), n = 5, mass = 19,2 g ± 9,13 (1SD), n = 5; Mean female SVL (>250,0 mm) = 518,0 mm ± 151,71 (1SD), n = 6, mass = 40,88 g ± 26,34 (1SD), n = 6. Tail contained in total length 4,86 - 6,32 times in males and 5,76-7,11 times in females.



MAP 184.

Telescopus semiannulatus semiannulatus.
Recorded distribution in the Transvaal, and in southern Africa.



Distribution

Northern Cape Province, Botswana, north-eastern South West Africa/Namibia, Transvaal (except the highveld), Natal/KwaZulu north to Mozambique and Zimbabwe, to Kenya and Zaire.

Distribution in the Transvaal (Map 184).

Amsterdam 116LS; Barberton Townlands 369JU; Beit Bridge; Blyde River Nature Reserve; Boekenhout 706KR; Boekenhoutkloof; Boekenhoutskloofdrift 286JR; Bristol 760MS; Brits; Buffelshoek 340KU, Manyeleti Game Reserve; Bulhoek 75JQ; Die Vesting, 32 km N of Pretoria; Doorndraaidam Nature Reserve; Droogekloof 471KR; Dublin; Dublin 218KT; Elandsfontein 440JQ; Excelsior 266KU; Granite Hill 452JT; Hartebeeshoek Provincial Nursery; Hartebeeshoek, 18 km NW Pretoria; Hartebeestpoort; Hazyview; Hectorspruit 164JU; Hoedspruit; Jacob 191LT; Kalkheuwel 493JQ; Kameeldrift 298JR; Komatipoort Townlands 182JU; Krabbefontein; Lekkergoed 160KT; Letaba; Leydsdorp Dorpsgronde 779LT; Louis Trichardt; Malelane 289JU; Manyeleti Game Reserve, Main Camp; Middelburg Nature Reserve; Mokeetsi 376LT; Mooifontein 285JS; Niklaas 148MT; Nooitgedacht 345JS; Olievenbosch 506KQ; Oxford 183KT; Pietersburg; Plot 93 Kameeldrift, 16 km NE Pretoria; Pongola 61HU; Pont Drift 12MS; Potgietersrus; Pretoria; Pretoria District; Pretoria North; Pretoria, Bon Accord; Pretoria, Fountains; Pretoria, Hercules; Pretoria, Mountain View; Pretoria, Pienaarsrivierdam; Pretoria, Riviera; Pretoria, Waterkloof; Rhenosterpoort 283KQ; Rietfontein 214JR; River 141MS; Rochdale 700MS; Rondavelskraal 290JP; Ross 55KU; Rubbervale 784LT; Sekororo; Shilowane; Shiyalongubo Dam; Shlaralumi;

Skukuza, Thankerton 144KT; Tshipise 105MT; Umzinto 36MR; Veekraal 1031LS; Weltevreden 822KS; Whitecliff 30HU; Zondagfontein 300MR; Zoutpansberg Dist.

Literature Records

Bandolierkop; Crocodile Bridge; Crocodile/Komati R. Junction; Dongola; Duba; Groblersdal; Kaapmuiden; Kingfisherspruit; Kralingen; Magaliesberg; Malopene; Mara; Nelspruit; Olifants R; Olifants Camp; Onderstepoort; Pinedene; Pretoriuskop; Rivulets; Rooiberg; Rustenburg; Satara; Tshokwane; Verlief; Waterberg; Zandfontein; Zeerust (FitzSimons, 1962). Duba station; W.N.L.A. quarters, Pafuri; Nshawu windmill No. 5; between Hlangulene and Swartgat dam; Shangoni ranger's quarters; Mala-Mala picket area; Pumbe sandveld; between beacon 7 and Nyandu sandveld; new tarred road north of Luvuvhu river 1-10 km; Mshatu mouth (Pienaar et al 1983). 16 km SW of Bandolierkop; Makalali 167KT (NMZB).

Hatitat and Ecology

A nocturnal snake uncommon but widespread. On the reserve in Nylsvley Nature Reserve, in an area of 64 ha only two individuals, a male and a female were found. Usually found in well wooded areas in veld types 8, 9, 10, 11, 12, 13, 14, 15, 18, 19 and 20, at altitudes of 200-1600 m a.s.ℓ. Resting up by day the snake is found under rocks, in crevices between rocks and occasionally even in small shrubs. Partially arboreal, the species appears mostly to move along the ground but it often climbs under the eaves of houses where sufficient purchase can be obtained. Feeds mostly on lizards especially geckos but also skinks. One female 642,0 mm

SVL (N 7598 - Bristol 760MS) had consumed two Mabuya quinquetaeniata margaritifer one of which measured 100,0 mm SVL with a mass of 23,1 g. The other lizard was a juvenile. They also consume birds, rodents and even bats. Liebenberg (1981) recorded that mating only took place in late winter/early spring (August). The species is oviparous and according to Liebenberg (1981) lays two clutches per season, one during October/November and another December/January after an apparent gestation of 54-95 days for the first clutch and between 45-67 days for the second. According to Broadley (1983) 6-20 eggs are laid while Liebenberg (1981) recorded 10-13 and a specimen from near Pretoria laid 10 ova. The eggs measure 23,0-
28,0x12,0-14,5 mm (pers. obs.), 27,0-35,0x13,0-14,0 mm (Liebenberg, 1981) and 30,0x10,0 mm (Broadley, 1983). Liebenberg (1981) incubated the eggs at 31°C coupled with high humidity the eggs hatching in 58-67 days. Sperm retention is suggested in the case of the second egg clutch as the male had been previously removed on all occasions after the initial mating.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Uncommon, the species appears to occur at very low densities over much of its range. Although any one nature reserve may not have sufficient individuals to promote a viable population, the species occurs extensively in the Kruger National Park and is therefore secure.

Genus Dispholidus Duvernoy, 1832

Dispholidus Duvernoy 1832, Ann. Sci. Nat. Paris, 26, p. 150. Type: Dispholidus lalandii Duvernoy = Bucephalus typus A. Smith.

A widespread monotypic genus occurring in Africa south of the Sahara. A large snake with a distinctive short somewhat rounded head. Head very distinct from the neck. Eye very large with a round to horizontally pear-shaped pupil. Maxillary short and broadened posteriorly, articulating with the forked pterygoid. Maxillary teeth present ending posteriorly, after a gap in three very large, subequal, grooved fangs situated below the eye. Mandibular teeth also present. Body slender and slightly compressed; dorsal scales in oblique rows, keeled and number 19 or 21 at midbody. Ventrals smooth; anal scale divided. Tail moderately long, slender and tapered. Subcaudals in two rows. Oviparous. Only one species is known which is widespread in the Transvaal. Arboreal, it does not occur in treeless zones, which lately include areas of monoculture, especially in the south-western Transvaal where populations have been annihilated.

Dispholidus typus typus (A. Smith, 1829)

Bucephalus typus A. Smith, 1829, Zool. Journ. 4, p. 441. Type locality: "Old Latakoo" = Lattakoo or Lithako between Kuruman and Taung, N. Cape Province.
Dispholidus typus (A. Smith). FitzSimons, 1962, p. 196, 1966, p. 58, 1970/74, p. 121/122; Pienaar 1966, p. 174, pl. 76, Visser & Chapman, 1978, pp 63, 87 & 94; Underwood, 1979, p. 34.
Dispholidus typus typus (A. Smith). Jacobsen, 1977, p.

31; De Waal 1978, p. 103; Pienaar 1978, p. 158, pl. 71; Welch 1982, p. 157; Broadley, 1983, p. 252, figs. 143-145, pls. 57 & 58; Pienaar et al, 1983, p. 197, pls. 90, 90A & 90B; Auerbach, 1987, p. 186, pl. 17, fig. 8, pl. 18, fig. 1, Branch, 1988, p. 87, pl. 31.

Diagnosis. 188 Specimens examined.

Colour: Young specimens are a speckled grey or greyish-brown. Head brown above, this colour continuing in a broad dorsal band posteriorly down the back. Below grey to pinkish or yellowish grey speckled in varying degrees with brown; from the rostral, below the nostril through the lower margin of the eye to the angle of the jaw the upper lip is white to yellow. The iris of the eyes is green. In adults, only two basic colour morphs occur in the Transvaal including green above and yellowish or whitish green below which pertains mostly to males and a uniform brown to olive brown or blackish brown which colour is more faded ventrally but may be streaky. Females mostly brown to blackish-brown but not exclusively so.

Lepidosis: A medium to large snake with a relatively robust body. Head distinct from the neck and eye well developed. Tail long and tapering. Rostral almost as deep as broad; nostril pierced in centre of nasal; internasals in broad contact; loreal longer than deep; preocular 1, large and separate from frontal; postoculars 3 (exceptionally 2 or 4); temporals 1+2 (exceptionally 1+1, 1+3, 2+1, 2+2 or 2+3); UL 7 (rarely 8, exceptionally 6) usually 3rd and 4th (occasionally 4th and 5th) entering orbit; LL 8-13 with first 3-6 in contact with anterior sublinguals. Body scales keeled and imbricate forming oblique rows which at midbody number 19 (exceptionally 17 or 21); ventrals 164-201; anal scale divided; subcaudals 104-142.

Size: Largest male SVL = 1114,0 mm (J1938 - Reënpan

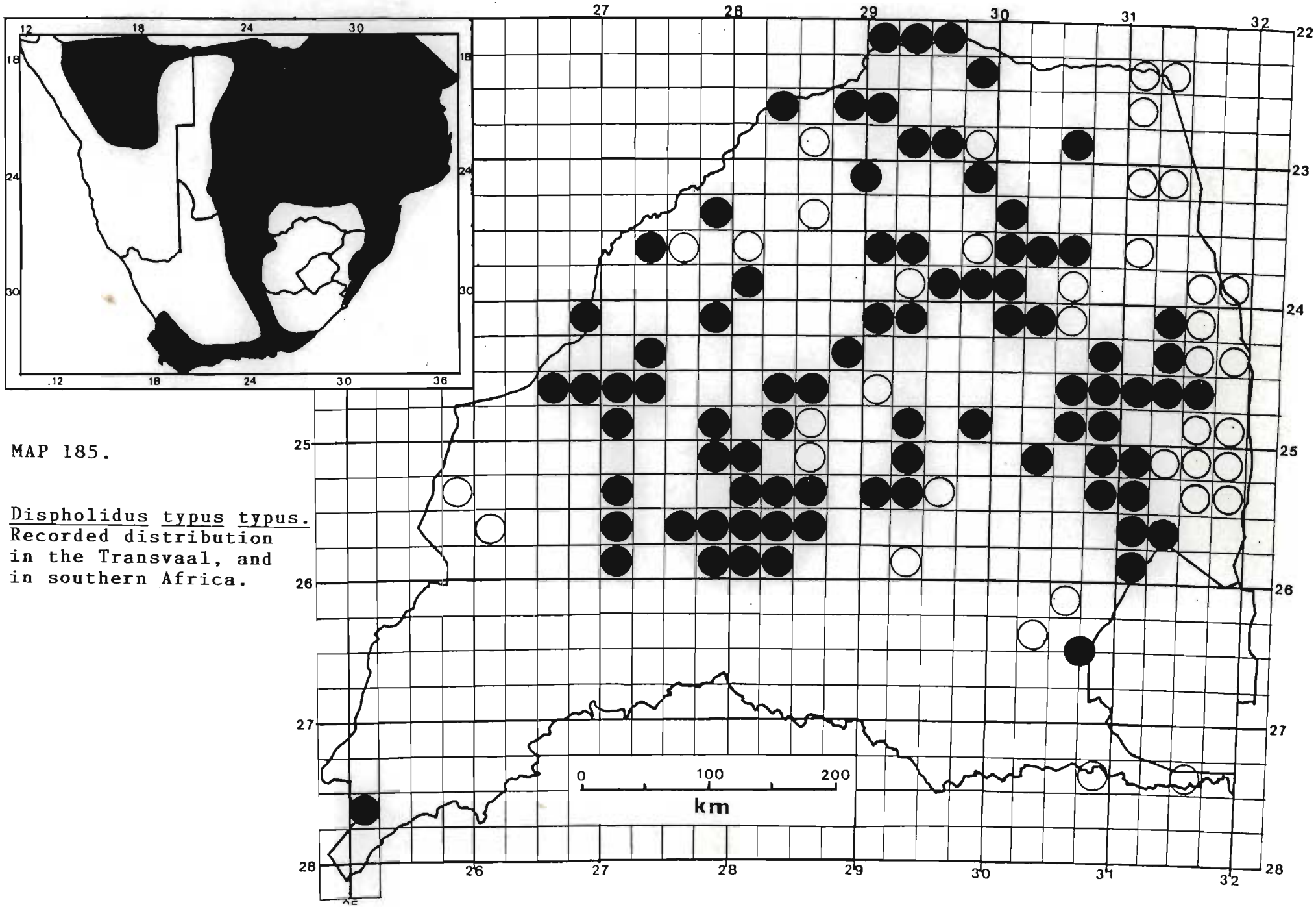
60KQ), mass = 452,0 g (J1938); Largest female SVL = 1025,0 mm (J4121 - Vogelstruiskraal 597KQ), mass = 380,0 g (J4121). Mean male SVL (>750,0 mm) = 996,26 mm ± 74,68 (1SD), n = 19, mass = 306,78 g ± 94,73 (1SD), n = 18; Mean female SVL (>750,0 mm) = 899,33 mm ± 93,14 (1SD), n = 6, mass = 242,67 g ± 110,94 (1SD), n = 6. There appears to be no differentiation in tail length between males and females and the tail length is contained in total length from 3,48 to 4,67 times.

Distribution

Throughout open bush and savanna country from tropical Africa south of 15°N Latitude, to the southern tip of the continent, but absent from such dry areas in the south as the Great Karoo, Little Namaqualand, Great Namaqualand and the Namib (Broadley, 1983).

Distribution in the Transvaal (Map 185).

5 km from Skeerpoort, Brits Dist.; 8 km Malelane - Jeppes Reef; 30 km N. Pietersburg - Vivo; 35 km Vaalwater - Ellisras; 40 km N. Roosenekal; Acornhoek 212KU; Barberton Townlands 369JU; Baviaanspoort 330JR; Between KaMotsotsotsela & KhaXani; Blouberg; Blyde River Nature Reserve; Boekenhoutskloofdrift 286JR; Broederstroom 481JQ; Canterbury 254MR; Carpediem 76KT; De Wildt; Doorndraaidam Nature Reserve; Eerste Geluk 600LS; Engeland 183KP; Fairfield 238JR; Ga Sekororo; Groenfontein, Warmbad Dist.; Grootdoorn 292LQ; Grootvlei 160KP; Haakdoornlaagte 167JQ; Haakdoringdraai; Hans Hoheisen Research Station; Hartebeestfontein; Hazyview; Hectorspruit 164JU; Hermanusdoorns 204KQ; Hoedspruit Air Base; Jachtdrift 190LT; Jakkalspruit - Rustenburg Dist.; Jerome 287MT;



MAP 185.

<u>Dispholidus typus typus.</u>
Recorded distribution in the Transvaal, and in southern Africa.

Kaapmuiden 212JU; Kalkheuwel 493JQ; Kameeldoorn 71JS; Kameelpan 276HO; Karoobult 126KQ; Kempiana 90KU; Killaloe 235MS; Kingston Vale 125JU; Klipfontein 429JR; Kransfontein 403LT; Krokodilsdraai 18KP; Kromdraai 115JR; Kromdraai, Plot 66 (32 km N. Pretoria); Letaba; Loretto 264MS; Loskop Noord 12JS; Louis Trichardt; Lydenburg; Lydenburg Fisheries; Magoebaskloof; Malta 65KT; Manyeleti Game Reserve; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Sarabank 323KU; Marakeli 437KQ; Marble Hall 29JS; Matibaskraal; Melkboomfontein 919LS; Miami 732LT; Murrayfield 343JR; Naboomspruit 348KR; Nationaal 29KT; Nelspruit; Nelspruit Citrus Research Station; New Belgium 608LR; New Forest 234KU; Nylstroom; Nylsvley Nature Reserve; Ohrigstad 443KT; Ohristad Dam Nature Reserve; Olifantsfontein; Onderstepoort 266JR; Pelindaba; Petershof 131MS; Pienaarsriver 83JR; Pilgrim's Rest; Plot 25 Kameeldrif, Pretoria; Pont Drift 12MS; Potgietersrus; Pretoria; Pretoria District; Pretoria, Fairy Glen; Pretoria, Pienaarsrivierdam; Pretoria, Pyramid; Pretoria, Silverton; Pretoria, The Willows; Rainpan 60KQ; Rhenosterkop 195JU, Portion 28; Rietfontein Plantation; Rietspruit 412KR; Rochdale 700MS; Rooiberg; Rooibokkop 744KS; Ross 55KU; Rustenburg; Rustenburg Nature Reserve; Sabi Sand Game Reserve; Sabie Game Reserve; Sekororo; Shilowane; Swadini Dam; Sweethome 322KQ; Swinburne 68LQ; Trekpan 455MS; Tzaneen 538LT; Umzinto 36MR; Usutu R., E. Tvl.; Vlakplaats 354JR; Vogelstruiskraal 397KQ; Vrisgewaagd - Dennilton; Vygeboomspoort 456KR; Warmbaths; Weipe 47MS; White River 64JU; Wildebeesthoek 310JR; Windhoek 649MS; Witfontein 526KQ; Woodbush; Zandfontein, Rustenburg Dist.; Zebediela Estates 101KS; Zoutpan 104JR; Zoutpan 459MS; Zuiverfontein 58JQ.

Literature Records

Boekenhout; Brits; Brondal; Commondale; Dongadziba; Elands R.; Ellisras; Karino; Kingfisherspruit; Leydsdorp; Linokana; Lothair; Mahlangene; Mariepskop; Mataffin; Mbyamide; Middelburg; Middelfontein; Munnik; Numbi; Overwinning; Overyssel; Pafuri; Pietersburg; Pongola; Rabelais; Roedtan; Rooikraal; Rust Der Winter; Sabie; Saltpan (Pretoria); Selati; Shingwedzi; Skukuza; The Brook; Tolwe; Tshokwane; Tuinplaats; Verlief; Waterpoort; Wolhuterskop; Woudkop; Zandfontein; Zeerust (FitzSimons, 1962). Serala 5KT (Snyders, 1987). Timbavati near Mbangari; Hlanganine spruit; Nahpe road; near Pretoriuskop camp; Mbyamiti experimental plots; 12,8 km east of Rabelais dam on road to Satara; Rabelais dam; W.N.L.A. quarters, Pafuri; Babahile on road to Pafuri; Punda Maria quarters; between Lower Sabie camp and Lubyelubye; near Sandriver causeway; Olifants camp; Shangoni quarters; Nkayeni windmill; Crocodile Bridge ranger's quarters; Letaba ranger's quarters; Eastern boundary near Olifants Gorge; Nwanedzi; Pafuri ranger's quarters (Pienaar et al, 1983). Outlook 789MS (NMZB).

Habitat and Ecology

A common species although less so in urban or peri-urban environments. Chiefly arboreal, it is just as frequently found traversing open ground. However, quick to take refuge in trees and bushes if disturbed. The species occurs in most habitats in the Transvaal, with the exception of the highveld proper. Has been found in veld types 8, 9, 11, 12, 13, 14, 15, 18, 19, 50, 61 and 67 at altitudes of 200-1700 m a.s.l. Usually seen in the branches of trees and shrubs, either foraging or lying

curled up but also enters holes in trees and even holes in termitaria (Macrotermes). Attracted to gardens by the dense foliage and climbers usually present, as well as to the birdlife normally encountered under such situations. The snake may spend several days at the same site and in winter this may refer to a particular tree. Boomslangs feed mainly on birds and arboreal lizards especially chameleons. They also consume frogs and mice. A specimen from the Klaserie Nature Reserve disgorged three large grey tree frogs (Chiromantis xerampelina). However it is most often seen foraging on the eggs and young of weaver birds. Oviparous from 8-23 (usually 10-14) eggs are laid in late spring to early summer. The eggs measure 40,0-43,0 x 16,0-26,0 mm. Thirteen eggs measured in situ and due to be laid shortly measured 29,0 - 36,0 x 15,0 - 22,0 mm indicating the variability of egg size from one specimen to another. Broadley (1983) records hatchlings measuring on average 330,0 mm in total length.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in many provincial nature reserves and in the Kruger National Park. Status is secure.

Genus *Thelotornis* A. Smith, 1849

Thelotornis A. Smith, 1849, *Ill. Zool. S. Afr., Rept., App.*, p. 19. Type: *Thelotornis capensis*.

An exclusively african genus of two species and several subspecies. Unique snakes the elongate, pointed snout is characteristic, as is the excavate loreal groove anterior to the eye. Eyes well developed and with a horizontally dumbbell-shaped pupil. Maxillary teeth present, followed by a gap after which three enlarged, grooved fangs are found below the posterior border of the eye; teeth also occur on the mandible. The body is very slender and cylindrical with dorsal scales slightly keeled and arranged in 19 oblique rows at midbody. Ventrals smooth; anal scale divided; tail very long, extremely slender and tapered; subcaudals in two rows. Oviparous. Only one species occurs in the Transvaal, widespread in the bushveld.

Thelotornis capensis capensis A. Smith, 1849

Thelotornis capensis A. Smith, 1849, *Ill. Zool. S. Afr., Rept., App.*, p. 19. Type locality: Kaffirland and the country towards Port Natal i.e. Durban. Jacobsen 1977, p. 31.

Thelotornis kirtlandii capensis A. Smith. FitzSimons, 1962, p. 201 (part); 1966, p. 57, 1970/74, p. 123/124; Pienaar, 1966, p. 177, pls. 77 & 78; Broadley, 1968(a), p. 405.

Thelotornis capensis capensis A. Smith. Visser & Chapman, 1978, p. 64; Broadley 1979(b), p. 126; Welch 1982, p. 158; Broadley, 1983, p. 256, figs. 146, 147 & 148, pl. 59; Pienaar et al, 1983, p. 200, pls. 91 & 91A; Auerbach 1987, p. 188, pl. 18, fig. 2; Branch, 1988a, p. 87, pl. 18, 1988b, p. 12.

Diagnosis. 74 Specimens examined.

Colour: Body above pale grey, grey to brownish grey often tinged with pink. Marked with lighter and darker blotches, striations and/or irregular oblique crossbands. Ventrally greyish with brown to blackish speckles and striations which become denser posteriorly. Head green to greenish brown or brown above, more less intensely speckled or blotched with dark brown to black, or dark markings concentrated on the crown. Upper and lower labials whitish with dark speckles. Chin and gular white with dark speckles.

Lepidosis: A medium sized very slender snake with a head very distinct from the slender neck. Tail very long, slender and tapered. Rostral broader than deep; nostril pierced in a single nasal near tip of narrow snout; internasals large and in broad contact; loreals 2 (rarely 1 or 3); preocular 1 (exceptionally 2) separated from frontal; postoculars 3, sometimes 2 or 4; temporals 1+2, occasionally 1+3 and rarely 1+1 or 2+2; UL 8 (rarely 7 or 9), 4th and 5th (rarely 3rd and 4th or 4th to 6th) entering the orbit; LL 10 to 12 (rarely 9 or 13), with the first four or five (rarely three or six) in contact with the anterior chin shields. Scales on body elongate, narrow, feebly keeled, very obliquely arranged, imbricate and in 19 rows at midbody; ventrals 144-160; anal scale divided; subcaudals 130-152.

Size: Largest male SVL = 824,0 mm (TM 13902 - Lake Fundusi), mass = 128,0 g (N5585 - Argyle 46KU); Largest female SVL = 911,0 mm (TM 5615 - Hectorspruit), mass = 77,4 g (J6398 - Lomati 466JU). Mean male SVL (>500,0 mm) = 729,67 mm ± 85,56 (1SD), n = 3 mass = 81,2 g ± 43,5 (1SD), n = 3. Mean female SVL (>500,0 mm) = 690,28 mm ± 114,56 (1SD), n = 7, mass = 55,67 g ± 29,83 (1SD), n = 6. Jacobsen (1982) found a mean SVL of 591,56 mm and mass of 42,8 g on the Nylsvley Nature Reserve, in a sample of 229 individuals. Tail length is contained in total length from 2,61 to 2,87 times.

Distribution

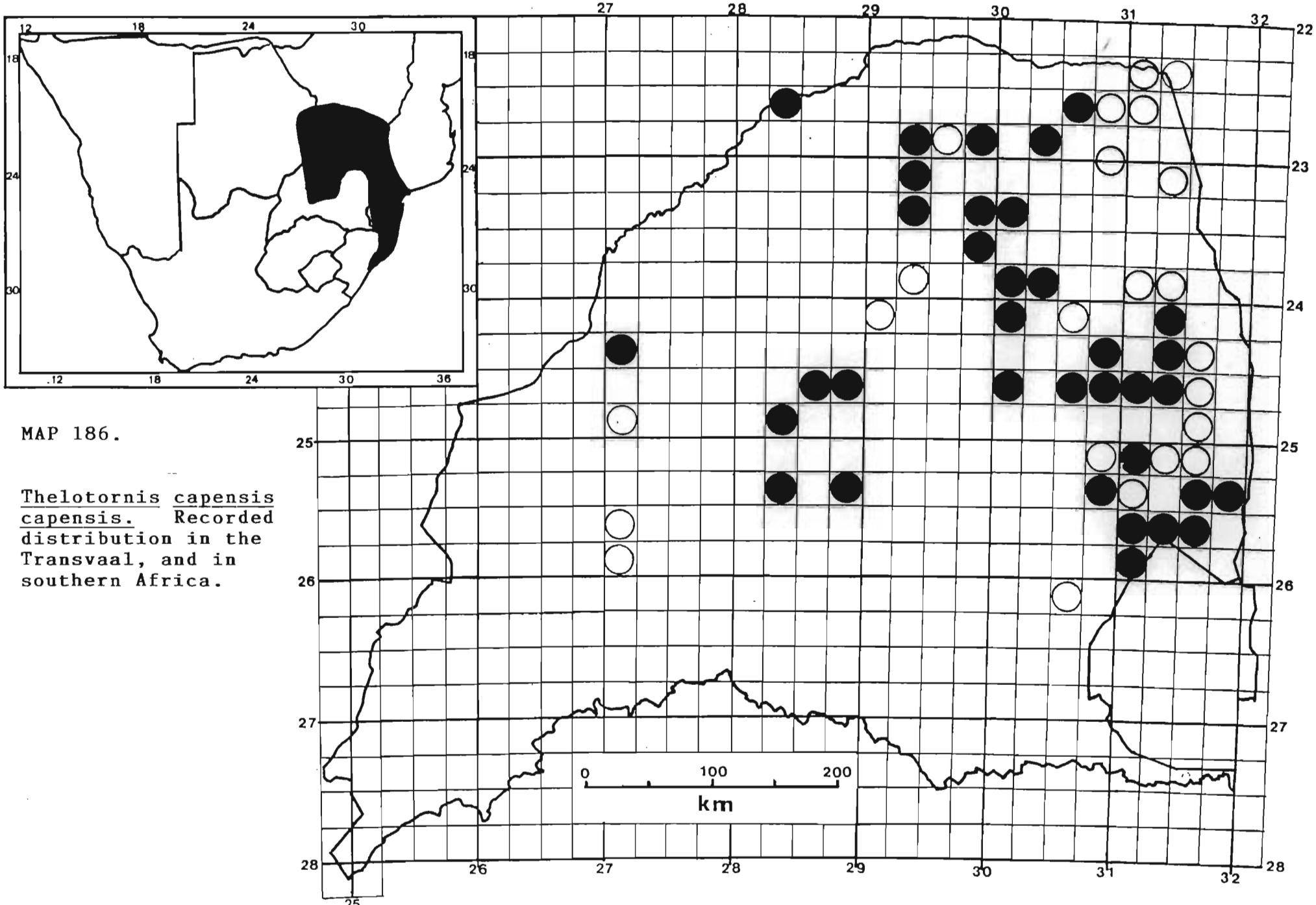
Natal, Swaziland, southern Mozambique westwards to southern Zimbabwe, Transvaal to north-eastern Botswana.

Distribution in the Transvaal (Map 186).

Acornhoek 212KU; Andover 210KU; Argyle 46KU; Bandelierkop 416LS; Barberton Townlands 369JU; Bethesda 208LS; Boekenhout 706KR; Boschjeskop 250JT; Buffelshoek 340KU, Manyeleti Game Reserve; Dwarsriver; Ehlatini, Nelspruit; Gana Hoek 111KQ; Haakdoringdraai; Hammanskraal; Hazyview; Hectorspruit 164JU; Hoedspruit Air Base; Jeppes Reef 334JU; Jouberts Hoop 67KU; Kaapmuiden 212JU; Komatipoort Townlands 182JU; Krugerskraal 583KR; Lake Fundudzi; Letsitele 652LT; Logies Farm 42JU; Lomati 466JU; Louws Creek 271JU; Malta 65KT; Manyeleti Game Reserve, Hermitage; Mariepskop 420KT; Matlapitsi River; Noordkaap; Nylstroom; Olievenbosch 506KQ; Orpen Gate; Overwinning 713MS; Paardekraal 135LT; Rietfontein 214JR; Rooigrond 464MS; Ross 55KU; Sabie Game Reserve; Saltpan; Shlaralumi; Silverleaves Farm, Tzaneen; Smitskraal 788LS; Soutpansberg; Steelpoort; Swadini Dam; Tevrede 178JT; Tshamavhudzi Peak, Northeast slopes of; Umzinto 36MR; Valley View; Vygeboomspoort 456KR; Warmbaths; York 108LS.

Literature Records

Brondal; Dwars R; Karino; Komati/Crocodile R. Junction; Legogote; Mara; Mbeamide; Middelfontein; Middelwit; Nelspruit; Numbi; Pafuri; Pietersburg; Pongola; Potgietersrus; Rustenburg; Sabie; Satara; Skukuza; The Brook; Waterpoort; White River; Zandfontein (FitzSimons, 1962). Serala 5KT (Snyders, 1987). Nylsvley Nature Reserve (Jacobsen, 1977, 1982).



MAP 186.

Thelotornis capensis capensis. Recorded distribution in the Transvaal, and in southern Africa.

Mbyamiti experimental plots; Sweni firebreak near Ngumula pan; Komapite windmill area; W.N.L.A. quarters, Pafuri; Mhukwene dam area; Sabie river (north bank) 8 km east of Skukuza; Shidzivane ridge, Luvuvhu river; Faai waterhole area; Kamban experimental plot No. 7, Punda Maria quarters; Skukuza experimental plot No. 7, Nahpe road; Maseya sandveld plateau near spring; Lipape, western boundary; near Ngwenyene windmill, Malopene road; Hlangulene area, western boundary, Tshokwane section; Shingwedzi; Letaba; Phalaborwa staff village; Shangoni; Malelane (Pienaar et al, 1983). Selati (NMZB).

Habitat and Ecology

The Vine Snake is mostly arboreal although descending to the ground when crossing open spaces. Widespread in the Transvaal, it occupies a variety of habitats including veld types 8, 9, 10, 11, 12, 13, 14, 15, 18, 19 and 20 at 200-1200 m a.s.l. May be locally common as in the Burkea africana savanna on the Nylsvley Nature Reserve where 147 snakes were collected on 64 ha. Here seasonal aggregations during September/October and May take place. The former period is post hibernation and serves to bring the sexes together when mating takes place. In the latter period, the reptiles move higher up the slope during autumn, where conditions are less extreme and evergreen trees such as Strychnos pungens permit a place of shelter from predators, in an area where most trees and shrubs lose their leaves. Here the snakes overwinter, moving to the east side of the tree in the morning and during the day retreat to the centre, followed by a movement to the western side in the afternoon. However when conditions become extreme they enter holes in trees. They are masters of camouflage and lie in the same position for hours at a stretch. This

camouflage ability allows the snakes to approach prey very closely, the latter being captured in a short rush. Vine snakes feed primarily on lizards and frogs and to a lesser degree on other snakes and birds eggs. Branch (1982) also records fledgling birds and small mammals including bats in their diet. Broadley (1983) and Henderson *et al* (1981) have reported on the binocular vision in the species, which permits these snakes to even see stationary prey. Bennefield (1982) recorded male to male combat in captivity in *T. c. mossambicanus* Bocage with individuals interwined, while the one forced the head of the other down. This behaviour has not been observed in *T. c. capensis* to date. Copulation followed, involving the dominant male and a female, which continued for eight days. Lengthy copulation has also been observed in *T. c. capensis* (Jacobsen, 1982). Oviparous, *T. capensis* lays from 4-13 eggs, measuring 34,0-43,5 x 14,0-18,0 mm, during midsummer. The hatchlings appear during March to May after an incubation of two to three months. Hatchlings measure 227,0-240,0 mm in SVL. Growth is rapid reaching 0,68 mm per day in juveniles but almost ceasing in very mature specimens, (Jacobsen, 1982).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread but not often seen owing to its cryptic coloration and behaviour. Occurs in the Kruger National Park and several provincial nature reserves. Considered secure. Large scale habitat destruction is the main threat.

Genus *Dasypeltis* Wagler, 1830

Dasypeltis Wagler, 1830, *Syst. Amph.*, p. 178. Type: *Coluber scaber* Linnaeus.

An exclusively African genus with seven species recognised. Typically the head is small and round, not distinctly broader than the neck; the eye is moderately large with a vertically elliptic pupil. Teeth are rudimentary, being found on the maxilla and dentary as well as on the palatines. Small to medium snakes, slender with a slightly compressed to cylindrical body. Dorsal scales elongate strongly keeled and arranged in 19 to 29 rows at midbody. Three to four lateral scale rows are obliquely arranged with keels distinctly serrated to smooth; ventral scales smooth; anal scale entire; tail short and subcaudals in two rows. Oviparous. Only two species occur in the Transvaal, one essentially a grassland form and the other throughout the Transvaal. The unique egg cutting processes and techniques have been extensively discussed, (Gans, 1959; Broadley, 1983) but little attention has been given to mechanisms of egg location, which appears to be of such accuracy and finesse. On one occasion a Black-throated Prinia built a nest outside the bedroom window. The nest had just been completed and two eggs laid when these disappeared and two juvenile *D. scabra* were inside the nest, an occurrence which almost took place overnight.

Key to Transvaal species

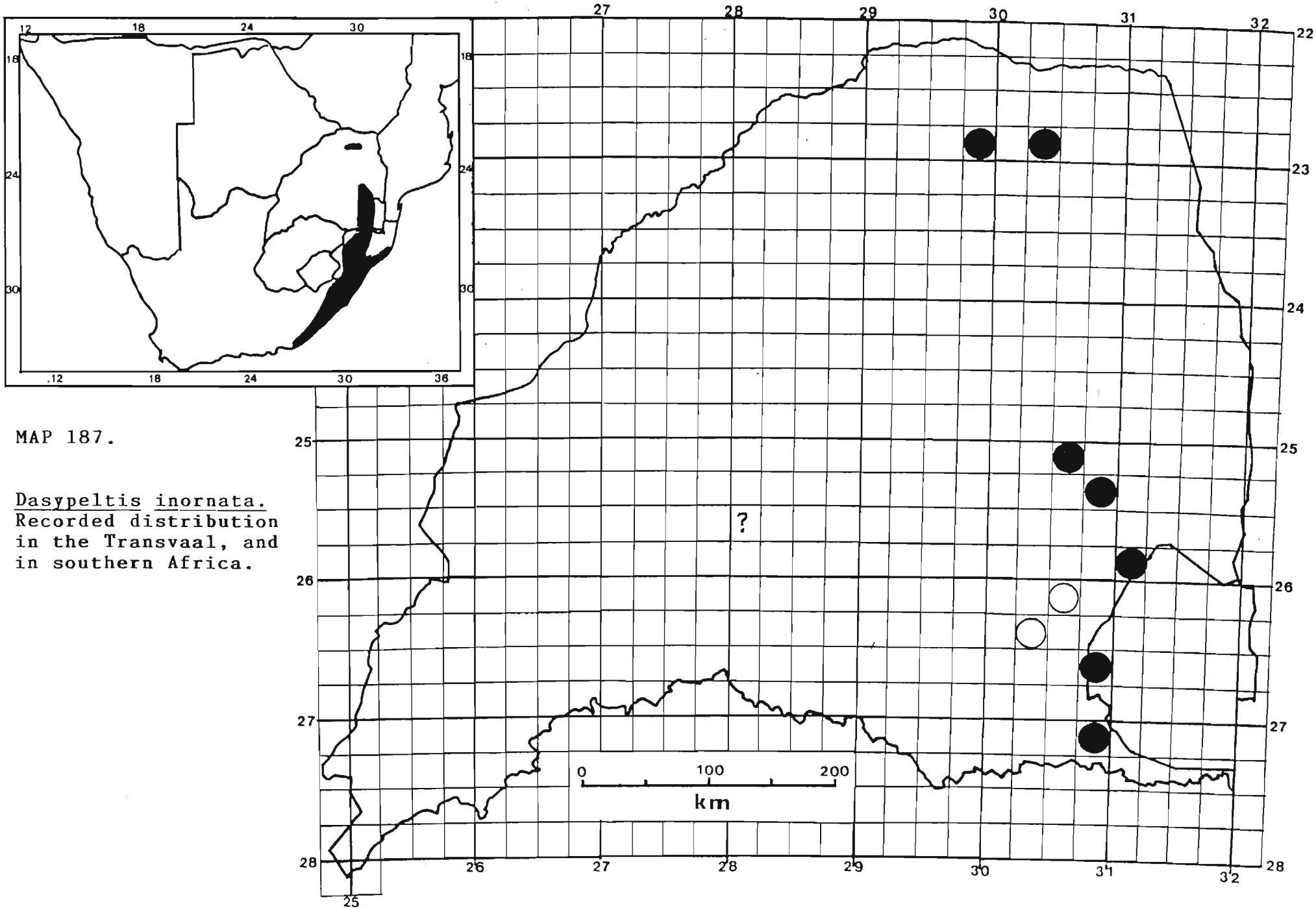
1. Three or four rows of lateral scales strongly reduced and with keels distinctly serrated; usually with dark markings, or at least indications of same, above .... *D. scabra*
   Lateral rows of scales only slightly reduced

and with keels for the most part unserrated; Subcaudals 69-92; uniform yellow to reddish or dark brown above and pale below .... D. inornata.

Dasypeltis inornata A. Smith, 1849

Dasypeltis inornatus A. Smith, 1849, Ill. Zool. S. Afr., Rept., pl. lxxiii & App., p. 20. Type locality: South-eastern districts of the Cape Colony, and also in Kaffirland, i.e. Natal.
Dasypeltis inornata A. Smith. FitzSimons 1962, p. 174, 1966, p. 55, 1970/74, p. 114/115; Jacobsen & Haacke, 1980, p. 40; Welch, 1982, p. 157; Broadley, 1983, p. 261, pl. 60; Branch, 1988a, p. 84, pl. 28, 1988b, p. 12.

Diagnosis. 14 Specimens examined.
Colour: Uniform yellow to reddish, olive or dark brown above becoming paler ventrolaterally. Interstitial skin darker; underparts uniformly pale yellowish brown to white. Inside of mouth dark.
Lepidosis: A small to medium sized snake, slender with a small head indistinct from the neck. Tail relatively short in relation to head and body. Snout rounded; nostril pierced in large nasal; internasals in broad contact; preocular 1, widely separated from frontal; postoculars 2; UL 7 (sometimes 6, exceptionally 8), 3rd and 4th (sometimes 2nd and 3rd, exceptionally 2nd, 3rd and 4th, 3rd, 4th and 5th or 4th, 5th and 6th) enters the orbit; LL 7 to 9, the first three in contact with the anterior chin shields. Dorsal scales strongly keeled and in 21 to 23 rows at midbody; the 3rd to 5th rows of lateral scales only slightly reduced in size and inclined, and with their keels for the most part unserrated; ventrals 208 to 237, 208-225 in males and



MAP 187.

Dasypeltis inornata.
Recorded distribution in the Transvaal, and in southern Africa.

219-237 in females; anal scale entire; subcaudals 63-69 in females and 70-80 in males.

Size: Broadley (1983) recorded a male (TM 21396 - Durban) with a SVL of 784,0 mm. A male with a SVL of 451,0 mm (N 9494 - Bakenkop 152HT) had a mass of 22,5 g. Length of tail is contained in total length from 4,5-7,0 times, Broadley (1983). He mentions sexual dimorphism in this ratio with males having tails 4,5-5,6 times and females 5,5 to 7,0 times. Three Transvaal specimens however have subcaudals ranging from 70 to 80 while the ratio of tail to total length ranges from 5,28-5,90 indicating higher values for males in the Transvaal.

Distribution

Eastern Cape Province, Natal and southern KwaZulu thence inland to Swaziland and Transvaal.

Distribution in the Transvaal (Map 187).

Bakenkop 152HT; Barberton Townlands 369JU; Brondal, Nelspruit; Entabeni 251MT, Matiwa Lookout; Harnham 793MS; Merriekloof 420IT; Nelspruit; Paardeplaats 154JT; Pretoria.

Literature Records

Lothair; The Brook (FitzSimons, 1962).

Habitat and Ecology

Restricted in the Transvaal to the south-eastern Transvaal and an apparent relict population in the Soutpansberg. The species occupies areas of montane grassland and at least in the Soutpansberg, mixed

woodland and grassland. Occurs in veld types 8, 62, 63 and 64 at altitudes of 1200-1600 m a.s.l. Usually found under rock on rock or on soil and probably also under grass tussocks, as one specimen was found crossing a road in front of a veld fire. Feeds solely on birds eggs as far as is known. Oviparous, from 6-12 eggs are laid during midsummer measuring 34,5-39,3 x 17,9-21,0 mm. Hatchlings measure 186,0 - 204,0 mm SVL with tails of 35,0 mm. Broadley (1983) records hatchlings measure on average 270,0 mm in total length. McCartney & Branch (1988) report that a Grahamstown female measuring 860,0 mm in total length laid seven eggs which were incubated at 29,0-30,0°C. Six eggs hatched after 62-64 days, the hatchlings measuring 201,0-223,0 mm SVL with masses of 3,38-3,53 g. Another female also from the eastern Cape Province laid a clutch of 16 eggs measuring 29,7-33,8 (mean 32,2 mm) x 17,7-21,0 mm (mean 19,1 mm) and weighed 5,3-6,4 g (mean 6,1 g).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A rare species, it is likely to be considerably influenced by the frequent grass fires and afforestation taking place. There is a need to survey this species more intensely and determine abundance. The species is vulnerable.

Remarks

The discovery of the species in the Soutpansberg is a considerable range extension and reinforces the link between the escarpment zone and the Soutpansberg. The Pretoria specimen must be viewed with caution, as it is far removed from the normal distribution of the species, and may be a translocation.

Dasypeltis scabra (Linnaeus, 1758)

Coluber scaber Linnaeus, 1758, Syst. Nat., ed. 10, 1, p. 223 and 1766, ed. 12, 1, p. 384. Type locality: "In Indiis" = South Africa.
Dasypeltis scabra (Linnaeus). Gans, 1959, p. 141, pls. iv-ix; De Waal, 1978, p. 98; Pienaar, 1978, p. 151, pl. 67, 67A; Welch, 1982, p. 157; Broadley, 1983, p. 262, figs. 150-152, pl. 61; Pienaar et al, 1983, p. 203, pl. 93; Auerbach 1987, p. 190, pl. 18, fig. 3; Branch, 1988a, p. 84, pl. 15, 1988b, p. 12.
Dasypeltis scabra scabra (Linnaeus). FitzSimons, 1962, p. 179, 1966, p. 55, 1970/74, p. 110/111; Pienaar, 1966, p. 167, pl. 71-72; Jacobsen 1977, p. 30.

Diagnosis. 287 Specimens examined.
Colour: Ground colour slate grey, light brown to greyish or olive brown or even amber with usually a vertebral series of large squarish to rhomboidal black spots, which may coalesce to form a zig-zag band. Between these dark spots the scales are often paler, and the dark blotches may be pale-centred or pale-edged. On the flanks there is a series of dark brown to blackish markings in the form of irregular vertical bars or stripes. An inverted V-shaped dark marking on the nape is preceded on the back of the head by one or two similar, but narrower and often faint, markings. Underparts white, pale cream to yellowish white or light yellow, uniform or more often spotted or mottled in varying degree with brown to black. Some specimens, especially in the Sasolburg area, are virtually uniform in colour and mistaken for the preceding species. The scales are strongly keeled. The gape of the mouth is black.
Lepidosis: A small to medium sized snake with a small head indistinct from the neck. Tail short. Snout

rounded; rostral broader than deep; nostril pierced at margin of incomplete suture in large nasal; internasals in broad contact behind rostral; loreal absent; preocular 1 (rarely 2); postoculars 2 (rarely 3); UL 7, occasionally 6, rarely 8, of which 3rd and 4th (sometimes 2nd and 3rd, exceptionally 2nd, 3rd and 4th, 3rd, 4th and 5th or 4th, 5th and 6th) enter the orbit; LL 7 (rarely 8 or 9), first three in contact with the anterior sublinguals. Scales on body elongate, lanceolate and strongly keeled and in 21 to 25 rows at midbody; three or four rows of scales on either side of the body are smaller and obliquely set with distinctly serrated keels; dorsals from occiput to tail tip range from 242 to 284 (mostly less than 270); ventrals 185-207 in males and 200-225 in females; anal scale entire; subcaudals 49-66 in males and 39-54 in females.

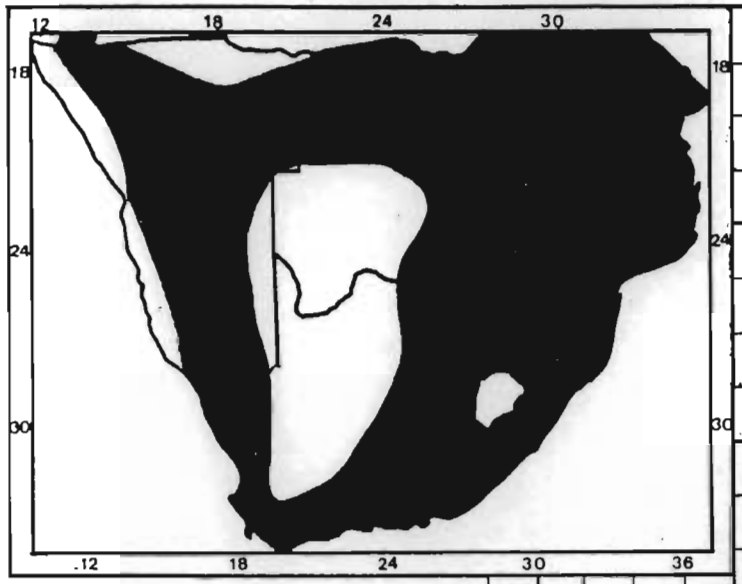
Size: Largest male SVL = 678,0 mm (N7362 - Pongola Nature Reserve), mass = 25,5 g (J6238 - Christiana 325HO); Largest female SVL = 674,0 mm (N 8018 - Verkyk 88HS), mass = 86,0 g (N9501 - Ishlelo 441IT). Mean male SVL (>250,0 mm) = 330,32 mm ± 51,56 (1SD), n = 50, mass = 13,02 g ± 4,56 (1SD), n = 50; Mean female SVL (>250,0 mm) = 413,0 mm ± 108,93 (1SD), n = 36, mass = 23,50 g ± 19,20 (1SD), n = 35. The tail is contained in total length from 5,33-7,80 times in males and 7,59-10,43 times in females.

Distribution

With the possible exception of the central and northern Cape Province, Dasypeltis scabra occurs throughout South Africa and northwards to South West Africa, Botswana, Zimbabwe and Mozambique to southern Sudan, Ethiopia, Somalia and southern Arabia in the east and Gambia in the west.

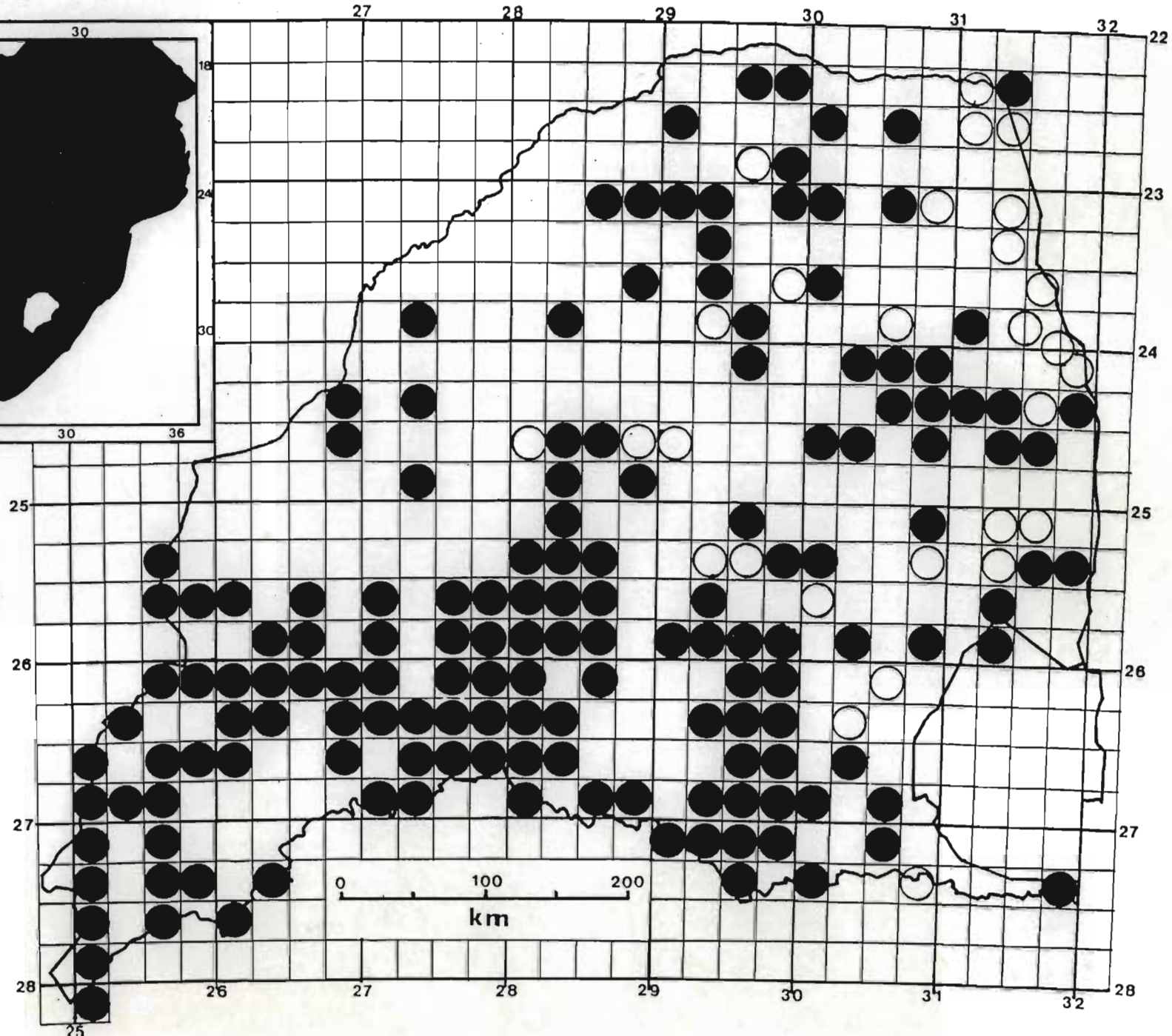
Distribution in the Transvaal (Map 188).

5 km from Pretoria - Delmas; 12 km E of Pretoria; 20 km S of Pretoria; Abe Bailey Nature Reserve; Aloe Fjord Holiday Resort, Vaaldam; Ameland 11LS; Amsterdam 116LS; Amsterdam 208KT; Anysspruit 139HT; Barberspan Nature Reserve; Bloemhof Dam Nature Reserve; Blyde River Nature Reserve; Boschkop, Bronkhorstspruit; Buffelshoek 340KU, Manyeleti Game Reserve; Buffelshoek 471IQ; Christiana 325HO; Cullinan; De Putten 56JO; De Roodepoort 435IS; De Ruigte 27LS; Delmas; Dongola; Doornbult 123HP; Doornkop School, Witpoort; Dwaalboom 217KP; Dwarsvlei 503JQ; Elandsfontein 308IQ; Evelyn 159MS; Geluk 235IP; Gestoptefontein 349IO; Glen Alpine 304LR; Goedehoop 152JS; Goedehoop, Carolina Dist.; Groot Denteren 533LR; Groothoek 171HT; Halfgewonnen 190IS; Halfway House, Noordwyk; Hartebeestfontein 437IQ; Hartebeestlaagte 325JS; Hartebeestpoortje 451IQ; Hectorspruit 164JU; Hekpoort 504JQ; Hoedspruit; Houthaaldoorns 2IP; Houtkop 152IP; Inyoku 159KT; Irene Agricultural Research Station; Ishlelo 441IT; Italie 123HO; Jericho 304IT; Johannesburg; Kaalbult 349JP; Kaalkraal 113IP; Kaalplaats 194IO; Kafferskraal 381IR; Kalkgat 554LS; Kalkoenkrans 366IT; Kalkpan 683KR; Kameeldrift 298JR; Kapsteel 81IO; Kareeboomput 286HO; Kareelaagte 45JO; Klein Tshipise; Klerkskraal 65IQ; Klipfontein 429JR; Klippan 140IP; Klipplaatdrift 43HS; Klipspruit 89HP; Komatipoort Townlands 182JU; Krabbefontein; Kromdraai 352IP; Kromdraai 486JS; Kromdraai 520JQ; Kruidfontein 470JP; Kruisrivier 270JP; Kunana Location 4IO; Langlaagte; Letaba Ranch turnoff; Lindeques Drift S. Tvl.; Lindleyspoort 220JP; London 29KP; Lot 43 250IO; Louis Trichardt; Louws Creek 271JU; Lyttelton 381JR; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp; Manyeleti



MAP 188.

<u>Dasypeltis scabra.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Game Reserve, Sarabank 323KU; Mapochsgronde 500JS; Margate 216KT; Masequa 714MS; Matibaskraal; Middelburg Town and Townlands 287JS; Modderfontein 351IR; Moilwas Location; Molepos Location 187KS; Mooimeisjesfontein 77HS; Morgenrood 354LT; Naudesbank 172IS; Nelshoogte Plantation; Nooitgedacht alias Vetpan 131IP; Nylsvley Nature Reserve; Onderstepoort 266JR; Onrust 332HO; Onverwacht 273IT; Orpen; Paardefontein 35HO; Pafuri; Palmietfontein; Phalaborwa; Pinedene; Plot 164 Rietgat 105JR; Pongola Nature Reserve; Pretoria; Pretoria North; Pretoria West; Pretoria, Capital Park; Pretoria, Clubview; Pretoria, Clubview East; Pretoria, Groenkloof; Pretoria, Monavoni; Pretoria, Montana; Pretoria, Monument Park; Pretoria, Mooiplaats; Pretoria, Mountain View; Pretoria, Muckleneuk; Pretoria, New Muckleneuk; Pretoria, Pienaarsrivier Dam; Pretoria, Rietfontein; Pretoria, Rietondale; Pretoria, Riviera; Pretoria, Shere Holdings; Pretoria, Skinners Court; Pretoria, Val de Grace; Pretoria, Voortrekkerhoogte; Pretoria, Waterkloof; Rainpan 60KQ; Randburg, Noordwyk; Randfontein; Rhenosterpoort, Nylstroom; Rietfontein 214JR; Rietgat 105JR; Rietkuil 491JS; Rietspruit 412KR; Rietvalei 285IP; Rietvlei 33HS; Rietvlei Dam, Pretoria; Roodekrans 457IS; Roodeplaat 293JR; Roodeplaat Dam Nature Reserve; Roodepoort 598IR; Roodewal 364IO; Rooijantjesfontein 89IP; Rooipoortje 453IQ; Rooiwal 270JR; Ross 55KU; Rust der Winter Nature Reserve; Rustenburg Nature Reserve; Rustkraal 129HP; Sabie; Satara; Schoongezicht 66KU; Selati Ranch 143KT; Sharpeville, Vereeniging Dist.; Sheba 219JT; Shilowane; Shingwidzi Agricultural Station; Shiyalongubo Dam; Shylock 256JQ; Silverbank 611IR; Spaarwater 171IR; Steelpoort; Steenbokpan 295LQ; Sterkfontein 173IQ; Sterkspruit 508IS; Steynskraal 399IR; Suikerboschfontein 422JT;

Swartkop 383JR; Sweethome 315LR; Syferfontein 293IQ; Syfergat 204HO; Tafelkop 270IS; Toevlugt 269JS; Tshipise 105MT; Tweeddale 262MS; Tweefontein 523JQ; Vaalboschfontein 188HO; Vaalkop 222IO; Vanderbijlpark; Ventersdorp Dorpsgebied; Verkyk 88HS; Vier en Twintig Rivier 701LR; Viljoenshoop 299KT; Vissershoek 435JQ, Donkerkloof; Vygeboomspoort 456KR; Waaikraal 396JQ; Wakkerstroom Townlands 121HT; Wanhoop 78JT; Waterpan 292IQ; Welbedacht 382IS; Welgedacht 130JR; Weltevreden 176HO; Windhoek 649MS; Witbank 236IS; Witkop 180IR; Witpan 20IP; Witrand 103IS; Zandfontein, Rustenburg Dist.; Zoetendalsvlei 125HS; Zonderhout 523IS; Zoutpan 104JR; Zuurfontein, Johannesburg; Zwartkop 369KQ; Zwartkrans 172IQ.

Literature Records

Belfast; Bon Accord; Burgersfort; Commondale; Crecy; Crocodile Bridge; Damwal; Kingfisherspruit; Kralingen; Letaba Camp; Leydsdorp; Lichtenburg; Lothair; Loubad; Munnik; Nelspruit; Nylstroom; Olienvenhoutpoort; Pietersburg; Pretoriuskop; Rayton; Roedtan; Rooikraal; Rustenburg; Shingwedzi; Skukuza; Standerton; Stungwane; The Brook; Vygeboom; Waterpoort; Wonderfontein (FitzSimons, 1962). Letaba rest camp; Komapite windmill; Shangoni ranger's quarters; Stungwane firebreak road; Olifants camp; Pafuri (W.N.L.A. quarters); Sabie river 3,2 km east of Skukuza; eastern boundary 6,4 km south of Pafuri; Malelane rest camp; eastern boundary between Nchindo- and Tabaglovu beacons; Malituve near Punda Maria; between Tsumanene and Madzaringwe turn-off; Pumbe sandveld; Nyandu sandveld; Masbambela picket; Eendrag windmill; Mooiplaas; Pafuri ranger's quarters; Marabou windmill (Pienaar et al, 1983).

Habitat and Ecology

One of the most widespread snakes in southern Africa, the species occurs in all veld types in the Transvaal at altitudes of 200-2300 m a.s.l. Very versatile, it is one of few species which has adapted to a degree to the urban environment. The species is largely dependant on moribund termitaria on the highveld but elsewhere occupies most available habitat, under rocks on soil, in crevices between rocks, under building rubble, under the eaves of houses, under or inside rotting logs and in fact anywhere where security is offered. Nocturnal and sluggish, it is solely adapted to locating birds nests, consuming only fresh eggs. The ability to locate nests is astonishing but how they do this is not known and poses an interesting field of research. No doubt highly developed sense organs are important, but finding a birds nest is like looking for a needle in a haystack. This indicates a low frequency of food uptake with a concomittant low energy budget despite the high energy content of the food. The pronounced seasonality of bird breeding seasons, which on the highveld is very brief, must pose considerable problems to egg-eaters.

Egg-eaters may be locally common, and up to five have been found in one moribund antheap. Oviparous, females lay 6-14 eggs in summer measuring 34,5-39,3 x 17,9-21,0 mm. Hatchlings measure 115,0-204,0 mm SVL. Branch & Branch (1988) reported on a large (total length 1079 mm) female from the Cape Province which laid 25 eggs measuring 27,0-29,0 x 18,0-19,0 mm. These ova hatched after an incubation of 71-72 days. Two months after laying the first clutch this female laid a second clutch of 13 eggs of which 7 hatched after an incubation of 96-98 days. The hatchlings measured 211,0-230,0 mm SVL. Almost a year later this female still without a male laid

fifteen eggs of which three were fertile one of which hatched after 58 days incubation. This indicates sperm retention and double clutching in the species. Dyer (1982) recorded a clutch of eggs from Cape Town measuring 36,0-41,0 x 16,0-19,0 mm, which, incubated at temperatures from 23-29°C hatched after 71 days. Hatchlings measured 219,0-229,0 mm (mean 225,0 mm) with masses of 4,6-5,2 g (mean 4,9 g).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread and common, its future on the highveld is largely determined by the availability of moribund termitaria. Occurs in most nature reserves and in the Kruger National Park. Its status is secure and common.

Remarks

Gans (1959) did an extensive revision of the genus Dasypeltis, including D. scabra, and came to the conclusion that the latter only shows geographic variation, including brown phases, throughout its range. Various groups have been given recognition in the past including scabra, abyssinus, mossambicus and loveridgei. Gans (1959) argued that the recognition of some of the above, would also imply separate recognition of "scabra" populations from the Cape of Good Hope area, from Egypt and others as well. He was loath to attempt a separation based on the limited material on hand and maintained that it would be premature. This is upheld at present, but the large number of Transvaal specimens indicate that possibly the time has come to re-evaluate "scabra" throughout southern Africa. A cursory examination of

tail length in relation to total length gives much higher values than that recorded by Broadley (1983). The number of subcaudals in both males and females indicates a marked step along a line extending from Zeerust to Standerton. South of the line, the subcaudals are significantly lower than those to the north of this line (females $p = 0,001$, $t = 12,6766$, 38 df, males $p = 0,001$, $t = 9,6879$, 48 df). Although not as marked, differences in the tail length to SVL ratio is also evident. It is perhaps time that a more detailed analysis of the species is undertaken. De Waal (1978) discussed brown phase specimens in the northern and central Orange Free State. Similar individuals are found in the southern Transvaal in a relatively localised area in the vicinity of Lenz. De Waal (1978) recorded numerous incidences of sympatry between the brown or plain coloured specimens and typical "scabra" but did not investigate the phenomenon further. It may now be necessary to do so.

Family: ELAPIDAE

Genus *Elapsoidea* Bocage, 1866

Elapsoidea Bocage, 1866a, *Jorn. Sci. Lisboa* 1, p. 50 & 1866b, p. 70. Type: *Elapsoidea güntheri* Bocage.

A genus of seven species and several subspecies restricted to tropical and southern Africa. Small to medium sized snakes ranging from slender to stocky. Head small not or only slightly distinct from the neck. Snout depressed with a rounded rostral; eye small with a round pupil; teeth are found anteriorly on the maxilla including a pair of large grooved poison fangs and on the palatines, pterygoids and dentary. Body cylindrical, typical of semifossorial and fossorial species. Dorsal scales smooth, overlapping and in 13 rows at midbody; ventrals smooth; tail very short; subcaudals mostly in two rows occasionally some scales entire. Oviparous. Two species and two subspecies occur in the Transvaal while the possibility of a third subspecies is under investigation. A very uniform group morphologically, which are difficult to distinguish from one another owing in part to a similarity in pigmentation.

Key to the Transvaal species

1. Sexual dimorphism in ventrals not strongly marked (males average up to 6 more than females); snout blunt to moderate; Ventrum usually grey to black ..... *E. semiannulata boulengeri*
   Males with much higher ventral counts than females (averaging 15 more); snout obtusely pointed 2

2. Juveniles and adults with 19-34 pairs of well-defined light transverse lines on body; range Natal to south-eastern Transvaal ..... E. sundevallii sundavallii
Juveniles with 16-23 pale crossbands, adults usually devoid of markings 3

3. Subcaudals 19-23 in males, 13-20 in females ..... E. sundevallii media
Subcaudals 26-33 in males, 22-28 in females ..... E. sundevallii longicauda

Elapsoidea semiannulata boulengeri Boettger, 1895

Elapsoidea Boulengeri Boettger, 1895, Zool. Anz. 18, p. 62. Type locality: Boroma, Zambesi river, Mozambique.
Elapsoidea sundevallii decosteri (not Boulenger). FitzSimons, 1962, p. 279 (part); Pienaar, 1966, p. 203 (part).
Elapsoidea semiannulata boulengeri Boettger. Broadley 1971, p. 611; FitzSimons, 1974, p. 178; Pienaar, 1978, p. 189, pl. 87; Visser & Chapman 1978, p. 59; Branch, 1979, p. 207, figs. 6-7; Welch, 1982, p. 188; Broadley, 1983, p. 270, figs. 156 & 157; Pienaar et al, 1983, p. 206, pl. 93; Auerbach 1987, p. 193, pl. 18, figs. 4 & 5; Branch 1988a, p. 91, pls. 21 & 37, 1988b, p. 13.

Diagnosis. 9 Specimens examined.
Colour: Body and tail banded alternately above with black and white to pale buff. The dark bands are much wider than the pale interspaces which number 8 to 17 on the body and 0-3 on the tail. These pale bands sometimes exhibit a darker dusky-brown or buff band through their

centres. Head whitish with a prolongation of the black nape extending forward to between the eyes. Sides of head uniformly pale or marked with brown. Below creamy white, uniform or with a dark band midventrally or uniformly dark to purplish brown.

Lepidosis: A small thick-bodied snake with a bluntly pointed snout and a short tail. Rostral broader than high; nostril pierced along suture between two nasals; internasals in broad contact; loreal absent; preocular 1; postoculars 2; UL 7, 3rd and 4th in contact with the orbit; LL 6-7 with first 3 or rarely 4 in contact with the anterior sublinguals. Body covered with smooth, imbricate scales in 13 rows at midbody; ventrals 143-158, males ranging from 148-158 and females 143-158; anal scale entire; subcaudals 22-26 in males and 19-23 in females.

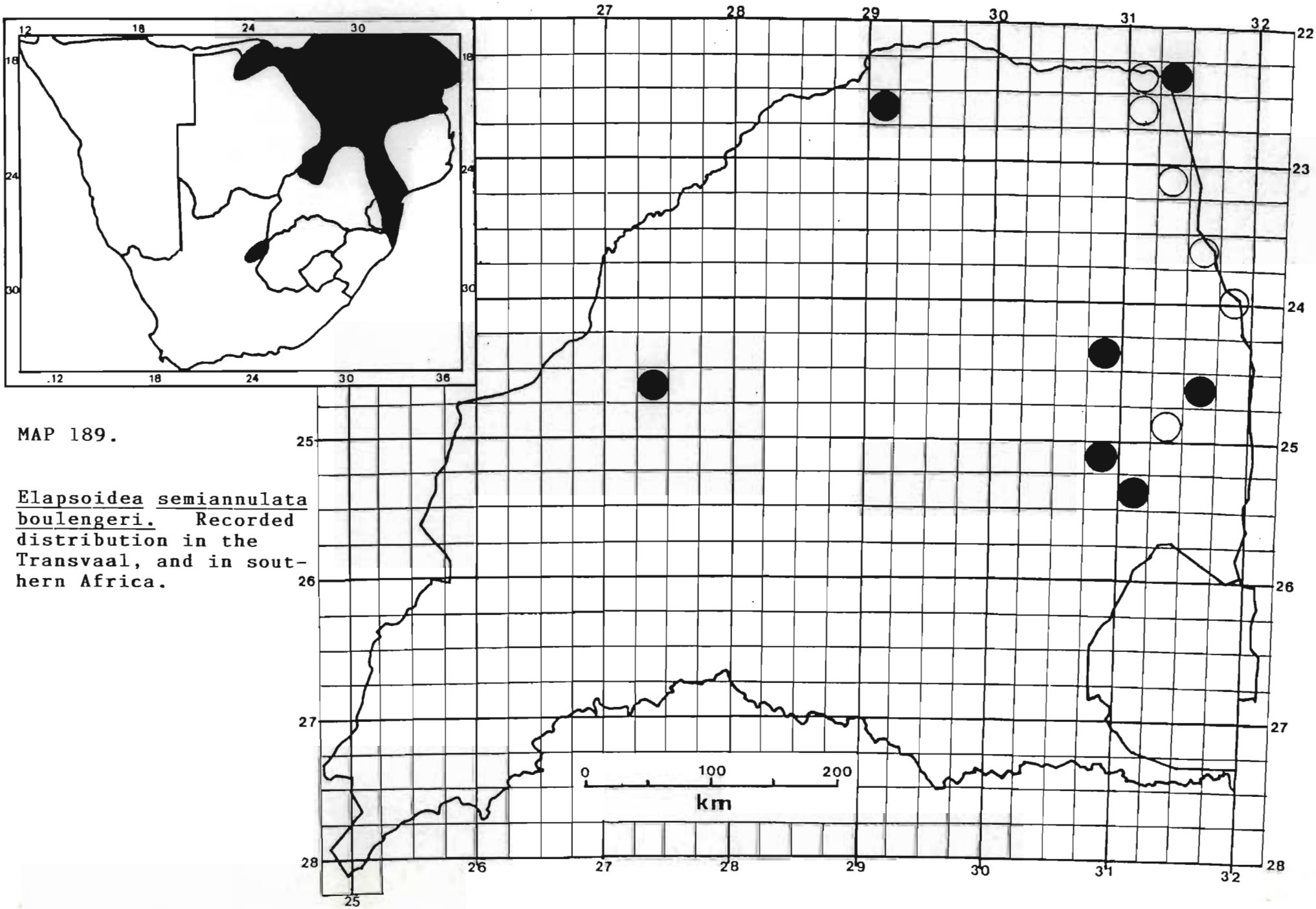
Size: Broadley (1983) records that the largest specimens measured are from Bulawayo, Zimbabwe reaching 605,0 mm and 603,0 mm SVL for a male and a female respectively (NMZB 3649 and NMZB 3735). The tails of these specimens go into total length 13,1 and 18,23 times respectively.

Distribution

South-eastern Africa, from southern Tanzania south to KwaZulu and west to Zambia, Botswana and the northern Cape Province.

Distribution in the Transvaal (Map 189).

16 km E. of Nelspruit; Coventry 261MS; Eastern Transvaal; Manyeleti Game Reserve, Main Camp; Pafuri; Paris 206KT; Sabie; Thabazimbi; White River 64JU.



MAP 189.

Elapsoidea semiannulata boulengeri. Recorded distribution in the Transvaal, and in southern Africa.

Literature Records

Malituve, near Punda Milia; Nchindo-Tabandhlovu; Shingwedzi (Broadley, 1971). W.N.L.A. quarters, Pafuri; near Pafuri picnic spot; Shingwedzi quarters; eastern boundary between Nchindo and Tabaglovu beacons; Malituve near Punda Maria; Letaba camp; Malonga; E. boundary south of Olifants river; sandveld north of Saselandonga gorge; Mala-mala, Sabie-Sand reserve (Pienaar et al 1983).

Habitat and Ecology

Very little is known of the habits and habitat preferences of this snake. Usually found under rotting logs and stones and mostly nocturnal. Sluggish, it feeds on skinks and amphibians but in captivity also feeds on mice and snakes. Found in veld types 10, 15 and 20 at altitudes of 200-1400 m a.s.l. Oviparous, 4 to 8 eggs are laid (Broadley, 1983), measuring 40,0 x 16,0 mm (Broadley, 1971).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A very rare, little known species mostly found in arid low lying terrain. Status indeterminate and more intensive surveys needed at specific localities where the species has been recorded to determine habitat requirements and abundance.

Remarks

The key in Broadley (1983) is difficult to use if comparative material is unavailable, and should be revised to incorporate more realistic characters including possibly colour where applicable.

Elapsoidea sundevallii sundevallii (A. Smith, 1848)

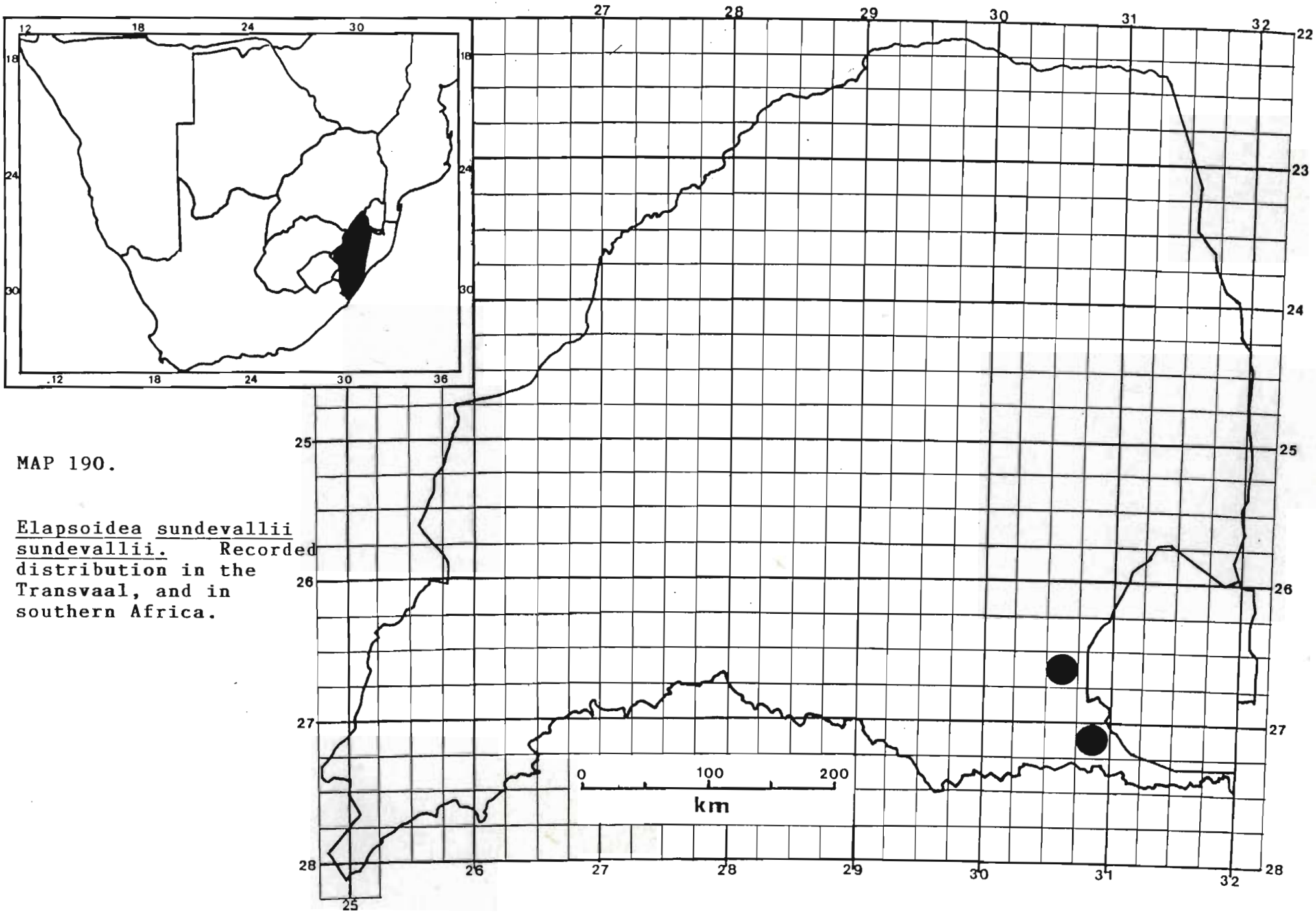
Elaps sunderwallii (sic) A. Smith, 1848, Ill. Zool. S. Afr., Rept., pl. lxvi. Type locality: Southern Africa to the eastwards of Cape Colony = Natal, fide Broadley, 1971a.

Elapsoidea sundevallii sundevallii (A. Smith). FitzSimons, 1962, p. 281, 1966, p. 70, 1970/74, p. 178/175; Visser, 1966, p. 19; Broadley, 1968a, p. 408, 1971, p. 615; Visser & Chapman 1978, p. 57; Branch, 1979, p. 208, fig. 8; Welch, 1982, p. 188; Broadley, 1983, p. 271, fig. 158, pl. 62; Branch 1988a, p. 91, 1988b, p. 13.

Diagnosis. 3 Specimens examined.

Colour: Young specimens conspicuously banded alternately with black and white to cream or buff, the bands being of equal width or pale bands a little wider; 19-34 crossbands on body and 2-4 on the tail; head pale above with a forward projecting V-shaped prolongation of the dark nuchal crossband extending to between the eyes. Below yellowish to buffy. In adults the pale bands darken first to ochre brown and then darker leaving only pale scales at the margins of the crossbands. Adults slaty grey to dark slate above with a reddish or purplish brown tinge; pale indistinct crossbands persist in varying degrees; head dark above. Ventrally yellowish to buff, uniform or with darker mottling or marbling (Broadley, 1983).

Lepidosis: A small thick bodied snake with the head merging into the neck and a short tail; snout obtusely pointed; rostral broader than high; internasals in broad contact; nasals 2; postnasal usually in contact with the single preocular, very rarely separated; postoculars 2; UL 6, 3rd and 4th entering orbit; LL 7, the first three in contact with anterior chin shields. Body scales smooth and imbricate in 13 rows at midbody;



MAP 190.

Elapsoidea sundevallii sundevallii. Recorded distribution in the Transvaal, and in southern Africa.

ventrals 163-181 in males and 147-156 in females; anal scale entire; subcaudals 20-28 in males and 16-21 in females.

Size: Broadley (1983) recorded the largest specimens examined as being a male (NM 430 - Hilton Road, Natal) with a SVL of 930,0 mm and a female (NM 1245 - Creighton, Natal) with a SVL of 580,0 mm. The tails of these individuals go into total length 15,31 and 13,89 times respectively.

Distribution

Natal, south-eastern Transvaal and Swaziland.

Distribution in the Transvaal (Map 190).

Athole 392IT; Piet Retief.

Habitat and Ecology

A very rare species in the Transvaal found in moribund termitaria in highveld grassland including veld types 57 and 63 at altitudes of 1500-1800 m a.s.l. Sluggish and no doubt nocturnal, the species feeds on lizard eggs especially geckos and amphibians (Broadley, 1983).
Oviparous, up to 10 ova are laid measuring 20,0x8,0-10,0 mm.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A very rare snake in the Transvaal. No specimens have been recorded in the province for more than 50 years. Although in part attributable to its secretive habits, the extant status

of the species in the Transvaal is in doubt. Additional surveys and monitoring actions during the summer months need to be undertaken in the south-eastern Transvaal.

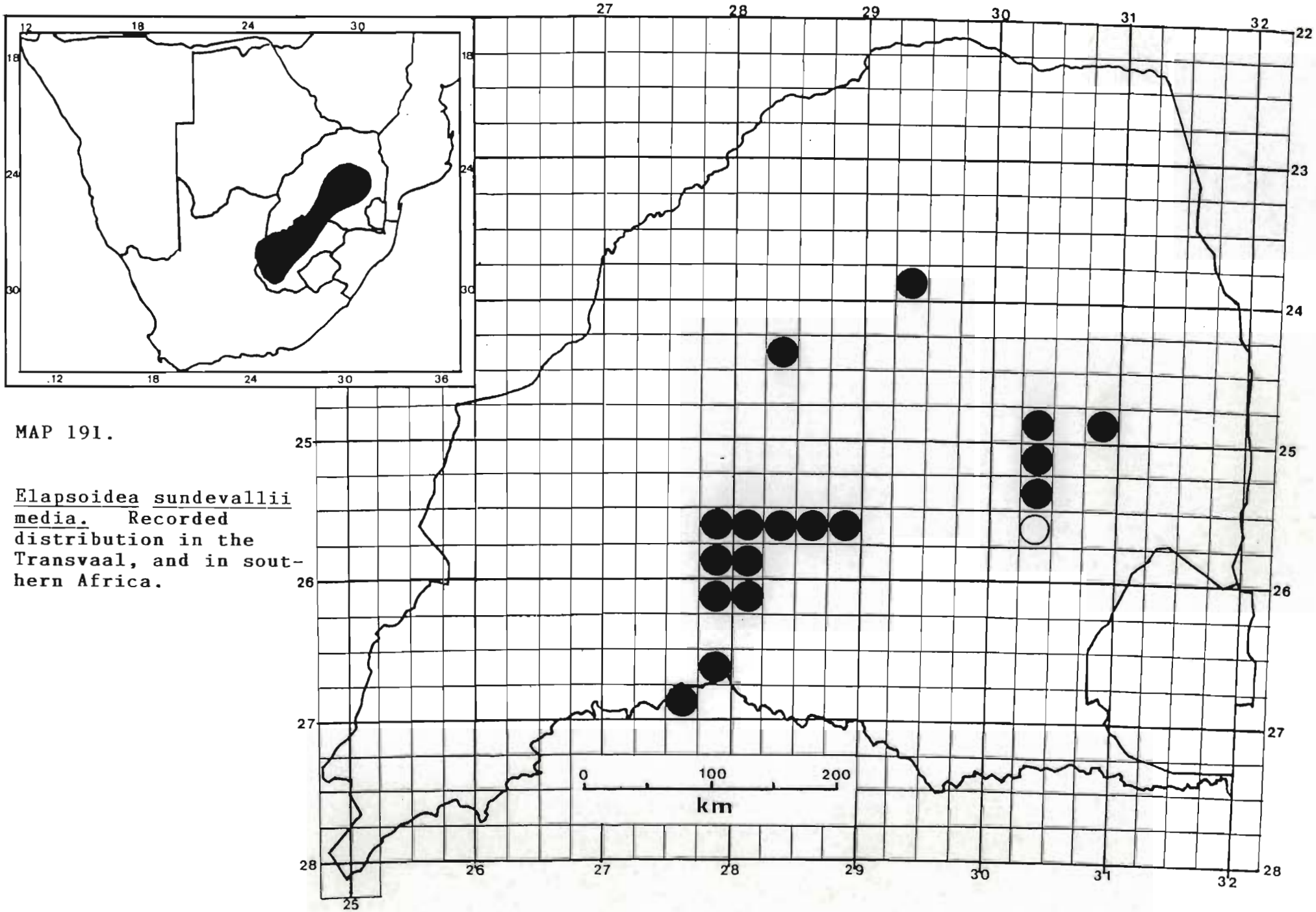
Remarks

As for the previous species. The forms are difficult to separate on morphological grounds.

Elapsoidea sundevallii media Broadley, 1971

Elapsoidea sundevallii media, Broadley, 1971, Arnoldia, Rhod. Ser. B, 4 (32), p. 615. Type locality: Galulis farm, Edenvale, Transvaal.
Elapsoidea sundevallii decosteri (not Boulenger). FitzSimons, 1962, p. 279 (part).
Elapsoidea sundevallii media Broadley. FitzSimons, 1974, p. 175; De Waal, 1978, p. 116; Visser & Chapman, 1978, p. 59; Branch 1979, p. 209, fig. 9; Broadley 1983, p. 272, fig. 159; Branch 1988a, p. 91, pls. 21 & 32, 1988b, p. 13.

Diagnosis. 25 Specimens examined.
Colour: Juveniles with 16-23 clearly defined white to pink bands along body and 2-3 on the tail, narrower than the blackbands. Head pale with black prolongation extending onto crown. Ventrum and lower half of outer scale row pale brown. The pale bands are well defined up to 320,0 mm SVL. Larger individuals are uniform steel grey to blackish or with brownish orange narrow paired crossbands along the body. Ventrum white to faint grey.
Lepidosis: A small thick-bodied snake with the head merging into the neck. Tail short. Snout obtusely pointed; rostral prominent; preocular 1; postoculars 2; UL 7, the 3rd and 4th entering the orbit; LL 7, the



MAP 191.

Elapsoidea sundevallii media. Recorded distribution in the Transvaal, and in southern Africa.

first 3 or 4 in contact with anterior sublinguals. Dorsal scales in 13 rows at midbody; ventrals 157-168 in males, 140-154 in females; anal scales entire; subcaudals 19-23 in males, 13-18 in females.

Distribution

Restricted to the highveld areas of the Transvaal and Orange Free State extending into the northern Cape Province.

Distribution in the Transvaal (Map 191).

Aandeblom, Middelburg; Boekenhoutskloofdrift 286JR; Brits; De Deur 539IQ; Gillooly's Farm; Irene; Kempton Park, Esselen Park; Lanseria Airport; Lydenburg; Magalakynsoog 199KR; Nooitgedacht 392KT; Pietersburg; Pilgrim's Rest; Pretoria; Pretoria, Rietondale; Pretoria, Valhalla; Pretoria, Waterkloof Ridge; Pretoria, Waverley; Rietfontein, Krugersdorp; Roodewal 117JT; Vlakfontein 457JR; Waterval, Pretoria Dist.

Literature Records

Lyttleton; Waterval Onder (Broadley 1971).

Habitat and Ecology

Mostly found in highveld grassland but also in bushveld occurring in veld types 48, 52, 57, 61 and 67 at altitudes of 1250-1800 m a.s.l. Usually inhabit moribund termitaria but are also found under rock on soil. Largely unknown, these snakes presumably also feed on lizards, amphibians and snakes.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Uncommon and relatively widespread in the Transvaal. Likely to occur in some provincial nature reserves. Current status indeterminate until more detailed surveys have established how common they are. Need to be monitored.

Remarks

Similar to sundevallii, and comments on the key pertain.

Elapsoidea sundevallii longicauda Broadley, 1971

Elapsoidea sundevallii longicauda Broadley, 1971, Arnoldia Rhod. Ser., B., 4(32), p. 617. Type locality: Malugwe pan, Gonarezhou National Park, Zimbabwe.
Elapsoidea sundevallii decosteri (not Boulenger). FitzSimons, 1962, p. 279 (part); Pienaar, 1966, p. 203 (part).
Elapsoidea sundevallii longicauda Broadley. FitzSimons, 1974, p. 175; Pienaar, 1978, p. 191, pl. 88; Visser & Chapman, 1978, p. 59, pl. 19, fig. 5; Branch, 1979, p. 209; Welch, 1982, p. 188; Broadley, 1983, p. 273, figs. 160 & 161; Pienaar et al, 1983, p. 207, pl. 94; Branch, 1988a, p. 91, pl. 37, 1988b, p. 13.

Diagnosis. 25 Specimens examined.
Colour: Juveniles with 17-20 buff crossbands on body and 2-3 on tail, about two-thirds width of black bands. The bands become indistinct with age and disappear altogether

in adults. Head white with median black marking reaching to between or first anterior to the eyes. Ventrum and outer scale row uniform white. Adults uniform grey to greyblack dorsally. Ventrally white to pink this colour more pronounced on outer scale row.

Lepidosis: A medium sized snake with a solid cylindrical body, a spade shaped depressed head and a relatively short tail. Snout obtusely pointed; rostral broader than high; nostril pierced along suture between two nasals; internasals in broad contact behind rostral; preocular 1; postoculars 2; UL 7, the 3rd and 4th entering the orbit; LL 7, the first three (rarely 4) in contact with the anterior chin shields. Dorsal scales in 13 rows at midbody; ventrals 164-177 in males and 152-170 in females; anal scale entire; subcaudals 21-33 in males and 23-28 in females.

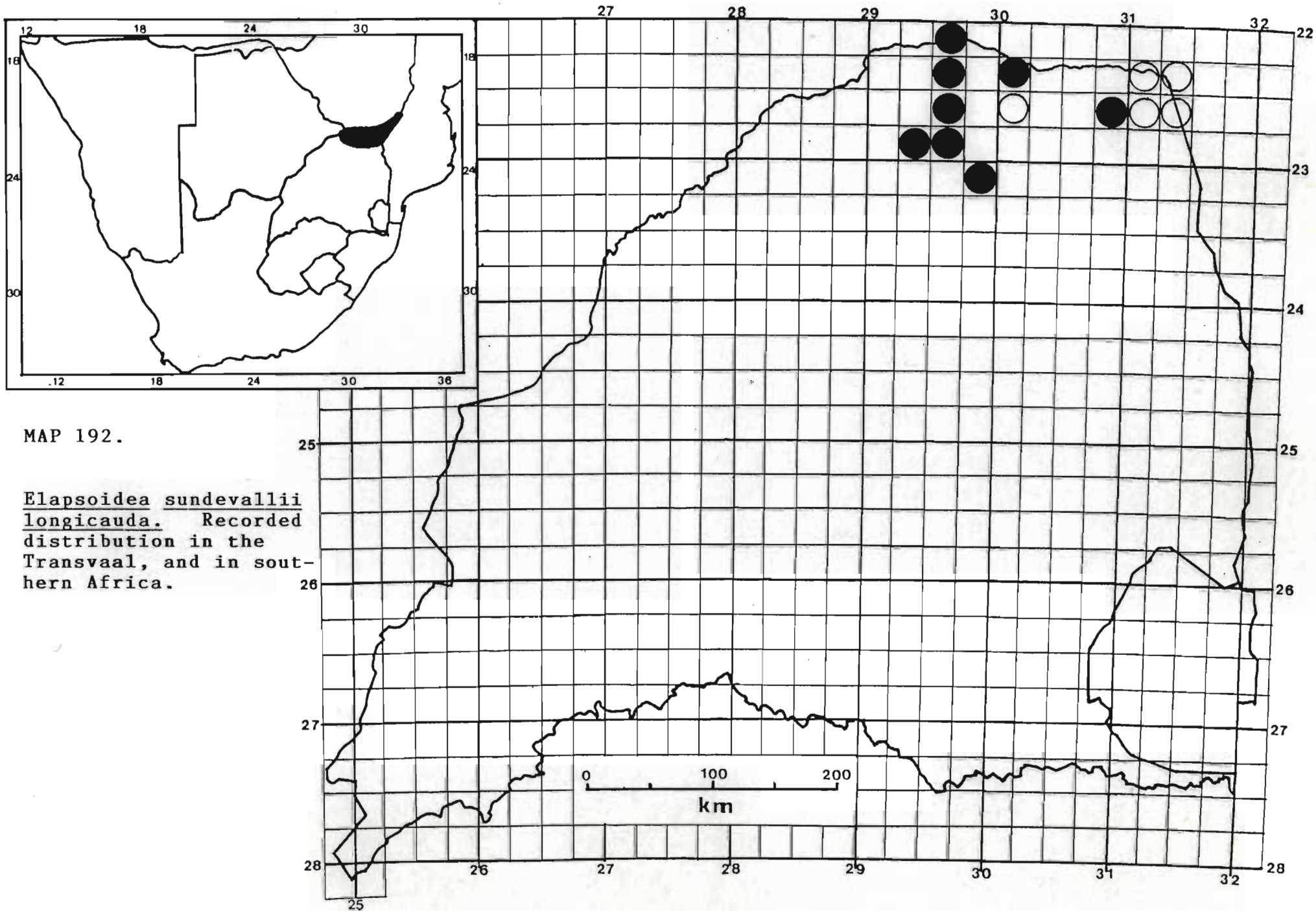
Size: Largest male SVL measured = 703,0 mm (JN 256 - Tshidzi Hill), mass = 122,0 g (JN 256); Largest female SVL measured = 600,0 mm (N11593 - Fontainebleau 537MS), mass = 103,0 g (N11593). Broadley (1983) records a male SVL = 1290,0 mm (UM 29379 - Mapinhane, Mozambique) and a female SVL = 650,0 mm (JPT 1831 - Banamana, Mozambique). Tail is contained in total length from 10,25 to 15,33 times (n = 7).

Distribution

Northern Transvaal, south-eastern Zimbabwe and southern Mozambique.

Distribution in the Transvaal (Map 192).

Celine 547MS; Dongola; Fontainebleau 537MS; Grootvlei 684MS; Louis Trichardt; Messina 4MT; Munnichshausen 151MS; Petershof 131MS; Rochdale 700MS; Rooigrond 464MS; Sudbury 392MS; Tshidzi Hill; Vetfontein 360MS; Zoutpan 459MS.



MAP 192.

Elapsoidea sundevallii longicauda. Recorded distribution in the Transvaal, and in southern Africa.

Literature Records

Beit Bridge; Malonga Spring; Tshipise; Waterpoort (Broadley, 1983). Mathlakuza pan area, eastern boundary between Mathlakuza pan and Saselandonga gorge; eastern boundary sandveld plateau between Pafuri and Saselandonga gorge; Eastern boundary between beacons 9 and 10 and between beacon 7 and Nyandu sandveld; Nyandu sandveld; sandveld north of Cabora Bassa powerlines (Pienaar et al, 1983).

Habitat and Ecology

Restricted to the far northern Transvaal in Veld types 14, 15, 18, 19 and 20 at altitudes of 200-850 m a.s.ℓ. in sandy areas. Many be locally common such as near Mopane. Fossorial they move about on the surface during the rainy season feeding on snakes, burrowing lizards and golden moles. Broadley (1983) recorded a Transvaal snake containing a Lygosoma sundevallii while a specimen from near Mopane regurgitated a Nucras intertexta and a Heliobolus lugubris.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Uncommon and scattered, local populations may be more abundant. Likely to occur in two provincial nature reserves and the species is found in the north-eastern Kruger National Park. The species is secure.

Remarks

Broadley (1971a) discusses the variability of certain morphological characters between populations of south-eastern Zimbabwe and the northern Transvaal. Two specimens from Zoutpan 459MS (TM14973) and Messina (TM 9500) have short tails and low subcaudal counts showing affinity to E. s. fitzsimonsi Loveridge. However, until additional material is obtained these specimens are incorporated under longicauda following Broadley (1971a).

Genus Hemachatus Fleming, 1822

Hemachatus Fleming, 1822, Philos. Zool. p. 295. Type: Coluber haemachata Lacépède.

An endemic genus to southern Africa and monotypic. A large stocky snake with a head indistinct from the neck. Head broad and little flattened; eye well developed and pupil round; canthus rostralis distinct. Ribs in neck elongate and capable of being raised laterally to form a hood. A pair of large, grooved poison fangs are found anteriorly on the maxilla but no solid teeth; Solid teeth occur on the mandible, palatine, pterygoid and the dentary. Body somewhat broad and depressed. Dorsal scales keeled and in 19 oblique rows at midbody. Ventrals smooth; tail moderately long and subcaudals in two rows. Viviparous. The species is restricted to the highveld and montane grasslands in the Transvaal.

Hemachatus haemachatus (Lacépède, 1788)

Vipere haemachate Lacépède, 1788, Hist. Nat. Quad. Ovip. Serp., 2, p. 115, pl. iii, fig. 2. Type locality: Japan - et Perse, in error for South Africa, fide Broadley, 1983.

Hemachatus haemachatus (Lacépède). FitzSimons, 1962, p. 287, 1966, p. 74, 1970/74, p. 167/166; Visser, 1966, p. 19; Broadley, 1968, p. 410; De Waal, 1978, p. 120; Visser & Chapman, 1978, p. 49; Branch, 1979, p. 213; Welch, 1982, p. 188; Broadley, 1983, p. 275, figs. 162 & 163; pl. 64; Branch 1988a, p. 94, pls. 20 & 35, 1988b, p. 13.

Diagnosis. 120 Specimens examined.

Colour: Variable but Transvaal specimens usually black,

grey-black or brownish black with irregular crossbars of dull yellowish to pale brown or individuals may be uniform black. Below black to dark brown, usually with one or two (rarely three) white crossbands on the neck.

Lepidosis: A thick bodied medium to large snake with a triangular head which merges into the neck. Tail relatively short. Snout obtusely pointed; rostral almost as broad as high; nostril pierced between internasal and two nasals; internasals in broad contact behind rostral; preocular 1, well separated from frontal; postoculars 3; UL 7, 3rd and 4th entering orbit, former also in contact with postnasal; LL 8 or 9 (exceptionally 7), first four in contact with the anterior sublinguals. Body scales dull, rough, strongly keeled and imbricate, in 19 (rarely 17) rows at midbody; ventrals 116-150 (rarely less than 128); anal scale entire; subcaudals 30-47 (rarely less than 36), first 3 or 4 frequently undivided.

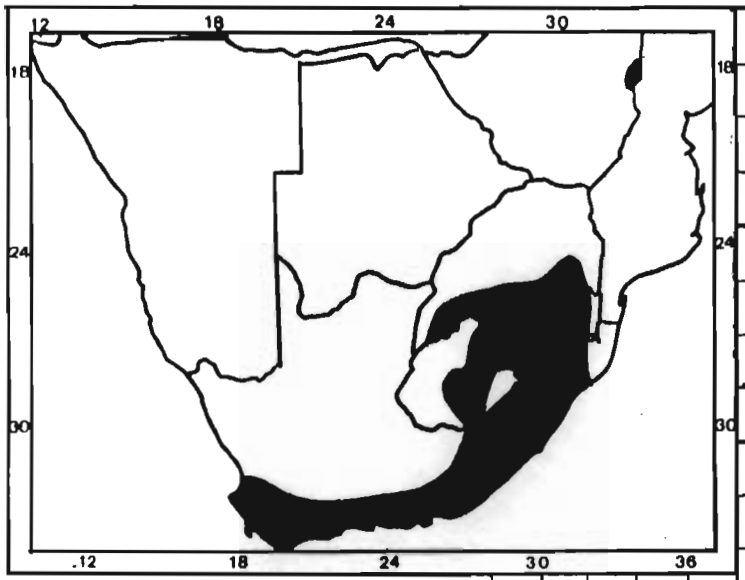
Size: Largest male SVL = 1140,0 mm (N5843 - Wolmaransstad), mass = 2000,0 g + (N5843); Largest female SVL = 1022,0 mm (P6775 - Palmietfontein 337IR), mass = 775,0 g (P6775). Mean male SVL = 685,0 mm ± 212,68 (1SD), n = 12, mass = 380,67 g ± 530,76 (1SD), n = 13; Mean female SVL = 692,0 mm ± 242,82 (1SD), n = 6, mass = 307,27 g ± 283,99 (1SD), n = 6. Tail is contained in total length from 5,38-7,01 times, males ranging from 5,38-6,33 and females 5,51-7,01.

Distribution

From the southern Cape Province eastwards and northwards to Natal, the Orange Free State and the southern Transvaal. A relict population exists in eastern Zimbabwe.

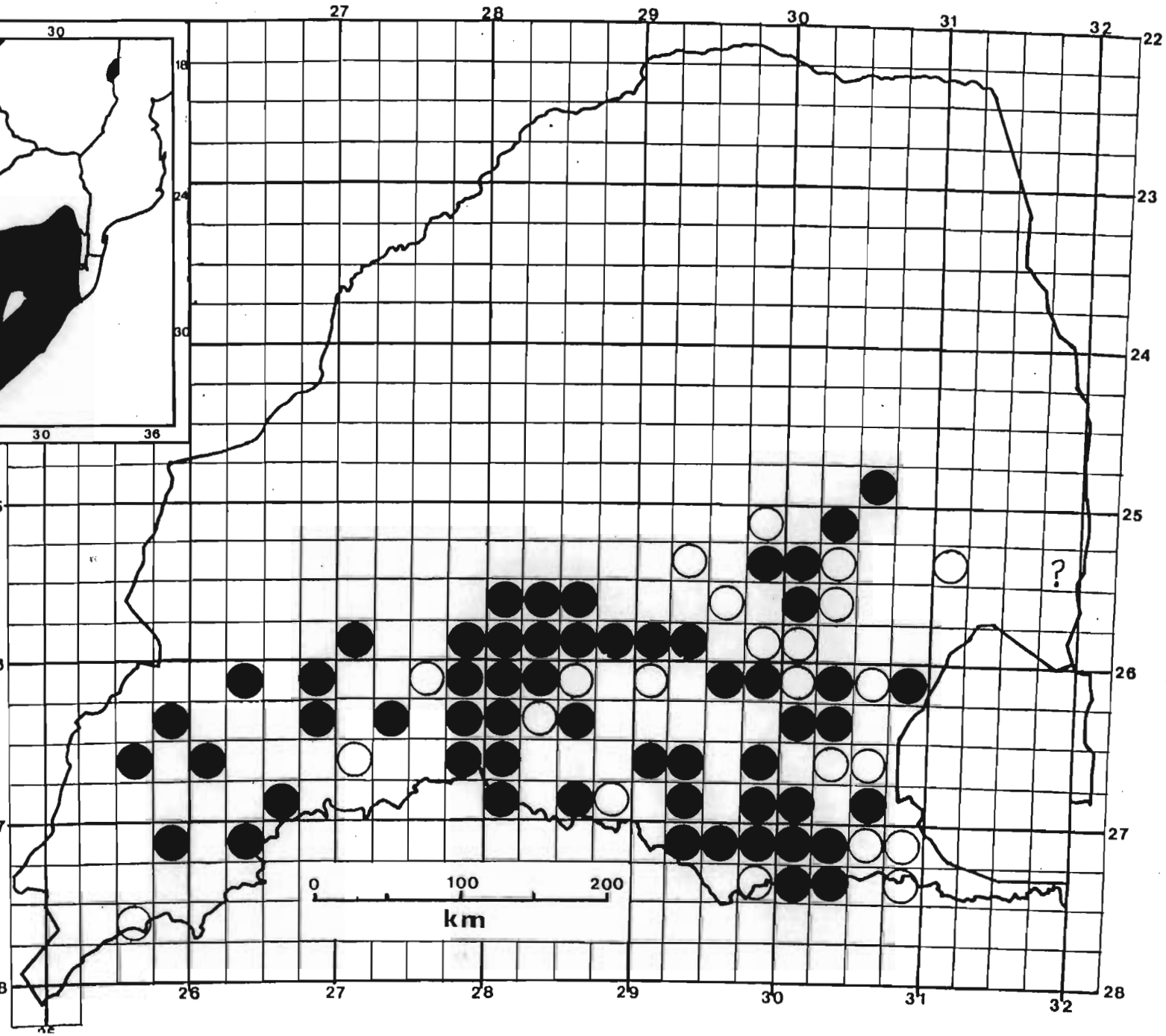
Distribution in the Transvaal (Map 193).

6 km Rayton - Cullinan; 8 km E of Bronkhorstspruit; 12 km Machadodorp - Middelburg; 16 km Lichtenburg - Koster; 22 km Krugersdorp - Pretoria; Abe Bailey Nature Reserve; Athole 392IT; Barberspan Nature Reserve; Belfast; Between Rietvlei Dam & Irene; Biesjesvlei 149IO; Bosjesspruit 291IS; Bosmanslaagte 181IS; Caledonia 97IT; Cleveland; De Kroon 363JT; Derby; Doornkop School, Witpoort; Doornrug 302JS; Ermelo; Germiston; Glen Austin, Halfway House; Goedemoed 373IT; Goedgedacht, Amersfoort; Groenvlei 353JT; Grootvlei 293IS; Halfway House; Heerenveen 27IT; Hexrivier 634IR; Irene; Irene Agricultural Research Station; Johannesburg; Johannesburg, Blairgowrie; Johannesburg, Craighall; Johannesburg, Delta Sewage Works; Johannesburg, Edenvale; Johannesburg, Wynberg; Kafferskraal 381IR; Kastrolnek, Wakkerstroom; Kempton Park Technical College; Kempton Park, Edleen; Kleinfontein 3HT; Kleinsuikerboschkop 93JT; Klerksdorp; Kliprivier - Lido Hotel - Johannesburg; Kloofsig, Vereeniging; Komatipoort Townlands 182JU; Kromdraai 338IO; Lake Chrissie 92IT; Lake Denysville Yacht Club, Vaal Dam; Langkloof 356JT; Lydenburg; Lyttelton 381JR; Middelburg Town and Townlands 287JS; Naudesbank 172IS; Nooitgedacht 176IR; Nooitgedacht alias Vetpan 131IP; Olifantsfontein; Orkney 437IP; Palmford Station; Palmietfontein 337IR; Peach Tree 544KT; Pinedene; Plot Waterlands; Pretoria; Pretoria District; Pretoria, Colbyn; Pretoria, Fountains Grove; Pretoria, Mooiplaats; Pretoria, Waterkloof; Pretoria, Waterkloof Ridge; Pretoria, West End; Pretoria, Wierda Park; Pretoria, Zwartkop; Putfontein 26IR; Randburg, Bush Hill; Rhenosterfontein; Rietfontein 40HS; Rietpoort 83HS; Rietvlei Dam, Pretoria; Rolfontein 536IS;



MAP 193.

<u>Hemachatus haemachatus.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Sandton; Standerton; Suikerbosrand Nature Reserve; Syferfontein 12HP; Syferfontein 293IQ; Tygerkloof 193IT; Uitschot 233IP; Ventersdorp Dorpsgebied; Vereeniging; Vlakplaats 354JR; Wachtenbietjeskop 506JR; Wakkerstroom Townlands 121HT; Waschbank 1HT; Wolmaransstad Town and Townlands 184HO.

Literature Records

Amsterdam; Anysspruit; Arnot; Bankop; Bloemhof; Bronkhorstspruit; Carolina; Commondale; Damwal; Delmas; Dunottar; Goedewil; Hendrina; Krugersdorp; Lochiel; Lothair; Machadodorp; Moedig; Ogies; Pan; Piet Retief; Plaston; Potchefstroom; Randfontein; Rayton; Sheepmoor; Springs; Tautesberg; The Brook; Tonteldoos; Val; Volksrust; White River; Witbank (FitzSimons, 1962).

Habitat and Ecology

In the Transvaal, the rinkhals is mainly found in the grasslands of the highveld and to a lesser degree the more wooded south-west. A sluggish, relatively inoffensive snake, it is usually found close to vleis where its main food sources, amphibians and rodents, are available. Broadley (1983) mentions that vision is relatively poor in this snake and that it relies mainly on smell in finding its prey. This is in keeping with its wait and see foraging techniques. It appears to be analagous to the American Water Mocassin or Cotton Mouth Agkistrodon piscivorus both in appearance and habitats. Feeds on amphibians, one specimen regurgitating a Rana fuscigula while another was seen chasing a rodent. Have also been observed feeding on Cordylus giganteus (Jacobsen et al, 1989). The snakes appear to be mostly

diurnal, taking refuge in rodent and mole burrows as well under rocks and among thick grass tussocks. Found in veld types 48, 50, 52, 54, 55, 57, 61 and 63 at altitudes between 1400-2000 m a.s.l.

Oviviparous, the species produces live young from 15 to 60 in number (Broadley 1983). A specimen from Lothair gave birth to 63 neonates. However mostly up to 35 are produced per season during the summer months i.e. January to March. The neonates have a SVL = 170,0-180,0 mm and a mass of 3,4 to 5,5 g. As this snake is so sluggish, it is vulnerable to aerial predation. An incidence of this nature was observed by G. Alberts (pers. comm.) during September, 1974. In this instance two Pied crows (*Corvus albus*) were harassing a metre long rinkhals, one bird teasing the snake from the front and when the latter struck at the bird, its partner nipped the snake in the rear. On reacting to this attacker the snake was then pecked by the first crow. If the snake coiled up and waited then the birds would walk about unconcernedly. Within a minute or two the snake began to move off and promptly the crows moved to attack again. This process must have happened repeatedly as the snake was already weakened and Alberts had observed this for 35 minutes. Fortunately for it, the snake found a hole down which it fled.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Although originally common in the highveld (Broadley 1983), the species has declined in numbers due mainly to habitat destruction, destruction by humans and especially road kills. A large proportion 12/32 (37,50%) of specimens were collected D.O.R. indicating the pressures on this, the largest of

highveld snakes. The relative paucity of specimens found during this survey leads to an indeterminate status. Monitoring of populations on provincial nature reserves is important in assessing whether viable populations exist.

Genus *Aspidelaps* A. Smith, 1849

Aspidelaps A. Smith, 1849, *Ill. Zool. S. Afr., Rept., App.*, p. 21. Type: *Natrix lubrica* Laurenti.

An essentially southern African genus with two species and four subspecies. Squat, thick-bodied highly irascible snakes, they are characterised by a short head, not depressed and indistinct from neck. Eye of small to moderate size with a round or vertically elliptic pupil. Rostral shield much enlarged particularly in *scutatus* and free laterally allowing it to be usued when burrowing. Body cylindrical or depressed with dorsal scales smooth to nodular and keeled, arranged in 19 to 23 oblique rows at midbody; ventrals rounded; tail short cylindrical and tapered; subcaudals in two rows. Oviparous. Only one species and one subspecies is found in the bushveld and lowveld of the Transvaal respectively. Partially fossorial but emerging after rain has fallen.

Key to the Transvaal species.

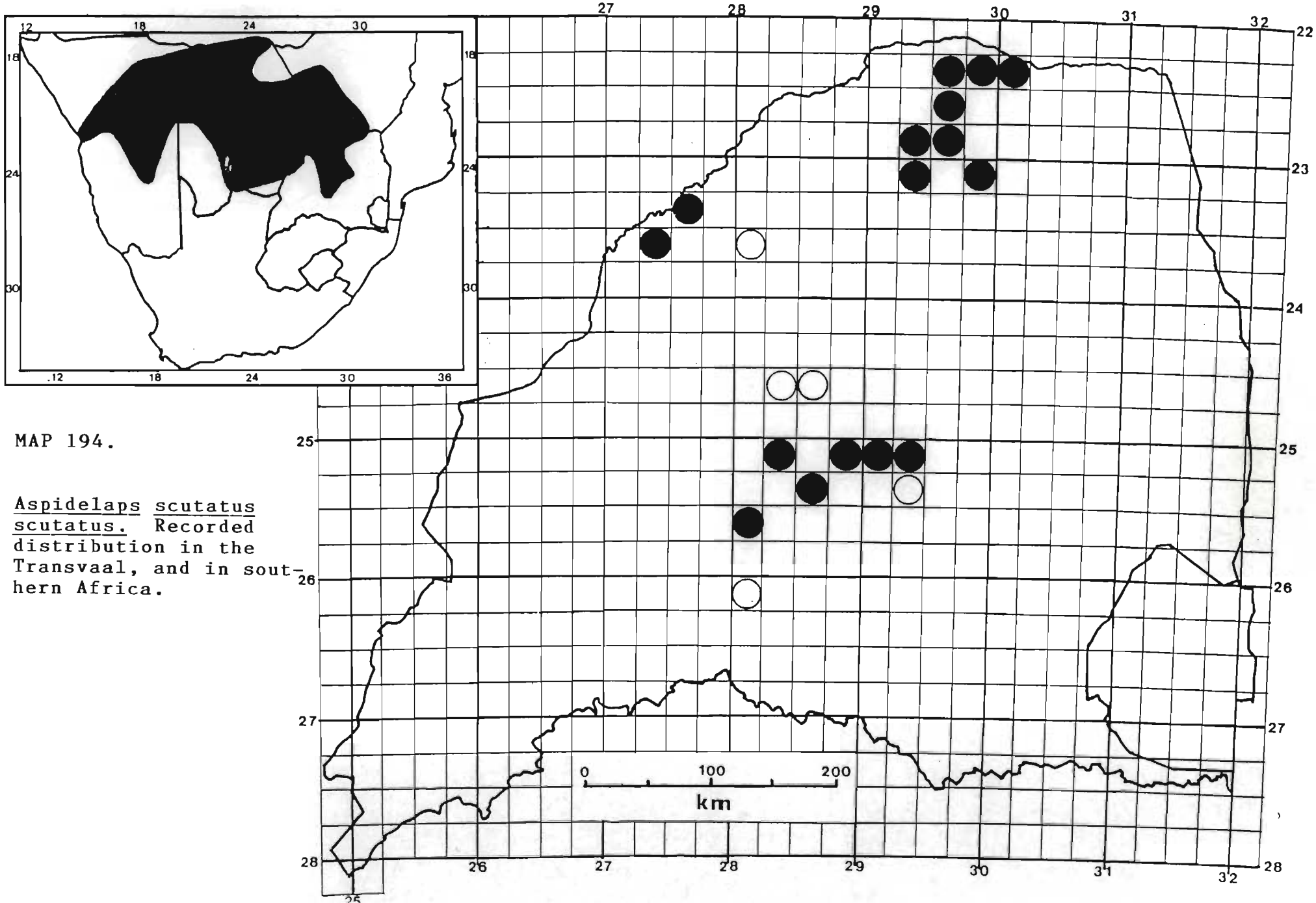
1. Subcaudals 25-30 in males, 20-24 in females ..... *A. scutatus scutatus*
   Subcaudals 32-35 in males, 27-31 in females ..... *A. scutatus intermedius*

Aspidelaps scutatus scutatus (A. Smith, 1848)

Cyrtophis scutatus A. Smith, 1848, *Ill. Zool. S. Afr., Rept., App.*, p. 22. Type locality: "Kaffirland and the country towards Natal" corrected to the Marico-Crocodile Confluence, Transvaal, by Broadley, 1968c.
Aspidelaps scutatus (A. Smith). FitzSimons, 1962, p.

273, 1966, p. 72; Visser 1966, p. 19; Broadley 1968e, p. 406; FitzSimons 1970/74, p. 171/170.
Aspidelaps scutatus scutatus (A. Smith). Broadley 1968a, p. 3, Broadley & Cock, 1975, p. 57; Visser & Chapman, 1978, p. 56, pl. 19, fig. 4; Branch 1979, p. 203, fig. 4; Welch, 1982, p. 186; Broadley, 1983, p. 282, fig. 166, pl. 66; Auerbach 1987, p. 195, pl. 18, fig. 7; Branch 1988a, p. 90, pl. 26, 1988b, p. 13.

Diagnosis. 36 Specimens examined.
Colour: Pale grey-brown to red-brown with a series of dark dorsal blotches (usually poorly defined) and scales often dark edged. Head and neck almost entirely black in adults but in juveniles there are one or two white chevrons on the nape. Uniform white below.
Lepidosis: A small thick bodied snake with the head slightly wider than the neck. Tail short. Snout blunt with a very large, broader than deep rostral; nostril pierced along suture between two nasals and junction with internasal; internasals separated by rostral; preocular 1, widely separated from frontal; postoculars 3 (exceptionally 2 or 4); UL 6, (exceptionally 5), only the 4th enters the orbit; LL 8, the first three or four in contact with the anterior chin shields. Dorsals smooth or faintly keeled and in 21 rows (rarely 20 or 23) at midbody. Scales more rugose and tubercularly keeled posteriorly, distinctly larger and smoother on sides than above. Ventrals 110-122; anal scale entire; subcaudals 21 to 31, ranging 26-31 in males and 21-24 in females.
Size: Largest male SVL measured = 484,0 mm (9867 - Trekpad 455MS), mass = 190,0 g (9867); Largest female SVL measured = 460,0 mm (9868 - Trekpad 455MS), mass = 125,0 g (9868). Mean SVL = 381,40 mm ± 121,05 (1SD), n = 5, mass = 86,38 g ± 72,33 (1SD), n = 5. Tail contained in total length in males is 6,56-7,28 times and in



MAP 194.

<u>Aspidelaps scutatus scutatus.</u> Recorded distribution in the Transvaal, and in southern Africa.

females 8,47 to 9,60. A male specimen in Broadley (1983) from Botswana had a tail contained 8,47 times in total length.

Distribution

South West Africa/Namibia, Botswana and south-western Zimbabwe and the western half of the Transvaal.

Distribution in the Transvaal (Map 194).

Celine 547MS; Dongola; Groblersdal; Killaloe 235MS; Louis Trichardt; Mara 38LS; Messina 4MT; Messina area; Pretoria, Wonderboom; Rietfontein 214JR; Rochdale 700MS; Rust der Winter Nature Reserve; Siabushwe, 30 kms. S.W. Marble Hall; Skilpadfontein; Steenbokpan 295LQ; Sudbury 392MS; Trekpad 455MS; Windhoek 127LQ; Zoutpan 459MS, Crystal Salt works.

Literature Records

Damwal; Mara; Nylstroom; Overyssel (FitzSimons, 1962); Johannesburg; NumNum; Wonderboomspruit, Pretoria (Broadley, 1968).

Habitat and Ecology

A sluggish, irritable, burrowing snake found in veld types 12, 14, 15, 18 and 20 at altitudes of 500-1300 m a.s.l. Appears to favour stony and sandy areas. Usually only observed when active in the evening. One specimen was observed to emerge from loose sand and a gathering of leaf litter at the base of a tree at approximately 19h00. When disturbed it puffs and hisses, simultaneously striking widely, usually with a closed mouth but if irate

enough will bite. Feeds on toads, frogs and rodents mostly, although Broadley (1983) also includes lizards and other snakes in their diet. Broadley (1968a) recorded Breviceps sp. in three stomachs and another specimen contained a Tomopterna cryptotis. A captive specimen fed readily on Schismaderma carens and Bufo garmani. Oviparous, eggs appear to be laid in mid- to late summer.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. A secretive snake with a wide distribution but possibly more common in the low lying country to the north and west of the Soutpansberg. Eight specimens were collected on each of two farms Sudbury 392MS and Celine 547MS belonging to Mr. D. Muller. However whether they originated here or on surrounding farms is not known. It does indicate that the species may be locally common. Detailed surveys and monitoring of prime areas should be consired. Currently considered secure.

Aspidelaps scutatus intermedius Broadley, 1968

Aspidelaps scutatus intermedius Broadley, 1968a, Arnoldia Rhod., 4(2), p. 7. Type locality: Selati, E. Transvaal. Pienaar, 1978, p. 187, Visser & Chapman, 1978, p. 57; Branch 1979, p. 204; Welch, 1982, p. 186; Broadley, 1983, p. 283, fig. 167; Pienaar et al, 1983, p. 208, pl. 95; Branch 1988, p. 90; pl. 18, 1988b, p. 13.

Aspidelaps scutatus (not A. Smith). FitzSimons, 1962, p. 273 (part); Pienaar, 1966, p. 201.

Diagnosis. 18 Specimens examined.

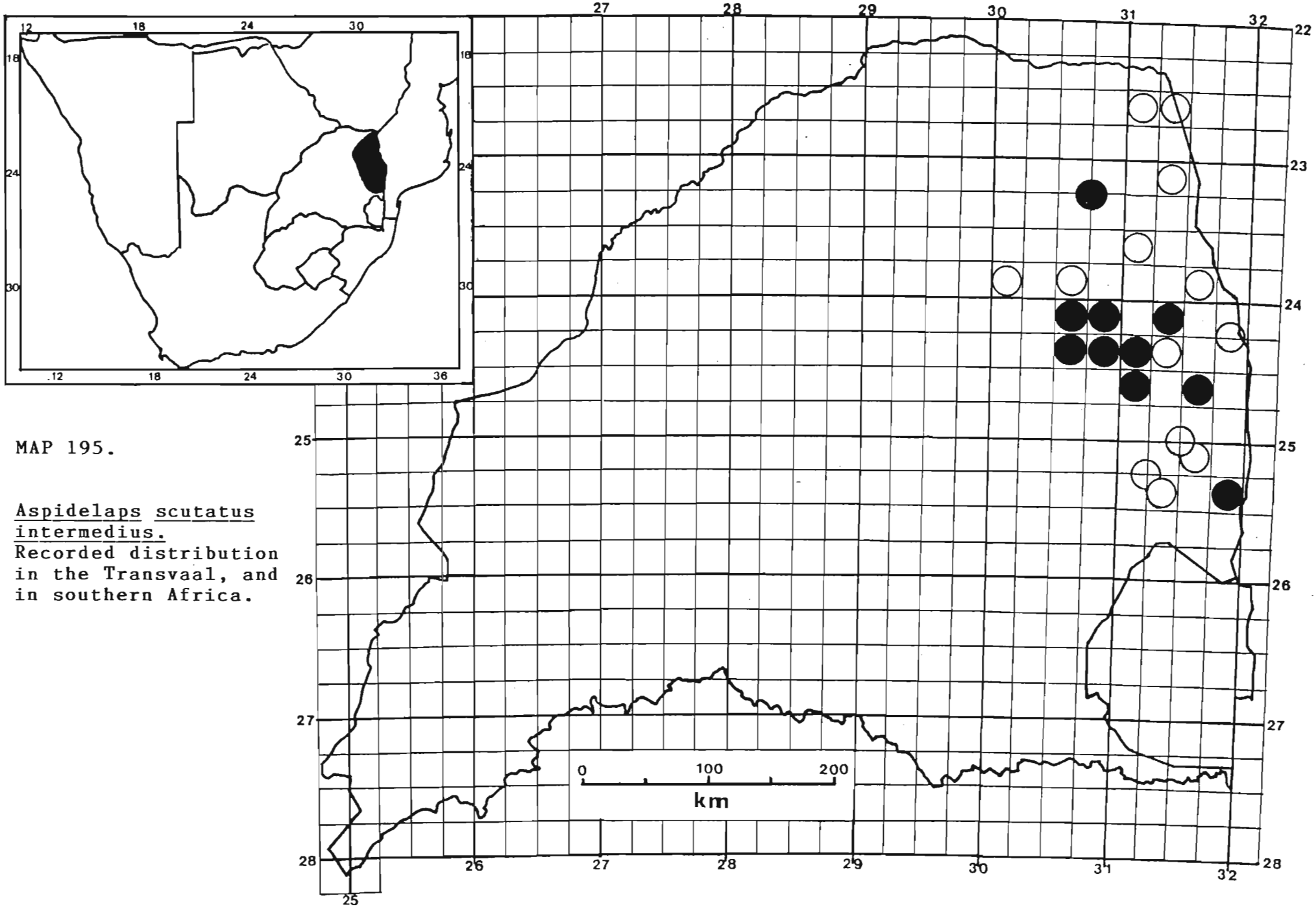
Colour: Grey-brown to reddish brown with distinct to indistinct large blackish blotches down the back, laterally a series of smaller elongate spots or blotches are found. Head black above as is the neck, the black forming broad forward pointing V-shaped marking interrupted by a narrow pale interspace which merges into the white ventrally. A Black collar or band occurs posterior to this. Below white to yellowish-white.

Lepidosis: A thick bodied snake with the head slightly wider than the neck and with a short tail. Rostral very large, broader than deep. Nostril pierced between two nasals and the internasal; internasals widely separated by rostral; preocular 1 (very rarely 2 or 0); postoculars 2 or 3; UL 6 (exceptionally 7), the 4th (rarely 3rd and 4th) entering the orbit; LL 8 (exceptionally 9), the first three or four (very rarely five) in contact with anterior sublinguals. Dorsal scales smooth anteriorly and keeled posteriorly becoming tubercular on the tail, in 21 (mostly) to 23 rows at midbody; ventrals 108-117 in males and 117 to 121 in females; anal scale entire; subcaudals 30-35 in males and 24-29 in females.

Size: Largest male SVL = 460,0 mm (TM 26753 - Letaba); Largest female SVL = 510,0 mm (TM 26447 - 120 km NE of Tzaneen), Broadley (1983). Two females with SVL of 314,0 and 362,0 mm had masses of 21,0 g and 56,0 g respectively. Tail length is contained in total length from 6,05-10,23 times.

Distribution

Endemic to the eastern Transvaal, may possibly also occur in western Mozambique.



MAP 195.

<u>Aspidelaps scutatus intermedius.</u>
Recorded distribution in the Transvaal, and in southern Africa.

Distribution in the Transvaal (Map 195).

Acornhoek 212KU; Amsterdam 208KT; Andover 210KU; Archie 156KT; Arthursrust 219KT; B.V.B. Ranch 776LT; Chester 235KT; Hlaralumi; Komatipoort Townlands 182JU; Manyeleti Game Reserve, Main Camp; Okkernootboom 211KU; Pilgrim's Rest Dist. on Main Road; Selati Ranch 143KT; Tsama R. Letaba Dist.; Vienna 207KT.

Literature Records

Leydsdorp; Tzaneen (FitzSimons, 1962). Letaba camp; Makutwanine koppies; Pretoriuskop; Mahlangene; Shingwedzi quarters; Kokodzi fire-break, 3,2 km west of main road; Skukuza; eastern boundary between Saselandonga gorge and Mathlakuza pan; Pumbe picket; Malituve near Punda Maria; Nyandu sandveld; between beacon 7 and Nyandu sandveld; Orpen rest camp (Pienaar et al, 1983).

Habitat and Ecology

Much the same as the preceding race. Pienaar et al (1983) record that a specimen was collected in the burrow of a rodent mole, upon which it appears to feed, as well as prey described for scutatus. Occurs in veld types 10, 11 and 15 at altitudes of 200-1400 m a.s.l.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Secretive and more uncommon than the previous species. Occurs throughout the Kruger National Park and probably some provincial nature reserves. Large numbers are killed on roads in the lowveld. Status appears to be secure.

Genus *Naja* Laurenti, 1768

Naja Laurenti, 1768, *Synop. Rept.*, p. 90. Type: *Coluber naja* Linnaeus = *Naja naja* (Linnaeus).

An African and Asian genus with about five species and several subspecies in Africa from Egypt to the Cape Peninsula. Among the largest of poisonous snakes they are only exceeded by the larger and bulkier genus *Ophiophagus*. Head not or but slightly distinct from the neck; eye moderate with a round pupil; ribs in neck region elongate and movable laterally to form a hood. A pair of large grooved poison fangs are found anteriorly on the maxilla, posterior to which are found a few small, faintly grooved, slightly recurved solid teeth possibly non-functional; solid teeth are found on the palatine, pterygoid and the dentary. Body robust cylindrical and depressed, with dorsal scales smooth and in 17 to 25 oblique rows at midbody. Ventrals smooth; anal scale entire; tail of moderate length and cylindrical, tapering to a rounded tip. Caudal autotomy occurs in these snakes. Subcaudals mostly in two rows.
Broadley (1983) gives a more detailed account of the ecology and habits of the group as a whole. Three species are found in the Transvaal inhabiting bushveld and scrub.

Key to the Transvaal *Naja* species.

1. Upper labials usually excluded from the orbit by suboculars ..... *N. haje annulifera*
   One or two upper labials enter orbit 2

2. Sixth upper labial largest and in contact with postoculars, a single preocular ..... *N. nivea*

Sixth upper labial not largest, not in contact with the postoculars; two preoculars ..... *N. mossambica*

Naja haje annulifera Peters, 1854

Naja haje var. *annulifera* Peters, 1854. *Monatsb. Akad. Wiss., Berlin*, p. 624. Type locality: Tete, Mozambique.
Naje haje (not Linnaeus). Broadley & Cock, 1975, p. 51, pl. 8.
Naja haje haje (not Linnaeus). FitzSimons, 1962, p. 293, 1966, p. 73, 1970, p. 157; Pienaar, 1966, p. 206, pl. 95; Visser, 1966, p. 19, Col. pls.; Broadley, 1968e, p. 410 (part).
Naja haje annulifera Peters. Broadley, 1968b, p. 4; FitzSimons, 1974, p. 156; Pienaar, 1978, p. 192, pl. 89; Visser & Chapman, 1978, p. 42, pl. 16/5; Branch, 1979, p. 216, figs. 15-16; Welch, 1982, p. 189; Broadley, 1983, p. 286, figs. 168-170, pls. 67 & 68; Pienaar et al, 1983, p. 210, pl. 96; Auerbach, 1987, p. 196, pl. 18, fig. 8; Branch 1988a, p. 92, pls. 20 & 27, 1988b, p. 14.

Diagnosis. 188 Specimens examined.
Colour: Highly variable. Juveniles brownish to olive yellow dorsally and yellow ventrally with a broad black collar. Subadults brownish orange mottled with grey black blotches or crossbands. Ventrally olive yellow with darker streaks and spots. Adults uniform greyblack above, or mottled or banded with grey black on brownish orange, the dorsal scales frequently washed with orange brown. The most extreme banded forms occur in the far northern Transvaal and especially in Zimbabwe. Ventrally yellow brown to orange brown or olive brown with dark patches and markings.

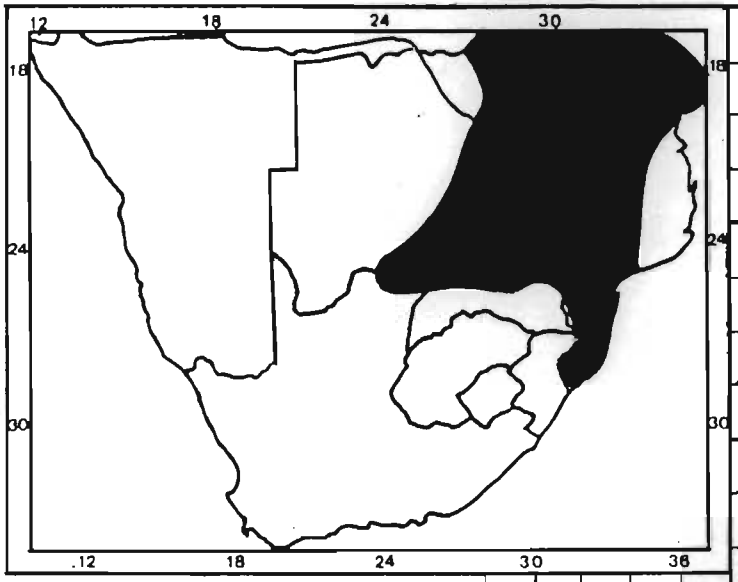
Lepidosis: A medium to very large snake with the head slightly broader to as broad as the neck in older specimens. Tail short but tapered. Rostral as broad as, to a little broader than deep; nostril pierced in large nasal; internasals in median contact; preocular 1 (rarely 2), separated from internasal; postoculars 2, rarely 1 or 3; suboculars 2 or 3, normally separating orbit from labials. UL 7 (exceptionally 8), 3rd in contact with postnasal and suboculars, 6th (rarely 7th) largest and in contact with the lower postocular; LL 8 or 9 (exceptionally 10), first four in contact with anterior sublinguals. Scales on body smooth but dull, forming oblique rows and imbricate, in 19 (exceptionally 17 or 21) rows at midbody; ventrals 175-203; anal scale entire; subcaudals 51-65.
Size: Largest male SVL = 1 540,0 mm (11500 - Orpen), mass = 1025,0 g (11500); Largest female SVL = 1655,0 mm (8497 - Durham 30KU), mass = 1750,0 g (8497). Mean male SVL (>500,0 mm) = 1204,25 mm ± 347,30 (1SD), n = 4, mass = 650,75 g ± 436,11 (1SD), n = 4; Mean female SVL (> 400,0 mm) = 1088,85 mm ± 472,43 (1SD), n = 7, mass = 648,5 g ± 581,17 (1SD), n = 7. Tail length is contained in total length 5,61-7,08 times with no apparent sexual dimorphism.

Distribution

Widespread from southern Zambia and Malawi, south through Mozambique to Natal, Zimbabwe, Transvaal and Swaziland, westwards to eastern Botswana (Broadley, 1983).

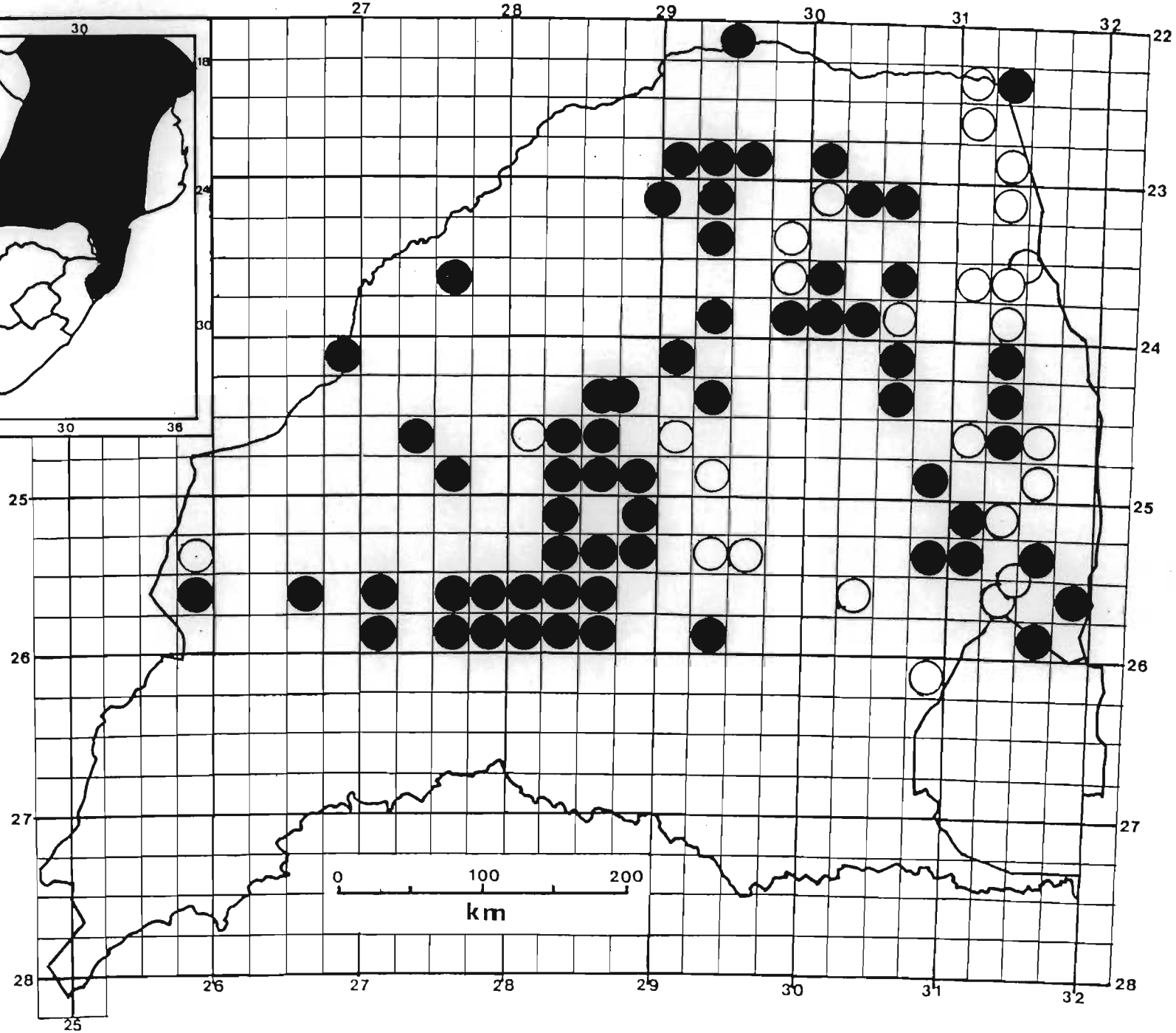
Distribution in the Transvaal (Map 196).

3 km E. of Faerie Glen, Pretoria; 3 km N. of Bon Accord Dam; 10 km N. Onderstepoort, Pretoria Dist.; 10 km N.



MAP 196.

<u>Naja haje annulifera</u>
Recorded distribution in the Transvaal, and in southern Africa.



Settlers; 15 km W. Pretoria, N. of Daspoort Range; 35 km N.E. Mafeking-Zeerust; Alfred 383MS; Amsterdam 116LS; Baviaanspoort 330JR; Beynespoort 335JR; Blouberg; Boekenhoutskloofdrift 286JR; Botaniese Tuine, Brummeria, Pretoria; Brits; Brits area; Broederstroom 481JQ; Broederstroom, Haenertsburg; Buffelshoek (?); Daspoort 319JR; De Wildt; Derdepoort 327JR; Donkerhoek 365JR; Doorndraaidam Nature Reserve; Doreen 108MT; Durham 30KU; Dzumeri; Elandskraal 71JR; Ellisras; Entabeni 251MT; Gegund 679KR; Groenkloof, Rustenburg Dist.; Hammanskraal; Hartebeeshoek Provincial Nursery; Hartebeespoortdam; Hartebeesthoek 502JQ; Hazyview; Hectorspruit 164JU; Hekpoort 504JQ; Helena 400JU; Hennopsrivier 489JQ; Kalkheuwel 493JQ; Klipfontein 429JR; Komatipoort Townlands 182JU; Kosmos, Brits Dist.; Kruisfontein 262JR; Letaba; Letsitele 652LT; Manyeleti Game Reserve, Main Camp; Margate 216KT; Maroelesfontein 602KR; Middelburg Dist.; Middelburg town and Townlands 287JS; Middelfontein turnoff, N. Nylstroom; Mokeetsi 376LT; Morgenrood 354LT; Murrayfield 343JR; Narina, Duiwelskloof; Nelspruit; Nylstroom; Nylsvley Nature Reserve; Nzulase; Onderstepoort 266JR; Orpen; Pafuri; Palala 35KR; Pelindaba; Percy Fyfe Nature Reserve; Petershof 131MS; Pienaarsriver 83JR; Pietersburg; Pieterskraal 190JR; Plot 19 Klipfontein, Wonderboom, Pretoria; Politsi; Potgietersrus; Pretoria; Pretoria District; Pretoria, Annlin; Pretoria, Brummeria; Pretoria, Erasmia; Pretoria, Florauna; Pretoria, Kwaggasrand; Pretoria, Lynnwood Glen; Pretoria, Menlo Park; Pretoria, Meyerspark; Pretoria, Moreleta Spruit; Pretoria, Pumulaan, Kameeldrif; Pretoria, Pyramid; Pretoria, Rietfontein; Pretoria, Rietondale; Pretoria, Roberts Heights; Pretoria, Rosslyn; Pretoria, Shere Holdings; Pretoria, The Willows; Pretoria, Uitspan Drive-In;

Pretoria, Valhalla; Pretoria, Valley Farm; Pretoria, Villieria; Pretoria, Wapad Nek, The Willows; Pretoria, Waterkloof; Pretoria, Willow Glen; Pretoria, Wonderboom; Rhenoster Spruit; Rietfontein 214JR; Rochdale 700MS; Roodeplaatdam Nature Reserve; Rooiberg, Waterberg Dist.; Rooikoppies, Pretoria Dist.; Rooiwal 270JR; Rust der Winter Nature Reserve; Rustenburg; Saartjies Nek, 25 km W. Pretoria; Selati Ranch 143KT; Shavavunga Hill, Giyani; Shiyalongubo Dam; Swartruggens; Thabazimbi; The Curlews 103JU; Trekpad 455MS; Tshakuma, Venda; Uitzicht 314JR; Verpoort 161KP; Vivo area; Warmbaths; Weipe 47MS; Welverdiend 249JR; Wilgeboom Plantation, Pilgrims Rest Dist.; Wolvengaten 255JR; Zandfontein 317JR; Zandfontein, Rustenburg Dist.; Zebediela Estates 101KS.

Literature Records

Acornhoek; Damwal; Goudplaats; Groenbult; Holme Park; Kralingen; Leydsdorp; Linokana; Lochiel; Loubad; Louws Creek; Machadodorp; Mara; Marble Hall; Mataffin; Mcosene; Middelburg; Munnik; Naboomspruit; Numbi; Ratomba; Roedtan; Rooikraal; Settlers; Shawu; Shingwedzi; Ship Mountain; Skeerpoort; Skukuza; Tuinplaats; Zoekmekaar (FitzSimons, 1962). Kingfisherspruit; Nshawu picnic spot; sandstone koppies at Letaba causeway; Hartebeesfontein; Mbyashishe koppies; near Mpenza dam site; Pswaeni turn-off, western boundary; Skukuza; near Luvuvhu-Limpopo junction. Pafuri; Ngirivane; Nahpe road near (east of) Nahpe koppies; Punda Maria; Nwatimofo windmill; Mahlati spring; Shingomene; near Nhlanganine dam (Pienaar et al, 1983).

Habitat and Ecology

A versatile species, excluded from most of the highveld but may ascend up major river valleys onto the plateau. Found in veld types 6, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20 and 67 at altitudes of 250-1400 m a.s.l. The largest of our poisonous snakes, it is only superceded in length by the Black mamba, but not in mass. Broadley (1983) recorded specimens of 2,3-2,4 m in length. Although usually shy, fleeing from danger, these snakes are quick to take offence if molested and will attack a tormentor even to the extent of giving chase. They take refuge in holes in the ground, especially in the ventilation pipes of antheaps (*Macrotermes* sp.) as well as in rocky outcrops. They emerge to bask in the sun near their retreat. Diurnal and crepuscular, these snakes move about during the day but appear to feed during the evening. Food is varied, records from the Nylsvley Nature Reserve including snakes, birds and toads, but they feed on rodents as well.
Oviparous, from 8-20 eggs, averaging 50,0-60,0 x 30,0-35,0 mm in size (Broadley, 1983) are laid in early summer, hatchlings appearing from February to March (Jacobsen, 1982).

Conservation Status

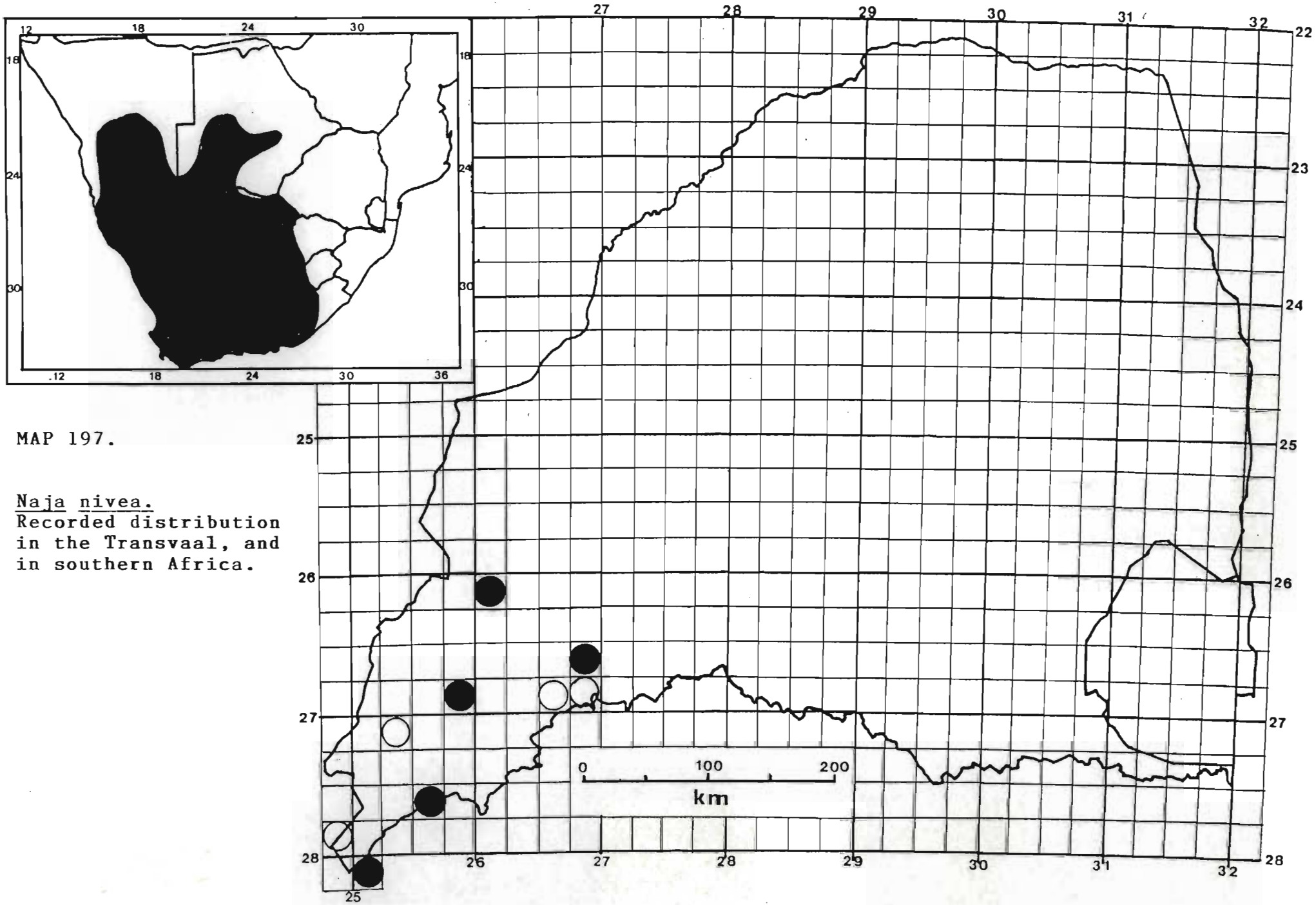
Partially protected. Schedule 5, Transvaal Nature Conservation Ordinace 12 of 1983. Widespread in the Transvaal and generally common, although uncommon in parts of its range. Little is known considering population size. In the *Burkea africana* savanna on the Nylvley Nature Reserve, found on only 29 occasions in two years. They appear to be more common in the *Acacia* savanna. The species is currently secure as it occurs on

several provincial nature reserves and in the Kruger National Park. However large specimens are becoming increasingly rare as they are killed off by the ever increasing human population especially when crossing roads.

Naja nivea (Linnaeus, 1758)

Coluber niveus Linnaeus, 1758, Syst. Nat. ed. 10, 1, p. 223 and 1766, ed. 12, 1, p. 384. Type locality: "In Africa" i.e. Cape of Good Hope.
Naja nivea (Linnaeus). FitzSimons, 1962, p. 297, 1966, p. 73, 1970/74, p. 158/157; Visser, 1966, p. 19; Broadley 1968e, p. 412, 1968b, p. 5; De Waal, 1978, p. 121; Visser & Chapman, 1978, p. 44, pl. 17/1-3; Branch 1979, p. 219, fig. 18; Welch, 1982, p. 190; Broadley, 1983, p. 289, figs. 172 & 173, pls. 70-72; Auerbach, 1987, p. 197, pl. 19, fig. 1; Branch 1988a, p. 93, pls. 20 & 27, 1988b, p. 14.

Diagnosis. 6 Specimens examined.
Colour: Variable, yellow, coppery-yellow, beige, brown to dark brown dorsally; ventrally brown to white. Young specimens have a black to brown band under the throat.
Lepidosis: A medium to large snake with a cylindrical body. Head broader than neck but not pronounced. Tail short in relation to body. Rostral as broad as deep; nostril pierced along suture between two nasals and internasal; internasals in broad contact; preocular 1, horizontally elongate; postoculars 3 (rarely 4); UL 7, 3rd and 4th entering orbit, 3rd in contact with postnasal and orbit; LL 9 (occasionally 8 or 10), the first four (rarely 3) in contact with the anterior sublinguals.



MAP 197.

Naja nivea.
Recorded distribution in the Transvaal, and in southern Africa.

Body scales smooth, imbricate and shiny, in 21 (rarely 19) rows at midbody. Ventrals 195-227 seldom exceeding 220; anal scale entire; subcaudals 50-68. De Waal (1978) recorded sexual dimorphism in ventral counts of specimens from the Orange Free State, males ranging from 190-205 and females 203-220.

Size: De Waal (1978) recorded maximum male SVL in the Orange Free State = 1466,0 mm (NMB 591 - Albion) and a female SVL = 1275,0 mm (NMB 4564 - Beginselsdam). Broadley (1983) records that the tail length is contained in total length from 6 to 7,2 times.

Distribution

Throughout the Cape Province and southern South West Africa/Namibia to central and Southern Botswana, south western Transvaal, the south-western Orange Free State and Lesotho.

Distribution in the Transvaal (Map 197).

Cawood's Hope 324HO; Kalkfontein; Lichtenburg Town and Townlands 27IP; Modderkop, Potchefstroom Dist.; Ottosdal; S.A. Lombard Nature Reserve.

Literature Records

Andalusia; Klerksdorp; Schweizer Reneke, Hartebeestfontein (FitzSimons, 1962).

Sight Records

Honesty 43HN; Uitvalskop 14HN.

Habitat and Ecology

Peripheral in the Transvaal, being confined to the south-west in veldtypes 16, 48 and 50 at altitudes of 1300-1600 m a.s.l. Inhabits holes in the ground, usually those of mongooses and ground squirrels but also rodent and springhare burrows. Usually observed when foraging, traversing open stretches and frequenting homesteads in search of food. De Waal (1978) records stomach contents containing rodent remains, a bufonid and a *Psammophylax tritaeniatus*. Elsewhere it appears to feed largely on the fledgelings of Sociable weavers (*Philetarius socius*) (MacLean, 1973).
According to Broadley (1983), mating takes place during September/October and from 8-20 ova measuring 60,0-65,0 x 25,0-35,0 mm are laid during December/January.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Rare in the Transvaal and considered endangered in the province. Large scale habitat destruction over much of the south-western Transvaal, coupled with persecution and road kills have no doubt decimated the population. The extreme south-west still harbours a small population. It possibly occurs in both the S.A. Lombard and Bloemhof Nature Reserves. More detailed surveys are needed to establish the extent of the population.

Naja mossambica Peters, 1854

Naja mossambica Peters, 1854, *Monatsb. Akad. Wiss. Berlin*, p. 625. Type locality: Sena and Tete,

Mozambique. Visser, 1972, p. 59; Broadley & Cock, 1975, p. 54, pl. x; Visser & Chapman, 1978, p. 45, pl. 17/4; Branch, 1979, p. 220, fig. 19; Broadley, 1983, p. 295, figs. 178 & 179, pl. 74; Pienaar et al, 1983, p. 212, pl. 97; Auerbach, 1987, p. 199, pl. 19, fig. 2. Branch 1988a, p. 93, pl. 27, 1988v, p. 14.

Naja mossambica mossambica Peters. Broadley, 1968b, p. 11; 1974a, p. 159; FitzSimons, 1974, p. 163; Jacobsen, 1977, p. 35; Pienaar 1978, p. 194, pl. 90; Welch, 1982, p. 189.

Naja nigricollis nigricollis Bogert, (Part). FitzSimons 1962, p. 302, 1966, p. 74; Pienaar 1966, p. 208, pl. 96; FitzSimons 1970, p. 162.

Diagnosis. 127 Specimens examined.

Colour: Olvie-brown to brown above with some or all of the scales black edged and the interstitial skin black, this providing a checkered appearance; Ventrally glossy salmon-pink to yellowish, with irregular black or grey-black bars across the throat. The ventrals are frequently edged with black or grey-black and some specimens may be almost totally grey black below with the margins of the ventrals pinkish.

Lepidosis: A medium sized but stout snake with a head slightly broader than the neck. Tail relatively short in relation to SVL. Rostral broader than deep; nostril pierced along suture between two nasals; internasals in broad contact behind rostral; preoculars 2 (rarely 1); postoculars 3 (rarely 2); UL 6 (occasionally 7), 3rd entering orbit (rarely 3rd and 4th) and not in contact with postnasal; LL 9 (rarely 8 or 10 and exceptionally 11, with the first four in contact with the anterior chin shields. Dorsal scales smooth and overlapping, in 23-25 rows at midbody (rarely 21 or 28); ventrals 177-205; anal scale entire; subcaudals 52-71 (Broadley, 1983).

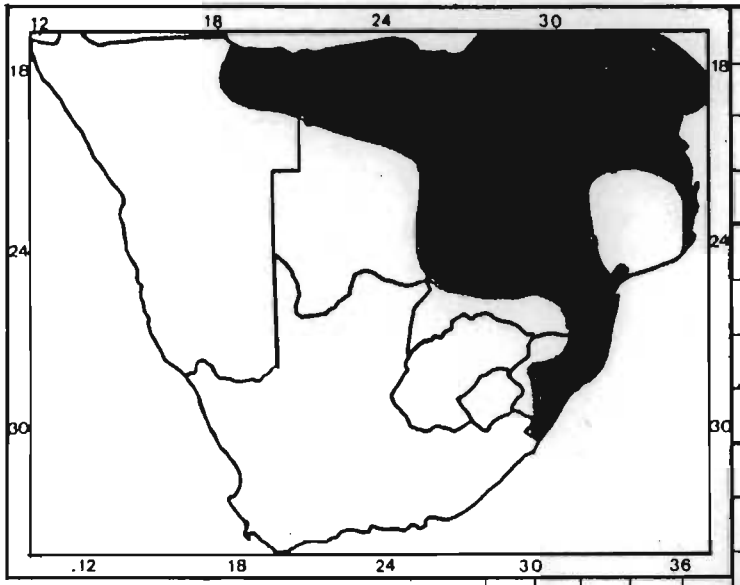
Size: Largest male SVL = 1092,0 mm (N989 - Canterbury 254MR), mass = 595,0 g (N989); Largest female SVL = 1090,0 mm (J4539 - nr Gopane Mine), mass = 580,0 g (N3651 - Droogedal 120KP). Mean male SVL (>500,0 mm) = 789,21 mm ± 175,70 (1SD), n = 14, mass = 285,37 g ± 177,24 (1SD), n = 15. Mean female SVL (>500,0 mm) = 890,56 mm ± 172,36 (1SD), n = 9, mass = 331,98 g ± 161,07 (1SD), n = 9. Tail length is contained in total length in males from 4,86-5,75 times and females from 5,49-6,83 with one aberrant specimen reaching 10,09 times.

Distribution

South-eastern Tanzania south to Natal, west to southern Angola and northern South West Africa/Namibia. Also Pemba Island, (Broadley, 1983).

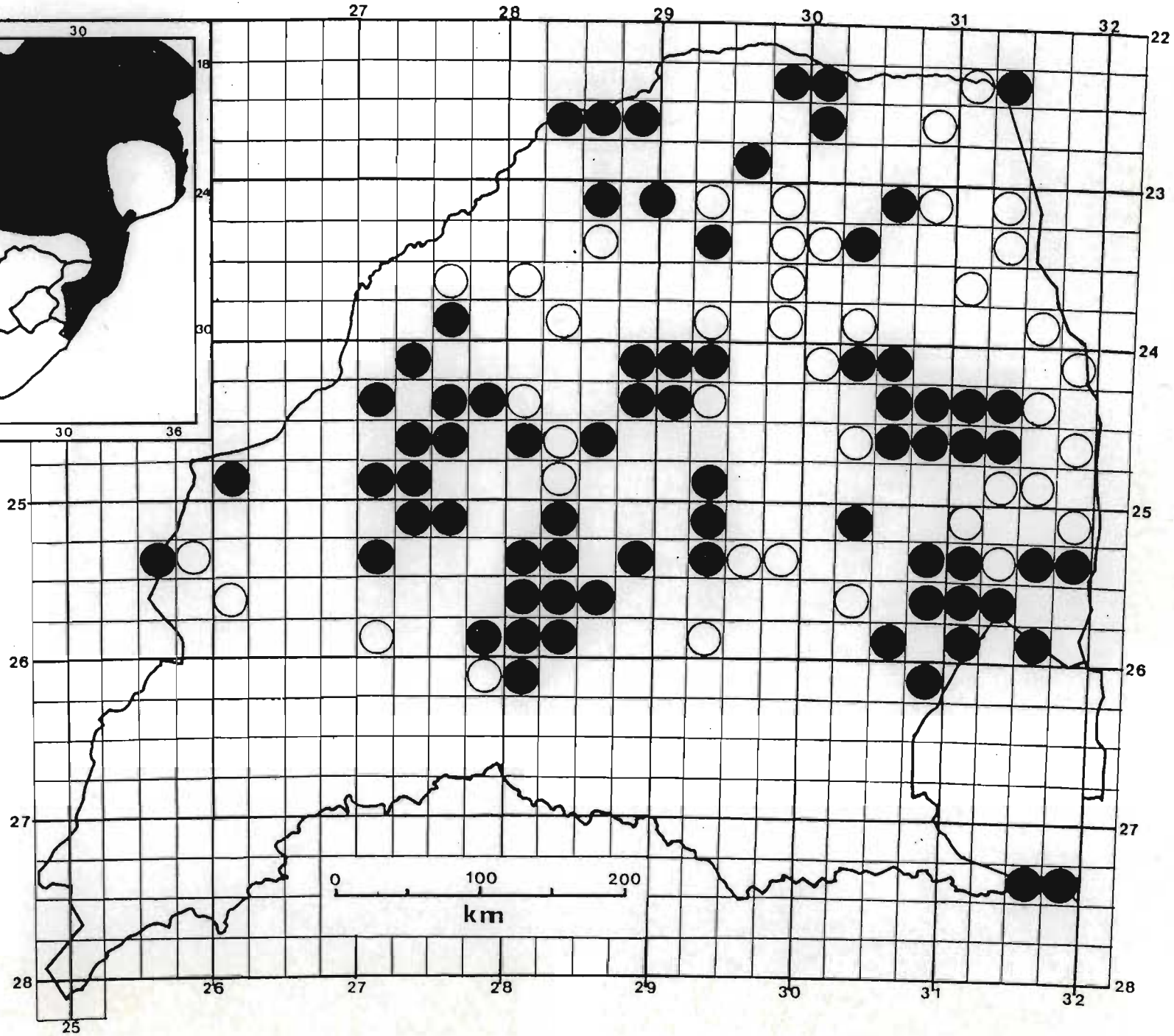
Distribution in the Transvaal (Map 198).

8 km NW Rooiberg; 8 km West of Pongola; 10 km SE Trichardtsdal; 13 km SE of Messina; Acornhoek 212KU; Amsterdam 116LS; Barberton Townlands 369JU; Bellevue C 518JT; Blouberg; Blyde River Nature Reserve; Boekenhoutskloofdrift 286JR; Broedershoek 129JU; Broederstroom 481JQ; Canterbury 254MR; Casketts 65KU; De Wagendrift 79JS; Diepkloof 44JS; Doorndraai 282KR; Doorndraai Dam Nature Reserve; Doornhoek, Komati R.; Doreen 108MT; Droogedal 120KP; Dwaalpan 297KQ; Elandsfontein 352JR; Glen Alpine 304LR; Goedehoop 31KS; Goevernements Plaats 417KQ; Gopane Mine; Groenfontein 120JR; Groothoek 278KQ; Halfway House; Harmony 140KT; Hartebeespoort Dam; Hectorspruit 164JU; Heidelberg; Hennopsrivier 489JQ; Illovo 187MR; Impala 486JU; Junc. Pienaars & Crocodile R.; Kalkheuwel 493JQ; Kees Zyn Doorns 708JT; Kempiana 90KU; Kingston Vale 125JU; Kleinelandfontein - Waterberg Dist.; Klipfontein 11KQ;



MAP 198.

<u>Naja</u> <u>mossambica.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Klipfontein 205JR; Klipfontein 429JR: Kloof Snake Park, Pretoria Dist.; Komatipoort Townlands 182JU; Leankloof; Leeuwwater 251KQ; Loskop Dam Nature Reserve; Louws Creek 271JU; Malelane 289JU; Manyeleti Game Reserve, Dixie Hill; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp; Marble Hall 29JS; Nelspruit; Nkungwini; Nooitgedacht; Olifantspoort 414KR; Oostenryk 92KS; P.O. Hope, Vaalwater; Pafuri; Palala River; Pelindaba; Percy Fyfe Nature Reserve; Pimlico 305JT; Pongola Nature Reserve; Potloodspruit 30JT; Pretoria; Pretoria District; Pretoria, Fountains; Pretoria, Gardens; Pretoria, Roberts Heights; Pretoria, Shere Holdings; Pretoria, Shere Holdings, Pretoria; Rhenosterkop 195JU; Rhenosterpoort 283KQ; Rhenosterspruit 59JQ; Rietfontein State Forest; Ross 55KU; Rust der Winter Nature Reserve; Sandringham 197KU; Schelem 32KT; Selati Ranch 143KT; Sheldrake 239MS; Shilowane; Shingwidzi Agricultural Station; Sionwe Mountain; Strydfontein 442KT; Thabazimbi; The Curlews 103JU; Umzinto 36MR; Uniondale 756MS; Vlakplaats 354JR; Vygeboomspruit 29JQ; Witkoppen 194IQ; York 188KT; Zandspruit 287KR; Zoutpan 104JR.

Literature Records

Brondal; Burgersfort; Damwal; Ellisras; Gollel; Johannesburg; Kaapmuiden; Karino; Kingfisherspruit; Komati/Crocodile R. Junction; Kralingen; Letaba; Letsitele; Linokana; Lochiel, Loubad; Louis Trichardt; Machadodorp; Malta 65KT; Mara; Mataffin; Middelburg; Modderfontein; Moepel; Munnik; Numbi; Nylstroom; Overyssel; Pienaars River; Pietersburg; Piet Retief; Plaston; Pongola; Potgietersrus; Punda Milia; Rooikraal; Saltpan; Shingwedzi; Skukuza; Tende R.; Tonteldoos; Tshokwane; Vaalwater; Verlief; Vygeboompoort 456JR; Warmbaths; Waterpoort; White

River; Witkoppen; Woodbush; Woudkop; Zandfontein; Zebediela; Zeerust; Zoekmekaar (FitzSimons, 1962). Nylsvley Nature Reserve, (Jacobsen, 1977, 1982). Letaba camp; Malelane; Pretoriuskop quarters; Shingwedzi quarters; main road just north of the Trichardt memorial; Tsende river between Shipandane drift and Tsende-Shongololo junction; Numbi gate; Satara ranger's quarters; Shipudze ridge, Punda Maria; Shangoni quarters; between Olifants river causeway and Olifants camp; Mutale; Pumbe sandveld; Pafuri ranger's quarters; W.N.L.A. Pafuri; Mahlangene; Lower Sabie camp; Mlambane drift (Pienaar et al, 1983).

Habitat and Ecology

Most common on rocky, well vegetated hillsides but also found moving about foraging, particularly around human habitation where it finds food in abundance. Takes refuge in holes in the ground, under rocks on soil and on rock, in crevices and anywhere where shelter is available. Occurs in veld types 6, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 61, 63 and 67 at altitudes of 200-1750 m a.s.l. Usually single, on occasions two may be found together in the same retreat (September). One specimen, found under rock on rock was in the company of another, as well as seven Gerrhosaurus validus, four Platysaurus intermedius wilhelmi, five Mabuya quinquetaeniata and three Pachydactylus bibronii. Although normally seen in the day time, they also appear to be crepuscular, foraging on warm humid summer nights. Feeding records include Kassina senegalensis and rodents on the Nylsvley Nature Reserve (Jacobsen, 1982), while during this survey one specimen contained a Schismaderma carens, another was in the process of feeding on a Crotaphopeltis hotamboeia and a third contained a small

Python sebae. They also consume chickens and are often killed in chicken runs. They are very quick to take offence and spit at the slightest provocation, even with the head still almost flat on the ground. Oviparous, the species lays from 10-22 eggs measuring on average 35,0x20,0 mm during summer (Broadley, 1983). Egg measurements from a captive specimen ranged from 37,0 - 51,0 x 18,0-21,0 mm (x = 44,15 x 18,85 mm) with a mass of 8,25-9,35 g (X = 8,94 g).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in the province but rare around urban areas. Elsewhere still fairly common. Occurs on several provincial nature reserves and in the Kruger National Park. Status is secure.

Genus Dendroaspis Schlegel, 1848

Dendroasis Schlegel, 1848, Versl. Zool. Gen. Amsterdam, p. 5. Type: Elaps jamesoni Traill.

An exclusively African genus of four species and two subspecies, it contains the longest poisonous snakes on the African continent. The head is narrow and elongate; eye well developed with a round pupil, the anterior ribs are slightly elongated and can be expanded to form a narrow hood. The maxillary bone is curved upwards, with a narrow posterior process; a pair of large canaliculate poison fangs are situated at the anterior of the maxillae, much further forward than in other elapids. The mandible bears a solid tooth anteriorly followed by a gap and other solid teeth posteriorly. The dentary also has an enlarged slightly recurved solid tooth (canine-like) anteriorly, followed by a series of smaller solid teeth posteriorly. Body slightly compressed and slender; dorsal scales dull, smooth and narrow, arranged in 13 to 25 oblique rows at midbody; ventrals smooth; anal scale divided; tail long and subcaudals in two rows. Oviparous. Only one species occurs in the Transvaal, D. polylepis (Günther) which is widespread in the bushveld and lowveld of the province.

Dendroaspis polylepis (Günther, 1864)

Dendraspis polylepis Günther, 1864, Proc. Zool. Soc. London, p. 310. Type locality: Zambesi river, Mozambique.

Dendroaspis polylepis (Günther). Broadley & Cock, 1975, p. 58, pl. 14; Pienaar, 1978, p. 197, pl. 91 & 91A; Branch, 1979, p. 211, figs. 10-11; Broadley, 1983, p.

297, figs. 180 & 181, pl. 75; Pienaar et al, 1983, p. 215, pl. 98 & 98A; Auerbach, 1987, p. 201, pl. 19, fig. 3, Branch 1988, p. 95, pl. 35.

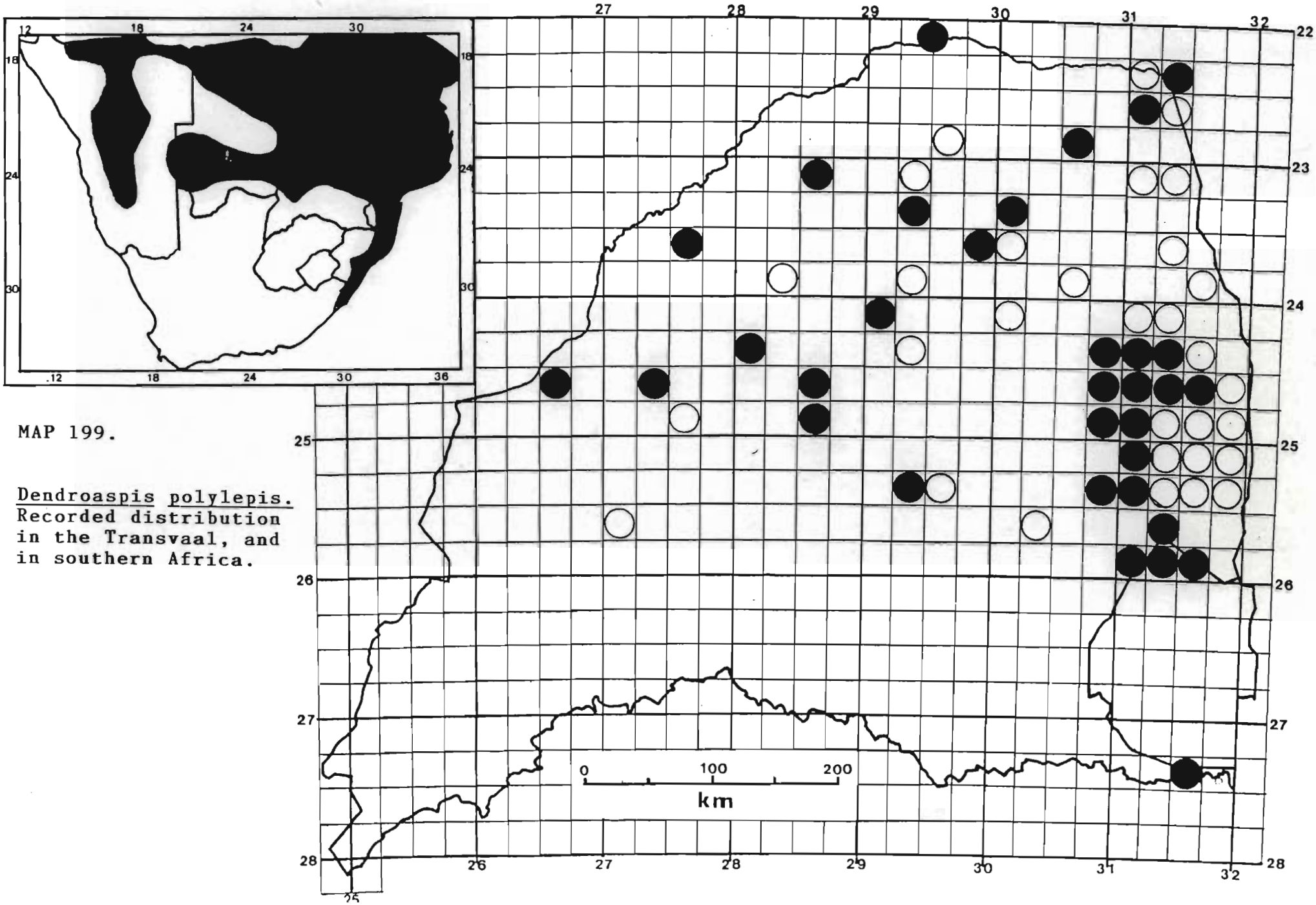
Dendroaspis polylepis polylepis (Günther). FitzSimons, 1962, p. 307, 1966, p. 69, 1970/74, p. 168; Pienaar, 1966, p. 210, pls. 97 & 97A; Visser, 1966, p. 18; Broadley, 1968e, pp. 407 & 432, fig. 18; Jacobsen, 1977, p. 135; Visser & Chapman, 1978, p. 52, pl. 18/4; Welch, 1982, p. 186.

Diagnosis. 61 Specimens examined.

Colour: Usually a uniform olive grey to olive-grey brown often with faint linear diagonal stripes along the body. Ventrally a mottled grey to greenish grey becoming paler under chin and throat including the upper and lower labials. In old specimens the skin colour is darker but never black. The inside of the mouth is black or grey black.

Lepidosis: A very long, slender snake with an elongated head, very distinct from the neck. Tail long, slender and tapered. Rostral broader than deep; nostril pierced in postnasal adjacent to nasal and internasal; internasal in broad contact behind rostral; preoculars 3 (rarely 4); postoculars 3 or 4 (rarely 2 or 5); UL 7-10, 4th entering orbit (rarely 3rd and 4th), 2nd in contact with prefrontal above; LL 11-13 (rarely 10 or 14), just four or five in contact with the anterior sublinguals. Body covered in smooth, imbricate but dull scales, in 23-25 (occasionally 21) rows at midbody; ventrals 248-281; anal scale entire; subcaudals 109-132.

Size: Largest male SVL = 2055,0 mm (Nylsvley nature reserve), mass = 1660,0 g (Nylsvley nature reserve); Largest female SVL = 1755,0 mm (N3580 - Mooifontein 597KR), mass = 878,0 g (N3580). Broadley (1983) accepts



MAP 199.

Dendroaspis polylepis.
Recorded distribution in the Transvaal, and in southern Africa.

that they attain, in exceptional cases, as much as 4,3 m. Mean SVL (>1300,0 mm) = 1749,71 mm ± 271,02 (1SD), n = 7, Mass = 895,29 g ± 405,19 (1SD), n = 7. Tail length is contained in total length from 4,76-5,30 times.

Distribution

From Senegal east to Somalia, south to the Transkei, west to South West Africa and Angola, excluding only true desert and rainforest areas.

Distribution in the Transvaal (Map 199).

Amsterdam 116LS; Barberton Townlands 369JU; Blyde river Nature Reserve, Watervalspruit; Boschfontein 470JU; Boston 61KU; Bushbuckridge; De Rust 12JU; De Wagendrift 79JS; Ellisras Area; Glen Alpine 304LR; Grootfontein; Hoedspruit Air Base; Kaapmuiden 212JU; Kingston Vale 125JU; Klaserie; Manyeleti Game Reserve; Manyeleti Game Reserve, Dixie Hill; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Hermitage Dam; Manyeleti Game Reserve, Sarabank 323KU; Marble Hall 29JS; Mariepskop 420KT; Mgcobaneni; Mooifontein 597KR; Munnik; Nelspruit; Ntlaveni 2MU; Nylsvley Nature Reserve; Pafuri; Paris 206KT; Pongola 61HU; Potgietersrus; Punda Milia; Ross 55KU; Scotia 248KT; Shiyalongubo Dam; Swadini Dam; Three Sisters, Louws Creek; Verpoort 161KP; Vliegepoort, Ruscenburg; Weipe 47MS; White River 64JU; Witpoort 182KR.

Literature Records

Brondal; Crocodile Bridge; Dendron; Gollel; Goudplaats; Karino; Letaba Camp; Leydsdorp; Louws Creek; Lower Sabie; Malelane; Mara; Mataffin;

Mbeamide; Moepel; Numbi; Orpen Camp; Pietersburg; Plaston; Rooiberg; Rooikraal; Rustenburg; Satara; Shawu; Shingwedzi; Skukuza, Tshokwane; Vaalwater; Verlief; Waterpoort; Waterval Boven; Zebediela (FitzSimons, 1962). Serala 5KT (Snyders, 1987). Near Nsemane windmill; Magondswane spruit near Orpen; 14,4 km loop road, Letaba section; Matukwane near Punda Maria; Kruger Memorial tablets; between Mazite and Kumane; Munweni drift on Hutomi road near Manzi-mahle windmill; near W.N.L.A. quarters, Pafuri; Hippo pool road, 11,2 km from Skukuza; Punda Maria quarters; Paben spruit; 4,8 km from Lower Sabie camp on the Gomondwane road; Jim-spruit drift along the Shingwedzi; Middle firebreak, 4,8 km north of Shingwedzi drift; lower reaches of the Mbyamiti spruit; Malelane quarters; western boundary near Tswiriri turn-off; Lower Sabie road between Nwatiwambu and Nwatimhiri; Shirimantanga; Rockvale; Mtjulu; near Shidzavane windmill; Nwambiya pan; Pretoriuskop camp; main road just north of Trichardt memorial; main road 12 km south of Letaba camp; Putwane koppies, Letaba section; Mkwakwene picket, Malelane section; Engelhard dam; Mtshawu firebreak; 3 km from Punda Maria; Machuluana firebreak; Mtjulu headwaters; Nhlarulumi drift; Mbadze picket area (Pienaar et al, 1983).

Habitat and Ecology

A shy, retiring snake preferring to escape even when provoked. Usually found in more remote areas where it is unlikely to be disturbed by humans. Although apparently residing for long periods at a particularly favourable retreat, considerable movements take place as the animal shifts to another retreat or when dispersal of young take place, as well as when foraging. It is then that the

snake comes in contact with humans around dwellings and when crossing roads. The Black mamba lives mostly on rocky hillsides and outcrops and is less frequent in open woodland in the bushveld and loweveld. It is likely that most farms of 3000 ha in size do not house more than 15-20 snakes at any one time, (pers. obs.; D. Muller, pers. comm). The snake feeds mostly on rodents, birds and hyraxes. One specimen (N3580 - Mooifontein 597KR) regurgitated a Praomys natalensis on capture. Broadley (1983) gives a more detailed account of prey capture and venom quality and quantity. Male combat has been recorded in this species (Broadley, 1983). Oviparous, from 9 to 14 eggs, measuring 60,0-80,0 x 30,0-36,0 mm are laid in summer, mating having been recorded in July/August. Hatchlings measure 300,0-400,0 mm in total length. Growth is rapid under conditions of plentiful food. A juvenile, 450,0 mm SVL attained a length of 1 500,0 mm in one year (Jacobsen, 1982), while the late H. Erasmus (pers. comm.) mentioned that one achieved 2100,0 mm during the same period. In the Transvaal the species is found in veld types 6, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19 and 20 at altitudes of 200-1600 m a.s.l.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread and mostly uncommon to rare being only locally common in suitable localities. Persecuted wherever it occurs including most provincial nature reserves and also in part in the Kruger National Park, its main stronghold. Details of local abundance are needed. Provincial nature reserves are mostly too small to house a viable population even if rigidly protected in these areas. In need of greater

conservation effort. Eight of 17 specimens collected were found D.O.R. indicating the pressure on these snakes when crossing roads.

Family: VIPERIDAE

Genus *Causus* Wagler, 1830

Causus Wagler, 1830, *Nat. Syst. Amph.*, p. 172.
Type: *Sepedon rhombeata* Lichtenstein.

An exclusively African genus, six species occur, mainly south of the Sahara. Small to medium sized snakes with a small head not or slightly wider than the neck. Enlarged head shields present. Eye moderately developed with a rounded pupil separated from upper labials by suboculars. The body is cylindrical to slightly depressed, scales dull but smooth and arranged in 15 to 22 oblique rows at midbody; ventrals smooth; anal scale entire. Tail short and subcaudals single or in two rows. Oviparous. Two species enter our limits, *C. rhombeatus* preferring moister habitats even on the highveld and *C. defilippi* occurring in more arid terrain. Both species are terrestrial.

Key to the Transvaal species

1. Snout obtuse and not upturned;
   Ventrals 134-155 ..... *C. rhombeatus*
   Snout pointed and upturned at the tip:
   Ventrals 108-126 ..... *C. defilippi*.

Causus rhombeatus (Lichtenstein, 1823)

Sepedon rhombeata Lichtenstein, 1823, *Verz. Doubl. Mus. Zool.* Berlin, p. 106. Type locality: None given.
Causus rhombeatus (Lichtenstein). FitzSimons, 1962, p.

324, 1966, p. 75, 1970/74, p. 185; Visser, 1966, p. 17; Broadley 1968e, pp. 424 & 433, fig. 19; Broadley & Cock, 1975, p. 47, pl. 6; Branch, 1978, p. 70, fig. 3; De Waal 1978, p. 124; Visser & Chapman, 1978, p. 36, pl. 14/3; Welch, 1982, p. 200; Broadley, 1983, p. 307, figs 185-187, pl. 77; Auerbach, 1987, p. 204, pl. 19, fig. 4; Branch 1988a, p. 97, pl. 15, 1988b, p. 14.

Diagnosis. 120 Specimens examined.

Colour: Variable, brown to light or dark grey-brown with a characteristic black to blackish forward directed shaped marking on the back of the head. Down the back is a series of black to brown distinct and white edged to indistinct rhomboidal blotches. In well marked specimens oblique or irregular black markings occur laterally also edged with white. A black or greyish-black streak entends from the nostril, though the eye to the angle of the jew. Ventrally pearly yellow to pinkish, dirty white to greyish or gunmetal, uniform or with ventrals dark edged.

Lepidosis: A small to medium, thick bodied snake; head slightly wider than neck and indistinct; tail short. Snout obtusely pointed; rostral slightly wider than high; nostril pierced along suture between nasals and in contact with internasal; internasals in broad contact; anterior nasals separated by rostral; loreal present; preoculars 2 or 3; postoculars 1 or 2; suboculars 2 or 1 separating orbit from upper labials; UL 6 (exceptionally 7); LL 9 or 10 (rarely 8 exceptionally 11, 12 or 13), the first three or four in contact with the anterior chin shields. Body scales dull, satiny in texture, and in 17 to 19 (rarely 21) rows at midbody, more less keeled above. Ventrals 134-155; anal scale entire; subcaudals 20-33.

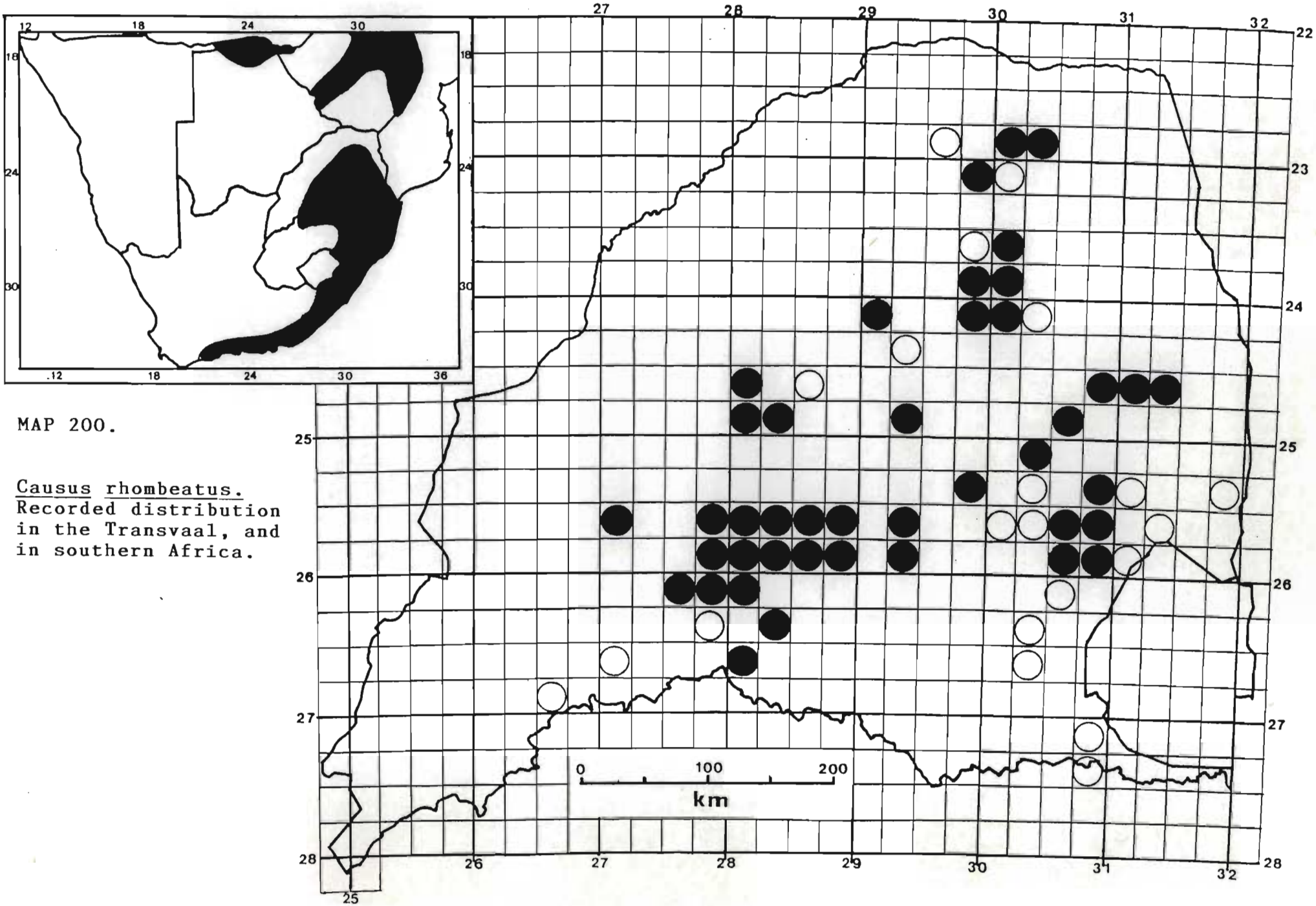
Size: Largest male SVL = 530,0 mm (N11410 - 17 km N. of Middelburg), mass = 96,5 g (N11410); Largest female SVL = 552,0 mm (N7991 - Serala 5KT), mass = 120,0 g (N7991). Mean male SVL (>250,0 mm) = 414,29 mm ± 107,13 (1SD); n = 7, mass = 48,94 g ± 29,47 (1SD), n = 7. Mean female SVL (>250,0 mm) = 396,5 mm ± 137,45 (1SD), n = 6, mass = 53,1 g ± 42,75 (1SD), n = 6. Length of tail from 7,92 to 13,38 but mostly 8,5 to 11,0.

Distribution

From eastern Nigeria, Sudan and Somalia south to Tanzania and Angola, Zimbabwe, northern Botswana and Mozambique and throughout the eastern half of South Africa.

Distribution in the Transvaal (Map 200).

5 km S. of Haenertsburg; 8 km E. of Bronkhorstspruit; 17 km N. of Middelburg on Groblersdal Road; Abe Bailey Nature Reserve; Acre 2KT; Airlie Waterval on Godwan R.; Apollo Power Station; Badplaas; Blyde River Nature Reserve; Boekenhoutkloof; Boschhoek 36JT; Brits; Broederstroom 481JQ; Buffelspruit 443KR; Clearwaters, Haenertsburg; Cloudend 279LS; Cullinan; Debengeni Waterfalls, Magoebaskloof; Devils Knuckles, Barberton; Donkerhoek 365JR; Doornkop School, Witpoort; E. of Pretoria; Entabeni 251MT; Groenfontein 526JR; Haenertsburg; Irene; Kafferskraal 381IR; Kleinelandfontein - Waterberg Dist.; Krugersdorp; Lake Funduzi; Lydenburg; Magaliesberg; Magoebaskloof; Manyeleti Game Reserve, Main Camp; Marble Hall 29JS; Mariepskop 420KT; Middelburg Town and Townlands 287JS; Nelspruit; Ohrigstad Dam Nature Reserve; Onderhoek 595LT; Onverwacht 532JR; Pienaarspoort 339JR; Pinedene; Plot 216 Vlakplaas; Plot 24 Olympus,



MAP 200.

Causus rhombeatus.
Recorded distribution in the Transvaal, and in southern Africa.

Pretoria; Plot 41 N. of Krugersdorp; Potgietersrus; Pretoria; Pretoria District; Pretoria, East; Pretoria, Erasmia; Pretoria, Fountains; Pretoria, Fountains Grove; Pretoria, Meintjieskop; Pretoria, New Muckleneuk; Pretoria, Roberts Heights; Pretoria, Silverton; Pretoria, Valhalla; Pretoria, Voortrekkerhoogte; Pretoria, Waterkloof; Pretoria, Zoological Gardens; Rietfontein; Rietfontein 255JT; Rietvlei Dam, Pretoria; Rolle 235KU, Thulemahashi; Rustenburg Nature Reserve; Santa Estates, Belfast Dist.; Serala 5KT; The Rest 454JT; The Willows 340JR; Toevlugt 269JS; Vlakplaats 354JR; Vygeboomspoort 456KR; Wachtenbietjeskop 506JR; White River 64JU; Wilkenshof 252JT; Witbank Munisipaliteit; Wolkberg; Woodbush; Woodlands Farm; Zandfontein 317JR; Zuurfontein, Johannesburg; Zwavelpoort 373JR.

Literature Records

Bankop; Barberton; Belfast; Brondal; Commondale; Confidence; Damwal; Frederikstad; Goedewil; Johannesburg; Kaapmuiden; Kelvinside; Kingfisherspruit; Klerksdorp; Komati/Crocodile R. Junction; Kralingin; Lawley; Lothair; Loubad; Louis Trichardt; Machadodorp; Mataffin; Mizpah; Modderfontein; Moolman; Mphome; Munnik, Naboomspruit; Olifantsfontein; Piet Retief; Plaston; Premier Mine; Ratomba; Rayton; Rustenburg; Shiluvane; Sheepmoor; The Brook; Tonteldoos; Vaderland; Waterpoort (FitzSimons, 1962). Serala 5KT (Snyders, 1987).

Habitat and Ecology

Particularly fond of damp localities, it is found mostly in areas of high rainfall. In the Transvaal it occurs in veld types 8, 10, 11, 13, 18, 20 and 61 at altitudes of

1250-1800 m a.s.l. Nocturnal to partially diurnal on warm overcast days, it takes refuge under rocks on soil, in moribund termitaria, in earth banks or amongst rank grass occasionally foraging around houses where it is usually killed. Montane grassland and even forest are utilised by the species. Usually solitary, occasionally two may be found under the same rock sometimes in the company of other snakes such as Lycodonomorphus rufulus. The species feeds mostly on toads and frogs (Broadley, 1983), a specimen (N8438 - 2528CD) consuming a Bufo gutturalis was suffocated when the bufo inflated itself and the snake was jammed in the hole in which it had found the toad. Oviparous, 12 to 26 eggs, measuring 25,0-28,0 x 14,0-18,0 mm are laid in summer. Fifteen eggs measured in situ ranged from 25,0-30,0 x 12,5-17,0 mm. Dyer (1979) records a 700,0 mm female laying 47 eggs over a period of six months and 44 eggs over two months. Hatchlings measure 130,0-160,0 mm emerging after approximately 10 weeks, a 147,0 mm hatchling having a mass of 2,65 g. Sperm retention has been demonstrated in this species (Woodward, 1932, Dyer 1979).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Although widely distributed in the Transvaal, it is uncommon over most of its range. Locally more common along the eastern Transvaal escarpment and possibly in the Soutpansberg. Status currently secure.

Causus defilippii (Jan, 1862)

(Heterodon) De Filippii Jan, 1862b, Arch. Zool. Anat. Fisiol. 2, p. 225. Type locality: Buenos Aires - erroneus.

Causus defilippii (Jan). FitzSimons, 1962, p. 328, 1966, p. 76, 1970/74, p. 186; Pienaar, 1966, p. 216, pl. 99, 1978, p. 202, 93; Visser, 1966, p. 17; Broadley, 1968e, p. 423; Broadley & Cock, 1975, p. 48, pl. 7; Jacobsen, 1977, p. 37; Branch, 1978, p. 71, fig. 4; Visser & Chapman, 1978, p. 37, pl. 14, fig. 4; Welch 1982, p. 200; Broadley, 1983, p. 310, figs. 188 & 189, pl. 78; Pienaar et al, 1983, p. 218, pl. 99; Auerbach 1987, p. 205, pl. 19, fig. 5. Branch 1988a, p. 98, pl. 15, 1988b, p. 14.

Diagnosis. 47 Specimens examined.

Colour: Velvety, grey to greyish green or light to pinkish brown or pale brown with a broad slightly darker vertebral stripe and a series of large rounded, rhomboidal or V-shaped dark brown to black white edged blotches over back and tail; a well defined, large forward directed chevron on the crown of the head, its apex on the frontal; oblique blackish stripe extends from the nostril through the eye to the angle of the jaw. Ventrally yellowish white uniform or with scattered, small, greyish brown spots usually glossy black in juveniles (Broadley, 1983).

Lepidosis: A small stocky snake with the head slightly broader to as broad as the neck and indistinct. Snout upturned at the tip. Tail very short. Rostral large, much broader than high and upturned; nostril pierced in nasal near suture with internasal; internasals in broad contact behind rostral; loreal present slightly broader than high; preoculars 1 or 2; postoculars 1 or 2; suboculars 1 or 2, separating upper labials from orbit; UL 6 (rarely 7); LL 8 or 9 (rarely 7 or 10), the first three or four in contact with the very small chin shields. Body scales feebly keeled above, velvety and imbricate, in 17 (exceptionally 16 or 18) rows at midbody. Ventrals 103-126, 108-117 in males and 118-126

in females; anal scale entire; subcaudals 10-14 in males and 15-19 in females.

Size: Broadley (1983) recorded a male SVL = 392,0 mm (UM 11345 - Inyangani Tea Estates, Zimbabwe and a female SVL = 387,0 mm (UM 31308 - Garuso, Mozambique). A female with SVL = 286,0 mm had a mass of 11,0 g (8435 - Rhenosterpoort 283KQ). Tail short, its length is contained in the total length 10,7-14,4 times in males and 13,2-18,2 in females.

Distribution

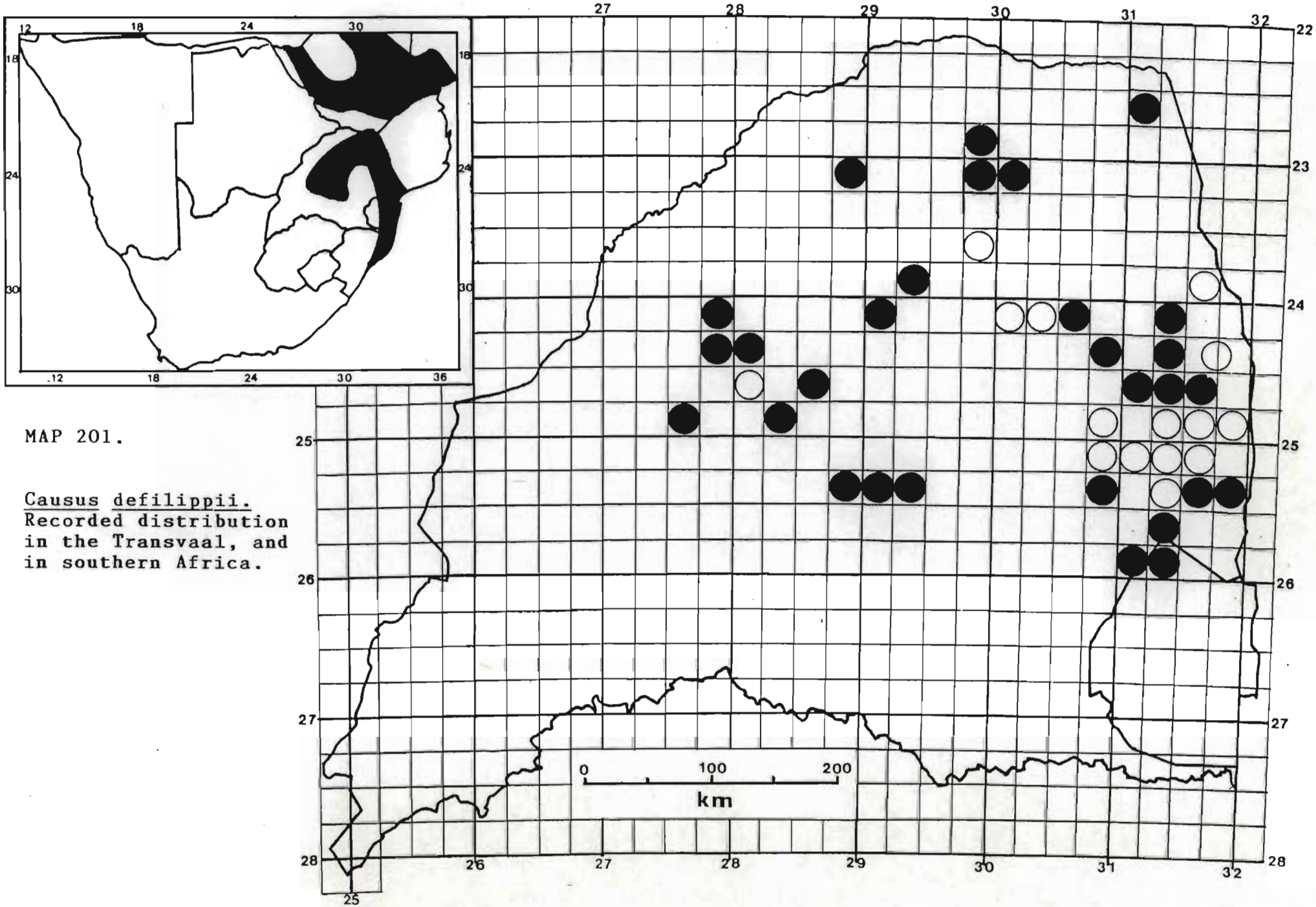
Tanzania, south through Mozambique and Zimbabwe to the northern Transvaal and northern Natal.

Distribution in the Transvaal (Map 201).

Barberton Townlands 369JU; Ben Lavin Nature Reserve; Blouberg; Buffelshoek 340KU, Manyeleti Game Reserve; Diepgezet 388JU; Doornspruit 215KQ; Elim Hospital; Hans Hoheisen Research Station; Hectorspruit 164JU; Holworth 783MS; Impala 486JU; Ingwe Motel; Kampersrus, Hoedspruit; Klipdrift; Klipdrift 62JS; Komatipoort Townlands 182JU; Loskop Dam Nature Reserve; Lunsklip 7KS; Manyeleti Game Reserve; Manyeleti Game Reserve, Albatros; Manyeleti Game Reserve, Main Camp; Nylsvley Nature Reserve; Pietersburg; Punda Milia; Rhenosterpoort 283KQ; Rooiberg; Sabie Game Reserve; Schagen 273JT; Selati Ranch 143KT; Shiyalongubo Dam; Shlaralumi; Three Sisters, Louws Creek; Vaalwater; Vygeboomspoort 456KR; Wilderne Ranch 176JU.

Literature Records

Kingfisherspruit; Kralingen; Letaba Camp; Louws Creek; Munnik; Nelspruit; Newington; Olifants Camp; Pilgrims



MAP 201.

Causus defilippii.
Recorded distribution in the Transvaal, and in southern Africa.

Rest; Pretoriuskop; Sabie; Satara; Shiluvane; Skukuza; Tshokwane (FitzSimons, 1962). Serala 5KT, (Snyders, 1987). Mahlobyanine picket, western boundary; Malelane quarters; Mbyamiti experimental plot No. 1; Faai experimental plot No. 5; Punda Maria quarters; Mcosene near Numbi gate; Shirimantanga koppies; Crocodile bridge quarters; Malamala picket area; between Sabie and Sand rivers; Orpen camp; Mlambane headwaters (Pienaar et al, 1983).

Habitat and Ecology

A small, very irascible snake which hisses and jerks the body violently when molested. The body is flattened and the snake almost seems to leap at the attacker. Prefers the drier areas of the Transvaal especially in the northern and eastern Transvaal where it replaces rhombeatus. Found in veld types 8, 9, 10, 11, 14, 15, 18 and 20 at altitudes of 200-1200 m a.s.l. Usually found while moving about and foraging. One specimen was collected swimming far out in Loskop dam. Appears to be found under rocks on soil and under rotting logs often in association with rocky outcrops. Feeds mostly on toads and frogs but small rodents and insectivores may also be eaten. Oviparous, 6-8 eggs, measuring 20,0-25,0 x 14,0-16,0 mm are laid in summer. Botha (1984) and Haagner (1986) reported on clutches numbering 9 and 5 respectively. The latter included eggs which measured 22,0-29,8 (Mean 26,2 mm ± 3,75) x 10,1-13,2 mm (mean 12,1 ± 1,2). Total egg mass was 6,1 g while that of the post partum female was 25,3 g. The eggs had a mass of 0,7-1,8 g, mean 1,2 g ± 0,39. Hatchings takes place after 3,5 months and hatchlings measure 100,0 mm in total length, (Broadley 1983). Botha (1984) recorded an incubation period of 58 days at temperatures ranging from 22-30°C.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Rare, although widespread in the northern half of the Transvaal. Probably most frequent in the lowveld. Elsewhere densities appear to be very low. On the Nylsvley Nature Reserve only two specimens were found over three years or more. More detailed surveys using trapping techniques are needed to establish densities in the bushveld and lowveld. Currently considered secure.

Genus *Bitis* Gray, 1824

Bitis Gray, 1824b *Zool. Miscell.*, p. 69. Type: *Cobra lachesis* Laurenti and 1849, p. 25.

An exclusively African genus of 13 species and two subspecies characterised by the squat body, triangular to broadly linear head, covered in numerous small overlapping scales. Head broad and very distinct from the neck and flattened. A well developed supranasal sac present; maxillary much smaller and bearing anteriorly a pair of large recurved, hollow poison fangs; small recurved teeth are present on the palatines and pterygoids. Body somewhat thickened to very gross; scales keeled ranging from 22-46 at midbody; ventrals smooth; anal scale entire; very short and subcaudals in two rows and in one species a single row. Ovo-viviparous. Nine species occur in southern Africa but only three species occur in the Transvaal. All are terrestrial, one, *atropos* occurring along the eastern Transvaal Drakensberg, while *caudalis* is restricted to sandy habits in the northern and north-western Transvaal and *arietans* is ubiquitous, inhabiting most if not all habitats.

Key to the Transvaal species.

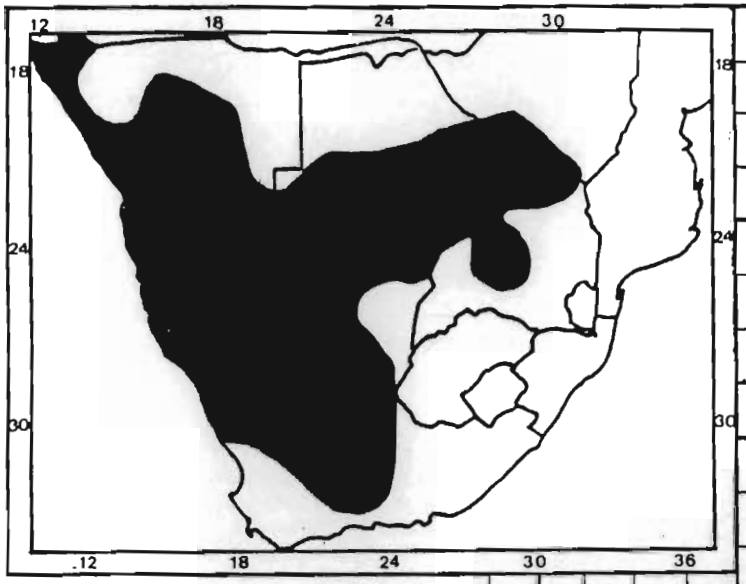
1. Nostrils directed upwards and outwards 2
   Nostrils directed vertically upwards;
   Scales in 29-41 rows at midbody .. *B. arietans arietans*

2. Supraorbital region of head not raised ..... *B. atropos*
   Supraorbital region of head raised ..... *B. caudalis*

Bitis caudalis (A. Smith, 1839)

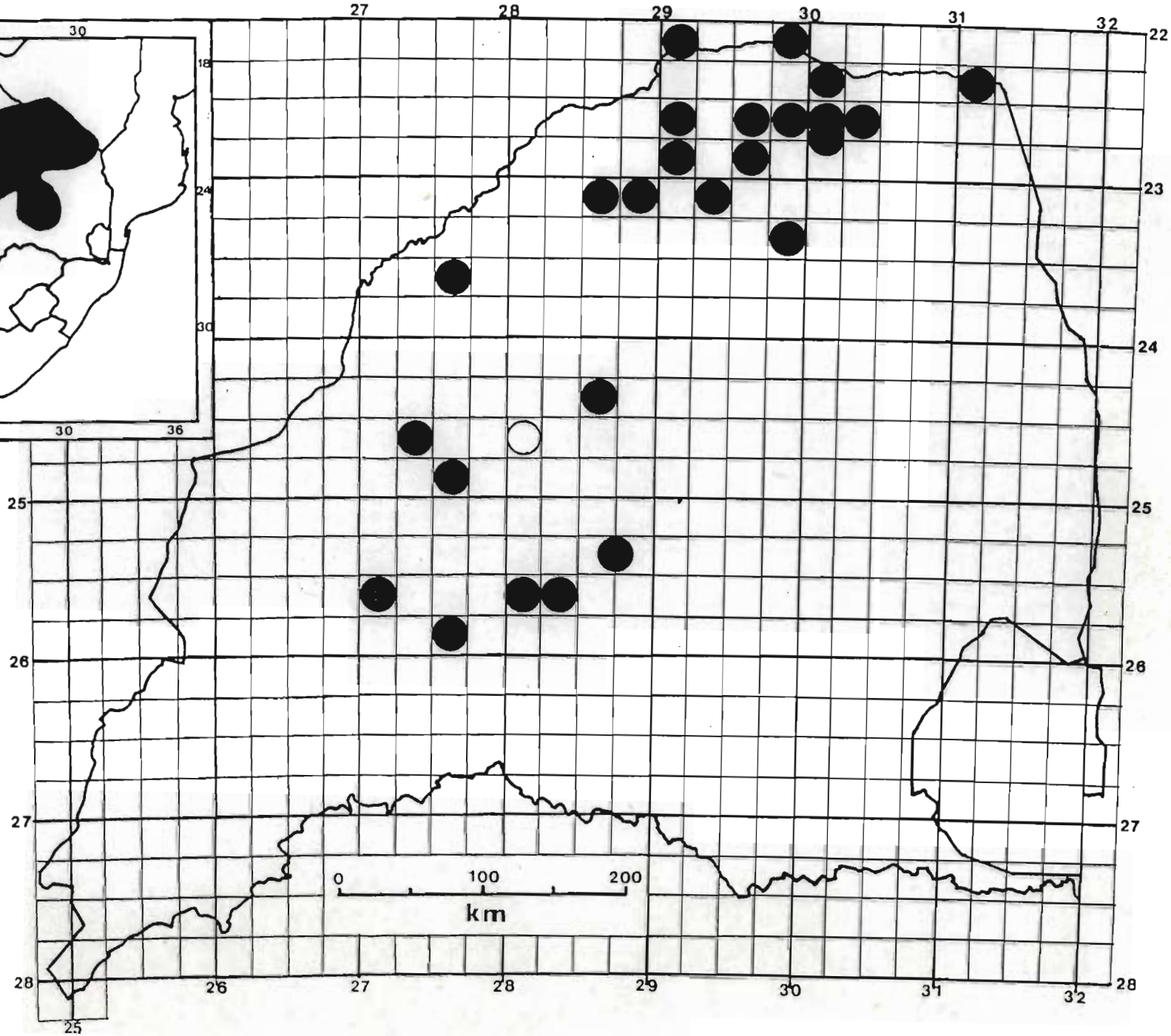
Vipera (Cerastes) caudalis A. Smith, 1839, Ill. Zool. S. Afr., Rept. pl. vii. Type locality: Sandy districts north of Cape Colony.
Bitis caudalis (A. Smith). FitzSimons, 1962, p. 349, 1966, p. 79, 1970/74, p. 197; Visser, 1966, p. 18, fig. 2; Marx & Rabb, 1965, p. 162; Broadley & Cock, 1975, p. 46, pl. 4; Branch, 1978, p. 76, fig. 10; Visser & Chapman, 1978, p. 40, pl. 2 & 16, fig. 1; Welch, 1982, p. 197; Broadley, 1983, p. 313, figs. 191 & 192, pl. 79; Pienaar et al 1983, p. 220, pl. 100; Auerbach 1987, p. 205, pl. 19, fig. 8, Branch 1988a, p. 100, pl. 13, 1988b, p. 14.

Diagnosis. 92 Specimens examined.
Colour: Variable from light to sandy grey, fawn to reddish- or greyish-brown with a series of dark quadrangular blotches which may be pale edged and often pale centred. Dorsolaterally a series of smaller rounded to squarish dark spots or blotches alternating with the vertebral blotches. A broad rough forward pointing V-shaped marking extends into the buck of the head. A dark streak extends through the eye to anterior to the ear. Upper labials marked with alternating shades of brown. Ventrally creamy to yellowish white.
Lepidosis: A small squat snake with a very distinct bluntly triangular head. Tail short. Nostrils directed upwards and outwards; rostral small; supraorbital ridge strongly raised, usually bearing a single erect horn-like scale above each eye; 9-18 scales (usually 10-16) around eye; 2-5 (usually 3) scales between eye and upper labials; 2 or 3 series of scales between supranasals; 2 series of scales between nasal and rostral; 10-14 UL; 10-15 LL, the first 2 or 3 in contact with the chin shields. Scales on body strongly keeled and imbricate



MAP 202.

Bitis caudalis.
Recorded distribution in the Transvaal, and in southern Africa.



usually 23-31 (rarely 21) rows at midbody (Transvaal specimens 24-27); ventrals 120-155 (Transvaal specimens 131-138); anal scale entire; subcaudals 16-40, (20-26 in Transvaal specimens), usually smooth or at most keeled distally in males, smaller, scale-like and distinctly keeled throughout in females.

Size: Largest male SVL = 292,0 mm (N9936 - Bordeaux 555MS), mass = 30,0 g (N9936); Largest female SVL = 330,0 mm (N872 - Tweedale 262MS), mass = 58,7 g (N872). Mean SVL = 282,75 mm ± 42,97 (1SD), n = 4, mass = 39,2 g ± 16,90 (1SD), n = 3. Tail contained in total length 8,0-12,4 times in males and 12,5-14,4 times in females (Broadley, 1983). Transvaal males range from 10,42-10,73 (n = 2) and females 12,79-15,15 times.

Distribution

Throughout South West Africa/Namibia and the western half of the Cape Province to Botswana, the north-western Transvaal and southern Zimbabwe.

Distribution in the Transvaal (Map 202).

Bandelierkop 416LS; Beit Bridge; Blouberg; Bordeaux 555MS; Calais 563KS; Celine 547MS; Coventry 261MS; Donkerhoek, Rustenburg Dist.; Dover 44MT; Easter Kloof, Magaliesberge; Ellisras; Enkeldoornoog 219JR; Glen Alpine 304LR; Grootfontein, Palala Post Office; Gulliver 237MS; Kromdraai 106MT; Langjan Nature Reserve 370MS; Leeuwpoort, N. Tvl.; Mabyeni Hill; Magalakwin River, Potgietersrus Dist.; Magaliesberg Range; Magaliesberg, above Sinoville; Magdala 9MT; Maseri Pan 520MS; Messina 4MT; Moorddrift 470LQ; Niklaas 148MT; Njelele River; Oorsprong 62MT; Pont Drift 12MS; Pretoria, East Lynne Quarry; Pretoria, Magaliesberg,

Ster Drive-In; Pretoria, Rietfontein; Pretoria, Sinoville; Pretoria, Waverley; Pretoria, Wonderboom Suid; River 141MS; Rochdale 700MS; Roodeplaat Dam Nature Reserve; Rooiberg; Rustenburg Nature Reserve; Strydfontein 84 - Hornsnek; Tempelhof 150MS; Thabazimbi; Trevenna 119MT; Tweeddale 262MS; Varedig 265LR; Veenen 48MT; Vivo area; Waterpoort 694MS; Wildebeesthoek 310JR.

Literature Records

Huntleigh; Kralingen; Mara (FitzSimons, 1962). Alldays (NMZB).

Habitat and Ecology

The species exhibits a most peculiar distribution pattern in the Transvaal, making a complete switch in habitat choice from the Kalahari sands of the north-western and northern Transvaal to along the tops of the Magaliesberg. The species is found in veld types 13, 14, 15, 18 and 20 at altitudes of 300-1600 m a.s.l. Often found buried in sand with only the top of the head showing, sharing this behaviour with other psammophilous adders. also takes refuge under overhanging rocks, vegetation and even human debris particularly during the hottest times of the day. The characteristic side-winding spoor is easily seen on sandy surfaces, with the short tail leaving little wriggling tracks. When buried the tail may be elevated and wriggled about in an attempt to lure an unwary lizard to investigate. This snake feeds mostly on lizards and rodents. Ovoviviparous, 4-27 neonates are born at a time measuring 130,0-140.0 mm in total length. Douglas (1981) and Jacobsen (1986d) recorded a gestation period of 98-105 days, but late matings may require overwintering

strategies including a lengthened gestation of 133-135 days. Mating observed in September, October and possibly May, indicating a lengthy reproductive season. Neonates measured from two litters by Douglas (1981) ranged from 142,0-152,0 mm and 119,0-145,0 mm in total length. The typical "horns" are not developed at birth, these only appearing 3-4 weeks later.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Although infrequently seen because of their camouflage ability, they may be locally common. Fifty-four specimens in the Transvaal Museum Collection originated from the farm Celine 547MS during the space of a year. Elsewhere it is much less abundant. Possibly occurs marginally in the north-western Kruger National Park and the provincial nature reserves north of the Soutpansberg. Status appears secure if exploitation is contained.

Remarks

A more detailed analysis of Magaliesberg specimens is warranted on the basis of the shift in habitat preferences.

Bitis atropos (Linnaeus, 1754)

Coluber atropos Linnaeus, 1754, *Mus. Adolphi. Frid.*, 1, p. 22, pl. xiii, fig. 1, 1766, *Syst. Nat.*, ed. 12, 1, p. 375. Type locality: "Habitat in America" - erroneus.
Bitis atropos (Linnaeus). Marx & Rabb, 1965, p. 190;

Broadley & Cock, 1975, p. 44, pl. 3; Visser & Chapman, 1978, p. 38, pl. 15, fig. 1; Broadley, 1983, p. 322, figs. 199 & 200, pl. 82; Branch 1988a, p. 99, pl. 12, 1988b, p. 14; Haagner & Hurter 1988, p. 71, fig. 1.

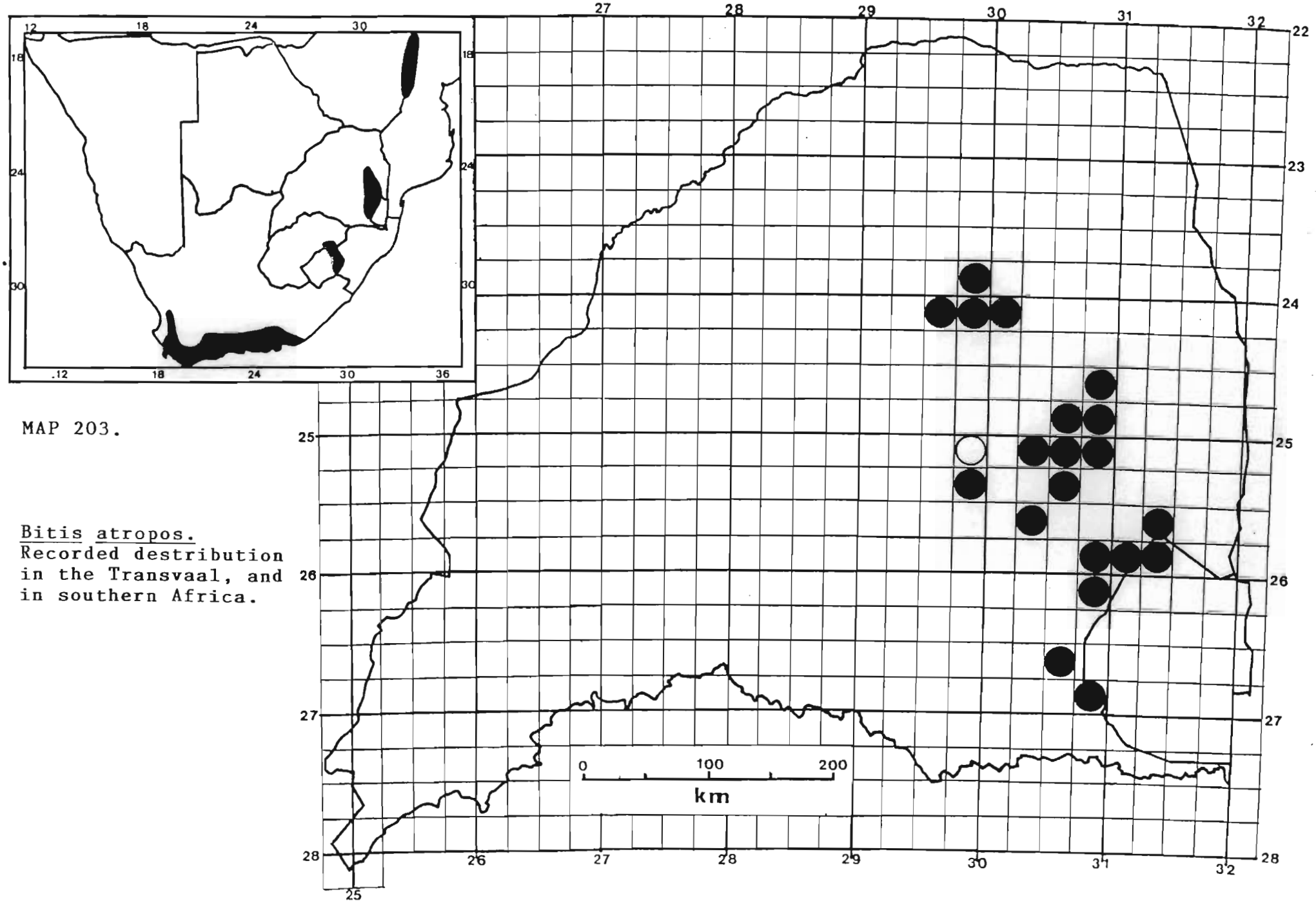
Bitis atropos unicolor (FitzSimons. FitzSimons 1962, p. 345, 1966, p. 78, 1970/74, p. 195; Visser, 1966, p. 16; Broadley 1968a, p. 421; Branch, 1978, p. 76.

Bitis atropos atropos (Linnaeus). FitzSimons, 1962, p. 343, 1966, p. 78, 1970/74, p. 194; Visser, 1966, p. 16, pl. 5; Broadley, 1968e, p. 420; Branch 1978, p. 75, fig. 9; De Waal, 1978, p. 126; Welch, 1982, p. 197.

Diagnosis. 79 Specimens examined.

Colour: Greyish olive to greyish or brown above with two rows of large, subtriangular to semicircular, black blotches or markings, so arranged that their apices face inwards towards the vertebrae; a broken white to yellowish longitudinal line along either side edging the dark markings below; a lateral row of similarly shaped, but smaller, black spots which are however pale edged. Between upper and lower rows of dark spots is a series of Y-shaped dark markings. A broad arrowhead-shaped black marking on the top of the head with apex directed forward. Two pale streaks are found on either side of the head. Upper and lower labials marked with black and white. Ventrally chin and throat white with black spots. Belly and underside of tail dirty white with dusky infusions or uniformly pale slate grey, plumbeus or black becoming paler laterally. Some specimens from the Belfast district are uniform khaki to red-brown above (var. unicolor), (Broadley, 1983).

Lepidosis: A larger, less squat species than B. caudalis but still a stout snake. Head tapering rectangular, distinct from the neck. Tail short. Rostral small; nostrils directed upwards and outwards; 12-15 scales



MAP 203.

Bitis atropos.
Recorded destribution in the Transvaal, and in southern Africa.

between the eyes; 10-16 scales around eye; 2 to 5 scales between supranasals; 2 series of scales between nasal and rostral; 9-13 (rarely 14) UL; 10-16 LL, the first three or four in contact with the chin shields. Scales on body strongly keeled and imbricate and in 27 to 33 rows (Transvaal 29-30) at midbody. Ventrals 118-144; anal scale entire; subcaudals 15-31 (Transvaal 19-28), usually more than 24 in males and less than 25 in females.

Size: Broadley (1983) recorded a male from the eastern Cape Province measuring 470,0 mm SVL. Largest female SVL = 490,0 mm (Jacobsen, 1986c), The Downs 34MT. This female had a midbody girth of 96 mm, and a mass of 150,8 g. However a male with a 245,0 SVL had a mass of 14,8 g and two other females of 276,0 and 297,0 mm SVL had masses of 24,1 g and 31,0 g respectively.

Distribution

From the Cape Peninsula eastwards along the coast to the eastern Cape Province, then to the Natal Drakensberg and north-eastern Orange Free State, the eastern Transvaal and eastern Zimbabwe.

Distribution in the Transvaal (Map 203).

3 km SE. Sibthorpe Station; 3 km from Lydenburg; Amo 259JU; Bettysgoed 213IT; Brooklands State Forest; Diepgezet 388JU; Doornkop 356JS; Doornkop School, Witpoort; Duurstede 361JU; Evergreen 425IT; Flynn 217KS; Iron Crown; Kamslubana Kop 335JU; Langbaken 342KS; Lisbon State Forest; Long Tom Pass; Long Tom State Forest; Lydenburg Area; Mac Mac Mountain Hut; Makwanekop, Oshoek 212IT; Mandandeka Hill, Barberton Dist.; Mauchsberg; Morgenzon State Forest; Mt. Sheba;

Pilgrim's Rest; Rietfontein 255JT; Sabie; Saddleback Hill, Barberton; Sandringham 197KU; Schoonoord 380JU; Schoonoord 380JU, Mlembe Hill; Serala 5KT; Spitzkopjes, Lydenburg Dist.; Strydkraal 477IT; Sunnymead 600JT; The Chine 259IT; The Downs 34KT; Veekraal 1031LS; Vooruitzicht 374JU; Whisky Spruit; Zwartkopje 329JT.

Literature Records

Barberton; Malta 65KT (FitzSimons, 1962). Roossenekal area (Hurter, 1986). The Bearded Man, Waaiheuwel 360JU (Haagner & Hurter, 1988).

Habitat and Ecology

A montane species usually found on rocky slopes and hillsides in veld types 8, 9, 57 and 63 at altitudes of 1200-2000 m a.s.l. Takes refuge under slabs of rock and grass tussocks. Usually observed basking on grass tussocks or on open patches and rocks. May hiss at intruders from several metres away, giving advance warning. Quick to bite if molested and accompanied by violent expulsions of breath and wild strikes. Diurnal and possibly nocturnal or crepuscular, the Mountain adder feeds on rodents and other small mammals as well as lizards, amphibians and even fledgeling birds and small snakes. In captivity they feed mostly on rodents. Ovoviviparous, 3-9 (exceptionally to 15) neonates are born in summer from September to April. Jacobsen (1986c) recorded a gestation in excess of 130 days unless sperm retention and/or delayed fertilization is involved. This relatively long period serves to tide the development of the young over winter. Neonates measured 141,0-149,0 mm in total length and had masses of 3,7-3,8 g. Haagner & Hurter (1988) recorded neonate lengths of 94,5-124,9 mm and masses of 1,1-3,5 g from the Barberton area.

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Mostly rare throughout their distribution range in the Transvaal, although they may be locally common in the Wolkberg and Makonjwa ranges. The latter area fortunately falls into a new Kangwane nature reserve and hopefully will be fully protected. Elsewhere increased afforestation and development threatens the survival of the species. Uncontrolled veld fires must influence their survival. The species is considered vulnerable in the Transvaal and increased conservation action is warranted. Increased surveys in areas of occurrence are necessary to establish the most favourable areas for more concerted action.

Remarks

Broadley (1983) briefly discusses the local variation in scalation and colour in the scattered disjunct populations of this species. Transvaal material appears to be no exception to this. Haagner & Hurter (1988) record that specimens from the Makonjwa range flanking Swaziland all conformed to var. "unicolor" and not to the more typical colour pattern found along the remainder of the Drakensberg escarpment.
With the increased material available a revision of this species is necessary to address clinal variations, if any, and the status of the various populations.

Bitis arietans arietans (Merrem, 1820)

Vipera (Echidna) arietans Merrem, 1820, Vers. Syst. Amphit., p. 152. Type locality: Cape of Good Hope.

Bitis arietans (Merrem). Marx & Rabb, 1965, p. 162, figs. 33 & 43; Broadley & Cock, 1975, p. 40, pl. 1. Bitis arietans arietans (Merrem). FitzSimons, 1962, p. 334, 1966, p. 77, 1970/74, p. 188; Pienaar, 1966, p. 218, pl. 100, 1978, p. 204, pl. 94; Visser, 1966, p. 16, fig. 1, pl. 1; Broadley, 1968e, pp. 422 & 433, fig. 20; Jacobsen, 1977, p. 37; Branch, 1978, p. 73, fig. 5; De Waal, 1978, p. 125; Visser & Chapman, 1978, p. 34, pl. 14/1; Welch, 1982, p. 196; Broadley, 1983, p. 324, figs. 190 & 201-203, pl. 83; Pienaar et al, 1983, p. 222, pl. 101; Auerbach, 1987, p. 206, pl. 19, fig. 6; Branch 1988a, p. 98, pl. 12, 1988b, p. 14.

Diagnosis. 222 Specimens examined.
Colour: Variable according to geographical location and soil colour. Yellow-brown to brown, red-brown or dark-brown above with black, pale edged rearward directed chevrons forming irregular bars down the back. The crown of the head has a broad dark triangular patch with apex at the nostrils. A light interorbital bar present. Ventrally off white to yellow with scattered dark blotches and spots. Unusual colour patterns are known to occur including a plain orange brown xanthic specimen bred in captivity, and lined or striped individuals.
Lepidosis: A large bulky snake with a heavy body and large triangular head very distinct from the neck. Tail short, longer in males than females. Rostral small, nostrils directed upwards; 11 scales across head between eyes; 12-16 scales around the eye; 3 or 4 (usually 3) rows of scales between eye and upper labials; 2 (rarely 3) series of scales between nasal and rostral; 12-17 UL; 13-19 LL, the first three or four in contact with the chin shields. Body covered in strongly keeled, imbricate scales in 29-41 rows at midbody. Ventrals 123-147 (usually 125-140); anal entire; subcaudals 25-38 in

males and 14-24 in females.

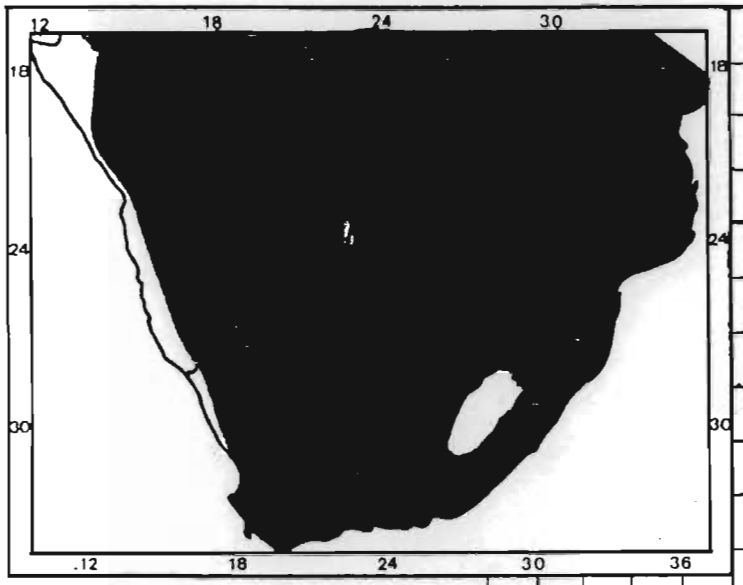
Size: Largest male SVL = 790,0 mm (7206 - Rietfontein 214JR), mass = 670,0 g (7206); Largest female SVL = 834,0 mm (N650 - Doreen 108MT), mass = 1000,0 g (N7311 -Pongola 61HU). Mean male SVL (>350,0 mm) = 618,0 mm ± 131,49 (1SD), n = 10, mass = 373,61 g ± 192,98 (1SD), n = 8. Mean female SVL (>350,0 mm) = 622,0 mm ± 145,46 (1SD), n = 18, mass = 458,39 g ± 276,59 (1SD), n = 18. Sexual dimorphism is apparent in that the tails of males are contained in total length from 6,80-9,27 times and females from 8,36-16,40 times (mostly 10,0-16,0).

Distribution

Throughout Africa from southern Morocco east to Arabia and south to the Cape Province, excluding only forested areas and extreme deserts (Broadley, 1983).

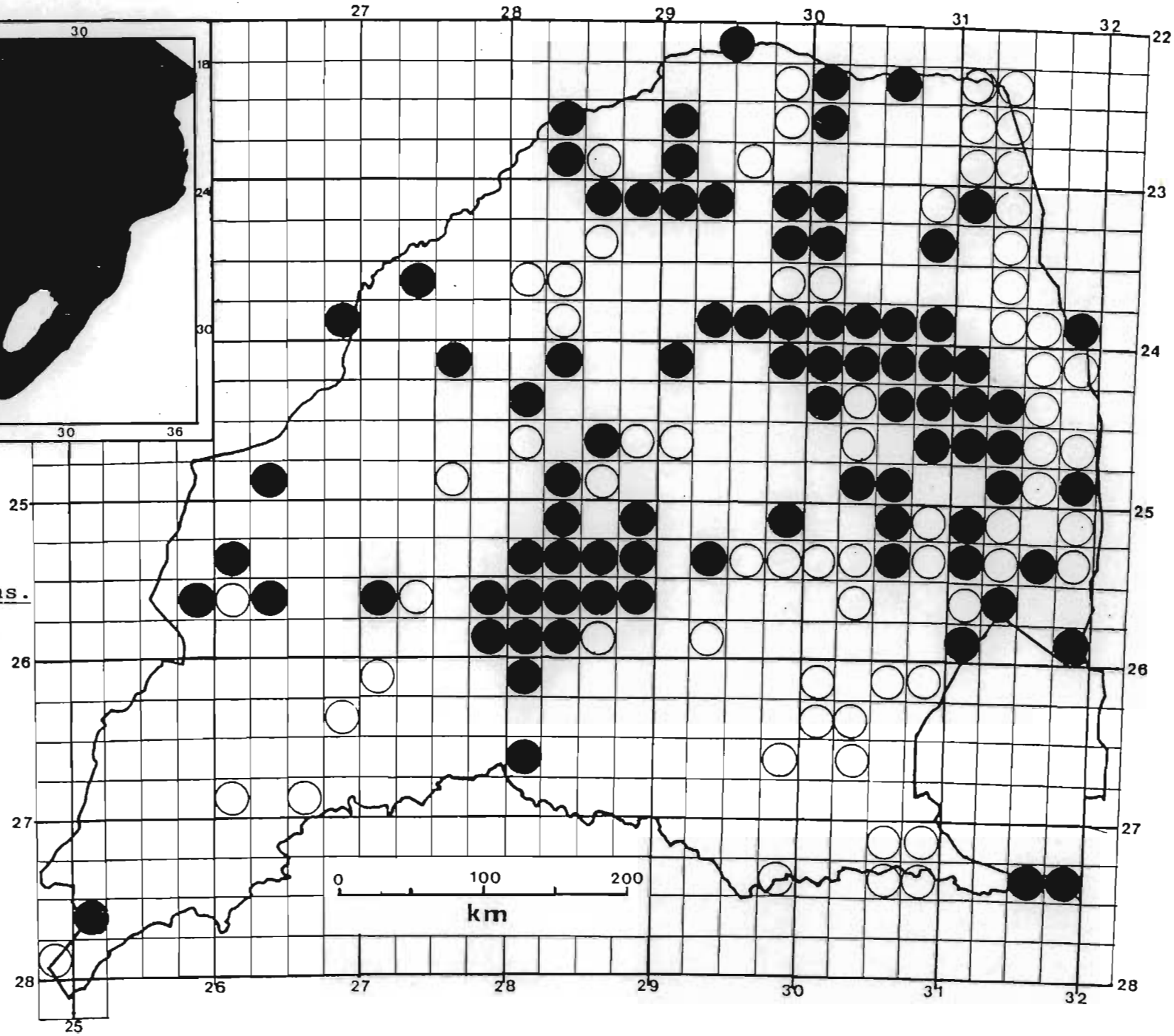
Distribution in the Transvaal (Map 204).

8 km N. of Alma; 10 km W. Mazithi Pan; 13 km SE of Messina; 15 km SE Pretoria; 22 km from Brits-Pretoria; Abek 6JU; Aden 1KT; Allandale 237KU; Alsace 74KT; Altever 103MR; Amsterdam 116LS; Andover 210KU; Anlage 225KT; Armoedsvlakte 281HO; B.V.B. Ranch 776LT; Bangu Gorge; Barberton Townlands 369JU; Baviaanspoort 330JR; Between Pienaars River Dam & Wallmansthal turn-off; Between Pretoria & Witbank; Birmingham 198KU; Blouberg; Blyde River Nature Reserve; Boekenhoutskloofdrift 286JR; Bridgewater 263MS; Brits; Broederstroom 481JQ; Bulge Rivier 198KQ; Busizi Hills; Clearwaters, Haenertsburg; Commandonek, Rustenburg Dist.; Coventry 261MS; Dambale Hills; De Bad 396KT; De Kroon 444JQ; De Putten 56JO; Doreen 108MT; Elim Hospital; Goedgevonden 104KR; Gumbani; Hans Hoheisen Research Station; Hectorspruit 164JU; Hoedspruit 346JS;



MAP 204.

<u>Bitis</u> <u>arietans</u> <u>arietans</u>.
Recorded distribution in the Transvaal, and in southern Africa.



Hoedspruit Air Base; Hoogelegen 82MR; Johannesburg 91IR; Johannesburg, Die Eike; Jouberts Hoop 67KU; Kafferskraal 381IR; Kalkfontein 111KP; Karino Farm 134JU; Kildare 277KU; Klaserie; Klipfontein 205JR; Klipfontein 429JR; Krododilspruit 290JR; Kromdraai 115JR; Krugersport 550KT; La Rochelle 310LR; Loskop Suid 53JS; Louis Trichardt; Louws Creek 271JU; Madrid; Makapansgat 39KS; Malta 65KT; Mananga; Manyeleti Game Reserve; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Sarabank 323KU; Mapochsgronde 500JS; Mariepskop 420KT; Matlapitsi River; Mecklenburg 112KT; Merinovlakte 495KR; Messina 4MT; Mezeg 77JP; Morgendal 216KS; Moria 83KU; Nylsvley Nature Reserve; Okkernootboom 211KU; Olifantsfontein; Olifantsgeraamte 198JT; Paardedood 186LT; Paris; Pienaarsriver 83JR; Pietersburg; Pieterskraal 190JR; Plot 158 Rietgat 105JR; Pongola 61HU; Pongola Nature Reserve; Potgietersrus; Pretoria; Pretoria, Leper Asylum; Pretoria, Petronella; Pretoria, Sandfontein; Pretoria, Uitspan Drive-In; Pretoria, Wierda Park; Pretoria, Wonderboom; Rietfontein 214JR; Rietfontein 255JT; Rietgat 105JR; Ritavi 2, Mmanopi; Rochdale 700MS; Rondavelskraal 290JP; Roodeplaat Agr. Res. Sta. Pretoria; Rooikopjes 483JR; Ross 55KU; Rudyard 244LS; Rustenburg; Rustenburg Nature Reserve; Sabie; Sekororo; Sheila 10KU; Shilowane; Steenbokpan 295LQ; Swadini Dam; Swartkop 383JR; Thankerton 144KT; Troya 151JR; Tweefontein 491JR; Tygerfontein 93MR; Tzaneen 538LT; Vergulde Helm 316LQ; Vissershoek 435JQ, Donkerkloof; Vivo; Vlakplaats 354JR; Vygeboomspoort 456KR; Weipe 47MS; Welverdiend 243KT; Willie 787LT; Wintersveld 427MS; Witfontein 18LS; Worcester 5LP; Zoekmekaar 778LS.

Literature Records

Acornhoek; Alldays; Andalusia; Anysspruit; Brondal; Bronkhorstspruit; Burgersfort; Carolina; Cobalt Mine; Commondale; Crecy; Crocodile Bridge; Damwal; Doispan; Duiwelskloof; Dullstroom; Ermelo; Goedewil; Gollel; Gravelotte; Haenertsburg; Hendriksdal; Holme Park; Houtbosloop; Huntleigh; Kaapmuiden; Kingfisherspruit; Klerksdorp; Klerkskraal; Koedoeskop; Komatipoort; Kralingen; Lake Chrissie; Legogote; Letaba; Letaba Camp; Leydsdorp; Lochiel; Lothair; Lower Sabie; Machadodorp; Mahlangane; Malelane; Mara; Marikana; Marken; Mataffin; Melk River; Melliodora; Metsi-metsi; Mhluwati Drift; Middelburg; Middelfontein; Moepel; Mokeetsi; Munnik; Naboomspruit; Nelspruit; Nwambia Pan; Nwanetzi; Ottoshoop; Overyssel; Pafuri; Penge; Piet Retief; Pinedene; Plaston; Pretoriuskop; Punda Milia; Rayton; Roedtan; Rooikraal; Schagen; Sheepmoor; Shingwedzi; Skukuza; Stoffberg; Sunkle's Drift; Tautesberg; The Brook; Tolwe; Tshokwane; Tuinplaats; Vaderland; Ventersdorp; Verlief; Volksrust; Warmbaths; Waterpoort; Waterval Boven; White River; Woudkop; Zeerust (FitzSimons, 1962). Serala 5KT (Snyders, 1987). Timbavati, 8 km north of Orpen-Satara road; Letaba camp; Malelane quarters; Nwanedzi camp; Mareyo windmill; Shaben experimental plots; Doispane; between Lower Sabie camp and Gomondwane; near Machai pan; W.N.L.A. quarters, Pafuri; Mhluwati drift, western boundary; Lower Sabie road, 11 km west of Lower Sabie camp; Masoweni koppie on road to Mahlangene; Dzombo experimental plots; Shingwedzi quarters; Dzundwene hill; on road to Nwambiya pan; on road to Shingedzane at crossing with Metsi-metsi firebreak; Bangu gorge camp; near Stangene windmill; Nwamuriwa; near Bangu

windmill; Olifants river causeway; Shangoni quarters; Tsende experimental plots; north bank of Sabie river, 4,8 km east of Skukuza; Numbi gate; new Hlanganine firebreak; Mala-mala ranger's quarters; between beacon 7 and Nyandu sandveld; Nyandu sandveld; between beacons 5 and 7; between Nyandu sandveld and beacon 9; Masanje (Pienaar et al, 1983). 16 km S. of Messina; 16 km W. of Kaapmuiden; Mkuhlu (NMZB).

Habitat and Ecology

Distributed throughout most of the Transvaal, lacking only from the south-eastern highveld possibly due to lack of cover and frequency of fire and habitat destruction. The species occurs in most veld types including 6, 8, 9, 10, 11, 13, 14, 15, 16, 18, 19, 20, 61 and 63 at altitudes ranging from 300-1800 m a.s.l. Inhabits grasslands to rocky hillsides, taking refuge under rock on rock, rock on soil or under rotting logs and moribund grass and in fact under anything which supplies sufficient cover. Many are killed in winter fires as they lie under collections of dry grass. Are reputed to move into groundnut stacks in search of rats and, of course, shelter. Often found moving about during the day, progressing in their rectilinear manner using the belly scales to propel them forward. On rocky outcrops may forage in crevices searching for rock rats (*Aethomys namaquensis*) which build large grass nests which are also used for shelter. I have on occasions been hissed at by invisible snakes under such circumstances. These snakes are relatively inoffensive and do not appear to bite unless molested or stepped on. On occasions I have stepped over individuals which have either hissed or else moved off in these circumstances. Powerful snakes, they have large fangs which are used to inject poison into the

prey, which if large is released and followed up later after the poison has taken effect. They consume mostly rodents such as Otomys spp. and possibly Rhabdomys pumilio which use runs and are ideal for the puff adder, which lies in wait for a rodent to come past. It is a veritable mouse trap and must play a role in helping to contain population explosions. They also feed on toads and may include ground nesting birds in their diet. On the Nylsvley Nature Reserve puff adders were more common in areas of dense grass cover along the ecotone between woodland and vlei than in the Burkea africana woodland, where rodents were at low densities and ground cover sparse. Ovoviviparous, 20-40 young are produced during summer although exceptional records of up to 156 young have been recorded from very large East African snakes. Mating takes place during summer, the young being born during December/January. Neonates measure 150,0-200,0 mm in total length and a mass of 8,5 g. Growth is exponential and rapid, a captive snake reaching 550,0 mm and a mass of 170,5 g within the space of a year (Coulson & Riddell, 1988). Growth continues rapidly, only levelling off during the winter months when food consumption is lower. Between 800,0-1000,0 mm in length, the growth rate declines whereafter growth continues but at a reduced rate (Jacobsen, 1986a). Coulson & Riddell (1988) recorded a growth rate of 1,3 mm per day in the first year of life. Jacobsen (1986a) recorded a growth rate of 0,71 to 1,25 mm per day in their second year of life which dropped to 0,26-0,37 mm per day during their third year even though they consumed up to 1,5 times as much food as in their second year. A male is still growing at the age of 11 years and 8 months achieving a rate of 0,12 mm/d. Growth in reptiles slows after sexual maturity owing to the energy demands of gonadal maturation (Andrews, 1982). According to this, puff

adders become sexually mature at approximately 3 years of age. Unconfirmed reports indicate that sexual maturity may be achieved at an earlier age (H. Erasmus pers. comm.).

Conservation Status

Partially protected. Schedule 5, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in the province its status is secure. However habitat destruction has been responsible for the extermination of the species around Middelburg and Lichtenburg while it is scarce in most areas where intensive agriculture is practiced. The species is also frequently persecuted by man and numbers are killed while crossing roads. At least 18/57 (31,58%) of specimens collected during this survey were snakes found D.O.R., indicating the extent of the problem.

Class : Reptilia
Order : Testudinata
Suborder: Cryptodira
Family : TESTUDINIDAE

Genus: Geochelone Fitzinger 1835

Geochelone Fitzinger 1835, Ann. Wiener Mus. 1, pp. 108, 112, 122 (as a subgenus). Type by original designation: Testudo stellata Schweigger = T. elegans Schoepff.

A large genus of tortoises characterised by the strongly ridged maxilla which is excluded from the roof of the palate. The quadrate usually encloses the stapes. Carapace and plastron unhinged and the anterior neural pattern octagonal alternating with the quadrilateral. Two suprapygals with the anterior larger than the posterior, and partially surrounding it; single or double gular scutes which are usually longer than broad (Pritchard, 1979). According to Pritchard (1979) only two species occur in Africa of which one extends over much of South Africa including the Transvaal.

Geochelone pardalis (Bell, 1828)

Testudo pardalis Bell 1828, J. Zool. Lond. 3, p. 420, Suppl. Table 25. Type locality: Cape of Good Hope.
Testudo pardalis babcocki Loveridge. Loveridge & Williams 1957, p. 235, figs; Wermuth & Mertens 1961, p. 219, fig. 164; De Waal 1980, p. 86.
Testudo (Geochelone) pardalis babcocki Loveridge. Jacobsen 1977, p. 15.

Geochelone pardalis babcocki (Loveridge). Pienaar 1978, p. 211, pl. 96; Pienaar et al 1983, p. 20, pl. 1.
Geochelone (Geochelone) pardalis pardalis (Bell). Pritchard 1979, P. 267; Welch 1982, p. 207.
Geochelone (Geochelone) pardalis babcocki (Loveridge). Pritchard 1979, p. 267; Welch 1982, p. 207.
Geochelone pardalis (Bell). Greig & Burdett 1976, p. 249; Boycott & Borquin 1988, p. 86, pls. 18-20, fig. 17; Branch 1988a, p. 26, pl. 4, 1988b, p. 5.

Diagnosis. 73 Specimens examined.
Colour: Transvaal specimens are mostly straw yellow, yellow to yellow-brown in ground colour with heavy black blotching or streaking in an irregular radiate pattern which is heaviest dorsally and lightest ventrolaterally. Ventrally yellow to yellow grey with dark grey to black streaks around the perimeter of the scutes. Limbs yellow-brown to greyish yellow. Older specimens become more drab.
Lepidosis: Large tortoises with a rounded, domed carapace characterised by the absence of a nuchal scale. Vertebrals 5; costals 4; marginals 11; suprapygal 1; gulars 2; pectorals 2; humerals 2; abdominals 2; femorals 2; and 2 forelimbs armoured anteriorly by heavy triangular scales. Five claws on forefeet and 4 on the hind feet.
Size: Boycott & Borquin (1988) record that the species reaches a carapace length of 650,0 mm with a mass of 40 kg +. However this pertains to the Cape Province. In the Transvaal the species is mostly considerably smaller. The impracticality of collecting large specimens has led to a bias towards small or juvenile individuals. A female with a carapace length of 408,0 mm and plastron length of 252,0 mm had a mass of 4,8 kg while another female of 410,0 mm carapace length and plastron length of 230,0 mm had a mass of 3,75 kg. Particularly large Transvaal specimens have a plastron length of 270,0 mm.

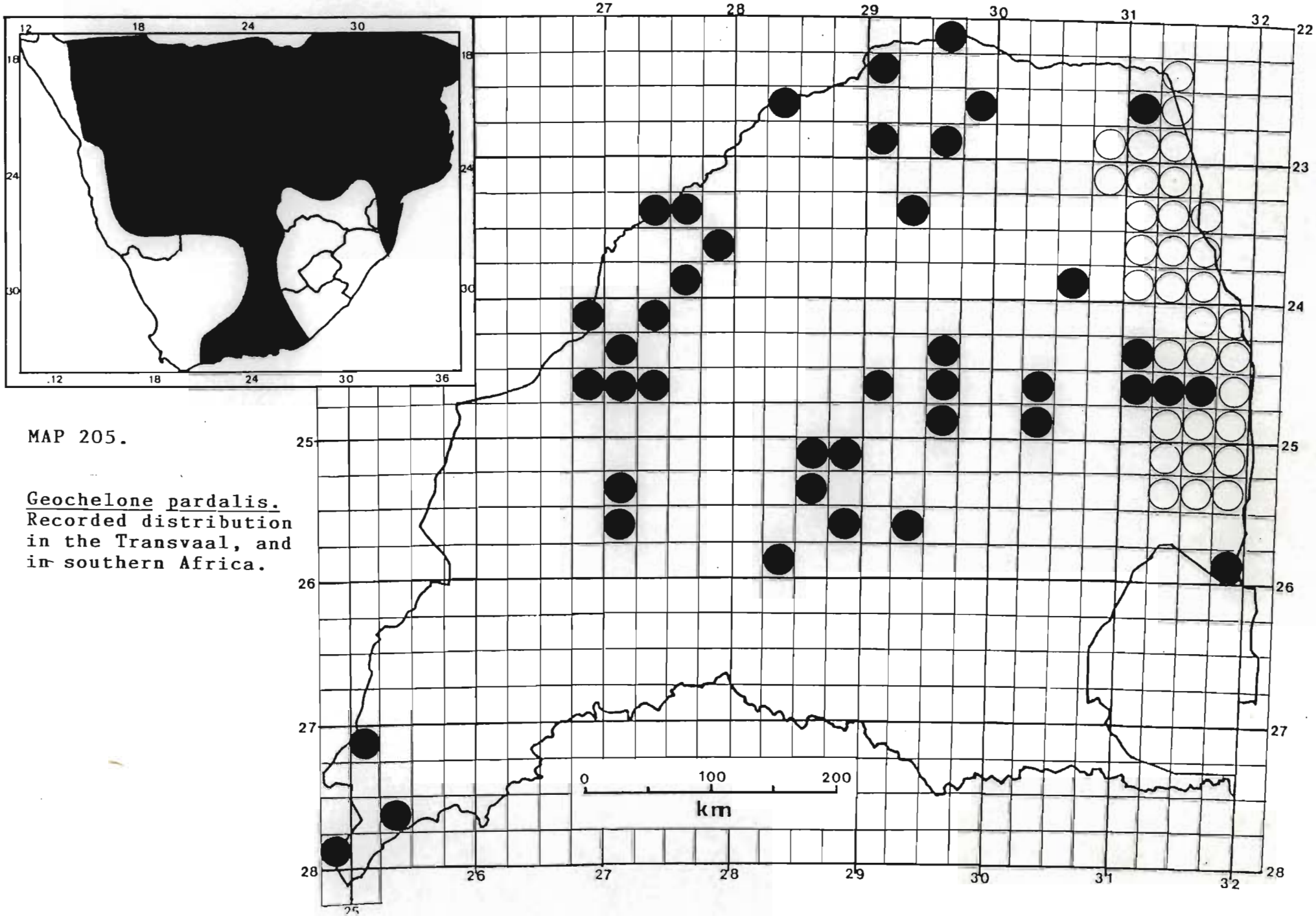
Most Transvaal adults would therefore have a mass of less than 10 kg and in the bushveld and lowveld possibly as low as 4-6 kg.

Distribution

Ethiopia and Sudan south to the southern Cape Province excluded only from the extremely arid south-west parts and most of the Orange Free State, Natal and north-eastern Cape Province.

Distribution in the Transvaal (Map 205).

Amsterdam 116LS; Andover 210KU; Between Roedtan & Potgietersrus; Bezuidenhoutskraal 166JR; Botsabelo, Middelburg; D'Nyala Nature Reserve; De Bad 396KT; Dwaalboom 217KP; Engeland 183KP; Gravelotte 783LT; Grootfontein 352KQ; Grootplaats 29HN; Honeymoon 80KQ; Houwater 54JQ; Kent 57KU; Klipfontein 11KQ; Kloppersdam 187JR; Leydsdorp Dorpsgronde 779LT; Limpopodraai; Lolamontes 682KS; Mananga; Manyeleti Game Reserve, Albatros; Manyeleti Game Reserve, Buffelshoek 340KU; Manyeleti Game Reserve, Dixie Hill; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Mohlwareng Hill; Manyeleti Game Reserve, Sarabank 323KU; Marokane 1HN; Melkbosch 49MR; Naauwpoort 441KS; Panfontein 270HO; Petershof 131MS; Pietersburg Dist.; Pretoria, Bashewa Agricultural Holdings; Punda Milia; Riekerts Laager 165JR; Rietfontein 214JR; Rietspruit 385MS; Rustenburg Nature Reserve; Sandfontein via Marahelni Warmbaths; Sekale; Timbavati Nature Reserve; Vaalbank 163JR; Viljoenshoop 299KT; Weltevreden 81MS.



MAP 205.

Geochelone pardalis.
Recorded distribution in the Transvaal, and in southern Africa.

Literature Records

S.A. Lombard Nature Reserve (Van Zyl, 1966). Nylsvley Nature Reserve (Jacobsen 1977). Pafuri; Klopperfontein; Malonga; Nyandu firebreak; Babalala; Nwahlangari south; Middle firebreak between Phugwane and Mpholongolo; Punda Maria-Shangoni road between Phugwane and Dobotzi; Shangoni; Shingwedzi river road near Joao; Dzombo west; 3,2 km north of Shilowa; Dzombo experimental plots; Nwambu firebreak near Mbyashishe drift; Shipandane; Mahlangene firebreak between rangers quarters and Masoweni; Malopanyane; Makadze firebreak near Manyeleti dam; Mbulweni pan area; western boundary north of Malopene; Tsutsi picket area; Letaba-Phalaborwa road between Shivulani and Ngwenyeni; near Wamantse; Bangu; Shitsalaleni; Gudzane windmill; Pumbe; Timbavati road north of Mbangari; Ngirivane; Pelwane; Sikkeltowkloof; Hengel; Majekejekene pan area; Nwanedzi experimental plots; Kambane, near Satàra; Sweni firebreak west of Ngumula pan; Kumane; Lindanda; Hutomi dam area; Hlangulene; western boundary north of Lipape; Tshokwane; Machapiri; Tswiriri dam area; Nwanitsana dam area; Manzimahle; Leeupan area; sandstone koppies Saliji road, near Gaben; Mlondozi upper reaches; Mlondozi loop road near Mlondozi dam; Skukuza; Lower Sabie camp area; Gomondwane; Shipalên; Panamana dam area; Bumi road north of Gaisenga; Skukuza koppies; Crocodile bridge; Malelane road east of Mlambane drift; Mlambane dam area; Mavukane-Makutwanine firebreak; Rockvale; Jock road near Ship Mountain; Nahpe road near Nhlangainine drift, Nahpe plots and Naphpe koppies; Pretoriuskop area; Mcosene near Numbi gate; Faai experimental plots; Mahlabantu; Numbi loop road; Doispane road near Masahalane; Mbyamiti experimental plots; Nwashitsaka experimental plots; Mtjulu causeway (Pienaar et al 1983).

Habitat and Ecology

Widespread in the Transvaal, excluded only from the central and south-eastern highveld in veld types 8, 9, 48, 50, 52, 54, 55, 57, 61, 62 and 63. The species lives at altitudes of 200-1500 m a.s.l. Mostly found in flat wooded terrain, the species rarely is found on hillsides preferring more level habitat. Mostly active during the summer months, they are most frequently seen after the passage of a rain storm, wandering about foraging or drinking at puddles. During summer they take refuge at the base of clumps of vegetation or under grass tussocks whereas in winter they enter more secluded retreats under rocks on soil, under stumps and even in the burrows of other animals but also hibernate under dense shrubs as evidenced by Van Zyl (1966) and Milstein (1968). May be injured or burnt to death or asphyxiated during winter veldfires. Some individuals exhibit remarkably twisted and distorted shells, the result of hibernating under piles of dead vegetation which have subsequently burnt with the passage of a veld fire. In the Serengeti the home range of a female tortoise was 1,5 km^2 (Bertram, 1979).

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in the Kruger National Park and several provincial nature reserves, the status of the species appears vulnerable but currently secure. Occurs in low densities over much of the range and therefore a nature reserve of 3000 ha is not likely to have a viable population.

Remarks

Loveridge & Williams (1957), Wermuth & Mertens (1961) recognised two forms of pardalis with diagnostic characters restricted to height and width of vertebral scutes and numbers of dark spots per vertebral scute in hatchlings. Both characters are extremely variable and scute shape varies geographically as well as within a population. Greig & Burdett (1976) and Boycott & Borquin (1988) express doubt as to the validity of the subspecies and I am in agreement with this. Cape 'pardalis' are much larger than Transvaal specimens, with the possible exception of animals from the extreme south-western Transvaal. It has long been accepted that this situation exists, but explanation is lacking barring that of type and quality of food being different in the two regions. This question remains as yet unanswered.

Although habitat destruction is undoubtedly the greatest threat to the species, other threats include fire, human predation and death on roads. A somewhat more insidious threat is the large scale translocation of individuals from the Cape Province to and also within the Transvaal, creating a mixing of gene pools which could be detrimental to the species. Irresponsible releases of Cape tortoises in the Transvaal are commonplace, including even officers of the Directorate: Nature and Environmental Conservation. This has resulted in the establishment of a population on the Suikerbosrand Nature Reserve. Whether this population is on the increase or just maintaining status quo is a question necessitating an answer. The removal of these animals is of prime concern. There is no indication that tortoises were resident here, although veld fires may have created this vacuum as the Cape tortoises are still alive after many years and to all intents and purposes have established

themselves. Broadley (*in litt.*) is re-examining the status of the subspecies of '*pardalis*' after an intensive investigation of material.

Genus *Psammobates* Fitzinger, 1835

Psammobates Fitzinger 1835, *Ann. Wiener Mus.* 1, pp. 108, 122 & 133. Type: *Testudo geometrica* Linnaeus (designation by Fitzinger, 1843, *Syst. Rept.* part 1, p. 29).

According to Pritchard (1979), the genus is differentiated from *Geochelone* by the absence of a nuchal, the primitive hexagonal shape of the neurals and although there may be one or two pygal bones, in the latter, they are separated by a straight transverse suture. The skull is advanced having lost the maxillary ridging, as is the longer than broad gulars. Only three *Psammobates* species are currently considered valid, with several subspecies of which only three are currently recognised. All are endemic to southern Africa but only one, *Psammobates oculifer*, is found in the Transvaal, and is easily recognisable by the serrate nature of the posterior marginals.

Psammobates oculifer (Kuhl, 1820)

Testudo oculifera Kuhl, 1820, *Beitr. Zool. Amph.*, p. 77. Type locality: "Cap" presumably referring to the Cape Province. Loveridge & Williams 1957, p. 315, fig. 31; Wermuth & Mertens 1961, p. 214, fig. 163; De Waal 1980, p. 86.

Testudo (Psammobates) oculifera Kuhl. Jacobsen 1977, p. 15.

Psammobates oculifer (Kuhl). Greig & Burdett 1976, p. Welch 1982, p. 207; Milstein 1968, p. 42; Boycott & Borquin 1988, p. 94, pl. 23; Pritchard 1979, p. 439; Branch 1988a, p. 28, pl. 7, 1988b, p. 5.

Diagnosis. 25 Specimens examined.

Colour: Variable but mostly pale yellow or horn-coloured but may also be light brown rays on a dull black background. The lightness or darkness of individuals depends on the width of the rays. Ventrally similar to the dorsals.

Lepidosis: A small tortoise with a domed carapace and posterior marginals arranged in a toothed fashon and slightly curled upwards at their tips. Dorsal shields comprise 5 vertebrals, 4 costals dorsolaterally on each side and 11 marginals on each side. A narrow elongated nuchal is present. Suprapygal/caudal 1. Ventrally gulars 2, humerals 2, pectorals 2, abdominals 2 and anals 2. Five claws present on the forefeet and four on the hind feet. Sexual dimorphism exists with males being slightly hollowed posteriorly although Boycott & Bourquin (1988) mention that this is not well developed and may be absent altogether. Buttock tubercle prominent.

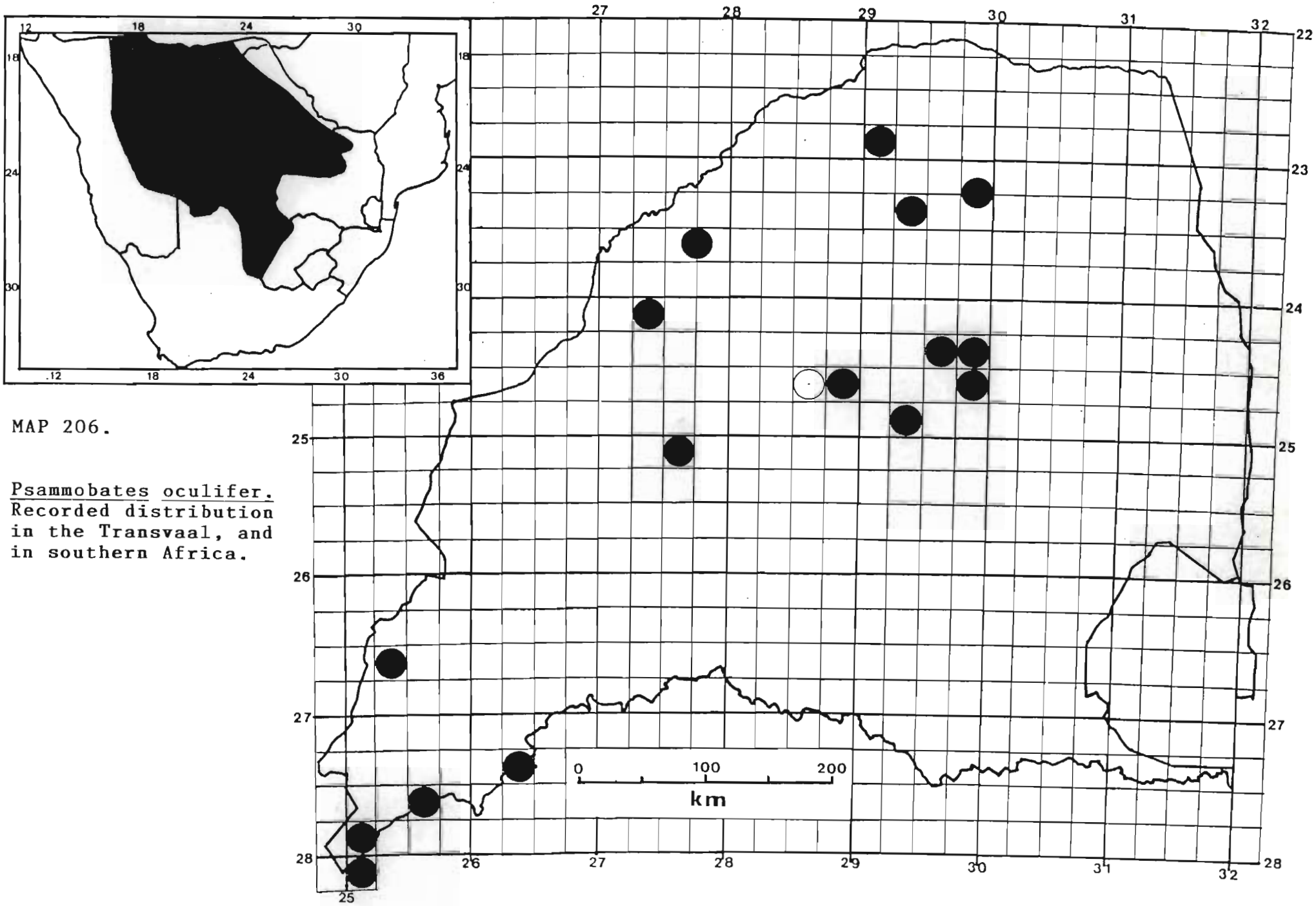
Size: A male plastron length 82,0 mm (N5188 - Leeukop 425KS) and a mass of 178,0 g (N5188). Boycott & Bourquin (1988) record females with a carapace length of 130,0 mm and a mass of 410,0 g, and males 110,0 mm length and a mass of 200,0 g. It would appear that Transvaal specimens may not reach these lengths.

Distribution

South West Africa/Namibia, Botswana and eastwards to the Transvaal, western Orange Free State and northern Cape Province.

Distribution in the Transvaal (Map 206).

16km Heuningvlei-Morokweng; 58km N. Marble Hall - Pietersburg; Amsterdam 116LS; Between Bandelierkop & Louis Trichardt; Bloemhof Dam Nature Reserve; Brandhoek 78HP; Christiana 325HO; Delareyville; Ellisras Area;



MAP 206.

Psammobates oculifer. Recorded distribution in the Transvaal, and in southern Africa.

Klipfontein 11KQ; Langjan Nature Reserve; Leeuwkop 425KS; Marble Hall 29JS; Mosdene Private Nature Reserve; Rietspruit 385MS; Sekukuniland on Lapilane R.; Vlakplaats 535KS; Vogelstruispan 189JQ; Wintersveld 417KS.

Literature Records

Nylsvley Nature Reserve (Jacobsen, 1977).

Habitat and Ecology

Restricted to patches or areas of kalahari sand in the Transvaal. Found in veld types 14, 16 and 18 at altitudes of 800-1300 m a.s.l. Their distribution is therefore restricted. In this regard the species is only found in the Burkea africana savanna on the Nylsvley Nature Reserve and at low densities possibly as a result of limited available habitat. Similar to other tortoise species the Serrated tortoise is active during the summer months and especially after thunderstorms. During winter the species, much like other tortoises, only partially buries itself in the sand, usually in secluded situations such as bushclumps, fallen trees and the burrows of other animals such as antbears (pers. obs.) but probably others as well. Milstein (1968) recorded the hibernation activities of two individuals one of which shifted its position by nine metres during midwinter. Both individuals were originately found among the branches of a fallen tree, partially buried in the soil. Hibernation extended for a minimum of 4,5 months.

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. The species occurs in three provincial nature reserves but may also be found in

others. Status is vulnerable owing to the low densities and limited available habitat. Surveys of populations on provincial nature reserves are needed.

Remarks

Some variation in colour pattern is evident in the Transvaal, with specimens being mostly black with pale yellow rays extending on each scute while, in the northern Cape Province and Botswana the specimens are predominantly straw coloured with small areas of black. Specimens from the Kalahari also appear to be more robust.

Genus *Homopus* Duméril & Bibron, 1835

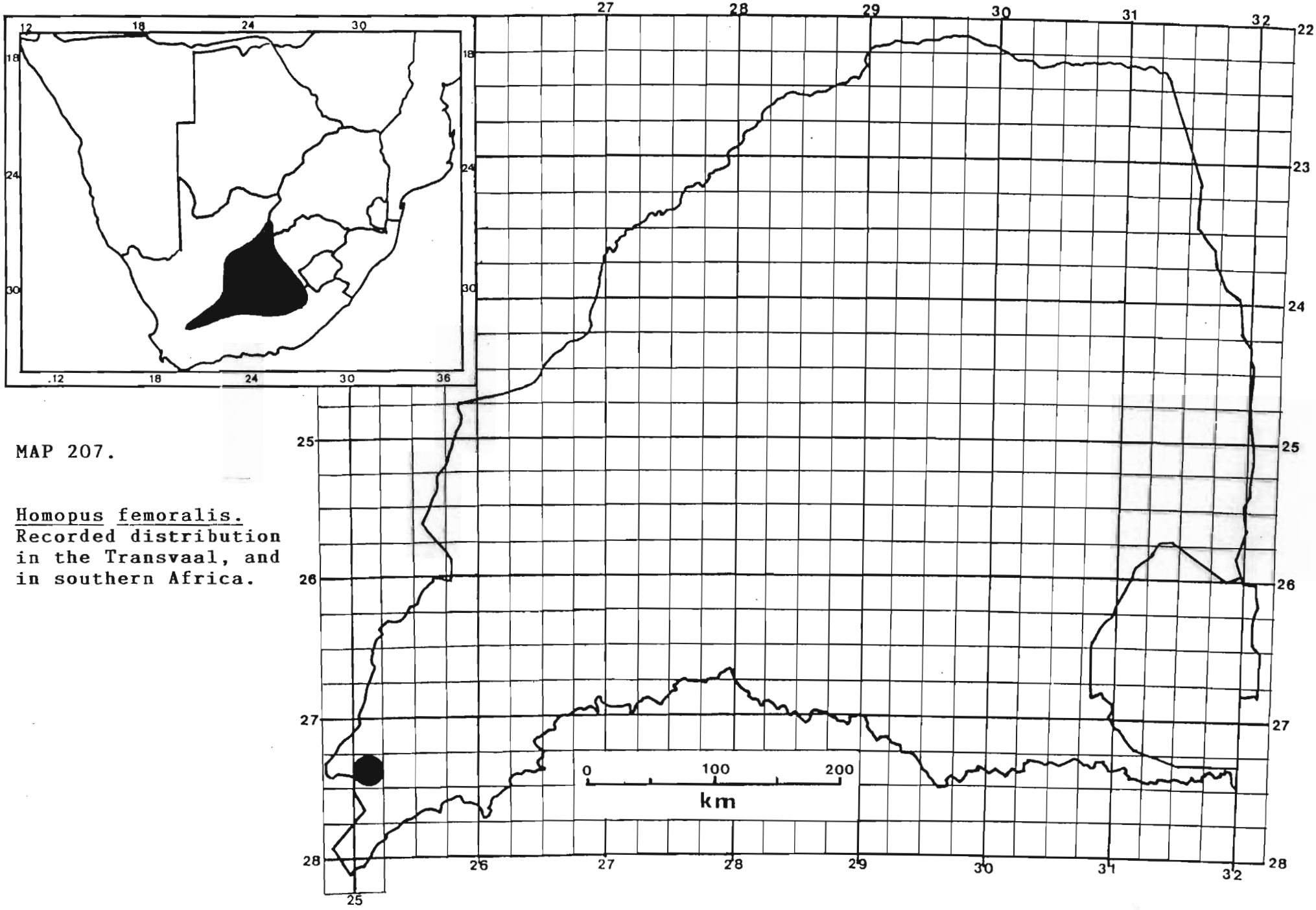
Homopus Duméril & Bibron, 1835, *Erpét. Gen.*, 2, p. 145. Type: *Homopus areolatus* (Thunberg).

An endemic southern African genus of five species and a single subspecies which are defined by their generally depressed appearance. The apparent more or less primitive pattern of hexagonal and quadrilateral elements of the neurals contrasts with an advanced pygal pattern, incorporating an enlarged suprapygal, enclosing a smaller between posterior prolongations. The triturating surfaces of the maxilla are unridged. Gular scutes are short and broad. One species, *Homopus femoralis*, occurs marginally in the Transvaal.

Homopus femoralis Boulenger, 1888

Homopus femoralis Boulenger 1888, *Proc. Zool. Soc. Lond.*, p. 251, table 14. Type locality: Cradock, Cape Province. Loveridge & Williams 1957, p. 365; Wermuth & Mertens 1961, p. 175, fig. 132; Greig & Burdett 1976, p. 256; Pritchard 1979, p. 452; Welch 1982, p. 207; Boycott & Borquin 1988, p. 110, pls. 35 & 36, fig. 23; Branch 1988a, p. 23, pl. 6, 1988b, p. 5.

Diagnosis. 1 Specimen examined.
Colour: Olive brown dorsally and slightly paler ventrally. Limbs tinged reddish-brown.
Lepidosis: A medium sized tortoise dorsoventrally compressed. Dorsal shields composed of 5 vertebrals (sometimes 6, 7 or 8 (Boycott & Borquin, 1988), 4 costals on each side (rarely 5), and 11 marginals (rarely 12). Supracaudal 1. According to Boycott & Borquin (1988) supernumerary scales are frequent in this



MAP 207.

Homopus femoralis.
Recorded distribution in the Transvaal, and in southern Africa.

species usually reflected in the number of vertebrals and costals. Ventrally gulars 2; humerals 2; pectorals 2; abdominals 2; femorals 2 and anals 2. This species has four claws on all four feet and the buttock tubercles are usually well developed.

Size: Largest female plastron length = 106,0 mm and a mass of 265,0 g (J6307 - Matjesspruit 101HO). Boycott & Borquin (1988) report that females may have a carapace length of 160,0 mm and a mass of 600,0 g while males have a carapace length of 130,0 mm and a mass of 350,0 g.

Distribution

Mostly restricted to the Cape Province but also in the western Orange Free State and extreme south-western Transvaal (Boycott & Bourquin, 1988).

Distribution in the Transvaal (Map 207).

Matjesspruit 101HO.

Habitat and Ecology

Only recorded from one farm in the south-western Transvaal on the border with the northern Cape Province. Appears to prefer rocky ridges and mountains where it finds shelter in winter under rocks or in crevices. Temperatures in this habitat drop well below freezing and the tortoises remain inactive at least from June to September but probably even longer.

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. The species occurs only very marginally in the Transvaal as far as has been

established. More detailed surveys of available and suitable habitat need to be carried out to determine the extent of the occurrence. Status indeterminate but of low conservation priority owing to its exceptionally peripheral occurrence. However, one should strive to maintain natural ranges as completely as possible.

Remarks

The occurrence of the species on Matjesspruit 101HO was confirmed by farmers and labourers in the area.

Genus *Kinixys* Bell, 1827

Kinixys Bell, 1827, *Trans. Linn. Soc. Lond.* 15, p. 398.
Type: *Kinixys erosa* (Schweigger).

A characteristic African tortoise genus easily distinguished on the depressed to relatively depressed carapace, and the unique dorsal hinge. The hinge is found between the fourth and fifth pleural and seven and eighth peripheral bones. Externally this position corresponds to the sutures between the 2nd and 3rd costals and seventh and eighth marginals. The hinge is absent in juveniles and leads to confusion with *Homopus*. However the ranges of the two genera do not overlap and therefore origin is also diagnostic. Other characteristics include the hexagonal neural bones and the anterior extension of the front peripheral bones and marginal scutes (Pritchard 1979). Three species were recognised (Wermuth & Mertens 1961, Pritchard, 1979) but a revision of south-eastern forms (Broadley, 1981) revealed the presence of a fourth and at least three subspecies. Only two species occur in the Transvaal although Broadley (*in. litt.*) is currently examining the south-western forms which may lead to the recognition of other forms.

Key to the Transvaal species.

1. Unicuspid beak; supracaudal single never divided. Plastron shields mostly with out a characteristic black ring and light yellow to pale brown along the sutures between the shields ..... *K. belliana spekii*

Tricuspid beak; supracaudal frequently split in two, length ways. Plastron mostly with a characteristic black ring on each shield and sutures between shields yellow to pale brown ..... K. natalensis

Kinixys belliana spekii Gray, 1863

Kinixys spekii Gray, 1863, Ann. Mag. nat. Hist. (3) 12 p. 381. Type locality: Central Africa.
Kinixys belliana belliana Gray. Loveridge & Williams 1957, p. 384; Wermuth & Mertens 1961, p. 180 (part); Pienaar 1966, p. 127, 1978, p. 213, pl. 97; Jacobsen 1977, p. 15, fig. ;
Kinixys belliana spekii Gray. Broadley 1981a, p. 211, fig. 11 & 12; Pienaar et al, 1983, p. 22, pl. 2; Snyders 1987, p. 19; Boycott & Borquin 1988, p. 124, pls. 42-44, fig. 27; Branch 1988a, p. 30, pl. 5, 1988b, p. 5.
Kinixys belliana Gray. Auerbach 1987, p. 69, pl. 7, fig. 1.

Diagnosis. 76 Specimens examined.
Colour: Olive-brown to brown above and pale brown to yellow-brown below. Dorsal scutes may be dark centred with yellow-brown to brown, followed by dark brown to black at the junction of the scutes particularly in younger specimens. Occasionally a broken ray pattern is in evidence on the scutes. Sexual dichromatism is present. Ventrally yellow brown to brown.
Lepidosis: A medium sized, mostly depressed tortoise with a hinge between the 7th and 8th marginal scutes. Dorsally, 5 vertebral scutes; 4 (exceptionally 5) costals and 11 marginal scales (occasionally 10 or 12)

and a single undivided supracaudal. Nuchal present. Ventrally 2 gulars; 2 humerals; 2 pectorals; 2 abdominals; 2 femorals and a pair of anals. Five claws on forefeet and four on the hind feet. The hinge in adults is absent in hatchlings and juveniles. Sexual dimorphism pronounced with the plastron of males hollowed posteriorly and length of tail much greater than in females. The horny beak is unicuspid.

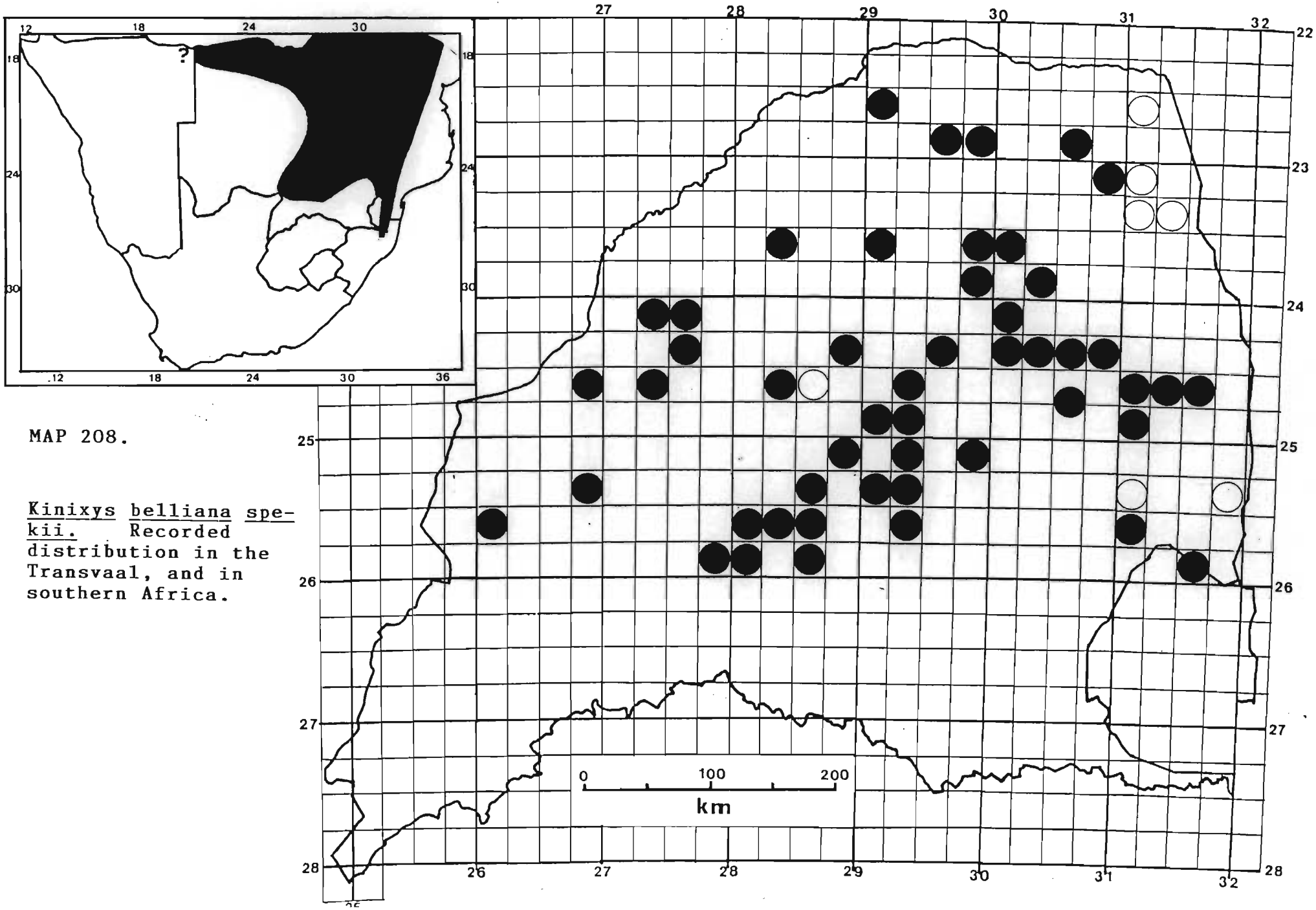
Size: Largest male plastron length = 145,0 mm (J6397 - SA Bantu Trust), mass = 780,0 g (J6397); Largest female plastron length = 157,0 mm (J4862 - Tivoli 98KT), mass = 820,0 g (N9050 - Goedehoop 749KS). Mean male plastron length (>110,0 mm) = 131,25 mm ± 9,91 (1SD), n = 4, mass = 575,0 g ± 147,53 (1SD), n = 4; Mean female plastron length (>110,0 mm) = 130,36 mm ± 16,39 (1SD), n = 7, mass = 564,57 g ± 193,22 (1SD), n = 7. Boycott & Borquin (1988) record a carapace length of 250,0 mm for females and 170,0 mm for males with masses of 1,5 kg and 820,0 g respectively.

Distribution

From Angola and southern Zaire to western Tanzania and Kenya south to northern Transvaal, Mozambique, Swaziland and northern Natal/KwaZulu.

Distribution in the Transvaal (Map 208).

58 km N. Marble Hall - Pietersburg; Acornhoek 212KU; Alldays 295MS; Antioch 240KT; Bekaf 650MS; Boekenhoutskloofdrift 286JR; Buffelshoek 351KQ; Buffelspoort 421KR; Daspoort 319JR; De Hoop 203JU; Die Bron; Dwaalboom 217KP; Goedehoop 749KS; Hennopsrivier 489JQ; Inkerman 10KQ; Jerome 287MT; Ka Mininginisi;



MAP 208.

Kinixys belliana spekii. Recorded distribution in the Transvaal, and in southern Africa.

Kloppersdam 187JR; Kromdraai 520JQ; Leamington 207KU; Leeuwfontein 188JR; Loskop Noord 12JS; Loskop Dam Nature Reserve; Lotteringskraal 243JP; Maiepo, Letaba Drift 727LT; Malta 65KT; Mamiaanshoek 279KQ; Manyeleti Game Reserve; Manyeleti Game Reserve, Buffelshoek 340KU; Manyeleti Game Reserve, Dixie Dam; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Sarabank 323KU; Marble Hall 29JS; Merry Pebble Stream 246KU; Mmboleta Estate NW. Maasstroom; Mokeetsi 376LT; Mooiplaats 242JS; Naauwpoort 441KS; Nylstroom; Nzulase; Ohrigstad 443KT; Ostend 104KT; Pretoria District; Pretoria, East Lynne Quarry; Pretoria, Mountain View; Rietfontein 214JR; Rietspruit 412KR; Rochdale 700MS; Rolle 235KU; S.A. Bantu Trust; Schilderkrans 1041LS; Seville 224KU; Steynsdrift 145JS; Syferfontein 178JP; Tivoli 98KT; Uitkomst 769LS; Vlakfontein 723KS; Vlakplaats 354JR; Vlakplaats 535KS; Vulcanus 584LS; Waterval 297KR; Witfontein 521JR; Zandspruit 189JR; Zonkolol 473JR.

Literature Records

Nylsvley Nature Reserve (Jacobsen 1977). Komatipoort; White River (Broadley, 1981a). Wolkberg Wilderness Area (Snyders, 1987).

Habitat and Ecology

Widespread in the bushveld and lowveld of the Transvaal mostly along rocky hillsides but also on flatter terrain. Recorded from veld types 8, 9, 10, 13, 14, 15, 18, 19, 20, 61 and 67 at altitudes of 200-1700 m a.s.l. These tortoises also become more active after the passage of rain but if it is hot they take refuge under shrubs,

aestivating until temperatures are more amenable. During winter they hibernate between May and September taking refuge under rocks or in crevices between rocks, also under logs usually partially buried in the soil. Boycott & Borquin (1988) and Branch (1988) present details of food, feeding, mating and egglaying. A female from the farm Rietfontein 214JR laid six eggs on the 13th April of which three hatched out after 313 days (10,1 months) which is close to the 12 months recorded by Boycott & Bourquin (1988). A specimen from the Daspoort range defaecated the following:- largely vegetable matter leaves of a herb; seeds of a legume - Elephantorrhiza; two species of tenebrionid beetles; a heliocoprid beetle; a millipede. Further details are given by Boycott & Bourquin (1988).

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Occurs throughout the Kruger National Park and in several provincial nature reserves. Although its survival is assured in the KNP, more details concerning population numbers on the various reserves are needed. The species suffers from habitat destruction, human persecution and road kills, while the translocation of specimens is commonplace. Details of population size on reserves are needed to determine viability.

Remarks

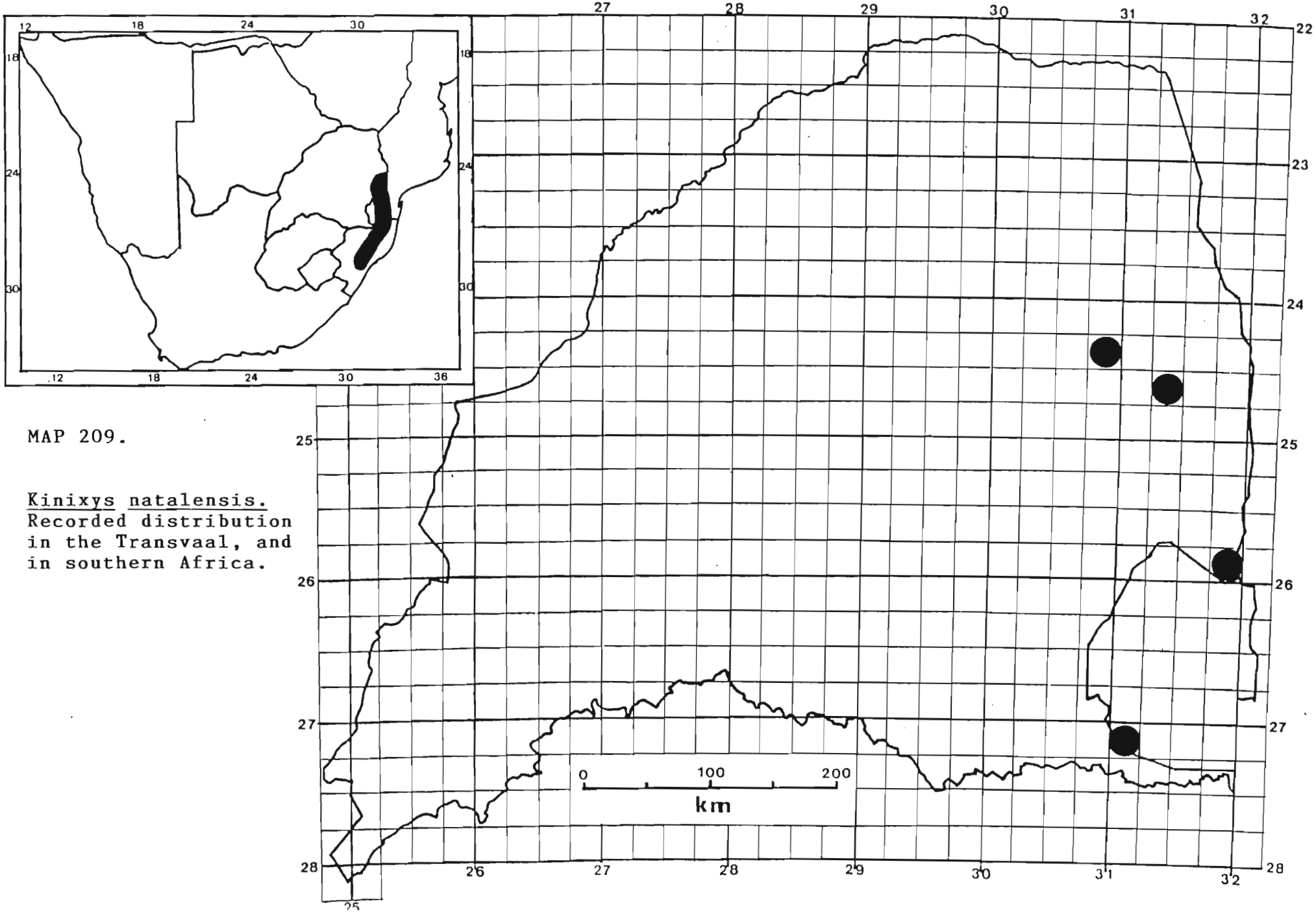
Broadley (1981) revised a portion of southern Kinixys species and is currently investigating the status of other synonymised species and subspecies. He reinstated K. natalensis Hewitt as a full species, and a localised endemic. Boycott & Jacobser (1988) reported on the

apparent confusion between two specimens of spekii and natalensis indicating sympatry where none existed and the presence of spekii far from the nearest other record. This was rectified.

Kinixys natalensis Hewitt, 1935

Kinixys natalensis Hewitt 1935, Rec. Alb. Mus. 4, p. 353, pl. xxxv, figs. 3-4. Type locality: Jameson Drift, Tugela river, Natal. Archer 1967, p. 62; Broadley 1981a, p. 204, fig. 7, pl. 8; Boycott & Bourquin 1988, p. 127, pls. 45-47; Boycott & Jacobsen 1988, p. 93, figs; Branch 1988a, p. 31, pl. 5, 1988b, p. 5.
Kinixys belliana belliana Gray (part). Loveridge & Williams 1957, p. 384; Wermuth & Mertens 1961, p. 180.

Diagnosis. 5 Specimens examined.
Colour: Varies considerably but according to Boycott & Bourquin (1988) females are marked more boldly than males. In old specimens the colour may be uniform pale yellow to orange or brown. In adult females the dorsal pattern is usually black and orange-yellow while in males they are dark-brown to light-brown, grey or pale yellow. The areolae are usually dark and surrounded by a broad light coloured ring, which is surrounded by a broad dark-coloured ring mostly at the edge of the shield. The shields are separated from each other by a narrow light coloured border. Ventrally shields light brown to yellow with large distinct black rings, one on each shield.
Lepidosis: Medium sized tortoises, moderately depressed dorsoventrally. A poorly developed carapacial hinge present between marginals 7 and 8. Dorsally 5 vertebrals present (rarely 6); costals 4 (rarely 5); marginals 11, occasionally 12; supracaudal frequently divided or



MAP 209.

<u>Kinixys natalensis.</u>
Recorded distribution in the Transvaal, and in southern Africa.

partially divided. Nuchal present. Plastron with 2 gulars; 2 humerals; 2 pectorals; 2 abdominals; 2 femorals and 2 anal shields. Five claws present on the fore feet and four on the hind feet. Buttock tubercles are absent. The beak is typically and diagnostically tricuspid.

Size: Boycott & Bourquin (1988) record that females have a carapace length of up to 160,0 mm with a mass of 300,0 g. A female with a plastron length of 88,0 mm had a mass of 238,0 g (N8863 - Mananga).

Distribution

Southern Mozambique, south-Eastern Transvaal and the Natal Midlands.

Distribution in the Transvaal (Map 209).

Bergplaats 25HU; Hoedspruit 346JS; Mananga; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Main Camp.

Habitat and Ecology

Mostly found in association with rocky outcrops and ridges in veld types 6, 10 and 11 at altitudes of 200-900 m a.s.l. Usually observed moving about among leaf litter but also crossing roads. They shelter under rocks on soil.

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Has as yet not been recorded from the Kruger National Park or any provincial nature reserve but this is likely to happen. Currently considered rare but indeterminate, further surveys in the southern Kruger National Park are needed to establish its presence.

Suborder: Pleurodira
Family : PELOMEDUSIDAE

Genus Pelomedusa Wagler, 1830

Pelomedusa Wagler 1830, Nat. Syst. Amph. p. 136. Type: Testudo galeata Schoepff = Pelomedusa subrufa (Lacépède).

A monotypic genus characterised by the lack of a hinge in the plastron. According to Pritchard (1979) a subspecies has been described from north-eastern Africa but appears not to be generally accepted, hence the binomial name. The species is depressed in appearance and the bridge of the plaston is comprised of about equal contributions of pectoral and abdominal scutes. In Pelusios the abdominals make up almost all of the bridge (Pritchard, 1979). The species is widespread in South Africa and occurs over most of the Transvaal.

Pelomedusa subrufa Lacépède, 1788, Hist. nat. Quadrup. ovip. 1, p. 173, table 12. Type locality: Taolanaro (= Fort Dauphin), Madagascar (Bour 1979).
Pelomedusa subrufa (Lacépède). Wermuth & Mertens 1961, p. 284, fig. 201; Rose 1962, p. 462; Broadley 1966c, p. 87; Jacobsen 1977, p. 17; Pritchard 1979, p. 770, fig. De Waal 1980, p. 88; Pienaar 1966, p. 129, pl. 51; 1978, p. 215, pls. 98 & 98A; Pienaar et al 1983, p. 24, pls. 3 & 3A; Boycott & Bourquin 1988, p. 60, pls. 1 & 2, fig. 14; Branch 1988a, p. 39, pl. 10, 1988b, p. 4.

Diagnosis. 55 Specimens examined.
Colour: Grey to black or olive black and even dark-brown usually uniform or with verniculations. Plastron

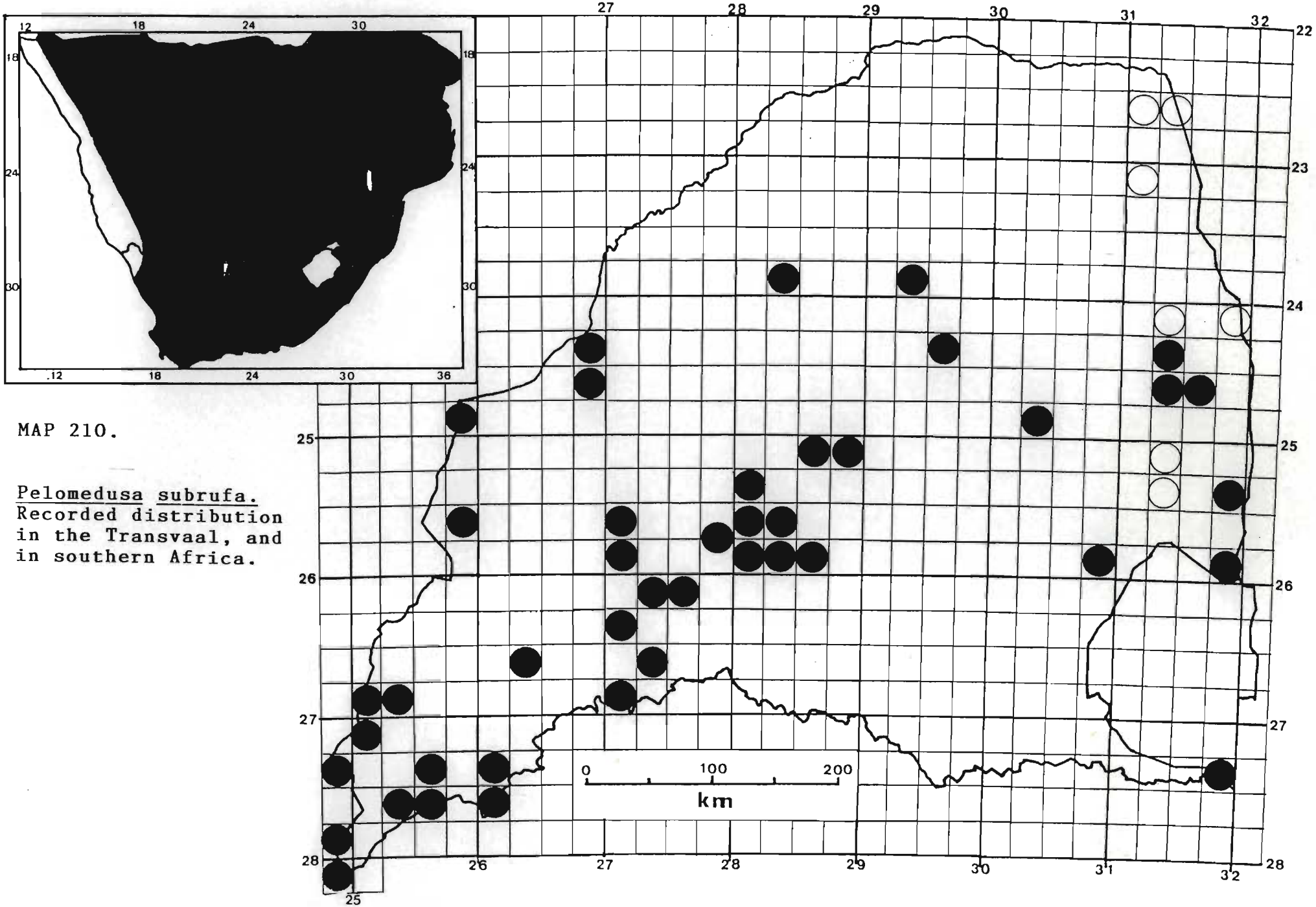
very variable from black to uniformly horn coloured or with dark-brown and yellow patches. Around the perimeter alternating black and yellow triangular markings are often present. Head grey to olive grey or olive-brown with darker speckling.

Lepidosis: A medium slightly depressed terrapin with a well developed large flattened head. Under the chin a pair of small barbels are present. Dorsal scutes include 5 vertebrals; 4 costals per side; 11 marginals and a divided supracaudal. No nuchal shield present. Plastron with two gulars separated by an elongate intergular; humerals 2; pectorals 2; abdominals 2, femorals 2 and 2 anal shields. Feet well developed with five well developed claws on forefeet and hind feet. Hindfeet are webbed and a fringe of webbing extends around perimeter of foot.

Size: Largest male plastron length = 173,0 mm (P10257 - Turfontein 126IQ), mass = 1,0 kg +; Largest female plastron length = 145,0 mm (N9636 - Doornbult 123HP), mass = 750,0 g (N5912 - S.A. Lombard Nature Reserve). Mean male plastron length (>100,0 mm) = 134,37 mm ± 21,72 (1SD), n = 8, mass = 454,14 g ± 161,38 (1SD), n = 7; Mean female plastron length (>100,0 mm) = 122,0 mm ± 14,61 (1SD), n = 8, mass = 448,25 g ± 183,91 (1SD), n = 8. Boycott & Bourquin (1988) record that the species reaches a carapace length of 280,0 mm and a mass of up to 2,5 kg, although a male in the Kaffrarian Museum has a carapace length of 325,0 mm. In this species, males grow larger than females.

Distribution

Throughout southern Africa with the exception of the central highveld and mountainous areas of the Orange Free State and Transvaal, as well as the arid west. Also extends north to the Sudan as well as Madagascar.



MAP 210.

Pelomedusa subrufa.
Recorded distribution in the Transvaal, and in southern Africa.

Distribution in the Transvaal (Map 210).

15 km E. Pretoria; 19 km E. of Pretoria; Bloemhof; Brakpan 251IP; De Bad 396KT; De Putten 56JO; Doornbult 123HP; Eersteling 63HP; Elandsfontein 366JQ; Engeland 183KP; Geluk 42HN; Grootplaats 29HN; Hartebeespoort Dam; Holfontein 49IQ; Hondsrivier 508JR; Jackalskraal 45KP; Klipdrift 395IQ; Kraalhoek 269JQ; Kwa Sipunu; Lorasa 258IQ; Lot 43 250IO; Manyeleti Game Reserve; Manyeleti Game Reserve, Buffelshoek 340KU; Marokane 1HN; Naauwpoort 441KS; Palmietfontein 24KS; Pietersburg; Pongola Nature Reserve; Pretoria; Pretoria District; Pretoria, Hornsnek; Pretoria, Marabastad; Pretoria, Menlo Park; Riekerts Laager 165JR; Rooikop 181JR; Rooipoortje 453IQ; Ross 55KU; S.A. Lombard Nature Reserve; Smaldeel 36KP; Sterkfontein 173IQ; Ten Bosch 162JU; The Willows 340JR; Tjakastad 730JT; Turffontein 126IQ; Uitvalskop 14HN; Vaalbank 163JR; Vaalbsochfontein 188HO; Van Tondershoek 10KO; Zoutpansspruit 30 km N. of Pretoria.

Literature Records

Shantangalane waterholes; Zwartkops east windmill; Nwambiya pan; Pumbe pan; between Malelane and Mtjulu drift; pan along upper reaches of Tsange spruit; rock pool at Skukuza experimental plot No. 2; Nhlanganine drift, Nahpe road; upper reaches of Shipampanane, on road to Ngwenyene waterhole; Timatoro windmill; Pumbe picket (Pienaar et al 1983).

Habitat and Ecology

Mostly found in pans and dams including those that are temporary, and more rarely in rivers although more

frequent in smaller rivers than some larger ones. Also found in swamps and even ponds around homesteads. Found in most habitats in the Transvaal with the exclusion of most of veld types 8, part of 48, 52, 57, 61 and 63, and all of 55 and 62. Found at altitudes ranging from 200-1600 m a.s.l. Well adapted to a life in water, it is almost equally at home on land, travelling great distances over land particularly during the rains or immediately thereafter (Stuart & Meakin, 1983). Some movement may also take place if the waterbody in which it resides, dries up. During this survey, terrapins were found even in cattle drinking troughs, from one of which escape was only possible if it was full of water, and another was several kilometres from the river and the area surrounding the trough completely open. However, the cold, dry periods are avoided by the animals burying themselves in the mud for periods of months. Stuart & Meakin (1983) mention that farmers maintain that these terrapins do not bury themselves in the mud of the dried out dams but move off and bury themselves in the soil below dense bush. Two specimens were collected during this survey under or among rocks away from water, one of which was on a kopje. Boycott & Bourquin (1988) summarised available knowledge on reproduction in the species. Growth is recorded by Stuart & Meakin (1983) ranging from 0,0 to 0,116 mm/day over periods ranging from 253-631 days. The greatest growth is found in juveniles while one large male exhibited no growth over the period of a year.

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Widespread in the Kruger National Park and also occurs in most provincial nature reserves. Status secure.

Genus *Pelusios* Wagler, 1830

Pelusios Wagler, 1830, *Nat. Syst. Amph.*, p. 137.
Type: *Pelusios subniger* (Lacépède).

A pan-african genus south of the Sahara. Easily recognised by the hinge across the plastron between the pectorals and abdominal shields. According to Pritchard (1979), this is the only living turtle genus in which mesially contiguous mesoplastral bones are present in the plastron. Pritchard (1979) briefly discusses the variation in the number of species recognised. From five (Wermuth & Mertens, 1961) to 10 (Pritchard, 1979), species are accepted, the difference being due to the weight given to different morphological characters by various authors. Broadley (1981b) reviewed the southern forms of the genus, using various morphological characters including the colour, of the head, neural pattern, shape of beak and plastron colour leading to the recognition of six species and two subspecies south of Latitude 8°S. Recently, Broadley (1981b) using neural pattern as a criterion was able to separate 10 species and six subspecies, giving new insight into species relationships. He advocated greater research on the less well known northern forms using neural pattern. Only four species occur in South Africa of which two occur in the Transvaal.

Key to the Transvaal species.

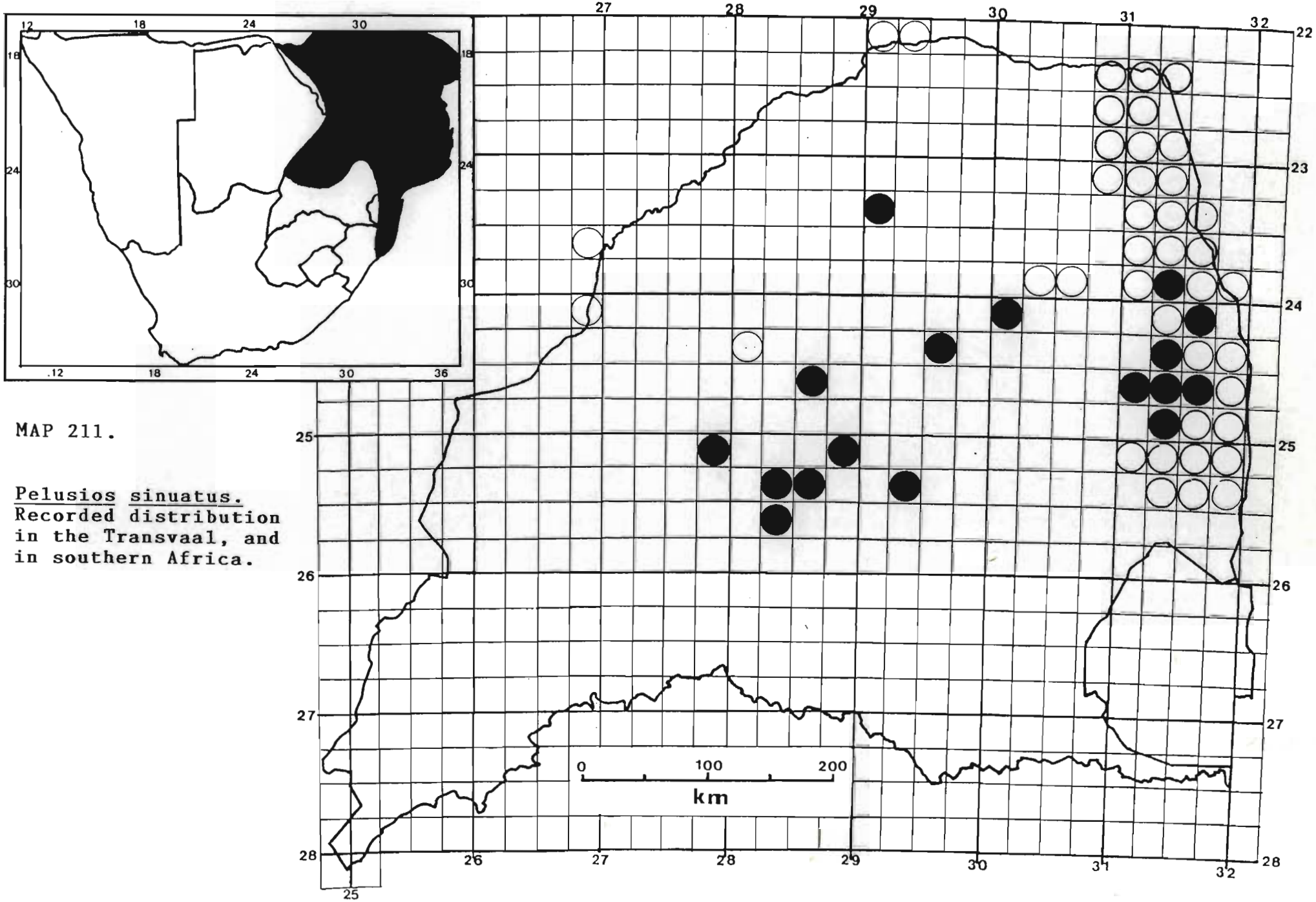
1. Carapace flattened and marginal scutes not upcurved or serrated. No auxillary scale between marginals and pectorals ..... *P. subniger*

Carapace ridged mesially, marginal
scutes posteriorly sinuate or serrated.
An auxillary scale present between
marginals and pectorals ..... P. sinuatus

Pelusios sinuatus (A. Smith, 1838)

Sternothaerus sinuatus A. Smith, 1838, Illus. Zool. S. Afr. Rept. pl. i. Type locality: Rivers to the north of 25° south latitude, restricted to the Crocodile/Marico Confluence, N. Transvaal by Broadley (1981).
Pelusios sinuatus (A. Smith). Wermuth & Mertens, 1961, p. 291 (part); Blake & Broadley 1974, p. 311; Jacobsen 1978, p. 19; Pienaar 1978, p. 217, pl. 99; Raw 1978, p. 289; Broadley & Black 1979, p. 5; Pritchard 1979, p. 762, fig.; Broadley 1981b, p. 675, pl. iv, fig. 15; 19, p. 162, fig. 2F-H; Auerbach 1987, p. 75, pl. 7, fig. 6 &7; Patterson & Bannister 1987, p. 17, fig. 5; Boycott & Bourquin 1988, p. 65, pls. 4-6 & 50; Branch 1988, p. 40, pl. 11.

Diagnosis. 35 Specimens examined.
Colour: Carapace dark olive-grey to blackish. Plastron yellowish with a well defined black triangular edging. In adults the plastron may be a shiny reddish-brown. In juveniles the dorsal colour is light to orange-brown with thin black rays radiating outwards from the centre of the shields. Head brown with irregular dark ocelli, blotches and particularly on the upper jaw streaks.
Lepidosis: The largest South African terrapin with a broad and flattened head. The beak is weakly bicuspid and two poorly developed barbels are under the chin. Carapace characterised by the serrate and upturned posterior marginals. Dorsal scutes comprised of 5



MAP 211.

Pelusios sinuatus.
Recorded distribution in the Transvaal, and in southern Africa.

vertebrals; 4 costals per side; 11 marginals per side and a divided supracaudal. The nuchal scale is absent. Plastron has a well developed hinge at the junction of the pectorals and abdominals. Gulars 2, separated by an elongated intergular; humerals 2; pectorals 2; abdominals 2; femorals 2 and a pair of anals. An auxillary shield is present.

Size: Boycott & Bourquin (1988) record a carapace length of 400,0 mm with a mass of up to 7 kg. Females are larger than males.

Distribution

Somalia south to Natal, west to Lake Tanganyika, Zambia, Zimbabwe and Transvaal.

Distribution in the Transvaal (Map 211).

Athol 238KU; Bochem 145LS; Chalons; Hangasine R. aff. Letaba. R.; Klaserie; Klipvoor 159JQ; Koedoespoort 325JR; Loskop Dam Nature Reserve; Malta 65KT; Manyeleti Game Reserve; Manyeleti Game Reserve, Buffelshoek 340KU; Manyeleti Game Reserve, Dixie Dam; Manyeleti Game Reserve, Hermitage; Manyeleti Game Reserve, Hermitage Dam; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Main Dam; Manyeleti Game Reserve, Mohlwareng Hill; Manyeleti Game Reserve, Sarabank 323KU; Naboomspruit 348KR; Nwanebi River, aff. Letaba R.; Ravenscourt 257KU; Rietfontein 214JR; Ross 55KU; Timbavati Nature Reserve; Vaalbank 163JR; Vlakplaats 535KS.

Literature Records

Crocodile river; Sabie river; Sand river; Olifants river; Letaba river; Luvuvhu river; permanent and

semi-permanent pools in the Nsikazi river, Mbyamiti river, Mlambane spruit, Bumi spruit, Orami spruit, Nwashitsaka spruit, Nwatimhiri spruit, Nhlowe spruit, Mtsawu spruit, Faaispruit, Mestel spruit, Mlondozi spruit, Nwatindlopfu spruit, Nwaswitsontso river, Nwanedzi and Sweni rivers, Timbavati and Shisakashangondzo rivers, Nhlarulumi river, Ngotsa spruit, Bangu spruit, Hlanganine spruit, Ngwenyene spruit; Makadze spruit, Tsende river, Shipikane spruit, Mbyashishe spruit; Klein Letaba river, Shingwedzi river, Nyavutsi spruit, Nshawu spruit, Dzombo spruit; Bubube river, Phugwane river, Mphongolo river, Shisha spruit and Mashikiri spruit; Hape pan; Klopperfontein dam; Phugwane dam; Tsange dam; Mala-mala waterhole; Tsutsi waterhole; Hartebeesfontein dam; Rabelais dam; Gudzane dam; W.N.L.A. and Nwanedzi dams; Ngotsa dam; Bangu dams; Shisakashangondzo dam; Ngwenyene dam; Airforce dam; Hutomi dam; Kumane dam; Mazite dam; Orpen dam; Mlondozi dam; Nwatindlopfu dam; Tswiriri dam; Mhlanganzwane dam; Orami dam; Panamana dam; Mlambane dam; Tlapa-la-mokwena dam; Mbyamiti dam; Nahpe dam; Manung dam; Folly dam; rock pool at Skukuza experimental plot No. 2 (the only locality where Pelomedusa subrufa was also found); windmill dam Mbyamiti causeway; Machai pan (Pienaar et al 1983).

Habitat and Ecology

Mainly found along the major streams and rivers pertaining to the Limpopo drainage system, incorporating all north and east flowing rivers between 200-1500 m a.s.l. Also dams and pools, one even residing in a swimming pool in the lowveld. Usually observed sunning themselves on rocks and logs along rivers. Will also emerge along the banks and even cross roads when moving

between more permanent pools. There is no evidence to suggest that they hibernate during winter but this may take place at higher altitudes in areas where water availability is seasonally reduced. Boycott & Bourquin (1988) give an account of the food and feeding, reproduction and enemies of the species.

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Occurs along all major rivers in the Kruger National Park. Also occurs in a few provincial nature reserves. Status secure.

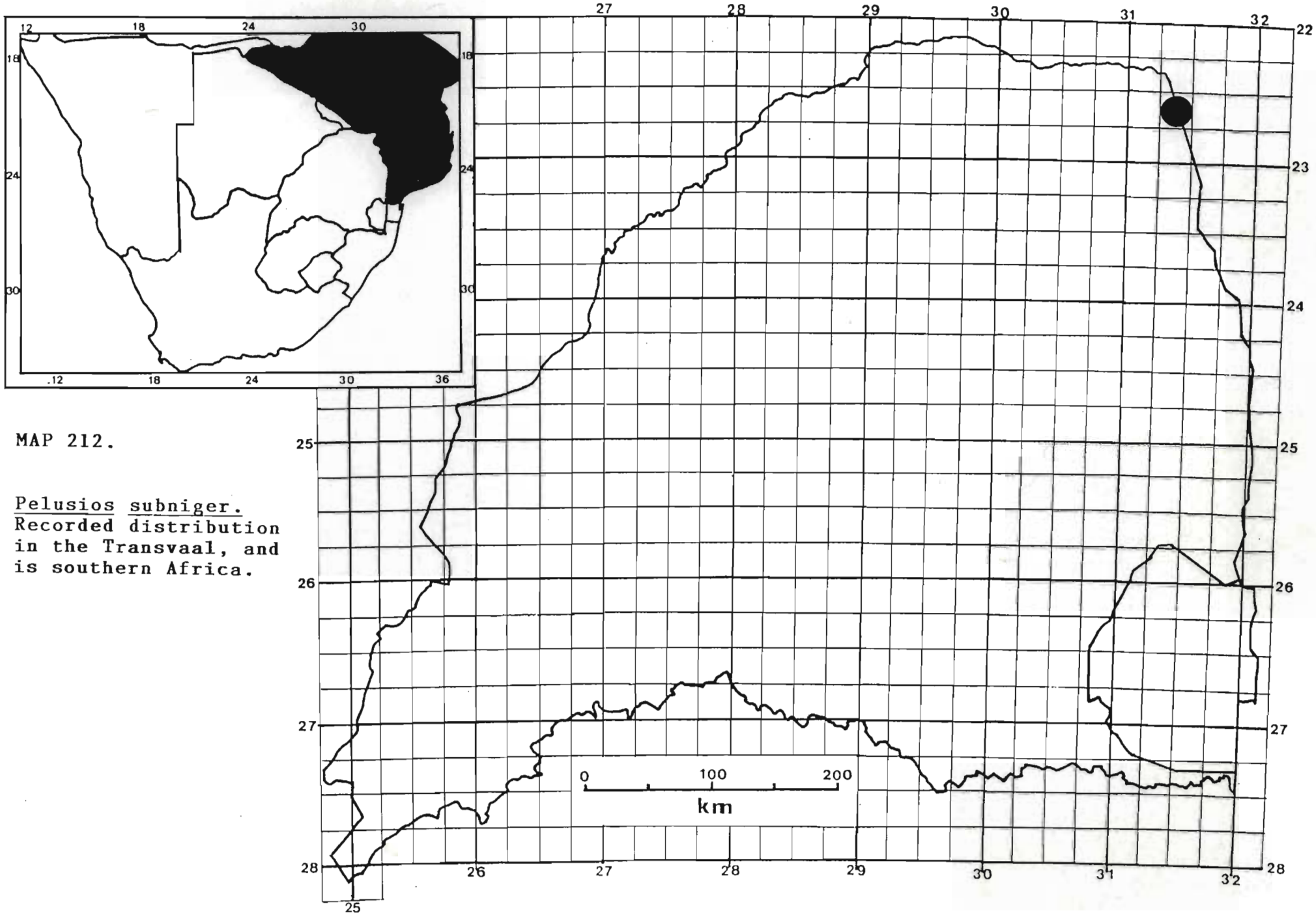
Remarks

Broadley (1981b) discussed the neural patterns in Pelusios, finding it a useful diagnostic technique on a specific level within the Pelomedusidae.

Pelusios subniger (Lacépède, 1789)

Testudo subnigra Lacépède 1789, Hist. nat. Quadrap. ovip. Serpens, 2; Synops méthod; p. 175, fig. 13. Type locality: Toamasina (= Tamatave), Madagascar (Bour 1979).

Pelusios subniger (Lacépède). Wermuth & Mertens 1961, p. 291 (part); Laurent 1965, p. 28; Blake & Broadley 1974, p. 314; 1979, p. 5; Broadley 1981b, p. 661, fig. 11, 19 p. 161, fig. 1F; Raw 1978, p. 287; Pritchard 1979, p. 765; Auerbach 1987, p. 73, pl. 7 fig. 3; Pienaar et al 1983, p. 26, pl. 4; Boycott & Bourquin 1988, p. 63, pl. 3; Branch 1988a, p. 40, pl. 11, 1988b, p. 5.



MAP 212.

<u>Pelusios subniger.</u>
Recorded distribution in the Transvaal, and is southern Africa.

Diagnosis. 1 Specimen examined.

Colour: (After Pienaar et al, 1983). Brown to reddish-brown. Marginal scales have yellow centres and dark-brown margins. Plastron shields yellow mesially becoming brown towards the sutures. Anal and gular shields more uniformly dark coloured. Head uniformly brown with or without black spots.

Lepidosis: A small terrapin with an oval carapace in males and subcircular in females. Vertebral scutes not keeled. Dorsal shields composed of 5 vertebrals, 4 costals per side and 11 marginals per side. Supracaudal divided and nuchal absent. Plastron with a well developed hinge. Plastral shields comprised of a pair of gulars, separated by an intergular. Humerals 2, pectorals 2, abdominals 2, femorals 2 and a pair of anal scutes. The auxillary shield is absent.

Size: According to Broadley (1981) maximum carapace length is 200,0 mm.

Distribution

Burundi and Tanzania to southern Mozambique and west to Zaire, Zambia, Zimbabwe, northern Botswana and the north-eastern Transvaal. Also Madagascar, Gloriosa and Seychelles Islands, (Broadley 1981b).

Distribution in the Transvaal (Map 212).

Nwambiya pan

Literature Records

Broadley (1981) refers to a Pretoria specimen TM 4803 originating from the National Zoological Gardens which he discarded as being doubtful. Shirombe; Mahlakuza pan (Pienaar et al, 1983).

Habitat and Ecology

The species inhabits a series of ephemeral pans in the sandveld of the northern Kruger National Park in veld type 15 at an altitude of 200 m a.s.l. More detail is supplied by Pienaar et al (1983) and Boycott & Bourquin (1988).

Conservation Status

Protected, Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Only known distribution in the Transvaal is in the Kruger National Park. Population estimates needed to determine status, but likely to be secure.

Class : Reptilia
Order : Crocodylia
Suborder: Eusuchia
Family : CROCODYLIDAE

Genus Crocodylus Laurenti

Crocodylus Laurenti, 1768, Syn. Rept., p. 53. Type by subsequent designation by Stejneger & Barbour (1917): C. iloticus Laurenti = Lacerta crocodilus Linnaeus (part).

A widespread genus characterised by a moderate to elongated snout, much longer than broad. Nasal passages not divided by a septum. Upper eyelid partially bony and rough. Iris green to yellowish. Median dorsal scutes strongly keeled. Twelve species are found in Africa, Asia, Australia and Central America. Only one species occurs in South Africa and that mainly in the Transvaal.

Crocodylus niloticus Laurenti, 1768

Crocodylus niloticus Laurenti (part), 1768, Syn. Rept., p. 53. Type locality: "India orientali et Aegypto" = India and Egypt. Wermuth & Mertens 1961, p. 364, fig. 259; Broadley 1966, p. 93; Pienaar 1966, p. 121, pl. 48; 1978, p. 207, pl. 95; Pienaar et al 1983, p. 225, pls. 102, 102A & 102B; Auerbach 1987, p. 78, pl. 7, fig. 8; Jacobsen 1984, p. 191; Branch 1988a, p. 215, pl. 96, 1988b, p.5.

Diagnosis. No specimens examined.
Colour: Adults dark olive green to olive grey with darker markings. Ventrally pale yellow to yellow. Juveniles much brighter being greenish with irregular blackish markings over the back and sides and tail. Eye

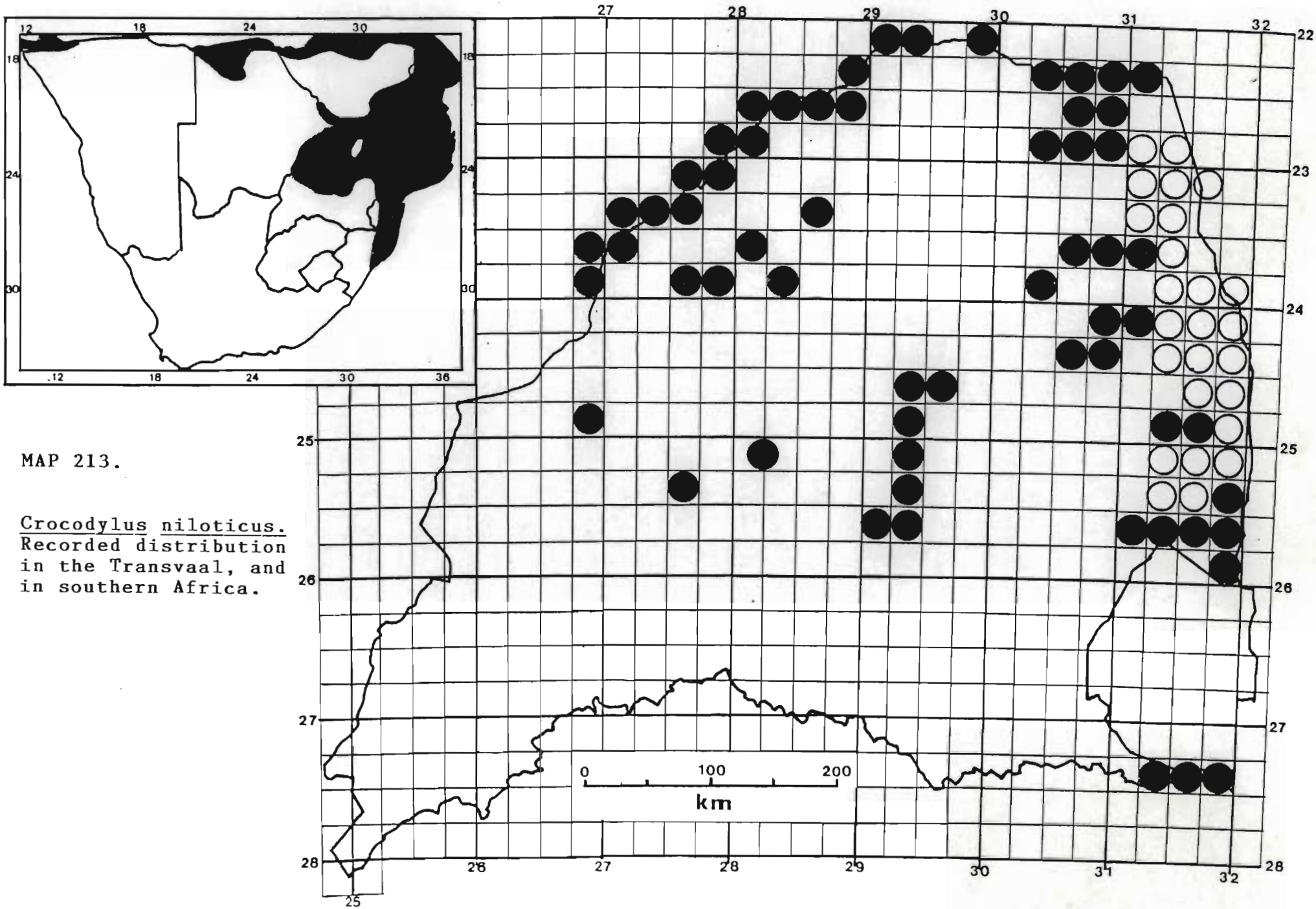
yellowish while inside of mouth yellow to orange yellow.
Lepidosis: Large lizard-like reptiles with nostrils situated on top of snout near the tip. Eyes with vertical pupil and eyebrows forming raised ridges. Dorsum of animal covered in ridged transverse osteodermal rows. Ventrally scales squarish and flat. Tail with two rows of raised flattened scutes proximally which merge to form a single middorsal row posteriorly. Forelimbs with five free digits, 1st very reduced; hindlimbs stout with five digits fully webbed.
Size: Possibly up to six metres. The largest specimen measured in the Transvaal being 5,49 m. Hatchlings measure 250-300 mm in length. On a recent aerial survey 32% of crocodiles in the Transvaal outside the Kruger National Park were estimated to be under a metre in length; 31% between 1-2 metres; 16,6% between 2-3 m and only 2,1% may exceed 3 m (Jacobsen, 1984).

Distribution

Africa south of the Sahara except the arid south west. The southern limit on the east coast is the Tugela river although occurring further south to the eastern Cape Province in living memory. Also known to have occurred in the Tibesti and Ahagger mountains in the central Sahara and up the Nile to Egypt. Also on Madagascar.

Distribution in the Transvaal (Map 213).

Most rivers contributing to the Limpopo drainage system although only sporadic in many.



MAP 213.

Crocodylus niloticus. Recorded distribution in the Transvaal, and in southern Africa.

Literature Records

Crocodile river; Sabie river; Sand river; Olifants river; Letaba river; Luvuvhu river; waterholes of a permanent nature in the Faai spruit, Nsikazi river, Mbyamiti spruit, Nwatimhiri spruit, Nhlowe spruit, Bumi spruit, Orami spruit, Mlondozi spruit, Munweni spruit, Nwaswitsontso river, Nwanedzi and Sweni rivers, Timbavati and Shisakashangondzo rivers, Nhlaralumi spruit, Nyamene spruit, Hlangene spruit, Ngotsa spruit, Bangu spruit, Hlanganini spruit, Ngwenyene spruit, Shipikane spruit, Mbyashishe and Klein Letaba rivers, Tsende river, Makadze spruit, Shingwedzi river, Bububa river, Phugwane river, Mphongolo river, Shisha river, Madzaringwe river and Nyavutsi spruit; Mhlanganzwane dam; Mbyamiti dam, Mbyamiti causeway dam; Nwatindlopfu dam; Airforce dam; Hutomi dam; Orpen dam; Mazite dam; Kumane dam; Ngwenyene dam; Ngumula pan; Sweni windmill; Nwanedzi and W.N.L.A. dams; Gudzane dam; Hartebeesfontein dam; Rabelais dam; Bangu dams; Shisakashangondzo dam; Tsange dam; Phugwane dam; Matukwane dam; Shabarumbe pan; Hape pan; Mahembane windmill and Shalungwa spring (Pienaar et al 1983).

Habitat and Ecology

Mostly restricted in the Transvaal to the major north and east flowing rivers, inhabiting permanent pools and even dams some distance away. Found in the northern and eastern Transvaal at altitudes of 200-1400 m a.s.l. Although mostly associated with large waterbodies these animals will travel far upstream, frequently males to attempt to find suitable habitat. Will also travel extensive distances overland, hence the colonisation of many farm dams in the lowveld. Various authors (Pienaar

et al, 1983, Cott 1961, Branch 1988) have reported on the ecology, feeding habits and reproduction in Crocodylus niloticus. Egg-laying in the Transvaal takes place during November.

Conservation Status

Protected. Schedule 2, Transvaal Nature Conservation Ordinance 12 of 1983. Occurs widespread in the Kruger National Park and marginally in one or two provincial nature reserves. Although currently secure in the KNP, the fact that all rivers flowing to the park have their origins on the highveld or in well settled areas results in pollution and decreased flow. A reduction in crocodile numbers in the Loskop dam nature reserve is cause for concern and should be monitored for mortality and levels of pesticides in the tissues. Vulnerable in the Transvaal. More adequate protective measures needed.

Remarks

A recent aerial survey of crocodiles in the Transvaal (Jacobsen, 1984) indicated that, with the exception of one breeding population in the central Transvaal, all others were found to be peripheral. The ever-increasing usage of rivers by man has led to a dramatic reduction in water availability for the maintainance of river flow and function. This is likely to continue in the future, with less and less water becoming available at the periphery of the province, which will lead to a further reduction in the range of the crocodile in South Africa.

CHAPTER 5
AMPHIBIA

Family PIPIDAE

Genus *Xenopus* Wagler, 1827

Xenopus Wagler, 1827, *Isis von Oken*, 20, col. 726. Type by monotypy: *Xenopus boiei* Wagler = *Bufo laevis* Daudin.

The genus is characterised by having the toes fully webbed, with the inner three clawed. A series of stitch-like rows dorsolaterally indicate the neuromast or lateral line sense organs. The tympanum is lacking and a variable subocular tentacle is present. Widespread in Africa south of the Sahara, most species are found in tropical Africa, only two taxa accurring in the Transvaal.

Key to the Transvaal species.

1. Subocular tentacle at least half orbital diameter ..... *X. muelleri*
   Subocular tentacle less than half orbital diameter ..... *X. laevis laevis*

Xenopus laevis laevis (Daudin, 1802)

Bufo laevis Daudin, 1802, *Hist. Nat. Rainettes*, p. 85, pl. 30, fig. 1. No type locality.
Xenopus laevis (Daudin). Wager, 1965, p. 92, figs.; Van Dijk 1966, p. 255; Frost 1985, p. 428; Wager, 1986, p. 52, figs.
Xenopus laevis laevis (Daudin). Poynton, 1964, p. 30, fig. 3; Broadley 1966c, p. 465; Passmore & Carruthers 1979, p. 44, figs; De Waal 1980, p. 95; Poynton & Broadley 1985a, p. 507; Loumont 1984, p. 725; Auerbach 1987, p. 31, pl. 4, fig. 1; Lambiris 1988, p. 67; Branch 1988b, p. 2.

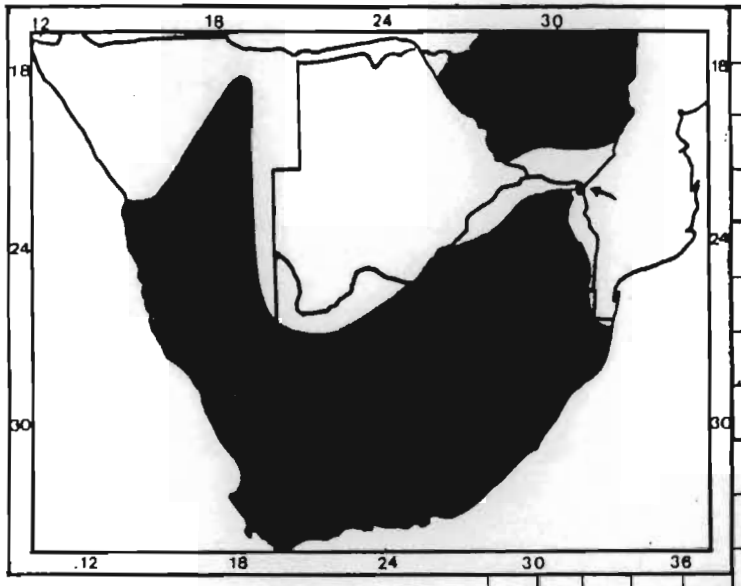
Diagnosis. 137 Specimens examined.
Colour: Pale olive grey to brown or even olive above with irregular brown to grey brown or olive-grey blotches. Ventrally immaculate white or yellow, or variably mottled or spotted with grey.
Morphology: Largest SVL = 95,5 mm (J6605 - Buffelsfontein 443IP), mass = 88,5 g (J6605). Head small and body robust. Hindlimbs well developed with feet extensively webbed and strong claws on inner three toes. Inner metatarsal tubercle raised into a narrow ridge. Forelimbs reduced and pentadactyle with slender non webbed fingers. Length of subocular tentacle much less than half diameter of eye. Width of nostril divided by internarial space is mostly equal to or greater than 0,8 but sometimes less.

Distribution

Widespread in southern Africa from the southern Cape Province to Zimbabwe and adjacent high lying Mozambique. Also isolated populations in south-eastern Botswana and South West Africa/Namibia. Relict populations occur in Malawi and on Inhaca island (Poynton & Broadley, 1985a).

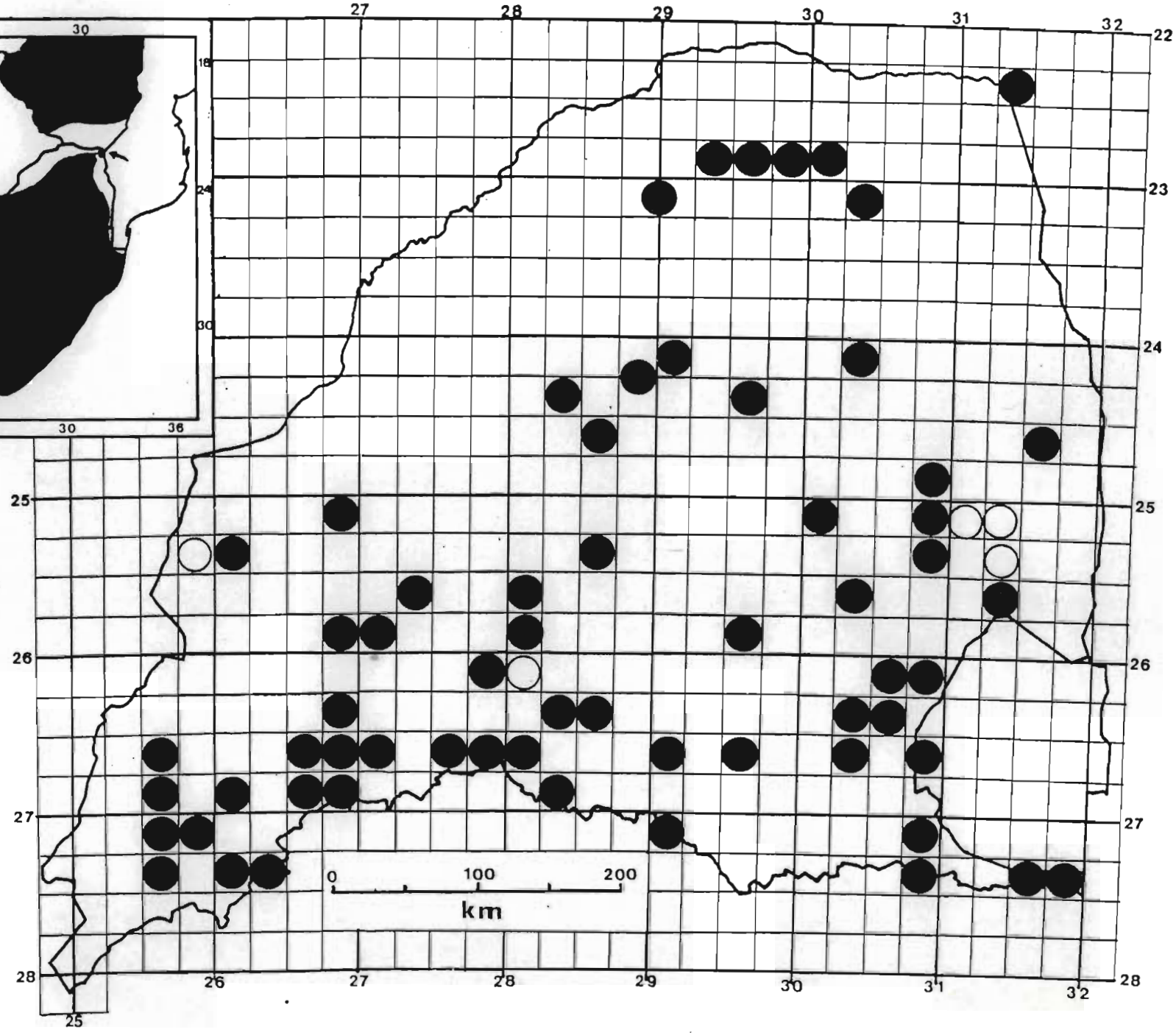
Distribution in the Transvaal (Map 214).

Barberspan Nature Reserve; Beerlaagte 494IR; Bendor 211HT; Blouberg; Blyde River Nature Reserve; Boschpoort 284JQ; Buffelsfontein 443IP; Caledonia 97IT; Carolina District, Komati River; Carpediem 76KT; Doornfontein 345IP; Eersteling 63HP; Elandsfontein 366JQ; Glaudina; Graskop; Heidelbergkloof; Kaalfontein 212IP; Kafferskraal 400IP; Koster; Kromdraai 325IS; Kromdraai 486JS; Kromdraai 520JQ; Langzeekoegat 325IR; Leek 769MS; Lochiel 192IT;



MAP 214.

<u>Xenopus laevis laevis.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Lochleven 233IT; M'Pefu 202MT; Makapansgat 39KS; Manyeleti Game Reserve, Main Camp; Mezeg 77JP; Moorddrift 289KR; Naauwpoort 441KS; Naudes Rust 272JU; Nelspruit; Nelspruit, Steiltes; Nerston 401IT; Normandie 178HT; Nylsvley Nature Reserve; Pafuri; Parkfield 725MS; Percy Fyfe Nature Reserve; Pittville 197IT; Pongola 61HU; Pongola Nature Reserve; Potberg 30HS; Potchefstroom; Pretoria, Iscor; Pretoria, Waterkloof; Pretoria, Wonderboom South; Ratelhoek 158KR; Rhenosterfontein 563IQ; Rietfontein 214JR; Rietkuil 186HO; Rietspruit 91KQ; Rietvlei 375JT; Roodekrans 457IS; Roodewal 364IO; Ruighoek 169JP; Rustenburg District, Zandfontein; Sabie; Sheepmoor; Shilowane; Suikerbosrand Nature Reserve; Syfergat 56HP; Tshakhuma; Vaalboschfontein 188HO; Wanhoop 78JT; Waterval Boven; Witfontein 306IP; Witrand 457JP; Witrandsfontein 348IP; Zoutpan 459MS.

Literature Records

Linokana; Potgietersrus; Pietersburg dist.; Johannesburg; Pretoriuskop (Poynton 1964). Folly dam; Shabeni fountain (KNP Records).

Habitat and Ecology

Entirely aquatic although the species has been observed crossing areas of land during showers in Zimbabwe (pers. obs.). Lambiris (1988a) observed such movements for distances up to 1 km. Large scale movements were recorded by Hewitt & Power (1913) which were associated with the drying up of their habitat. On the farm Vaalboschfontein 188HO, 10 laevis were captured during March in wire traps set approximately 200 m from the nearest water. Usually associated with still open bodies

of water such as pans, dams and pools along streams and rivers. Man-made impoundments and storage tanks have benefitted these amphibians tremendously. Usually observed floating or resting on the bottom in shallow water. If disturbed, take refuge under stones or rocks, rotting vegetation and in the mud on the floor of the pool. Will consume almost anything smaller than itself including insects and flesh of carcasses. They breed during the summer months laying several thousand eggs, the tadpoles aggregating into swarms.

Conservation Status

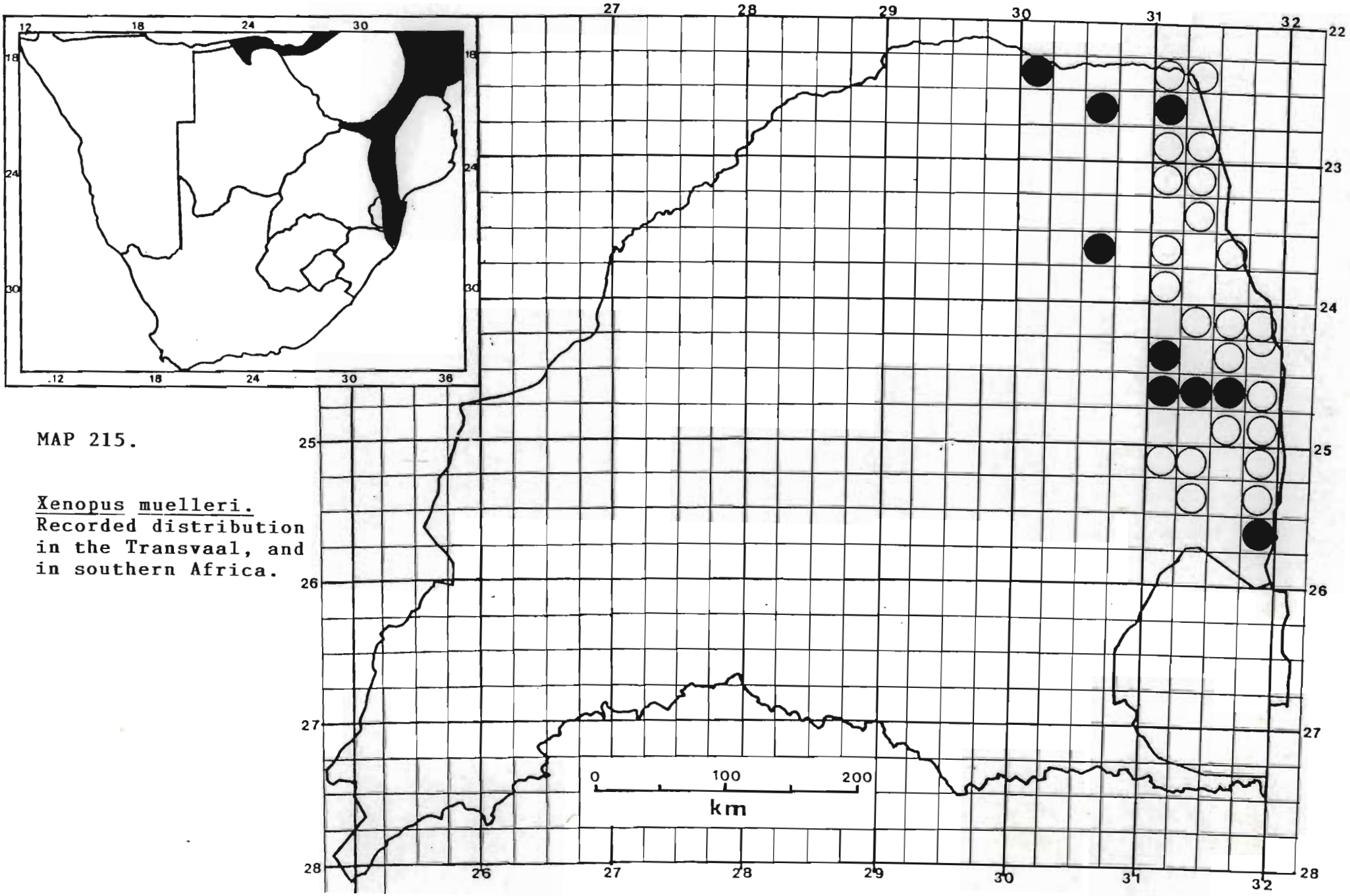
Unprotected, with control only on removal of animals from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). Although used extensively in teaching courses and for research at Universities, many institutes are breeding these animals to ensure a constant supply. Some biological supply houses have also entered into this market. The species is on the increase over most of its range.

Remarks

The great degree of variation in ventral coloration makes diagnosis of this character difficult to appply.

Xenopus muelleri (Peters, 1844)

Dactylethra muelleri Peters, 1844, *Monatsb. Akad. Wiss. Berlin*, p. 37. Type locality: Mozambique (restricted to Tete, Zambesi by Loveridge 1953).
Xenopus muelleri (Peters). Poynton 1964, p. 33, fig. 4, 1982, p. 67; Broadley 1966, p. 467; Wager 1965, p. 97,



MAP 215.

Xenopus muelleri.
Recorded distribution in the Transvaal, and in southern Africa.

figs.; Van Dijk 1966, p. 252; Stuckenberg 1969, p. 152; Passmore & Carruthers 1979, p. 46, figs,; Loument 1984, p. 725; Frost 1985, p. 429; Wager 1986, p. 53, figs.; Poynton & Broadley, 1985, p. 51; Auerbach 1987, p. 32, pl. 4, fig. 2; Lambiris 1988, p. 70; Branch 1988b, p. 2.

Diagnosis. 32 Specimens examined.
Colour: Dorsally olive to olive-brown or even yellow brown with irregular and variable dark olive blotches. Webbing between toes translucent yellowish. Ventrally creamy-white to yellow, the latter more pronounced on the thighs, and variably spotted with grey.
Morphology: Largest SVL = 82,0 mm (JN 38 - Klein Tshipise), mass = 48,6 g (JN38). Mean male SVL (>50,0 mm) = 56,75 ± 8,13 (1SD), n = 2, mass = 20,2 g ± 4,67 (1SD), n = 2; Mean female SVL (>50,0 mm) = 70,5 mm ± 6,86 (1SD), n = 9, mass = 31,03 g ± 9,60 (1SD), n = 9. Not as large as laevis. Head small with a robust, depressed body and well developed hindlimbs. Toes fully webbed, and inner three strongly clawed. Inner metarsal tubercle papillate. Forelimbs reduced, digits free and pointed. Subocular tentacle greater in length than half diameter of eye.

Distribution

Sudan south to the Transvaal lowveld, Swaziland and KwaZulu west to northern Botswana, Ghana and Upper Volta.

Distribution in the Transvaal (Map 215).

Andover 210KU, Doreen 108MT; Dzundwini Waterhole; Hans Merensky Nature Reserve; Helena 400JU; Klein Tshipise; Manyeleti Game Reserve; Manyeleti Game Reserve, Hermitage Dam; Manyeleti Game Reserve, Main Camp;

Manyeleti Game Reserve, Sarabank 323KU; Newington, 12 kms. N. of; Rolle 235KU; Ross 55KU; Tshidzi Hill.

Literature Records

Bangu Gorge; Bobomeni; Dick; Lipape Dam; Maseya fountain; Nwambiya Windmill; Nwarihlangari; Fayi Roan Camp; Ranuti Pan; Sand river, 1 km above bridge; Shantangalani Waterhole; Swartkops windmill (KNP Records). Pafuri (Poynton, 1964). Makalali, Selati R., (NMZB).

Habitat and Ecology

Restricted to altitudes below 600 m a.s.l. in veld types 8, 9, 10, 11, 15 and 19 occupying pans, streams and dams including those of cement. At Klein Tshipise, individuals were observed lying still at the edge of the dam with their heads above water. Often found in groups of 3 to 6 individuals. Little is known of their breeding habits, however all females (8) collected at Klein Tshipise during October were filled with ova indicating a degree of synchronisation of reproductive effort.

Conservation Status

Unprotected, legislation aimed at controlling the exportation of animals from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). Although restricted in distribution to the lowveld of the Transvaal it is secure. The possible encroachment of X. l. laevis on its habitat through human intervention may become a problem. Currently considered secure and widespread in the Kruger National Park as well as in some provincial nature reserves.

Remarks

Occurs parapatrically with *laevis* in the Manyeleti Game Reserve and at Pafuri. As hybrids have been recorded these populations should be monitored. Further translocations of *laevis* into traditional *muelleri* habitat should be prevented.

Family HELEOPHRYNIDAE

Genus *Heleophryne* Sclater, 1899

Heleophryne Sclater 1899, *Ann. S. Afr. Mus.* 1, p. 110. Type by monotypy: *H. purcelli* Sclater.

Characterised by a vertical pupil, maxillary teeth and a discoidal tongue. A well developed glandular fold or ridge extends from the posterior margin of the eye down to the shoulder. The tips of the fingers and toes terminate in expanded discs. The fingers are free of webbing but the toes are extensively webbed. In breeding males, elongate nuptial pads bearing well-developed spines occur at varying sites along the forelimbs.
These amphibians are restricted to areas of deep shade, swift flowing streams with rocky or stony bottoms, usually in kloofs or ravines. The adults are secretive usually being found in crevices or under stones, but more out in the open at night. The tadpoles with their wide suckerlike mouthparts are torrent adapted, clinging to rocks in swiftly flowing streams. Endemic to South Africa, five species occur along the eastern and southern mountain ranges of which one species, *H. natalensis* Hewitt, occurs in the Transvaal.

Heleophryne natalensis Hewitt, 1913

Heleophryne natalensis Hewitt, 1913, *Ann. Natal Mus.* 2 p. 477, pl. 34, figs. 1, 3, 5-7. Type locality: "A tributary of the Krantzkloof River". Poynton 1964 p. 41, fig. 8; Wager 1965, p. 99, figs.; Van Dijk 1966, p. 255; 1977, p. 174; Passmore & Carruthers, 1979, p. 56, figs.; Frost 1985, p. 108; Wager 1986, p. 134, figs.; Lambiris, 1988, p. 75; Branch 1988b, p. 2.

Diagnosis. 33 Specimens examined.

Colour: Dorsally purplish brown with irregular, variable yellow to greenish spots, blotches or speckles. Ventrally whitish with the underside of the limbs dark brown.

Morphology: Largest SVL = 69,0 mm (Lambiris 1988). Head well developed and broad with raised eyelids. Tibiotarsal articulation of adpressed hindlimb not reaching beyond the eye. Tips of fingers and toes expanded into slightly rounded dises but not markedly flattened. Outer metacarpal tubercle oval, inner metacarpal tubercle oval to slightly rounded. 2½ to 3 (usually) phalanges of fourth toe and 1 to 1½ phalanges of fifth toe free of web (Poynton, 1964).

Distribution

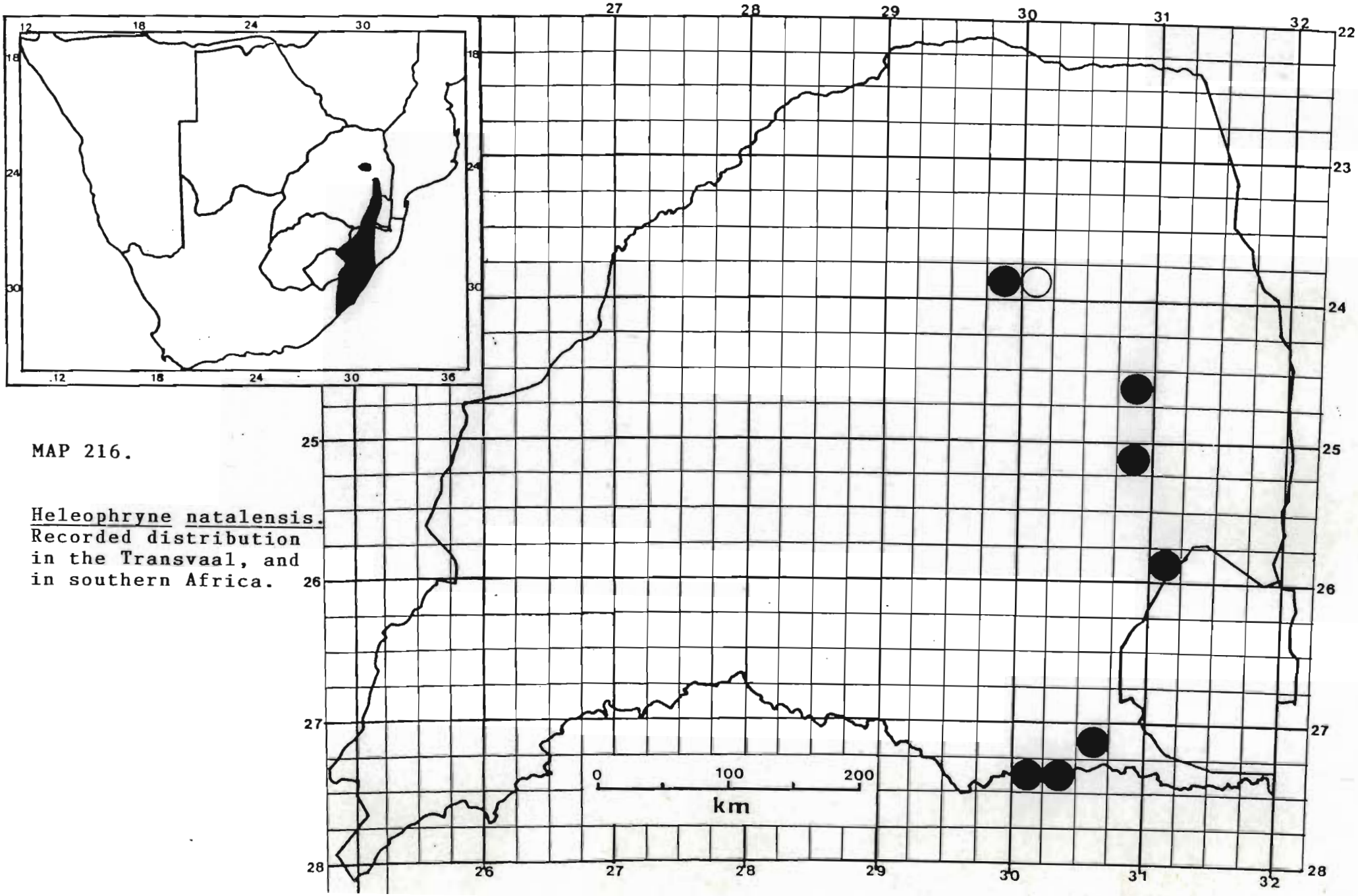
Restricted to southern and central Natal and the eastern Transvaal. Its occurrence in western Swaziland is yet to be confirmed.

Distribution in the Transvaal (Map 216).

Barberton Townlands 369JU; Haenertsburg; Kastrolnek, Wakkerstroom; Magalieskop; Mariepskop; Mariepskop & Magalieskop, between; Paardeplaats 101HT, Ntombe Forest; Sabie; Woodbush.

Literature Records

Horo forest; nr. Wakkerstroom (Poynton, 1964); Magoebaskloof (Inger, 1959 in Poynton, 1964).



MAP 216.

Heleophryne natalensis. Recorded distribution in the Transvaal, and in southern Africa.

Habitat and Ecology

In the Transvaal, natalensis is a medium altitude species occurring only in montane forest zones in veld types 8 and 9 at altitudes of 1500-1800 m a.s.l. Confined to cold fast-flowing mountain streams with a dense vegetation cover usually associated with dark ravines and kloofs. The tadpoles require a clear stream with numerous rocks and boulders under which they shelter, and feed on algae growing on the rocks. Tadpoles have been recorded in November and February.

Conservation Status

Unprotected, restrictions existing only in the export of animals from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). The species shows a sporadic distribution pattern in keeping with the limited habitat available. Afforestation may in parts have affected the distribution of the species. The species is vulnerable although occurring in a provincial nature reserve. The difficulties of establishing population densities are great but should receive attention.

Remarks

Boycott (in litt.) has recently completed a survey of natalensis in the Transvaal which it is hoped will clarify the position of this secretive species. Lambiris (1988) has shown the relative morphological homogeneity of natalensis which can be extrapolated to include Transvaal material. This aspect needs further attention.

Family BUFONIDAE

Genus *Bufo* Laurenti, 1768

Bufo Laurenti, 1768, *Synops. Rept.* p. 25. Type by tautonomy: *B. vulgaris* Laurenti = *Rana bufo* Linnaeus.

The genus is typified by the presence of parotid glands, a horizontal pupil and the lack of teeth. The tongue is well developed and elongate. Toads are stout with short slender to stocky limbs. The skin is dry and usually with a rugose dorsum. Sexual dimorphism is present in the breeding season with males developing pigmented gular regions and modified nuptual pads on the thumbs.
Usually inhabitants of open drier country, they are resistent to dessication. These animals are largely nocturnal, emerging under conditions, when other amphibians remain in shelter. Seasonal movements take place to and from water associated with reproduction. Females are prolific, laying up to 20 000 ova which may be entangled around aquatic vegetation in shallow water. The taxonomy of southern African *Bufo* is in need of revision. *B. fenoulheti* and *B. vertebralis* were examined by Grandison (in litt) but the work has not progressed owing to her retirement. Confusion still occurs in separating *B. pardalis* and *B. rangeri*, while the validity of *B. maculatus/pusillus* needs to be ascertained. Some *"maculatus"* tend towards *"gutturalis"* while *B. garmani* may be a complex of species. Lambiris (1988) refers to three forms in Natal, while in the Transvaal two forms appear apparent. Further north in Botswana and South West Africa further complexities are found including the description of a new *Bufo*, *B. pseudogarmani* (Hulselmans, 1969) although Channing (1972a) showed the contrary, indicating that *pseudogarmani* is a synonym of *garmani*.

Poynton & Broadley (1988) have pointed out the current state of the art, indicating avenues for further research which hopefully will resolve many of the problems currently experienced. The genus is widespread in Africa, Asia, Europe and North and South America. Ten species occur in South Africa of which seven occur in the Transvaal.

Key to the Transvaal species.

1. Tarsal fold present 2
   Tarsal fold absent 6

2. Throat not as granular as lower abdomen ..... B. gariepensis nubicolus
   Throat as granular as lower abdomen 3

3. A light cross on the head formed by interocular bar and a median line present 4
   No light cross on top of head 5

4. Parotid glands prominent and not partly obscured by dark tip warts ..... B. gutturalis
   Parotid glands not raised and almost totally obscured by dark-tipped warts ..... B. maculatus

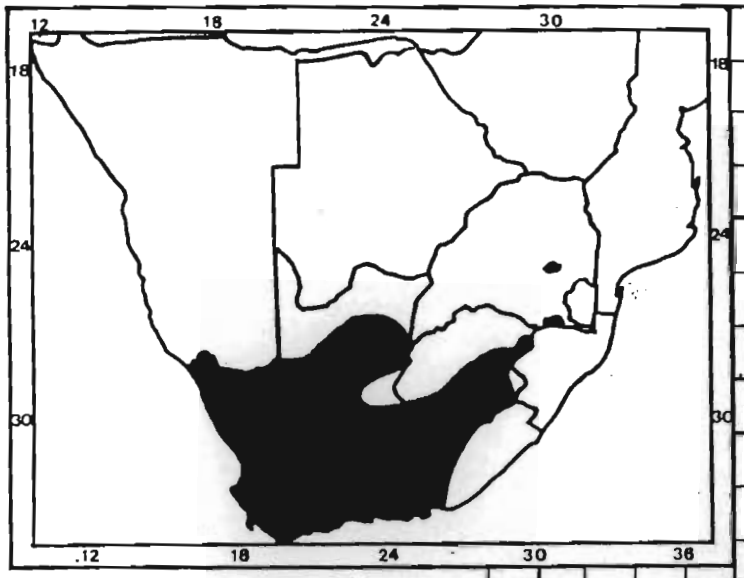
5. Dark interocular bar divided; red infusions frequently present on upper thighs and inguinal region ..... B. garmani
   Dark interocular bar usually not divided but may be medianly constricted. No red infusions on the upper thighs or inguinal area ..... B. rangeri

6. Chest and belly not or poorly marked ..... B. fenoulheti
   Chest and belly strongly blotched or
   spotted with blue grey ..... B. vertebralis

Bufo gariepensis nubicolus Hewitt, 1927

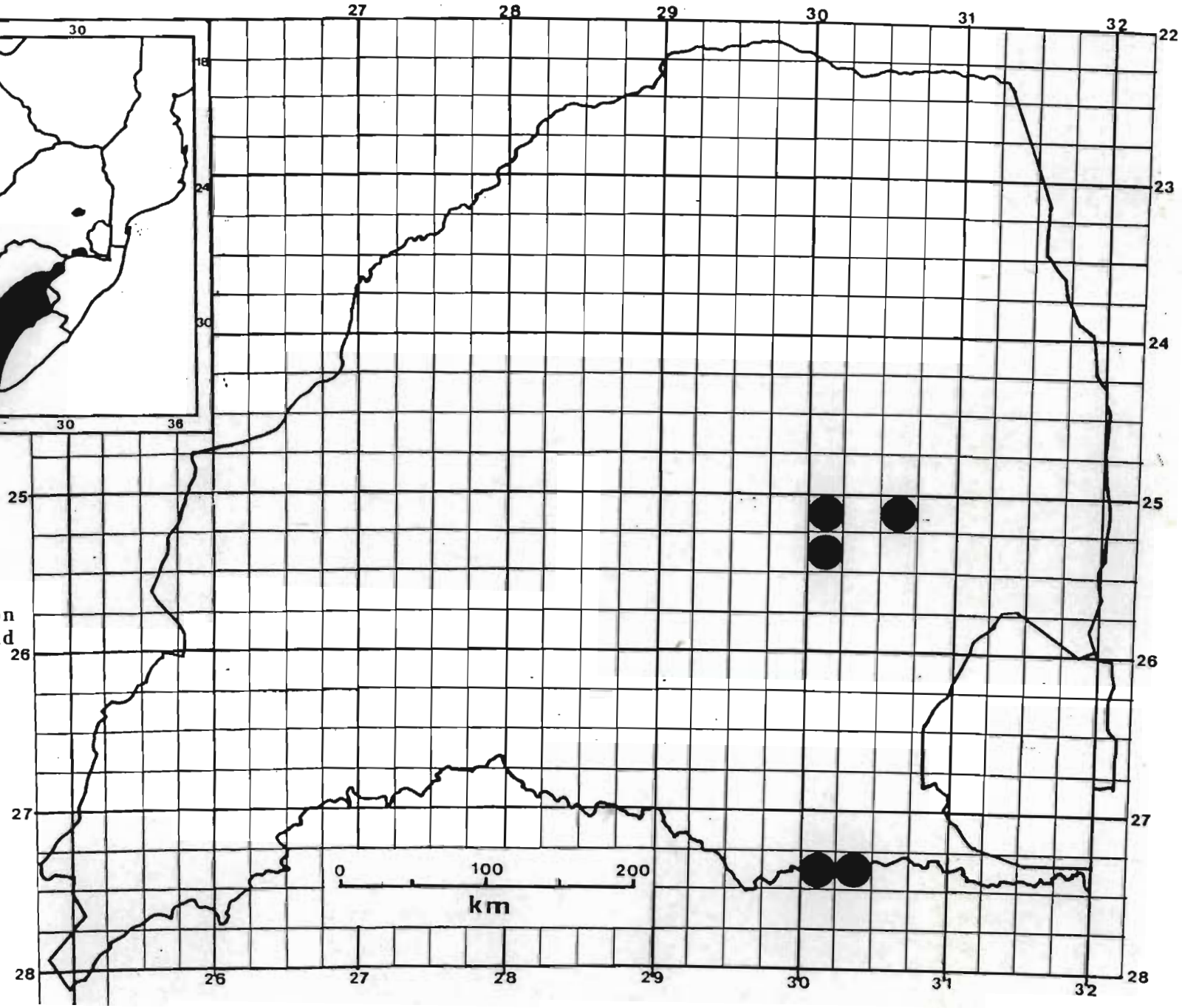
Bufo gariepensis nubicola Hewitt, 1927, Rec. Albany Mus., 3: 412, pl. 24, fig. 5. Type locality: Summit of Mont-aux-Sources.
Bufo gariepensis nubicolus Hewitt. Poynton 1964, p. 48, fig. 13; Wager 1965, p. 113, figs; Passmore & Carruthers 1979, p. 64, fig; Wager 1986, p. 62, figs; Lambiris 1988, p. 84; Poynton & Broadley 1988, p. 465; Branch 1988b, p. 2.

Diagnosis. 27 Specimens examined.
Colour: Yellow- to olive-brown in ground colour irregularly and variably blotched with dark brown. The ventrum is off-white with many specimens showing blue grey spotting, this not restricted to juveniles only.
Morphology: Largest male SVL = 45,0 mm (J6837 - Wanhoop 78JT), mass = 7,7 g (J6837); Largest female SVL = 46,0 mm (N9438 - Buitenzorg 114HT), mass = 10,2 g (N9438). Mean SVL (>20,0 mm) = 37,84 mm ± 5,80 (1SD), n = 22. Small toads somewhat depressed with a broad head. Body warts less pronounced than those of Beaufort West, Cape Province (Passmore & Carruthers, 1979). Pupillary umbraculum present. Tympanum well developed but camouflaged. Parotid glands variable, from well developed but narrow and not obscured to slightly raised and camouflaged as to virtually indistinguishable. Skin with scattered rounded warts, larger and most pronounced dorsolaterally; a continuous glandular ridge is found under the forearm. Subarticular tubercles of fingers single. Length of outer metatassal greater than or more rarely equal to half the length of the inner.



MAP 217.

<u>Bufo gariepensis nubicolus.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Distribution

Most of the Cape Province to the south-eastern Transvaal.

Distribution in the Transvaal (Map 217).

Buitenzorg 114HT; De Kuilen 205JT; Kastrolnek, Wakkerstroom; Long Tom Pass; Paardeplaats 154JT; Tafelkop 126HT; Wakkerstroom; Wanhoop 78JT.

Habitat and Ecology

In the Transvaal this species is a high altitude montane grassland species occurring in veld types 8, 57 and 63 at 1800-2300 m a.s.l. Usually found under rocks on soil but also takes refuge in burrows of other animals or even in holes in earthbanks such as at quarries. Appears to require similar habitats to that of inyangae.

Conservation Status

Unprotected, there being only control in the export of live animals from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). The species has a very limited area of distribution in the Transvaal, some of which has been modified for agricultural purposes. The species is currently secure but agriculture and afforestation could threaten the survival of the species should such practices continue uncontrolled. The species occurs marginally in the De Kuilen nature reserve.

Remarks

Poynton (1964) and Poynton & Broadley (1988) pointed out the similarity of the specimens from Lesotho and the

eastern Transvaal, including nubicolus and inyangae. This similarity also pertains to habitat. The pronounced difference in habitat between typical gariepensis from the Karoo and the montane forms leads one to suspect that more than one species are involved.

Bufo gutturalis Power, 1927

Bufo regularis gutturalis Power, 1927, Trans. R. Soc. S. Afr. 14, p. 416, pl. 21, fig. 2. Type locality: Lobatse and Kuruman.
Bufo regularis (not Reuss). Poynton 1964, p. 51, fig. 15; Wager 1965, p. 102, figs., Broadley 1966c, p. 469; Stuckenberg, 1969, p. 152; Van Dyk 1971 (a), p. 73, 1971 (b), p. 113, 1977, p. 176.
Bufo gutturalis Power. Passmore & Carruthers, 1979, p. 68, figs.; De Waal 1980, p. 96; Frost, 1985, p. 47; Wager 1986, p. 54, figs.; Auerbach 1987, p. 34; Lambiris 1988, p. 86; Poynton & Broadley 1988, p. 452; 1988b, p. 2.

Diagnosis. 302 Specimens examined.
Colour: Yellow brown to pale brown with irregular paired brown to dark brown markings extending down the back paravertebrally. A distinct pale interorbital bar is found forming a cross with a narrow pale to white vertebral stripe. Inguinal region and upper thighs variably suffused with red. Ventrally granular and off-white but males have the gular region suffused with blackish grey.
Morphology: Largest male SVL = 82,0 mm (N8439 - Woodlands farm), mass = 59,0 g (N8439); Largest female SVL = 92,0 mm (N7117 - Rolle 235KU), mass = 73,0 g (N9388 - Kameelpoort 202JR). Mean male SVL (>50,0 mm) = 68,06 mm ± 8,85 (1SD), n = 30, mass = 34,15 g ± 13,24 (1SD), n = 28. Mean female SVL (>50,0 mm) = 67,97 mm ± 10,52

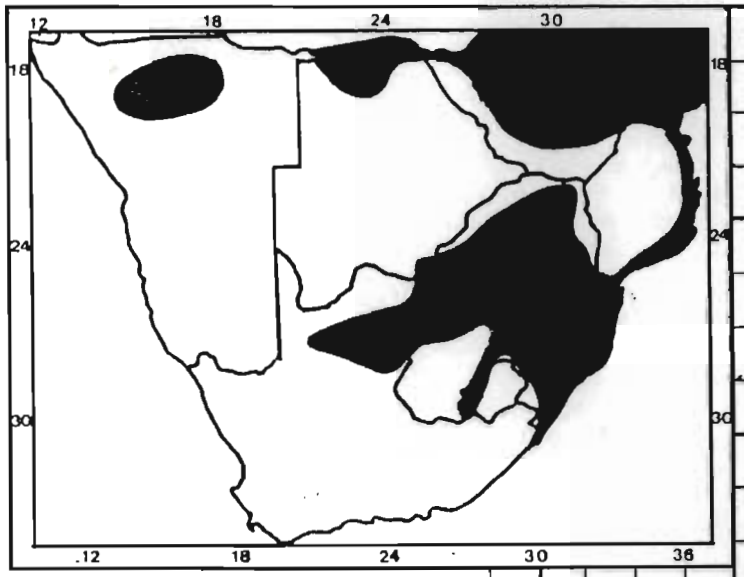
(1SD), n = 35, mass = 33,48 g ± 14,87 (1SD), n = 35. A medium sized toad with a broad head. Tympanum well developed and visible; parotid glands well developed and visible; glands under the forearm usually forming two conspicuous, discontinuous rows of whitish tubercles; a continuous to discontinuous glandular ridge at the angle of the jaw above the shoulder. Feet largely free of webbing with at least two phalanges of toes 3 and 5 free. Subarticular tubercles of fingers single.

Distribution

From the northern and eastern Cape Province northwards through Transvaal, Natal and Mozambique to Uganda and Kenya. An apparently isolated population occurs in northern South West Africa/Namibia.

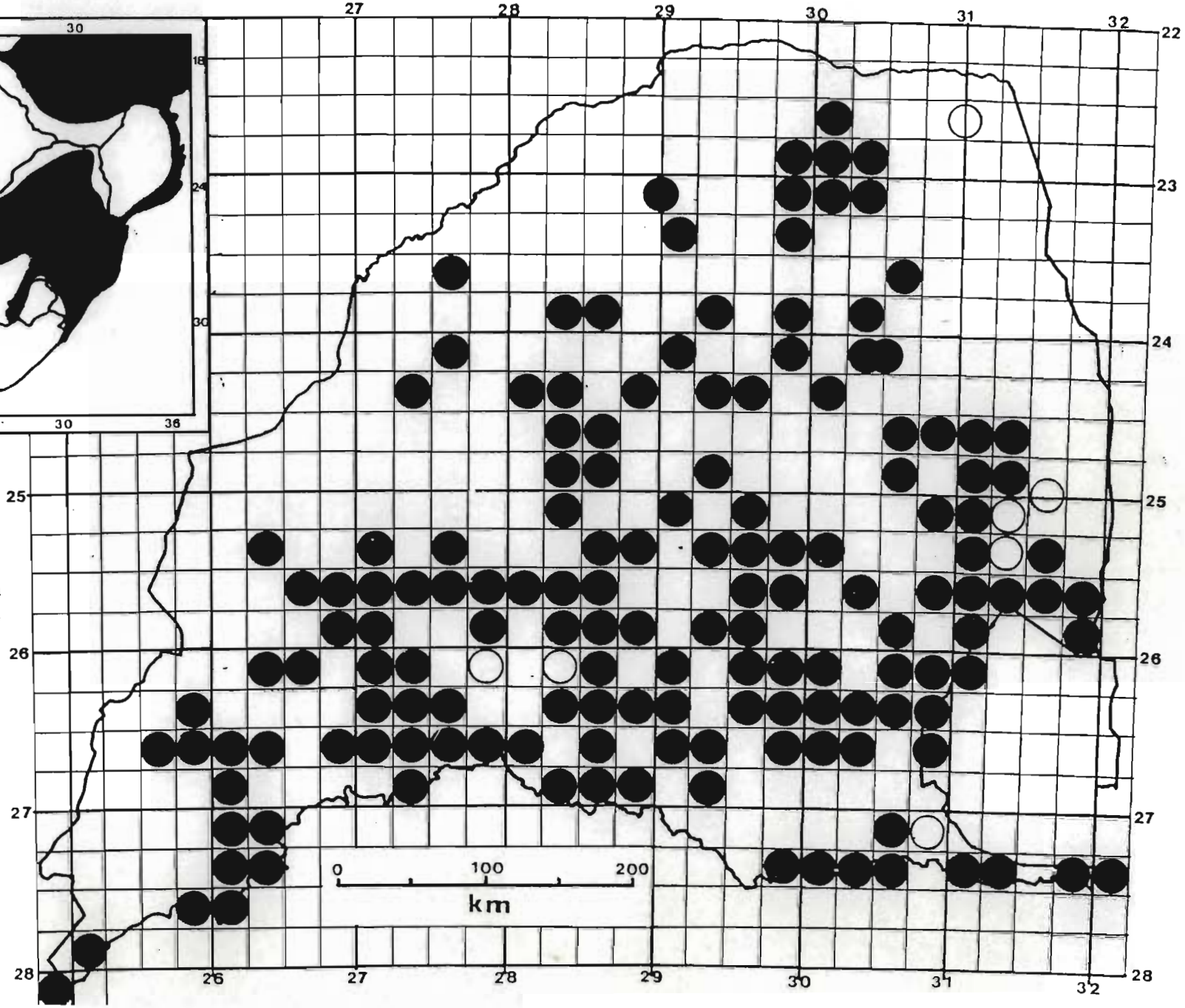
Distribution in the Transvaal (Map 218).

Abe Bailey Nature Reserve; Allandale 237KU; Anysspruit 139HT; Barberspan Nature Reserve; Barberton Townlands 369JU; Bellevue C 518JT; Ben Lavin Nature Reserve; Between Lake Funduzi & Entabeni; Blouberg; Bluegumsport 779MS; Bochem 145LS; Bokfontein 448JQ; Boschpoort 284JQ; Bovenste Oog van Mooi Rivier 68IQ; Buffelshoek 171IQ; Bulhoek 389JP; Bulskop 225IP; Bushbuckridge; Caledonia 97IT; Carolina Town and Townlands 43IT; Carpediem 76KT; Charl Cilliers 332IS; Christiana 325HO; Dap Naude Dam; De Bilt 372JU; De Krans van Blesbokspruit 305IS; De Kroon, Crocodile River; De Kuilen 460IR; Diepgezet 388JU; Doornbult 123HP; Doorndraai 282KR; Doornhoek 46IP; Doreen 108MT; Driefontein 77LT; Elandsfontein 366JQ; Ellisras; Entabeni Forest Reserve; Ga Chweni; Galakwyns Stroom 745LR; Geduld 270IP; Gemsbokfontein 290IQ;



MAP 218.

Bufo gutturalis.
Recorded distribution in the Transvaal, and in southern Africa.



Gestoptefontein 349IO; Godlwayo; Goedehoop 152JS; Goedgevonden 134HT; Goedvertrouwd 499JR; Goedvooruitzicht 242IP; Gollel 73HU; Greylingsrus 101HP; Groot Denteren 533LR; Groothoek 171HT; Haenertsburg; Halfgewonnen 190IS; Handsup 305JU; Hans Merensky Nature Reserve; Hartbeestlaagte 325JS; Hartbeestpoort 482JQ; Havercroft 99KT; Helena 400JU; Hoedspruit 346JS; Holfontein 138IS; Holfontein 279IP; Holfontein 49IQ; Honesty 43HN; Houwater 54JQ; Ireagh 263KU; Kafferskraal 618JT; Kameelpoort 202JR; Kareebosch 413IS; Klipdrift 395IQ; Klipfontein 241IS; Klipnek 199JS; Klipspruit 89HP; Koedoesdraai 49HP; Koedoespoort 402LS; Kromdraai 486JS; Kromdraai 712KS; Kwa Sipunu; La Belle Esperance 191HT; Lake Chrissie 92IT; Lake Fundudzi; Langkloof 356JT; Langzeekoegat 325IR; Leeuwfontein 466JR; Levubu; Lochleven 233IT; Lomati 466JU; Loskop Dam; Louws Creek; Ludlow 227KU; Maiepo, Letaba Drift 727LT; Makhutswi River, Leydsdorp; Malmaniesrivier 236KQ; Manyeleti Game Reserve; Marico Bosvelddam; Mariepskop; Masekwas Location; Merry Pebble Stream 246KU; Mgcobaneni; Mooifontein 597KR; Morgendal 216KS; Muiskraal 127IQ; Naudes Rust 272JU; Naudesbank 172IS; Nelspruit, Steiltes; Nerston 401IT; Nylstroom; Nylsvley 560KR; Nylsvley Nature Reserve; Ohrigstaddam Nature Reserve; Onverwacht 273IT; Othobothini; Oude Zwaanskraal 542JR; Percy Fyfe Nature Reserve; Pietersburg; Pilgrims Rest District, Herbronberg; Pipe Klip Berg 21HU; Pongola Nature Reserve; Potchefstroom; Pretoria; Pretoria, 18 km E. of Shere Plots; Pretoria, Derdepoort; Pretoria, Wonderboom; Ratelhoek 158KR; Rhenosterfontein 560IQ; Rietbult Estates 505IR; Rietfontein 214JR; Rietfontein 313IR; Rietspruit 91KQ; Rietvlei 433IS; Roerfontein 465JP; Rolle 235KU; Roodepoort 598IR; Rust der Winter Nature Reserve; Rustenburg District, Zandfontein;

Rustenburg Kloof; Rustenburg Nature Reserve; Rustvoorby 383JP; Sabie; Simonsdal 88IT; Spaarwater 171IR; Sterkspruit 412KT; Steynsdorp; Suikerbosrand Nature Reserve; Tafelkop 46KR; The Chine 259IT; The Curlews 103JU; Thornhill Farm 171JU; Tweelingspruit 152IO; Tweerivier 197JQ; Vaalbank 233IS; Vaalbank 388HO; Vierfontein 61IS; Vlakplaats 535KS; Volksrust; Vrieskraal 4JS; Vygeboomspoort 456KR; Wakkerstroom; Wanhoop 78JT; Waterval 273KU; Waterval Boven; Waterval Onder; Weergevonden 173IT; Welgevonden 312JO; Weltevreden 174IS; Winkelhaak 723JT; Witbank; Witfontein 306IP; Witklipbank 202IR; Witpoort Dorpsgebied; Witpoort, Doornkop; Woodbush; Woodlands Farm; Zebediela; Zuurbron 132HT; Zwartkloof 60HU; Zwartrand 123IP; Zwartwater 288IT.

Literature Records

Benoni; Ermelo; Linokana; Louis Trichardt; Piet Retief; Roodepoort, (Poynton, 1964). Fayi Picket; Fayi/Shingwane Firebreak; Folly Dam; Matukwala Dam; Mestel Dam; Nshawu Dam; Sand River Bridge; Sabie River Bridge (Skukuza); Shabeni Fountain; Shipudza Fountain; Skukuza (KNP Records). Abel Erasmus Pass (NMZB).

Habitat and Ecology

Widespread in the bushveld, lowveld and highveld of the Transvaal in all veld types at altitudes of 200-1800 m a.s.l. They show a preference for the mesic moister climates as is evidenced by the paucity of records in the dry north west and north of the province (Map). They are often found around human habitation where they are attracted to the availability of food and water. These toads take refuge in almost any shelter usually holes in

the ground but also under rocks or building debris. Extensive movements take place to and from breeding sites which are normally streams, dams and ponds. Such movement may entail at least a kilometre. Catholic in their choice of food, gutturalis on the Nylsvley Nature Reserve consumed Isoptera, Hymenoptera, Hemiptera and Coleoptera which are all slow moving prey. They are however opportunistic and feed on what is readily available.

Conservation Status

Unprotected, except insofar export of individuals from the province is restricted, (Transvaal Nature Conservation Ordinance 12 of 1983). Widespread, occurring in the Kruger National Park and most provincial nature reserves. Common in urban areas being able to adapt and benefit from changing environments, the species is secure.

Remarks

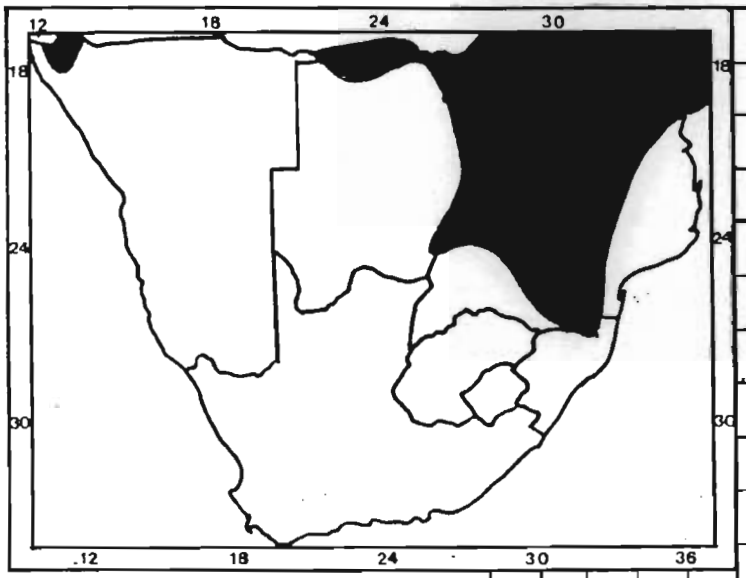
In using the species name 'gutturalis' this discussion follows Passmore & Carruthers (1979) who have accepted the evidence laid down by Tandy & Keith (1972).

Bufo maculatus Hallowell, 1854

Bufo maculatus Hallowell, 1854, Proc. Acad. Nat. Sci. Philadelphia, 7, p. 101. Type locality: Liberia. Passmore & Carruthers 1979, p. 70, figs,; Frost 1985, p. 52; Wager 1986, p. 58, fig; Auerbach 1987, p. 35; Poynton & Broadley, 1988, p. 460; Branch 1988b, p. 2.

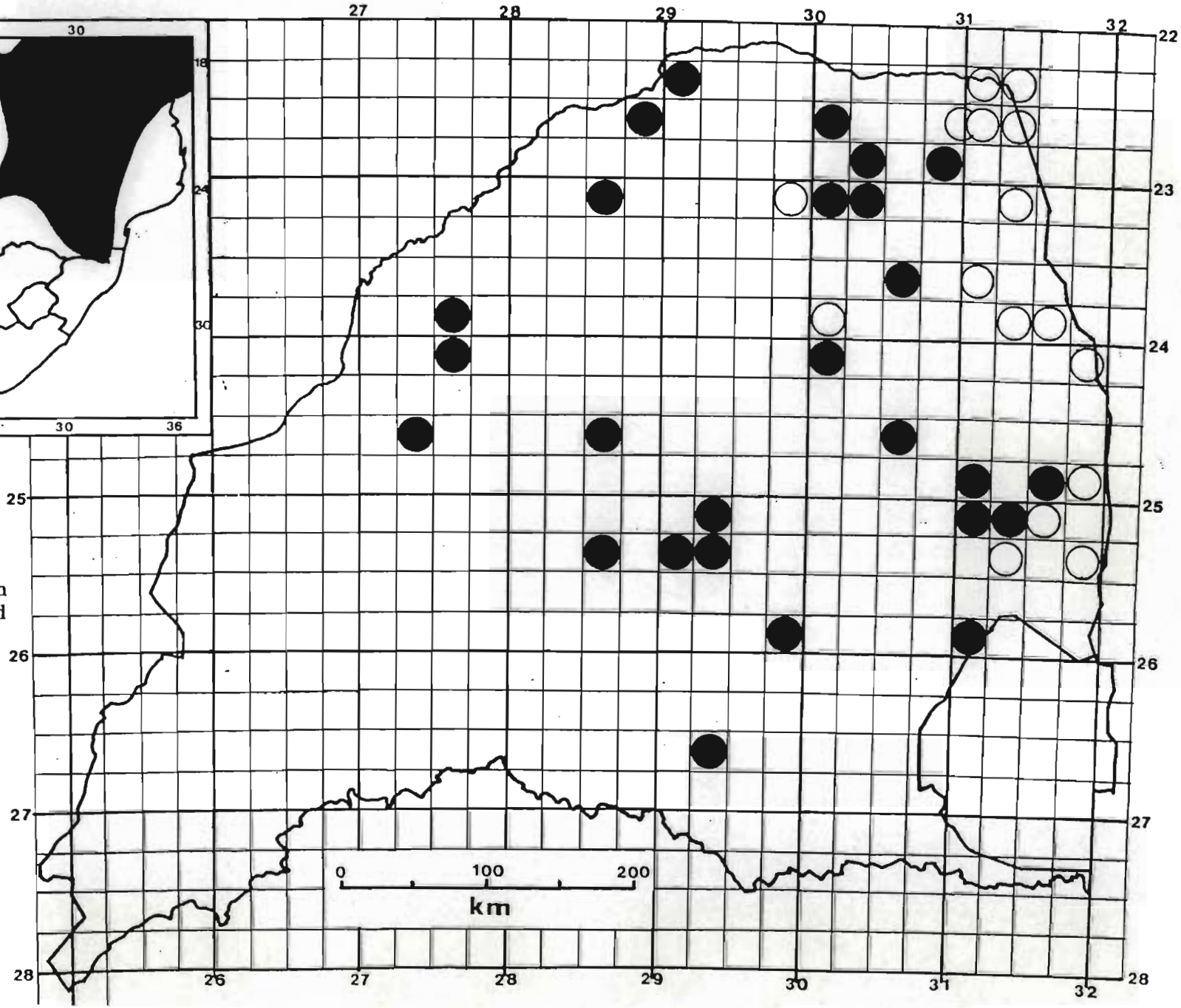
Bufo pusillus Mertens. Poynton 1964, p. 53, fig. 16; Wager 1965, p. 107, fig.; Broadley 1966c, p. 471; Stuckenberg 1969, p. 152; Van Dijk, 1971(b), p. 113, 1977 p. 176; Lambiris, 1987, p. 89.

Diagnosis. 44 Specimens examined.
Colour: Yellow brown, pale brown to pinkish- or grey-brown dorsally with irregular, paired dark paravertebral blotches. A narrow pale to white vertebral stripe present forming a distinct cross pattern. No red patches on upper thighs or inguinal region. Ventrally white to off-white to speckled. Males have gular and upper chest suffused with blackish grey tinged with yellow.
Morphology: Largest male SVL = 56,0 mm (8905 - Hans Merensky Nature Reserve), mass = 14,8 g (N5630 - Rolle 235KU); Largest female SVL = 58,0 mm J1979 - Malmaniesrivier 236KQ, N2087 - Canterbury 254MR), mass = 17,3 g (J1977). Mean male SVL = 49,0 mm ± 4,04 (1SD), n = 7, mass = 10,51 g ± 3,07 (1SD), n = 5; Mean female SVL = 49,87 mm ± 7,20 (1SD), n = 8, mass = 11,94 g ± 4,91 (1SD), n = 8. A small to medium toad with the head not as pronounced as gutturalis. Glandular ridge at angle of jaw above the shoulder, well developed, forming a broken ridge. Tympanum clearly visible and well developed. Parotid glands flattened, indistinct and usually covered by dark tipped warts occasionally relatively smooth. Glands under forearm forming an interrupted conspicuous row of white tubercles. Tarsal fold present. Subarticular tubercles under fingers single. Two or slightly less phalanges of third and fifth toes free of webbing. A narrow margin of webbing sometimes reaches the terminal phalanx.



MAP 219.

Bufo maculatus.
Recorded distribution in the Transvaal, and in southern Africa.



Distribution

Northern KwaZulu, Transvaal, to Mozambique, Zimbabwe and further north. Also a population in northern South West Africa/Namibia.

Distribution in the Transvaal (Map 219).

Barberton Nature Reserve; Breslau 2MS; Buffelspoort 421KR; Canterbury 254MR; Deelkraal 561KR; Doreen 108MT; Glen Alpine 304LR; Haffenden Heights 35KT; Hans Merensky Nature Reserve; Joubertsvallei 337IS; Lake Fundudzi; Levubu; Loskop Dam; Lukale Hill, 3 km east of; Malamala; Malmaniesrivier 236KQ; Mgcobaneni; Pretoriuskop; Rietfontein 214JR; Rietkuil 491JS; Rolle 235KU; Sedula, Leydsdorp; Sterkspruit 412KT; Waterval 601LQ; Welgevonden 36LT; Welverdiend 24JS.

Literature Records

Komatipoort; Louis Trichardt; Tzaneen, (Poynton 1964). Bobomeni; Malonga Fountain; Munweni; Mutjulweni Stream; Nwambiya Pan; Shalungwa Fountain; Shipudza Fountain; Skukuza; Tshokwane (KNP Records). Malta 65KT; Klipfontein 53KR (NMZB).

Habitat and Ecology

Although widespread in the Transvaal, the species is much less common than other species such as gutturalis. Appears to occur sporadically and not continuously, in veld types 6, 8, 9, 10, 11, 14, 15, 18, 19, 20, 52 and 61 at altitudes ranging from 300-1700 m a.s.l. Mostly found alongside water amongst grass tussocks or rocks but also on occasions found away from water. Calls from the

vicinity of water in the afternoon. Lambiris (1988) records calls usually at night and also from the water's edge.

Conservation Status

Unprotected, with the exception of restrictions on export out of the province, (Transvaal Nature Conservation Ordinance 12 of 1983). The species is uncommon and populations appear to be scattered. Known to occur in the Kruger National Park and at least one provincial nature reserve. Currently considered secure but surveys of populations are needed.

Remarks

The use of 'maculatus' follows Passmore & Carruthers (1979) and Poynton & Broadley (1988). The latter have accepted the findings of Tandy & Keith (1972) with reservations pending the availability of more detailed geographical and phenetic data. Poynton & Broadley (1988), p. 461, mention the similarity between maculatus and gutturalis. They also mention specimens in which the flattened parotid glands are not covered by dark tipped spines, "which does not allow ready assignment either to maculatus or to gutturalis". This situation also exists in the Transvaal. Such specimens have preliminary been included under maculatus, although appearing intermediate between the two species.

Bufo garmani Meek, 1897

Bufo garmani Meek, 1897, Field. Mus. nat. Hist. Zool. Ser. 1, p. 176. Type locality: Haili = Halleh, British

Somaliland. Poynton, 1964, p. 55, fig. 17; Wager 1965, p. 107, figs.; Broadley 1966c, p. 472; Stuckenberg 1969, p. 152; Van Dijk 1971(a), p. 73, 1971(b), p. 113; 1977, p. 176; Passmore & Carruthers, 1979, p. 72, figs.; De Waal 1980, p. 100; Frost 1985, p. 46; Wager 1986, p. 57, figs.; Auerbach 1987, p. 85, pl. 3, fig. 2; Lambiris 1988, p. 92; Poynton & Broadley 1988, p. 455; Branch 1988b, p. 2.

Diagnosis. 171 Specimens examined.
Colour: Olive brown in ground colour with paired russet brown or brown markings extending paravertebrally down the back. A brown or russet brown interocular bar is divided in two medianly. The red brown markings may be outlined by a dark line. Red infusions are found on the rear of the thighs and sometimes in the inguinal region. Ventrally white to off white. Males have a blackish grey infusion under the chin and throat which may also be tinged with yellowish.
Morphology: Largest male SVL = 106,0 mm (N2278 - Witkop 287LQ), mass = 73,5 g (N2278); Largest female SVL = 115,0 mm (N5859 - Leeufontein 185HO), mass = 130,0 g (N5859). Mean male SVL (>50,0 mm) = 76,89 mm ± 12,04 (1SD), n = 23, Mass = 44,0 g ± 15,58 (1SD), n = 20; Mean female SVL (>50,0 mm) = 71,93 mm ± 13,91 (1SD), n = 27, mass = 41,72 g ± 27,64 (1SD), n = 25. Tympanum clearly discernible; Glands at angle of jaw to above shoulder present but discontinuous. Parotid glands prominent and smooth. Glandular ridge under forearm flattened but more or less continuous. Tubercles under hands and feet small and irregular. Tarsal fold ridged. Two to 2,5 phalanges of third and fifth toes, free of webbing.

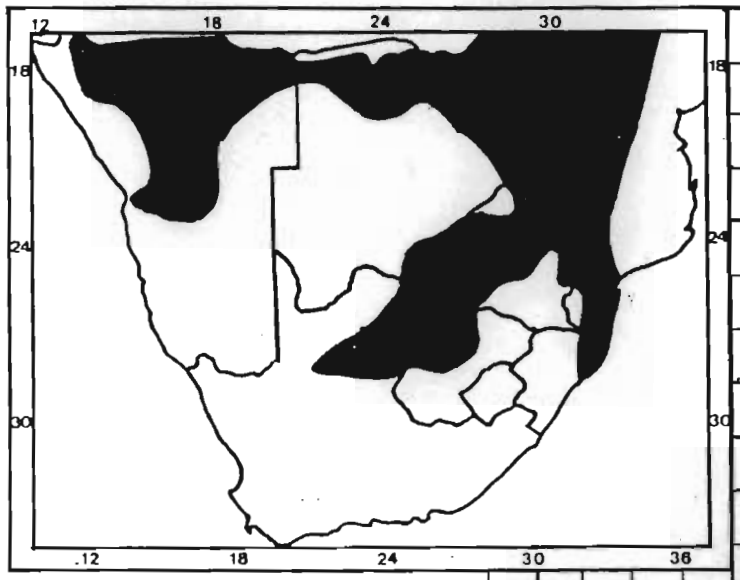
Distribution

The uncertain nomenclatural position of this group which may consist of more than one species renders the total

distribution arbitrary. However, forms of this complex extend from the northern Cape Province and Kwa Zulu north through the Transvaal, Botswana and Mozambique to the savanna areas of central and East Africa.

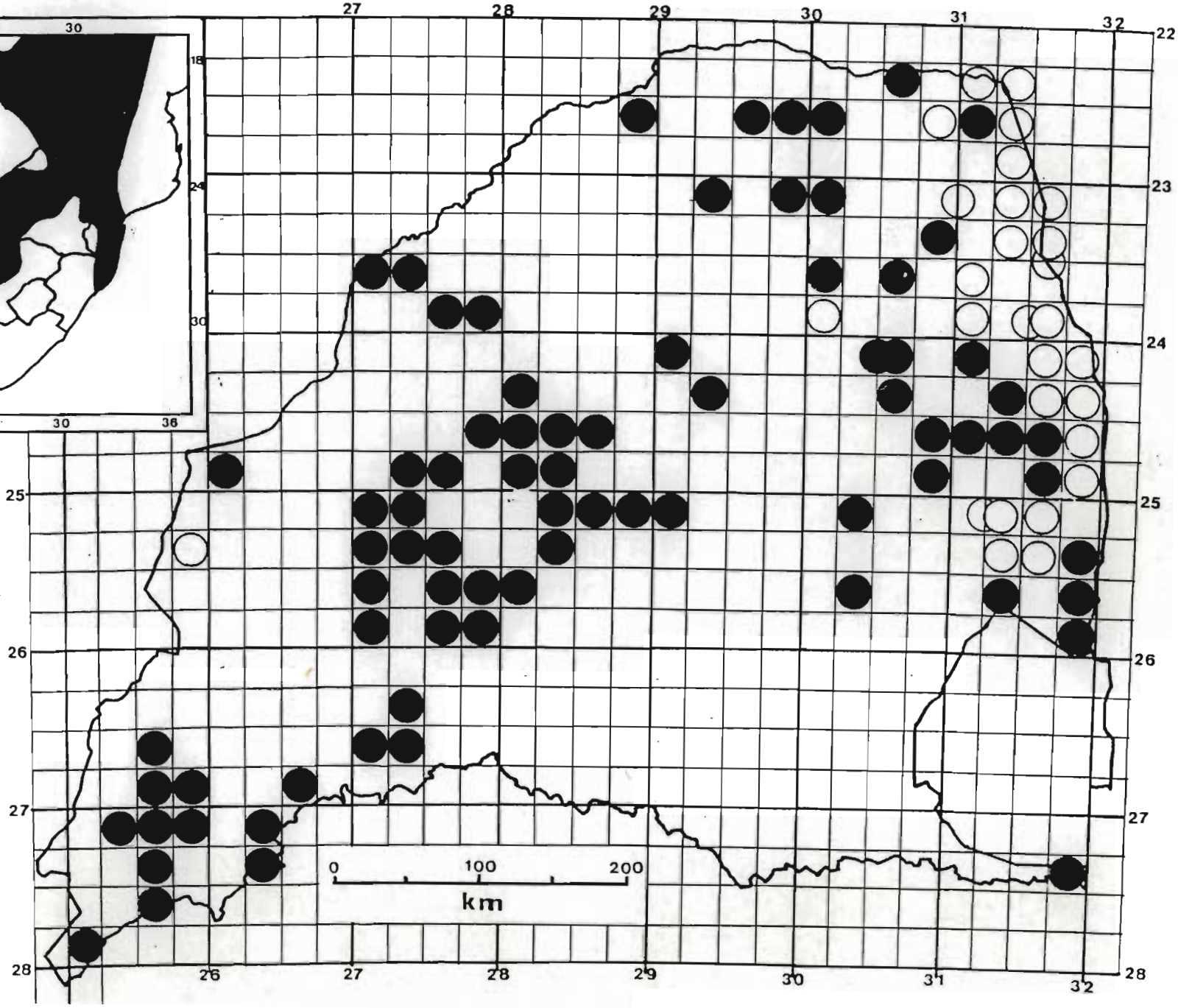
Distribution in the Transvaal (Map 220).

Abe Bailey Nature Reserve; Andover 210KU; Arthursrust 219KT; Arundel 788LT; Barberspan Nature Reserve; Ben Lavin Nature Reserve; Blyde River Nature Reserve; Brits; Canterbury 254MR; Christiana 325HO; De Kroon; De Nyl Zyn Oog 423KR; Doreen 108MT; Driefontein 77LT; Dundee 32KU; Dwarsvlei 503JQ; Elandsfontein 366JQ; Fontainebleau 537MS; Groote Zwart Bult 290LQ; Groothoek 106KS; Hans Merensky Nature Reserve; Hartbeestpoort 482JQ; Hartebeespoortdam; Heimwehberg 121KP; Helena 400JU; Hoedspruit, 40 km W.S.W. of; Humanskraal 346IO; Kareefontein 340HO; Klerksdorp; Klipdrift 395IQ; Klipspruit 89HP; Koedoesdraai 49HP; Komatipoort Townlands 182JU; Komatipoort, Lebombo border; Kruidfontein 40JQ; Kwa Sipunu; Leeuwfontein 185HO; Leonard 360IO; Lydenburg; Makhutswi River, Leydsdorp; Manyeleti Game Reserve; Manyeleti Game Reserve, Buffelshoek 340KU; Manyeleti Game Reserve, Dixie Dam; Manyeleti Game Reserve, Dixie Hill; Manyeleti Game Reserve, Main Camp; Manyeleti Game Reserve, Mohlwareng Hill; Manyeleti Game Reserve, Sarabank 323KU; Mara 38LS; Morgenrood 354LT; Naudes Rust 272JU; Nsama River; Nylstroom; Nylsvley Nature Reserve; Olievenbosch 506KQ; Percy Fyfe Nature Reserve; Pilgrim's Rest; Pongola Nature Reserve; Potchefstroom; Potchefstroom, 5 mls N. Welverdiend; Pretoria; Rhenosterspruit 59JQ; Rooipoortje 453IQ; Ross 55KU; Rust der Winter Nature Reserve; Rustenburg Nature Reserve; Schweizer Reneke Town and Townlands 62HO;



MAP 220.

<u>Bufo garmani.</u>
Recorded distribution in the Transvaal, and in southern Africa.



Soutpansberg, N. of; Troya 151JR; Tweerivier 197JQ; Vaalboschfontein 188HO; Vaalkop Dam; Vrieskraal 4JS; Vrouwensbrom 80MT; Vygeboomspoort 456KR; Vygeboomspruit 29JQ; Waaiheuwel 360JU; Waaikraal 396JQ; Waterval Onder; Welgedacht 130JR; Weltevreden 176HO; Weltevreden 596LQ; Witklip 100KR; Witkop 287LQ; Wonderboomhoek 550LQ; Zwartkloof 470KR; Zwartkop 369KQ.

Literature Records

Komatipoort; Linokana; Sunningdale; Tzaneen (Poynton, 1964). Beacon R-5; Beacon 7, Nyandu; Fayi Roan Camp; Machayi Pan; Malonga; Mashadya Spruit; Matjulwane Spruit; Ngoka/Timbavati Junction; Pafuri; Pumbe Sandveld; Punda Milia; Skukuza; Tshokwane (KNP Records). Olifants River 40 km WSW Hoedspruit - Strydom Tunnel Motel (Lambiris, 1988). Makalali, Selati R.; Klipfontein 53KR (NMZB).

Habitat and Ecology

Most savanna areas of the Transvaal with the exclusion of the Transvaal highveld. This includes veld types 6, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 48, 50 and 61 at altitudes of 300-1700 m a.s.l. Mostly nocturnal, the toads take refuge by day in holes in the ground as well as under stones and other debris. They appear to be more common in sandy areas but not exclusively so. Large scale movements take place between overwintering areas and breeding sites (Jacobsen, 1982), which may incur distances of up to a kilometre. On the Nylsvley nature reserve the toads emerge on warm nights in September, with a peak in October whereafter these animals move to breeding grounds over November/December. A tremendous influx of young toads return to the overwintering grounds from January to April.

Bufo garmani feeds mostly on ants (Hymenoptera) and beetles (Coleoptera) on the Nylsvley nature reserve but being opportunistic also include Araneae, Hemiptera, Orthoptera, Isoptera, Dictyoptera, Heteroptera, Diplopoda, Mollusca, Chilopoda and Psocoptera. These toads are prolific breeders laying up to 20 000 eggs (Taylor, 1982) which hatch within 24 hrs. and metamorphosis is completed in 64 days when juveniles are 9 mm in SVL. These toads grow rapidly and appear to reach adult size in less than a year.

Conservation Status

Unprotected, restriction only being placed on the export of individuals from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). Widespread and occurring in the Kruger National Park and most nature reserves, the species is secure.

Remarks

The taxonomic status of the species is uncertain. Channing (1972) commented on the variability of the colour pattern and other morphological features in South West African material while examining the status of *B. pseudogarmani*. Although a measure of overlap exists between *garmani* and *pseudogarmani*, the validity of the latter form is not totally discounted. Lambiris (1988) and Poynton & Broadley (1988) have discussed this problem, the latter authors in great detail. I am in agreement with Lambiris (1988) that populations from the east central and eastern Transvaal differ from those of the west and south-west. The former have russet brown markings edged with black paravertebrally and the latter have brown markings which are mostly not highlighted. It

appears therefore that in the Transvaal two forms are found. However until a more intensive investigation of morphological and ecological characters are undertaken, both 'forms' will be incorporated under 'garmani'.

Bufo rangeri Hewitt, 1935

Bufo regularis rangeri Hewitt, 1935, Rec. Albany Mus., 4, p. 285. Type locality: "Glennifer", Kei Road, Cape Province.
Bufo rangeri Hewitt. Poynton 1964, p. 57, fig. 18; Wager 1965, p. 106, figs.; Van Dijk 1971a, p. 73; 1971(b), p. 113, 1977, p. 176; Passmore & Carruthers 1979, p. 74, figs.; De Waal 1980, p. 101; Frost 1985, p. 58; Wager 1986, p. 56, figs.; Lambiris, 1988, p. 95; Branch 1988b, p. 2.

Diagnosis. 159 Specimens examined.
Colour: Pale brown, to olive or grey brown in ground colour, with paired dark brown, highlighted paravertebral blotches extending down the back. An entire (rarely split) dark brown interocular bar present. Ventrally off white with males having a grey-black pigmented gular. No red infusions on the thighs. Parotid glands very distinct and yellow brown.
Morphology: Largest male SVL = 77,0 mm (N5778 - Buffelshoek 171IQ, N8091 - Schuilhoek 139HS), mass = 51,2 g (N5778); Largest female SVL = 100,0 mm (N7021 - Blyde R. N.R., N7870 - Joubertsdal 448JT), mass = 103,0 g (N7021). Mean male SVL (>50,0 mm) = 70,33 mm ± 6,15 (1SD), n = 6, mass = 36,3 g ± 11,42 (1SD), n = 6. Mean female SVL (>50,0 mm) = 69,11 mm ± 15,73 (1SD), n = 35, mass = 36,37 g ± 26,72 (1SD), n = 36. Medium to large toads with a clearly defined tympanum; parotid glands prominent; glands at angle of mouth interrupted and

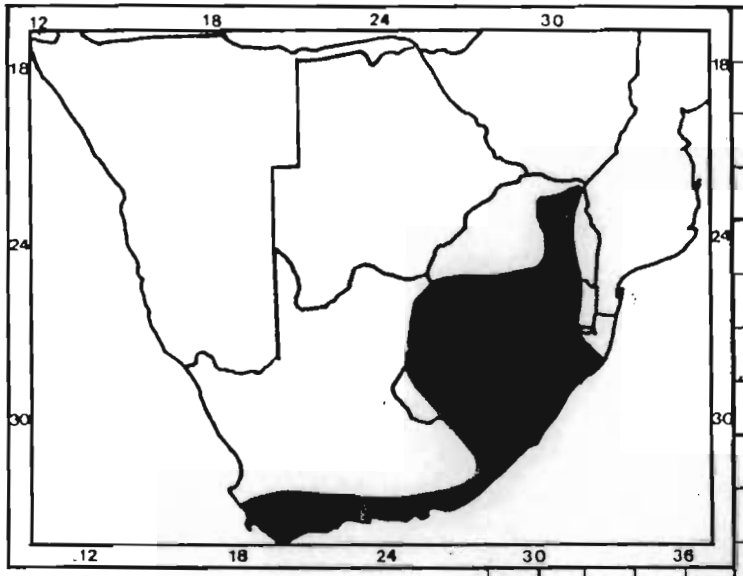
variable frequently very poorly defined. Glands under fore-arm poorly developed, often a row of interrupted warts, more rarely an entire row. Subarticular tubercles of fingers single. Tarsal fold present. 2,5-3 phalanges of third and two of fourth toe free of web; free phalanges of toes have a conspicuous narrow margin of webbing.

Distribution

Widespread along the southern and eastern Cape Province north through the Orange Free State, Natal and most of the Transvaal.

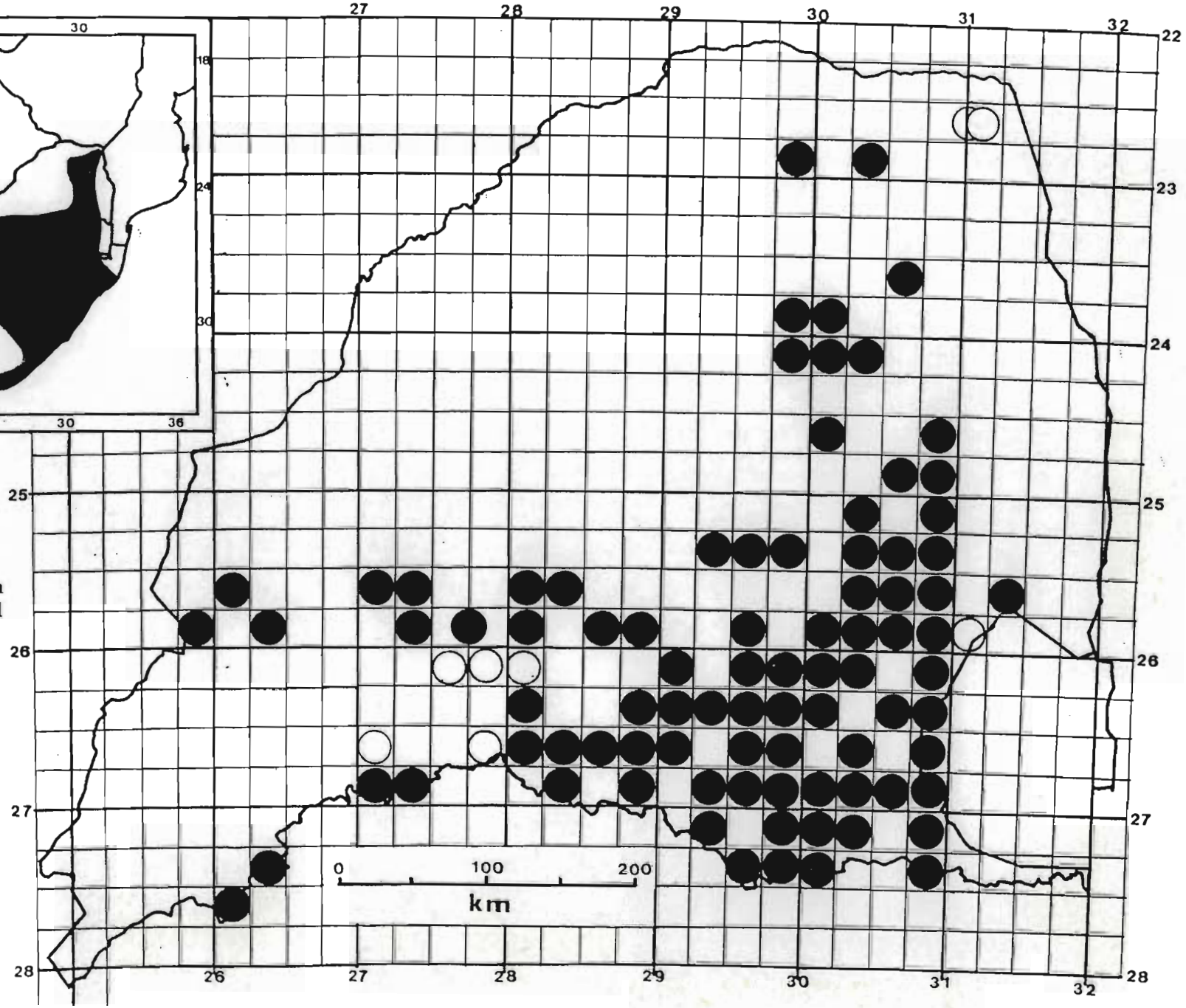
Distribution in the Transvaal (Map 221).

Bakenkop 152HT; Bendor 211HT; Between Lake Fundudzi & Entabeni; Blesboklaagte 181IR; Bleskop, Rustenburg; Bluegumsport 779MS; Blyde River Nature Reserve; Bosjespruit 291IS; Broederstroom, Haenertsburg; Bronkhorstspruitdam; Buffelshoek 171IQ; Clearwaters, Haenertsburg; Dap Naude Dam; De Kuilen 460IR; De Roodepoort 435IS; Debegeni Falls; Dientje 453KT; Diepdal 244IT; Doornkop 420JT; Elandsfontein 36HT; Elandsfontein 471JT; Elandspruit 115JT; Entabeni 251MT, Matiwa Lookout; Entabeni Forest Reserve; Flynn 217KS; Garatouw 282KT; Goedgedacht 38HS; Goedvertrouwd 499JR; Goedverwachtinge 333JT; Greylingstad; Haenertsburg; Halfgewonnen 190IS; Hans Merensky Nature Reserve; Harlem 443IT; Heerenveen 271IT; Irene; Ishlelo 441IT; Joubertsdal 448JT; Kafferskraal 513IS; Kafferskraal 618JT; Kalkoenkrans 366IT; Kareebosch 413IS; Kleinfontein 3 HT; Kleinkopje 15IS; Klipdraai 3KT; Klipfontein 241IS; Klipnek 199JS; Klipplaatdrift 504IS; Klipspruit 89HP; Konigstein 625JT; Kranspoort 248IS;



MAP 221.

Bufo rangeri.
Recorded distribution in the Transvaal, and in southern Africa.



Kromrivier 347JQ; Kuilfontein 324JP; Kwarriefontein 280JP; Leiden 340IT; Lisbon State Forest; Lochleven 233IT; Loskop Dam; Lydenburg; Mapochsgronde 500JS; Morgenzon; Naudes Rust 272JU; Nerston 401IT; Nooitgedacht 508IQ; Ohrigstad Dam Nature Reserve; Onverwacht 273IT; Ottoshoop; Paardeplaats 101HT; Palmietfontein 110IS; Pretoria; Pretoria, Gezina; Pretoria, The Willows; Rietfontein 255JT; Rietfontein 313IR; Rietpoort 83HS; Roodekrans 457IS; Roodepoort 598IR; Rustenburg Nature Reserve; Rustenburg, Kroondal; Rustkraal 129HP; Sabie, Castle Rock Caravan Park (AJL); Schuilhoek 139HS; Sekororo; Speculatie 483JS; Steynskraal 399IR; Suikerboschfontein 422JT; Tevreden 56IT; The Downs 34KT; Tweefontein 467IS; Uitkomst 499JQ; Venterskroon SE of Potchefstroom; Wakkerstroom; Waterval Boven; Waterval Onder; Weergevonden 173IT; Welgelegen 107IT; Welgemeend 206IS; Weltevreden 174IS; Wilge River; Witbank 236IS; Witpoort 545IR; Woodbush; Woodbush Forest Station; Zoetendalsvallei 125HS; Zondagsfontein 124IS.

Literature Records

Barberton; Ermelo; Henley on Klip; Johannesburg; Potchefstroom; Punda Milia; Roodepoort; Sterkfontein Caves; Vereeniging (Poynton 1964). Suikerbosrand Nature Reserve (Carruthers, 1978). Malta (NMZB).

Habitat and Ecology

The species exhibits a peculiar distribution pattern occupying the highveld proper but northwards and westwards following the mountain chains. Occurs in veld types 8, 9, 10, 11, 16, 19, 20, 48, 52, 54, 55, 57, 61, 62, 63 and 64 at altitudes between 450-1800 m a.s.l.

Most frequent in montane grassland and highveld grassland but also commonly found among leaf litter. Nocturnal and partially diurnal, the species takes refuge under rocks on soil but will also shelter under other debris including pieces of rusting roofing material or plastic. Rarely shelters in burrows of other animals. Twice found in the burrows of Cordylus giganteus. Frequently found in close proximity to water.

Conservation Status

Unprotected, except for export control of specimens from the province (Transvaal Nature Conservation Ordinance 12 of 1983). The species is widespread and adaptable occurring around human habitation where man made ponds and dams have no doubt contributed to its continued survival. Despite large scale habitat destruction over much of its range through agriculture and afforestation its future is still considered secure.

Remarks

Lambiris (1976) recorded a specimen of B. pardalis from Sabie in the eastern Transvaal. Having examined this specimen (AJL 335 - Castle Rock Caravan Park) it appears that this specimen, a female, has no obvious pardalis features and fits well typical rangeri characteristics. The infratympanic glands are easily visible and the specimen has more extensive webbing than is typical of pardalis. Although AJL 335 is a female, Lambiris (1976) reported observing the specimen calling while floating in the typical outspread position, which could suggest that AJL 335 is not the specimen seen calling. Another specimen AJL 344, identified as rangeri from the same locality as the previous specimen showed no difference in

morphological characters to that of AJL 335. It is therefore considered that until evidence to the contrary is produced, pardalis is a coastal species not occurring above 600 m.

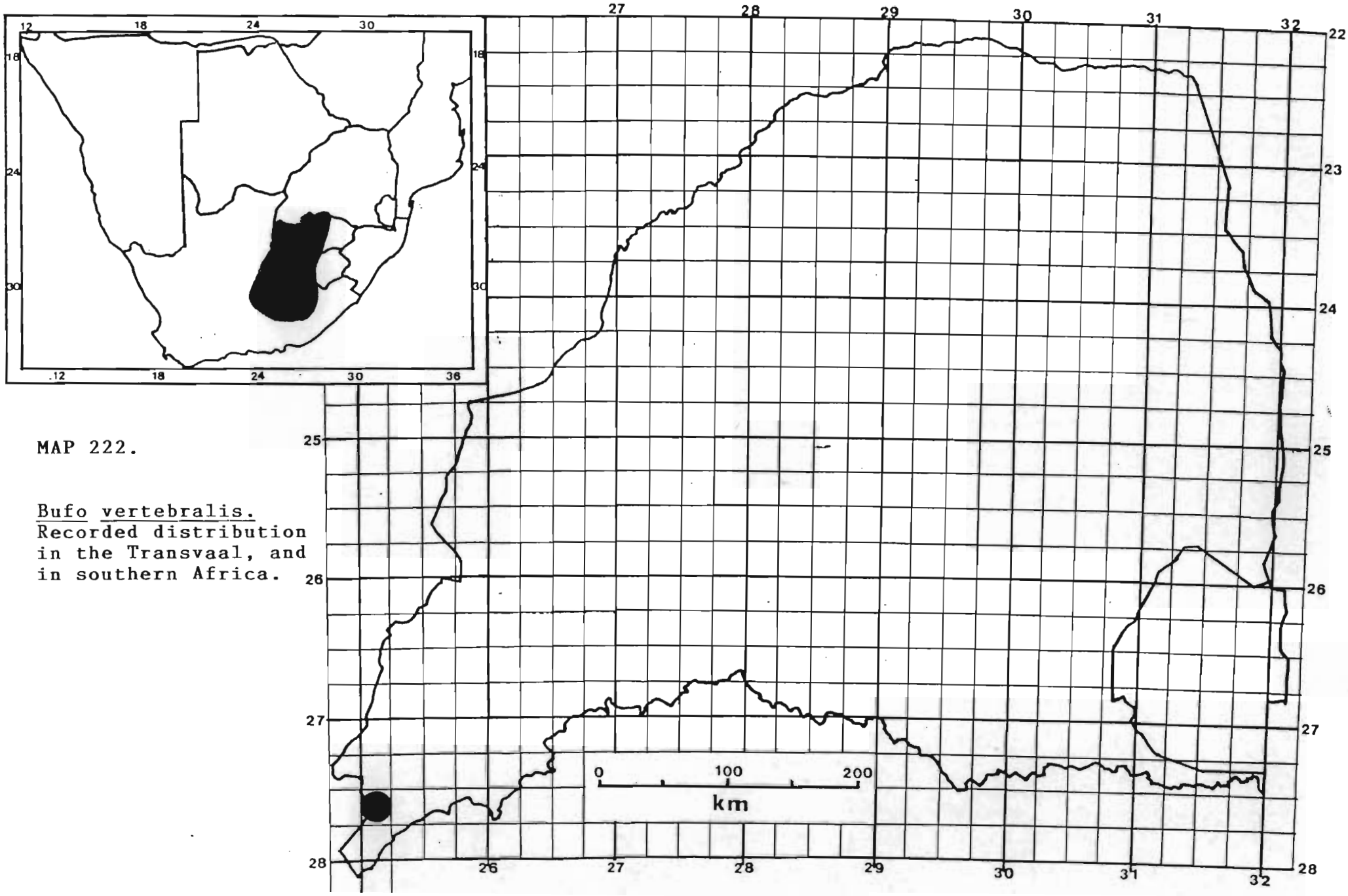
Bufo vertebralis Smith, 1848

Bufo vertebralis Smith, 1848, Illus. Zool. S. Afr., Rept., pl. 68, figs. 2 & 2a. Type locality: interior districts of southern Africa. Branch 1988b, p. 2.
Bufo vertebralis vertebralis Smith. Poynton 1964, p. 62; Wager 1965, p. 115; Van Dijk, 1971, p. 71 Passmore & Carruthers, 1979, p. 80, figs; De Waal 1980, p. 99; Wager, 1986, p. 64.

Diagnosis. 1 Specimen examined.
Colour: Pale grey to olive in ground colour with variable dark blotchings down the back and dorsolaterally. A dark interocular bar present. A pale scapular patch is present. Ventrally white with pronounced black spots of variable size and shape. Throat yellow in males.
Morphology: (After Poynton, 1964 and De Waal, 1980). A small toad with a maximum size of 35,5 mm (Poynton, 1964). De Waal (1980) records a SVL of 39,5 mm. Tympanum distinct or hidden (De Waal, 1980). Parotid glands mostly indistinct. Skin on snout smooth as is the throat. Ventrum granular. Tarsal fold absent; webbing reduced, 2 to 2,5 phalanges of third toe free of web.

Distribution

North eastern Cape Province, Orange Free State and the extreme south western Transvaal.



MAP 222.

Bufo vertebralis.
Recorded distribution in the Transvaal, and in southern Africa.

Distribution in the Transvaal (Map 222).

Kareeboomput 286HO.

Habitat and Ecology

Open grassland with scattered tree clumps or trees in veld type 50 at an altitude of 1400 m a.s.l. The single specimen was found under a lump of calcrete near a pan-like depression. De Waal (1980) records that specimens were found in old termitaria and under rocks. The species is uncommon but should be more widespread in the extreme south western Transvaal although De Waal (1980) did not record the species in the extreme western Orange Free State, which may represent an avoidance of aeolian sand areas.

Conservation Status

Unprotected, except for export control, (Transvaal Nature Conservation Ordinance 12 of 1983). Status uncertain due to paucity of specimens. The species occurs marginally in the Transvaal. Efforts should be made to determine the total distribution and status of the species.

Remarks

Until recently 'vertebralis' and 'fenoulheti' were regarded as subspecies (Passmore & Carruthers 1979, De Waal, 1980). Only recently has it become usual to refer to 'vertebralis' as a full species. Poynton & Broadley (1988) discuss the 'raison de etre' behind the change although other authors (Auerbach, 1987, Lambiris, 1988) have already accepted the change by referring to B. fenoulheti. Although the presence of the species from the Transvaal was only confirmed during this survey,

three specimens TM 7809, 7861 and 7862 from Rosslyn and Zoutpan 104JR, although attributable to this species, must be viewed with caution as these localities are far out of context with the known distribution of the species. This species is marginal in the Transvaal and apparently isolated from other populations. They could however represent relict populations which have recently become extinct or are in the process of becoming extinct.

Bufo fenoulheti fenoulheti Hewitt & Methuen

Bufo fenoulheti, Hewitt & Methuen, 1913, Trans. R. Soc. S. Afr. 3 p. 108. Type locality. Newington and Woodbush, north-eastern Transvaal.
Bufo vertebralis fenoulheti Hewitt & Methuen. Poynton 1964, p. 63, fig. 22; Wager 1965, p. 116, fig.; Broadley 1966c, p. 476. Van Dijk, 1971(b), p. 113; Passmore & Carruthers, 1979, p 80.
Bufo fenoulheti fenoulheti Hewitt & Methuen. Auerbach 1987, p. 36, pl. 4, fig. 4; Lambiris 1988, p. 101; Poynton & Broadley 1988, p. 466; Branch 1988b, p. 2.

Diagnosis. 158 Specimens examined.
Colour: Very variable above, brown to olive with irregular but symmetrical darker markings. A pale scapular patch is usually present. Usually a dark interorbital bar present. Ventrally white, mostly immaculate exceptionally with irregularly placed dark spots. Gular area in males yellow.
Morphology: Very small depressed toads. Largest male SVL = 40,5 mm (J1989 - Malmaniesrivier 236KQ), mass = 4,5 g (J1989); Largest female SVL = 51,0 mm (TM 54194 - 5 km W. of Lukale Hill), mass = 7,7 g (TM 54227 - Malmaniesrivier 236KQ). Mean male SVL (>25,0 mm) = 29,79 mm ± 3,75 (1SD), n = 24, mass = 2,1 g ± 0,95 (1SD), n =

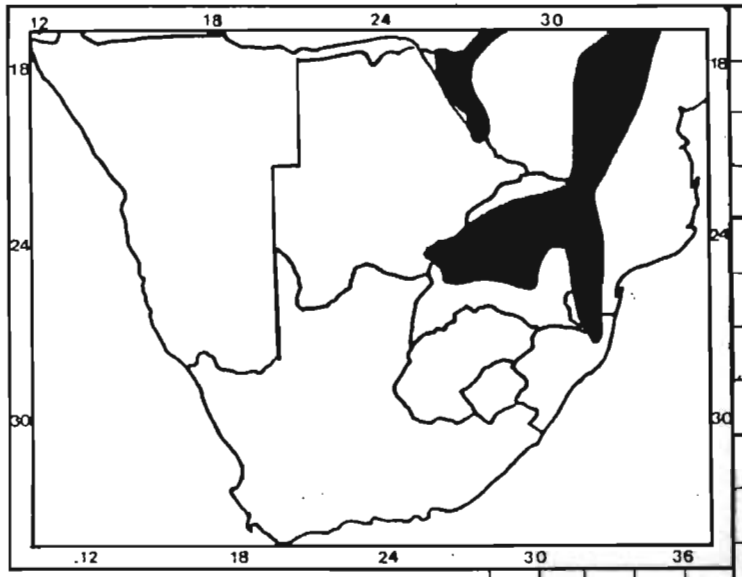
19. Mean female SVL (>25,0 mm) = 31,81 mm ± 5,90 (1SD), n = 50, mass 2,48 g ± 1,42 (1SD), n = 50. Tympanum moderately to clearly visible. Parotid glands depressed and poorly to moderately visible, slightly warty. No distinguishable glandular ridge at angle of jaw. Tarsal fold absent; 2 to 2,5 phalanges of third and fifth toes free of web; a broad web between third and fourth toes up to or just passing base of proximal phalanx of fourth toe. Subarticular tubercles of fingers usually double. Two enlarged palmar tubercles, the inner being much smaller.

Distribution

Northern Natal, southern Mozambique (excluding coastal lowlands), Transvaal, south western Botswana, Zimbabwe (excluding Chimanimani Mountains) and extreme southern Zambia (Poynton & Broadley, 1988).

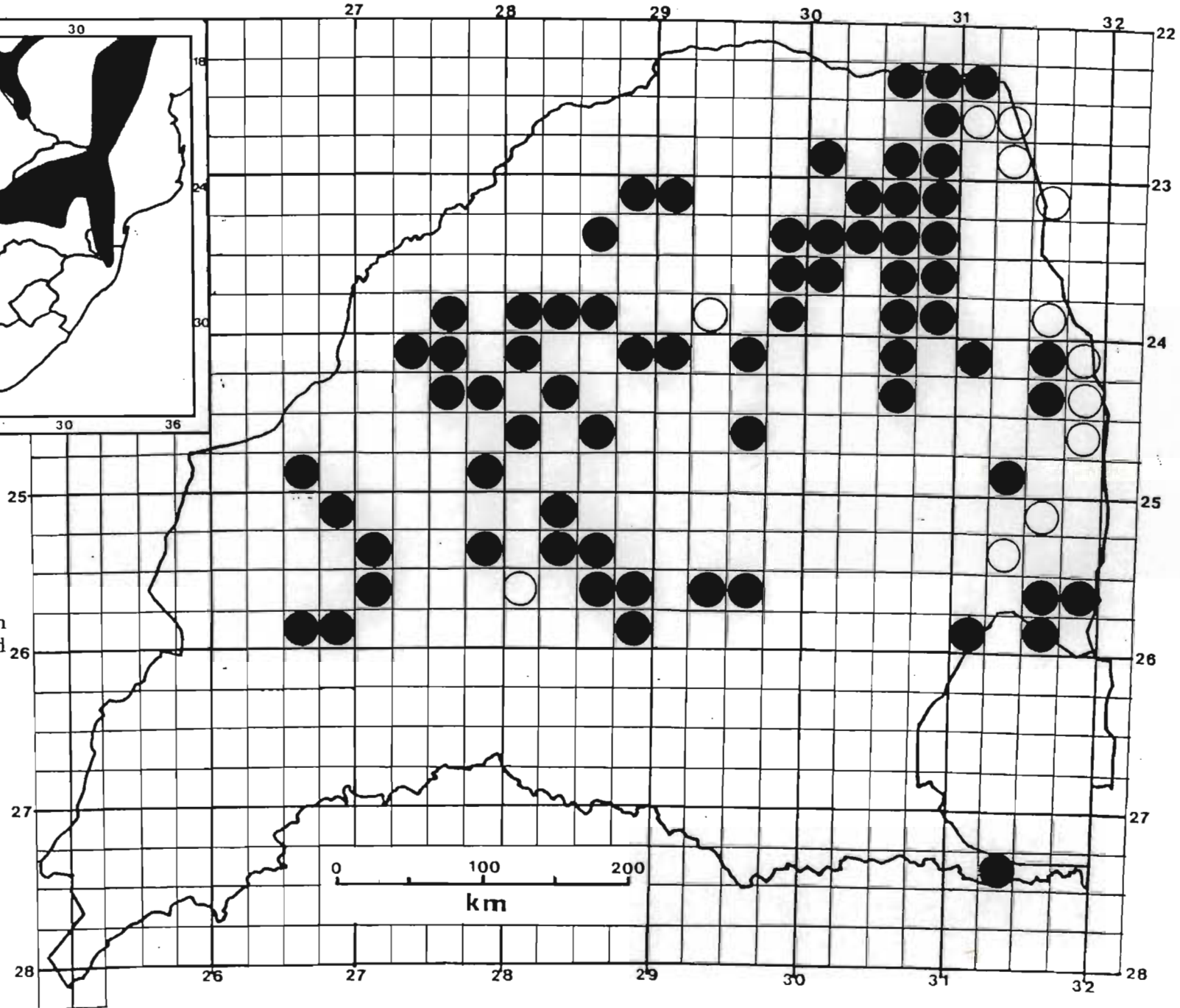
Distribution in the Transvaal (Map 223).

Blouberg, Leipzig Mission; Boschfontein 470JU; Copenhagen 58KU; Dambale Hills; Dantzig 3LS; De Oude Stad van Sekwati 765KS; Donkerkloof 162KR; Doornhoek 284KR; Dublin 218KT; Duivelskloof 436LT; Elandsfontein 290KQ; Galakwyns Stroom 745LR; Godlwayo; Goede Hoop 490JP; Griffin Mine; Groothoek 278KQ; Gunfontein 71KR; Ha Madzhiga; Hans Merensky Nature Reserve; Harmony 140KT; Hartbeestfontein 281KQ; Helena 400JU; Houwater 54JQ; Jerome 287MT; Ka Mininginisi; Klipbank 406LS; Klipfontein 11KQ; Klipfontein 566JR; Leipsig 264LR; Lomati 466JU; Lukale Hill, 5 km West of; M'Pefu 202MT; Mabyeni Hill; Malmaniesrivier 236KQ; Masisi; Molepos Location 187KS; Molototsi River; Monte Christo 388LR; Mooiplaats 242JS; Morgenrood 354LT; Mpafuri's Location;



MAP 223.

Bufo fenoulheti fenoulheti.
Recorded distribution in the Transvaal, and in southern Africa.



New Belgium 608LR; Newington 255KU; Nieuwpoort 516KQ; Nkungwini; Nooitgedacht 345JS; Nylsvley Nature Reserve; Paardedood 186LT; Percy Fyfe Nature Reserve; Rhenosterpoort 402KR; Rietfontein 214JR; Rietfontein 487JP; Riverhead 755LT; Ruighoek 169JP; Rust der Winter Nature Reserve; Rustenburg Nature Reserve; Schoonkloof 273KP; Shamiriri; Sheiding 746LT; Shingwedzi Agricultural Station; Sionwe Mountain; Spitskop 502JR; The Willows 197KT; Tshamavhudzi Peak, N. slope; Tshidzi Hill; Venice 40KU; Waterval 220JQ; Welgedacht 130JR; Wildeboschdrift 599LR; Wilgeboschfontein 818LS; Witbank 647LQ; Woodbush; Zonkolol 473JR.

Literature Records

Blouberg District; Gravelotte; Newington; near Pietersburg; near Pretoria; Rustenburg District, (Poynton, 1964). Beacon 1-3; Beacon 5-7; Klipkoppies Ranger Post; Leonardi Sandveld; Machayi Pan; Magovani Ridge; Mashatukop; Pumbe Pan; Punda Milia; Shilowa Picket; Shitsonhweni (KNP Records). Arbeidsgenot, Waterberg; Klipfontein 53KR (NMZB).

Habitat and Ecology

Widespread throughout the bushveld areas although usually associated with rocky outcrops. Found in veld types 8, 9, 10, 11, 14, 15, 18, 19, 20, 61 and 63 at altitudes of 300-1700 m a.s.l. Nocturnal and partially diurnal particularly during the breeding season. Usually found in crevices under rock on rock or rock on soil, either singly or in small groups of five or six individuals, but even up to nine, almost invariably in the company of scorpions and lizards, more rarely with other amphibians.

Poynton & Broadley (1988) and Lambiris (1988) mention that these toads breed in temporary pools. This was borne out during this survey. After a shower of rain had fallen on the previous afternoon and evening 36 Bufo fenoulheti were captured in traps and trapped animals even went into amplexus while in bottles and were released like that. The strings of eggs were observed everywhere at the edge of the pools. Hatching took place after approximately 24 hours. Massive mortalities are ensured with the drying up of these pools should no subsequent rain fall.

Conservation Status

Unprotected, except for export control (Transvaal Nature Conservation Ordinance 12 of 1983). Widespread in the Kruger National Park (Pienaar et al, 1976) and in several provincial nature reserves. However its habitat is mostly secure and the status of this species follows suit.

Remarks

Measurements of specimens indicate a greater size range than that recorded by Lambiris (1988) and Poynton & Broadley (1988). Comments on the systematics of the species have been included under vertebralis p. and Poynton & Broadley (1988) present a lengthy discussion on the complexity of this and allied species.

Genus Schismaderma Smith, 1849

Schismaderma Smith, 1849, Illus. Zool. S. Afr., Rept., App. p. 28. Type by monotypy: S. lateralis Smith, 1849 (substitute name for Bufo carens Smith, 1849).

A monotypic genus characterised by a horizontal pupil, an elongate, posteriorly free tongue and an absence of parotid glands. A ridge of glandular skin is found dorsolaterally from above the tympanum almost to the groin. A remarkably successful toad occupying more arid habitats than most other species. The species is widespread in Africa from Natal and the Transvaal north to Tanzania and south-eastern Zaire (Frost, 1985) in savanna country. Breeding takes place in shallow water bodies usually with grass around the perimeter. Sexual dimorphism is apparent. The tadpoles swim in dense shoals.

Schismaderma carens Smith, 1848

Bufo carens Smith, 1848, Illus. Zool. S. Afr., Rept., pl. 68, fig. 1. Type locality: interior of Southern Africa. Poynton 1964, p. 60, fig. 20; Wager 1965, p. 108, figs.; Broadley 1966c, p. 474; Stuckenberg, 1969, p. 152; Passmore & Carruthers 1979, p. 78, figs.; De Waal, 1980, p. 97; Wager 1986, p. 58, figs.
Schismaderma carens Smith. Van Dijk 1977, p. 255; 1971, p. 113; Frost 1985, p. 76, Poynton & Broadley 1985, p. 484; Auerbach 1987, p. 37, pl. 3, fig. 3; Lambiris 1988, p. 106; Branch 1988b, p. 2.

Diagnosis. 204 Specimens examined.
Colour: The dorsum in females mostly reddish brown to red with paired paravertebral darkish partly obscured

markings. The thickened dorsolateral glandular tissue edged with blackish ventrally. Laterally a mottled or speckled greyish. The limbs are paler dorsally, tinged with pinkish brown. Males are paler more yellowish to yellowish grey dorsally and with a grey-black often yellow tinged gular area. Ventrally off-white variably speckled with grey, this increasing posteriorly.

Morphology: Largest male SVL = 88,0 mm (J6364 - Helena 400JU), mass = 58,8 g (J6364); Largest female SVL = 83,0 mm (N3919 - Mollepoos Oog 332JP), mass = 48,9 g (J4105 - Zwartkop 369KQ). Mean male SVL (>50,0 mm) = 64,17 mm ± 12,32 (1SD), n = 27, mass = 27,77 g ± 15,66 (1SD), n = 27; Mean female SVL (>50,0 mm) = 62,23 mm ± 10,17 (1SD), n = 35, mass = 22,3 g ± 10,86 (1SD), n = 35.

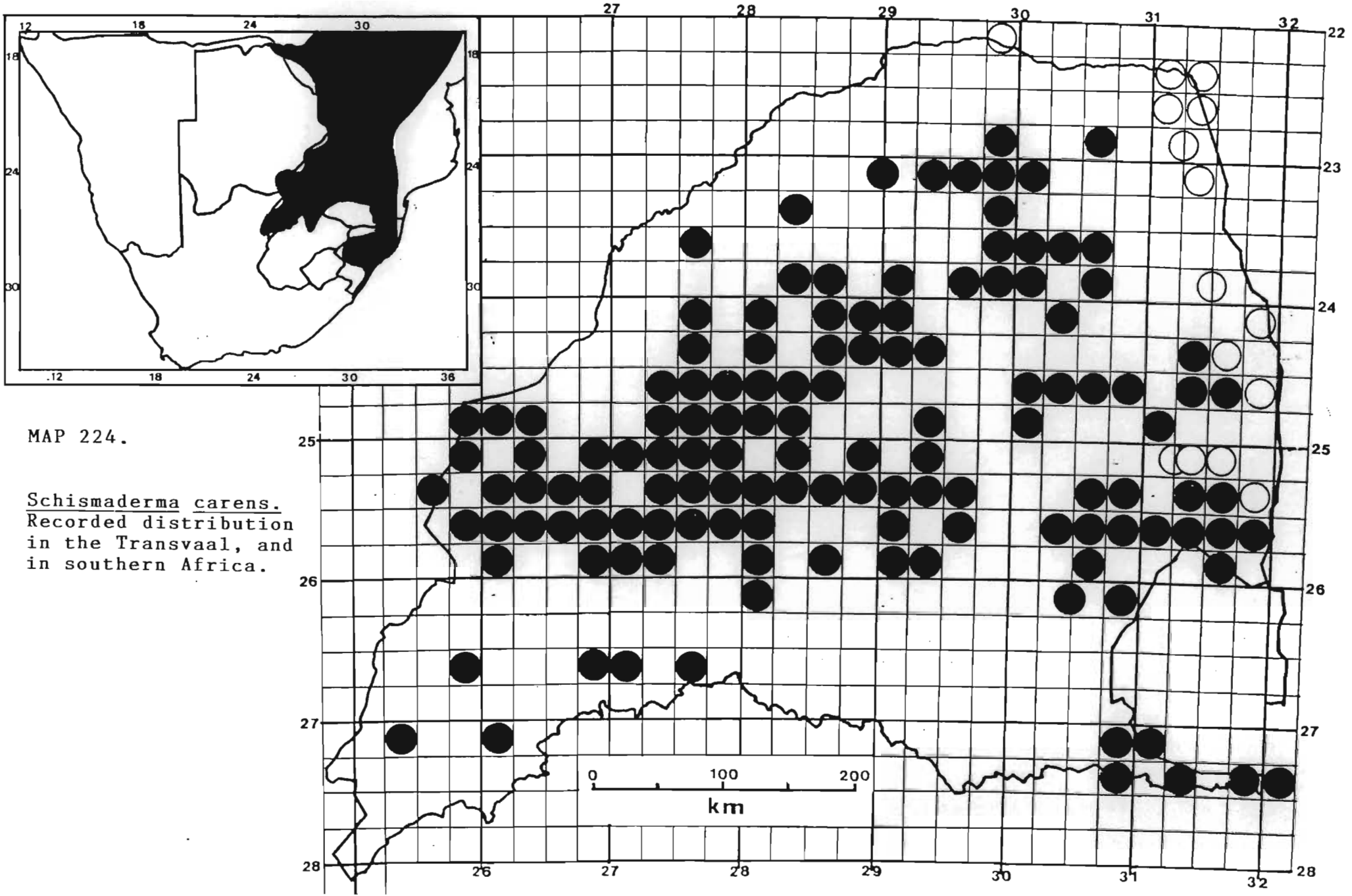
Head smaller than other toads with a horizontal pupil to the eyes. The tympanum is large and very distinct. Parotid glands absent. A thickened glandular ridge extends from above the tympanum dorsolaterally to just anterior to the thigh. Glands under forearm absent. Tubercles under hands and feet moderate to large. Three phalanges of inner and two of the outer sides of the third toe mostly free of web. A narrow fringe of webbing extends along phalanges free of the main web.

Distribution

North-eastern Cape Province and Natal north to south-eastern Zaire (Frost, 1985).

Distribution in the Transvaal (Map 224).

Ben Lavin Nature Reserve; Bendor 211HT; Bergplaats 25HU; Bhokweni; Blouberg; Blyde River Nature Reserve; Blyde River Nature Reserve, Bourkes Luck; Boschkom 272JT; Brondal, Nelspruit; Buffelshoek 277KR;



MAP 224.

Schismaderma carens.
Recorded distribution in the Transvaal, and in southern Africa.

Buffelshoek 446KQ; Buffelshoek 91JS; Buffelspoort 421KR; Buisdorp 37LS; Bulskop 225IP; Bultfontein 178JQ; Bushbuckridge; Carolina District, Komati River; Carpediem 76KT; Clearwaters, Haenertsburg; Cyferfontein 434KR; De Kroon; Dientje 453KT; Doorndraai 282KR; Doornhoek 284KR; Eastern Transvaal, Godwan River; Ellisras; Galakwyns Stroom 745LR; Gestoptefontein 349IO; Gillooly's Farm (AJL); Godlwayo; Goedgelegen 194LR; Griffin Mine; Groenfontein 458KQ; Groenfontein 526JR; Groot Denteren 533LR; Groot Nylsoog 447KR; Grootfontein 352KQ; Gunfontein 71KR; Haakbosch 79JQ; Handsup 305JU; Hans Merensky Nature Reserve; Hartbeestfontein 281KQ; Hartebeestpoort E 215JQ; Hectorspruit; Helena 400JU; Irene, Hennops Spruit; Kafferskraal 43JQ; Kalkfontein 367KT; Kameelpoort 202JR; Klipbank 406LS; Klipnek 199JS; Klipspruit 714KS; Knoppieskraal 537KQ; Kosterfontein 460JP; Kromrivier 347JQ; Kroondal; Kwa Seane; Kwarriekraal 148JQ; Leeuwenhoek 112KP; Leeuwfontein 188JR; Leeuwfontein 228JS; Lindleyspoort 220JP; Loskop Dam; Lot 19 20HO; Louws Creek; Louws Creek, Roux Dam; Luphisi; Maandagshoek 254KT; Malelane 189JU; Malemetsa; Malmaniesrivier 236KQ; Manyeleti Game Reserve, Buffelshoek 340KU; Manyeleti Game Reserve, Hermitage 205KU; Marico Bosvelddam; Mariepskop; Matangari; Matlala Location; Melkboomfontein 919LS; Mezeg 77JP; Moilwas Location; Mollepoos Oog 332JP; Mooifontein 285JS; Mooiplaats 355JR; Morgenrood 354LT; Nahala 75HU; Naudes Rust 272JU; Nelspruit; Nelspruit, Godwan River; Nelspruit, Steiltes; Newgate 802MS; Nieuwpoort 516KQ; Nooitgedacht 345JS; Normandie 178HT; Nylsvley 560KR; Nylsvley Nature Reserve; Nzulase; Olievenbosch 506KQ; Oostenryk 92KS; Percy Fyfe Nature Reserve; Pongola Nature Reserve; Potchefstroom; Pretoria; Pretoria District; Pretoria, Apies River;

Pretoria, Fountains; Pretoria, Waterkloof; Pretoria, Wonderboom; Pretoria, Zoo Hill; Rhenosterfontein 563IQ; Rhenosterpoort 402KR; Rhenosterpoort 442KQ; Rietfontein 179JP; Rietfontein 214JR; Rietgat 224JQ; Rietspruit 83JQ; Ronderand 41JP; Roodewal 251JT; Rooiberg; Ross 55KU; Ruighoek 169JP; Rust der Winter Nature Reserve; Rustenburg; Rustenburg District, Zandfontein; Rustenburg Kloof; Rustenburg Nature Reserve; Rustfontein 781LS; S.A. Bantu Trust; Steenbokfontein 426JP; Sterkriviernedersetting 253KR; Sterkspruit 412KT; Sterkstroom 411JP; Syferfontein 178JP; Tweefontein 58JO; Tzaneen 538LT; Van Tondershoek 10KO; Vergelegen 728JT; Viljoenshoop 299KT; Vlakbult 450JU; Vogelfontein 400JP; Vygeboomspruit 286LS; Vygeboomspruit 29JQ; Waaiheuwel 360JU; Waaikraal 396JQ; Waerkum 302LS; Waterval 273KU; Waterval Onder; Weergevonden 173IT; Welgedacht 130JR; Welgevonden 36LT; Witbank; Witklip 100KR; Witpoort Dorpsgebied; Wolvenkraal 13JS; Wonderboom 98KP; Wonderboomhoek 550LQ; Zebediela; Zeerust; Zeerust, Marico River; Zoutpan 104JR; Zwartkloof 60HU; Zwartkop 369KQ.

Literature Records

Beit Bridge; Johannesburg; Nylstroom; Pafuri; Sunningdale; Tzaneen (Poynton, 1964); Beacon F, Nyandu; Fayi Roan Camp; Hildebrandtia Pan; Ngirivane Windmill; Pumbe Pan; Pumbe Pit; Punda Milia; Satara; Shingwedzi; Skukuza (KNP Records). Suikerbosrand Nature Reserve (Carruthers, 1978). Klipfontein 53KR (NMZB).

Habitat and Ecology

Widespread in the Transvaal, favouring rocky areas in the

bushveld but also found in the lowveld. Appears to be largely excluded from the highveld. Occurs in veld types 6, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 48, 50, 61, 63, 64 and 67 although mostly in 18, 19 and 20, at altitudes of 300-1700 m a.s.ℓ. Associated with rocky outcrops and hillsides carens takes refuge in crevices between rocks or under rock on rock or rock on soil. Will also utilise human debris, rotting logs, and holes in the ground. It is active during dry periods when most other amphibians are aestivating and can tolerate hot and cold conditions therefore allowing it to be active earlier in spring and later in autumn than other species. Will shelter in caves and buildings including cellars where they may move into any available shelter, including desk drawers. During the breeding season in midsummer they move to the nearest suitable and available water where their characteristic calls can be heard. During this time they are absent from their normal haunts, only returning in January or February once the breeding season is over.

Conservation Status

Unprotected, with the exception of export control, (Transvaal Nature Conservation Ordinance 12 of 1983). Occurs in many provincial nature reserves and in the Kruger National Park. Its adaptability to changing conditions renders the species secure.

Family MICROHYLIDAE

Genus *Breviceps* Merrem

Breviceps Merrem, 1820, *Tent. Syst. Amph.*, p. 177. Type by monotypy: *Rana gibbosa* Linnaeus.

A unique frog genus usually referred to as blaasops or rainfrogs. They are characterised by having a relatively small head which when the animal inflates itself merges into the body. The pupil is horizontal, teeth are absent but there are dermal ridges present on the roof of the mouth. Snout extremely abbreviated and mouth small. The limbs are short and digits lack webbing. The inner and outer metatarsal tubercles well developed, an adaptation to a burrowing existance. Totally terrestrial, these amphibians feed mostly on Isoptera - Termitidae and Hymenoptera - Formicidae, moving about slowly although able to a adopt a faster shuffling run. Unable to swim for any length of time, they nest in burrows underground, laying small numbers of very large ova which hatch and metamorphose inside the spherical burrow. Mostly restricted to southern Africa, the genus extends as far north as Tanzania. Some 17 taxa occur in southern Africa. Some forms are easily separated morphologically, others are in need of taxonomic revision. The genus as a whole needs a reappraisal to determine phylogenetic affinities between species. Four species and two subspecies occur in the Transvaal.

Key to the Transvaal species.

1. Fifth toe passing well beyond basal tubercle of fourth toe ..... *B. verrucosus verrucosus*

Fifth toe very small not reaching basal tubercle of fourth toe 2

2. Outer toe with a subarticular tubercle 3
Outer toe minute, without a subarticular tubercle 4

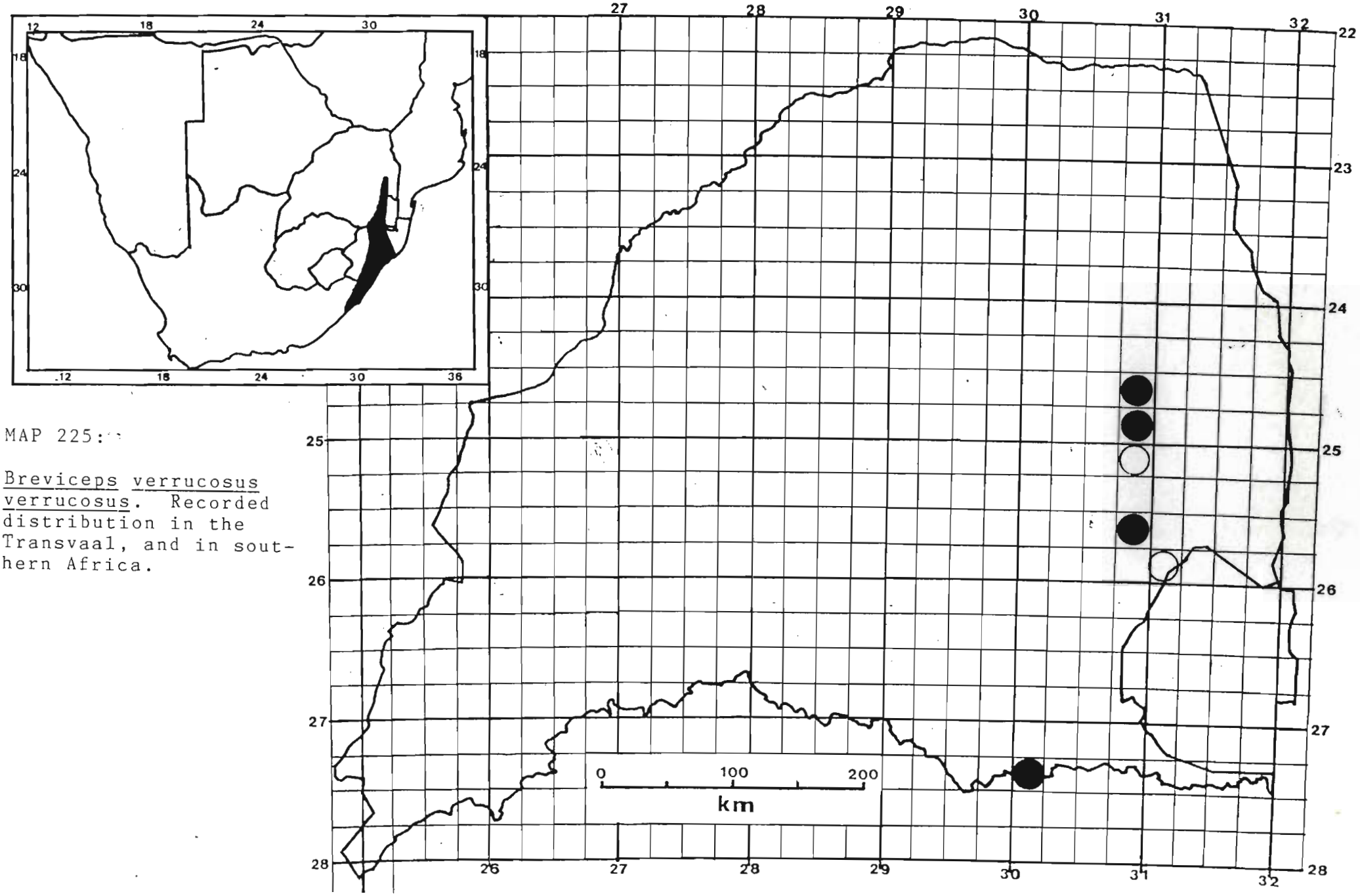
3. Ridges converging over back to about width of gape; Range: Drakensberg Escarpment ..... B. sylvestris sylvestris
Ridges almost parallel; Range: Eastern Soutpansberg ..... B. sylvestris taeniatus

4. Vertebral region without light spots and smooth ..... B. mossambicus
Vertebral region with light spots paravertebrally; skin warty 5

5. Ventrum not marbled ..... B. adspersus adspersus
Ventrum marbled ..... B. adspersus pentheri

Breviceps verrucosus verrucosus Rapp, 1842

Breviceps verrucosus Rapp, 1842, Arch. Naturgesch 8, p. 291, pl. 6, fig. 5. Type locality: Natal. Van Dijk, 1966, p. 271, 1971(b), p. 114.
Breviceps verrucosus verrucosus Rapp. Poynton 1964, p. 70, fig. 28; Wager 1965, p. 121, fig.; Van Dijk 1977, p. 175; Passmore & Carruthers, 1979, p. 84, figs.; Wager, 1986, p. 122, fig; Lambiris 1988, p. 119; Branch 1988b, p. 2.



MAP 225:

Breviceps verrucosus verrucosus. Recorded distribution in the Transvaal, and in southern Africa.

Diagnosis. 4 Specimens examined.

Colour: Uniformly brown to blackish brown with glandular ridges sometimes darkened. Ventrally off-white, granular and may be mottled or speckled with grey.

Morphology: Largest female SVL = 53,0 mm (N7925 - Kaapsche Hoop 483JT), mass = 16,0 g (N7925). Tympanum usually visible. Dorsum rugose and granular, the granules usually deeply pitted. A series of one to more pairs of longitudinal glandular ridges on the back. The limbs are short with reduced hands and feet. Subarticular tubercles single while the outer toe extends well beyond basal tubercle of the fourth, reaching that of the second. No webbing present.

Distribution

Endemic to South Africa, Lesotho and Swaziland.

Distribution in the Transvaal (Map 225).

Blyde River Nature Reserve, Gods Window; Kaapsche Hoop 483JT; Kastrolnek, Wakkerstroom; Mariepskop.

Literature Records

Barberton; Sabie (Poynton, 1964).

Habitat and Ecology

Mostly occurs along rocky hillsides in montane grassland in veld types 8 and 57 at altitudes of 1600 to 1700 m a.s.l. Occupy short horizontal burrows just below the ground but specimens have also been collected under rocks on soil. Usually solitary.

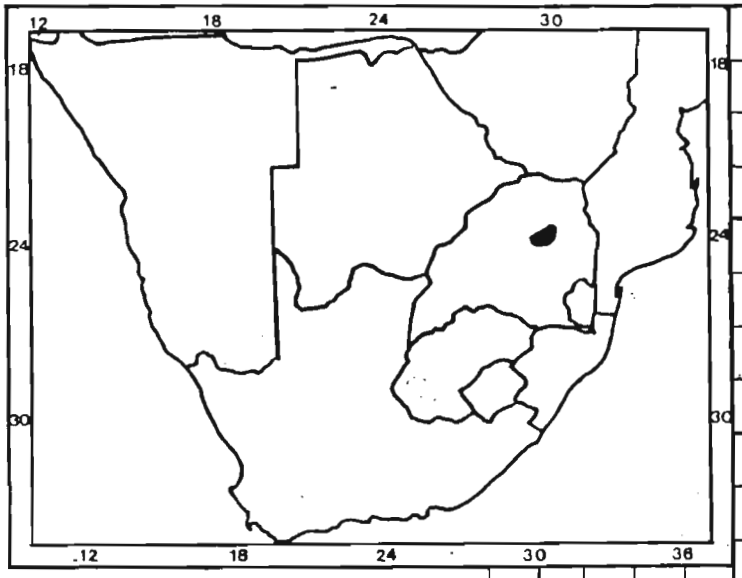
Conservation Status

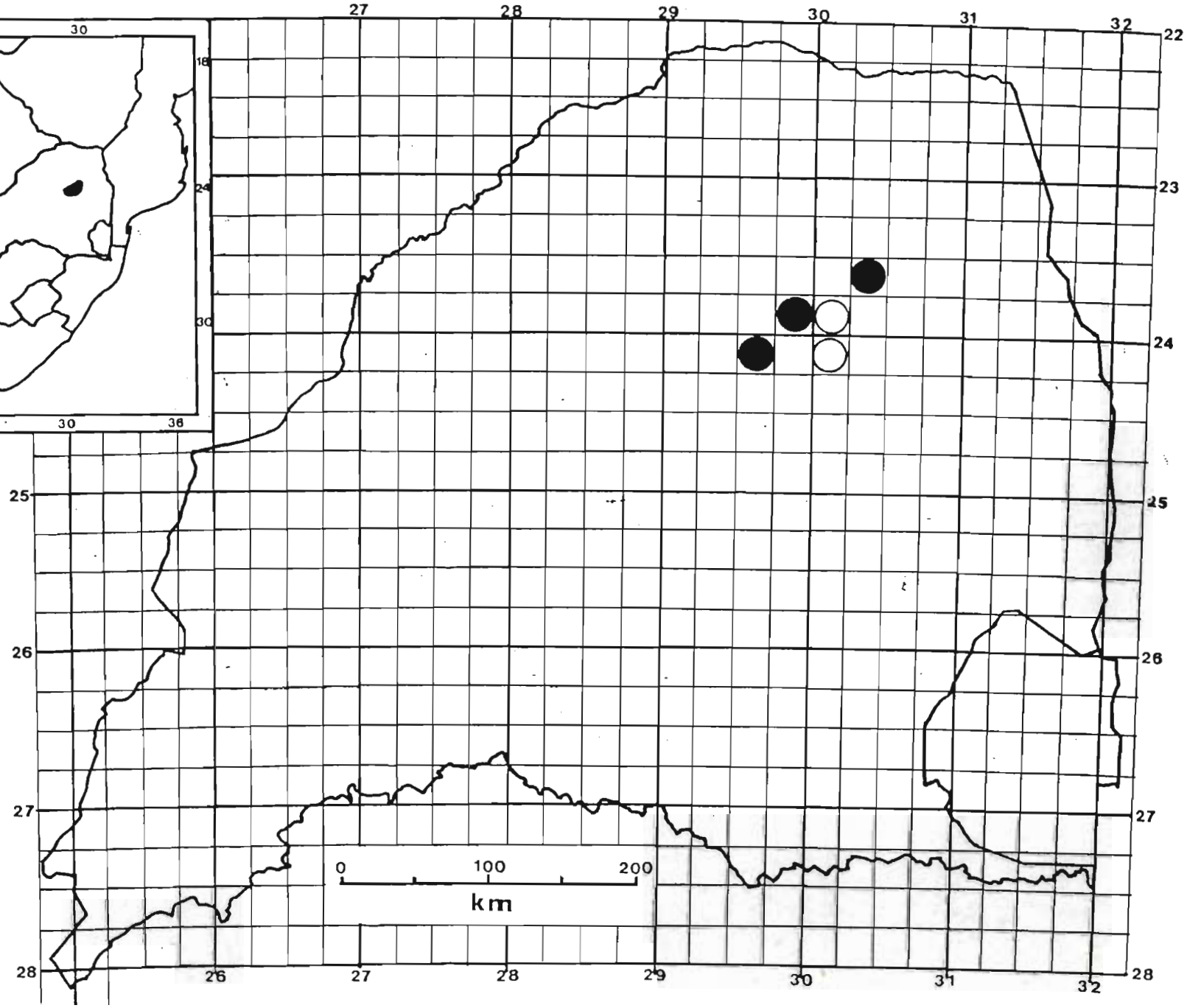
Unprotected although export from the province is controlled (Transvaal Nature Conservation Ordinance 12 of 1983). Peripheral in the Transvaal and very limited in distribution. The total distribution of the species in the province needs to be established. The species range has been reduced by afforestation in parts of its range and this needs to be monitored.

Breviceps sylvestris sylvestris FitzSimons, 1930

Breviceps sylvestris FitzSimons, 1930, Ann. Tvl. Mus. 14, p. 46, figs. 27-29. Type locality: Woodbush, eastern Transvaal.
Breviceps sylvestris sylvestris FitzSimons. Poynton 1964, p. 75, fig. 33; Wager 1965, p. 120; Van Dijk, 1971a, p. 114; Passmore & Carruthers 1979, p. 92, figs. Wager 1986, p. 121, fig; Branch 1988b, p. 2.

Diagnosis. 32 Specimens examined.
Colour: Two colour phases are apparent. One form is uniform brown above with distinct raised paravertebral ridges. A blackish streak extends from below the eye to just anterior to the forelimb. The second form is blackish above with reddish brown paravertebral patches, (Passmore & Carruthers 1979, p. 92, fig.). Dorsolaterally a series of irregular pale blotches are found. A blackish streak extends from below the eye to anterior to the shoulder. Ventrally both forms are white, variously variegated with greyish black. Males have dark pigmented gulars.





MAP 226:

Breviceps sylvestris sylvestris. Recorded distribution in the Transvaal, and in southern Africa.

Morphology: Largest female SVL = 54,0 mm (J1740 - Malemetsa), mass = 27,0 g (J1740); Largest male SVL = 53,0 mm, (JN2920 - Moleps Location), mass = 17,6 g (JN2920). Tympanum hidden within dark streak. Dorsal surface granular with a pronounced ridge commencing behind each eye and extending posteriorly at a distance subequal to the width of the mouth as far as the sacral region. The outer toe only just reaching basal tubercle of the fourth toe but not the second tubercle.

Distribution

Endemic to the Transvaal.

Distribution in the Transvaal (Map 226).

Clearwaters, Haenertsburg; Dap Naude Dam; Diepgelegen 945LS; Haenertsburg; Haenertsburg, Ottoshalt; Malemetsa; Molepos Location 187KS; Woodbush; Woodbush Forest Reserve.

Literature Records

Magoebaskloof (Poynton, 1964). Malta 65KT (NMZB).

Habitat and Ecology

Restricted to montane forest along the Transvaal escarpment in veld types 8, 9 and 19 at altitude of 1600-1700 m a.s.l. Takes refuge under rocks or logs and probably constructs shallow burrows as well under leaf litter on the forest floor. A nest with eggs was found adjacent to a large female during November. The chamber was about 5 cm below the surface.

Conservation Status

Unprotected except for export control (Transvaal Nature Conservation Ordinance 12 of 1983). Probably occurs in two provincial nature reserves. Elsewhere its habitat has been considerably depleted due to afforestation. The species is vulnerable. Monitor actions are required to determine abundance and the total range of the species.

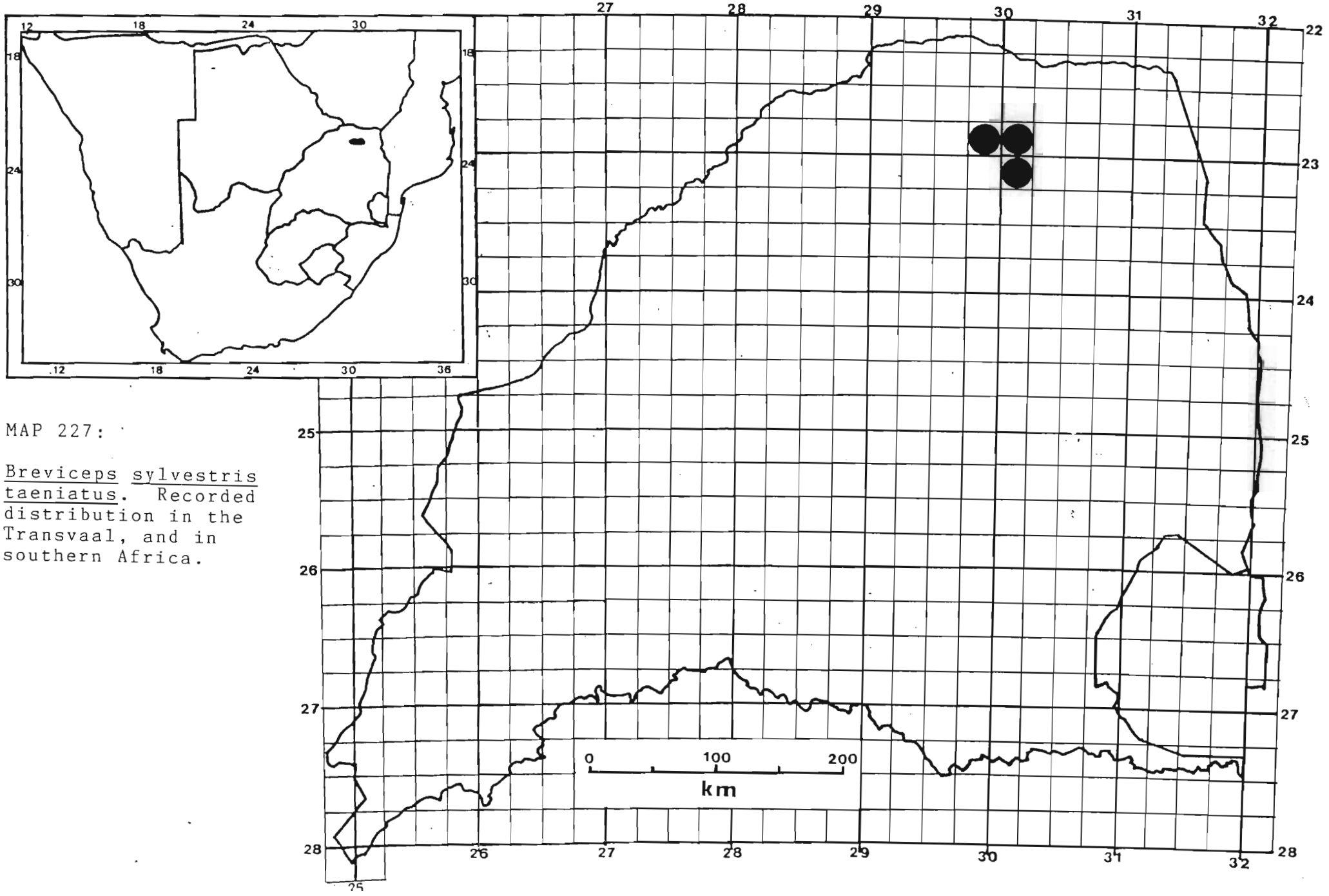
Remarks

There is room for doubt as to the identity of the form depicted by Passmore & Carruthers, 1979, p. 92. This form appears to be closely allied to 'adspersus' and not 'sylvestris'. It occurs along the stream leading out of the Dap Naude dam and as such not in true forest. However, Minter (pers. comm.) informs me that tape recordings of the two forms indicate no difference in the call pattern.

Breviceps sylvestris taeniatus Poynton, 1963

Breviceps sylvestris taeniatus Poynton, 1963, Ann. Natal Mus. 15, p. 322. Type locality: Soutpansberg, Transvaal. Poynton 1964, p. 76, fig. 34; Van Dijk 1971(b), p. 114; Wager 1965, p. 121; Passmore & Carruthers 1979, p. 92-93, fig; Wager 1986, p. 122; Branch 1988b, p. 2.

Diagnosis. 8 Specimens examined.
Colour: Yellow brown to brown above with blackish transverse bars extending paravertebrally down the back. The bars lie obliquely extending to the glandular ridges. Ventrally irregular brownish variegations on an off-white to cream background.



MAP 227:

Breviceps sylvestris taeniatus. Recorded distribution in the Transvaal, and in southern Africa.

Morphology: Largest female SVL = 44,0 mm (N7425 - Newgate 802MS), mass = 17,5 g (N7425). This is in agreement with Poynton (1964), p. 76. A broad head with tympanum hidden. Dorsal surface granular with distinct glandular ridges extending paravertebrally down the back from the posterior margin of the eye. Abdomen slightly granular. Outer toe reaching basal tubercle of fourth and almost as far as the second.

Distribution

Endemic to the Soutpansberg, Transvaal.

Distribution in the Transvaal (Map 227).

Bluegumsport 779MS; Entabeni Forest Reserve; Newgate 802MS; Ratombo.

Literature Records

Outlook 789MS (NMZB).

Habitat and Ecology

Found in thickly wooded savanna and montane forest along the Soutpansberg living in burrows in the soil or under rocks and rotting logs. Little known the species occurs in veld types 8, 9 and 20 at altitudes of 1200-1600 m a.s.l.

Conservation Status

Unprotected, except for export control from the province, (Transvaal Nature Conservation Ordinance 12 of 1983). Occurs in one provincial nature reserve. The range of

the species has been affected by agricultural and sylvicultural activities particular from Louis Trichardt eastwards. The species is secure owing to the ruggedness of the terrain but details of population density are needed.

Breviceps adspersus adspersus Peters, 1882

Breviceps adspersus Peters, 1882, Reise nach Mossambique, p. 177. Type localities: Damaraland and Transvaal. Poynton & Broadley 1985a, p. 523.
Breviceps adspersus adspersus Peters. Poynton 1964, p. 79, fig. 40; Wager 1965, p. 118, fig.; Wager 1986, p. 119, fig.; Passmore & Carruthers 1979, p. 102, figs; De Waal, 1980, p. 102; Auerbach 1987, p. 40, pl. 4, fig. 8; Lambiris, 1988, p. 128; Branch 1988b, p. 2.

Diagnosis. 223 Specimens examined.
Colour: A mottled blackish and brown with paired pale paravertebral blotches extending down the black. These blotches are dark edged. Dorsolaterally a variable series of pale to orange dark edged blotches occur from above the shoulder to the groin. A dark stripe extends from below the eye to the shoulder. Ventrally white. The throat in males pitch black, usually as a pair of longitudinal bands or patches. Those in females a marbled greyish black.
Morphology: Largest male SVL = 47,0 mm (J1473 - Glen Alpine 304LR), mass = 12,3 g (J1473); Largest female SVL = 54,0 mm (J1543 - Moonlight 111LR, N5008 - Calais 563KS), mass = 32,0 g (N5008). Mean male SVL (>20,0 mm) = 31,8 mm ± 5,22 (1SD), n = 38, mass = 5,34 g ± 2,92 (1SD), n = 37; Mean female SVL (>20,0 mm) = 35,58 mm ± 6,93 (1SD), n = 50, mass = 6,04 g ± 4,14 (1SD), n = 48.

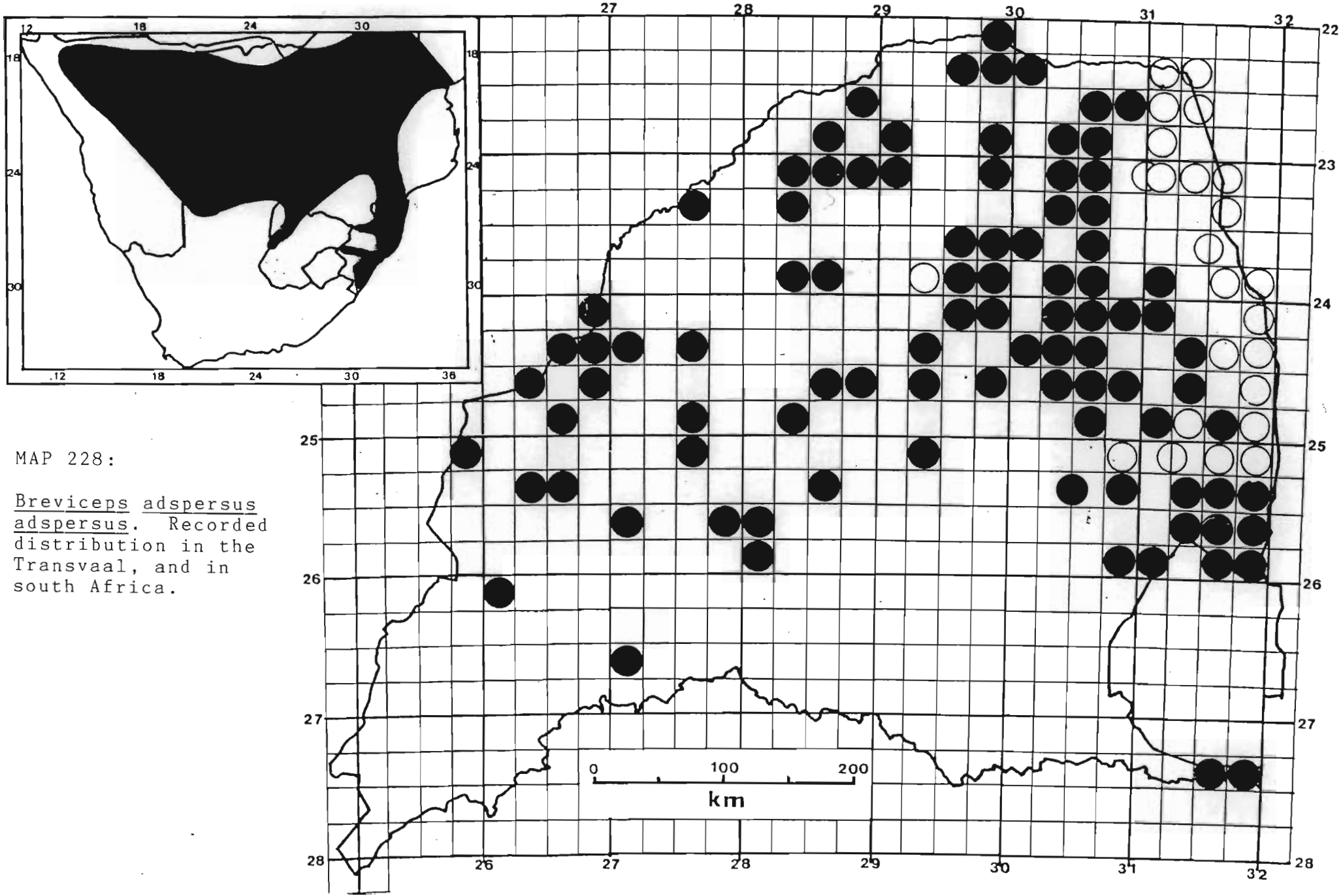
Tympanum obscured. Dorsum smooth to granular. Ventrally smooth. Basal subarticular tubercles are single and palmar tubercles moderately to well developed. Outer toe not reaching basal tubercle of fourth toe falling far short of the second.

Distribution

North-eastern South West Africa, Botswana, Zimbabwe to southern Mozambique, south to the northern Cape Province, western Orange Free State and Natal.

Distribution in the Transvaal (Map 228).

Ameland 11LS; Archie 156KT; Arundel 788LT; Barberton Townlands 369JU; Ben Lavin Nature Reserve; Bergfontein 277KQ; Berlyn 670LT; Between Lake Fundudzi & Entabeni; Blouberg; Bluegumsport 779MS; Bobomeni; Brak River, Northern Transvaal; Calais 563KS; Canterbury 254MR; Carpediem 76KT; Clearwaters, Haenertsburg; Copenhagen 58KU; De Kroon; Diepkloof 44JS; Dongola; Doreen 108MT; Drakenstein 77LQ; Dusseldorp 22KT; Dzumeri; Galakwyns Stroom 745LR; Glen Alpine 304LR; Gollel 73 HU; Groot Denteren 533LR; Haenertsburg; Hans Merensky Nature Reserve; Helena 400JU; Honeymoon 80KQ; Houthaaldoorns 2IP; Islet 137MS; Jerome 287MT; Junction of Olifants and Selati River; Kalkfontein 84LR; Kgoloko Location; Khandizwe; Killaloe 235MS; Klaserie R. Valley, Mariepskop; Klein Tshipise; Komatipoort Townlands 182JU; Konigstein 625JT; Krugerskraal 583KR; Kwa Seane; Langjan Nature Reserve; Liamule Hill; Louws Creek; Ludlow 227KU; Magalieskop; Makhutswi River, Leydsdorp; Malabuke; Malamala; Malavuhe; Mananga; Manwayingwe; Marico Bosvelddam; Mariepskop; Mataffin; Matangari; Mica Siding, Juction Olifants & Letaba



MAP 228:

Breviceps adspersus adspersus. Recorded distribution in the Transvaal, and in south Africa.

Rivers; Mooiplaats 355JR; Mooiplaats 65KP; Moonlight 111LR; Morgenrood 354LT; Mt. Sheba; Nwanetsi; Nylsvley Nature Reserve; Nzulase; Olievenbosch 506KQ; Paardevlei 201KS; Pafuri; Perkeo 223KT; Pretoria; Pretoria, Meyerspark; Punda Milia; Rietfontein 179JP; Rietfontein 214JR; Riverhead 755LT; Rolle 235KU; Roodekuil 183JQ; Ross 55KU; Rustenburg Kloof; S.A. Bantu Trust; Schiettocht 25LU; Schilderkrans 1041LS; Schoemanskloof; Segop's Location 821LS; Sekororo; Shaholle, Gravelotte; Shamiriri; Shilowane; Skukuza; Smaldale 225KP; Smaldeel 36KP; Sterkspruit 412KT; Streatham 100KT; Takane; The Willows 197KT; Thornhill Farm 171JU; Tivoli 98KT; Tshakhuma; Tshidzi Hill; Uitkomst 769LS; Van Stadenshoek 12KP; Venice 40KU; Verpoort 161KP; Viljoenshoop 299KT; Vygeboomspoort 456KR; Weihoek 540KQ; Welgegund 375JQ; Woodbush; Zandrivierspoort 851LS; Zebediela; Zeekoegat 12KU; Zondagfontein 300MR; Zuni Zuni 96KP; Zwartkloof 60HU.

Literature Records

Hectorspruit; Leydsdorp; Newington; Pafuri; Pietersburg; Sabie; Waterberg (Poynton, 1964). Beacon 1-3; Beacon 2-5; Beacon 7, Nyandu; Between Eendrag Windmill and Mabodhleleni; Cabora Bassa Line to end of Sandveld; Fayi Roan Camp; Klipkoppies Ranger Post; Lebombo N171; Malonga; Malopenyana Windmill; Napi Road S25; Nyandu Bush; Pumbe Sandveld; New tar road north of Levubu 10-12 km from Sandneck; New tar road N of Levubu on Sandneck Plateau; New tar road 12-17 km N of Levubu; New tar road 0-10 km N. of Levubu; Shabeni Borrow Pit; Shirhombe Picket; Stolznek (KNP Records). The Downs 34KT; Outlook 789MS (NMZB).

Habitat and Ecology

Widespread throughout the bushveld and lowveld of Transvaal, being most common in sandveld areas but also locally common elsewhere. Found in all veld types excluding 16, 48, 50, 52, 53, 54, 55, 57 and 62 at altitudes of 200-1700 m a.s.l. Mostly inhabit short burrows which may be 10 cm or more deep but also utilise rocks as the roofs to their burrows, frequently being found buried in the soil under rocks, rarely down to 50,0 mm beneath the rock. Also found under rotting logs. Usually single but occasionally pairs are found and on rare occasions up to five under a log. They are probably stimulated to call by a drop in atmospheric pressure, and anticipate rain by calling up to two days or even more prior to rain falling. (See also Poynton & Pritchard 1976). If atmospheric humidity is high enough and rain imminent, these amphibians will emerge to forage but are more often found during or after the passage of rain. On one occasion along a 100 m trapline 22 frogs were captured after rain had fallen the previous afternoon. Usually nocturnal, they will under favourable conditions emerge in the late afternoon. They feed mostly on Isoptera and Hymenoptera - Formicidae but include smaller quantities of Coleoptera, Lepidopteran larvae and spiders in their diet (Jacobsen, 1982). They are able to make the most of the sporadic opportunities to feed by being able to consume vast quantities at a time. Thus one <u>adspersus</u> contained 38,3% by volume of its mass in food. This phenomenon is made possible by the remarkable distensibility of the stomach. A 35,0 mm SVL adult has an empty stomach volume of about 0,15 cc which can expand to contain 2,5 cc or in excess of 16 times the empty volume (Jacobsen 1982, fig. 44). This is of considerable survival value and of great importance to the life style

of these animals. Breeding takes place during the rainy season, and during warm, humid weather the males call constantly, chorussing periodically into a crescendo of sound. Egg-laying takes place in the underground burrow. Only few eggs (17-22) are laid and take in excess of 19 days to develop into fully fledged juveniles ranging from 8,0-12,0 mm SVL and masses of 0,05-0,4 g.

Conservation Status

Unprotected, with the exception of export control out of the province, (Transvaal Nature Conservation Ordinance 12 of 1983). Occurs in many provincial nature reserves and in the Kruger National Park. The species is currently secure.

Remarks

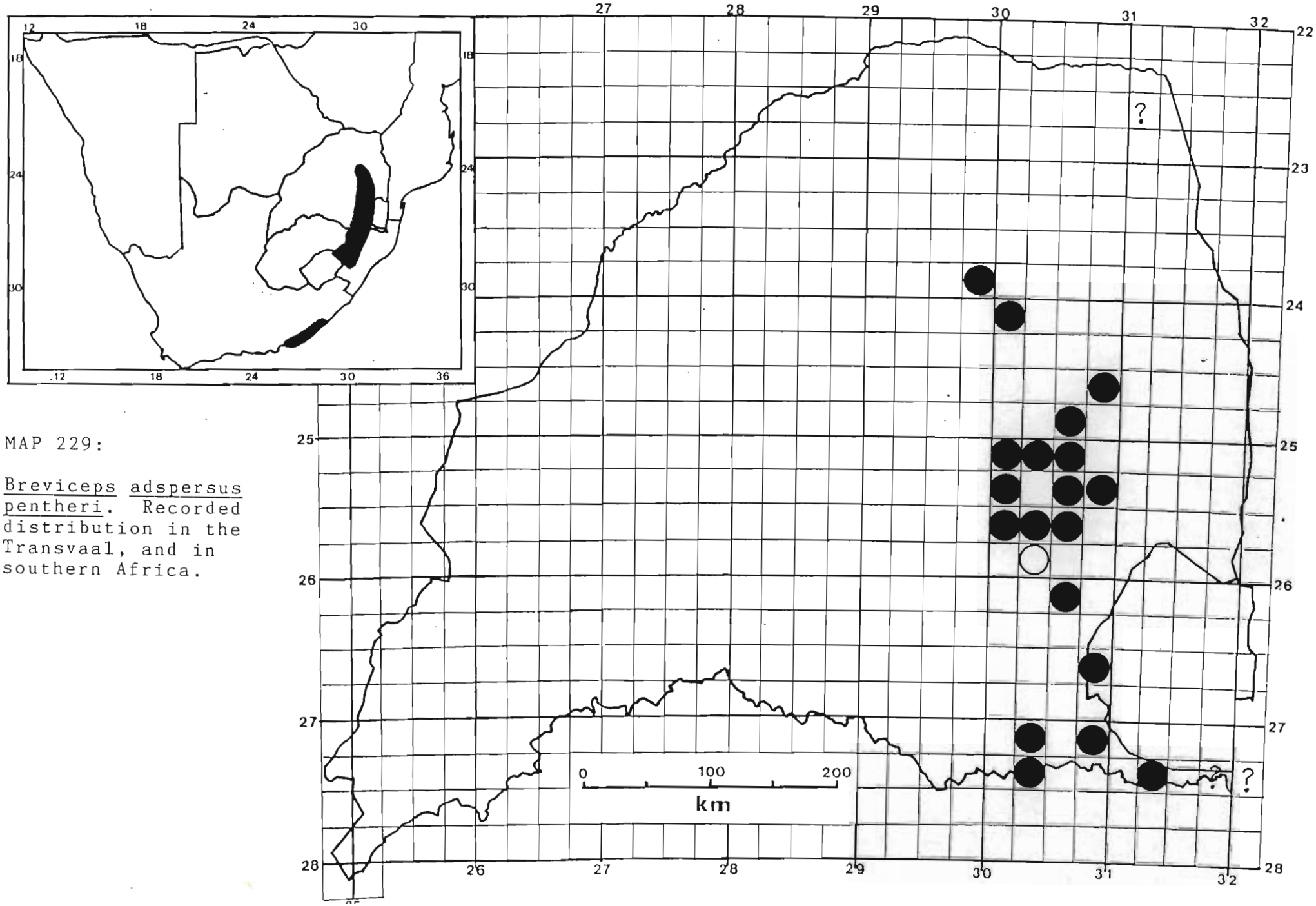
Although relatively uniform morphologically over most of its range in the Transvaal but being most typical in the north-west, there are differences in those populations from Tshakuma in the north-eastern Transvaal and those of Khandizwe in the southern Kruger Nationl Park. The latter are largely without paravertebral markings and in calling seem not to incorporate the crescendo reached by more typical "adspersus". The complex needs to be intensively investigated throughout their range. Although for the purpose of this report Transvaal pentheri are retained on a subspecific level, it is likely that the Transvaal and Orange Free State material forms a separate species in its own right. De Waal (1980) has recorded true adspersus from the north-eastern Orange Free State which warrants confirmation considering the altitude and habitat available. It should be a 'pentheri'. A considerable discussion has hinged around

the mossambicus - adspersus problem (Poynton, 1964, Poynton, 1982 and Poynton & Broadley 1985). Several specimens from the Lowveld of the Transvaal are indicative of hybridization between mossambicus and adspersus, with the only true mossambicus in the Transvaal possibly restricted to the extreme south-east of the province.

Breviceps adspersus pentheri Werner, 1899

Breviceps pentheri Werner, 1899, Zool. Anz. 22, p. 116. Type locality: Cape Province, probably Grahamstown.
Breviceps adspersus pentheri Werner. Poynton 1964, P. 82, fig. 41; Wager 1965, p. 118; Van Dijk 1971(b), p. 114, 1977, p. 175; Passmore & Carruthers 1979, p. 102, fig.; Wager 1986, p. 120; Lambiris 1988, p. 131; Branch 1988b, p. 2.

Diagnosis. 77 Specimens examined.
Colour: Similar to adspersus but more orangy in the paler areas and may be uniform in colour without paravertebral patches. Dorsally variably spotted or speckled with black. Ventrally white with the gular area black in males and variegated in females.
Morphology: Very small Breviceps. Largest male SVL = 38,5 mm (J1324 - Groothoek 171HT), mass = 5,1 g (J1324); Largest female SVL = 32,0 mm (J6809 - Wanhoop 78JT), mass = 6,3 g (J6809). Mean male SVL (>15,0 mm) = 23,01 mm ± 5,22 (1SD), n = 22, mass = 2,16 g ± 1,31 (1SD), n = 22; Mean female SVL = 27,58 mm ± 2,83 (1SD), n = 13, mass = 4,16 g ± 1,52 (1SD), n = 13. Tympanum not visible. Dorsum rugose, ventrally smooth to granular. Subarticular tubercles very large and single; Outer toe not reaching basal tubercle of fourth or of second toes.



MAP 229:

Breviceps adspersus pentheri. Recorded distribution in the Transvaal, and in southern Africa.

Distribution

South-eastern Cape Province north through western Natal to the eastern Transvaal.

Distribution in the Transvaal (Map 229).

Acre 2KT; Bakenkop 152HT; Blyde River Nature Reserve; Boschhoek 36JT; De Kuilen 205JT; Doornhoek 545KT; Elandsfontein 322JT; Farrefontein 349JT; Godlwayo; Groothoek 171HT; Kastrolnek, Wakkerstroom; Kranskloof 554KT; Lisbon State Forest; Loopfontein 298JT; Magalieskop; Mariepskop; Pittville 197IT; Punda Milia; Redcliff 426IT; Rietfontein 255JT; Rietvlei 375JT; Stanley Bush Kop; Tafelkop 126HT; Wanhoop 78JT; Wilkenshof 252JT; Woodbush.

Literature Records

16 km NE of Carolina (NMZB).

Habitat and Ecology

A highveld and montane grassland species in veld types 8, 19, 54, 57, 63 and 64 at altitudes of 1200-2300 m a.s.l. Although probably living in self-excavated burrows, they are most frequently found in soil under rocks on rocky hillsides. Usually single, pairs are found together during the midsummer breeding season. Parents with eggs have been observed in January.

Conservation Status

Unprotected, except for control in export of individuals from the province (Transvaal Nature Conservation

Ordinance 12 of 1983). Occurs in few provincial nature reserves. However its habitat along rocky hillsides renders the species secure.

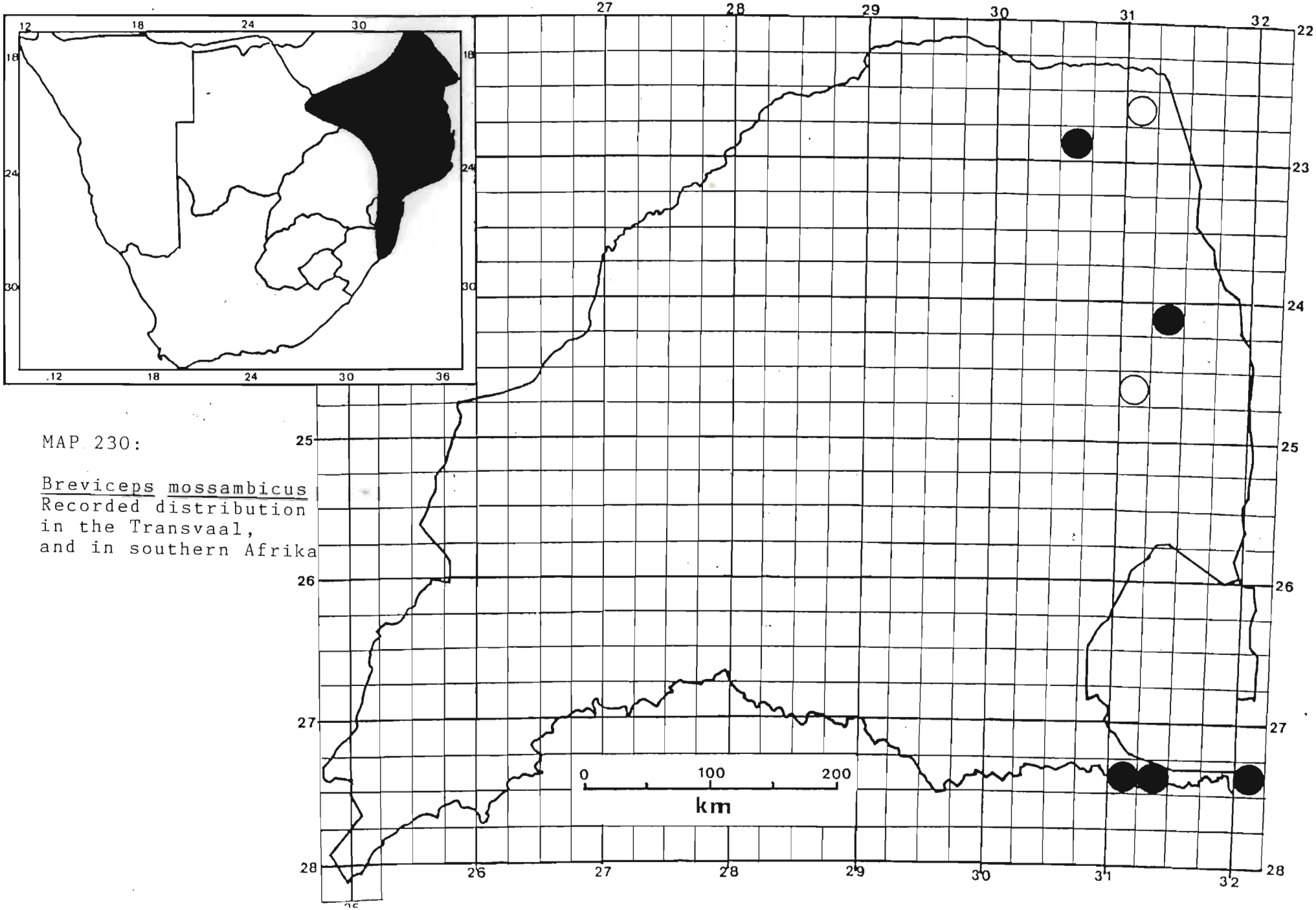
Remarks

A taxonomic investigation of these very small rain frogs is needed to ascertain their true status. The very small size and habitat and possible sympatry in some areas with adspersus proper needs to be assessed. Specimens tentatively placed as pentheri (Map 229) but occurring in the lowveld are atypical and probably belong to adspersus or mossambicus.

Breviceps mossambicus Peters, 1854

Breviceps mossambicus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 628. Type locality: Mozambique Island and Sena. Poynton 1964, p. 83, fig. 43; Wager 1965, p. 119, fig.; Van Dijk 1966, p. 171; Stuckenberg 1969, p. 152; Van Dijk 1971b, p. 112, 1977, p. 175; Passmore & Carruthers 1979, p. 104, figs; Frost 1985, p. 356; Poynton & Broadley 1985, p. 517, fig. 4; Auerbach 1987, p. 40, pl. 4, fig. 7; Lambiris 1988, p. 133; Branch 1988b, p. 2.

Diagnosis. 10 Specimens examined.
Colour: Yellow or orange-brown dorsally with black paravertebral spots. A black stripe extends from lower margin of eye to axil of arm. Ventrally off-white to cream speckled with brown. Gular grey-black to black according to sex.
Morphology: Largest male SVL = 33,0 mm (J4834 - Dusseldorp 22KT), mass = 5,35 g (J4834); Largest female SVL = 40,0 mm (N7327 - Umkoonyan 42HU), mass = 10,0 g



MAP 230:

Breviceps mossambicus
Recorded distribution
in the Transvaal,
and in southern Afrika

(N7327). Mean male SVL = 27,2 mm ± 5,54 (1SD), n = 5, mass = 3,78 g ± 1,07 (1SD), n = 5; Mean female SVL = 32,3 mm ± 5,40 (1SD), n = 5, mass = 7,58 g ± 2,41 (1SD), n = 5. Tympanum not visible; dorsum smooth; ventrum smooth. Palmar tubercles moderately to well developed; basal subarticular tubercles single but partially subdivided in some specimens. Outer toe does not reach basal tubercle of fourth or of second toe.

Distribution

Southern Tanzania, south through Zambia, Malawi and Mozambique to eastern Botswana, Zimbabwe, eastern Transvaal and northern Natal/KwaZulu.

Distribution in the Transvaal (Map 230).

Dusseldorp 22KT; Godlwayo; Malavuhe; Pongola Nature Reserve; Umkoonyan 42HU.

Literature Records

Near Klaserie; Punda Milia (Poynton, 1964).

Habitat and Ecology

Mixed woodland savanna in veld types 6, 9, 11 and 15 at altitudes of 200-700 m a.s.l. Usually found on rocky hillsides or outcrops under rock on soil. Also under heaps of decomposing vegetation in cultivated areas (Poynton & Broadley, 1985).

Conservation Status

Unprotected except for export control (Transvaal Nature Conservation Ordinance 12 of 1983).

Remarks

Typical mossambicus has been collected at Umkoonyan 42HU while what appears to be adspersus x mossambicus hybrids have been collected at Pongola and further north in the lowveld. Many of these exhibit pale dorsolateral patches. Considerable discussions concerning these have been presented by Poynton (1964) and Poynton & Broadley (1985). With the relatively few specimens available further comment is superfluous. Lambiris (1988) has gone so far as to geographically delineate hybrids and their distribution. It is felt that in the Transvaal the variations within mossambicus is insufficiently known and therefore precludes a similar attempt.