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Ichnotropis capensis

An annotated bibliographic history of *Ichnotropis* PETERS, 1854 (Reptilia, Lacertidae) with remarks on the validity of some of the including species

MARTEN VAN DEN BERG, May 2017

Abstract: Today *Ichnotropis* is still a poorly understood genus. This is an attempt to initialize some change herein, by providing an extensive bibliographic history of the genus, together with some remarks on the described taxa. Necessary future research is suggested.

Zusammenfassung: *Ichnotropis* ist auch heute noch eine Gattung, über die wir nur sehr wenig wissen. Mit der vorliegenden Arbeit wird versucht, dieses zu ändern, indem eine ausführliche Bibliografie der Gattung inklusive Bemerkungen zu den beschriebenen Taxa bereitgestellt wird. Notwendige zukünftige Untersuchungen werden angeregt.

Keywords: *Ichnotropis*, taxonomy.

Introduction

The idea of this article was born during revision of some poorly substantiated distribution maps on www.lacerta.de, while revising the genus *Ichnotropis*. Since the publication of the “Kommentierte Lacertiden-Liste für Europa, Afrika, den Nahen Osten inklusive der Arabischen Halbinsel und Asien” (MAYER 2013), it was evident that some adjustments regarding *Ichnotropis* were essential. In a prior revision of *Ichnotropis* (2012, see figure 1) we already discarded all the subspecies that were maintained until that moment; *Ichnotropis capensis nigrescens* LAURENT, 1952 and *Ichnotropis bivittata pallida* LAURENT, 1964. These subspecies are still listed today in “The Reptile Database” (UETZ 2017). Although we already listed *Ichnotropis tangericiana* BOULENGER, 1917 in 2012 as “doubtful species”, WERNER MAYER took a step beyond, and intentionally did not include this species at all, because the description was only based on a single juvenile specimen and since then (for 100 years!) has never been confirmed again. (MAYER 2013). Furthermore he doubted the validity of *Ichnotropis microlepidota* MARX, 1956, where the type and paratypes were removed from the crop of a shot chanting goshawk (*Melierax metabates*) (MAYER 2013).

Ichnotropis in VAN DEN BERG (2017)

Ichnotropis - In: TROIDL, S., R. GROBHANS & M.P. VAN DEN BERG (editors), <http://www.lacerta.de>, accessed March 6, 2017.



Fig. 1. *Ichnotropis* in VAN DEN BERG (2017).



Fig. 2. WERNER MAYER (1943-2015).

We must admit; there goes the terra typica, because the collector, GERD HEINRICH, did forget to ask the hawk, where he had caught his booty, before he shot him down back in 1954. That means that the described type location, “from the foot of Mount Moco, Benguela Province, Angola” (MARX 1956), just as well could have been the top of Mount Moco, or whatever other location within the bird’s range.



Fig. 3. Chanting goshawk, *Melierax metabates*.

In short, there was enough reason, while reading the bibliographic records for *Ichnotropis*, not only to look for the distribution data, but to go a little deeper into the material. This resulting in the following annotated bibliographic compilation, with a following discussion on the validity of some of the including species.

I want to dedicate this effort in the memory of WERNER MAYER, who played, as highly valued member of our advisory board, a very important role in the establishment of our present day www.lacerta.de website, not to mention his comprehensive contribution to herpetology in general.

The lizards

Ichnotropis is a small lacertid lizard (snout-vent length up to 75 mm), with a very short lifespan. It is generally considered to be an annual lizard, with some specimens surviving into their second year (BROADLEY 1967c), although it is uncertain that this will apply to all species (BROADLEY 1979). Coloration is in general cryptic, and well adjusted to the sandy substrate on which they can be found. On the other hand, sexually mature males display, at least in *Ichnotropis capensis*, a very striking coloration of yellow on the ventral- and lateral parts of the anterior body, and a contrasting orange-red lateral band on a white background, starting behind the forelegs (see figure 4).

MONARD (1930) gives the following description of coloration, based on many living specimens: In males the flanks are adorned with a broad black longitudinal band, beginning at the tip of the nasal plate, passing through the eye, and vanishing towards the third or half of the tail. This band is lined with two light stripes, one superior, the other lower, the first beginning at the supra ocular plates, the second beginning at the rostral plate, crossing the tympanum and accompanying the black band along its length. It is bordered by a second black line, also beginning at the rostrum, continuing into the forelegs. On the flanks, this line changes into bright brown, and then becomes black again near the hind-legs. The major black band is often marbled with white spots. On the back, small black accents form two longitudinal lines. Females are much less varied in coloration. From the general gray-brown tint, lighter on the belly, only one dark band emerging from the rostrum, passing through the eye, spreading on the flanks and eventually disappearing on the tail (MONARD 1930).

On the major part of its distribution range *Ichnotropis* is confined to hot and dry upland savanna (LOVERIDGE



Fig. 4. Male *Ichnotropis capensis* from Katima Mulilo (Namibia).



Fig. 5. Subadult *Ichnotropis capensis* from Koanaka Hills (Botswana).



Fig. 6. Male *Ichnotropis capensis* from Nylsvlei (South Africa).

1937), although in some parts of its range more moist conditions are to be expected, but not in such extent as PARKER (1936) stated; true rain forest lizards.

The bibliographical records



Fig. 7.
ANDREW SMITH
(1797-1872).

Algyra capensis SMITH, 1838a

Contributions to the Natural History of Southern Africa. Art. VIII. - Magazine of natural history, London, 2 (14): 92-94.

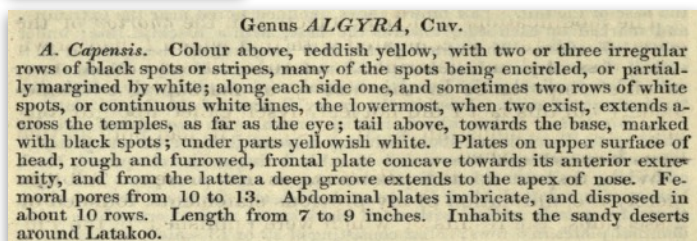


Fig. 8. *Ichnotropis capensis* in SMITH (1838a).

The first description of *Ichnotropis capensis* was made by ANDREW SMITH M.D., surgeon to the (British) Forces in the Cape Colony (SMITH 1838a), although these 130 words lack the most basic parts of a proper species description. The notes on coloration, size, and rough and furrowed head scales, make it certain that we are dealing with what we nowadays consider as *Ichnotropis*. Unfortunately, it remains unclear how many specimens he studied and if he actually designated a voucher specimen. However, GRAY (1845) listed this "*Algira capensis*" specimen in the catalog of the British Museum.

The indicated type location of Latakoo can be found in the vicinity of Kuruman, in the Northern Cape province of South Africa, and at that time being a mission station of the London Missionary Society, founded by ROBERT MOFFAT in 1821. More details on ANDREW SMITH's wanderings through Southern Africa are reported in SMITH (1838b): Report of the Expedition for Exploring Central Africa from the Cape of Good Hope, June 23, 1834.



Fig. 9. Landscape around Kuruman in the Kalahari region.

Tropidosaura capensis in DUMÉRIL & BIBRON (1839)

Livre quatrième: De l'ordre des lézards ou des sauriens - Seconde sous-famille. Autosaures Coelodontes. - Erpétologie Générale ou Histoire Naturelle Complète des Reptiles, 5: 153-317.

The second bibliographic record of *Ichnotropis capensis* was recorded in Erpétologie Générale ou Histoire Naturelle Complète des Reptiles by DUMÉRIL & BIBRON (1839).

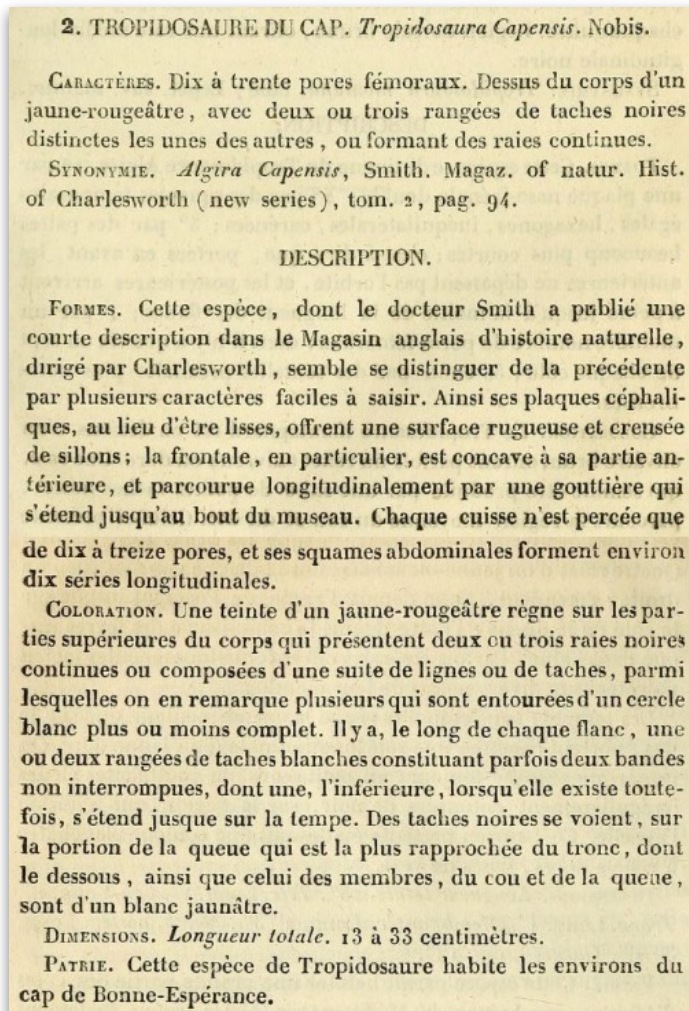


Fig. 10. "*Ichnotropis capensis*" in DUMÉRIL & BIBRON (1839).

UETZ (2017) lists this record of *Tropidosaura capensis* DUMÉRIL & BIBRON, 1839 as one of the synonyms of *Ichnotropis capensis*. However, the major problem with this record is the collection location. Cape of Good Hope, situated near Cape Town, is to our present knowledge not a location where *Ichnotropis capensis* could have been collected. It is very likely that DUMÉRIL & BIBRON (1839) made a wrong determination. This was suggested by BEDRIAGA (1886), who placed this record in the synonymy of *Tropidosaura montana*. Of this latter species a single specimen was described by DUMÉRIL & BIBRON (1839), originating all the way from Java (Indonesia). This specimen can only represent a *Takydromus*.



Fig. 11. *Tropidosaura montana* from the western Cape.

***Thermophilus capensis* in FITZINGER (1843)**

II. Sectio. Coelodontes. DUM. BIBR. - In: Systema Reptilium, Fasciculus Primus: Amblyglossae. Braumüller & Seidl, Wien: 20-21.

FITZINGER (1843) was able to include *Thermophilus capensis* in a tribe together with, amongst others, the Asian *Takydromus*, and even the South-American and non-lacertid Ocellated Tegu, *Cercosaura ocellata*. Admitted, there are some resemblances, at least it is a small lizard too.

II. Tribus. Peroblephari.			
1. Fam. TACHYDROMI.			
1. Gen. Tachydromus. Daud.	As.	Tachydr. sezlineatus. Daud.	
2. Gen. Cercosaura. Wagl.	Am.	Cercos. ocellata. Wagl.	
3. Gen. Tropidopholis. Fitz.	Eur.	Notopholis Fitzingeri. Wieg.	
2. Fam. PSAMMODROMI.			
1. Gen. Calosaura. Dum. Bibr.	As.	Calos. Leschenaultii. Dum. Bibr.	
2. Gen. Psammodromus. Fitz.	Eur. Afr.	Psammodr. hispanicus. Fitz.	
3. Gen. Amystes. Wieg.	As. Afr.	Amystes Ehrenbergii. Wieg.	
3. Fam. PSAMMURI.			
1. Gen. Tropidosaura. Boie.	As. Austr.	Tropidos. montana. Boie.	
2. Gen. Psammuros. Wagl.	Eur. Afr.	Psammur. algirus. Wagl.	
Thermophilus.	Afr.	Tropidos. capensis. Dum. Bibr.	

Fig. 12. "*Ichnotropis capensis*" in FITZINGER (1843).

***Algira capensis* in GRAY (1845)**

Catalogue of the Specimens of Lizards in the Collection of the British Museum. - London. 289 pp.

The CAPE ZERMOUMEAH. *Algira capensis*, A. Smith, Mag. N. H. ii. 94. Dum. et Bib. E. G. v. 171.
 Reddish yellow above, with 2 or 3 series of black spots or streaks; femoral pores 10—13; head-shields rough, grooved, frontal with a groove.
 Inhab. S. Africa. Mus. Dr. A. Smith.

Fig. 13. *Ichnotropis capensis* in GRAY (1845).



Fig. 14. *Meroles squamulosa* (formerly *Ichnotropis squamulosa*) from Mpumalanga in South Africa.



Fig. 15. *Cercosaura ocellata* from Rondonia in Brazil.

***Tropidosaura dumerelii* in SMITH (1849)**

Tropidosaura dumerelii - Illustrations of the zoology of South Africa, III, Appendix: 7.

TROPIDOSAURA CAPENSIS, Dum. et Bib. Erpet. Gener. tom. v. page 171. Algira Capensis, Smith, Mag. Nat. Hist., new series, vol. ii. p. 94. Gray, Cat. of Lizards, British Museum, p. 86. Kalkhari desert.

TROPIDOSAURA DUMERELII, n. s.

Head subovate, narrow towards the nose; body rather slender; back convex; sides slightly protuberant; tail slightly depressed at the base, elsewhere cylindrical, tapered, and pointed. Nasal plate somewhat kidney shaped; the nostril in the notch behind, its surface smooth; all the other plates of the upper surface of the head finely ribbed. Frontal plate club-shaped; scales of the temples strongly keeled; scales of the body and sides subovate, or subrhomboidal and strongly keeled; the keel prolonged into a fine pointed spine; scales of the tail long, four-sided and strongly keeled; the keel of the belly quadrangular, or somewhat six-sided; the lateral sides oblique, and arranged in six longitudinal rows. The outermost toe of fore foot rather short, the second and third equal and considerably longer; the outer or posterior of hinder foot short, and much behind the base of the second toe, the second very long, and the third considerably shorter, and the innermost very short. Femoral pores 12. Lower eyelid coated with small semi-pellucid plates. External ear-opening vertically ovate, the anterior edge nearly even, and with a long narrow plate at and towards the upper end. The ground colour of the upper surface of the head, the back, the sides, the upper surface of the tail, and the outer surfaces of the extremities, rusty buff-orange, the body and base of the tail variegated with four longitudinal reddish brown, and two rusty white lines, the latter one on each side between the brown lines, and the second below the lowermost. Under surface of body and tail, and the inner surface of extremities, straw-yellow, or sienna-yellow. Length from nose to base of tail, 2 inches, length of tail, 4 inches. Inhabits sandy deserts to the north-east of Latakoo, towards the tropic of Capricorn.

Fig. 16. *Tropidosaura dumerelii* in SMITH (1849).

BOULENGER (1887) assigns this specimen of *Tropidosaura dumerelii* SMITH, 1849 as the voucher specimen of *Ichnotropis capensis* in the British Museum of Natural History (with the correct spelling).

So it seems that SMITH (1849) is now following the genus designation *Tropidosaura* of DUMÉNIL & BIBRON (1839), and even changed *capensis* into *dumerelii*. A little bit confusing, and a lot of credits given, not often seen as common practice. Moreover, this proved to be a bad choice, which will be further addressed in the notes at BEDRIAGA (1886).



Fig. 17. All records listed up to 1849 with their original species designation.

***Tropidosaurus capensis* in BIANCONI (1850)**

Tropidosaurus capensis. DUM. et BIBR. - Specima Zoologica Mosambicana (Bologna), 4 (4): 61-62.

***Tropidosaurus capensis*. Dum. et Bibr. (1)**

Hoc peculiare circa hanc speciem adnotandum puto, scilicet colorem non luteum-rubentem esse, quemadmodum Bibronius tradit, sed viridem obscurum. Cuique tamen innotescit quanta colores varietate donentur pro varietate regionum, quantumque in Alcoole diluantur. Desunt duo, tresve lineae in dorso, at ad latera fascia est brunneo nigricans, quae ab orbita ad primam quartam caudae partem extenditur, et sub initio albo colore cingitur. Alia parva infula ab hiatu auriculari ad humera usque nigrescens perducitur. Scutum nasale in longitudinem divisum. Squamae caephalicae rugosae ac sulcatae.

(1) Erpet. T. V. p. 171.

Fig. 18. *Ichnotropis capensis* in BIANCONI (1850).

Although not mentioned in the text, the collection location should have been Inhambane, because it was listed in BOULENGER (1887) as the only location without prior publication, and at least it is located in Mozambique, which is probably required for publication in Specima Zoologica Mosambicana.

***Ichnotropis macrolepidot* PETERS, 1854**

Diagnosen neuer Batrachier, welche zusammen mit der früher (24. Juli und 17. August) gegebenen Übersicht der Schlangen und Eidechsen mitgetheilt werden. - Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königlichen Preussische Akademie des Wissenschaften zu Berlin, 1854: 614-628.

PETERS (1854) provided us the present accepted genus name *Ichnotropis*, and adds Lourenço Marques as third location of what will become later *Ichnotropis capensis*. Lourenço Marques was the colonial name of present-day Maputo. The species name was originally printed as *macrolepidot* (PETERS 1854), and later corrected to *macrolepidota* (PETERS 1855).

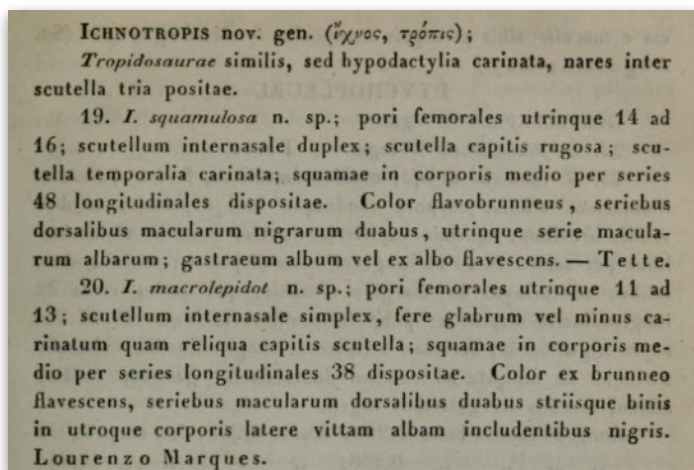


Fig. 19. *Ichnotropis macrolepidota* in PETERS (1854).

***Ichnotropis macrolepidota* in PETERS (1855)**

Übersicht der auf seiner Reise gesammelten Amphibien. - Archiv für Naturgeschichte, 21 (1): 43-58.

20. *I. macrolepidota* n. sp.; pori femorales utrinque 11 ad 13; scutellum internasale simplex, fere glabrum vel mi-

Fig. 20. *Ichnotropis macrolepidota* in PETERS (1855).

***Ichnotropis macrolepidota* in LICHTENSTEIN (1856)**

Nomenclator reptilium et amphibiorum musei zoologici Berolinensis Königlichen Akademie der Wissenschaften, Berlin. 48 pp.

***Ichnotropis* Peters.**

squamulosa Peters.	Tette	2
macrolepidota Peters.	Tette	2

Fig. 21. *Ichnotropis macrolepidota* in LICHTENSTEIN (1856).

Second and last record of *Ichnotropis macrolepidota*: 2 specimens from Tete (Mozambique).

Fig. 22.

JOSÉ VICENTE BARBOSA DU BOCAGE (1823-1907).

***Ichnotropis bivittatus* BOCAGE, 1866**

Lista dos reptis das possessões portuguezas d'Africa occidental que existem no Museu de Lisboa. - Jornal de Sciencias Mathematicas, Physicas e Naturaes, Academia Real das Sciencias de Lisboa, I (1): 37-56.

Several specimens from Duque de Bragança collected by Senhor BAYÃO. Some specimens were shipped to London where GÜNTHER compared them to the *Tropidosaura dumerilii* (SMITH 1849) voucher specimen. GÜNTHER considered them identical (see also CERÍACO et al. 2014). The type location Duque de Bragança was a military post in 1866, what became later Calandula (Angola).

19. *Ichnotropis Dumerilii*.

Tropidosaura Dumerilii. Smith. *Ichnotropis bivittatus*. Nob. Mss. Varios exemplares do Duque de Bragança. — Sr. Bayão.

Cabe-lhe perfeitamente a característica imposta pelo dr. Peters ao genero *Ichnotropis*. «*Tropidosaurae* similis, sed hypodactylia carinata; nares inter scutella tria positae» (loc. cit., pag. 617). Em vista, sobretudo, d'este ultimo caracter julgavamos-o distincto do *Trop. Dumerilii*, que Smith descreve como tendo as narinas situadas entre duas placas tão sómente: «Nasal plate somewhat kidney shaped; the nostril in the notch behind, its posterior margin formed by a small rhomboidal plate.» Smith (*Ill. Zool. South Afr. App. p. 7*). O dr. Günther, porém, que teve a bondade de comparar alguns specimens, que lhe enviámos com o exemplar typo do *Trop. Dumerilii*, existente tambem no Museu Britannico, acaba de nos informar que os considera identicos. Muito desejaríamos tambem poder confrontar esta especie com o *I. macrolepidot*. Peters (loc. cit., p. 617).

Fig. 23. *Ichnotropis bivittata* in BOCAGE (1866).

***Tropidosaura capensis* in STEINDACHNER (1869)**
 Reptilien - Lacertidae. - In: Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, unter den Befehlen des Commodore B. VON WÜLLERSTORF-URBAIR. Zoologischer Theil. Erster Band: 41-43.

2. Art TROPIDOSAURA CAPENSIS sp. Smith.
 Syn. *Algira capensis* Smith, Magaz. of Nat. Hist. of Charless. (new series), t. II, p. 94; Gray Cat. Liz. Brit. Mus. p. 36. — *Tropidosaura capensis* Dum. Bibr., Erpét. gén. t. V, p. 171. — *Thermophilus capensis* Fitz. Ausb. p. 402.
 Zwei Exemplare vom Cap der guten Hoffnung, durch Herrn Zelebor.

Fig. 24. "*Ichnotropis capensis*" in STEINDACHNER (1869).

We are confronted with the same problem as in DUMÉRIL & BIBRON (1839); Cape of Good Hope as collection location. Although the collector ZELEBOR made some

inland expeditions, he never travelled much further than Worcester, which is still far away from the closest present location of *Ichnotropis capensis*.

***Ichnotropis Dumérili* and *Ichnotropis bivittatus* in BEDRIAGA (1886)**

Beiträge zur Kenntnis der Lacertiden-Familie. (*Lacerta*, *Algiroides*, *Tropidosaura*, *Zerzumia* und *Bettaia*). - Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft, 14: 17-443.

Was endlich die von mir oben angeführten angeblichen *Tropidosaura*-Arten betrifft, so muß erwähnt werden, daß *Tropidosaura capensis* D. B. und Bianconi (Specim. zoolog. mosambicana, pag. 61) mit Recht in die Synonymik von *Ichnotropis macrolepidota* versetzt worden ist (Vergl. Peters, Naturwissenschaftl. Reise nach Mossambique, Amphibien S. 45, Berlin 1882). Als ich die Originalstücke der Smith-Duméril-Bibron'schen sog. *Trop. capensis* im British Museum erblickte, fielen mir sofort die der *Tropidosaura* nicht eigenen Kiele an der Unterseite der Zehen auf. Herr G. A. Boulenger machte mich bei dieser Beobachtung auf das obige Peters'sche Reisewerk aufmerksam, und er fand nun auch, daß die betreffende angebliche *Tropidosaura* »*Ichnotropis*« heißen muß. Im British Museum habe ich ebenfalls zwei Gläser vorgefunden mit der Etiquette »*Algira Dumérili*«; das eine enthält das Smith'sche Originalstück vom Cap, das andere aber ein *Ichnotropis bivittatus* Barboza du Bocage aus West-Afrika. Beide gehören wohl sicher der Gattung *Ichnotropis* an, stellen aber nicht eine und dieselbe Species vor, vielmehr müßte diejenige von Barboza du Bocage *Ichnotropis bivittatus*, dagegen die von Smith *Ichnotropis Dumérili* heißen. *Tropidosaura Burchelli* Smith und *Tropidosaura capensis* Steind. ¹⁾ (von Smith, Duméril, Bibron!) müssen einfach in die Synonymik von *Tropidosaura montana* versetzt werden.

Fig. 26.

JACQUES VLADIMIR VON BEDRIAGA. (1854-1906).

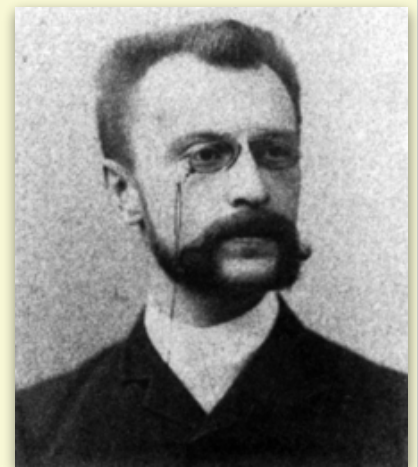


Fig. 25. Discussion on *Ichnotropis* and *Tropidosaura* in BEDRIAGA (1886).

BEDRIAGA (1886) incorrectly states that *Tropidosaura capensis* DUMÉRIL & BIBRON, 1839 correctly is placed in the synonymy of *Ichnotropis macrolepidota* PETERS, 1854. This should only have been applied to the genus name. On the other hand he correctly states that *Tropidosaura capensis* STEINDACHNER, 1867 should be placed into the synonymy of *Tropidosaura montana*. The same is applicable to *Tropidosaura capensis* DUMÉRIL & BIBRON, 1839, and derived from the latter, *Thermophilus capensis* FITZINGER, 1843.

BEDRIAGA (1886) also confirms the voucher specimen of *Ichnotropis capensis*, although it was labelled "*Algira Dumérili*". Without explanation he distinguished between *Ichnotropis capensis* and *Ichnotropis bivittata*, despite of GÜNTHER considered them identical (BOCAGE 1866). Maybe BEDRIAGA did study both species while visiting London, but this will remain unclear.

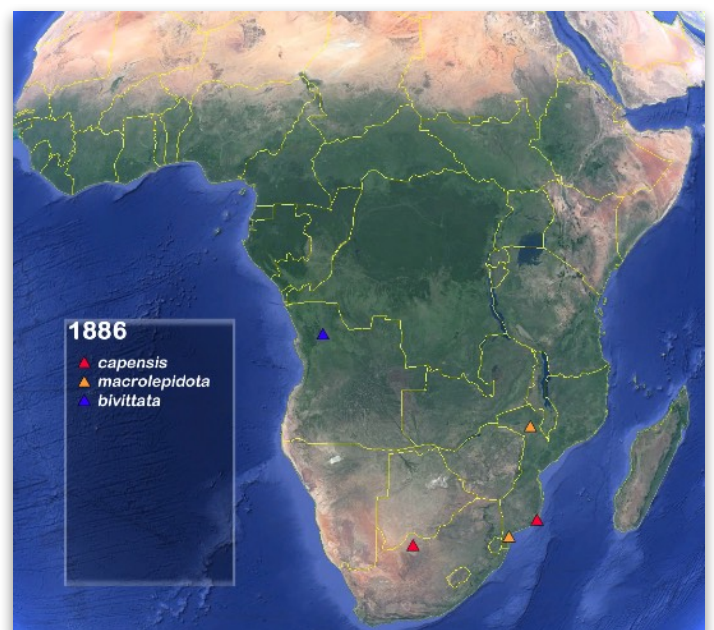


Fig. 27. All records listed up to 1886 with their original species designation.



Fig. 28.
GEORGE ALBERT BOULENGER
(1858-1937).

***Ichnotropis capensis* in BOULENGER (1887)**

Catalogue of the lizards in the British Museum (Natural History). Vol. III. Lacertidae. - London, 1887: I-XII + 1-118.

13. ICHNOTROPIS.

Tropidosauria, part., *Dum. & Bibr.* v. p. 163.
Algira, part., *Gray, Cat. Liz.* p. 35.
Ichnotropis, *Peters, Mon. Berl. Ac.* 1854, p. 617, and *Reise n. Mossamb.* iii. p. 45; *Strauch, Mém. Biol. Ac. St. Pétersb.* vi. 1867, p. 408; *Lataste, Ann. Mus. Genov.* (2) ii. 1885, p. 125.
Eremias, part., *Peters, Mon. Berl. Ac.* 1866, p. 888.

Head-shields normal. Nostril pierced between three nasals. Lower eyelid scaly. No trace of a collar, save a curved fold on the side of the neck. Dorsal scales large, strongly imbricate, strongly keeled; ventral shields strongly imbricate, smooth. Digits sub-cylindrical, with sharply keeled, spinose lamellae inferiorly. Femoral pores. Tail cylindrical.
Africa south of the equator.

1. *Ichnotropis capensis*.

Algira capensis, *Gray, Cat.* p. 36.
— *dumerilii, Gray, l. c.*
Algyra capensis, *Smith, Mag. N. H.* ii. 1838, p. 94.
Tropidosauria capensis, *Dum. & Bibr.* p. 171; *Bianconi, Spec. Zool. Mossamb.* p. 61.
— *dumerilii, Smith, Ill. S. Afr., Rept., App.* p. 7.
Ichnotropis macrolepidota, *Peters, Mon. Berl. Ac.* 1854, p. 617, and *Reise n. Mossamb.* iii. p. 46, pl. viii. fig. 1.
— *dumerilii, Bocage, Journ. Sc. Lisb.* i. 1866, p. 43.
— *bivittata (Bocage), Peters, Reise n. Mossamb.* p. 48.

Head-shields strongly striated and keeled; frontonasal single; interparietal pentagonal, its posterior border forming a suture with a distinct occipital; parietals with rounded or angular posterior border; two or three elongate shields on the outer border of the parietals; subocular bordering the lip, between the fourth and fifth (or fifth and sixth) upper labials. Dorsal scales nearly as large as caudals; ventrals rounded, in 10 longitudinal series; 35 to 40 scales round the middle of the body. Praeanal scales small, sub-equal. The hind limb reaches the axilla or the shoulder. 9 to 12 (or 13) femoral pores on each side. Tail once and a half to twice the length of head and body. Yellowish or reddish brown above, with three longitudinal series of black spots on each side, more or less confluent into longitudinal bands, separated by light yellowish streaks; the lower black band extends along the upper lip; lower surfaces yellowish white.

	♂. millim.	♀. millim.
Total length	137	156
Head	15	14
Width of head	9.5	9
From end of snout to fore limb	24	23
From end of snout to vent	61	66
Fore limb	21	21
Hind limb	32	31
Tail	76*	90

Inhambane, Delagoa Bay, Kalahari Desert, Angola.

a. ♂, bad state. N.E. of Lattaku, towards the tropic of Capricorn. Sir A. Smith [P.]. (Type of *Tropidosauria dumerilii*.)
b-c. ♂ ♀. Duque de Bragança, Angola. Prof. Barboza du Bocage [P.]. (As typical of *I. bivittata*.)

Fig. 29. *Ichnotropis capensis* in BOULENGER (1887).

In the catalogue of the lizards in the British Museum (BOULENGER 1887), we become more knowledgeable about the characteristics of *Ichnotropis capensis*, although BOULENGER seems not yet to distinguish between *Ichnotropis capensis* and *Ichnotropis bivittata*.

***Ichnotropis capensis* in BOCAGE (1895)**

Herpétologie d'Angola et du Congo. - Ministério da Marinha e das Colónias, Lisbonne. 203 pp.

New records for Lobango, Caconda, Quindumbo, Cahata and Galanga (= Cangala). More interesting is the presentation of these records: BOCAGE bids farewell to his own *bivittata*, which originally still was *bivittatus*.

34. *Ichnotropis capensis*

Algyra capensis, *Smith, Mag. N. H.*, ii, 1838, p. 94.
Tropidosauria capensis, *Bianconi, Spec. Zool. Mossamb.*, p. 61.
T. Dumerilii, *Smith, Ill. S. Afr. Zool., Rept., App.* p. 7.
Ichnotropis macrolepidota, *Peters, Monatsb. Ak. Berl.*, 1854, p. 617.
I. bivittata, *Bocage, Journ. Ac. Sc. Lisb.*, i, p. 43.
I. Dumerilii, *Bocage, Journ. Ac. Sc. Lisb.*, i, 1866, p. 43.
I. capensis, *Bouleng., Cat. Liz. B. Mus.*, iii, 1887, p. 78.

Fig. *Peters, Reise n. Mossamb., Rept.*, pl. viii, fig. 1.

Vit dans l'Afrique méridionale, d'où il se répand vers l'est et l'ouest du continent africain. En Angola l'*Ichnotropis capensis* paraît affectionner surtout les hauts-plateaux de l'intérieur: nous l'avons reçu du *Duque de Bragança*, par Bayão; de *Lobango*, dans l'intérieur de Mossamedes, par M. F. Newton; de *Caconda*, *Quindumbo*, *Cahata* et *Galanga*, par M. d'Anchieta. Son nom indigène dans ces deux dernières localités est—*Cangala*, qu'il partage avec d'autres sauriens.

La plupart de nos individus d'Angola portent de chaque côté du tronc deux raies claires ou blanches, bien distinctes sur le fond noir des flancs, qui manquent ou ne se font pas remarquer aussi nettement chez d'autres individus d'Angola, ni chez ceux de Mozambique de notre collection.

Fig. 30. *Ichnotropis capensis* in BOCAGE (1895).

***Ichnotropis capensis* in BOULENGER (1897)**

A list of reptiles and batrachians from the Congo Free State, with the description of two new snakes. - The Annals and magazine of natural history, (6) 19: 276-281.

First record in the Democratic Republic of the Congo, along the Kuango river.

XXVI.—*A List of Reptiles and Batrachians from the Congo Free State, with Descriptions of Two new Snakes.* By G. A. BOULENGER, F.R.S.

AT the request of the Secretary of the Department of the Interior, Congo Free State, I have undertaken to name a collection of Reptiles and Batrachians formed in the State within the last few years, and which will be exhibited at the International Exhibition to be held this year in Brussels. At the same time I accepted to look over the specimens from the same region which are the property of the Brussels University, where they are being arranged by the Curator of the Collection, my friend M. L. De Pauw.

6. *Ichnotropis capensis*, Smith.—Kuango.
First record north of Angola.

Fig. 31. *Ichnotropis capensis* in BOULENGER (1897).

***Ichnotropis capensis* in SCLATER (1898)**

List of the Reptiles and Batrachians of South Africa, with descriptions of New Species. - *Annals of the South African Museum*, 1 : 95-111.

57. *Ichnotropis capensis* (Smith); *Cat. Liz.* iii. p. 78.

Fig. 32. *Ichnotropis capensis* in SCLATER (1898).

***Ichnotropis longipes* BOULENGER, 1902**

A List of the Fishes, Batrachians, and Reptiles collected by Mr. J. FFOLIOTT DARLING in Mashonaland, with Descriptions of new Species. - *Proceedings of the Zoological Society of London*, 1902 (2): 13-18.

BOULENGER (1902) describes this new species based upon 3 male specimens from Zimbabwe, with a shorter body and longer limbs as the discriminating character.

The fauna of Rhodesia is still so imperfectly worked out that all zoologists will feel grateful to Mr. Darling for the trouble he has taken in forming collections in the part of the country in which he has been residing for the past few years, viz. the district about Salisbury. The series of Fishes, Batrachians, and Reptiles, the names of which follow, was collected at Mazoë and between Umtali and Marandellas, and presented by him to the British Museum. Two Fishes, a Frog, a Tortoise, and a Lizard are new to science.

9. *ICHNOTROPIS LONGIPES*, sp. n. (Plate III. fig. 2.)

Closely allied to *I. capensis* Smith, with which it entirely agrees in the scaling, but body shorter and limbs longer, the hind limb, if pressed against the body, reaching between the ear and the eye. Foot much longer than the head. 36 to 40 scales round the middle of the body. 9 or 10 femoral pores on each side. Pale grey-brown above, tinged with orange on the sides of the back, which is unspotted; a black streak along each side, from the tip of the snout, through the eye, to the anterior fourth of the tail; a second black streak along the upper lip, extending to the shoulder and separated from the upper one by a white streak; some large black spots on the hind limbs; lower parts white.

Total length	160 millim.	From end of snout	
Head	13 "	to vent.....?	49 millim.
Width of head ...	8 "	Fore limb	19 "
From end of snout		Hind limb	33 "
to fore limb.....	21 "	Tail	111 "

This new Lizard is represented by three male specimens.

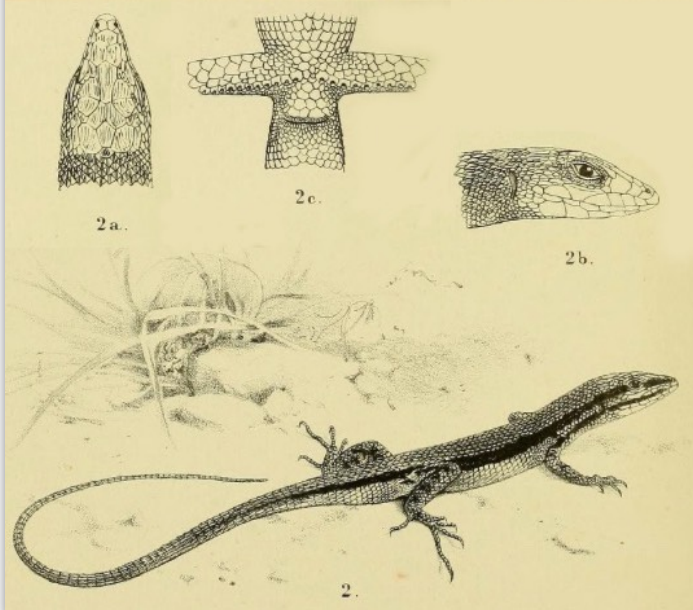


Fig. 33. *Ichnotropis longipes* in BOULENGER (1902).



Fig. 34. Duque de Bragança Falls in Angola.

***Ichnotropis capensis* in BETTENCOURT-FERREIRA (1903)**

Reptis de Angola da região norte do Quanza da colleção PEREIRA DE NASCIMENTO (1902). - *Jornal de Sciencias Mathematicas, Physicas e Naturaes*, Segunda Série, VI (21): 129-137.

New record: Duque (Angola).

16. *Ichnotropis capensis* (Smith).

Algira capensis, Smith, *Mag. N. H.*, 1838, p. 94.

3 exemplares typicos, ad. N. ind. *Nezenguela*. Duque.

Fig. 35. *I. capensis* in BETTENCOURT-FERREIRA (1903).

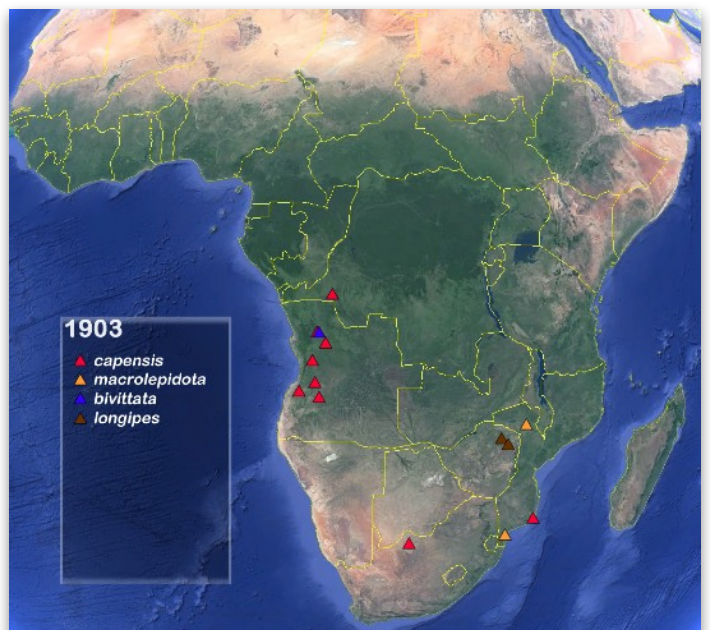


Fig. 36. All records listed up to 1903 with their original species designation.

***Ichnotropis capensis* in BOULENGER (1905)**

A List of the Batrachians and Reptiles collected by Dr. W.J. ANSORGE in Angola, with descriptions of new species. - The Annals and magazine of natural history, (7) 16: 105-115.

More records of *Ichnotropis capensis* in Angola.

THE collection made in 1903-1905 by Dr. Ansonge has considerably added to our knowledge of the Batrachians and Reptiles of Angola, the study of which has been pursued for so many years by Professor Barboza du Bocage. Travelling under somewhat unfavourable conditions for the preservation of specimens in spirit, Dr. Ansonge has been so fortunate as to discover as many as four new species. As a contribution to the knowledge of the exact distribution, a full list of the species represented in the collection is here given.

Dr. Ansonge has supplied me with the following notes on some of the localities visited by him:—

Bange Ngola.—The Portuguese were erecting a fort here when I visited it (end of 1903). It is named, as usual with African natives, after the important chief who lives here. In maps the whole of this north-eastern part of the Loanda province is called the “Jinga country,”

Bihé.—A district in the north-east of the occupied portion of the Benguella province; roughly only the eastern half of the Benguella province is only nominally Portuguese. End of 1904.

Duque de Bragança.—Some hundreds of years ago this was an important Portuguese fort, now it is an insignificant military station with a dozen shops. It lies on the south side of the Lucalla River. End of 1903.

7. *Ichnotropis capensis*, A. Smith.

Duque de Bragança, Bange Ngola, between Benguella and Bihé.

Fig. 37. *Ichnotropis capensis* in BOULENGER (1905).

***Ichnotropis capensis* and *I. longipes* in BOULENGER (1906)**

Revised List of South African Reptiles and Batrachians. Family Lacertidae. - Annals of the South African Museum, 5: 473-479.

In this first revision, BOULENGER (1906) seems to be unaware of the *Ichnotropis macrolepidota* records, and he

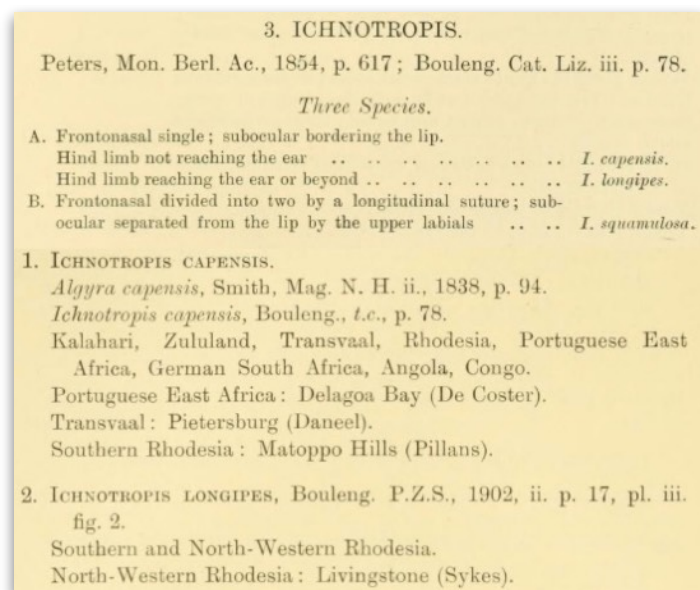


Fig. 38. *I. capensis* and *I. longipes* in BOULENGER (1906).

still is ignoring *Ichnotropis bivittata*.

New records:

Ichnotropis capensis

- Delagoa (Mozambique)
- Pietersburg (South Africa)
- Matoppos Hills (Zimbabwe)

Ichnotropis longipes

- Livingstone (Zambia).

***Ichnotropis capensis* in ROUX (1907)**

Beiträge zur Kenntnis der Fauna von Süd-Afrika. - Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Tiere, Jena, 25: 425-429.

Two new records for Transvaal (South Africa).

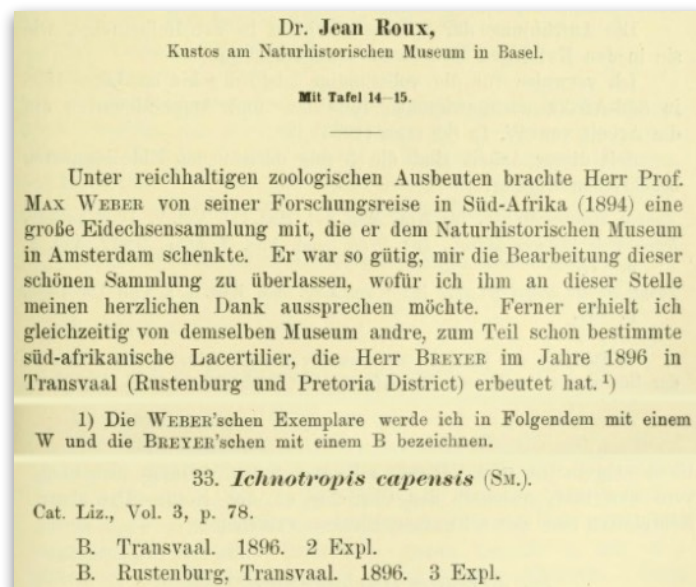


Fig. 39. *Ichnotropis capensis* in ROUX (1907).

***Ichnotropis capensis* in BOULENGER (1908)**

On a Collection of Fresh-water Fishes, Batrachians, and Reptiles from Natal and Zululand, with descriptions of New Species. - Annals of the Natal Government Museum, 1 (3): 219-236.

New record for Mseleni (South Africa).

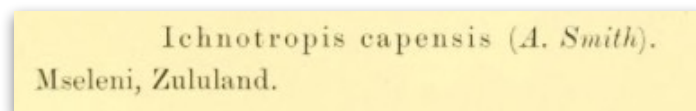


Fig. 40. *Ichnotropis capensis* in BOULENGER (1908).

***Ichnotropis capensis* in ODHNER (1908)**

Reptilien und Batrachier, gesammelt von Dr. I. TRÄGÄRDH in Natal und Zululand 1904-05. - Arkiv för Zoologi, 4 (18): 1-7.

New record for Somkele (South Africa).

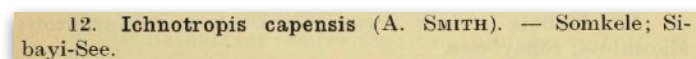
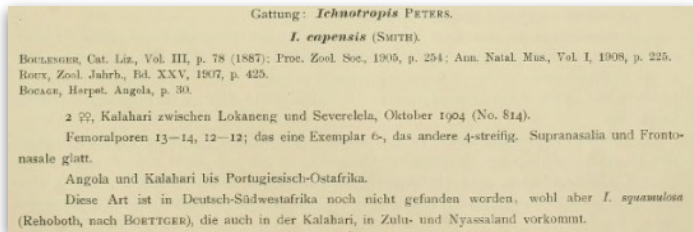


Fig. 41. *Ichnotropis capensis* in ODHNER (1908).

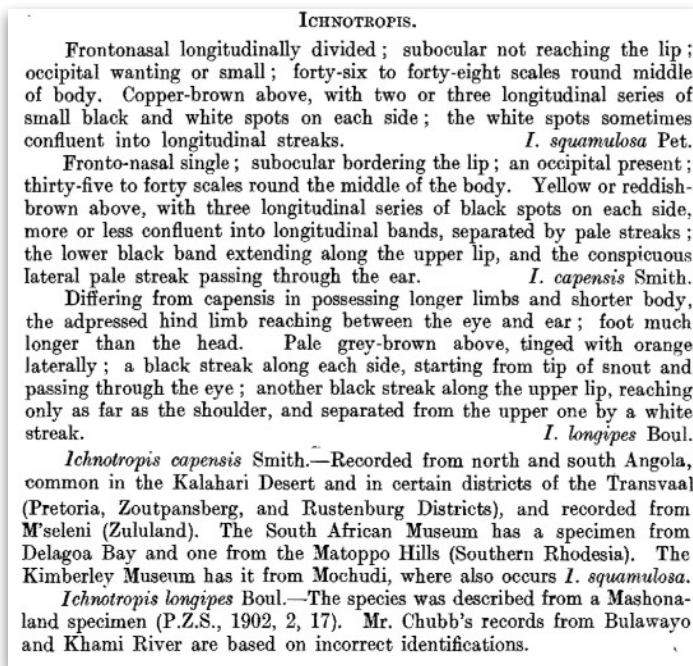
***Ichnotropis capensis* in WERNER (1910)**

Zoologische und Anthropologische Ergebnisse einer Forschungsreise im Westlichen und Zentralen Südafrika, ausgeführt in den Jahren 1903-1905. Vierter Band. Systematik und Tiergeographie. Reptilia et Amphibia. Familia Lacertidae. - Denkschriften der Medizinisch-Naturwissenschaftlichen Gesellschaft zu Jena, 16: 329-340.

New record for the Kalahari (Botswana).

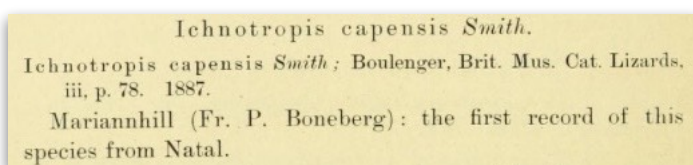
Fig. 42. *Ichnotropis capensis* in WERNER (1910).***Ichnotropis capensis* and *I. longipes* in HEWITT (1910)**

A key to the South African species of Geckonidae, Scincidae, Gerrhosauridae, and Lacertidae, together with some notes on the specific characters and a brief summary of the known of their distribution. - Annals of the Transvaal Museum, 2: 77-115.

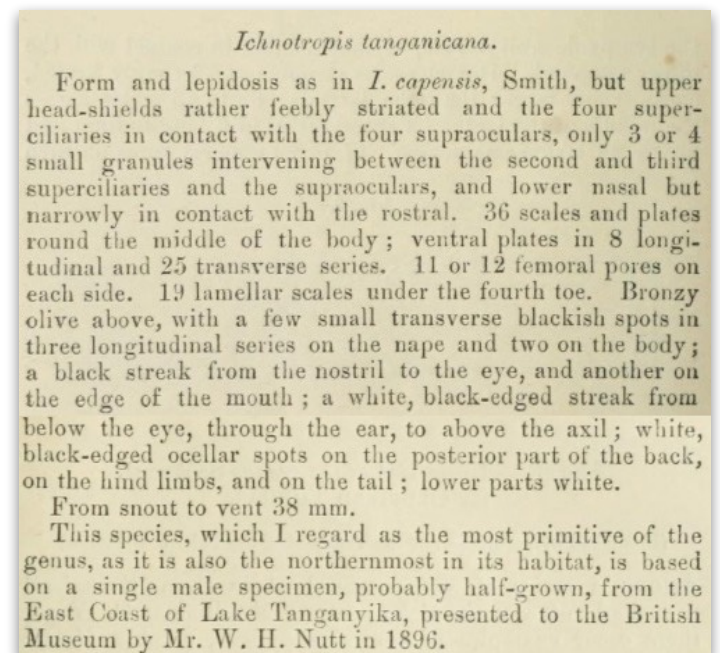
Fig. 43. *I. capensis* and *I. longipes* in HEWITT (1910).***Ichnotropis capensis* in HEWITT & CAMB (1916)**

Description of *Heleophryne natalensis*, a New Batrachian from Natal, and Notes on Several South African Batrachians and Reptiles. - Annals of the Natal Museum, 2: 475-484.

New record for Mariannahill (South Africa).

Fig. 44. *Ichnotropis capensis* in HEWITT & CAMB (1916).***Ichnotropis tanganicana* BOULENGER, 1917**

Descriptions of new lizards of the family Lacertidae. - The Annals and magazine of natural history (8) 19: 277-279.

Fig. 45. *Ichnotropis tanganicana* in BOULENGER (1917).

BOULENGER (1917) describes this new species based upon one sub-adult male specimen from either Burundi or Tanzania. Type location: East coast of Lake Tanganyika, which means a terra typica of 625 km; extraordinary precise! The mere facts of the absence of the actual type location, and the description upon a single sub-adult specimen, should have been enough reason not to describe this specimen as new species, more than 20 years after collection. To speak with the collector's name: Nut(t)s!

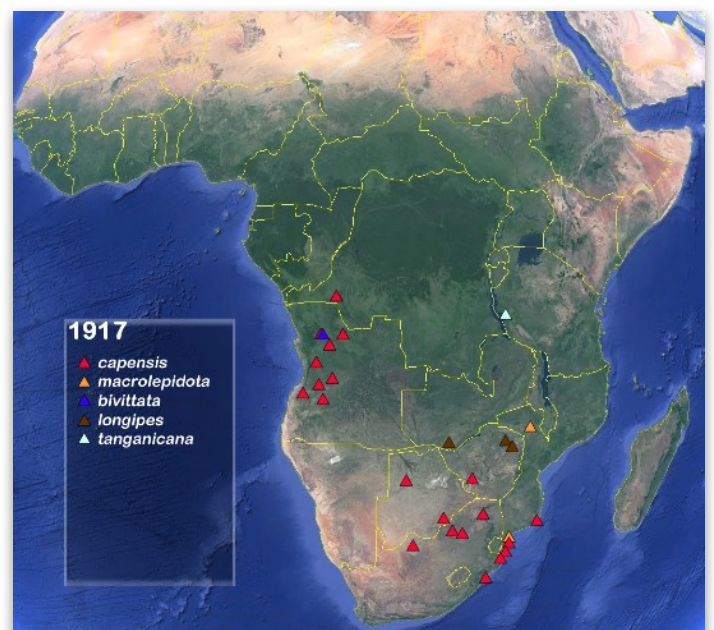


Fig. 46. All records listed up to 1917 with their original species designation.

***Ichnotropis chapini* SCHMIDT, 1919**

Contributions to the herpetology of the Belgian Congo based on the collection of the American Congo Expedition, 1909-1915. Pt. I. Turtles, crocodiles, lizards, and chameleons. - Bulletin of the American Museum of Natural History, 39 (2): 385-624.

***Ichnotropis* Peters**

Synopsis of the Species of *Ichnotropis*

- A. Frontonasal divided longitudinally, subocular cut off from lip, no distinct occipital.....*squamulosa*.
- AA. Frontonasal single, subocular bordering lip, a distinct occipital.
 - B. Frontal square anteriorly, a pair of small anterior supralorals.
chapini.
- BB. Frontal more or less pointed anteriorly, no small anterior supralorals.
 - C. Hind limb not reaching ear.....*capensis*.
 - CC. Hind limb reaching ear or beyond.....*macrolepidota*.

***Ichnotropis chapini*, new species¹**

Text Figure 17; Map 14

A single specimen (A. M. N. H. No. 10674) from Aba, July 1911, requires distinction as a new species.

The distribution of the species of this genus is of considerable interest. *Ichnotropis capensis* (Smith) is southern, extending farthest north in Angola, where it is the sole species, but, curiously enough, unrecorded from German Southwest Africa. *Ichnotropis macrolepidota* Peters appears to be derived directly from *capensis*, probably replacing it in Matabeleland and northern Rhodesia. *Ichnotropis squamulosa*, a very distinct form, overlaps much of the range of *capensis* and probably all of that of *macrolepidota* and extends much farther north than these, into German East Africa, reaching also Angola to the west. The present form, known only from the Sudan, is closely allied to *capensis*, consequently there is a very wide gap in the distribution of the *capensis* group.

Diagnostic characters

Habitus as in *Ichnotropis capensis*, to which it is closely allied. Hind leg not reaching axilla; head shields very rugose; frontonasal undivided; an occipital; a supraloreal between the frontonasal and the anterior loreal; an auricular shield. Anterior border of frontal square.

Detailed description

Type: A. M. N. H., No. 10674.

Habitus lacertiform; body slender; legs short; tail .56 of the total length (.57 in *capensis*). Head shields very rugose, except nasals and anterior loreals,

¹ *Ichnotropis chapini*. Named in honor of Mr. James P. Chapin, who accompanied Mr. Lang on the American Museum's Congo Expedition, and prepared in the field a valuable series of color sketches from life of many of the species included in this paper.



Map 14. Distribution of *Ichnotropis* in Africa.

- *Ichnotropis capensis*.
- *Ichnotropis macrolepidota*, probably a northeastern subspecies of *capensis*.
- △ *Ichnotropis chapini*. Closely related to *capensis* but widely separated in range.
- + *Ichnotropis squamulosa*. Represents a distinct section of the genus.

Fig. 48a. *Ichnotropis chapini* in SCHMIDT (1919).



Fig. 47. KARL PATTERSON SCHMIDT (1890-1957).

Another new species based upon a single specimen, this time a female from the Democratic Republic of the Congo, and not, but close to, the Sudan.

It is unclear why SCHMIDT (1919) is using especially *capensis*, *macrolepidota* and *chapini* as species of *Ichnotropis*. Also his expectation that *I. macrolepidota* is replacing *I. capensis* in northern Zimbabwe (= *I. longipes*) is without explanation. Besides the records from Zimbabwe, SCHMIDT (1919) also includes the *I. capensis* record from Inhambane in Mozambique into *I. macrolepidota*.

about as in *squamulosa*, more so than in *macrolepidota*. Rostral nearly as high as wide, five-sided, pointed above, narrowly separated from the frontonasal by the superior nasals. Nostril circumscribed by three nasals, an anterosuperior, an inferior, and a very small posterior, the latter much smaller than observed in *macrolepidota* and *squamulosa*. A smooth supraloreal between the two upper nasals, the frontonasal, prefrontal, anterior and posterior loreals. Frontal four-sided, with two longitudinal keels, anteriorly enclosed between the prefrontals. Four supraoculars; four supraciliaries, of which the anterior exceeds the other three, separated from the supraoculars by a series of granular scales. Frontoparietals slightly exceeded by the interparietal, which is bordered behind by an occipital. Parietal shields rounded behind, with three enlarged scales on each side. Temporals small, uniform, keeled. A curved auricular bordering the ear opening anteriorly; auricular larger than in *squamulosa* or *macrolepidota* examined. Labials 8-7, above and below, four anterior to the subocular (which borders the lip) on one side, five on the other.

Dorsal scales strongly keeled and imbricate, in twenty-five longitudinal and fifty-five transverse series. Ventrals smooth, imbricate, in ten fairly regular longitudinal series and thirty cross-rows to the arms. Twenty-three scales from brachial region to the gular symphysis. Scales of the preanal area small. Fold anterior to the shoulder faint.

General color grayish brown above. A lateral white stripe originating on the subocular, outlined above and below with black, passes above the arm, but does not reach the hind leg. A very faint dorsolateral line above this (visible only when in alcohol). Between these lines on the sides is a series of transverse black spots, two or three scales wide and half a scale long, on the tips of scales; two series of similar transverse markings dorsally, one on each side of the median line, extending to the

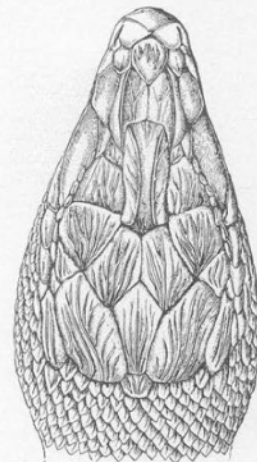


Fig. 17. Head of *Ichnotropis chapini*, (type, 10674, X 5).

longitudinal dorsolateral stripe. Ventral scales and chin shields white, outlined with gray, the two outer rows of ventrals punctate with brown dots. Lower and upper labials mottled with light and dark. Limbs grayish brown above, light beneath.

Measurements of A. M. N. H. No. 10674 (♀): length, 135; body, 58; tail, 77; axilla to groin, 33; snout to arm, 21; arm, 18; leg, 28; head length, 14; head breadth, 8 mm.

Fig. 48b. *Ichnotropis chapini* in SCHMIDT (1919).

***Ichnotropis capensis* in LOVERIDGE (1920)**

Notes on East African lizards collected 1915-1919, with description of a new genus and species of skink and new subspecies of gecko. - Proceedings of the Zoological Society of London, 1920: 131-167.

ICHNOTROPIS CAPENSIS (Gray).
Blgr. Cat. Liz. iii. 1887, p. 84.

One specimen taken at Delagoa Bay, 24.xii.14. They were not uncommon, darting about the reddish sandy soil among the thorn-bush.

Fig. 49. *Ichnotropis capensis* in LOVERIDGE (1920).

Certainly not (GRAY), notwithstanding GRAY was mentioned in BOULENGER's (1987) catalog. Another record for Delagoa (Mozambique).

***Ichnotropis* in BOULENGER (1921)**

Monograph of the Lacertidae. Vol. II. - British Museum (Natural History). Department of Zoology. London. 451 pp.

As is true for many other Lacertidae, 1921 is also for *Ichnotropis* one of the genus milestones, because of the publication of the Monograph on the Lacertidae by BOULENGER (1921). It is the first attempt of systematic description of the species within *Ichnotropis*, which result is in general still considered valid today (UETZ 2017), with the exception for *Ichnotropis longipes*. The latter was placed in the synonymy of *Ichnotropis capensis* by LOVERIDGE (1953). In this revision BOULENGER placed *I. macrolepidota* in the synonymy of *Ichnotropis capensis* (BOULENGER 1921).

Looking at the keys given to the species, I am glad that I was not obliged to decide in 1921 what was what. At first glance, and considering the small datasets, the differences between the species looks somewhat far-fetched. Remarkably, the only feature which could have been a useful evolutionary adaptation, the relative length of hind legs, did not uphold (LOVERIDGE 1953).

What are the differences between the two major species, *I. capensis* (incl. *I. longipes*) and *I. bivittata*? They both have strongly striated head shields. Prefrontal not reaching the anterior of the two large supraocular plates in *I. capensis* and prefrontal usually in contact with the anterior of the two large supraocular plates in *I. bivittata*. This is different, but not absolute. Both have a series of small scales between supraocular plates and supraciliar plates. Is this all there is? No, if we compare the snout-vent length from both species in BOULENGER (1921), it seems that *I. bivittata* is a little longer than *I. capensis* (incl. *I. longipes*): 66,6 mm (n=21) versus 51,3 mm (n=15). However, this character should be used with caution (see BROADLEY 1967c ; BROADLEY 1979).

New records:

Ichnotropis bivittata

- Caconda (Angola).
- Chiyaka (Angola).
- French Congo (Gabon or Republic of the Congo), (PÓBEGUIN/Paris Museum).

According INEICH & LE GARFF (2015) this last record is most probably from the Batéké Plateau in southeastern Gabon.

Ichnotropis capensis

- Okwa (Botswana).
- Umfulosi (South Africa).
- Vunda (Democratic Republic of the Congo).

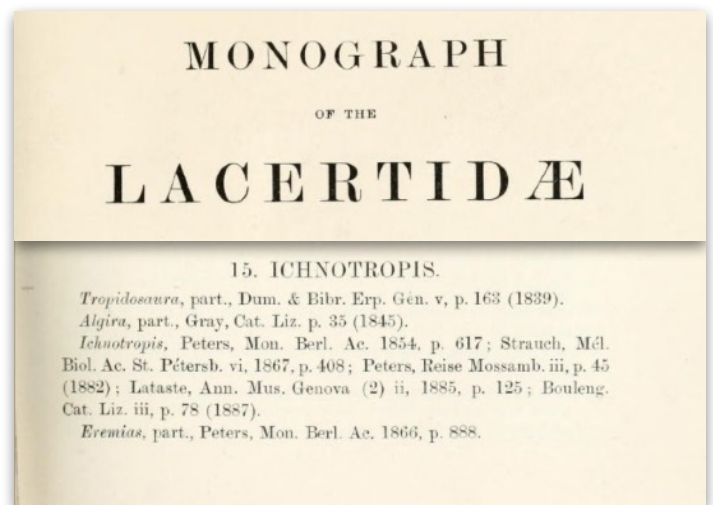


Fig. 50a. *Ichnotropis* in BOULENGER (1921).

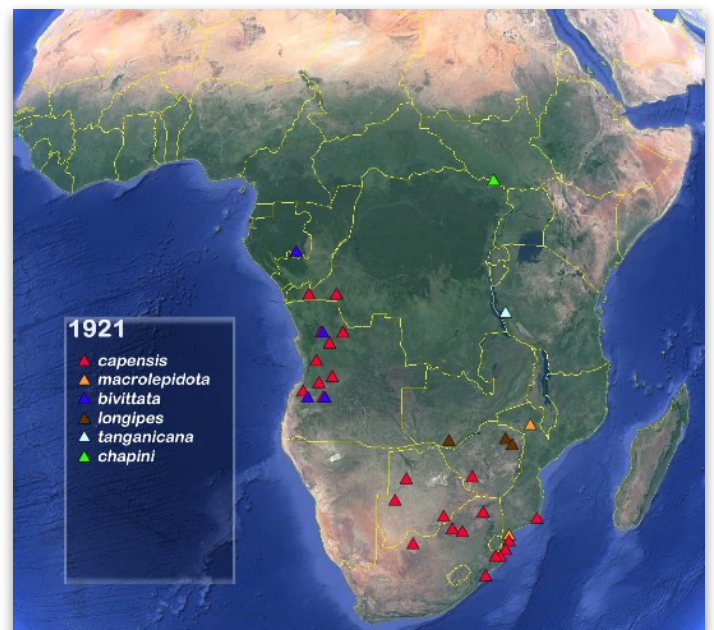


Fig. 51a. All records listed up to 1921 with their original species designation.

Head-shields normal, but occipital sometimes absent. Nostril pierced between an upper and a lower nasal and a postnasal. Lower eyelid scaly. Collar absent; a short fold in front of the arm. Back covered with large rhombic or lanceolate, strongly keeled and imbricate scales; ventral plates smooth, imbricate. Digits feebly compressed, with sharply keeled lamellæ inferiorly. Femoral pores. Tail long, cylindrical.

Tropical and South Africa.

The parietal foramen and pterygoid teeth are present.

This genus may be regarded as derived from *Tropidosauria*, differing only in the keeled subdigital lamellæ combined with the presence of a subnasal separating the nasal from the first upper labial; but it must be borne in mind that the latter difference is no greater than between species united in the same genus under *Cabrila* and *Ophiops*.

Synopsis of the Species.

I. Frontonasal single; subocular usually bordering the mouth; occipital usually present; 34 to 40 scales and plates round middle of body; 8 to 13 (rarely 15) femoral pores on each side.

A. A single anterior loreal.

Upper head-shields rather feebly striated; prefrontal in contact with the anterior of the two large supraoculars, which are in contact with superciliaries; hind limb reaching a little beyond the shoulder in males *I. tanzanica*, Blgr., p. 181.

Upper head-shields strongly striated and keeled; prefrontal usually in contact with the anterior of the two large supraoculars, which are separated from the superciliaries by small scales; hind limb reaching axil or shoulder in males.

I. bivittata, Bocage, p. 182.

Upper head-shields strongly striated; prefrontal not reaching the anterior of the two large supraoculars, which is as long as or a little shorter than its distance from the second loreal; a series of small scales between supraoculars and superciliaries; hind limb reaching between shoulder and ear in males *I. capensis*, A. Smith, p. 185.

Upper head-shields strongly striated; prefrontal not reaching the anterior of the two large supraoculars, which is longer than its distance from the second loreal; a series of small scales between supraoculars and superciliaries; hind limb reaching ear or between ear and eye in males *I. longipes*, Blgr., p. 188.

B. Two superposed anterior loreals; upper head-shields strongly striated; frontonasal not broader than long.

I. chapini, Schmidt, p. 190.

II. Frontonasal longitudinally divided; subocular not bordering the mouth; occipital usually absent; 46 to 58 scales and plates round middle of body; 13 to 16 femoral pores on each side *I. squamulosa*, Peters, p. 191.

I. ICHNOTROPIS TANGANICANA.

Ichnotropis tanzanica, Bouleng. Ann. & Mag. N. H. (8) xix, 1917, p. 278.

Head and body feebly depressed. Head $1\frac{1}{2}$ times as long as broad, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{1}{2}$ times in length to vent; snout obtusely pointed, as long as the postocular part of the head, with rather strong canthus and feebly concave loreal region; a feeble concavity on the upper surface of the snout and the anterior half of the frontal; a feeble keel below the eye. Pileus $2\frac{1}{2}$ times as long as broad. Neck narrower than the head. The hind limb reaches a little beyond the shoulder; foot a little longer than the head; digits feebly compressed.

Upper head-shields rather feebly striated; nostril between three shields; nasals forming a suture behind the rostral; frontonasal as long as broad; prefrontals longer than broad, in contact with the second supraocular; frontal as long as its distance from the rostral, nearly twice as long as broad, a little narrower behind than in front; parietals longer than broad, rounded behind, in contact with the third supraocular; interparietal a little larger than the frontoparietals, in contact with a small and rather irregular occipital, which projects beyond the parietals. 4 supraoculars, first and fourth small; 4 superciliaries, first longest and forming a very oblique suture with the second, its inner border entirely in contact with the first and second supraoculars; fourth superciliary in contact with the third and fourth supraoculars; 3 or 4 small granules between the second and third superciliaries and the supraoculars. Lower nasal narrowly in contact with the rostral; anterior loreal shorter than the second; 4 upper labials anterior to the subocular, which is a little narrower beneath than above and broadly borders the mouth. A large upper temporal, forming a suture with the fourth supraocular; temporal scales rather large, hexagonal, feebly keeled; a narrow tympanic shield. Lower eyelid with a series of vertically enlarged scales in the middle.

5 pairs of chin-shields, the 3 anterior in contact in the middle;

Fig. 50b. *Ichnotropis* in BOULENGER (1921).

MONOGRAPH
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gular scales imbricate, passing gradually into the ventral plates, 22 in a straight median line.

Dorsal scales rhombic-lanceolate, strongly keeled, acutely pointed, a little smaller than upper caudals; lateral scales a little smaller, smooth towards the ventral plates, into which they pass gradually; ventral plates rounded-hexagonal, not broader than long, in 8 longitudinal and 25 transverse series; 36 scales and plates round the middle of the body. Preanal region covered with irregular scales.

Scales on limbs smaller than dorsals, strongly keeled. 11–12 femoral pores. Subdigital lamellae tricarinate, 19 under the fourth toe.

Caudal scales strongly keeled, upper similar to dorsals, 26 in the fourth whorl behind the postanal granules.

Bronzy olive above, with a few small transverse blackish spots in three longitudinal series on the nape and two on the body; a black streak from the nostril to the eye, and another on the edge of the mouth; a white, black-edged streak from below the eye, through the ear, to above the axil; white, black-edged ocellar spots on the posterior part of the back, on the hind limbs, and on the tail. Lower parts whitish.

Measurements (in millimetres):

From end of snout to vent	38
" " " fore limb	15
Length of head	10
Width of head	6
Depth of head	4
Fore limb	13
Hind limb	21
Foot	11

This species is based on a single male specimen, probably half-grown, from the East Coast of Lake Tanganyika, presented to the British Museum by Mr. W. H. Nutt in 1896.

The feebly striated upper head-shields and the arrangement of the nasal and supraocular shields are my reasons for regarding *I. tanganicana* as the most generalized species of the genus.

2. ICHNOTROPIS BIVITTATA.

Ichnotropis bivittata, Bocage, Journ. Sc. Lish. i, 1866, p. 43; Peters, Reise Mossamb. iii, p. 48 (1882).

Ichnotropis capensis, part., Bouleng. Cat. Léz. iii, p. 78 (1887); Bocage, Herp. Ang. p. 30 (1895).

Body moderately depressed. Head rather feebly depressed, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum, its length $3\frac{3}{4}$ to 4 times in length to vent in males, $4\frac{1}{4}$ to $4\frac{3}{4}$ times in females; snout pointed, as long as the postocular part of the head, with sharp canthus and concave loreal region; a rather deep concavity on the upper surface of the snout and on the frontal, between two strong keels; an obtuse keel below the eye. Pileus 2 to $2\frac{1}{2}$ times as long as broad. Neck as broad as or a little narrower than the head. The hind limb reaches the axil or the shoulder in males, the elbow or the axil in females; foot as long as or a little longer than the head; digits feebly compressed. Tail $1\frac{1}{2}$ to 2 times as long as head and body.

Upper head-shields strongly and coarsely striated and keeled; nostril between three shields; nasals forming a suture behind the rostral; frontonasal as long as broad or a little broader than long; prefrontals much longer than broad, usually in contact with the anterior of the two large supraoculars, and forming an extensive median suture*; frontal as long as or a little shorter than its distance from the end of the snout, 2 to $2\frac{1}{2}$ times as long as broad, of equal width throughout or a little narrower behind than in front; parietals $1\frac{1}{2}$ to 2 times as long as broad, rounded or obliquely truncate behind; interparietal as large as or larger than the frontoparietals, usually in contact with a shorter occipital, which may be large or small, and the posterior border of which is rounded and projects beyond the parietals; occipital exceptionally broken up into scales. 4 supraoculars, the first small or broken up into 2 to 5 shields; anterior large supraocular longer than its distance from the second loreal, second usually in contact with the parietal; 4, rarely 5, superciliaries, first longest and forming a very oblique suture with the second; one, rarely two, series of small scales between the supraoculars and the superciliaries. Lower nasal broadly in contact with the rostral; postnasal small, between the upper and lower nasals; anterior loreal much shorter than second; 4, rarely 5 or 6, upper labials anterior to the subocular, which is much narrower beneath than above, and borders the mouth.† An enlarged upper temporal usually present, sometimes separated from the parietals by small shields; temporal scales rather large, hexagonal, strongly keeled; a narrow tympanic shield. Lower eyelid with a series of vertically enlarged scales in the middle.

5 pairs of chin-shields, the 3 anterior in contact in the middle;

* Separated by two azygos shields in a male from Caconda.

† In a male from Caconda, the lower part of the right subocular is cut off to form an additional upper labial.

Fig. 50c. *Ichnotropis* in BOULENGER (1921).

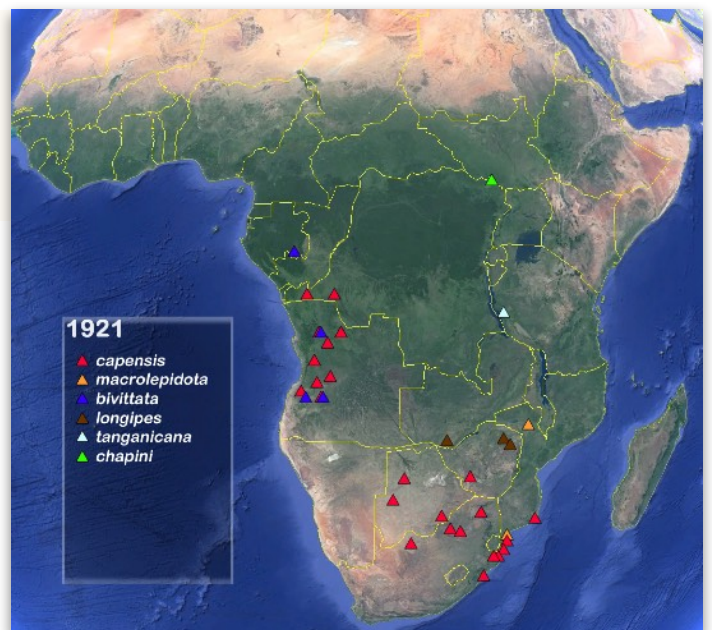


Fig. 51b. All records listed up to 1921 with their original species designation.

Body rather strongly depressed. Head moderately depressed, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum, its length $3\frac{1}{2}$ to $3\frac{3}{4}$ times in length to vent in males, 4 to $4\frac{1}{4}$ times in females; snout pointed, as long as the postocular part of the head, with sharp canthus and concave loreal region; a lanceolate concavity on the upper surface of the snout and the anterior half of the frontal; a strong keel below the eye. Pileus 2 to $2\frac{1}{4}$ times as long as broad. Neck as broad as or a little narrower than the head. The hind limb reaches between the shoulder and the ear in males, the axil or the shoulder in females; foot a little longer than the head; digits feebly compressed. Tail $1\frac{1}{2}$ to 2 times as long as head and body.

Upper head-shields strongly and coarsely striated and keeled; nostril between three shields; nasals forming a suture behind the rostral; frontonasal broader than long; prefrontals longer than broad, not reaching the first large supraocular, forming an extensive median suture; frontal as long as or a little shorter than its distance from the end of the snout, $1\frac{1}{2}$ to $2\frac{1}{4}$ times as long as broad, narrower behind than in front; parietals longer than broad, rounded behind; interparietal as large as the frontoparietals, in contact with or narrowly separated from a much shorter occipital, the posterior border of which is rounded and projects beyond the parietals. Two large supraoculars, preceded and followed by small keeled scales; first supraocular as long as or a little shorter than its distance from the posterior loreal, in contact with the posterior half of the frontal, second sometimes narrowly in contact with the parietal; 4 or 5 superciliaries, first longest and forming a very oblique suture with the second; 1 or 2 series of granular scales between the supraoculars and the superciliaries. Lower nasal broadly in contact with the rostral; postnasal small, between the upper and lower nasals; anterior loreal as long as or a little shorter than second; 4, rarely 5, upper labials anterior to the subocular, which is much narrower beneath than above, and borders the mouth.* A large upper temporal; temporal scales rather large, hexagonal, strongly keeled; a narrow tympanic shield. Lower eyelid with a series of vertically enlarged scales in the middle.

5 pairs of chin-shields, the 3 anterior in contact in the middle; gular scales imbricate, passing gradually into the ventral plates, 19 to 23 in a straight median line.

Dorsal scales rhombic-lanceolate, strongly keeled, acutely pointed or shortly mucronate, nearly as large as upper caudals; lateral scales

* In a male from Moeleni the lower part of the subocular is cut off to form a supplementary labial as in *I. squamulosa*.

a little smaller, smooth towards the ventral plates, into which they pass gradually; ventral plates rounded-hexagonal, not or but little broader than long, in 8 or 10 longitudinal and 25 to 31 transverse series; 34 or 36 scales and plates round the middle of the body. Preanal region covered with irregular scales, which are very small in females.

Scales or limbs smaller than dorsals, strongly keeled, tri- to quinque-carinate on the arm. 9 to 13 femoral pores on each side.* Subdigital lamellae pluricarinate, spinulose, 18 to 24 under the fourth toe.

Caudal scales strongly keeled, upper similar to dorsals, 24 to 28 in the fourth or fifth whorl behind the postanal granules.

Greyish or yellowish brown above, head and back sometimes with small blackish spots; two whitish streaks on each side, edged with black streaks or series of spots or ocelli, the upper light streak from the superciliary edge to the base of the tail, the lower from the upper lip to the groin and reappearing on the tail; sometimes a third light streak from below the ear to the fore limb; two black streaks on each side of the head, the upper passing through the eye, the lower along the edge of the mouth. Lower parts white.

Hewitt thus describes the life colours of a breeding pair: "Male reddish brown above; a series of ill-defined and almost confluent black spots dorsolaterally; more laterally a broad black band, starting from the end of the snout and passing through the eye above the ear and going down the tail; more ventrally another prominent black band, arising from the tip of the snout and passing along the upper lip and to the shoulder, whence the band is continued along the flanks to the thighs as a brilliant vermilion red streak†; these three bands enclose two pale streaks, the more dorsal being white, and the lower one bright yellow in the head and neck region; ventrally white, except on the lower lip, gular region, and neck, where there is a decided yellow tinge. The female is similar, but not so brightly coloured, the yellow colour being absent, and the black and red bands less brilliant."

Measurements (in millimetres):

	♂	♀
From end of snout to vent	50	55
" " " " fore limb	19	21
Length of head	13	13
Width of head	7.5	8
Depth of head	6	6

* 12 to 14 in Kalahari specimens, according to Werner.

† I have also observed this red lateral streak in preserved male specimens from Zululand.

Fig. 50e. *Ichnotropis* in BOULENGER (1921).

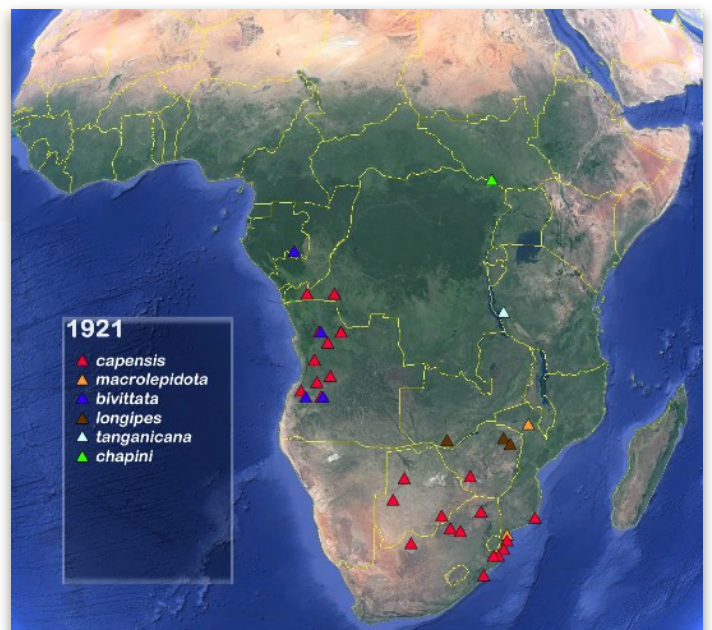


Fig. 51c. All records listed up to 1921 with their original species designation.

	♂	♀
Fore limb	17	20
Hind limb	26	30
Foot	15	15
Tail	100	92

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ type of <i>T. damerilii</i>	57	36	28	22	13-11	24	4
.. Mseleni, Zululand	55	36	28	22	12	21	4
.. " " " "	51	34	27	22	11-12	22	4
♀ " " " "	48	34	31	21	12-11	20	4
♂ Umfulosi " " " "	52	34	25	22	12-13	20	4
" " " " " "	52	34	29	22	11	19	4
" " " " " "	50	34	28	20	12-11	20	4-5
" " " " " "	48	34	27	19	12	21	4-5
♀ " " " " " "	55	36	28	23	12	20	4
" " " " " "	51	36	30	20	11	18	4
.. Vunda, Lower Congo	57	36	29	21	9	19	4

1. Length from snout to vent (in millimetres). 2. Scales and plates round middle of body. 3. Transverse series of ventral plates. 4. Gular scales in straight median series. 5. Femoral pores (right and left if differing). 6. Lamelle under fourth toe. 7. Upper labials anterior to subocular.

Same explanation for the following tables.

Habitat.—Portuguese East Africa and Southern Rhodesia to Zululand, the Transvaal, and the Kalahari. Also Lower Congo.

The types of *A. capensis*, which appear to be lost, as well as those of *T. damerilii*, were obtained in the sandy deserts about Latakoo, Bechuanaland.

The specimens in the S. African Museum are from Delagoa Bay, Pietersburg (Transvaal), Matoppo Hills (S. Rhodesia), and Mochudi (Bechuanaland).

4. ICHNOTROPIS LONGIPES.

Ichnotropis longipes, Bouleng. Proc. Zool. Soc. 1902, ii, p. 17, pl. iii, fig. 2.

Body rather strongly depressed. Head moderately depressed, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as broad, its depth equal to the distance between the centre of the eye and the tympanum, its length $3\frac{1}{2}$ to $3\frac{3}{4}$ times in length to vent (males); snout pointed, as long as the postocular part of the head, with sharp canthus and concave loreal

region; a feeble concavity along the upper surface of the snout and the frontal shield; a strong keel below the eye. Pileus twice as long as broad. Neck as broad as or a little narrower than the head. The hind limb reaches the ear or between the ear and the eye; foot $1\frac{1}{4}$ to $1\frac{1}{2}$ times the length of the head; digits feebly compressed. Tail 2 to $2\frac{1}{4}$ times as long as head and body.

Upper head-shields strongly and coarsely striated and keeled; nostril between three shields; nasals forming a suture behind the rostral; frontonasal broader than long; prefrontals longer than broad, not reaching the first supraocular, forming an extensive median suture; frontal as long as or a little shorter than its distance from the end of the snout, $1\frac{2}{3}$ to 2 times as long as broad, narrower behind than in front; parietals longer than broad, rounded behind; interparietal as large as or a little larger than the frontoparietals, in contact with a much shorter occipital, the posterior border of which is rounded and projects beyond the parietals. Two large supraoculars, first longer than its distance from the second loreal, from which it is separated by one, two, or three small keeled shields; one or two small posterior supraoculars; 4 superciliaries, first longest and forming a very oblique suture with the second; a series of granular scales between the supraoculars and the superciliaries. Lower nasal broadly in contact with the rostral; postnasal small, between the upper and lower nasals; anterior loreal shorter than the second; 4 upper labials anterior to the subocular, which is much narrower beneath than above and borders the mouth. A large upper temporal; temporal scales rather large, hexagonal, strongly keeled; a narrow tympanic shield. Lower eyelid with a series of vertically enlarged scales in the middle.

5 pairs of chin-shields, the 3 anterior in contact in the middle; gular scales imbricate, passing gradually into the ventral plates, 21 to 23 in a straight median line.

Dorsal scales lanceolate, strongly keeled, acutely pointed or shortly mucronate, nearly as large as the upper caudals; lateral scales not smaller, smooth towards the ventral plates, into which they pass gradually; ventral plates rounded-hexagonal, not broader than long, in 10 longitudinal and 26 or 27 transverse series; 36 or 38 scales and plates round the middle of the body. Preanal region covered with irregular scales.

Scales on limbs smaller than dorsals, strongly keeled, tri- or quinque-carinate on the arm. 9 or 10 femoral pores on each side. Subdigital lamellæ pluricarinate, spinulose, 19 to 21 under the fourth toe.

Caudal scales strongly keeled, upper similar to dorsals, 24 to 28 in the fourth or fifth whorl behind the postanal granules.

Fig. 50f. *Ichnotropis* in BOULENGER (1921).



Pale grey-brown above, tinged with orange on the sides of the back; no spots on the head and body; a black streak along each side, from the tip of the snout, through the eye, to the anterior fourth of the tail; a second black streak along the upper lip from the second labial, extending to the shoulder and separated from the upper one by a white streak; some large black spots on the hind limbs. Lower parts white.

Measurements (in millimetres):

From end of snout to vent	49
" " " fore limb	21
Length of head	13
Width of head	8
Depth of head	6
Fore limb	19
Hind limb	33
Foot	17
Tail	111

Particulars of Specimens Examined.

	1.	2.	3.	4.	5.	6.	7.
♂ Mazoe, Mashonaland (type)	49	38	27	23	10-9	19	4
" " " "	46	38	26	23	10	21	4
" " " "	46	36	27	22	9	19	4
" Bulawayo "	53	36	27	21	10-9	21	4

Habitat.—Southern Rhodesia. A specimen from Livingstone, N.W. Rhodesia, is preserved in the South African Museum.

5. *ICHNOTROPIS CHAPINI*.

Ichnotropis chapini, Schmidt, Bull. Amer. Mus. N. H. xxxix, 1919, p. 508, fig.

Habitus as in *I. capensis*; hind limb not reaching axil (female). Upper head-shields strongly striated, frontal bicarinate; nasals forming a short suture behind the rostral; frontonasal small, as long as broad; prefrontals longer than broad, not reaching the first large supraocular, forming an extensive median suture; frontal as long as its distance from the end of the snout; $2\frac{1}{2}$ times as long as broad, of equal width throughout; parietals longer than broad, rounded behind; interparietal as long as the frontoparietals, in contact with a small occipital, the posterior border of which is rounded and projects beyond the parietals; two large supraoculars, preceded and followed by small scales, first longer than its distance from the posterior loreal,

in contact with the posterior half of the frontal, second narrowly in contact with the frontal; 4 superciliaries, first very large; a series of granular scales between the supraoculars and the superciliaries. Nostril between three shields; two superposed anterior loreals; 4 or 5 upper labials anterior to the subocular, which borders the mouth. A large upper temporal; temporal scales small, uniform, keeled; a curved tympanic shield.

Dorsal scales strongly keeled; ventral plates in 10 longitudinal and 30 transverse series; 35 scales and plates round the body. Preanal region with small scales.

Greyish brown above; a white black-edged lateral stripe originating on the subocular, passing above the arm but not reaching the hind limb; transverse black spots on the sides and two series of similar markings along the back; ventral plates white, edged with grey, those of the two outer rows dotted with brown.

Total length 135 millim.; tail 77.

Habitat.—Abu, Uelle, Belgian Congo.—The type is preserved in the American Museum of Natural History, New York.

6. *ICHNOTROPIS SQUAMULOSA*.

Ichnotropis squamulosa, Peters, Mon. Berl. Ac. 1854, p. 617, and Reise Mossamb. iii, p. 49, pl. viii, fig. 2 (1853); Bouleng. Cat. Liz. iii, p. 79 (1887); Boettg. Ber. Senck. Ges. 1894, p. 89; Tornier, Tierw. O.-Afr., Kriechth. p. 39 (1897); Sternf. Sitzb. Ges. Naturf. Fr. Berl. 1911, p. 247, and Mitt. Zool. Mus. Berl. v, 1911, p. 417; Nieden, Mitt. Zool. Mus. Berl. vii, 1913, p. 78.

Head and body moderately depressed. Head $1\frac{1}{2}$ times as long as broad, its depth equal to the distance between the anterior corner or the centre of the eye and the tympanum, $3\frac{2}{3}$ to $4\frac{1}{4}$ times in length to vent in males, $4\frac{2}{3}$ times in females; snout pointed, as long as the post-ocular part of the head, with sharp canthus and concave loreal region; a deep concavity along the upper surface of the snout and the frontal shield, bordered by two strong keels; a strong keel below the eye. Pileus twice as long as broad. Neck as broad as or a little narrower than the head. The hind limb reaches the shoulder or the ante-humeral fold; foot as long as or a little longer than the head; digits feebly compressed. Tail nearly twice as long as head and body.

Upper head-shields with granular rugosities, keels, and radiating striae; nostril between three shields; nasals forming a suture behind the rostral; frontonasal as long as broad or a little broader than long, longitudinally divided into two; prefrontals longer than broad,

Fig. 50g. *Ichnotropis* in BOULENGER (1921).

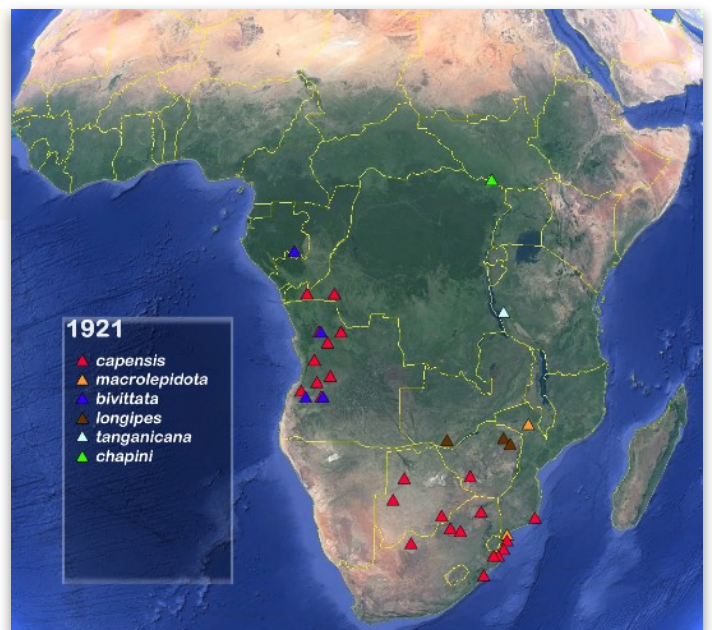


Fig. 51d. All records listed up to 1921 with their original species designation.



Fig. 52.
ALBERT MONARD
(1886-1952).

Ichnotropis capensis in MONARD (1930)

Mission Scientifique Suisse dans Angola, Resultats Scientifiques. - Bulletin de la Société Neuchâteloise des Sciences Naturelles, 55: 89-111.

Big collection of around 70 specimens from Angola: Caluquembe, Santo-Amaro, Rio Mbalé, Caquindo and Chimporo. The posterior limbs appear longer in this collection compared to BOULENGER (1921). An extensive color description in males and females is given.

Ichnotropis capensis Smith.

Cette petite espèce de lacertilien, extrêmement variable de coloration, est très abondante dans l'intérieur de l'Angola, et pullule littéralement en certains endroits. Aussi en avons-nous rapporté une belle série de tous âges, de toutes grandeurs, et de toutes colorations. Les détails de l'écaillage concordent avec ceux qu'indique Boulenger. Toutefois les membres postérieurs paraissent plus longs dans nos exemplaires. L'extrémité de la jambe (plus grand orteil), ramenée en avant, atteint le tympan.

Mâles et femelles diffèrent de coloration.

Mâles. — Les flancs sont ornés d'une large bande longitudinale noire, commençant à l'extrémité du museau, traversant l'œil et s'éteignant vers le tiers ou la moitié de la queue. Cette bande est bordée de deux bandes claires, l'une supérieure, l'autre inférieure, la première commençant aux sourcils, la deuxième, mieux marquée, commençant au rostre, traversant le tympan et accompagnant la bande noire sur toute sa longueur. Elle est bordée d'une deuxième raie noire, débutant à la lèvre supérieure, se poursuivant jusqu'aux bras, qui sont foncés; sur les flancs, cette raie passe au marron vif, puis redevient noire au voisinage de la jambe. Celle-ci est noire et marbrée de blanc. Sur le dos, de petits accents noirs forment deux lignes longitudinales.

D'autres grands mâles ont les pattes antérieures d'un rouge intense; ou bien les cuisses ne sont pas marbrées et ont la couleur du dos.

Femelles. — Elles sont beaucoup moins variées de coloration. De la teinte générale gris-brun, plus claire sur le ventre, ne ressort qu'une bande sombre naissant du rostre, traversant l'œil, s'éclaircissant sur les flancs et finissant par disparaître sur la queue.

Nous en avons recueilli environ soixante-dix exemplaires du Caluquembe, de Santa-Amaro, du Rio Mbalé, de Caquindo, mais surtout du Chimporo, où l'espèce qui pullule nous a fourni les exemplaires les plus colorés.

Fig. 53. *Ichnotropis capensis* in MONARD (1930).

Ichnotropis bivittata in SCHMIDT (1933)

The Reptiles of the PULITZER Angola Expedition. - Annals of the Carnegie Museum, 22: 1-15.

Records for Gauca and Chitau (Angola).

19. *Ichnotropis bivittata* Bocage

Ichnotropis bivittata BOCAGE, 1866, Journ. Sci. Lisboa, 1, 43.

Sixteen specimens of this well marked species, C. M. Nos. 5725, 5927-28, Gauca, Jan. 8-10, 1931, and 5847-59, Chitau, Jan. 12, 1931.

Fig. 54. *Ichnotropis bivittata* in SCHMIDT (1933).



Fig. 55.
ARTHUR LOVERIDGE
(1891-1980).

Ichnotropis bivittata in LOVERIDGE (1933)

Reports on the Scientific Results of an Expedition to the Southwestern Highlands of Tanganyika Territory. VII: Herpetology. - Bulletin of the Museum of Comparative Zoology at Harvard College, 74: 197-416.

First record of *I. bivittata* in Tanzania from Ipemi in the Udzungwa Mountains. Another observation was made at Tandala in the Ukinga mountains.

LOVERIDGE (1933) considers the Tanzania *Ichnotropis* equal to the Angola lizards, and different from the quite distinct *Ichnotropis tanganyicana* specimen, which he personally examined in London. It is not mentioned what differences he observed between *I. bivittata* and *I. tanganyicana*.

ICHNOTROPIS BIVITTATA Bocage

Ichnotropis bivittata Bocage, 1866, Journ. Sci. Lisboa, 1, p. 43; Duque de Bragança, Angola; Boulenger, 1921, Monogr. Lacertid., 2, p. 183; French Congo; Belgian Congo and Angola.

2 (M. C. Z. 30836-7) Ipemi, Uzungwe Mtns. 7. i. 30.

Distribution. The above constitute the first records for the occurrence of this West African species in East Africa. Salimu, who assisted me in catching them, reported seeing one which escaped him at Tandala, Ukinga Mountains on 11. ii. 30.

Variation. After careful comparison with a female from Caconda, Angola in the collection of the Museum of Comparative Zoology, I can see no grounds for separating the Tanganyika specimens from the Angolan. The type of *I. tanganyicana* Boulenger was examined in London and is quite distinct.

Midbody scale-rows (including ventrals) 34-37; transverse ventral rows 24; gular series 24; femoral pores 12-13.

Coloration in life. Realizing that this beautiful lizard was new to the Tanganyika fauna, a detailed description of its coloration was made in the field. Above, head deep brown; back olive, on either side of a faintly indicated, light vertebral line are a series of bright chestnut-brown squarish blotches whose outer edges are touched with black and sometimes a little white, anteriorly these blotches tend to coalesce; a light (anteriorly it is tinged with yellowish) dorso-lateral line has its origin near the last supraocular and disappears on the base of the tail; below it is another series of blotches which are rather more black than chestnut-brown and having the appearance of ocelli by reason of a bluish-white central spot in each; a white band along the upper labials becomes bright yellow behind the eye, passes across the ear-opening and (beneath the black blotches) along the flank to the hind limb, having become whiter between the fore and hind limbs; it is bounded below by a vermilion line commencing on the lower labials and passing along the flank to the hind limb but interrupted by the fore limb. Below, china-white except the regenerated portion of the tail which is brown.

Measurements. The larger of these two males is 143 (59+84) mm. Diet. A cricket was in the stomach of one of these lizards.

Defence. When captured one gave a faint squeak or chirp, both gaped widely showing the scarlet edges and black interstices of their mouths.

Habitat. Both were taken running about in short grass on either side of the path on the northern ascent to the village.

Fig. 56. *Ichnotropis bivittata* in LOVERIDGE (1933).

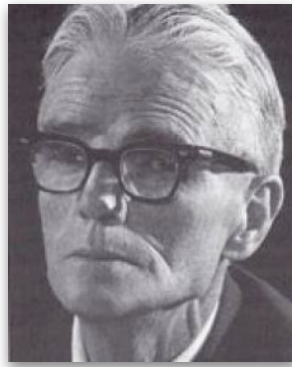


Fig. 57.
VIVIAN FREDERICK MAYNARD
FITZSIMONS (1901-1975).

***Ichnotropis capensis* in FITZSIMONS (1935)**

Scientific results of the VERNAY-LANG Kalahari Expedition, March to September, 1930. Reptilia and Amphibia. Part 2. - Annals of the Transvaal Museum, 16 (2): 295-397.

Records: Between Kaotwe and Damara Pan (Botswana), Kabulabula (Namibia) and N'kate (Botswana).

***Ichnotropis capensis* (A. Smith)**

Algyra capensis A. Smith, 1838, *Mag. Nat. Hist.* (2), II, p. 94 (type loc.: Latakoo).

Ichnotropis capensis Werner, 1910, *Jena. Denkschr.* XVI, p. 329 (between Lokaneng and Severelela, Kalahari). Boulenger, 1921, *Monogr. Lacertidae*, II, p. 425 (30 miles north of Okwa, Kalahari).

Four specimens were collected as follows: V.L.K.E. No. 467 (April 1930), between Kaotwe and Damara Pan; No. 468 (July), Kabulabula; Nos. 469 and 470 (August), N'kate.

DISTRIBUTION. From the lower Congo, Angola, Rhodesia and Portuguese East Africa, southwards to South-West Africa, Bechuanaland, the Transvaal and Natal.

REMARKS. The above series comprises three half-grown specimens (2 ♂♂ and 1 ♀) and a juvenile. Postocular in contact with prefrontal; interparietal in contact with occipital in three cases; four to six labials anterior to subocular; scales round body 36-40; ventral scales in 10 longitudinal and 26-28 transverse rows; 22-23 lamellae under fourth toe; foot distinctly longer than head (up to 1½ times), and in the two male specimens adpressed hind limb reaches the ear or beyond.

COLOUR. Above tawny brown, with two interrupted series of black spots on back, sometimes indistinct and ill-defined; usually a black-edged whitish streak along sides from just below eye, through ear to groin. Below dirty white.

FIELD NOTES. Very shy and elusive, and difficult to detect owing to their dun colour, which matches well with the Kalahari scrub.

DISCUSSION. An examination of a long series of specimens from South Africa, including Southern Rhodesia and South-West Africa, discloses great variation in length of foot and hind limb, the foot in many cases being as much as 1½ times length of head and adpressed hind limb reaching ear or beyond. It is mainly by these two characters that Boulenger has separated his *I. longipes*, which we may now consider along with *I. macrolepidota* as a synonym of *capensis*.

DIMENSIONS. The measurements of the two largest specimens are as follows:

	♂ (No. 470)	♀ (No. 469)
Total length	151.0 mm.	144.0 mm.
Snout to vent	41.0 mm.	43.0 mm.
Tail	110.0 mm.	101.0 mm.
Snout to fore limb	18.0 mm.	17.7 mm.
Head length	11.6 mm.	11.7 mm.
Head width	6.7 mm.	7.1 mm.
Head depth	5.0 mm.	5.0 mm.
Arm	17.0 mm.	16.0 mm.
Leg	30.0 mm.	31.0 mm.
Foot	16.0 mm.	15.5 mm.
Femoral pores	10-11	11

Fig. 60. *Ichnotropis capensis* in FITZSIMONS (1935).

***Ichnotropis* in DE WITTE (1933)**

Reptiles récoltés au Congo belge par le Dr. H. SCHOUTEDEN et par M. G.-F. DE WITTE. - Annales du Musée Royal du Congo Belge, Sciences Zoologiques, Tervuren, (1) 3: 53-100.

New records:

Ichnotropis bivittata

- Kansenia (Democratic Republic of the Congo).

Ichnotropis chapini

- Adra (Democratic Republic of the Congo).

Ichnotropis longipes

- Dilolo (Democratic Republic of the Congo).

Measurements of *Ichnotropis longipes* and the coordinates for Adra are given:

1. — Aba	3° 50' N., 30° 10' E.
2. — Abimva	3° 05' N., 29° 30' E.
3. — Adra	3° 30' N., 30° 30' E.

Fig. 58. Coordinates of Adra in DE WITTE (1933).

41. — *Ichnotropis bivittata* BOCADE.
Coll. DE WITTE (1 exemplaire).
R. G. 7674 : Kansenia, 1931.

42. — *Ichnotropis Chapini* SCHMIDT.
Coll. SCHOUTEDEN (2 exemplaires).
R. G. 3656-3657 : Adra, IV-1925.

43. — *Ichnotropis longipes* BOULENG. (Pl. II, fig. 1).
BOULENGER, Proc. Zool. Soc. London, 1902, vol. II, p. 17, pl. III, fig. 2-2c.
Coll. DE WITTE (51 exemplaires).
R. G. 7777-7827 : Dilolo, 1-15-IX-1931.

La description de cette espèce reposait sur 4 spécimens seulement, tous mâles, provenant du Mashonaland, de la localité qui avait fourni le type du *Rana Darlingi*. La grande série que j'ai rapportée de Dilolo montre, comme il fallait s'y attendre, que les membres sont plus courts chez la femelle; reportés en avant les postérieurs atteignent ou dépassent à peine le membre antérieur.

MENSURATIONS, EN MILLIMÈTRES

	R.O. ♂	R.O. ♀	R.O. ♂	R.O. ♀	R.O. ♂	R.O. ♀	R.O. ♂	R.O. ♀	R.O. ♂	R.O. ♀	R.O. ♂	R.O. ♀
Du museau à l'anus	55	54	60	58	55	57	57	57	60	57	55	52
Du museau au membre antérieur	21	20	25	24	23	19	22	23	29	20	19	20
Longueur de la tête	15	14	15	15	15	14	15	15	24	14	14	14
Largeur de la tête	10	9	10	9	9	9	9	9	9	9	9	9
Hauteur de la tête	8	8	8	8	8	7	8	8	7	7	7	8
Membre antérieur	32	30	22	23	22	21	21	22	21	10	19	19
Membre postérieur	37	36	40	37	35	34	38	36	32	33	34	34
Pied	17	17	18	18	19	16	17	17	15	16	16	16
Queue	130	110	—	70	—	125	105	—	90	103	—	—

CARACTÈRES NUMÉRIQUES

Écailles et plaques autour du milieu du corps	42	32	37	37	30	34	35	32	38	35	36	36
Séries transversales de plaques centrales	35	23	21	21	22	24	24	25	25	24	24	22
Écailles gularies en série médiane droite	20	18	20	18	21	20	19	19	23	10	23	19
Pores fémoraux (droite et gauche)	12-12	10-11	14-13	0-9	13-12	12-12	10-10	11-11	11-11	8-9	14-14	10-10
Lamelles sous le 4 ^{ème} art. sup.	17	20	19	18	22	20	19	18	19	16	22	16
Labiales supér. antérieures à la sous-oculaire	4	4	4	4	4	5	4	4	4	4	4	3

Fig. 59. *Ichnotropis* in DE WITTE (1933).

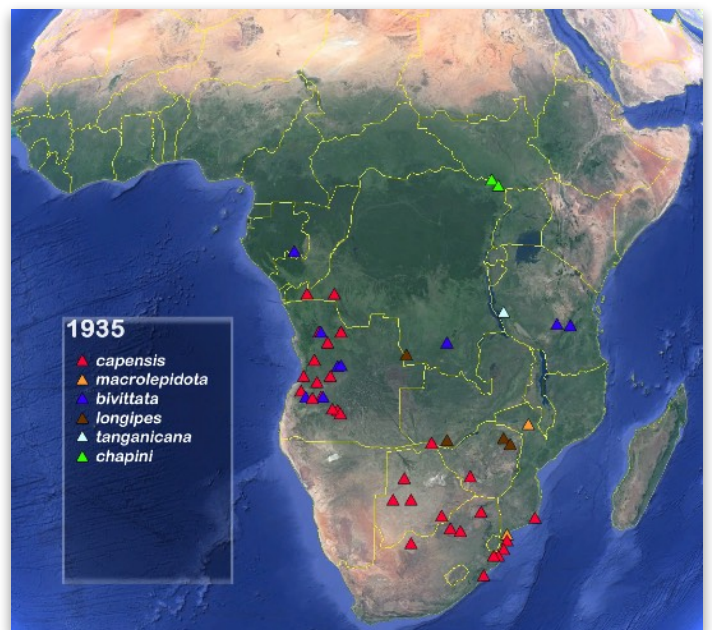


Fig. 61. All records listed up to 1935 with their original species designation.



Fig. 62. Mount Moco, with 2,620 m the highest mountain of Angola.

Ichnotropis bivittata in PARKER (1936)

Dr. KARL JORDAN's Expedition to South-West Africa and Angola: Herpetological Collections. - *Novitates Zoologicae*, 40: 115-146.

This actually might be a first record (Mount Moco, Angola) of what later was described as *I. microlepidota* by MARX (1956).

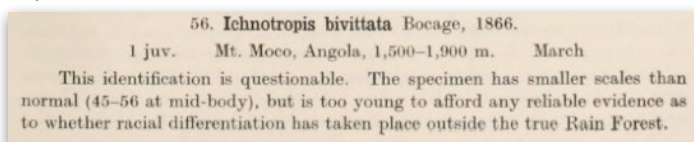


Fig. 63. *Ichnotropis bivittata* in PARKER (1936).

Ichnotropis capensis in FITZSIMONS (1937)

Notes on the reptiles and amphibians collected and described from South Africa by ANDREW SMITH. - *Annals of the Transvaal Museum*, 17 (4): 259-274.

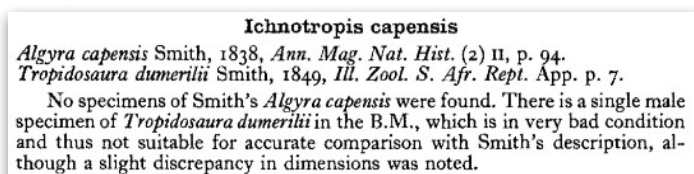


Fig. 64. *Ichnotropis capensis* in FITZSIMONS (1937).

Ichnotropis bivittata in LOVERIDGE (1937)

Reports on the Scientific Results of an Expedition to Rain Forest Regions in Eastern Africa. IX: Zoögeography and Itinerary. - *Bulletin of the Museum of Comparative Zoology at Harvard College*, 79 (9): 481-541.

A record of *Ichnotropis bivittata* east of Lake Tanganyika.

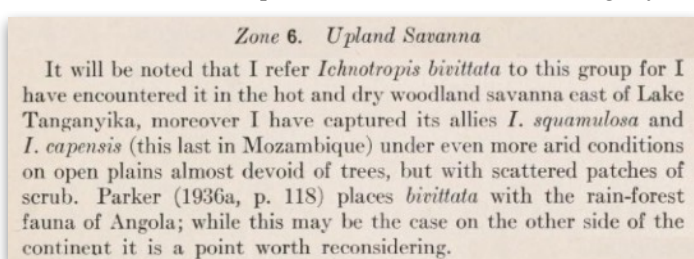


Fig. 65. *Ichnotropis bivittata* in LOVERIDGE (1937).

Ichnotropis bivittata and *I. longipes* in MONARD (1937)

Contribution à l'Herpétologie d'Angola. - *Arquivos do Museu Bocage*, 8: 19-154.

In his Contribution à l'Herpétologie d'Angola, MONARD (1937) is using the same key to the species as proposed by BOULENGER (1921).

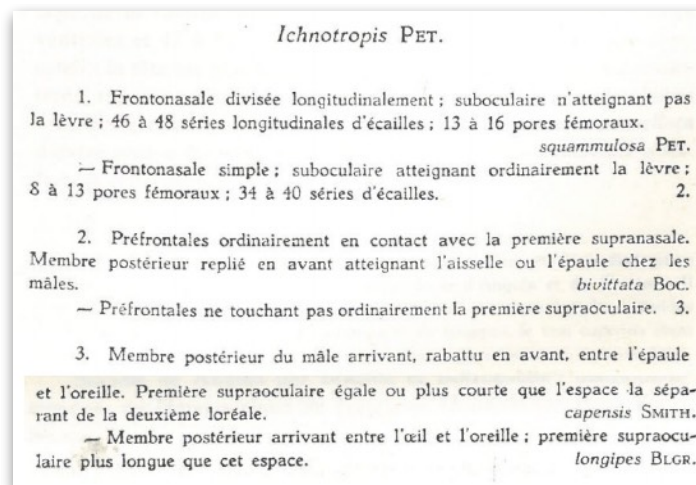


Fig. 66. *Ichnotropis* in MONARD (1937).

Consequently MONARD (1937) changed some of the previous (MONARD 1930) described records;

- *Ichnotropis capensis* from Santo Amaro and Caluquembe into *Ichnotropis bivittata*.
- *Ichnotropis capensis* from Rio Mbalé and Chimporo into *Ichnotropis longipes*.

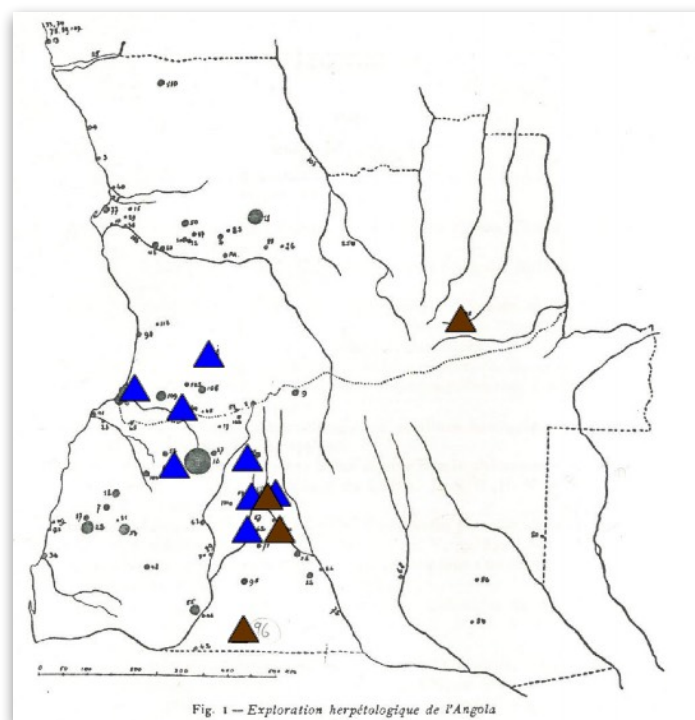


Fig. 67. Distribution of *Ichnotropis* in MONARD (1937).



Fig. 70. Lake Tanganyika.

***Ichnotropis bivittata* in MONARD (1937)**

New records: d'Ebanga, Bimbi, Kasinga, Kului, Sangevé and Kuvangu (Angola).

Ichnotropis bivittata BOCAGE

BOCAGE : Herp. d'Angola, p. 30 ; BOULENGER : Monogr. Lacert., II, p. 182.

Nombreux exemplaires venant d'Ebanga, Bimbi, Kasinga, Kului, Sangevé, Kalukembé, Kuvangu, Santo Amaro.

L'espèce créée par BOCAGE fut réunie plus tard avec *capensis* (voir Herpétologie d'Angola et du Congo), puis rétablie, avec les caractères différentiels que nous avons donnés plus haut. La coloration est assez stable dans les individus adultes: une couleur rouge-brun assez vive, deux rangées dorsales de taches noires et, plus ou moins marquée et encadrée de noir, une ligne blanche latérale naissant de la lèvre supérieure.

Très abondante dans la partie moyenne de l'Angola, l'espèce atteint le Congo belge (DE WITTE).

Fig. 68. *Ichnotropis bivittata* in MONARD (1937).

Fig. 71. Surroundings of Ebanga (Angola).

***Ichnotropis longipes* in MONARD (1937)**

New records: Dala and Mupanda (Angola).

Ichnotropis longipes BOULENGER

BOULENGER : Monogr. Lacert., II, p. 188.

Neuf exemplaires venant de la région de Dala (Lunda). Nombreux exemplaires du fl. Mbalé, Chimporo (1^{er} voyage), Mupanda.

Les mâles sont très typiques ; leur membre postérieur, ramené en avant, dépasse l'oreille. Mais chez les femelles, il dépasse à peine l'épaule, comme l'a relevé DE WITTE. La couleur nous a paru un peu plus claire que dans *bivittata* ; la raie blanche latérale encadrée de noir existe aussi. Les exemplaires mâles du Chimporo étaient brillamment colorés: les pattes antérieures rouge-vif, les pattes postérieures marbrées de noir et de blanc ; les raies latérales très larges et coupées d'une bande blanche.

Distribution: Rhodésie du Sud et du Nord-Ouest, Dilolo (Congo) près de la frontière angolaise et aux portes de la Lunda d'où viennent nos exemplaires. Région du Sud de l'Angola, fleuve Mbalé, Chimporo, Mupanda, d'où nous avons rapporté des exemplaires à notre premier voyage, nommés à tort *Ichnotropis capensis* dans notre mémoire.

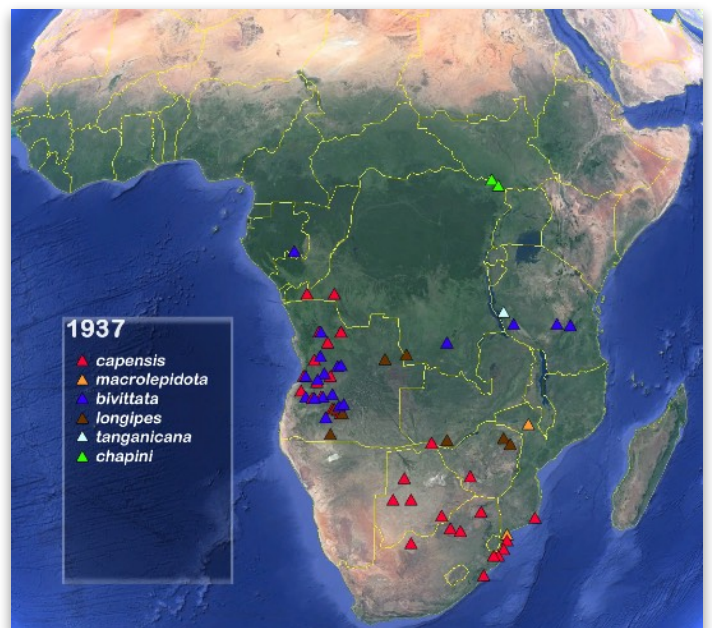
Fig. 69. *Ichnotropis longipes* in MONARD (1937).

Fig. 72. All records listed up to 1937 with their original species designation.



Fig. 73. GASTON-FRANÇOIS DE WITTE (1897-1980).



Fig. 74. RAYMOND FERDINAND LAURENT

Ichnotropis in DE WITTE & LAURENT (1942)

Liste des Lacertidae du Congo belge et description d'une espèce nouvelle. - Revue de Zoologie et de Botanique Africaines, Bruxelles, 36 (2): 165-180.

Ichnotropis chapini in DE WITTE & LAURENT (1942)

8. - *Ichnotropis chapini* SCHMIDT.

Ichnotropis chapini SCHMIDT, 1919, Bull. Amer. Mus. Nat. Hist., New York, 39, p. 508.

LISTE DES EXEMPLAIRES.

Collection du Musée du Congo (2 exemplaires).
R. G. 3656-57, Adra (Ituri), IV-1925 (SCHOUTEDEN).

LOCALITÉS DÉJÀ CITÉES DU CONGO BELGE.

SCHMIDT (n° 1, 1919, p. 508).
Aba (Ituri) (AMERICAN CONGO EXPEDITION).
WITTE (n° 2, 1933, p. 74).
Adra (SCHOUTEDEN).

Fig. 75. *Ichnotropis chapini* in DE WITTE & LAURENT (1942).

Ichnotropis bivittata in DE WITTE & LAURENT (1942)

New records: Bas-Congo and Kandolo (Democratic Republic of the Congo).

9. - *Ichnotropis bivittata* BOCAGE.

Ichnotropis bivittata BOCAGE 1866, Journ. Sc. Lisb., 1, p. 43.

LISTE DES EXEMPLAIRES.

Collection du Musée du Congo belge (3 exemplaires).
R. G. 914 « Bas-Congo », sans date (CABRA).
R. G. 7674, Kansenia (Katanga), 1931 (G. F. DE WITTE).
R. G. 2367, Kandolo (Sankuru), XI-1921 (GHESQUIÈRE).

LOCALITÉ DÉJÀ CITÉE DU CONGO BELGE.

WITTE (n° 2, 1933, p. 74).
Kansenia (G. F. DE WITTE).

Fig. 76. *Ichnotropis bivittata* in DE WITTE & LAURENT (1942).

Ichnotropis overlaeti DE WITTE & LAURENT, 1942

New records: Kapanga, Lofoi, Luluabourg and Mukishi (Democratic Republic of the Congo).

DE WITTE & LAURENT (1942) describe another new species, *Ichnotropis overlaeti*, with a female paratype (R.G. 40) from Kwango, which was earlier determined as *Ichnotropis capensis* by BOULENGER (1897).

This species is told to be most closely related to *Ichnotropis bivittata* and *Ichnotropis capensis*. It differs from *I. bivittata* by the position of the large anterior supraocular plate, separated from the prefrontal by one or more small supraocular plates, and from *I. capensis* by the dimension of the large anterior supraocular plate, longer than the distance that separates it from the posterior frenal (DE WITTE & LAURENT 1942).

10. - *Ichnotropis overlaeti* sp. n.

LISTE DES EXEMPLAIRES.

Collection du Musée du Congo (5 exemplaires).

R. G. 9691 [1 ♂ Type], Kapanga (Lulua), 1933 (OVERLAET).
R. G. 40 [1 ♀ Paratype], « Kwango », sans autre indication.
R. G. 678 [1 ♂ Paratype], Lofoi (Katanga), 1898-1900 (LEMAIRE).
R. G. 1869 [1 ♂ Paratype], Luluabourg (Kasai), sans date (R. P. CAMBIER).
R. G. 6045 [1 ♀ Paratype], Mukishi (Lomami), 1937 (BECQUET).

LOCALITÉ DÉJÀ CITÉE DU CONGO BELGE.

BOULENGER (n° 1, 1897, p. 277, *Ichnotropis capensis*).
« Kwango » (sans autre indication).

Tête et corps plus ou moins déprimé. Tête 1 3/4 fois aussi longue que large, sa hauteur étant moindre que la distance entre le bord antérieur de l'œil et le tympan; longueur de la tête un peu plus de 3 fois dans la longueur du corps jusqu'à l'anus; museau obtusement pointu, aussi long que la partie postoculaire de la tête, canthus rostralis bien distinct, région frenale concave; une concavité de forme lancéolée, bordée de fortes carènes sur la partie supérieure du museau (préfrontales et frontale); sous-oculaire non carénée, ou avec une carène plus ou moins distincte. Cou un peu plus étroit que la tête. Le membre postérieur étant ramené en avant, atteint l'épaule ou entre l'épaule et le tympan chez le mâle, l'aisselle chez la femelle; pied aussi long que la tête; doigts faiblement comprimés. Queue 1 5/9 fois aussi longue que le corps, tête comprise.

Plaques du dessus de la tête fortement striées et carénées. Narine entre 3 ou 4 plaques; nasales formant une suture derrière la rostrale; frontonasale aussi large que longue; préfrontales plus longues que larges, n'atteignant pas la plus grande sus-oculaire, et formant une suture médiane; frontale aussi longue que la distance qui la sépare de l'extrémité du museau, 2 à 3 fois aussi longue que large, plus étroite dans sa partie postérieure que dans sa partie antérieure; pariétales plus longues que larges, arrondies en arrière; interpariétale aussi grande que les fronto-pariétales, en contact avec une occipitale beaucoup plus courte, dont le bord postérieur est arrondi, et s'étend au-delà des pariétales; 2 grandes sus-oculaires (précédées et suivies d'une ou de plusieurs sus-oculaires), la première plus longue que la distance qui la sépare de la frenale postérieure, dont elle est séparée par une ou plusieurs petites sus-oculaires, la deuxième en contact avec la pariétale; 4 surciliaires, la première la plus longue et formant une suture très oblique avec la deuxième; une série de petites écailles carénées séparant entièrement ou partiellement les sus-oculaires des surciliaires. Nasale inférieure largement en contact avec la rostrale; 1 ou 2 petites postnasales, situées entre les nasales supérieure et inférieure; frenale antérieure plus courte que la deuxième; 4 labiales supérieures situées en avant de la sous-oculaire, qui est plus étroite en dessous qu'au-dessus et borde la bouche. Une temporale antérieure en contact ou séparée de la pariétale par de petites écailles carénées; écailles de la région temporale assez grandes, hexagonales, fortement carénées; plaque tympanique étroite. Paupière inférieure avec au milieu, une série d'écailles plus allongées verticalement; 5 paires de mentonnières, les 3 antérieures en contact au milieu; écailles gulaire imbriquées, se transformant graduellement en plaques ventrales, 16 dans une ligne médiane droite.

Écailles dorsales rhomboïdales, lancéolées, fortement carénées, légèrement mucronées, un peu plus petites que les caudales supérieures; plaques ventrales arrondies, plus ou moins hexagonales, un peu plus larges que longues, en 8-9 séries longitudinales et en 23 à 30 séries transversales; 33-38 écailles et plaques autour du milieu du corps. Région préanale recouverte d'écailles de taille irrégulière. Écaillure de la partie supérieure des membres antérieurs et postérieurs irrégulière, les plus grandes écailles atteignant la même dimension que les écailles dorsales, lisses ou carénées. 11-12 pores fémoraux de chaque côté. Lamelle subdigitales pluricarénées, spinescentes, 18-21 sous le quatrième orteil. Écailles caudales fortement carénées, les supérieures semblables aux inférieures, 23-26 dans le 5^e verticille situé après les granules postaux.

Brun bronzé au-dessus; dos avec 2 séries supéro-latérales plus ou moins irrégulières de petites taches noires présentant plus ou moins l'aspect d'une bande, et parfois aussi une série vertébrale. 2 bandes noires de chaque côté de la tête et du corps, la supérieure commençant à l'extrémité du museau, passant à travers l'œil, la partie supérieure du tympan et s'étendant tout le long du corps, jusqu'à la naissance des membres postérieurs; l'inférieure plus étroite, commençant, plus ou moins distinctement à l'extrémité du museau, traversant le tympan et s'étendant

Fig. 77a. *Ichnotropis overlaeti* in DE WITTE & LAURENT (1942).



Fig. 78. Royal Museum for Central Africa - Tervuren - Belgium.

jusqu'à la naissance des membres antérieurs; à partir de cet endroit elle est parfois remplacée par une série de petites taches bleues plus ou moins bordées de noir, s'étendant jusqu'à la naissance des membres postérieurs; des taches bleues sont également présentes à la bande supérieure, entre les membres antérieurs et postérieurs. Une bande blanche commençant au-dessus du tympan, s'étendant plus ou moins distinctement jusqu'à la naissance de la queue et séparant la série supéro-latérale de petites taches noires de la bande noire supérieure; une 2^e bande blanche commençant à l'extrémité du museau, passant à travers le tympan, s'étendant plus ou moins distinctement jusqu'à la naissance de la queue, et séparant la bande noire supérieure de la bande noire inférieure, et de la série de petites taches bleues. Ces dernières sont absentes chez la femelle.

Mensurations en millimètres.

	R.G. 9891 ♂ Type	R.G. 1899 ♂ Paratype	R.G. 678 ♂ Paratype	R.G. 6045 ♀ Paratype	R.G. 40 ♀ Paratype
De l'extrémité du museau jusqu'à l'anus	56	52	57	56	62
De l'extrémité du museau jusqu'au membre antérieur	22,5	28	21	20	22
Longueur de la tête	14,5	13,5	15	12	13
Largeur de la tête	9	9	9	8	8
Hauteur de la tête	7	7	7	6,5	7
Membre antérieur	20	18	19	17	19
Membre postérieur	30	28	33	28	28
Pied	14,5	13,5	15	13	13
Queue	97	100	mutilée	88	mutilée

Cette espèce se rapproche surtout d'*Ichnotropis bivittata* BOGAGE et d'*I. capensis* A. SMITH; elle se distingue du premier par la position de la grande sus-oculaire antérieure, séparée de la préfrontale par une ou plusieurs petites sus-oculaires et du deuxième par la dimension de la grande sus-oculaire antérieure, plus longue que la distance qui la sépare de la frénale postérieure.

Fig. 77b. *Ichnotropis overlaeti* in DE WITTE & LAURENT (1942).*Ichnotropis longipes* in DE WITTE & LAURENT (1942)11. - *Ichnotropis longipes* BOULENGER.

Ichnotropis longipes BOULENGER, 1902, Proc. Zool. Soc. London, 1902, 2, p. 17, pl. III, fig. 2.

LISTE DES EXEMPLAIRES.

Collection du Musée du Congo (41 exemplaires).

R. G. 7777-88, 7799-827, Dilolo (Lualaba), 1-15-IX 1931 (G. F. DE WITTE).

LOCALITÉ DÉJÀ CITÉE DU CONGO BELGE.

WITTE (n° 2, 1933, p. 74).

Dilolo (G. F. DE WITTE).

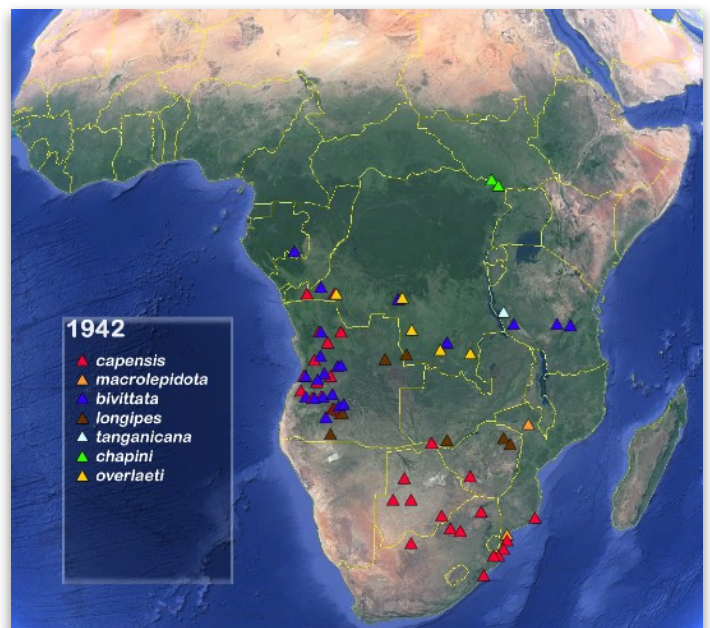
Fig. 79. *Ichnotropis longipes* in DE WITTE & LAURENT (1942).

Fig. 80. All records listed up to 1942 with their original species designation.

***Ichnotropis* in FITZSIMONS (1943)**

The Lizards of South Africa. - Transvaal Museum Memoir, Pretoria, South Africa, Memoir No. 1. 528 pp.

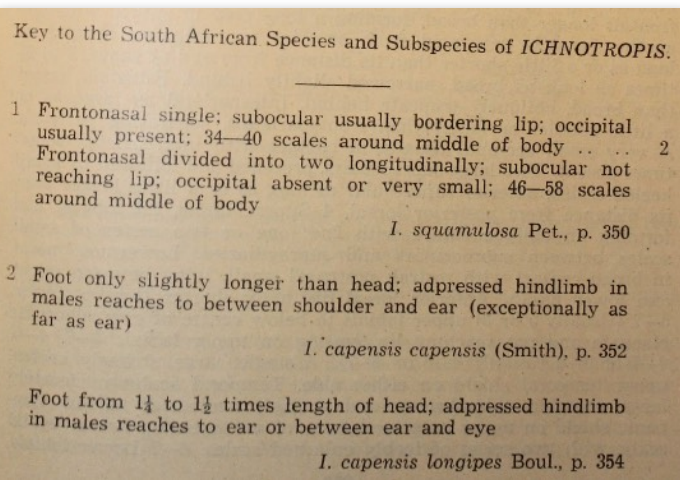


Fig. 81. *Ichnotropis* in FITZSIMONS (1943).

***Ichnotropis capensis capensis* in FITZSIMONS (1943)**

New records for South Africa: Honingsfontein, Driefontein, Pretoria, Premier Mine, Woodbush, Pienaars River, Sordwana Bay and Masieni. New records for Zimbabwe: Plumtree and Matopos.

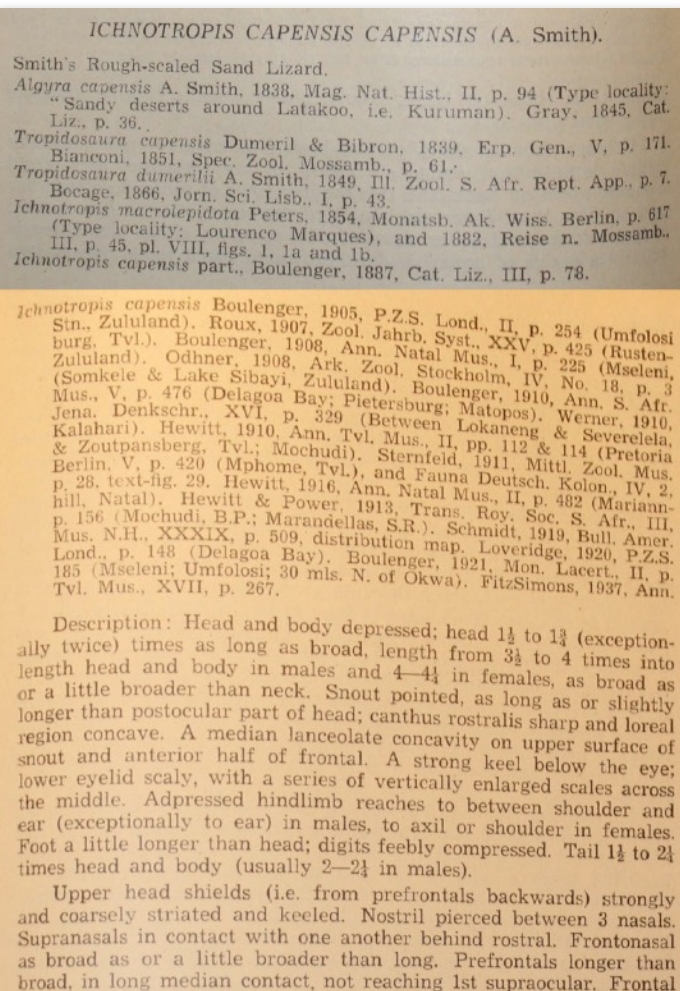


Fig. 82a. *Ichnotropis capensis capensis* in FITZSIMONS (1943).



Fig. 83. Train at Plumtree on Zimbabwe's border with Botswana.

as long as or a little shorter than its distance from end of snout, rounded in front, narrowed posteriorly, $1\frac{3}{4}$ to $2\frac{1}{4}$ times as long as broad. Parietals rounded behind, longer than broad. Interparietal subequal in size to frontoparietals, in contact with or sometimes narrowly separated from the much shorter occipital, whose posterior border is rounded and projects beyond parietals (exceptionally latter projecting further). Two large supraoculars, preceded and followed by a group of small keeled scales; anterior supraocular as long as or a little longer than its distance from posterior loreal, in contact with posterior half of frontal; posterior supraocular sometimes in narrow contact with parietal. 4 (Exceptionally 5) supraciliaries, 1st longest and forming a very oblique suture with 2nd. One or two (usually one) series of small granular scales between supraoculars and supraciliaries. Lowermost nasal in contact with rostral and 1st upper labial; postnasal small, between upper and lower nasals. Anterior loreal as long as or a little shorter than posterior. 4 (Exceptionally 5 or 6) upper labials anterior to subocular, whose lower border on lip is much narrower than upper. A single large elongate upper temporal shield. Temporal scales hexagonal and strongly keeled. A narrow tympanic shield on upper anterior border of ear-opening. 6 Lower labials. 5 Pairs of chin-shields, the three anterior pairs in median contact with one another. Gular scales flat and imbricate, somewhat elongate anteriorly, passing gradually into the ventral plates behind. Dorsal scales rhombic-lanceolate, strongly keeled and acutely pointed or shortly mucronate; lateral scales a little smaller than dorsals, smooth towards the ventral plates, into which they pass gradually. Ventral plates subhexagonal, strongly imbricate, as broad as or a

little broader than long, in 8 or 10 longitudinal and 25-31 transverse rows; 34-40 (usually 36) scales and plates round middle of body. Preanal scales irregular, very small in females. Scales on upper surface of limbs much smaller than those on back, strongly keeled, and on arm are tri- or quinquedecarinate. 9-15 (Usually 9-12) femoral pores on each side. Subdigital lamellae pluricarinate and spinulose, 18-24 (usually 20-22) under 4th toe. Caudal scales strongly keeled above, similar to those on back but slightly larger, in regular transverse whorls.

Colour: Above, olive, olive grey, greyish-brown, yellowish-brown to reddish-brown, uniform or sometimes with small black spots on head and middle of back; a regular or interrupted series of dark spots on either side of back (fusing on base of tail), bordered below by a pale white to greenish-white stripe (sometimes indistinct or absent) from supraciliary edge to base of tail; a dark brown to black band (uniform or bearing pale spots) on each side from nostril through eye (or only from ear) to tail; a well-marked white lateral streak (often dark-edged below) from upper labials to groin or on to base of tail (sometimes extending only to forearm). Below, white with a greenish or pinkish tinge; in breeding males the pale lateral streak is bright yellow on side of head and neck, and on flanks (from axil to groin) is edged below with bright red; lower lip, chin and throat yellow.

Dimensions: Male (T.M. 3386—Vygeboompoort), H. & B. 49.5, tail 101, length head 13.7, breadth head 8.2, forelimb 17, hindlimb 27, foot 14.5 mm. Female (T.M. 13782—Maputa), H. & B. 51.5, tail 90, length head 12.6, breadth head 7.6, forelimb 16, hindlimb 28, foot 13 mm.

Field notes: Found in sandy, grass-, scrub- or bushveld country; very shy and elusive and difficult to detect owing to their dun colouring. Diet consists mainly of diurnal termites, small beetles etc. The eggs, usually 6 in number, are oval and measure on the average 9.5×6.5 mm.

Distribution: From the Kalahari and Transvaal, eastwards into northern Natal, Zululand and Portuguese East Africa, and northwards into Southern Rhodesia. Recorded localities: Honingsfontein; Rankin's Pass; St. Lucia Bay; Matubatuba Flats; Plumtree; Salisbury; Driefontein (A.M.). Marandellas (A.M. & K.M.). Pretoria; Nylstroom (A.M. & T.M.). Premier Mine (K.M.). Mseleni (N.M.). Pietersburg; Delagoa Bay; Matopos (S.A.M.). Woodbush; Vygeboompoort; Pienaars River; Zoutpansberg; Maputa; Sordwana Bay; Mochudi; Masieni (T.M.).

Remarks: Types lost.

Fig. 82b. *Ichnotropis capensis capensis* in FITZSIMONS (1943).

***Ichnotropis capensis longipes* in FITZSIMONS (1943)**

New records for Zimbabwe: Chishawasha, Musami, Filabusi-Shabani, Makwiro, Bulawayo and Bembesi. New records for Namibia: Waterberg, Okahanja and Oshikango.

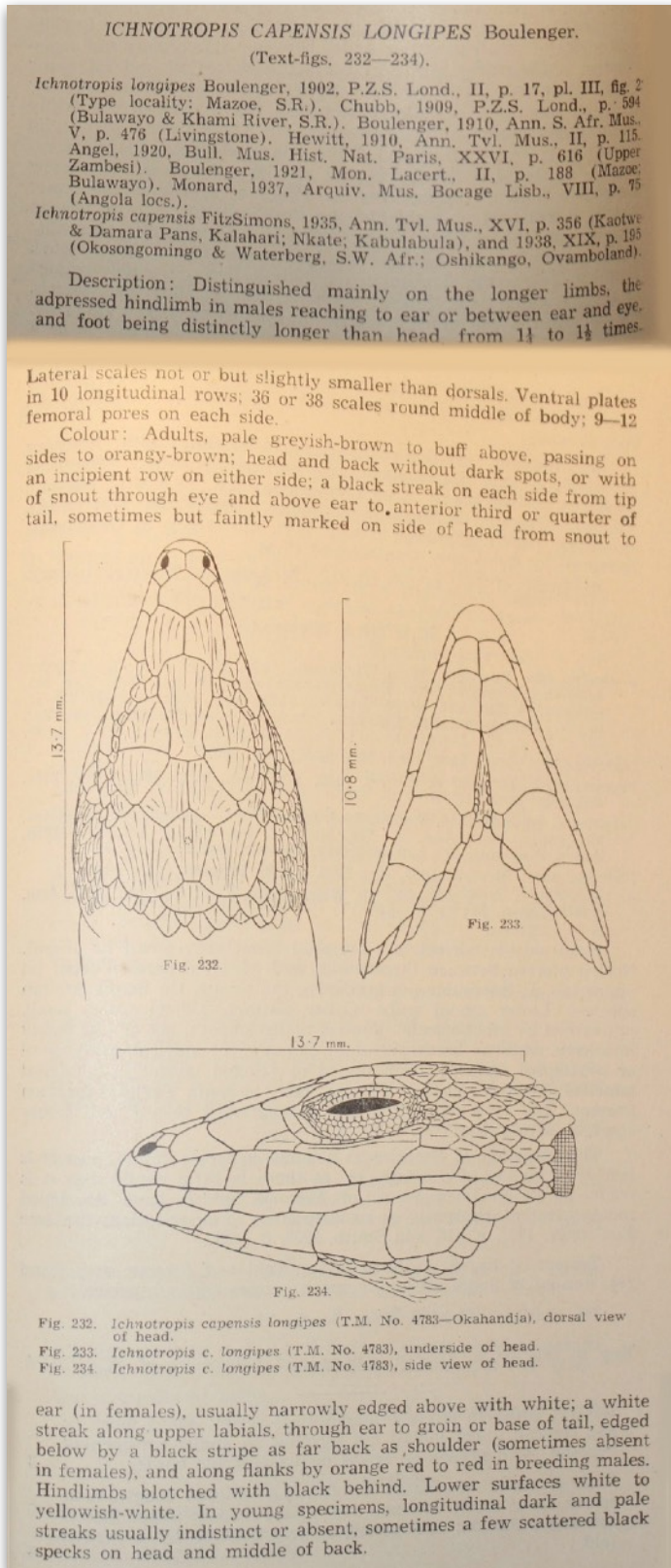


Fig. 84a. *Ichnotropis capensis longipes* in FITZSIMONS (1943).

FITZSIMONS (1943) is the first to use subspecies in order to distinguish between forms. This will become fashionable for a while, and was especially applied by LAURENT (1950 ; 1952 ; 1964).

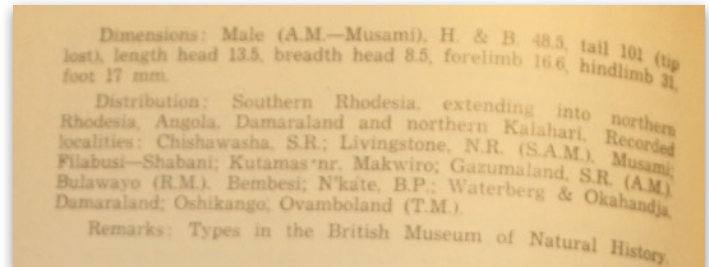


Fig. 84b. *Ichnotropis capensis longipes* in FITZSIMONS (1943).

***Ichnotropis capensis overlaeti* in LAURENT (1950)**

Reptiles et Batraciens de la region de Dundo (Angola du Nord-Est). - Companhia de Diamantes de Angola (Diamang), Serviços Culturais, Museu do Dundo (Angola), 10: 7-17.

New records for Angola: Dundo and Muita.

5. *Ichnotropis capensis overlaeti* Witte & Laurent

1 spécimen, Dundo (18-IX-1946); 3 spécimens, Dundo (14-XII-1947); 1 juv., Dundo (18-XII-1947); 1 spécimen, Muita, Luembe E (VII-1948).
Noms vernaculaires: Kassulu, Tshitombwe Muké.
Chez les mâles vivants, il existe une ligne latérale rouge vif.

Fig. 85. *Ichnotropis overlaeti* in LAURENT (1950).

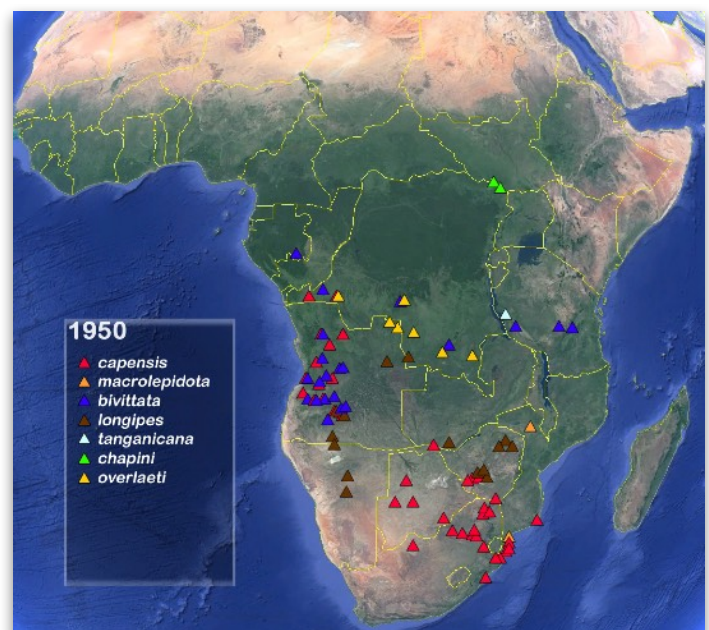


Fig. 86. All records listed up to 1950 with their original (sub)species designation.

***Ichnotropis capensis* in LAURENT (1952)**

Batraciens et reptiles récemment acquis par la Musée du Congo Belge. - Revue de Zoologie et de Botanique Africaines, Bruxelles, 45 (3-4): 198-203.

LAURENT (1952) decided to follow FITZSIMONS (1943) in rearranging everything into several subspecies of *Ichnotropis capensis* (explanation in the discussion section). He was also able to describe another new subspecies for Central Congo: *Ichnotropis capensis nigrescens*.

***Ichnotropis capensis bivittata* in LAURENT (1952)**

New record for Lemfu (Bas-Congo).

3. *Ichnotropis capensis bivittata* BOCAGE: 1 ♂ (R.G.M.C. 14719), environs de Lemfu, Bas-Congo (L. DE BEIR).

Un très bel exemplaire dont le coloris est bien conservé: son trait le plus remarquable est une étroite bande latérale carminée séparant la coloration dorsale de la coloration ventrale. Cette bande se continue sur une partie de la queue, la face antérieure des cuisses et des bras; elle est interrompue sous le tympan, mais réapparaît sous forme d'une tache allongée à la commissure des lèvres.

Fig. 87. *Ichnotropis bivittata* in LAURENT (1952).

***Ichnotropis capensis nigrescens* in LAURENT, 1952**

Records for Bolobo and Luluabourg, the latter previously described as *I. overlaeti* (DE WITTE & LAURENT 1942).

4. *Ichnotropis capensis nigrescens* sbsp. n. 1942

Ichnotropis overlaeti WITTE et LAURENT (part) 1942, Rev. Zool. Bot. Afr., 36, p. 173 (Luluabourg).

Holotype: 1 ♂ (R.G.M.C. 14671) Bolobo (ELOY).

Paratype: 1 ♂ (R.G.M.C. 1869) Luluabourg (CAMBIER).

Diagnose: Forme d'*Ichnotropis* proche de *chapini* et d'*overlaeti* s'en distinguant par sa coloration plus sombre et en particulier par l'existence d'une forte pigmentation ventrale, différenciant d'*overlaeti* par sa fronto-nasale plus large.

Discussion: Les formes décrites jusqu'à présent dans le genre *Ichnotropis* habitent des territoires différents sauf *I. squamulosa* PETERS qui est précisément bien distinct des autres. Ceux-ci paraissent constituer un groupe de formes vicariantes qui représentent vraisemblablement une espèce unique, *I. capensis*.

Les documents qui permettraient d'étudier la variation géographique de cette espèce sont peu abondants, c'est pourquoi il est impossible d'avoir une certitude quelconque quant au statut des formes qu'on peut y inclure actuellement, il se peut qu'il n'y ait pas de véritables races, mais seulement un certain nombre de « clines ». Provisoirement il n'y a d'autre solution que d'admettre une série de races.

- I. capensis capensis* (A. SMITH): Afrique du Sud jusqu'à la Rhodésie du Sud et au Mozambique.
- I. capensis longipes* BOULENGER: Rhodésie, Katanga.
- I. capensis tanganyicana* BOULENGER: Tanganyika Territory.
- I. capensis bivittata* BOCAGE: Angola-Bas Congo.
- I. capensis overlaeti* WITTE et LAURENT: Sud du Congo Belge, sauf le Bas-Congo et l'extrême Sud du Katanga; Nord-est de l'Angola.
- I. capensis nigrescens* sbsp. n.: Congo central.
- I. capensis chapini* SCHMIDT: Ituri.

Au point de vue de la coloration, *I. nigrescens* est la forme la plus sombre connue; elle l'est plus que *chapini* et surtout, elle a le ventre fortement pigmenté alors que chez les deux spécimens que je possède de *chapini*, il est parfaitement dépourvu de mélanophores.

Par les proportions de la plaque fronto-nasale, *nigrescens* se situe entre *overlaeti* et *chapini*. Chez *overlaeti* le rapport de la longueur à la largeur de la fronto-nasale varie de 0,85 à 1,14. Chez *I. c. nigrescens*, il vaut 1,22 chez le Type (Bolobo), 1,18 chez le Paratype (Luluabourg).

Fig. 88a. *Ichnotropis nigrescens* in LAURENT (1952).

Chez *I. c. chapini*, il est égal à 1,11 et 1,43 chez deux spécimens d'Adra.

Il reste à souligner le fait, jusqu'ici passé inaperçu, de l'invalidité du caractère prétendument diagnostique de *chapini* SCHMIDT, à savoir l'existence de deux frénales antérieures superposées. Chez les deux exemplaires d'Adra déjà cités en 1933 par G. F. DE WITTE, la frénale antérieure est simple. Le synopsis des Lacertides congolais (DE WITTE et LAURENT 1942, Rev. Zool. Bot. Afr., 36, p. 177) est donc inadéquat en ce qui concerne le genre *Ichnotropis*. Les intergradations connues rendent d'ores et déjà la construction difficile. Il en existe quant à la pigmentation ventrale entre *nigrescens* d'une part, *overlaeti* et *bivittata* de l'autre. Il existe certainement un gradient de fréquence pour le contact de la préfrontale et de la sous-oculaire antérieure entre *bivittata* d'une part, *overlaeti* et *longipes* de l'autre. Dès lors, la localisation géographique, comme dans bien d'autres cas difficiles, nous fournit l'indication la plus sûre, plus les proportions de la fronto-nasale pour *chapini*, la pigmentation ventrale pour *nigrescens*, les connexions de la préfrontale et la brièveté des membres postérieurs pour *bivittata*, l'effacement relatif des stries des plaques céphaliques et la longueur des membres postérieurs chez *longipes*, *overlaeti* se trouvant dans une position intermédiaire vis-à-vis de toutes ces formes, tant du point de vue morphologique que du point de vue géographique.

Fig. 88b. *Ichnotropis nigrescens* in LAURENT (1952).

***Ichnotropis* in DE WITTE (1953)**

Ordre III - Squamata - In: Exploration of Upemba National Park: Mission by G. F. De Witte (1946-1949). - Institut des Parcs Nationaux du Congo Belge, 1951-1976, 6. 322 pp.

DE WITTE (1953) did not follow the subspecies arrangement of LAURENT (1952). He did offer an extensive and detailed list of new samples of *Ichnotropis bivittata* and *Ichnotropis longipes* from the Parc National De l'Upemba.

***Ichnotropis bivittata* in DE WITTE (1953)**

18 records from the Parc National De l'Upemba. For details see the original article.

44. — *Ichnotropis bivittata* BOCAGE.

(Pl. II, fig. 1.)

Ichnotropis bivittata BOCAGE, 1866, JOURN. Sc. Lisb., 1, p. 43; BOULENGER, 1921, Mon. Lacertidæ, 2, p. 182; WITTE et LAURENT, 1942, Rev. Zool. Bot. Afr., 36, p. 173.

Ichnotropis capensis BOULENGER (part.), 1887, Cat. Léz. Brit. Mus., 3, p. 78.

LOCALITES DEJA CITEES DU KATANGA.

WITTE [n° 5, 1933, p. 74].

Kansenia (G. F. DE WITTE).

WITTE et LAURENT [n° 2, 1942, p. 173].

Kansenia (G. F. DE WITTE).

Remarques. — Cette espèce était déjà connue du plateau du Bianco; elle semble être assez commune sur le plateau des Kibara, ainsi qu'en bordure de ce plateau.

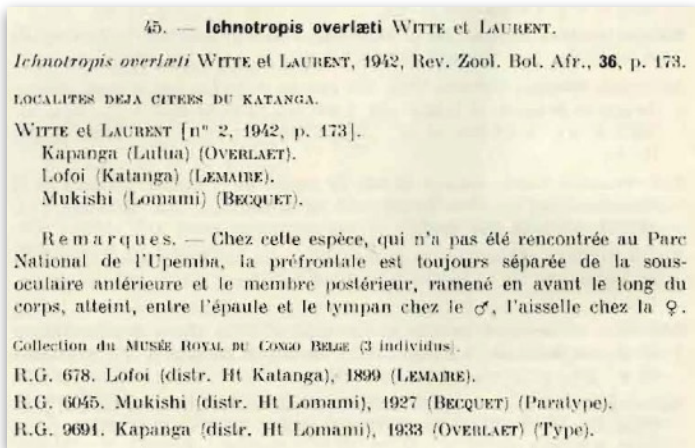
Variations. — ♂. Écailles et plaques autour du milieu du corps: 31-41; séries transversales de plaques ventrales: 21-24; écailles gulaires, en série médiane droite: 20-25; labiales supérieures, antérieures à la sous-oculaire: 4-4, 4-5; pores fémoraux: 10-11, 11-11, 12-12, 12-13, 13-13, 13-14, 14-14; lamelles sous le 4^e orteil: 18-23; ramené en avant, le long du corps, le membre postérieur atteint l'aisselle ou l'épaule.

♀. Écailles et plaques autour du milieu du corps: 31-39; séries transversales de plaques ventrales: 23-25; écailles gulaires, en série médiane droite: 18-23; labiales supérieures, antérieures à la sous-oculaire: 4-4, 4-5; pores fémoraux: 9-9, 10-10, 10-11, 10-12, 11-11, 11-12, 11-13, 12-12; lamelles sous le 4^e orteil: 18-21; ramené en avant, le long du corps, le membre postérieur atteint l'aisselle ou le coude.

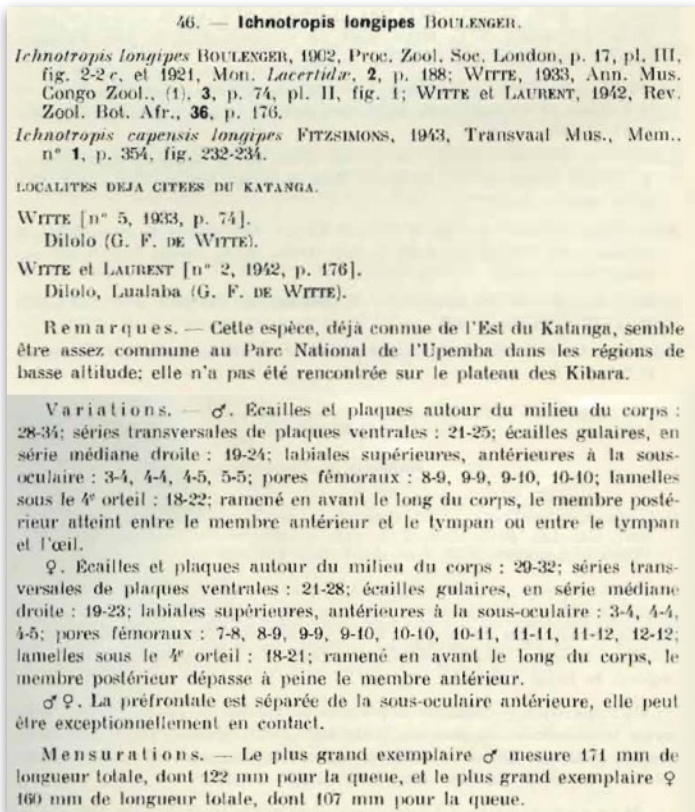
La préfrontale est généralement en contact avec la sous-oculaire antérieure, mais chez certains individus elle en est séparée par 2 petites plaques.

Mensurations. — Le plus grand exemplaire ♂ mesure 161 mm de longueur totale, dont 111 mm pour la queue, et le plus grand exemplaire ♀ 138 mm de longueur totale, dont 84 mm pour la queue.

Fig. 89. *Ichnotropis bivittata* in DE WITTE (1953).

Ichnotropis overlaeti* in DE WITTE (1953)**Fig. 90. *Ichnotropis overlaeti* in DE WITTE (1953).Ichnotropis longipes* in DE WITTE (1953)**

2 records (but a lot of specimens) from the Parc National De l'Umpemba. For details see the original article. One new record outside the park: M'Pala (Kanzenze).

Fig. 91. *Ichnotropis longipes* in DE WITTE (1953).***Ichnotropis capensis* in LOVERIDGE (1953)**

Zoological results of a fifth expedition to East Africa III: Reptiles from Nyasaland and Tete. - Bulletin of the Museum of Comparative Zoology, Harvard, 110: 143-487.

LOVERIDGE (1953) sets *I. macrolepidota*, *I. longipes* and *I. overlaeti* into the synonymy of *I. capensis*.

New records for Dilolo (Democratic Republic of the Congo), Waterberg plateau (Namibia), Chishawasha (Zimbabwe), Waterberg district (South Africa) and Kasungu (Malawi).

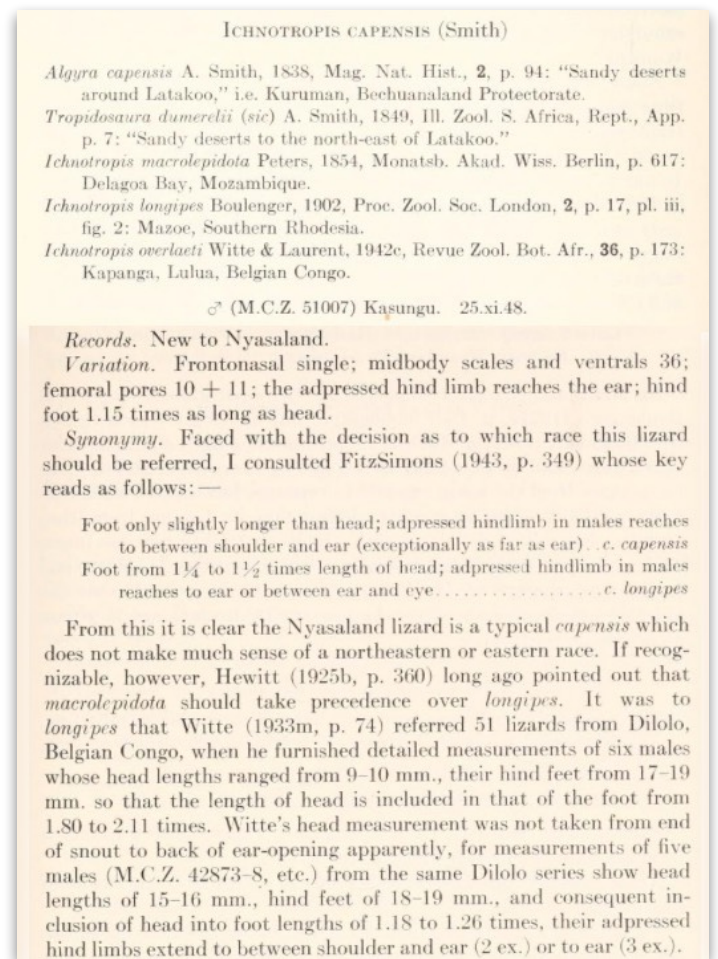
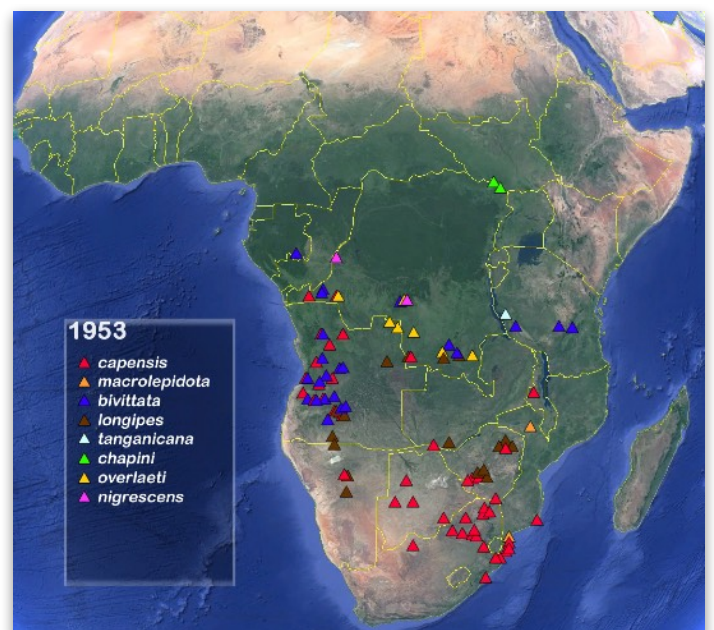
Fig. 92a. *Ichnotropis capensis* in LOVERIDGE (1953).

Fig. 93. All records listed up to 1953 with their original (sub)species designation.

Examination and scale counts of all our material suggests that the head/foot ratio of males provides no basis for separation of a zoogeographical race, the conclusion being that the adpressed hind limb of males normally reaches the ear but may sometimes fall short or extend beyond. I am assured by Mr. C. J. Battersby that it extends beyond in all three cotypes of *longipes* whose head to ear measurements are 12.5, 12 and 12 mm., the corresponding hind foot to heel measurements being 15, 15 and 16 mm. A summary of the material in the Museum of Comparative Zoology furnishes the following results:—

Adpressed hind limb reaches to between shoulder and ear, or to ear.

5 males from Dilolo, Belgian Congo	2	3
1 " Waterberg Plateau, S.W. Africa	1	0
1 " Chishawasha, S. Rhodesia	0	1
3 " Waterberg District, Transvaal	3	0
3 males Lourenço Marques, Mozambique	1	2
1 " Kasungu, Nyasaland Protectorate	0	1

An additional character employed for the separation of *longipes* in Boulenger's (1921a, p. 180) monograph, but omitted for good reason by FitzSimons (1943, p. 349) in his key, is the length of the anterior supraocular, said by Boulenger to be "as long as or a little shorter than its distance from the second loreal" in *capensis*, but which FitzSimons finds (p. 353) "as long as or a little longer than its distance from (the) posterior loreal." A definition with which our twenty-two specimens conform. Apparently it was Boulenger's statement that led Witte and Laurent to separate *overlaeti* from *capensis* on the grounds that the anterior supraocular was "plus longue que la distance qui la sépare de la frénale postérieure."

Fig. 92b. *Ichnotropis capensis* in LOVERIDGE (1953).

Ichnotropis capensis in MERTENS (1955)

Die Amphibien und Reptilien Südwestafrikas. Aus den Ergebnissen einer im Jahre 1952 ausgeführten Reise. - Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft (Frankfurt), 490. 172 pp.

New records for Namibia: Waterberg plateau, Mupapama, Sambiu, Okahandja, Ogosongomingo and Oshikango.

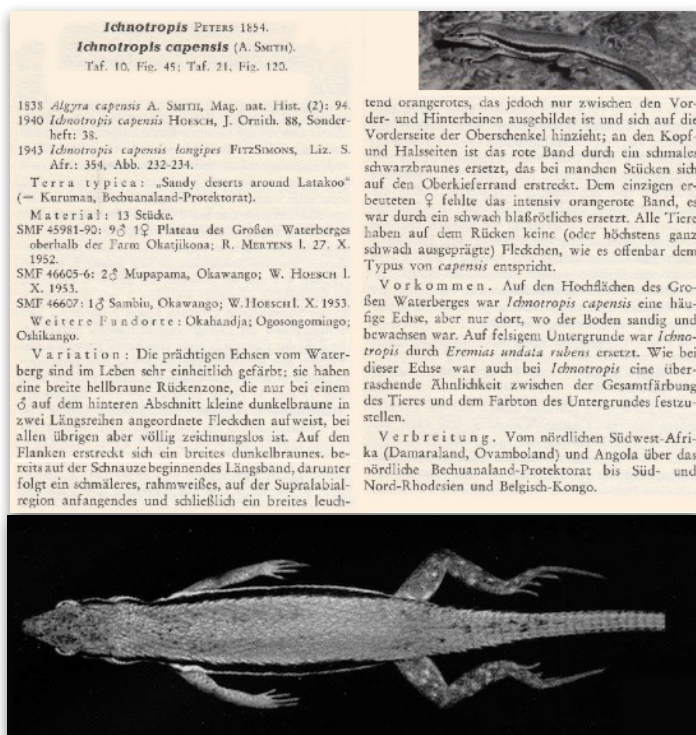


Fig. 94. *Ichnotropis capensis* in MERTENS (1955).

Ichnotropis microlepidota MARX, 1956

A new lacertid lizard from Angola. - Fieldiana: Zoology, 39 (2): 5-9.

Just after *I. macrolepidota*, *I. longipes* and *I. overlaeti* were canceled (LOVERIDGE 1953), we are treated with yet another new species: *Ichnotropis microlepidota* MARX, 1956, from the foot of Mount Moco (Angola).

Although MARX (1956) was aware of the specimen from the same location described by PARKER (1936), and the similarities of that specimen with the newly described species of *Ichnotropis microlepidota*, he left this without consequences (MARX 1956).

A NEW LACERTID LIZARD FROM ANGOLA

HYMEN MARX
 ASSISTANT, DIVISION OF REPTILES AND AMPHIBIANS

The Conover Angola Expedition, 1954, under the direction of Mr. Gerd Heinrich and sponsored by Chicago Natural History Museum, collected a series of lacertid lizards that are described below. The specimens were found in the crop of a goshawk collected at Mount Moco, in central Angola.

The drawing is the work of John Piffner, Staff Illustrator.

Ichnotropis microlepidota, new species. Figure 1.

Ichnotropis bivittata Parker (non Bocage), 1936, Nov. Zool., 40: 135.

Type.—Chicago Natural History Museum no. 74285, from the foot of Mount Moco, Benguela Province, Angola. A male collected by Gerd Heinrich, September 19, 1954.

Diagnosis.—An *Ichnotropis* with a single frontonasal, a single anterior loreal, prefrontals in contact with the second supraocular, a small series of scales separating the second and third supraoculars from the supraciliaries, unusually small dorsal scales, and a high number of scales around the middle of the body.

Description of type.—Upper head shields strongly striated and keeled; nostril between three shields; nasals forming a suture behind rostral equaling diameter of nostril; frontonasal one-third broader than long; prefrontals much longer than broad, forming an extensive median suture, in contact with the frontonasals, two loreals, first and second supraoculars, and frontal; frontal one-half as wide as long anteriorly, and two-fifths as wide as long where it is narrowest; frontoparietals longer than their broadest width (posteriorly); parietals longer than broad, separated from each other by a large interparietal and occipital, bordered laterally by an elongate shield; four supraoculars, the first very small, about three-fourths length of fourth and one-third width of fourth, the second and third supraoculars very large, the second much the largest and about the same size as a frontoparietal; second and third supraoculars separated from the supraciliaries by a single series of elongated, keeled scales; five supraciliaries, the anterior two much the longest.

Lower nasal broadly in contact with rostral, first upper labial, and anterior loreal; postnasal small, in contact with the other two nasals, anterior loreal, and frontonasal; anterior loreal much smaller

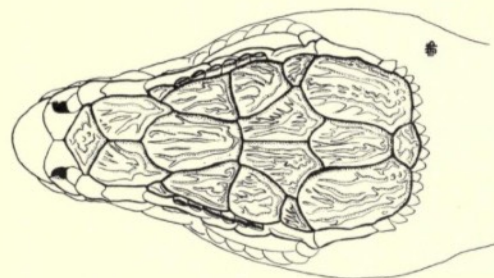


FIG. 1. Type specimen of *Ichnotropis microlepidota* sp. nov.; × 6.

Fig. 95a. *Ichnotropis microlepidota* in MARX (1956).



Fig. 96. HYMEN MARX (1925-2007).

than posterior loreal; four upper labials anterior to subocular; one subocular narrower beneath than above and bordering the mouth, separated from the posterior loreal by a freno-ocular; an enlarged temporal scale in contact with a subocular and the fifth upper labial and separated from the parietals by four temporal scales; tympanum distinct, with an enlarged anterior shield; lower eyelid with a series of vertically enlarged scales in the middle.

Five pairs of chinshields, the plates of the first three pairs in contact medially; gular scales imbricate.

Dorsal scales strongly keeled and imbricate, distinctly shorter than rounded ventral plates; 49 scales around middle of body; ventral plates in 10 longitudinal and 28 transverse series; preanal region covered with irregular scales; scales on dorsal side of forelimbs enlarged and imbricate; subdigital lamellae quinquecarinate, 17 under fourth toe; femoral-preanal pores 11-10.

Caudal scales strongly keeled except smooth in the anterior ventral region; 27 scales in the fourth whorl behind the postanal granules.

Body length 52 mm., regenerated tail 37 mm.

Color (in alcohol): head dark brown above; frontal and first supraocular light gray with dark fine spots; a light stripe running below eye from snout through tympanum to neck, breaking up into light spots on sides of body; lip with black blotches; under surface of head light gray with some black mottling; back with irregular longitudinal black bands, the light gray spots along the center of these bands forming irregular ocelli; ventral plates light gray with numerous tiny black spots except along posterior edges; dorsal surface of tail similar to back but lighter; under surface of tail uniformly light tan.

Paratypes.—CNHM nos. 74283-84, 74286-87, collected with the type. Tails of three of the paratypes are incomplete; that of specimen no. 74284 measured 56 mm., which is 0.52 of total length. For variation of these specimens see Table 1.

Remarks.—This form and *Ichnotropis bivittata* Bocage differ from the other known forms of this genus in having the following combination of characters: (1) a single frontonasal, (2) a single anterior loreal, (3) prefrontals in contact with second (largest) supraoculars, and (4) the two largest supraoculars (second and third) separated from the supraciliaries by a series of small scales.

I. microlepidota can be distinguished from *bivittata* by the much smaller dorsal scales and their greater number at mid-body, and the lower number of lamellae under the fourth toe (Table 2). Parker (1936, p. 135) noted that his specimen from Mount Moco, which he tentatively identified as *bivittata*, had unusually small dorsal scales (45-56 rows at mid-body) and might represent a racial differentiation of *I. bivittata*. I have examined four specimens of *I. bivittata* from Angola. The differences between these populations merit specific rank because the two forms occur together. This is especially clear, for CNHM no. 74288, collected at the foot of Mount Moco, is a typical *I. bivittata*. The other three *bivittata* are from Chitau, Bie Province, Angola. In Table 2 data from Boulenger (1921, p. 185) are also included.

Fig. 95b. *Ichnotropis microlepidota* in MARX (1956).

TABLE 1.—Comparison of *Ichnotropis microlepidota* and *I. bivittata*

Specimen number	Sex	Labials anterior to subocular	Pairs of chinshields ¹	Longitudinal rows of ventral plates	Transverse rows of ventral plates	Scales around mid-body	Femoral pores	Subdigital lamellae under 4th toe	Body length mm.
<i>I. microlepidota</i>									
CNHM 74283.....	♀	4	5 (3)	8	29	48	11-10	17	50
74284.....	♀	4	5 (3)	8	30	49	13-12	16	51
74285.....	♂	4	5 (3)	10	28	48	11-10	17	52
74286.....	♂	4	5 (3)	8	27	43	11-11	17	52
74287.....	♂	4	5 (3)	10	28	50	12-13	16	49
<i>I. bivittata</i>									
74288.....	♀	4-3	5 (3)	10	29	32	9-10	20	71
18507 (8856)...	♀	4	5 (3)	10	29	38	12-12	19	65
18507 (8856)...	♀	4	5 (3)	10	28	36	11-11	19	66
18507 (8851)...	♂	4-5	4 (3)	10	27	39	13-14	21	72

¹The number in parentheses is the number of those in contact.

TABLE 2.—Variation in Scale Characters of *I. microlepidota* and *I. bivittata*

Species	Sex	Number of specimens	Lamellae under 4th toe ¹	Scales at mid-body ¹	
<i>I. microlepidota</i>	♂	3	16-17 (16.6)	43-50 (47.0)	
	♀	2	16-17 (16.5)	48-49 (48.5)	
<i>I. bivittata</i>	CNHM specimens	♂	1	21	39
		♀	3	19-20 (19.6)	32-36 (35.3)
	Boulenger (1921)	♂	13	18-24 (19.9)	34-39 (36.0)
		♀	8	18-22 (20.0)	36-40 (38.1)

¹ Mean in parentheses.

Predation.—The type series (nos. 74283-87) was removed from the crop of a male chanting goshawk, *Melierax metabates* Heuglin (CNHM no. 224087). The hawk, with its lizard food, is figured on page 64 of the Annual Report of this Museum for the year 1955.

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1921. Monograph of the Lacertidae, 2: vii+451. London: printed by order of the Trustees.

PARKER, H. W.
1936. Dr. Jordan's expedition to South-West Africa and Angola: Herpetological collections. Nov. Zool., 40: 115-146.

Fig. 95c. *Ichnotropis microlepidota* in MARX (1956).

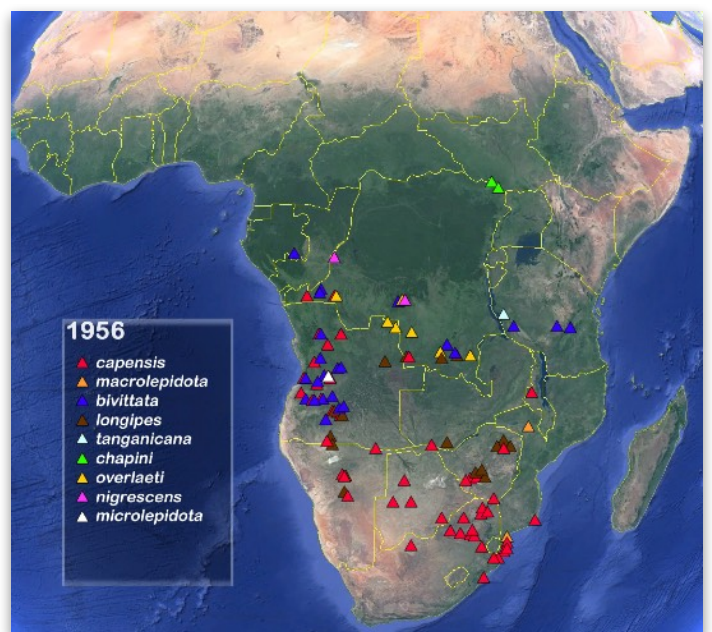


Fig. 97. All records listed up to 1956 with their original (sub)species designation.

***Ichnotropis capensis bivittatus* in HELLMICH (1957a)**

Herpetologische Ergebnisse einer Forschungsreise in Angola. - Veröffentlichungen der Zoologischen Staatssammlung München, 5: 1-92.

Ichnotropis capensis bivittatus Bocage

34 Ex. Bela-Vista

Fig. 98. *Ichnotropis bivittatus* in HELLMICH (1957a).

***Ichnotropis capensis bivittata* in HELLMICH (1957b)**

Die Reptilien Ausbeute der Hamburgischen Angola Expedition. - Mitteilungen aus dem Hamburger Zoologischen Museum und Institut, 55: 39-80.

The same records for Bela-Vista (Angola).

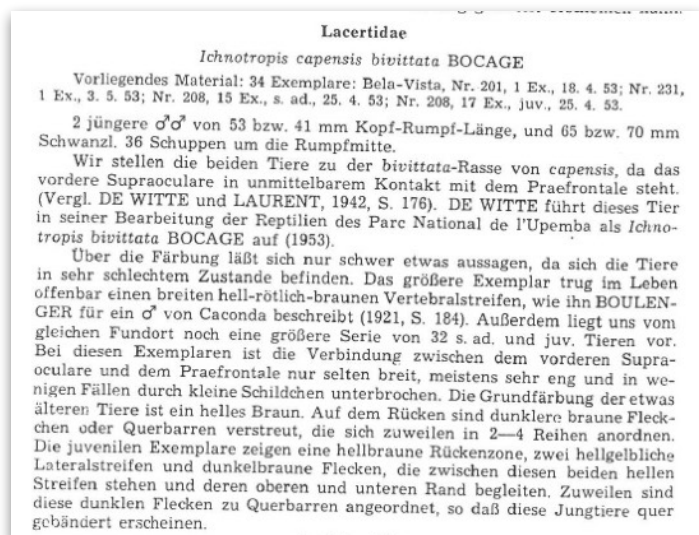


Fig. 99. *Ichnotropis bivittatus* in HELLMICH (1957b).

***Ichnotropis* in LOVERIDGE (1957)**

Checklist of the reptiles and amphibians of East Africa (Uganda; Kenya; Tanganyika; Zanzibar). - Bulletin of the Museum of Comparative Zoology at Harvard College. 117(2): 151-362.

Just a checklist of the reptiles and amphibians of East Africa (Uganda; Kenya; Tanganyika; Zanzibar). LOVERIDGE (1957) is now listing *I. bivittata* as subspecies of *I. capensis*.

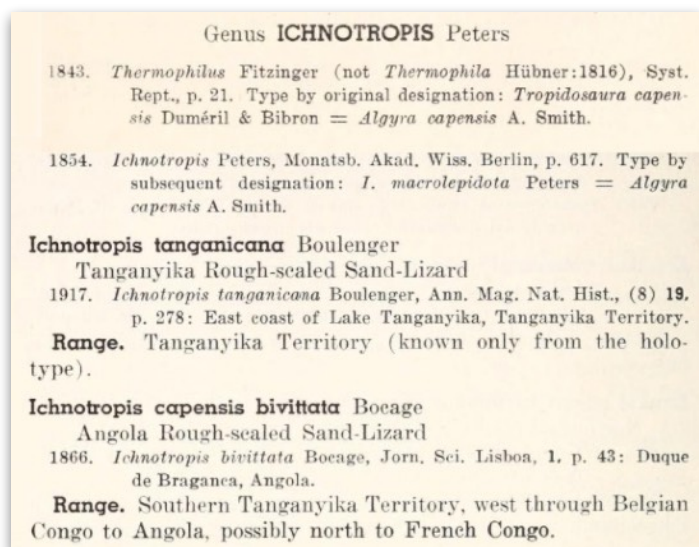


Fig. 100. *Ichnotropis* in LOVERIDGE (1957).

***Ichnotropis microlepidota* in MARX (1958)**

Catalogue of type specimens of reptiles and amphibians in Chicago Natural History Museum. - Fieldiana: Zoology, 36 (4): 407-496.

Ichnotropis microlepidota Marx

1956, Fieldiana, Zool., 39: 5, fig. 1.

Type: 74285, Angola, Benguela Province, foot of Mount Moco.

Paratypes: 74283-84, 74286-87, same locality as type.

Fig. 101. *Ichnotropis microlepidota* in MARX (1958).

***Ichnotropis* in BROADLEY (1962)**

NOT AVAILABLE

On some reptile collections from the North-Western and North-Eastern Districts of Southern Rhodesia 1958-1961, with descriptions of four new lizards. - Occasional Papers of the Natural History Museum of South Rhodesia 26 (B): 787-843.

***Ichnotropis capensis bivittata* in MANAÇAS (1963)**

Sáurios de Angola. - Memórias da Junta de Investigações do Ultramar, 43 (2a Série): 225-240.

New records for Angola: Cameia, Fazenda Santa Cruz and Calombe.

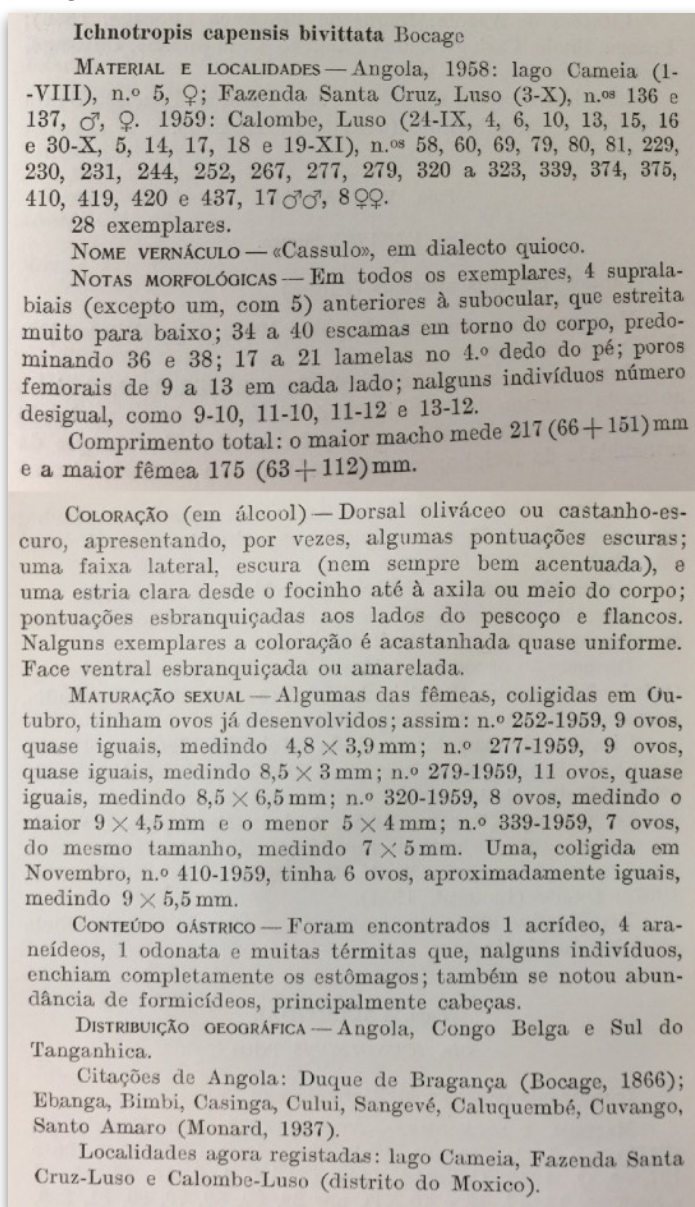


Fig. 102. *I. capensis bivittata* in MANAÇAS (1963).



Fig. 103. Rukwa Valley in southern Tanzania.

Ichnotropis capensis bivittata in ROBERTSON et al. (1963)
Notes on some reptiles collected in the Rukwa Valley, S. W. Tanganyika. - *Annals and Magazine of Natural History, Series 13*, 5 (55): 421-432.

New records from the area around Kafukola (Tanzania).

Ichnotropis capensis bivittata (Bocage).

Seven specimens were taken within the woodland habitats, two males, two females and three juveniles.

The female taken in July had ova in the ovaries 2 mm. in diameter and shelled eggs in the oviducts measuring 13.5 mm × 6.5 mm., one only in each oviduct. The one taken in August had ova in the ovaries 5.5 mm. in diameter and containing yolk.

Two males were examined and the average testis length, expressed as a percentage of the total length, was 2.8 in May and 3.7 in June.

The stomach contents of five specimens were examined, one was empty and the others contained Acrididae (3), Mantidae (1), Isoptera (1) and Araneae (1).

Fig. 104. *Ichnotropis capensis bivittata* in ROBERTSON et al. (1963).

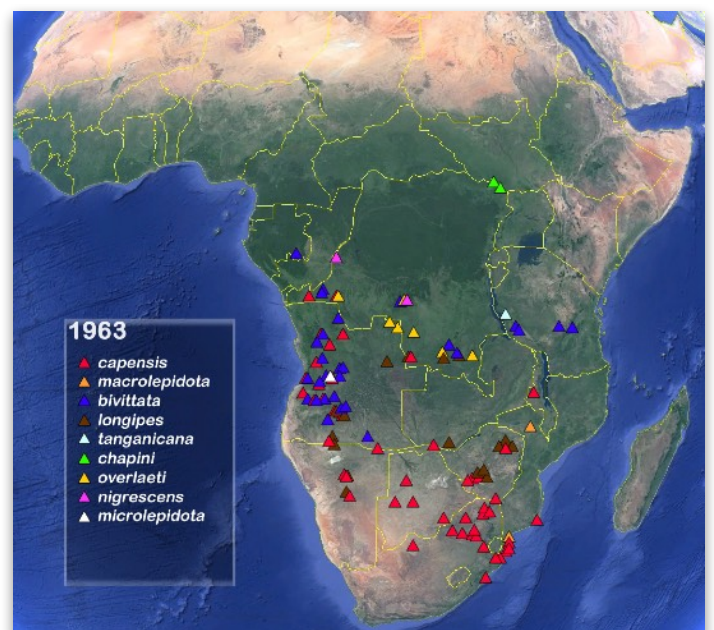


Fig. 105. All records listed up to 1963 with their original (sub)species designation.

***Ichnotropis* in LAURENT (1964)**

Reptiles et batraciens de l'Angola (troisième note). - Companhia de Diamantes de Angola (Diamang), Serviços Culturais, Museu do Dundo (Angola), 67: 61-65.

LAURENT (1964) becomes aware of conflicting sympatric subspecies, so the obvious solution is easy; everything becomes subspecies of *I. capensis*, except for *I. bivittata*.

Genre *Ichnotropis* Peters

La systématique du genre *Ichnotropis* est encore très mal établie. Naguère (LAURENT 1952) je m'étais résolu à grouper toutes les formes connues sauf *squamulosa* PETERS dans une seule unité spécifique (*I. capensis*) comprenant 7 races: *capensis* (A. SMITH), *longipes* BOULENGER, *tanganicana* BOULENGER, *bivittata* BOCAGE, *overlaeti* WITTE & LAURENT, *nigrescens* LAURENT et *chapini* SCHMIDT. Cependant, d'après DE WITTE (1953), *longipes* et *bivittata* sont sympatrics dans la région du Parc National de l'Upemba. De même dans la collection étudiée ici se trouve une série d'*Ichnotropis* d'Alto Cuilo comprenant deux formes distinctes: *bivittata* et *overlaeti*. Dès lors la position que j'avais adoptée en 1952, ne me paraît plus défendable: en dehors de *squamulosa* et de *microlepidota* MARX, il existe au moins deux espèces d'*Ichnotropis*. Comment faut-il distribuer les formes reconnues entre ces deux espèces? Ce problème exigerait non seulement de nouvelles investigations sur l'ensemble du matériel connu, mais le recours à des collections nouvelles.

Provisoirement, il semble qu'on puisse rattacher toutes les formes citées plus haut à *capensis*, sauf *bivittata* dont il est bien prouvé qu'il est sympatrique avec *longipes* d'une part et *overlaeti* de l'autre.

Fig. 106. *Ichnotropis* in LAURENT (1964).

***Ichnotropis bivittata bivittata* in LAURENT (1964)**

New records:
- Alto Cuilo (Angola).

***Ichnotropis bivittata bivittata* Bocage**

5 ♂, 2 ♀, 3 juv. (5311), Alto Cuilo, Lunda, VI-1954 (I).

Nom indigène. «Kassulu».

Variation. Occipitale différenciée. Interpariétale à côtés parallèles ou très faiblement convergents vers l'arrière, à bord postérieur situé dans le prolongement de celui des pariétales. Préfrontale en contact avec la 2e sus-oculaire ou très étroitement séparée de celle-ci chez un seul mâle. Labiales supérieures devant la sous-oculaire: 4 (5 chez un mâle). Gulaires sur la ligne médiane: 18 à 27 chez les mâles, 20-21 chez les femelles, 24 à 26 chez les juvéniles. Ecaillies autour du milieu du corps (dorsales+ventrales): 32, 34, 35, 37, 40 chez les mâles, 36 et 39 chez les femelles, 31-32 chez les jeunes. Rangées longitudinales de ventrales: 8 à 11 chez les mâles (8, 9, 9, 10, 11), 10 chez les femelles, 8 chez les jeunes. Ventrales entre les membres antérieurs et postérieurs: 26, 27, 27, 28 chez 4 mâles, 26-27 chez les femelles, 26-27 chez les jeunes.

Lamelles sous le 4e orteil: 21, 22, 22, 23 chez 4 mâles, 20 et 23 chez les femelles, 18 et 20 chez les jeunes. Pores fémoraux: 9 à 11 chez les mâles (9 sur 1 côté, 10 sur 6 côtés, 11 sur 3 côtés), 9 à 12 chez les femelles (9 sur 2 côtés, 11 sur 1 côté, 12 sur 1 côté), 10 chez les jeunes. Stries sur la frontale: 2 ou 3 carènes très fortes sans autre ornementation ou bien avec 1 à 3 stries ou carènes supplémentaires mais beaucoup moins saillantes.

Longueur de la tête en % de celle du pied: 83,3 à 89,3 chez les cinq mâles (m = 85,9); 82,7 et 84,3 chez les femelles, 84,3 et 88,2 chez les jeunes. Longueur de la fronto-nasale en % de sa largeur: 86,2 à 105,8 chez les mâles (m = 97,18); 99,4 et 107,3 chez les femelles, 98,5 à 107,6 chez les jeunes.

La longueur relative de la queue atteint au maximum 65,3% de longueur totale chez les mâles, 61,1% chez les femelles.

Taille. Le plus grand mâle mesure 153 mm (queue: 100 mm); un autre serait plus grand si sa queue était complète (tronc+tête = 53,6 mm). La plus grande des deux femelles mesure 137 mm (queue: 84 mm).

Discussion. Il est intéressant de souligner les différences corrélatives existant entre cette petite série et *I. capensis overlaeti* sympatrique de *bivittata* à Alto Cuilo.

	<i>bivittata</i>	<i>overlaeti</i>
Préfrontale.....	en contact avec la 2e sus-oculaire	non en contact avec la 2e sus-oculaire
Ornementation des plaques céphaliques	fortes carènes peu nombreuses (2 à 3 sur la frontale + au maximum 3 stries supplémentaires)	stries fines et nombreuses (5 à 14 sur la frontale)
Interpariétale	à bords parallèles ou peu convergents vers l'arrière	à bords en général fortement convergents vers l'arrière
Ecaillies autour du milieu du corps	31-40	34-43
Longueur de la tête en % de celle du pied	82,7-89,3	66,3-85,8
Coloration générale	plus sombre	plus claire

En outre, si l'on compte les écaillies dorsales différenciées entre les membres antérieurs (elles sont séparées de leur insertion par une zone couverte de minuscules écaillies granuleuses non comprises dans le compte), on observe une différence supplémentaire entre les deux séries sympatrics d'Alto Cuilo: 10 à 12 chez *bivittata*, 12 à 15 (12 dans un seul cas) chez *overlaeti*. Le spécimen noirâtre attribué à *I. capensis* sbsp. en a 14.

Fig. 107. *Ichnotropis bivittata bivittata* in LAURENT (1964).

***Ichnotropis capensis overlaeti* in LAURENT (1964)**

Remarks are made on the resemblance of *chapini*, *overlaeti* and *nigrescens*.

New records:
- Alto Cuilo (Angola).
- Caluango (Democratic Republic of the Congo).

***Ichnotropis capensis overlaeti* Witte & Laurent**

(Fig. 18)

2 ♀ (5067-68), Dundo, Lunda, 6-VII-1953 (I).
1 ♂, 2 ♀ (5069-71), id., 7-VII-1953 (I).
1 ♂, 7 ♀ (5077-84), id., 9-VII-1953 (I).
3 ♂, 6 ♀ (5086, 5091, 5093, 5095-98, 5100-01), id., 10-VIII-1953 (I).
5 ♂, 8 ♀ (5105-17), id., 13-VII-1953 (I).
4 ♂, 2 ♀ (5121-26), id., 14-VII-1953 (I).
17 ♂, 10 ♀ (5131-32, 5134), id., 15-VII-1953 (I).
4 ♂, 2 ♀ (5143, 5146, 5148), id., 16-VII-1953 (I).
3 ♂, 2 ♀ (5151-52), id., 17-VII-1953 (I).
3 ♂, 2 ♀ (5153, 5156), id., 20-VII-1953 (I).
8 ♂, 4 ♀ (5158), id., 21-VII-1953 (I).
7 ♂, 9 ♀ (5162, 5165), id., 22-VII-1953 (I).
6 ♂, 8 ♀ (5166), id., VII-1953 (I).
1 ♂, 3 ♀ (5202), id., 26-VIII-1953 (I).
2 ♂, 1 ♀ (5210), id., 21-VIII-1953 (I).
5 ♂, 2 ♀ 1 juv. (5311), Alto Cuilo, Lunda, VI-1954 (I). 10035/1931E
1 ♂ (16279), Caluango; R. Caquele, affluent Luangué (8°20' S, 19°53' E), forêt ouverte, 6-IX-1961 (M).

Noms indigènes. «Kassulu» (Alto Cuilo). «Kassulu-mukehe» ou «Kassule-mukepe» (Dundo).

Variation. L'occipitale est généralement différenciée et distincte. Interpariétale à côtés convergents vers l'arrière, à bord postérieur en général antérieur à celui des pariétales. La préfrontale est quasi toujours séparée de la 2e sus-oculaire (exceptions asymétriques 5%, exceptions symétriques 4%). Labiales supérieures devant la sus-oculaire: 3 à 5 (4 dans 85,5% des côtés; 3 dans 4,5%, 5 dans 10%), 5 paires de sublinguales dont 3 en contact (exceptionnellement 6 d'un côté, et 4 paires de sublinguales en contact). Gulaires sur la ligne médiane: 19 à 26 chez les deux sexes (m = 22,74 pour 47 mâles, m = 22,89 pour 44 femelles). Ecaillies autour du milieu du corps (dorsales+ventrales): 34-43 chez 55 mâles (m = 38,64), 35-43 pour 52 femelles (m = 38,63). Rangées longitudinales de ventrales: 7 à 10 chez les mâles (7 chez 8 spécimens; 8 chez 33; 9 chez 9; 10 chez 6), 7 à 9 chez les femelles (7 chez 6 spécimens; 8 chez 41; 9 chez 6). Nombre de ventrales entre les membres postérieurs et antérieurs: 24 à 32 chez 56 mâles (m = 27,50), 25 à 34 chez 50 femelles (m = 29,02). Lamelles sous le 4e orteil: 18 à 24 chez 55 mâles (m = 21,90), 19 à 26 chez 52 femelles (m = 21,50). Pores fémoraux: 9 à 13 chez 55 mâles (9 sur 11 côtés, 10 sur 45 côtés, 11 sur 43 côtés, 12 sur 9 côtés, 13 sur 2 côtés, m = 10,51), 8 à 12 chez 52 femelles (8 sur 4 côtés, 9 sur 16 côtés, 10 sur 50 côtés, 11 sur 24 côtés, 12 sur 10 côtés, m = 10,19). Stries sur la frontale: 7 à 14 chez 47 mâles (m = 10,23), 5 à 14 chez 42 femelles (m = 9,12). Longueur de la tête en % de celle du pied: 66,3 à 85,7 chez 54 mâles (m = 76,41), 68,8 à 85,8 chez 52 femelles (m = 77,06). Longueur de la fronto-nasale en % de sa largeur: 84,4 à 127,3 chez 55 mâles (m = 103,10), de 69,5 à 115,8 (m = 92,66) chez 52 femelles. La queue est très souvent mutilée et partiellement régénérée: sa longueur relative maximum dans la série examinée ici est 68,9% chez les mâles et 69,5% chez les femelles.

Taille. Le plus grand mâle mesure 204,7 mm (queue: 138 mm). La plus grande femelle mesure 187,2 mm (queue: 130 mm). La longueur du bout du museau à l'anus varie de 38,3 mm à 66,7 mm chez 56 mâles (m = 55,01 mm), de 40,6 mm à 61,7 mm chez 52 femelles (m = 52,34 mm).

Dimorphisme sexuel. Une différence notable entre mâles et femelles apparaît dans le nombre de ventrales entre les membres antérieurs et postérieurs (plus élevé chez les femelles), le nombre de pores fémoraux (moins élevé chez les femelles), le nombre de stries sur la frontale (moins élevé chez les femelles), la longueur relative de la fronto-nasale (plus élevée chez les mâles). Les mâles deviennent plus grands que les femelles. En vie ils ont en outre une pigmentation rouge latérale qui disparaît rapidement dans les liquides conservateurs.

Discussion. Les proportions de la fronto-nasale ont une variation étendue qui englobe celle qui a été signalée pour *nigrescens* LAURENT (1952, 1956); ce dernier se distingue néanmoins d'*overlaeti* par sa pigmentation ventrale. Chez *chapini* SCHMIDT la fronto-nasale peut être considérablement plus large que longue (1,43). Il se peut que ces trois formes soient unies par des gradients qui justifieraient leur réunion en un seul taxon (*chapini*) mais seul un matériel abondant du Congo Central pourrait nous fixer sur ce point. La proximité géographique de *longipes* BOULENGER suggère qu'un tel gradient n'existe pas pour la longueur des membres postérieurs et par conséquent qu'une discrimination subsppécifique entre *longipes* d'une part et le complexe *chapini-overlaeti-nigrescens* est moins suspect.



Fig. 18 — *Ichnotropis capensis overlaeti*, ♂ des environs de Dundo (Photo A. DE B. MACHADO).

Fig. 108. *Ichnotropis capensis overlaeti* in LAURENT (1964).

***Ichnotropis capensis* sbsp. in LAURENT (1964)**

LAURENT (1964) didn't know where the female came from, but it looks a little melanistic. Let's keep on the safe side, and claim this as a new subspecies without name. You never can be sure if others might find a look-alike somewhere else in Africa.

Ichnotropis capensis sbsp.

1 ♂, sans numéro, de provenance inconnue.

Ecaillage. Occipitale bien différenciée. Interpariétale subrectangulaire à bord postérieur prolongeant celui des pariétales. Préfrontale séparée de la 2e sus-oculaire. Labiales supérieures devant la sous-oculaire: 4. 5 paires de sublinguales dont 3 en contact. Gulaires sur la ligne médiane: 21. Ecailles autour du milieu du corps: 36. Rangées longitudinales de ventrales: 8. Ventrales entre les membres antérieurs et postérieurs: 26. Lamelles sous le 4e orteil: 21. Pores fémoraux: 10-10. Stries sur la frontale: 11. Longueur de la tête en % de celle du pied: 87,3. Longueur de la fronto-nasale en % de sa largeur: 99. Longueur relative de la queue: 61,6%.

Taille. Longueur totale: 157,7 mm. Queue: 97 mm. Tronc+tête: 60,7 mm.

Livrée. Coloration noirâtre. Une ligne blanche latérale sur la partie supérieure des labiales et de la sous-oculaire, traversant la région temporale. Continuant derrière l'oreille en s'estompant graduellement sur les flancs. Une autre ligne semblable longe le bord des labiales inférieures, passe sous l'oreille et s'arrête devant l'insertion du membre antérieur. Les labiales inférieures et les sublinguales sont claires, mais ornées de grosses taches noires. Tout le reste de la face ventrale est très parsemé d'abondants mélanophores qui donnent une tonalité générale noirâtre, sauf dans la région pectorale qui est un peu plus claire.

Discussion. Il est impossible de dire si ce spécimen représente un cas de mélanisme individuel ou appartient à une population mélanisante. Il diffère aussi de la grande série d'*overlaeti* par la forme de son interpariétale et ne semble pas pouvoir être considéré comme un individu aberrant de cette race. J'aurais pu l'attribuer à *nigriscens*, mais trois faits m'en ont dissuadé: je n'ai pu faire les comparaisons nécessaires; d'après mes souvenirs, *nigriscens* est sensiblement moins sombre que ce spécimen-ci; enfin, l'absence de localité nous prive de toute indication géographique. Je suis plutôt porté à admettre qu'il existe en Angola une autre race mélanique qu'il faudra redécouvrir.

Fig. 109. *Ichnotropis capensis* sbsp. in LAURENT (1964).

***Ichnotropis bivittata pallida* in LAURENT, 1964**

Just a single subspecies for *I. bivittata* might feel a little bit lonely, so here an additional subspecies, described on one female from Boca da Humpata (Angola).

Ichnotropis bivittata pallida sbsp. n.

(Figs. 4 e 19)

Holotype:

1 ♀ (1854), Boca da Humpata, Huíla, 1850 m, 21-IX-1949 (M). 150/4323

Diagnose. Race d'*Ichnotropis bivittata* différant de la forme typique par sa coloration pâle en rapport avec son habitat subdésertique, le pied un peu plus long par rapport à la tête, les carènes et stries des plaques céphaliques moins saillantes, l'interpariétale à bords incurvés et convergents vers l'arrière et à bord postérieur situé en avant par rapport à celui des pariétales, à fronto-pariétales assez petites et séparées l'une de l'autre par l'interpariétale qui touche la frontale.

Autres caractères. Occipitale différenciée. Préfrontale en contact avec la 2e sus-oculaire, portant une carène plus forte que les stries banales, de même que la frontale qui en porte deux (comme chez *bivittata*), plus 3 stries médianes assez émoussées. Labiales antérieures à la sous-oculaire: 4. Gulaires sur la ligne médiane: 19. Ecailles autour du milieu du corps: 36.

Rangées longitudinales de ventrales: 10. Ventrales entre les membres antérieurs et postérieurs: 27. Lamelles sous le 4e orteil: 20. Pores fémoraux: 11-11. Longueur de la tête en % de celle du pied: 80,2. Longueur de la fronto-nasale en % de sa largeur: 104,4. Longueur relative de la queue: 62,8%.

Taille: 159 mm (queue: 100 mm).

Livrée. Beige pâle avec deux lignes latéro-dorsales plus claires et peu nettes au niveau des épaules seulement; une bande latérale brunâtre part de l'oreille et se perd au niveau des reins; vers le bas et dans la région antérieure elle est nettement délimitée d'une bande blanchâtre qui se prolonge en avant sur les labiales supérieures; cette limite est soulignée au-dessus des membres antérieurs par deux traits arqués successifs de coloration brun sombre; sous cette bande blanche, une autre traînée pigmentée s'étend de l'oreille à l'insertion des membres antérieurs. Quelques rares concentrations pigmentaires sombres sur les côtés du dos, plus abondantes sur la queue. Face ventrale blanchâtre.

Discussion. Les connexions de la préfrontale et l'existence de carènes plus fortes que les stries banales suggèrent que cette forme appartient plutôt à *I. bivittata* qu'à *I. capensis*. Le nombre d'écailles dorsales différenciées entre les membres antérieurs qui est 11 confirme cette position systématique. Il se peut qu'une partie des *I. bivittata* cités auparavant, notamment ceux du bassin du Cunene (MONARD 1937) appartiennent à cette sous-espèce; l'espèce n'a en tout cas jamais été signalée d'une localité plus méridionale que Boca da Humpata.

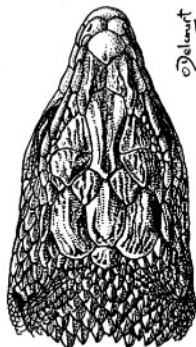


Fig. 19 — *Ichnotropis bivittata pallida* sbsp. n., Holotype (Ang. 1854) × 5.

Fig. 110. *Ichnotropis bivittata pallida* in LAURENT (1964).



Fig. 111. Fig. 4 in LAURENT (1964): Boca da Humpata, Sá Bandeira. Habitat of *Ichnotropis bivittata pallida* sbsp. n.

***Ichnotropis capensis* in BROADLEY (1966)**

Studies on the ecology and Ethology of African lizards. - The Journal of the Herpetological Association of Africa, 2 (1): 6-16.

5. Reproductive potential.

Cagle (1953) noted that there are no adequate techniques for determining the age of an individual reptile. Tropical forms which are active throughout the year are relatively short-lived compared with temperate forms which hibernate for several months. Nevertheless, there are great differences in life expectancy. At one extreme are "annual lizards" like *Ichnotropis squamulosa* and *I. capensis*, which rarely survive for more than twelve months; at the other are long-lived forms like *Platysaurus*. An adult male *P. imperator* in the live display at the Umtali Museum has been in captivity for 5 years, 8 months and was a large adult when captured with the type series in Mtoko District. This lizard can not be less than 8 years old.

Fig. 112. *Ichnotropis capensis* in BROADLEY (1966).

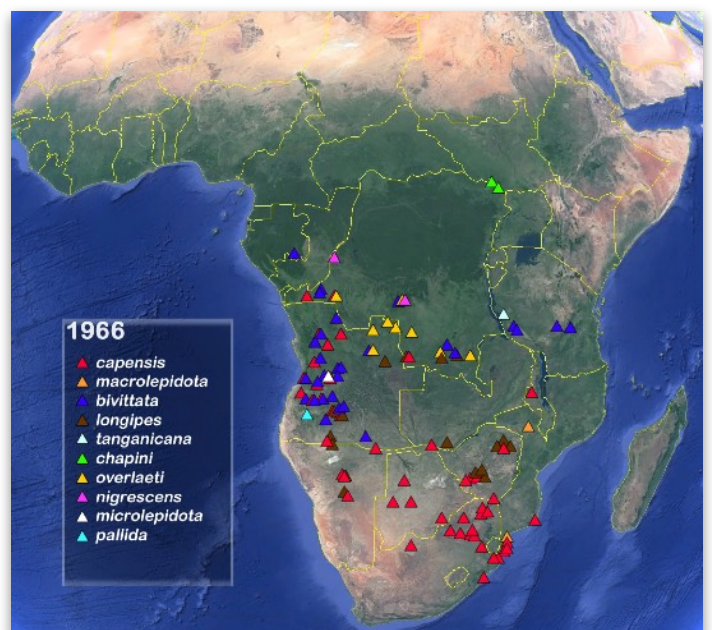


Fig. 113. All records listed up to 1966 with their original (sub)species designation.

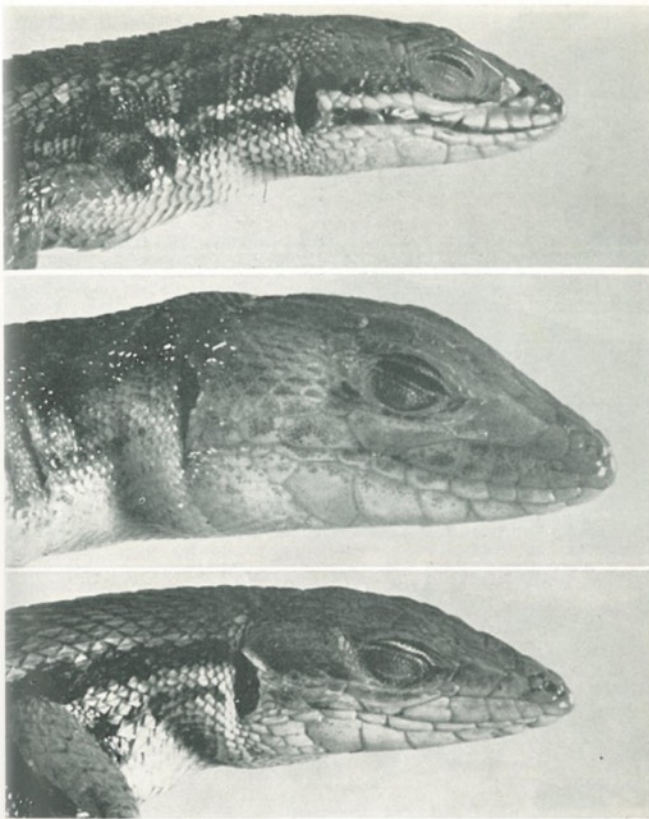


PLATE 2. Lateral views of the heads of three species of *Ichnotropis*: upper, *I. bivittata bivittata*, UM. 12728 from Masombwe, Parc National de l'Upemba, Katanga, Congo; centre, *I. grandiceps*, holotype; lower, *I. capensis capensis*, UM. 12225 from Szale Pan, Gona-re-Zhou, Rhodesia.

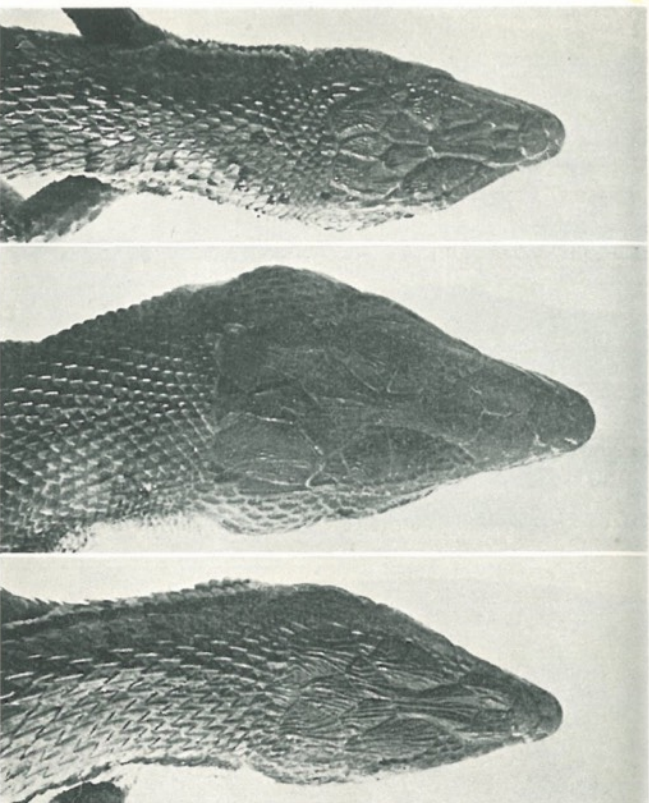


PLATE 3. Dorsal views of the heads of three species of *Ichnotropis*: upper, *I. bivittata bivittata*, UM. 12728 from Masombwe, Parc National de l'Upemba, Katanga, Congo; centre, *I. grandiceps*, holotype; lower, *I. capensis capensis*, UM. 12225 from Szale Pan, Gona-re-Zhou, Rhodesia.

borders the parietal; three supraoculars, the third small, separated from the supraoculars by 15-17 (12-17) small keeled scales; five supraoculars, the anterior two much the longest and forming a long oblique suture.

Lower nasal in contact with rostral, first labial and anterior loreal; postnasal small, in contact with the other two nasals, frontonasal and anterior loreal; two loreals, the posterior much the larger; five upper labials anterior to the subocular, whose lower border on lip is much shorter than the upper, three upper labials posterior to subocular; temporal scales strongly keeled; a narrow tympanic shield on the upper anterior edge of the vertically elongate ear opening; lower eyelid with a median series of vertically elongate scales.

Seven or eight (6-7) lower labials; five pairs of large chin shields, the first three pairs in median contact; gular scales imbricate.

Dorsal scales rhombic, strongly keeled and imbricate, laterals smaller and feebly keeled, passing gradually into the smooth, rounded ventrals, which are broader than long; 46 (44-47) scales round middle of body; ventrals in about 10 longitudinal and 30 transverse rows between fore and hind limbs; preanal scales irregular; scales on upper surfaces of limbs rhombic, strongly keeled and imbricate; 13 (12-13) femoral pores on each side; subdigital lamellae pluricarinate and spinulose, 24 (23-26) under the fourth toe; caudal scales strongly keeled except those just posterior to the vent, which are smooth.

Body moderately depressed; head not depressed, one and a half times as long as broad, its length equivalent to 26 (29-34)% of snout-vent length, expanded in the temporal region and very distinct from the neck. Adpressed hind limb reaches almost to the ear opening. Ratio of foot length/head length is 1.20 (1.21-1.27).

Length of head and body 70 mm., tail 148 mm.

Coloration (in alcohol): Above pale grey-brown, with darker stippling and a few scattered dark spots (not covering more than one scale) on body and tail; a poorly defined dark dorso-lateral band extends from neck to groin, where it breaks up into a line of lateral spots on the tail; side of head and lower flanks white with dark stippling; ventrum white. In the paratypes the dark lateral band is absent.

Habitat: Collected along the border road in open woodland on Kalahari sand. Associated reptiles were *Ichnotropis capensis capensis* (2 juveniles); *Ichnotropis squamulosa* (1 adult); *Mabuya spilogaster* and *Mabuya striata wahlbergi*.

ACKNOWLEDGEMENTS

I am grateful to the United States National Museum for allowing me to examine the herpetological material collected by their African Mammal Survey Team in Botswana.

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 FITZSIMONS, V. F. M. (1943). Lizards of South Africa. Pretoria: Transvaal Museum Memoir No. 1.
 LAURENT, R. F. (1964). Reptiles et Amphibiens de l'Angola (Troisieme contribution). *Publ. Cult. Comp. Diam. Angola*, 67, 11-165.
 MARK, H. (1956). A new lacertid lizard from Angola. *Fieldiana: Zoology*, 39, 2, 5-9.
 WITTE, G. F. de (1953). Reptiles. Exploration du Parc National de l'Upemba. Mission G. F. de Witte, 6, 1-322.

Fig. 117c. *Ichnotropis grandiceps* in BROADLEY (1967b).

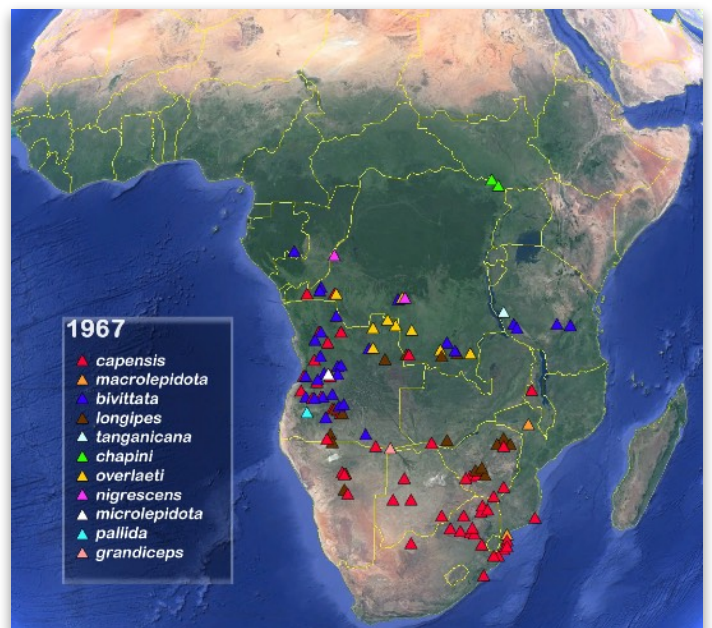


Fig. 118. All records listed up to 1967 with their original (sub)species designation.

Fig. 117b. *Ichnotropis grandiceps* in BROADLEY (1967b).

Some data on growth rate in BROADLEY (1967c), and clutch size in BROADLEY (1967c) and FITCH (1970).

***Ichnotropis capensis* in BROADLEY (1967c)**

The life cycles of two sympatric species of *Ichnotropis* (Sauria: Lacertidae). - Zoologica Africana, 3 (1): 1-2.

***Ichnotropis* in FITCH (1970)**

Reproductive Cycles of Lizards and Snakes. - Miscellaneous Publications of University of Kansas, 52: 102-107.

The sand-lizards *Ichnotropis squamulosa* and *I. capensis* are widespread and common in southern Africa, although not found south of the Orange River. They often occur together, but one species is invariably represented only by adults and the other only by subadults or juveniles. This phenomenon was analysed by recording the snout-vent length and month of collection for 124 specimens of *I. squamulosa* and 74 specimens of *I. capensis* in the Umtali Museum. The material is from Bechuanaland, Rhodesia, Zambia and Mozambique. The size range and mean snout-vent lengths for each month are shown in Table 1 and the growth curves for the two species are plotted in Fig. 1.

These data indicate that both lizards have remarkably short life cycles of less than one year's duration, so there is no overlap between generations, the species surviving in the egg form for a period of three to four months. These life cycles are staggered so that there is never inter-specific competition between lizards of similar size, the two species thus being segregated by size of prey. Competition between sympatric congeneric species of lizards is often reduced by differences in microhabitat (e.g. *Platysaurus torquatus* and *P. imperator*, Broadley 1962) or diet (e.g. *Pseudocordylus subviridis* and *P. langi*, Broadley 1964). Staggered life cycles can be equally effective for "annual" species.

Data on the life spans of lizards are meagre, but tropical forms are relatively short-lived when compared with temperate species which hibernate for nearly half the year. M. Smith (1951) considered the Palearctic species *Lacerta agilis* to be full grown when 4 or 5 years old and the same is probably true of *Lacerta vivipara*. Males of both species may be sexually mature when 22 months old.

Most African lacertids probably live for two or three years. With regard to *Nucras tessellata ornata*, *Eremias lugubris* and *Eremias namaquensis*, I have examined series which include at least two generations.

If factors like predation levels are similar for the local genera of lacertids, one could expect to find an indication of life expectancy in the number of eggs laid. FitzSimons (1943) gives approximate clutch sizes of 10-12 for *Ichnotropis squamulosa* and 6 for *I. capensis*, compared with 4-6 for *Eremias* spp., 4-6 for *Meroles* spp. and 4 for *Nucras* spp. It is significant that *Ichnotropis squamulosa* has both the shortest known life expectancy (8 months) and the largest clutch size, while the species of *Nucras*, which probably live for 2-3 years, have the lowest average clutch size.

There is plenty of scope for research on the ecology of local lizards, and their life cycles may prove to be particularly interesting.

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- BROADLEY, D. G. 1964. A review of the crag lizards (Genus *Pseudocordylus*) of Natal. *Ann. Natal Mus.*, 16: 99-110
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TABLE 1.

VARIATION IN SNOOT-VENT LENGTH FOR SAMPLES OF *Ichnotropis squamulosa* AND *I. capensis* BY MONTH OF COLLECTION.

Month	N	<i>I. squamulosa</i>		N	<i>I. capensis</i>	
		Snout-vent Lengths			Snout-vent Lengths	
		Range	Mean		Range	Mean
January	12	40-61	51.7	—	—	—
February	11	50-70	58.3	—	—	—
March	21	55-75	61.2	2	24-27	25.5
April	19	59-75	66.8	5	22-36	31.2
May	16	55-71	63.6	7	30-38	34.0
June	14	60-76	66.2	4	36-39	37.7
July	1	76	76.0	3	38-47	41.3
August	—	—	—	—	—	—
September	—	—	—	3	41-48	45.3
October	—	—	—	11	48-60	52.2
November	10	24-35	30.4	19	40-65	54.7
December	20	25-49	38.3	20	52-62	56.8

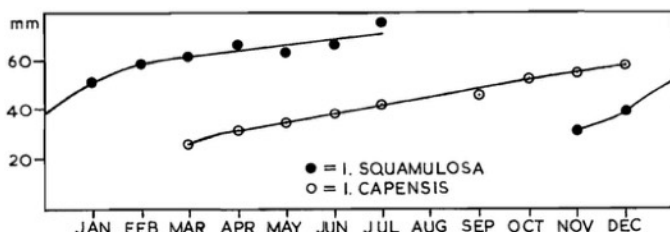


Fig. 1. Growth curves for *Ichnotropis squamulosa* and *I. capensis* based on mean snout-vent lengths of samples for each calendar month.

Fig. 119. *Ichnotropis capensis* in BROADLEY (1967c).

Ichnotropis

This genus includes several species of active terrestrial lizards of tropical Africa and some in South Africa. In Angola, Manças (1963:238) recorded gravid females of *I. capensis* in October and November. Different individuals contained 6, 7, 8, 9, 9, and 11 eggs. In the Rukwa Valley of Tanganyika 6° to 9° south latitude, Robertson, Chapman, and Chapman (1962:425) obtained a gravid female in July, having one shelled ovum in each oviduct, and one in July had ovarian eggs. Pienaar (1966:92, 93) writing of the fauna of Kruger National Park, but perhaps drawing upon records from other areas, stated that the clutch in *I. capensis* is usually six and that in *I. squamulosa* is usually 10 to 12.

Fig. 120. *Ichnotropis* in FITCH (1970).

***Ichnotropis grandiceps* in HAACKE (1970)**

New herpetological records from South West Africa. - Annals of the Transvaal Museum, 26: 277-283.

New records for *Ichnotropis grandiceps*:

- Ndobe (Botswana)
- Farm Deo Volente (Namibia)
- Grootfontein District (Namibia)

9. *Ichnotropis grandiceps* Broadley

Ichnotropis grandiceps Broadley, 1967. *Arnoldia* 3(24):1.
Type locality: 40 km W of Mohebo, Botswana.

MATERIAL: Four specimens, T.M. 30822, Ndobe, 15 km N of Aha Mts., Botswana-S.W.A. border, 12.IV.1965; T.M. 38309 and 38310, Farm Deo Volente, No. 1026 Grootfontein District, 7.IV.1970; T.M. 38404, Caprivi Strip-Botswana border, 16 km E of 21° E corner beacon, 11.IV.1970; all specimens collected by the author.

	H/B length	T. length	Upper labials ant. subocc.	Body scales
T.M. 30822	52	99.5	4 + 5	45
T.M. 38309	64.8	—	4 + 5	46
T.M. 38310	59.9	120	5 + 5	44
T.M. 38404	38.2	—	5 + 5	46

The first specimen was collected on hard limy soil in Combretum-Acacia bushveld while the others were collected in open woodland on white sand. At Farm Deo Volente this species occurs sympatrically with *Ichnotropis squamulosa* Peters, *Ichnotropis c. capensis* (Smith), *Eremias lugubris* (Smith) and *Gerrhosaurus n. nigrolineatus* Hallowell. The colouration is similar to Broadley's description but the dorsolateral band is either absent or only faintly noticeable.

RANGE: North-western Ngamiland, Botswana, and north-eastern South West Africa.

Fig. 121. *Ichnotropis grandiceps* in HAACKE (1970).

***Ichnotropis capensis* and *I. bivittata* in BROADLEY (1971)**
 Distribution of *Ichnotropis* in Zambia. - The Reptiles and Amphibians of Zambia. - The Puku. 143 pp.

Several new records of *I. capensis* for Zambia. Although for *Ichnotropis bivittata* two records are indicated in the map, in the text it reads: the only Zambezia specimen is from Mbala.

LACERTIDAE
 Genera

Frontoparietals absent; a paired series of smooth transversely enlarged plates extending down middle of back and tail; tail strongly depressed and fringed laterally *Holaspis* (*H. guentheri*)

Frontoparietals present; no vertebral series of enlarged scales; tail cylindrical, not fringed laterally 2

Subdigital lamellae smooth or tubercular *Nucas*

Subdigital lamellae keeled 3

Norstril surrounded by 3-5 nasals and the first labial, or narrowly separated from the latter *Latastia* (*L. johnstoni*)

Nostril surrounded by 2-4 nasals, well separated from the first labial 4

Collar well marked; dorsal scales small; head shields smooth or slightly rugose *Eremias* (*E. lugubris*)

Collar absent; dorsal scales large and strongly keeled; head shields keeled or striated *Ichnotropis*

Genus **ICHNOTROPIS** Peters Rough-scaled Sand Lizards

Lizards with keeled body scales, the ventrals being similar to the dorsals except for their slightly larger size.

Ichnotropis squamulosa Peters
Ichnotropis squamulosa Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 617: Tete, Mozambique.
 This species is widespread in Zambia, but apparently absent from the Northern Province (Map 5).
 Habitat: Savanna, most plentiful in sandy country.

Ichnotropis bivittata (Bocage)
 ICHNOTROPIS BIVITTATA BIVITTATA (Bocage)
Ichnotropis bivittata Bocage, 1866, Journ. Sci. Lisboa, 1, p. 43: Duque de Braganca, Angola.
 The only Zambian specimen is from Mbala (B) (Map 5).

Ichnotropis capensis (A. Smith)
 ICHNOTROPIS CAPENSIS CAPENSIS (A. Smith)
Algyra capensis A. Smith, 1838, Mag. nat. Hist., 2, p. 94: "Sandy deserts around Latakoo" (= Kuruman, Cape Province).
 This species is widespread in western Zambia, but has not been taken east of Lusaka (Map 5).
 Habitat: Savanna.

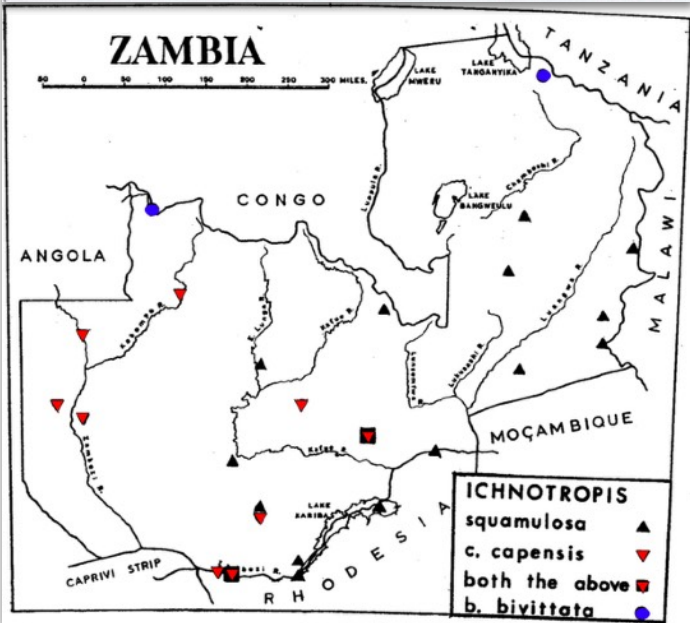


Fig. 122. *I. capensis* and *I. bivittata* in BROADLEY (1971).

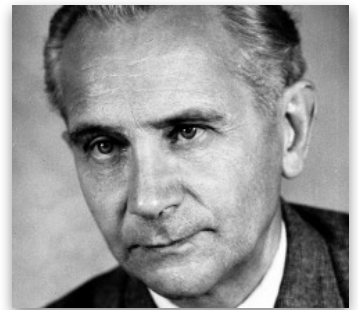


Fig. 123.
 ROBERT FRIEDRICH WILHELM MERTENS (1894-1975).

***Ichnotropis capensis* and *I. grandiceps* in MERTENS (1971)**
 Die Herpetofauna Südwest-Afrikas. - Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft, 529: 1-110.

***Ichnotropis capensis* (A. SMITH).**
Algyra capensis A. SMITH 1838, Mag. nat. Hist., London, (2) 2: 94. — Terra typica: „Sandy deserts around Latakoo“ (= Kuruman, Bechuanaland).
Ichnotropis capensis — MERTENS 1955: 70, Taf. 10, Fig. 45; Taf. 21, Fig. 120.
Ichnotropis c. capensis — HAACKE 1970: 281 (Farm Deo Volente, Grootfontein District).
 Soweit ich das von mir selber gesammelte Material dieser hübschen Eidechsen studiert habe, kann ich mich nicht entschließen, die von BOULENGER beschriebene *Ichnotropis longipes* als valides Taxon, also auch nicht als Unterart von *Ichnotropis capensis* anzuerkennen.

***Ichnotropis grandiceps* BROADLEY.**
Ichnotropis grandiceps BROADLEY 1967, Arnoldia (Rhodesia), 3; Nr. 24: 1. — Terra typica: 25 mi. westlich von Molembo, Botswana.
Ichnotropis grandiceps — HAACKE 1970: 281 (Ndobe, Grenzgebiet von Botswana-SW Afrika; Farm Deo Volente, Grootfontein District).

Fig. 124. *I. capensis* and *I. grandiceps* in MERTENS (1971).

***Ichnotropis capensis* in BROADLEY (1973)**
 Marking/Recapture programs with reptiles and amphibians in Umtali, District, Rhodesia. - The Journal of the Herpetological Association of Africa, 11 (1): 7-8.

Record for Zimunya (Zimbabwe).

It is hoped to mark sympatric populations of *Ichnotropis squamulosa* and *I. capensis* in Zimunya Township shortly, this should confirm the "annual" status of these lizards previously postulated from the collecting dates of Museum specimens (Broadley, 1967).

Fig. 125. *Ichnotropis capensis* in BROADLEY (1973).

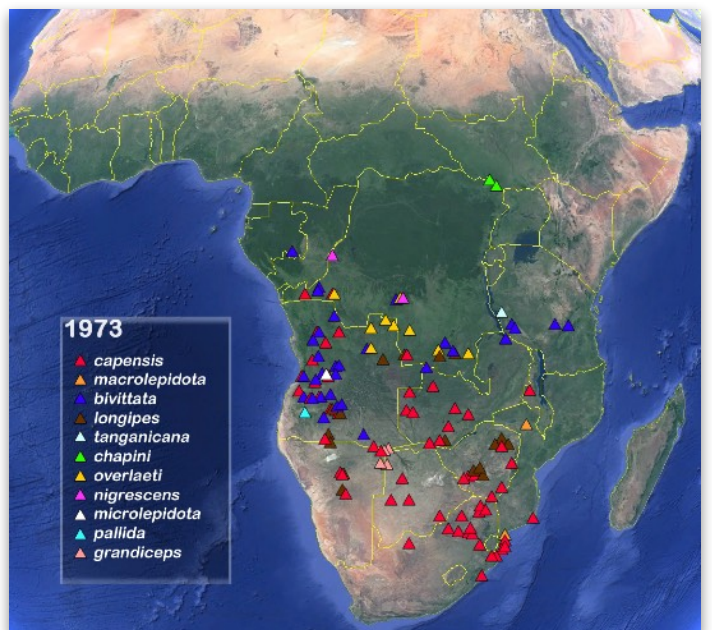
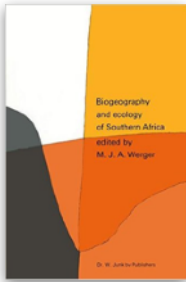


Fig. 126. All records listed up to 1973 with their original (sub)species designation.

***Ichnotropis capensis* in POYNTON & BROADLEY (1978)**

The Herpetofauna. - In: Werger, M.J.A. (ed.): *Biogeography and ecology of Southern Africa*. - Junk, The Hague, 1444 pp.



Abstract: The herpetofauna of southern Africa is currently receiving an increased amount of attention. The Zoological Society of Southern Africa held a symposium on herpetology and ichthyology in 1975, the proceedings of which have been published in *Zoologica Africana*, and no less than 17 papers dealt specifically with research carried out recently on southern African amphibians and reptiles. Our aim in this chapter, therefore, can be no more than to sketch the present state of knowledge and thinking in a rapidly changing field.

***Ichnotropis capensis* and *Ichnotropis grandiceps* in BROADLEY (1979)**

A field study of two sympatric “annual” lizards (genus *Ichnotropis*) in Rhodesia. - *South African Journal of Zoology*, Pretoria, 14 (3): 133-138.

Abstract: A fourteen-month marking/recapture study of the sympatric lacertids *Ichnotropis squamulosa* and *I. capensis* (Sauria:Lacertidae) was carried out at Zimunya township near Umtali. This confirmed that these lizards have staggered life cycles and that individuals rarely live for more than 12 months, thus reducing competition for food between similar-sized lizards of the two species.

Study site: Zimunya (Zimbabwe).

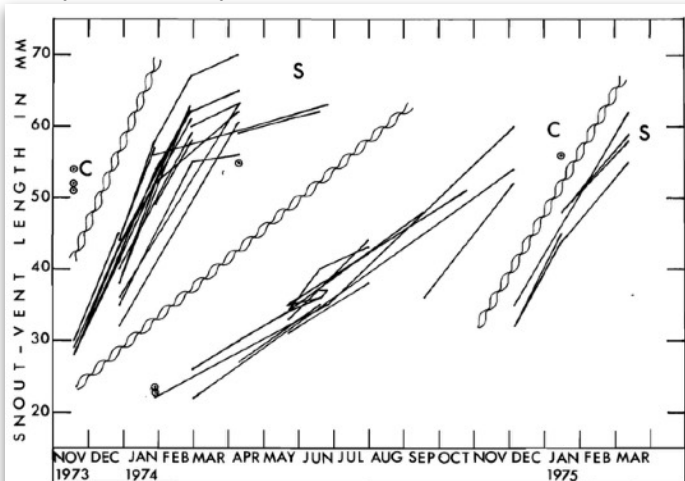


Fig. 1 Records of growth of marked *Ichnotropis* on the Zimunya study area. 'S' = *I. squamulosa*; 'C' and points enclosed in circles = *I. capensis*.

Conclusions

The data obtained from the Zimunya field study confirm that there is a temporal separation by size in sympatric *Ichnotropis squamulosa* and *I. capensis*, apart from occasional adults that survive into their second year. However the limited data available for the somewhat larger species *Ichnotropis grandiceps* (Broadley 1967a), which is sympatric with both *I. squamulosa* and *I. capensis* at its type locality on the Botswana/Caprivi border, suggests that this is not an ‘annual’ species, for the type series consists of two adult ♂♂ with snout-vent lengths 65–70 mm and a juvenile (s.v.l. 41 mm), all collected on 30 May. Four more specimens, collected during the first half of April, have snout-vent lengths ranging from 38,2 to 64,8 mm (Haacke 1970).

Fig. 130. *I. capensis* and *I. grandiceps* in BROADLEY (1979).



Fig. 131. *Ichnotropis capensis* in the Angola - Namibia border area.

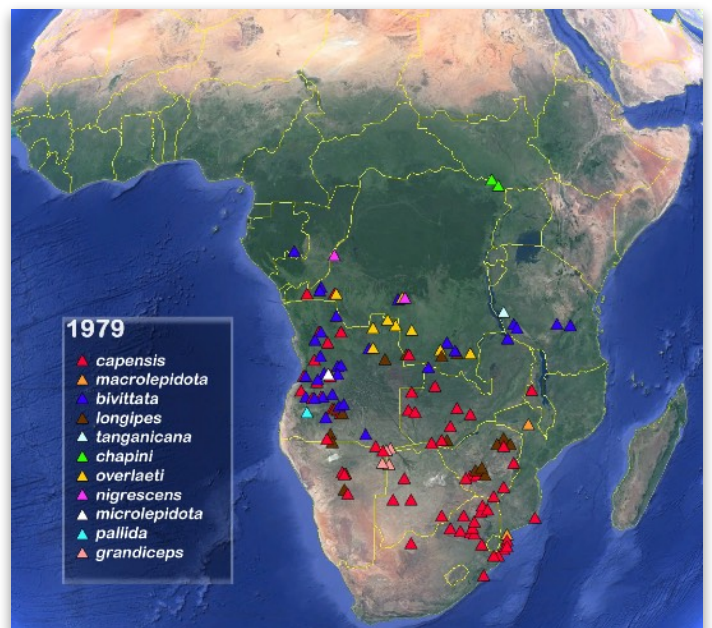


Fig. 132. All records listed up to 1979 with their original (sub)species designation.



Fig. 133.
BILL BRANCH

Ichnotropis capensis in BRANCH (1981)

An annotated checklist of the lizards of the Cape Province, South Africa. - *Annals of the Cape Provincial Museums Natural History*, 13 (11): 141-165.

The record in PIANKA (1971) applies to *M. squamulosa*.

Ichnotropis Peters
A small genus of rough-scaled, terrestrial lacertids, represented in southern Africa by three species.

Ichnotropis squamulosa Peters
Broadley (1976a) has shown that these lizards are very short-lived, hatching and growing to sexual maturity in six months and then dying soon after reproduction. *I. capensis* has a similar abbreviated life history, but the cycles of the two species are phased such that their eggs hatch at different times. This avoids competition for the same resources. Mainly distributed north of the Cape Province, it has recently been recorded from the Kalahari Gemsbok National Park (Pianka, 1971).

Fig. 134. *Ichnotropis capensis* in BRANCH (1981).

Ichnotropis in WELCH (1982)

Herpetology of Africa - a checklist and bibliography of the orders Amphisbaenia, Sauria and Serpentes. - KRIEGER Publishing Company, Malabar, Florida. 293 pp.

Genus: ICHNOTROPIS Peters 1854
Species typica: *capensis* Smith
Reference: Boulenger (1921)

Ichnotropis bivittata bivittata Bocage 1866
Distribution: Angola, Zaire and Congo
Reference: Broadley (1967b); Laurent (1964b); Loveridge (1957)

Ichnotropis bivittata pallida Laurent 1964
Distribution: Angola

Ichnotropis capensis (Smith 1838) *Algyra*
Distribution: South Africa north to Tanzania and southern Zaire
Reference: Broadley (1967b); Fitzsimons (1943); Loveridge (1953)
Ichnotropis capensis longipes Boulenger: Fitzsimons (1943)
Ichnotropis capensis overlaeti Witte and Laurent: Laurent (1964b)
Ichnotropis longipes Boulenger: Boulenger (1921)

Ichnotropis chapini Schmidt 1919
Distribution: Zaire

Ichnotropis grandiceps Broadley 1967
Distribution: Botswana

Ichnotropis microlepidota Marx 1956
Distribution: Angola

Ichnotropis tanganicana Boulenger 1917
Distribution: Eastern shores of Lake Tanganyika, Tanzania

Fig. 135. *Ichnotropis* in WELCH (1982).

In the course of compiling these generic synonymies, I came across several names that had priority over those currently in use. Rulings setting aside these older names should be obtained from the International Commission on Zoological Nomenclature without delay. They are:
Thermophilus Fitzinger (1843), not *Thermophila* Hübner (1816), antedates *Ichnotropis* Peters (1854) which has been in use as a genus of the LACERTIDAE for over a century.

Fig. 136. *Thermophilus* FITZINGER, 1843 in LOVERIDGE (1957).

Ichnotropis in BRANCH & BROADLEY (1985)

Ichnotropis PETERS, 1854 (Reptilia, Sauria): Proposed conservation by the suppression of *Thermophilus* FITZINGER, 1843. Z.N. (S.) 2377. - *Bulletin of Zoological Nomenclature*, 42 (1): 89-90.

ICHNOTROPIS PETERS, 1854 (REPTILIA, SAURIA): PROPOSED CONSERVATION BY THE SUPPRESSION OF THERMOPHILUS FITZINGER, 1843. Z.N.(S.)2377

By William R. Branch (Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa) and Donald G. Broadley (National Museum, P.O. Box 240, Bulawayo, Zimbabwe)

The purpose of this application is to suppress a generic name not used in the literature during the last hundred years and which is a senior synonym of *Ichnotropis* Peters, 1854.

2. In 1843 Fitzinger erected the genus *Thermophilus*, designating *Tropidosaura capensis* 'Duméril & Bibron' (i.e. *Algyra capensis* A. Smith, 1838) as the type species (*Syst. Rept.*, p. 21).

3. In 1854 Peters erected the genus *Ichnotropis* (*Mber. Acad. Wiss. Berl.*, p. 617), of which the type species by subsequent designation by FitzSimons, 1943, p. 349, is *I. macrolepidota* Peters, 1854 (= *Algyra capensis* A. Smith).

4. In 1921 Boulenger (*Monograph of the Lacertidae*, vol. 2, pp. 179-193) cited the use of *Ichnotropis* Peters by 12 authors in 17 papers, but overlooked the name *Thermophilus* Fitzinger.

5. In 1957 Loveridge pointed out that the name *Thermophilus* Fitzinger had priority over *Ichnotropis* Peters and urged that the Commission be requested to set aside the older name (*Bull. Mus. comp. Zool. Harv.*, vol. 117, pp. 149, 233).

6. Since 1921, the name *Ichnotropis* Peters has been used in at least 35 papers by 16 authors. In accordance with Article 79(b) of the Code, approved by the XVII Congress in 1972, the following is a selection of 'at least 5 different authors and in at least 10 different publications' in which *Ichnotropis* Peters has been used during the last 50 years:

Cott, H. B. 1934. *Proc. zool. Soc. Lond.*, 1934, vol. 1, pp. 145-173.

FitzSimons, V. F. 1943. *The Lizards of South Africa. Transvaal Mus. Mem.*, vol. 1, xv+528 pp.

Witte, G. F. de & Laurent, R. F. 1942. *Rev. Zool. Bot. Africa*, vol. 36(2), pp. 165-180.

Loveridge, A. 1953. *Bull. Mus. comp. Zool. Harv.*, vol. 110(3), pp. 143-322.

Mertens, R. 1955. *Abh. senkenb. naturforsch. Ges.*, vol. 490, pp. 1-172.

Marx, H. 1956. *Fieldiana Zool.*, vol. 39, pp. 5-9.

Laurent, R. F. 1964. *Publções cult. Co. Diam. Angola*, vol. 67, pp. 1-165.

Broadley, D. G. 1967. *Arnoldia Rhodesia*, vol. 3(24), pp. 1-5.

Pianka, E. R. 1971. *Ecol.*, vol. 52(6), pp. 1024-1029.

Broadley, D. G. 1971. *Puku*. No. 6, pp. 1-143.

7. Since its establishment, the generic name *Thermophilus* Fitzinger has not been formally used again.

8. In the interests of nomenclatural stability the International Commission on Zoological Nomenclature is therefore requested:

(1) to use its plenary powers to suppress the generic name *Thermophilus* Fitzinger, 1843, for the purposes of the Principle of Priority but not for those of the Principle of Homonymy;

(2) to place the generic name *Ichnotropis* Peters, 1854 (gender: feminine), type species, by subsequent designation by FitzSimons, 1943, *macrolepidota* Peters, 1854, on the Official List of Generic Names in Zoology;

(3) to place the specific name *capensis* A. Smith, 1838, as published in the binomen *Algyra capensis* (the valid name at the date of this request of the type species of *Ichnotropis* Peters, 1854) on the Official List of Specific Names in Zoology;

(4) to place the generic name *Thermophilus* Fitzinger, 1843, as suppressed under the plenary powers in (1) above, on the Official Index of Rejected and Invalid Names in Zoology.

Fig. 137. *Ichnotropis* in BRANCH & BROADLEY (1985).

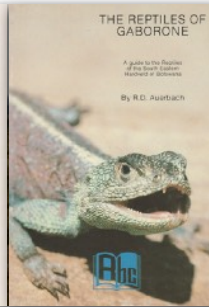
The plea for suppressing *Thermophilus* FITZINGER, 1843 was not necessary. LOVERIDGE (1957) probably never addressed this issue in the right way to the nomenclature commission, moreover, the assumption made by LOVERIDGE (1957) was incorrect (see figure 136, discussion at BEDRIAGA (1886), and TUBBS (1987)).

***Ichnotropis capensis* in AUERBACH (1985)**

The Reptiles of Gaborone.

A Guide to the Reptiles of the South-Eastern Hardveld of Botswana. - The Botswana Book Centre, Gaborone. 48 pp.

Ichnotropis capensis (A. Smith)
Cape Rough-scaled Sand Lizard
 Kaapse Grofskubsandakkedis (Afr); Kap-Wüstenrenner (Gmn).
 Description: Similar in build to the Tropical Rough Scaled Sand Lizard (*I. squamulosa*), and the Black and Yellow Sand Lizard (*Hejobolus lugubris*), but with a tail varying in length from one and a half to two and a quarter times the length of the head and body, also with strongly keeled scales. Olive through grey to reddish-brown above, with regular series of spots on either side of the back, which fuse at the base of the tail, a dark brown to black band on either side from the nostril to the tail, and pale green to white stripes from the eyes to the base of the tail. The belly is white with a green or pink tinge, and the lower lip, chin and throat are yellow. The species has 9-15 femoral pores on each hind limb.
 Size: Up to 160 mm.
 Reproduction: About 6 oval eggs measuring approximately 9.5x6.5 mm are laid.
 Diet: Small arthropods.
 Notes: Like the Rough Scaled Sand Lizard, this is an annual species. It is largely sympatric (found in the same place) with *I. squamulosa*, and competition is avoided partly through staggered life-cycles.

Fig. 138. *Ichnotropis capensis* in AUERBACH (1985).***Ichnotropis capensis* and *Ichnotropis grandiceps* in AUERBACH (1986)**

First steps in Setswana herpetology. - Botswana Notes and Records Volume, 18: 71-90.

48 *Ichnotropis capensis* (A. Smith)
 (Cape Rough-scaled Sand Lizard) — *Lekgaola tshega*?

49 *Ichnotropis grandiceps* (Broadley)
 (Caprivi Rough-scaled Sand Lizard) — *Lekgaola tshega*?

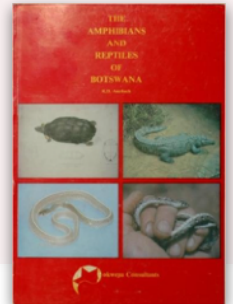
The term *Lekgaola tshega* is broadly applied to the active desert Lacertids. Tales of the antics of these lizards are told to frighten inattentive shepherds.

Fig. 139. *I. capensis* and *I. grandiceps* in AUERBACH (1986).***Ichnotropis capensis* and *Ichnotropis grandiceps* in AUERBACH (1987)**

The Amphibians and Reptiles of Botswana. - Gaborone, Mokwepa Consultants. 295 pp.

Like others before, AUERBACH (1987) put *I. longipes* into the synonymy of *I. capensis*. An extensive list of trivial names is given. Likewise descriptions of both species, notes on reproduction and distribution.

A long list of recorded localities is also included. The type locality of *I. grandiceps* is named: Dibejama, 40 km west of Muhembo.



See next page.

***Ichnotropis capensis* in BUSACK & MAXSON (1987)**

Molecular relationships among Iberian, Moroccan, and South African lacertid lizards (Reptilia: Lacertidae). - Amphibia-Reptilia, 8 (4): 383-392.

New record: Khwai (Botswana).

Ichnotropis capensis: (LM 1820) LACM (field number) KC 1221-1225, Botswana (Ngamiland), 100 km (air) NE Maun at Khwai.

Fig. 140. *Ichnotropis capensis* in BUSACK & MAXSON (1987).***Ichnotropis* in TUBBS (1987)**

Opinion 1422. *Ichnotropis* PETERS, 1854 (Reptilia, Sauria): conserved.
 - International commission on zoological nomenclature, Bolletino di zoologia, 54 (3): 273-275.

1422 *Ichnotropis* Peters, 1854 (Reptilia, Sauria): conserved.

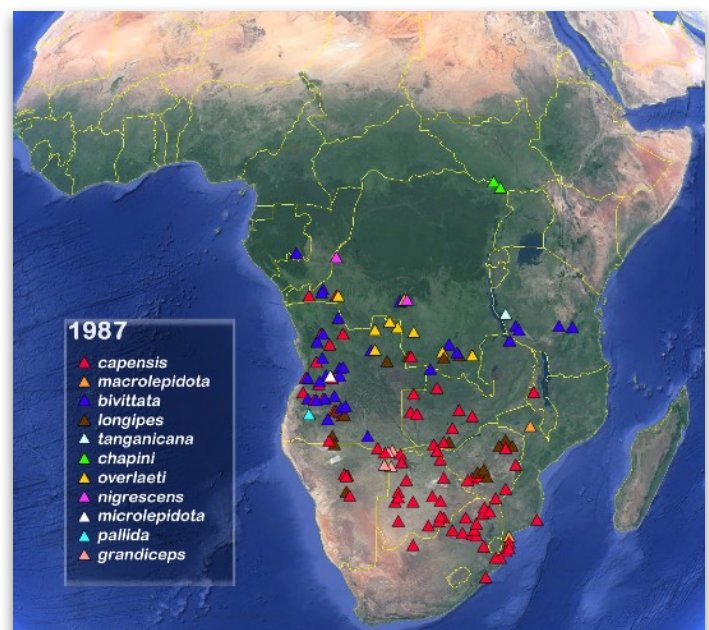
Fig. 141. *Ichnotropis* in TUBBS (1987).

Fig. 142. All records listed up to 1987 with their original (sub)species designation.

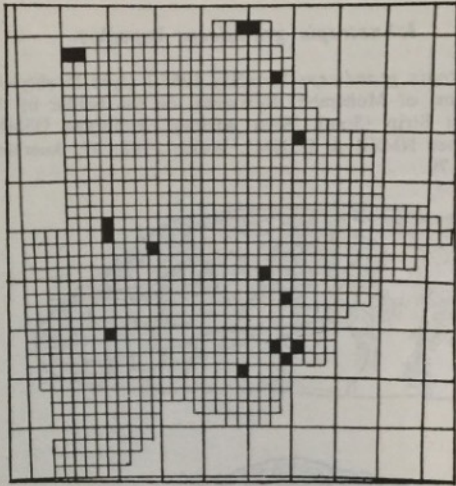
Ichnotropis capensis (Smith)

Algyra capensis Smith 1838a: 94 (type locality: "Sandy deserts around Latakoo", i.e. Kuruman).

Ichnotropis capensis Boulenger 1887a-III:78, 1905b - II:254, 1910, Werner 1910a:329, Hewitt 1910c:112, Sternfeld 1911:28, Hewitt & Power 1913:156, Boulenger 1921-II:185, FitzSimons 1935a:356, 1937:267, Broadley & Blake 1979:9, Welch 1982:97, Visser 1984a-35:59, Auerbach 1985a:28, 1986a:79.

Ichnotropis capensis capensis FitzSimons 1943:352.

Ichnotropis longipes FitzSimons 1943:354.



English: Smith's Rough-scaled Sand Lizard, Cape Rough-scaled Sand-lizard. **German:** Kap-wustenrenner, Kapeidechse. **Dutch:** Kaapse Kielschubhagedis. **Afrikaans:** Smithse skurwe sandakkedis, Kaapse grofkskub sandveldakkedis. (At) Alto Cuilo: Kassulu. (At) Dundo: Kassulu-mukehe, Kassulu-mukepe. **Lwena:** Tshitotombo. **Quico:** Cassulo. **Tswana** Mokgatutswa. **Description:** 4 or 5 supraciliaries. Narrow tympanic shield on anterior opening of ear. Ventrals in 8 to 10 longitudinal and 25-31 transverse rows. 24-40 scales around mid-body, 18-24 sub-digital lamellae under 4th toe. 6-15 femoral pores on each hind limb. Tail from one and a half to double the length of head and body, with strongly keeled scales. Olive through grey to reddish-brown above with regular series of spots on either side of the back which fuse at the back of the tail. The belly is white with a green or pink tinge, and the lower lip, chin, and throat are yellow.

Size: Up to 160 mm.

Reproduction: About 6 oval eggs are laid measuring approximately 9,5 x 6,5 mm.

Diet: Small arthropods.

Notes: Like *I. squamulosa* this is an annual species, and is sympatric with *I. squamulosa* through much of its range. (re. above for further notes.) FitzSimons (1943:354) records *I. longipes* Boulenger 1902 (Type locality: Mazoe, Southern Rhodesia) as a subspecies of *capensis*. He records this taxon from N'kate, citing a TM specimen from the Vernay-Lang Kalahari Expedition.

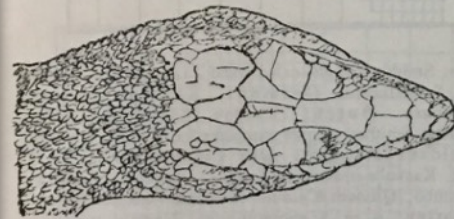
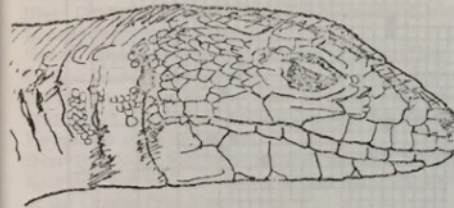
Distribution: Northern Namibia, Botswana excluding the arid south-west, northern Cape, Transvaal and northern Natal, Zimbabwe, southern Zambia and southern Mozambique.

Ecological affinity: Tropical transitional.

Recorded localities: Chobe. Kabulabula (FitzSimons 1935a), Dibejama- 80 km W Muhembo (NMZB), Dibejama East of- 40 km W Muhembo (NMZB), Gaborone (NMZB), Ghanzi-Tswaane- 55 Km S Ghanzi (NMZB), Kasane (NMZB), Khwai Camp (NMZB), Lephepe (NMZB), Lephepe NW of- 65 km NW (NMZB), Loakaneng-Severelela (Werner 1910), Magweagana- 30 km E (NMZB), Mochudi (TM), Molepolole (ZFMK, NMZB, UB), Nata- Nikati (FitzSimons 1935a), Nunga (NMZB), Okwa north of- 50 km N Okwa 2121 D4 (NMZB), Tshane (NMZB), Xade Pan- Kgaotwe-Damara Pan (FitzSimons 1935a).

Ichnotropis grandiceps Broadley

Ichnotropis grandiceps Broadley 1967:1 (type locality: 40 km West of Muhembo, Botswana, on the border of the Caprivi Strip (South West Africa)." Holotype USNM, paratypes NMZB & USNM), Welch 1982: 97, Auerbach 1986a:79.



Ichnotropis grandiceps (after Broadley 1967c:5).

English: Broadley's Rough-scaled Sand Lizard.

Description: Dorsal scales in 44-47 rows at mid-body, 23-26 sub-digital lamellae under 4th toe. 5 supraciliaries. A narrow tympanic shield on the upper anterior edge of the vertically-elongate ear-opening. Lower eye-lid with a median series of vertically elongate scales. Ventrals in 10 longitudinal and 30 transverse rows between fore and hind limbs. 12-13 femoral pores on each side. Tail with strongly-keeled scales and more than double the length of head and bod. Head relatively large, and build more robust than *I. capensis* (with which it is sympatric but with a far more limited distribution). Pale grey-brown with darker stippling dorsally, and with a few scattered dark spots on head and tail. A poorly-defined dark dorsolateral band extends from the neck to groin, where it breaks up into a single line of lateral spots on the tail. Sides of the head and lower flanks are white with dark stippling. The ventrum is white. In the paratypes the dark lateral band is absent.

Size: About 220 mm.

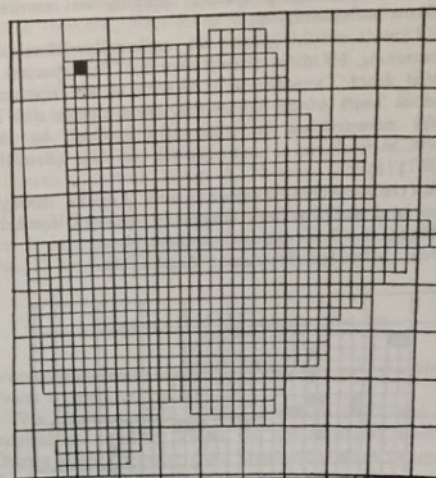
Reproduction: Presumably as for other members of the genus.

Notes: First described in 1967 by Dr. Broadley, little has been written about this species since. It is so far

presumably known only from the types. Sympatric with *I. capensis*.

Distribution: Known only from northern Botswana and the Caprivi Strip in Namibia.

Ecological affinity: Tropical- limited distribution.



Recorded localities: Dibejama- 40 km W Muhembo (USNM, NMZB)

Fig. 143. *I. capensis* and *I. grandiceps* in AUERBACH (1987).

***Ichnotropis capensis* in JACOBSEN (1987)**

Notes on reproduction in *Ichnotropis squamulosa* and interspecific competition with *I. capensis* (Reptilia, Lacertidae) in the Transvaal. - Journal of the Herpetological Association of Africa, 33: 13-17.

NOTES ON REPRODUCTION IN *ICHTNOTROPIS SQUAMULOSA* AND INTERSPECIFIC COMPETITION WITH *I. CAPENSIS* (REPTILIA, LACERTIDAE) IN THE TRANSSVAAL.

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Pretoria 0001
R.S.A.

ABSTRACT
The staggered life cycles of *I. squamulosa* and the related species *I. capensis* are ascribed by Broadley (1979) to avoidance of competition. This paper discusses this theory in the light of size, temporal and spatial distribution of the two species. Discussions on clutch size, time of laying and incubation period are incorporated.

SAMEVATTING
Die gespreide lewensiklusse van *I. squamulosa* en die verwante spesie *I. capensis* word deur Broadley (1979) aan die gevolge van vermyding van kompetisie toegeskryf. Hierdie artikel bespreek hierdie teorie met betrekking tot liggaamsgrootte en ruimtelike verspreiding tussen die twee spesies. Besprekings oor broeislegrootte, wanneer die eiers gele word en uitbroei tyd, word ingelyf.

INTRODUCTION
Broadley (1967, 1979) discussed aspects of the biology of sympatric populations of the rough-scaled lizards *Ichnotropis squamulosa* and *I. capensis*. According to Broadley (1979) both are short-lived "annual" species which apparently achieve resource partitioning by staggered life cycles, thereby reducing interspecific competition between similar-sized lizards. This paper presents additional data indicating that the theory that the staggered life cycles of these species avoids interspecific competition has, as yet, not been proven.

MATERIALS AND METHODS
During the current survey of reptiles and amphibians of the Transvaal, the reproductive state of 19 gravid *I. squamulosa* females was established by dissection.
Measurements of follicles and ova were made with Vernier callipers. Only developing, large vitellogenic follicles and oviducal ova were measured as in most cases undeveloped ovarian follicles were also present. No examination of the ovaries for the presence or absence of *caperea laeta* was made. It should be pointed out here that the gaps in the above sample of *I. squamulosa* reflect collecting procedures and may not be due to paucity of animals.
recorded for the spring laying *Ichnotropis capensis*. (Jacobsen 1982). Low winter temperatures appear to delay egg development to an extent that juveniles are prevented from hatching while food resources are possibly inadequate. This is an unusual mechanism for a species of tropical origin.
Size
The monthly size ranges of Transvaal *I. squamulosa* (Table 3) approximate those recorded by Broadley (1979) for Zimbabwe, suggesting a similar life cycle in the Transvaal. The three individuals collected during October are leftovers from the previous season which is quite different to that described by Broadley (1979) from Zimbabwe.
In the Transvaal, and at the Nylsvley Nature Reserve in particular, *Ichnotropis capensis* hatches during January/February thereby lagging behind *I. squamulosa* by two months (Jacobsen, 1982). Hatching *I. capensis* range in size from 19.0-22.0 mm S.V length, while juvenile *I. squamulosa* are \pm 38.0 mm S.V length at this time (Table 4). Therefore there should still be competition for similar food resources. Adult *I. capensis* (55.0 mm and larger S.V length) are still present in the population during January/February (Table 3), at which time *I. squamulosa* of that size are also present (Table 2, and Broadley, 1979).
This means that competition for food is not totally eliminated on a size basis only. Broadley (1979) mentions that both *I. squamulosa* and *I. capensis* showed flexible foraging behaviour, in contrast to Pianka (1971) who suggested that the former exhibited a "sit and wait" strategy. I am in agreement with Broadley (*loc cit*) finding both species very active while foraging. This does not mean that they compete for food, however, as *I. squamulosa* is a larger animal, both as a hatchling and as an adult, although some overlap in size occurs.
Although temporal segregation is suggested (Broadley 1967, 1979) as a means of resource partitioning, the examples of food eaten by the two species (Broadley, 1979) show that they prey to a degree on different species. On the Nylsvley Nature Reserve the most important prey of *I. capensis* were Isoptera (Termitidae) (2.7%), Araneae (21.5%), Coleoptera (20.1%) and Orthoptera (14.4%) (Jacobsen, 1982). Broadley (1979) mentions Orthoptera as important prey for *I. squamulosa* but gives little supportive data.
It is also apparent that in some areas the two species do not always occur sympatrically, as within the *Burkea africana* - *Eragrostis pallens* savanna study area on the Nylsvley Nature Reserve, near Naboosengruit, Transvaal (Jacobsen, 1982). Here there is apparent allopatry with *I. squamulosa* occurring in more open, sandy, grassland fringing the *Burkea* savanna. *I. capensis*, on the other

Previous research on the herpetofauna of the Nylsvley Nature Reserve (Jacobsen 1982) provided size range measurements for *Ichnotropis* which were used for comparison of snout-vent lengths and mass during this study.

RESULTS
Table 1 lists the reproductive data for the 19 *I. squamulosa*.
The follicles and ova in the ovaries and oviducts were at different stages of development. It was possible, by counting the largest, to estimate clutch size.
In the sample of 14, clutch size varied from 4 to 12 but was in 50% of the sample eight or more (Table 2).
Snout-vent lengths and mass for *I. squamulosa* and *I. capensis*, captured during the current survey of reptiles and amphibians of the Transvaal, are shown in Table 3 and 4 and Fig 1 and 2, respectively.

DISCUSSION
Time of laying
FitzSimons (1943) records the size of eggs at time of laying as 10-12 x 7.0 mm. This indicated that many of the ova measured *in situ* were very close to being laid (Table 1). Those recorded for March were still in various stages of development, including vitellogenic as well as ovarian follicles. Three captive females laid eggs on the 10th May (Table 2). It appears therefore that the months April-May are the main egg-laying months with isolated cases being noted as late as July.
Incubation
Hatchlings of *I. squamulosa* have mainly been recorded for November, with an isolated record for October (Broadley, 1979).
This means that the eggs have an extended incubation period of five to six months in contrast to the 56-77 days

hand, occurs exclusively within the more wooded *Burkea* savanna, possibly only meeting *I. squamulosa* on the fringes of its range. There is therefore a spatial separation as well as a temporal one.

CONCLUSION
It remains to be determined whether interspecific competition is a possible selective pressure, selecting in this instance for temporal as well as spatial separation.
Differences in size between the two *Ichnotropis* are not great enough to totally avoid food competition, particularly as the adults frequently feed on small prey if the opportunity arises (eg. Isoptera).
Attention should be focussed on the composition and size of prey consumed by both species throughout their life cycle in order to determine the overlap. This would be particularly applicable during the early life stages when the hatchlings and juveniles are under greatest stress, seeking food and avoiding predators.

ACKNOWLEDGEMENTS
I thank W. Haacke for the critical reading of the manuscript. R. Newbery and W. Peterson assisted with the collection of specimens. The Director of the Transvaal Nature Conservation Division is thanked for permission to publish this article.

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BROADLEY, D-G. 1979. A field study of sympatric "annual" lizards (genus *Ichnotropis*) in Rhodesia. *S. Afr. J. Zool.* 14: 133-138.
FITZSIMONS, V.F. 1943. The Lizards of South Africa. *Transv. Mus. Mem.* 1: 1-528.
JACOBSEN, N.H.G. 1982. The ecology of the reptiles and amphibians in the *Burkea africana* - *Eragrostis pallens* savanna of the Nylsvley Nature Reserve, unpubl. M.Sc. Thesis, University of Pretoria.
PIANKA, E.R. 1971. Lizard species density in the Kalahari Desert. *Ecology* 52: 1024-1029.

Fig. 144a. *Ichnotropis capensis* in JACOBSEN (1987).

TABLE 4: Measurements of *Ichnotropis capensis* in the Transvaal

Month	N	Snout-vent length			Mass (g)		
		mean	SD	range	mean	SD	range
January	24	34,10±	15,29	21,0-55,0	1,35±	1,43	0,15-3,65
February	17	29,41±	13,29	22,0-58,0	0,83±	1,25	0,15-3,80
March	20	25,55±	2,32	20,5-29,5	0,38±	0,13	0,20-0,65
April	27	34,24±	4,48	27,5-53,0	0,81±	0,37	0,40-2,45
May	23	34,33±	3,18	27,0-40,5	1,11±	0,29	0,50-1,80
June	30	37,28±	3,97	24,0-42,0	1,24±	0,37	0,25-1,75
July	27	39,78±	2,06	37,0-44,0	1,48±	0,29	1,0-2,05
August	28	41,93±	2,57	33,0-46,0	1,71±	0,28	1,0-2,30
September	34	46,510	2,50	38,0-51,0	2,16±	0,41	1,1-3,30
October	36	51,25±	2,53	46,0-58,0	2,79±	0,47	1,9-4,05
November	39	53,10±	2,61	49,0-60,5	3,22±	0,46	2,45-4,25
December	34	53,48±	2,81	50,0-60,0	3,07±	0,44	2,40-4,30

Fig. 144b. *Ichnotropis capensis* in JACOBSEN (1987).

***Ichnotropis capensis* and *Ichnotropis grandiceps* in BRANCH et al. (1988)**

A provisional and annotated checklist of the herpetofauna of southern africa. - Journal of the Herpetological Association of Africa, 34 (1): 1-19.

Ichnotropis capensis
Following the recommendation of Loveridge (1957), Branch and Broadley (1985) made a successful application to the International Commission for Nomenclature (Anon, 1987) for the suppression of *Thermophilus* Fitzinger, 1843 and conservation of *Ichnotropis* Peters, 1854.

I. grandiceps

Fig. 145. *I. capensis* and *I. grandiceps* in BRANCH et al. (1988).

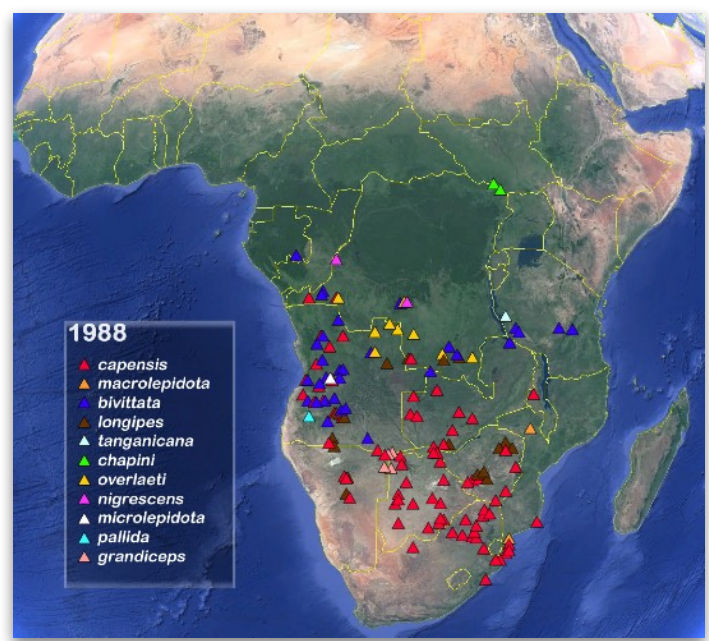


Fig. 146. All records listed up to 1988 with their original (sub)species designation.

***Ichnotropis capensis capensis* in BROADLEY (1988)**

A checklist of the reptiles of Zimbabwe, with synoptic keys. - *Arnoldia Zimbabwe*, 9 (30): 369-430.

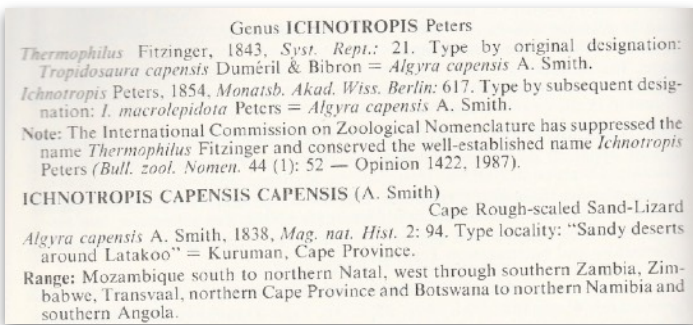


Fig. 147. *Ichnotropis capensis capensis* in BROADLEY (1988).

***Ichnotropis capensis* and *I. grandiceps* in BRANCH (1988)**

Field guide to snakes and other reptiles of southern Africa. - Struik Publishers, Cape Town. 326 pp.



Fig. 148. *Ichnotropis capensis* in BRANCH (1988).

Cape Rough-scaled Lizard *Ichnotropis capensis* (Pl. 61)
 16-18 cm; max. 20 cm
 A medium-sized lizard with a narrow head. The large body scales are in 20-44 rows at midbody. The frontonasal is undivided. There are four upper labials in front of the subocular, which borders the lip. The dorsal scales are strongly keeled and overlapping. There are 9-14 femoral pores on each thigh. Juveniles have a pale grey-brown back, with a white lateral stripe. In adults, the back becomes uniform grey to yellowish-brown or red-brown, with a narrow, white dorsolateral stripe that may be bordered above by a series of dark blotches. There is a broad, black stripe on the flank, bordered below by another white stripe. The belly is white. In breeding males, the white lateral stripe, chin and throat turn bright yellow, with an additional bright red stripe on the lower flank.

Biology and breeding: These lizards are active hunters, searching throughout the day for termites and other insects. Mating occurs in October-December, and is followed almost immediately by egg-laying. The female digs an inclined burrow 10-20 cm long in soft soil, and lays 3-9 eggs (6.5 x 9.5 mm). Development is rapid, and they hatch in 56-77 days, the hatchlings (60-70 mm) emerging in January-March. Two clutches may be laid by a female before she dies. Growth is rapid, and sexual maturity is reached in 7-8 months (14-15 cm). By December adults begin to disappear, although some may be present until May; it is unusual for an individual to live for longer than 13-14 months. **Habitat:** Arid and mesic savannah. **Range:** N. Zululand, Transvaal and S. Mozambique, through Botswana, Zimbabwe and NE. Namibia, to Angola and Zambia.

Caprivi Rough-scaled Lizard *Ichnotropis grandiceps*
 (Endemic) 15-18 cm, max. 22 cm
 A medium-sized species, similar to the Cape rough-scaled lizard, *I. capensis* (above), but with a larger head, small body scales in 44-47 rows at midbody, and without white borders to the dark dorsolateral stripe. The frontonasal is undivided. There are five upper labials in front of the subocular, which borders the lip. The dorsal scales are strongly keeled and overlapping. There are 13 femoral pores on each thigh. The back is pale grey-brown, with a few scattered, small, dark spots. A dark, broken dorsolateral band (which may be faint or absent) extends from the neck to the groin, where it breaks up into a line of lateral spots on the tail. The sides of the head and lower flanks are white stippled with grey, and the belly is white.

Biology and breeding: It is doubtful that this species is an 'annual' as adults and juveniles have been collected together. It lives together with both other species of rough-scaled lizards. **Habitat:** Open mesic savannah. **Range:** Caprivi Strip and adjacent: Botswana and NE. Namibia.

Fig. 149. *I. capensis* and *I. grandiceps* in BRANCH (1988).



Fig. 150. KIM M. HOWELL

***Ichnotropis bivittata* in BROADLEY & HOWELL (1991)**

A Check List of the Reptiles of Tanzania with synoptic keys. - Syntarsus, 1. 70 pp.

Abstract: This check list records 273 species of reptiles from Tanzania, divided among the suborders as follows: Pleurodira 6; Cryptodira 11; Sauria 120; Amphisbaenia 11; Serpentes 123; Crocodylia 2. Synoptic keys are provided for the identification of the various taxa. A zoogeographical analysis has resulted in the taxa being assigned to the floristic regions defined by WHITE (1983).

40. *Holaspis guentheri laevis*

41. *Adolus vauesesellii* (fp = frontoparietal)

42. *Ichnotropis capensis*

FIG. 40-42. Dorsal views of the heads of: 40, *Holaspis guentheri laevis*; 41, *Adolus vauesesellii* (fp = frontoparietal); 42, *Ichnotropis capensis*.

6b. Collar absent; dorsal scales large and strongly keeled; head shields keeled or striated (Fig. 42) *Ichnotropis*

Key to the genus **ICHNOTROPIS**

1a. Frontonasal single (Fig. 42); subocular bordering lip; 34-40 scales round middle of body 2
 1b. Frontonasal longitudinally divided; subocular not reaching lip; 46-58 scales round middle of body *I. squamulosa*
 2a. Dorsal head shields strongly keeled; prefrontal separated from the supraciliaries by small scales *I. bivittata bivittata*
 2b. Dorsal head shields feebly ridged; prefrontal in contact with supraciliaries *I. tanganicana*

ICHNOTROPIS BIVITTATA Bocage
 Angolan Rough-scaled Sand Lizard
Ichnotropis bivittata Bocage, 1866, *Jorn. Sci. math. phys. nat.*, 1: 43. Type locality: Duque de Bragança, Angola.
 Range: Southern Tanzania, west through northern Zambia and the Shaba Province of Zaire to Angola.

MAP. 2. Tanzania showing Floristic Regions (White, 1983) and important localities.

Key to Regions: Plain = Zambezi
 Horizontal stripes = Somalia - Masai
 Stippled = Afrostepane
 Cross-hatched = Lake Victoria
 Vertical stripes = East African Coastal Mosaic.

Fig. 151. *I. bivittata* in BROADLEY & HOWELL (1991).



Fig. 152. Mwinilunga (Zambia).

***Ichnotropis capensis* and *I. bivittata* in BROADLEY (1991)**

The herpetofauna of northern Mwinilunga District, northwestern Zambia. - *Arnoldia*, National Museums of Southern Rhodesia, 9 (37): 519-538.

Abstract: The amphibian fauna of northwestern Zambia was quite well known, but no systematic collection of reptiles had ever been made. This was rectified when I spent the period 23 September to 12 October 1990 based at Sakeji School near Ikelenge and collected 258 reptiles and 77 amphibians. Five reptile species are new for Zambia, i.e. *Adolfus africanus*, *Causus lichtensteinii*, *Limnophis bicolor*, *Thrasops j. jacksonii* and *Rhmannophis aethiopissa ituriensis*.

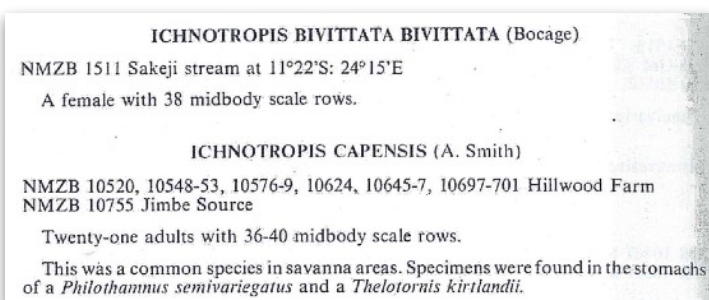


Fig. 153. *I. capensis* and *I. bivittata* in BROADLEY (1991).

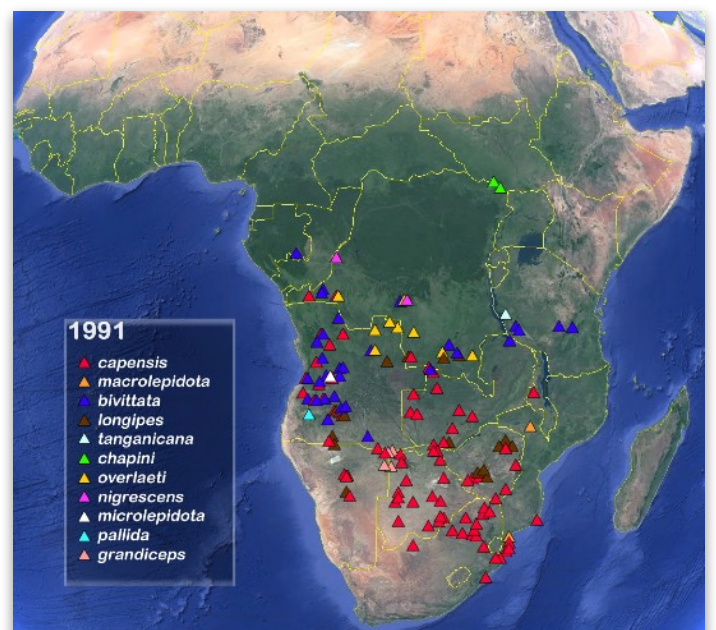


Fig. 154. All records listed up to 1991 with their original (sub)species designation.

***Ichnotropis* in BISCHOFF (1991)**

Übersicht der Arten und Unterarten der Familie Lacertidae. 2. Die Gattungen *Eremias*, *Gallotia*, *Gastropholis*, *Heliobolus*, *Holaspis* und *Ichnotropis*. - Die Eidechse, Bonn/Bremen, 1991 (2): 14-21.



Ichnotropis PETERS, 1854 [Rauhscuppeneidechsen]

An der Eigenständigkeit dieser Gattung besteht seit langem keinerlei Zweifel (vgl. BOULENGER 1921).

I. bivittata BOCAGE, 1866

bivittata bivittata BOCAGE, 1866

S-Tansania, Zaire, Kongo und Angola.

bivittata pallida LAURENT, 1964

Angola.

I. capensis (A. SMITH, 1838) [Rauhscuppige Kappeidechse]

capensis capensis (A. SMITH, 1838)

Von Tansania bis Namibia und zur Republik Südafrika.

capensis nigrescens LAURENT, 1952

Zaire.

I. chapini SCHMIDT, 1919

Zaire.

I. grandiceps BROADLEY, 1967

Botswana.

I. microlepidota MARX, 1956

Angola.

I. squamulosa PETERS, 1854 [Tropische Rauhscuppeneidechse]

Tansania, Sambia und S-Angola bis Namibia und N-Südafrika.

I. tanganicana BOULENGER, 1917

Tansania (O-Ufer des Tanganyika-Sees).

Fig. 155. *Ichnotropis* in BISCHOFF (1991).

***Ichnotropis capensis capensis* in BROADLEY & MCCARTNEY (1992)**

A report on a small collection of reptiles from southern Angola. - Journal of the Herpetological Association of Africa, 41 (1): 1-3.

New record: 50 km east of Cuito Cuanavale (Angola).

Ichnotropis capensis capensis (A. Smith 1838)

PEM R4822; approximately 50 km E of Cuito Cuanavale (15°14'S, 19°37'E: 1519Ba); caught in foxhole at about 10h00, 4 April 1988.

An adult male (45 + 104 mm), with two termite heads in stomach. Scutellation: 4 UL prior to subocular; 38 scales midbody; 24 lamella under fourth toe; occipital well-developed, crescentic, and extending only slightly behind parietals; striations on head well-developed: 12/13 femoral pores.

Remarks: This specimen appears to be the first record of the nominate race from Angola.

Fig. 156. *I. capensis* in BRANCH & MCCARTNEY (1992).

***Ichnotropis* in BRANCH (1993)**

A photographic guide to snakes and other reptiles of southern Africa. - Struik Publishers, Cape Town. 144 pp.

See BRANCH (1988).

NOT AVAILABLE



Fig. 157. Museum für Naturkunde - Berlin - Germany.

***Ichnotropis* in BAUER & GÜNTHER (1995)**

An annotated type catalogue of the lacertids (Reptilia: Lacertidae) in the Zoological Museum, Berlin - Mitteilungen aus dem Zoologischen Museum in Berlin, 71: 37-62.

***Ichnotropis bivittata* in BAUER & GÜNTHER (1995)**

Ichnotropis bivittata BOCAGE (166: 43)

Syntype: ZMB 5827; "Duque de Bragança" [Angola]; coll. Sr. BAYAO; don. J. V. BARBOZA du BOCAGE.

Remarks: The original description mentions "various exemplares", of which ZMB 5827 appears to be one. It is assumed that any syntypes in Lisbon were destroyed by fire in 1975.

Ichnotropis capensis see *Ichnotropis macrolepidot[a]*

Fig. 158. *Ichnotropis bivittata* in BAUER & GÜNTHER (1995).

***Ichnotropis macrolepidot[a]* in BAUER & GÜNTHER (1995)**

Ichnotropis macrolepidot[a] W. PETERS (1854: 617)

Syntype: ZMB 6123, 2 specimens; "Lourenço Marques" [= Maputo, Mozambique]; coll. W. PETERS.

Present Name: *Ichnotropis capensis* (SMITH, 1838)

Remarks: PETERS (1854) did not specify the number of specimens in the type series, but only two specimens were listed by LICHTENSTEIN (1856). The specific epithet was originally published as *macrolepidot* but was subsequently corrected to *macrolepidota* (PETERS 1855).

Fig. 159. *Ichnotropis macrolepidot[a]* in BAUER & GÜNTHER (1995).



Fig. 160. Transvaal Museum - Pretoria - South Africa.

***Ichnotropis* in JACOBSEN (1997)**

Sub-order Sauria: Family Lacertidae: Genus *Ichnotropis* - Proceedings of the Fitzsimons Commemorative Symposium - South African Lizards: 50 years of Progress and Third H.A.A. Symposium on African Herpetology. Transvaal Museum, Pretoria, South Africa. Herpetological Association of Africa. 277 pp.

The genus *Ichnotropis* Peters is African in origin with eight taxa (Welch 1982) being found from the tropics to the northern Cape Province. Only three taxa occur in the South African subregion, one of which is endemic. The taxonomy of the genus appears to be straightforward with the exception of *I. capensis* (A. Smith) as discussed below.

These lizards are small to medium sized, reaching a SVL of 65-76 mm. Head shields are normal but occipital sometimes absent; nostril pierced between 3 nasals. Lower eyelid scaly; collar absent. A short fold of skin in front of the arm. Dorsal scales large, rhombic or lanceolate, strongly keeled and imbricate. Ventral plates smooth and overlapping; subdigital scales sharply keeled, spinulose; femoral pores present. Tail long and cylindrical. Oviparous reproductive mode. These lizards display interesting life cycles which could provide opportunities for further research.

Problem Areas and Taxa

The South African species of the genus *Ichnotropis* do not appear to be problematic. Despite this, it is

necessary to clarify whether the seven races of *I. capensis* listed by Laurent (1964) are valid, requiring the use of trinomials when referring to this taxon. At least one, '*bivittata*' has been made a full species. Loveridge (1953) and Broadley (1966) have pointed out the futility of recognising *longipes* as a north-eastern race, as the characters used in distinguishing it from the nominate race overlap extensively.. Therefore these taxa must be viewed in synonymy. Whether there is justification for the other races '*overlaeti*', '*tanganicana*', '*nigrescens*' or '*chapini*' has not been established. Welch (1982) lists both *chapini* Schmidt and *tanganicana* Boulenger as full species, as well as listing *overlaeti* and *longipes* in the synonymy of *capensis*. The justification for these changes are unclear. Transvaal populations of *I. capensis* appear to differ morphologically from populations in Zululand but as these populations are not contiguous these differences may merely reflect clinal relationships. It appears that the Zululand population is the most south-eastern and linked to the Transvaal population via southern Mozambique, Zimbabwe and Botswana.

Fig. 161. *Ichnotropis* in JACOBSEN (1997).

***Ichnotropis capensis* in VONESH (1998)**

The amphibians and reptiles of Kibale forest, Uganda: Herpetofaunal survey and ecological study of the forest floor litter community. - M.Sc. Thesis, Department of Zoology, University of Florida. 101 pp.

In DE WITTE (1966) there is no record of *Ichnotropis capensis*, only the "*Ichnotropis capensis chapini*" record of SCHMIDT (1919) is mentioned.

Taxon	KOR	VIR	GAR	KIB	BWI	USA	UZU	ARA
<i>Ichnotropis capensis</i>			X					
Garamba National Park (GAR; DeWitte, 1966)								

Fig. 162. "*Ichnotropis capensis*" in VONESH (1998).

***Ichnotropis capensis* in TIMBERLAKE (1998)**

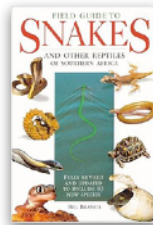
Biodiversity of the Zambezi Basin Wetlands. - Consultancy report IUCN. 155 pp.

New and additional records for: Zambezi headwaters (Zambia), Barotse floodplain (Zambia), Sesheke-Chobe floodplain (Botswana), Okavango Delta (Botswana) and Lower Shire Valley (Mozambique).

Taxon	Zhw	Bar	Cho	Kaf	Oko	Del	LSh	Pun	S	U	B	C
<i>Ichnotropis capensis</i>	X	X	X		X		X			X		

Source: D.G. Broadley (pers. comm.)
 Key: ZHW(1)=Zambezi headwaters; BAR(2)=Barotse floodplain; CHO(3)=Sesheke-Chobe floodplain; KAF(4)=Kafue Flats; OKO(5)=Okavango Delta; DEL(6)=Zambezi Delta; SHR(7)=Lower Shire Valley; PUN(8)=Pungwe Flats. Distribution of taxa in extralimital wetlands is indicated in the four columns on the right: S=Sudan (White Nile swamps); U=Lac Upemba, Zaïre; B=Lake Bangweulu swamps, Zambia; C=Lake Chilwa basin, Malawi; P=species probably present.

Fig. 163. *Ichnotropis capensis* in TIMBERLAKE (1998).



***Ichnotropis* in BRANCH (1998)**

Field guide to the snakes and other reptiles of southern Africa. Third Edition. - Struik Publishers, Cape Town. 368 pp.



See BRANCH (1988).

***Ichnotropis capensis* in VANHOODYDONCK & VAN DAMME (1999)**

Evolutionary relationships between body shape and habitat use in lacertid lizards. - *Evolutionary Ecology Research*, 1: 785-805.

Abstract: The aim of this study was to determine if divergence in habitat use among lacertid lizards is paralleled by morphological differentiation. For 35 lacertid species, we measured body, head and limb dimensions. Habitat use was inferred from the literature: ground-dwelling on open terrain, ground-dwelling in vegetated areas, shrub-climbing, tree-climbing, saxicolous (i.e. rock-climbing). Traditional (i.e. non-phylogenetic) statistical analyses suggest morphological differences among species groups with different habitat use. Ground-dwelling species from open habitats tend to have longer femurs, tibiae and humeri (relative to body length) than other groups. Cursorial (i.e. level-running) species have relatively high heads and trunks compared to climbing species. These differences follow bio-mechanical predictions and it is tempting to consider them as adaptations to habitat use. However, phylogenetic analyses of the data fail to establish a clear relationship between habitat use and morphology in the data set considered. There is a weak indication that the differences in head and trunk height have evolved as an adaptation to different habitat use, but the differences in relative limb dimensions among species groups with different habitat use vanish. Either adaptation of limb dimensions to habitat use has not occurred in lacertid lizards, or our methods are unable to demonstrate such an adaptation. We show that uncertainties in the topology of the phylogenetic tree used are unlikely to influence the outcome of our study. We also address the fact that habitat use is often similar in different branches of the phylogenetic tree, and the consequences this may have for the power of our statistical analyses.

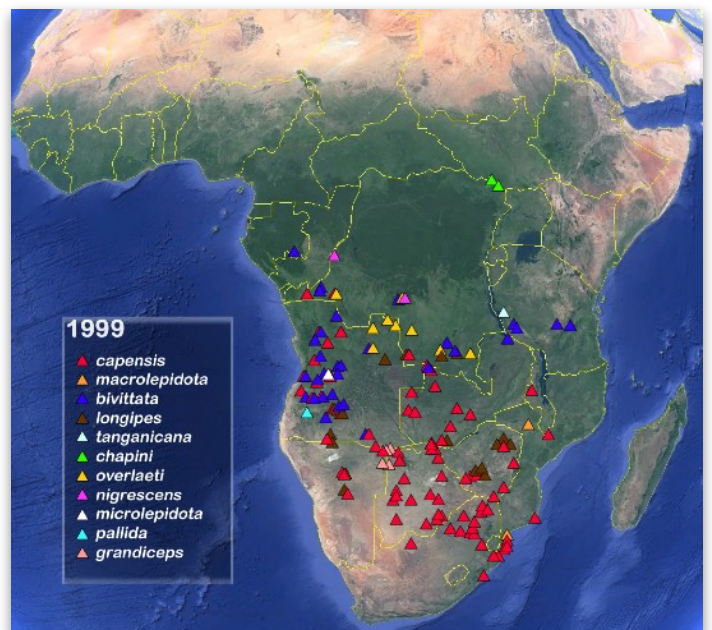


Fig. 164. All records listed up to 1999 with their original (sub)species designation.

***Ichnotropis* in HAAGNER et al. (2000)**

Notes on a collection of reptiles from Zambia and adjacent areas of the Democratic Republic of the Congo. - *Annals of the Eastern Cape Museum*, 1: 1-25.

***Ichnotropis capensis* in HAAGNER et al. (2000)**

New records: Sakeji school (Zambia), Chingola (Zambia), Situnda Pan (Zambia), Siyenge Pans, Isoka (Zambia), Lusaka (Zambia) and Mbala (Zambia).

***Ichnotropis capensis* (A. Smith 1838)**

Material examined: PEM R6277-80, 6282-83 - Sakeji School, Northwestern Province (1124Ab); PEM R12489-90 - Chingola, Copperbelt Province (1227Db); PEM R12621 - Situnda Pan, Luiwa Plains National Park, Western Province (1422Da); PEM R12622-23 - Siyenge Pans, Luiwa Plains National Park, Western Province (1422Dd): 12 adult males, the largest measuring 189(64+125)mm; 5 adult females, the largest intact specimen measuring 164(61+103)mm. Another female (PEM R1999) had a SVL of 68 mm. Light brown dorsum with well developed lateral lines, absent in one female (PEM R6277). Supralabials 8, supralabials anterior to subocular 4, midbody scale rows 38-40, lamellae under fourth toe 19-22, pre-frontal not in contact with anterior supra-ocular.

Additional material: PEM R6394-97 - Isoka, Northern Province (1032Ba), E Knowles-Jordan; PEM R1999 - Lusaka, Central Province (1528Ad); PEM R2817-18 - Mbala, Northern Province (0831Cd), H Bredo; PEM R12318-21 - Balovale, Northwestern Province (1323Ca).

Diet: Only two stomachs were empty. Prey items included: Isoptera (6), Orthoptera (7), Coleoptera (3) and Araneae (3). Four specimens from Sakeji all contained numbers of worker termites: PEM R6278 with 48, R6283 - 32, R6281 - 29 and R6279 with 27. The last also contained a small cricket and one Chingola specimen (PEM R12489) contained 22 worker termites, 6 termite heads and one soldier. Simbotwe and Garber (1979) reported that Isoptera comprised 99.6% of the diet of *I. capensis* from the Dambwa Forest Reserve (1725Dd).

Fig. 165a. *Ichnotropis capensis* in HAAGNER et al. (2000).

Reproduction: An adult Sakeji female (PEM R6277) contained no developing ova during July; a female from Lusaka (PEM R1999) had 6(3/3) ova (6.8x4.2mm) in December; and 2 females (PEM R2817-18) from Mbala had 7(4/3) and 6(3/3) ova, respectively, (4.3-4.6x2.9-3.8mm) in December. Males collected during January had a rich bronze-brown colour and their testes appeared inactive (flaccid, 3.2-4.6x2.6-3.2mm). Three males collected during October (PEM R12621-23) were in breeding colouration (bright orange flanks, dorsolateral white line, dorsum rusty brown, ventrum cream) with large testes (6.0-6.8x2.8-3.1mm).

Parasites: None found. Simbotwe (1979) reported nematodes (*Parathelandros* sp.) from the stomach of a specimen from Dambwa Forest Reserve (1725Dd).

Notes: Although Broadley (1971a) recorded this species as widespread in western Zambia, no previous records appear to exist for the Copperbelt Province. The Chingola records indicate a north-westerly range extension of more than 300km. Broadley (1979) recorded asynchronous reproductive cycling between the 'annual' lizards *I. capensis* and *I. squamulosa*. The presence of adults of both *I. capensis* and *I. bivittata* in July at Sakeji mitigates against the same phenomenon occurring between the latter two species.

Fig. 165b. *Ichnotropis capensis* in HAAGNER et al. (2000).

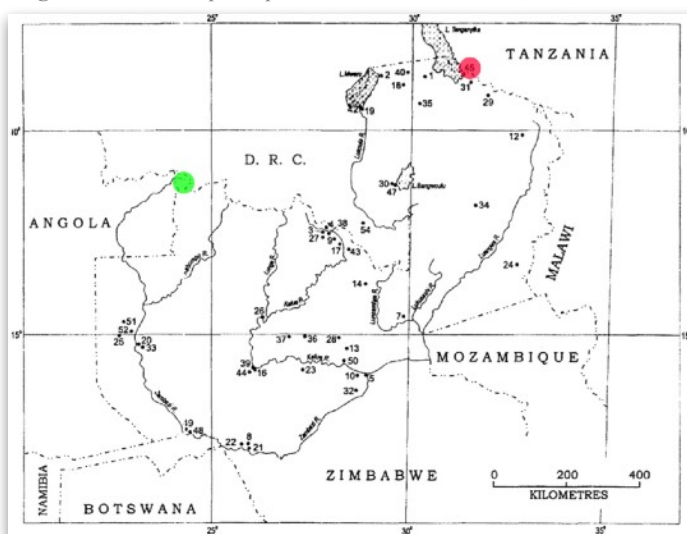


Fig. 166. Collection localities in HAAGNER et al. (2000).

The listed location of Sakeji school is wrongly indicated on this map (red dot) and should have been at the location of the green dot.



Fig. 167. Sakeji school, in the northwest of Zambia.

Ichnotropis capensis in ARNOLD (2002)

History and function of scale micro-ornamentation in lacertid lizards. - *Journal of Morphology*, 252 (2): 145-169.

Abstract: Differences in surface structure (oberhautchen) of body scales of lacertid lizards involve cell size, shape and surface profile, presence or absence of fine pitting, form of cell margins, and the occurrence of longitudinal ridges and pustular projections. Phylogenetic information indicates that the primitive pattern involved narrow strap-shaped cells, with low posteriorly overlapping edges and relatively smooth surfaces. Deviations from this condition produce a more sculptured surface and have developed many times, although subsequent overt reversals are uncommon. Like variations in scale shape, different patterns of dorsal body micro-ornamentation appear to confer different and conflicting performance advantages. The primitive pattern may reduce friction during locomotion and also enhances dirt shedding, especially in ground-dwelling forms from moist habitats. However, this smooth micro-ornamentation generates shine that may compromise cryptic coloration, especially when scales are large. Many derived features show correlation with such large scales and appear to suppress shine. They occur most frequently in forms from dry habitats or forms that climb in vegetation away from the ground, situations where dirt adhesion is less of a problem. Micro-ornamentation differences involving other parts of the body and other squamate groups tend to corroborate this functional interpretation. Micro-ornamentation features can develop on lineages in different orders and appear to act additively in reducing shine. In some cases different combinations may be optimal solutions in particular environments, but lineage effects, such as limited reversibility and different developmental proclivities, may also be important in their genesis. The fine pits often found on cell surfaces are unconnected with shine reduction, as they are smaller than the wavelengths of most visible light.

Ichnotropis bivittata bivittata in HAAGNER et al. (2000)

Ichnotropis bivittata bivittata (Bocage 1866)

Material examined: PEM R6280, R6284 - Sakeji School, Northwestern Province (1124Ab): 1 adult male measuring 126(42+84)mm and 1 adult female, SVL 40mm. Supralabials 8, mid-body scale rows 38-39, lamellae under 4th toe 17-18.

Diet: The female contained a large grasshopper and 16 ant mandibles; the male contained 5 ant mandibles.

Reproduction: The male's testes measured 4.2x2.7mm; the female contained no developing ova.

Notes: PEM R6280 was removed from the stomach of a *Thelotornis oatesi* (PEM R6195). This species was known from only one specimen from Mbala, Northern Province (0831Cd), until 1957, when Frank Ansell collected another (NMZB 1511) in the Northwestern Province. The above are only the third and fourth specimens for Zambia. Adults of both *I. bivittata* and *I. capensis* were collected from Sakeji during July, and it may be significant that *I. bivittata* had only eaten ants and *I. capensis* contained only termites (Broadley, pers. comm.).

Fig. 168. *Ichnotropis bivittata* in HAAGNER et al. (2000).

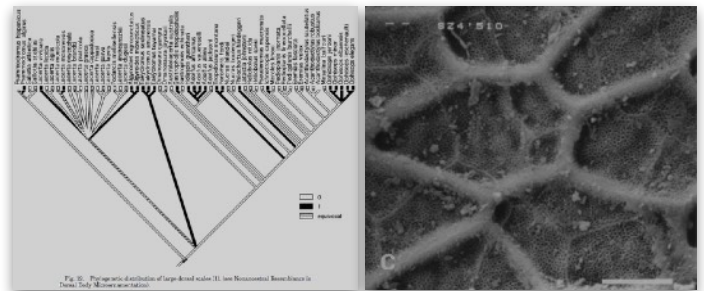


Fig. 169. Phylogenetic distribution of large dorsal scales (1) in *Ichnotropis*. Based on data from HAAGNER et al. (2000).

Fig. 170. Micro-ornamentation on dorsal scales of *I. capensis* (x4,000) in ARNOLD (2002).

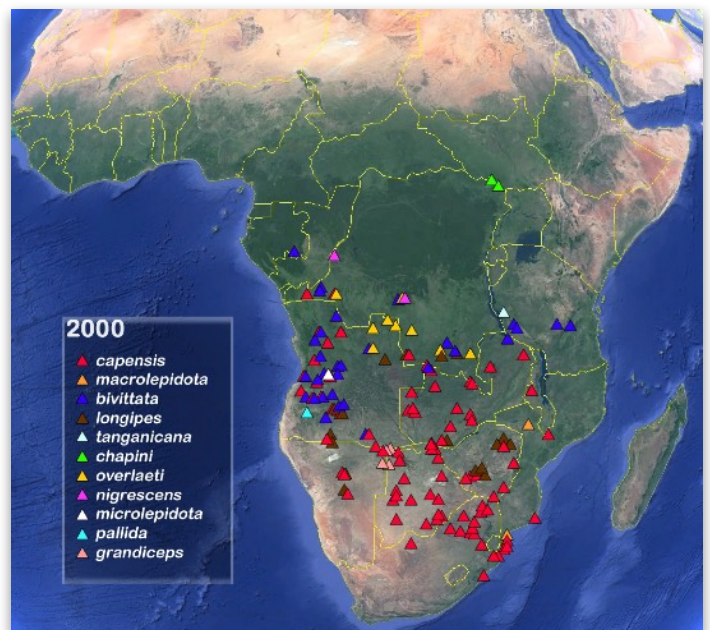
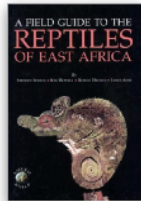


Fig. 171. All records listed up to 2000 with their original (sub)species designation.



Ichnotropis in SPAWLS et al. (2002)
Field Guide to the Reptiles of East Africa. -
Princeton University Press: 543 pp.

Ichnotropis bivittata in SPAWLS et al. (2002)

IDENTIFICATION:

The Angolan Rough-scaled Lizard is a slender, medium sized (snout-vent to 7.8 cm; total length to 24.5 cm) lacertid with a pointed snout and distinctive colour pattern. On the head, the frontonasal scale is single, undivided, the dorsal head shields strongly striated or keeled; the prefrontal scale is separated from the supraciliaries by one or two rows of small scales and the subocular scale borders the upper lip. The dorsal and lateral scales are enlarged, pointed, overlapping and strongly keeled in 34 to 40 rows around the middle of the body; the ventral scales are rounded, hexagonal, arranged in eight to 10 longitudinal rows, 27 to 33 transverse series. There are 18 to 24 spiny lamellae between the fourth toe, and nine to 13 femoral pores on each thigh. The dorsal colour pattern consists of a well-demarcated, broad, bronzy brown to coppery reddish uniform stripe that includes the entire top of the head and width of the back and extends the length of the body to the tip of the tail. The brown dorsal stripe is bordered laterally by an unmarked, jet-black stripe originating at the nostril, passing beneath the eye and extending the length of the body and tail; at midbody, the black stripes are about half the width of the dorsal stripe; these are, in turn, bordered by thin, pure white, lateral stripes about two scales wide, originating on the rostral scale, passing posteriorly through the dorsal half of the upper labial scales, the length of the body (somewhat diffuse at midbody) and onto the



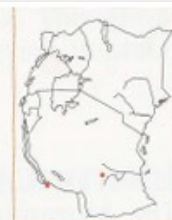
Fig. 172a. *Ichnotropis bivittata* in SPAWLS et al. (2002).



Fig. 173. Mamili National Park, Namibia.

ANGOLAN ROUGH-SCALED LIZARD, (*ICHNOTROPIS BIVITTATA*), ZAMBIA.

Robert Drewes



tail beyond its base. A second pair of black stripes, passing through the lower edge of the upper labial scales and the upper edge of the lower labials, originates at the snout, broadens beyond the mouth and terminates at the origin of the forelimbs. Beneath, the Angolan Rough-scaled lizard is whitish, usually unmarked. In breeding males, there is frequently a brilliant orange-red stripe between the fore- and hindlimbs, and the white stripes anterior to midbody can be bright chrome yellow. Juveniles may have similar, less-distinct markings as adults, occasionally pattern-less except for a round white spot above the shoulder.

HABITAT AND DISTRIBUTION:

In East Africa, the Angolan Rough-scaled Lizard is known only from two specimens collected at Ipeni, Udzungwa Mtns; it also occurs just across the Zambian border at the south end of Lake Tanganyika. The species is clearly an inhabitant of both drier and wetter miombo woodland habitats and might be expected in more localities in southern Tanzania. The range of *I. bivittata* extends west from southern Tanzania, through northern Zambia and Shaba Province, Congo to Angola.

NATURAL HISTORY:

The Angolan Rough-scaled Lizard is probably not an "annual species" (see *I. squamulosa*). It is a diurnal predator on insects and can be found active during the warmest part of the day. Although evidently favouring sandy open areas, specimens have been encountered in wooded *Brachystegia* areas as well.

Fig. 172b. *Ichnotropis bivittata* in SPAWLS et al. (2002).

Ichnotropis tanganicana in SPAWLS et al. (2002)**IDENTIFICATION:**

Known only from the type specimen (possibly a subadult), the Tanzanian Rough-scaled Lizard appears to be a rather small (snout-vent 3.8 cm; tail absent) lacertid similar to the Angolan Rough-scaled Lizard in possessing a single, undivided frontonasal scale and the subocular scale bordering the lip, but differing from it in smaller size, in the prefrontal scale in contact with the supraciliaries, and the head shields being weakly striated or keeled. The dorsal and lateral scales are enlarged, pointed, overlapping and strongly keeled in 36 rows at midbody; the ventral scales are smooth and in eight longitudinal and 25 transverse series. There are 19 lamellae beneath the fourth toe and 11 or 12 femoral pores under the thighs. The original description of the colour pattern includes "bronzy olive above with a few small transverse blackish spots in three longitudinal series on the nape and two on the body; a black streak from the nostril to the eye, and another on the edge of the mouth; a white, black-edged streak from below the eye, through the ear, to above the axil; white, black-edged ocellar spots on the posterior part of the back, on the hind limbs, and on the tail; lower parts white."

TANZANIAN ROUGH-SCALED LIZARD
(Ichnotropis tanganicana)


Based on the feeble striation of the head scales and aspects of the arrangement of the head shields, the describer of this species, G. A. Boulenger, considered it to be the most primitive member of the genus.

HABITAT AND DISTRIBUTION:

The Tanzanian Rough-scaled Lizard is known only from a single specimen collected at an unspecified locality on the east coast of Lake Tanganyika, in western Tanzania. This entire area is within the wetter Zambezi miombo woodland vegetation type.

NATURAL HISTORY:

Nothing is known of the natural history of this species.

Fig. 174. *Ichnotropis tanganicana* in SPAWLS et al. (2002).

Ichnotropis capensis and *Ichnotropis grandiceps* in GRIFFIN (2002)

Annotated Checklist and Provisional Conservation Status of Namibian Reptiles. - Technical Reports of Scientific Services Nr. 1. Windhoek: Ministry of Environment and Tourism. 76 pp.

Ichnotropis capensis in GRIFFIN (2002)

New records: Mamili National Park, Etosha National Park, Mangetti Game Camp and Mahango Game Reserve (Namibia).

<i>Ichnotropis capensis</i> (A. Smith)	CAPE ROUGH-SCALED LIZARD
Probably represented in Namibia by the nominate taxon (subspecific taxonomy in disarray):	
<i>Ichnotropis capensis</i> (A. Smith, 1838)	
<i>Algyra capensis</i> A. Smith, 1838b: 94; ΔSandy Deserts around Latakooë (=Kuruman, South Africa).	
DISTRIBUTION: From Windhoek, north and east, throughout the entire north-eastern quarter of Namibia; including Caprivi (terrestrial). <i>Potential proportion of taxon's range:</i> MARGINAL ; extralimital range to Angola, Zambia, Botswana and Zimbabwe.	
REMARKS: <i>Namibian Conservation and Legal Status:</i> SECURE-SP (taxonomy of subspecies); WILD ANIMAL (PROTECTED) . <i>International Status:</i> Not listed. A related Angolan species, <i>Ichnotropis bivittata</i> (Bocage) may cross into north-western Namibia (E.N. Arnold. pers.comm.). This species is known or expected to occur in the Mamili National Park, Mudumu National Park, Caprivi Game Park, Mahango Game Reserve, Popa Game Park, Mangetti Game Camp, Etosha National Park, and the Waterberg Plateau Park.	

Fig. 175. *Ichnotropis capensis* in GRIFFIN (2002).

Ichnotropis grandiceps in GRIFFIN (2002)

<i>Ichnotropis grandiceps</i> Broadley	CAPRIVI ROUGH-SCALED LIZARD
Represented in Namibia by the nominate taxon (no additional taxa are currently recognised):	
<i>Ichnotropis grandiceps</i> Broadley, 1967	
<i>Ichnotropis grandiceps</i> Broadley, 1967: 1; Δ25 miles west of Moheumbo, Botswana, on the border of the Caprivi Strip (South West Africa). Type specimens in USNM and NMZB-UM.	
DISTRIBUTION: Eastern Kavango & western Caprivi (terrestrial). <i>Potential proportion of taxon's range:</i> c. 75%; extralimital range to Botswana and probably Angola.	
REMARKS: <i>Namibian Conservation and Legal Status:</i> ENDEMIC & SECURE - SP (distribution); WILD ANIMAL (PROTECTED) . <i>International Status:</i> Not listed. This species is known or expected to occur in the Caprivi Game Park, Mahango Game Reserve, Popa Game Park and the Khaudom Game Park.	

Fig. 176. *Ichnotropis grandiceps* in GRIFFIN (2002).

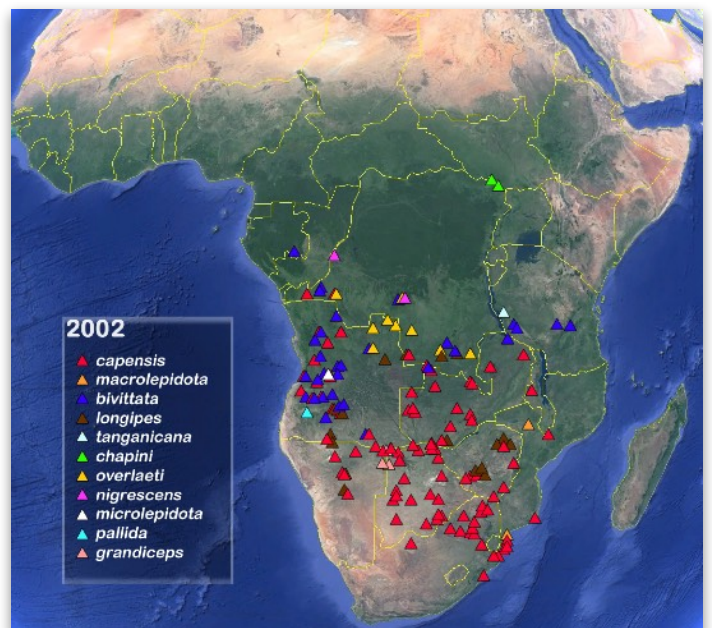


Fig. 177. All records listed up to 2002 with their original (sub)species designation.

***Ichnotropis capensis* and *Ichnotropis grandiceps* in BROADLEY (2004)**

Herpetofauna of the four corners area. - In: TIMBERLAKE, J.R. & S.L. CHILDES (Eds.): Biodiversity of the Four Corners Area: Technical Reviews Volume Two (Chapters 5-15). - Occasional Publications in Biodiversity No 15, Biodiversity Foundation for Africa, Bulawayo/ Zambezi Society, Harare, Zimbabwe: 313- 346.

Species	Common name	Ang	Bot	Cap	Zam	Zim
<i>Ichnotropis capensis</i>	Cape Rough-scaled Lizard	O	X	X	X	X
<i>Ichnotropis grandiceps</i>	Caprivi Rough-scaled Lizard		X	X		

Ichnotropis capensis (A. Smith 1838) Cape Rough-scaled Sand Lizard
A common medium-sized sand lizard found from S Angola and NE Namibia to Zambia, southern DRC, Botswana, Zimbabwe, northeastern parts of South Africa and S Mozambique [CPS]. It is an 'annual' species, eggs being laid in November/December and hatching in January/March. Few adults survive into their second year (Broadley 1967b, 1974)

Ichnotropis grandiceps Broadley 1967 Caprivi Rough-scaled Sand Lizard
A species with a relatively large head, known only from a small border area between Botswana and the W Caprivi (Broadley 1967a) [CAP], extending west into NE Namibia (Haacke 1970).

Fig. 178. *I. capensis* and *I. grandiceps* in BROADLEY (2004).

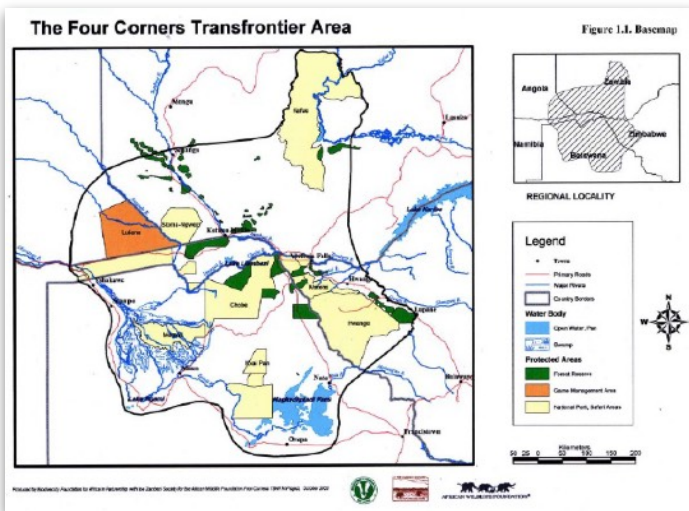


Fig. 179. The four corners area in TIMBERLAKE & CHILDES (2004).

***Ichnotropis* in BROADLEY & COTTERILL (2004)**

The reptiles of southeast Katanga, an overlooked 'hot spot'. - African Journal of Herpetology, 53 (1): 35-61.

***Ichnotropis bivittata* in BROADLEY & COTTERILL (2004)**

Ichnotropis bivittata Bocage 1866.—The Angolan Rough-scaled Lizard ranges from Angola east through southern Katanga, northern Zambia and northern Malawi to southern Tanzania. In the P.N.U. it inhabits the Kibara plateau (Witte 1953).

Fig. 180. *Ichnotropis bivittata* in BROADLEY & COTTERILL (2004).

***Ichnotropis capensis* in BROADLEY & COTTERILL (2004)**

Ichnotropis capensis (A. Smith 1838).—The Cape Rough-scaled Lizard has a wide range in south-central Africa. In the P.N.U. it occurs at low altitudes, 585 - 1050 m (Witte 1953 [as *I. longipes* Boulenger, a synonym]).

Fig. 181. *Ichnotropis capensis* in BROADLEY & COTTERILL (2004).

***Ichnotropis bivittata* in BISCHOFF (2005)**

Die Echten Eidechsen der Familie Lacertidae - eine Übersicht. - Draco, 5 (21): 4-27.

The shown image in BISCHOFF (2005) was made by FELIX HULBERT near Kinshasa in the Democratic Republic of the Congo in 2004. This specimen is also present with two images on www.lacerta.de.



Fig. 182. *Ichnotropis bivittata* in BISCHOFF (2005).

***Ichnotropis capensis* in SCHNEIDER et al. (2005)**

Checklist of Vertebrates of Mozambique. - Universidade Eduardo Mondlane Faculdade de Agronomia e Engenharia Florestal Departamento de Engenharia Florestal Maputo, Moçambique. 227 pp.

<i>Ichnotropis capensis</i> (Smith, 1838) (= <i>I. (I.) capensis</i>) (2)	Lagarto-de-cascaes-ograsa do Cabo	Cape Rough-scaled Lizard	KwaZulu (Rang), Namibe (Mau), Nyaminyinda (Torg), Nkolobalwa (Tson), Nhondwa (Sep), Nkomoze (Tava), Micalaluso, Nkolobalwa (Canda), Ezoany, Nyakalongo (Sh), Namita (Kis)
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Fig. 183. *Ichnotropis capensis* in SCHNEIDER et al. (2005).

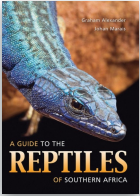
***Ichnotropis* in BRANCH (2006)**

Priorities for systematic studies on southern African reptiles. - In: BRANCH, W.R., K.A. TOLLEY, M. CUNNINGHAM, A.M. BAUER, G. ALEXANDER, J.A. HARRISON, A.A. TURNER & M.F. BATES (eds) (2006): A plan for phylogenetic studies of southern African reptiles: proceedings of a workshop held at Kirstenbosch, February 2006. Biodiversity Series 5. South African National Biodiversity Institute, Pretoria. 54 pp.

Family & genus	Sp. in Africa	Sp. in SADC region	New spp. known in SADC region	New spp. expected	Problem taxa/populations	Research effort Score (1-5)	Score (1-5) Funding needed	Total score
Lacertidae								
<i>Ichnotropis</i>	3	2		1	Capeensis	2	2	4

Ichnotropis Peters 1854
Taxa: Total: 3 South Africa: 2 Undescribed: 1?
Last generic revision: Laurent 1952.
Other taxonomic studies: Broadley 1967.
Current studies: None.
Remaining taxonomic problems:
• The status of the isolated coastal population of *I. capensis* in KwaZulu-Natal should be assessed.
• The relationship between *I. capensis* and northern taxa (e.g. *bivittata*, *tanganicana*), including a possible new species in Angola (Branch unpubl. obs.), remains unresolved.

Fig. 184. *Ichnotropis* in BRANCH (2006).



***Ichnotropis* in ALEXANDER & MARAIS (2007)**
 A Guide to the Reptiles of Southern Africa. -
 Struik publishers, Cape Town. 408 pp.

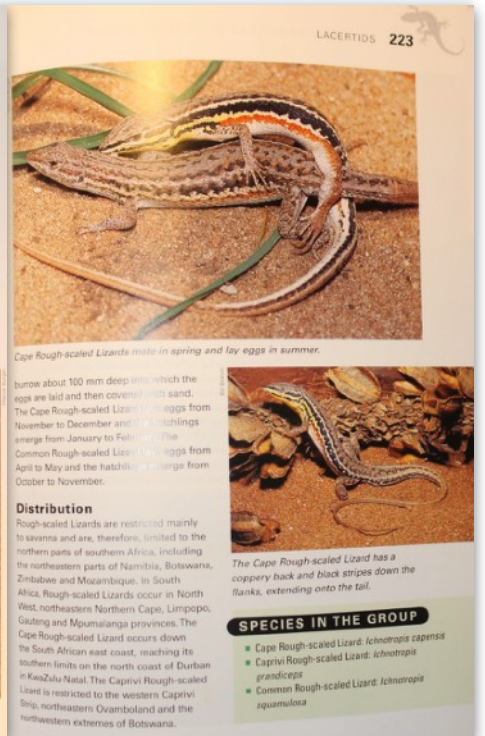


Fig. 185. *Ichnotropis* in ALEXANDER & MARAIS (2007).



Graham Alexander
 Johan Marais

Fig. 186. GRAHAM



Fig. 187. JOHAN MARAIS.

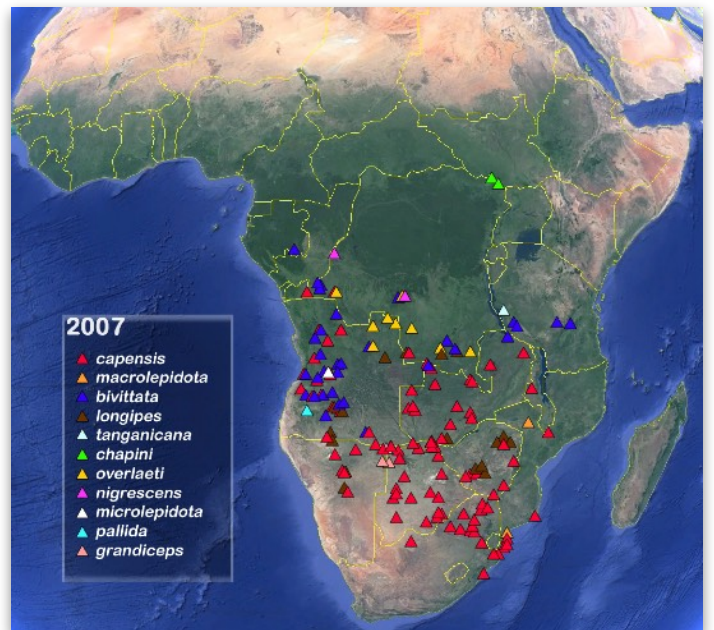


Fig. 188. All records listed up to 2007 with their original (sub)species designation.

***Ichnotropis capensis* in BAUER et al. (2009)**

The herpetofauna of Koanaka South and adjacent regions, Ngamiland, Botswana. - Herpetological Bulletin, 107: 16-26.

New record for Koanaka Hills (Botswana).

***Ichnotropis capensis* (Smith, 1838) (Fig. 9)**

Material: Five specimens: TNHC 68743–47 from the ‘Koanaka Hills.’

Habitat: TNHC 68743 was observed on a sand ridge northwest of Koanaka South. TNHC 68744 and TNHC 68745 were observed on a sandy track in dense shrub west of Koanaka South at 20° 09.167’ S, 21° 11.355’ E. TNHC 68746 and TNHC 68747 were caught in pitfall traps placed in dense shrub near Koanaka South.

Comments: Although the Koanaka area was included within Branch’s (1998) range map for this species, these specimens represent the first published record of voucher material for the Koanaka Hills and QDS 2021 Aa.

Fig. 189. *Ichnotropis capensis* in BAUER et al. (2009).

***Ichnotropis capensis* in MARAIS (2009a)**

Trip to Caprivi/Namibia with AARON BAUER and BILL BRANCH. - <http://www.johanmarais.co.za>

New record for Katima Mulilo.



Fig. 190. *Ichnotropis capensis* in MARAIS (2009a).

***Ichnotropis capensis* in MARAIS (2009b)**

Trip to Koanaka Hills, Botswana. - <http://www.johanmarais.co.za>



Fig. 191. *Ichnotropis capensis* in MARAIS (2009b).

***Ichnotropis grandiceps* in TURNER (2010)**

Ichnotropis grandiceps. - The IUCN Red List of Threatened Species.

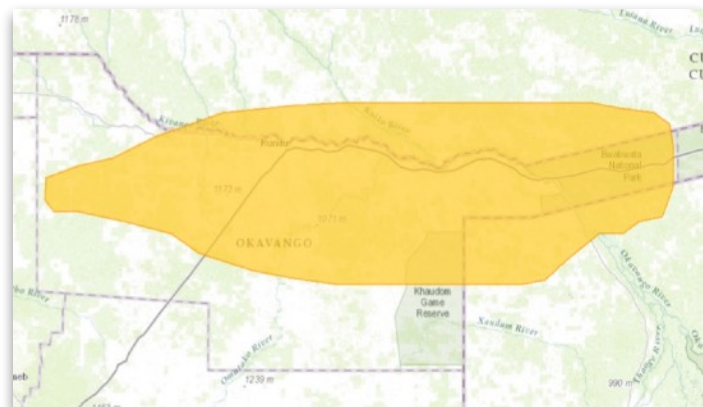


Fig. 192. *Ichnotropis grandiceps* in TURNER (2010).



Fig. 193. Pan and Aha Hills from Koanaka.

***Ichnotropis* in KAPLI et al. (2010)**

A re-analysis of the molecular phylogeny of Lacertidae with currently available data. - *Basic and Applied Herpetology*, 25: 97-104.

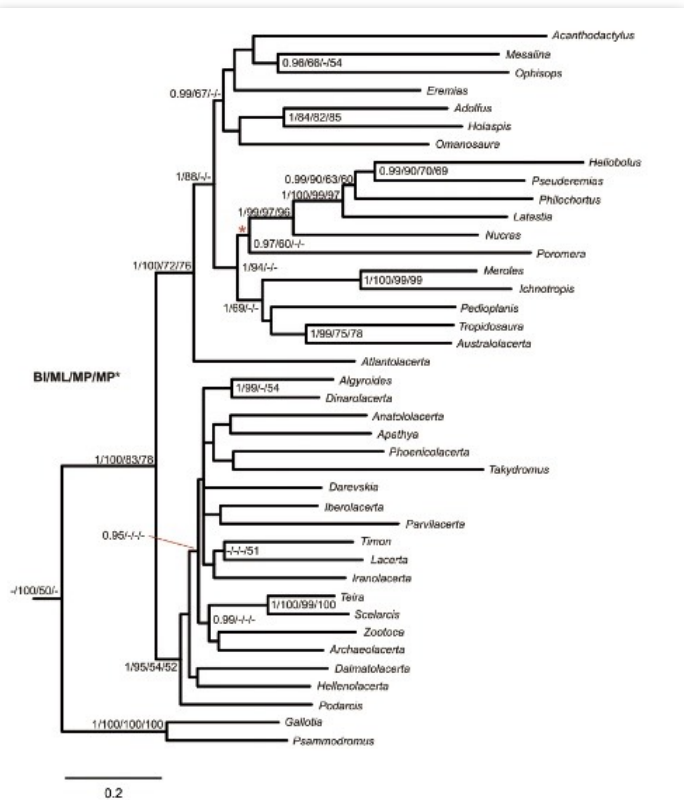


Figure 1: Phylogenetic relationships among the 40 genera included in the analyses as inferred by BI. Bayesian posterior probability values (> 0.95) are presented on the nodes followed by bootstrap values (> 50%) for ML, MP and MP* (considering the gap as a fifth character). Branch lengths statistically not significantly greater than zero are indicated with an asterisk (*). *Eumeces anthracinus*, *E. ergegius* and *E. inexpectatus* (Scincidae) were used as outgroup (not shown).

Fig. 194. *Ichnotropis* in KAPLI et al. (2010).



Fig. 195. San Sebastian Peninsula (Mozambique).

***Ichnotropis capensis* in JACOBSEN et al. (2010)**

A preliminary herpetological survey of the Vilanculos Coastal Wildlife Sanctuary on the San Sebastian Peninsula, Vilankulo, Mozambique. - *Herpetology Notes*, 3: 181-193.

Record for San Sebastian Peninsula (Mozambique).

***Ichnotropis capensis* (A. Smith) 1838**

A terrestrial lizard, that has been recorded throughout the Peninsula in open Miombo woodland. This record extends the distribution of the species 175 km north of the nearest record along the coast at Inhambane. It appears that this species occurs in two discrete populations, one along the coast of Kwazulu-Natal and southern Mozambique, with the main population extending from the northern Cape, Northwest and Limpopo Provinces in South Africa to Botswana, Zimbabwe, eastern Namibia and Angola.

Fig. 196. *Ichnotropis capensis* in JACOBSEN et al. (2010).

***Ichnotropis tanganicana* in CARO et al. (2011)**

Reptiles of Katavi National Park, western Tanzania, are from different biomes. - *African Journal of Ecology*, 49 (3): 377-382.

Records for the Katavi National Park (Tanzania) were expected, but not found.

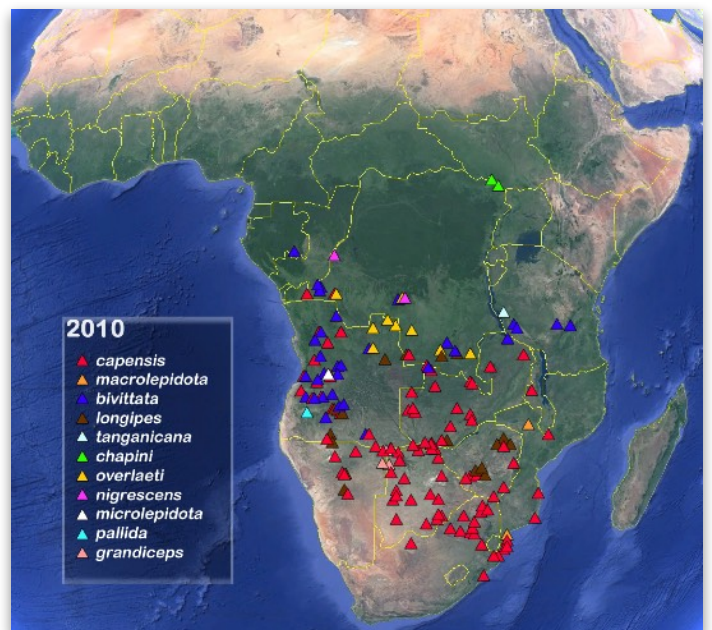


Fig. 197. All records listed up to 2010 with their original (sub)species designation.

***Ichnotropis capensis* in KIRCHHOF (2011)**

Auf der Suche nach Lacertiden in Südafrika: Ergebnisse einer Reise in den Nordosten des Landes. - Die Eidechse, Magdeburg/Hamburg, 22 (3): 71-82.

Records: Soutpansberg, Polokwane and Waterberg (South Africa).

In den Regionen südlich des Soutpansbergs in der Polokwane-Ebene und am Fuße des Waterbergs wurden *Ichnotropis capensis* und *Nucras holobi* entdeckt.

Fig. 198. *Ichnotropis capensis* in KIRCHHOF (2011).

***Ichnotropis capensis* and *Ichnotropis grandiceps* in KIRCHHOF et al. (2011)**

Die Radiation der Lacertiden des südlichen Afrikas. - elaphe, Rheinbach, 19 (4): 6-11.

Schließlich gehört noch die eher tropisch verbreitete Gattung *Ichnotropis* zu der Gruppe mit sechs (evt. sieben) Arten, deren Verbreitungsgebiete nach Norden bis in die Demokratische Republik Kongo reichen. Die drei südlich verbreiteten Arten *I. capensis* (namensgebende Art der Gattung/species typica), *I. squamulosa* und *I. grandiceps* sind typische Savannenbewohner auf Sandboden, besiedeln aber neben den Trockensavannen auch Regionen mit mittleren Feuchtigkeitsverhältnissen.

Fig. 199. *I. capensis* and *I. grandiceps* in KIRCHHOF et al. (2011).

***Ichnotropis* in CONRADIE (2012)**

Herpetofauna of the Cubango-Okovango River Catchment. A report on a rapid biodiversity survey conducted in May 2012. - Port Elizabeth Museum (Bayworld). 17 pp.

Cubango River Basin: *I. bivittata* and *I. capensis*.
Cuito River Basin: *I. capensis capensis* and *I. grandiceps*.

The record of *Ichnotropis grandiceps* was later reduced to *Ichnotropis* ssp. (CONRADIE et al. 2016).

<i>Ichnotropis</i>	<i>bivatatta</i>	Angola Rough-scaled Lizard	L	NE	Monard 1937
<i>Ichnotropis</i>	<i>capensis capensis</i>	Cape Rough-scales Lizard	L	NE	Monard 1937; Branch
<i>Ichnotropis</i>	<i>grandiceps</i>	Caprivi Rough-scaled Lizard *	V	NE	McCartney 1992

* sampled during this survey

The first record for Angola of the Caprivi Rough-scaled Lizard (*Ichnotropis grandiceps*). Two sub adult (see Addendum B) was collected at the HALO operational camp on the outskirts of Cuito Cuanavale. Species belonging to this genus have been reported to have annual live cycles. It is unclear if this specific species does the same as both adults and juveniles have been collected together (Broadley 1967).




Fig. 200. *Ichnotropis* in CONRADIE (2012).

***Ichnotropis capensis* and *Ichnotropis bivittata* in EDWARDS et al. (2012)**

Convergent Evolution Associated with Habitat Decouples Phenotype from Phylogeny in a Clade of Lizards. - PLoS ONE 7 (12): e51636. doi:10.1371/journal.pone.0051636

Abstract: Convergent evolution can explain similarity in morphology between species, due to selection on a fitness-enhancing phenotype in response to local environmental conditions. As selective pressures on body morphology may be strong, these have confounded our understanding of the evolutionary relationships between species. Within the speciose African radiation of lacertid lizards (Eremiadini), some species occupy a narrow habitat range (e.g. open habitat, cluttered habitat, strictly rupicolous, or strictly psammophilic), which may exert strong selective pressures on lizard body morphology. Here we show that the overall body plan is unrelated to shared ancestry in the African radiation of Eremiadini, but is instead coupled to habitat use. Comprehensive Bayesian and likelihood phylogenies using multiple representatives from all genera (2 nuclear, 2 mitochondrial markers) show that morphologically convergent species thought to represent sister taxa within the same genus are distantly related evolutionary lineages (*Ichnotropis squamulosa* and *Ichnotropis* spp.; *Australolacerta rupicola* and *A. australis*). Hierarchical clustering and multivariate analysis of morphological characters suggest that body, and head, width and height (stockiness), all of which are ecologically relevant with respect to movement through habitat, are similar between the genetically distant species. Our data show that convergence in morphology, due to adaptation to similar environments, has confounded the assignment of species leading to misidentification of the taxonomic position of *I. squamulosa* and the *Australolacerta* species.

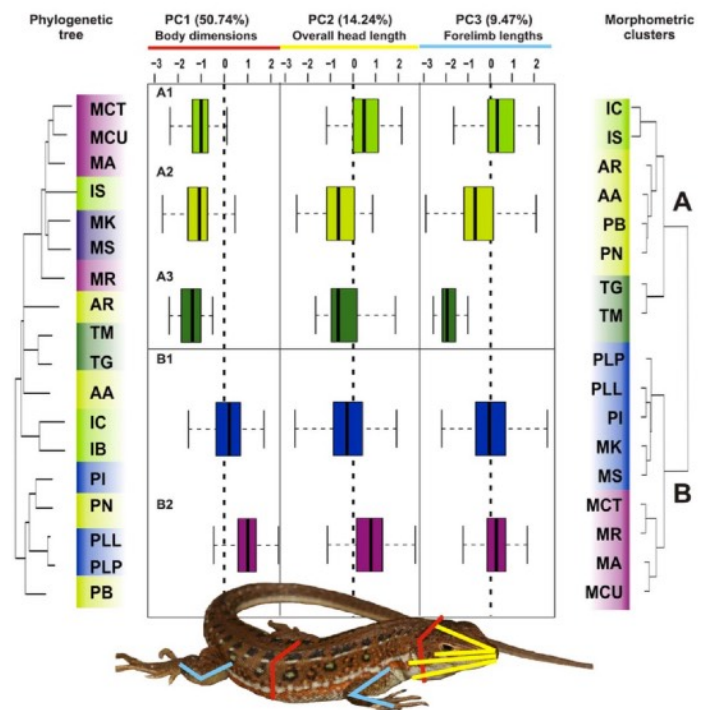


Figure 2. Clustering and principal components analysis of morphological markers. Boxplots of the first three principal component axes (center) for each morphological group (A, B) retrieved by hierarchical clustering (shown right). Positive values of the PC axes indicate larger body dimensions, whilst negative values indicate smaller body dimensions. Morphological groupings are shaded as follows: A1 = bright green, A2 = lime green, A3 = green, B1 = blue, B2 = purple. The phylogenetic tree (left) is color coded by species according to its morphological group membership. Morphological groupings are shown on lizard schematic, and line colors correspond to sets of original variables that loaded onto each PC (PC1 = red, PC2 = yellow, PC3 = light blue). Percentage of variation contributed to each PC axis is given. IC = *Ichnotropis capensis*, IB = *Ichnotropis bivittata*.



Fig. 201. WERNER CONRADIE.

***Ichnotropis capensis* in KENNEDY et al. (2012)**

Effect of Fire on the Herpetofauna of the Koanaka Hills, Ngamiland, Botswana. - Check List, 8 (4): 666-674.

Abstract: Ngamiland is one of the most remote regions in Botswana, and its herpetofauna is largely under-surveyed. This study documents the herpetofauna of the Koanaka Hills (KH) in Ngamiland in 2009 following extensive fire destruction and compares it to the pre-fire herpetofauna collected in 2008. We also provide new records for the region for three amphibian and six reptile species, and document vouchers for two taxa that were sighted but not collected in 2008. During 2009, 14 reptile and three amphibian species were collected, bringing the total number of confirmed herpetofaunal taxa near the KH to three amphibian and 19 reptile species. For seven species this is the first published occurrence in quarter degree square 2021 Aa. Analyses measuring changes in the KH herpetofauna following the fire are inconclusive due to differences in collection effort and weather conditions. However, these data suggest that fire impact was minimal.

Additional records: Koanaka Hills (Botswana).

***Ichnotropis capensis* (Smith 1838; Figure 7)**

Material. 18 specimens: TNHC 84970–87.

Other records. TNHC 68743–7 (Bauer et al. 2009).

Location and Habitat. TNHC 84979 was collected on a dirt track near Koanaka South. TNHC 84971–8 were found in a dry pan at 20°09.20'S, 21°11.36'E. TNHC 84970 was found in a sandy area behind the main camp at 20°09.19'S, 21°11.24'E. TNHC 84981–7 were collected in a sandveld area darting under bushes at 20°09.52'S, 21°11.57'E. TNHC 84980 was caught in a pitfall trap placed in dense shrub northwest of Koanaka South at 20°09.31'S, 21°11.38'E.



FIGURE 7. *Ichnotropis capensis* found on sandy dirt track near Koanaka South.

Fig. 202. *Ichnotropis capensis* in KENNEDY et al. (2012).

***Ichnotropis capensis* and *Ichnotropis grandiceps* in CONRADIE (2013)**

The herpetofauna of the lower Cuito and lower Cuando river. A report on a rapid biodiversity survey conducted in April 2013. - Port Elizabeth Museum (Bayworld). 14 pp.

During the period 12 April – 1 May we undertook a herpetological survey of the lower reaches of the Cuito and Cuando River (Figure 1).

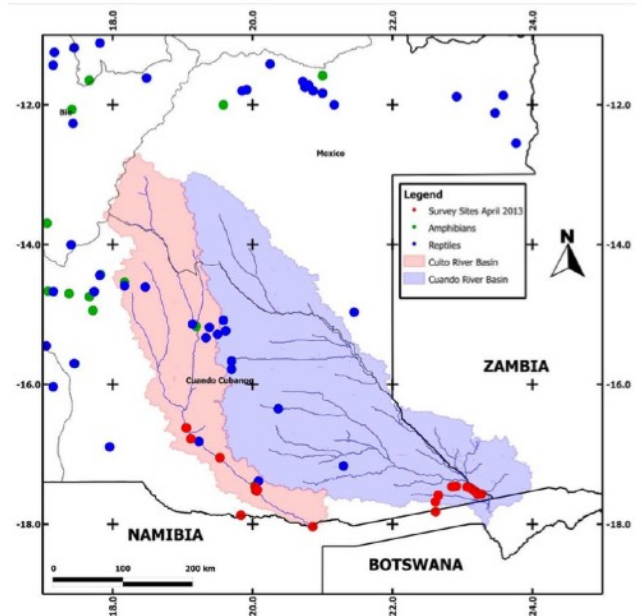


Figure 1. Map indicating the Cuito and Cuando River Basins. Red dots represent the latest survey collection sites.

Genus	Species	Common Name	Survey	Cuito River	Quando River	IUCN	Reference
<i>Ichnotropis</i>	<i>capensis</i>	Cape Rough-scaled Lizard*	L	X	X	NE	Branch & McCartney 1992
<i>Ichnotropis</i>	<i>grandiceps</i>	Capeini Rough-scaled Lizard	L	X		NE	Conradie 2012

Fig. 203. *I. capensis* and *I. grandiceps* in CONRADIE (2013).

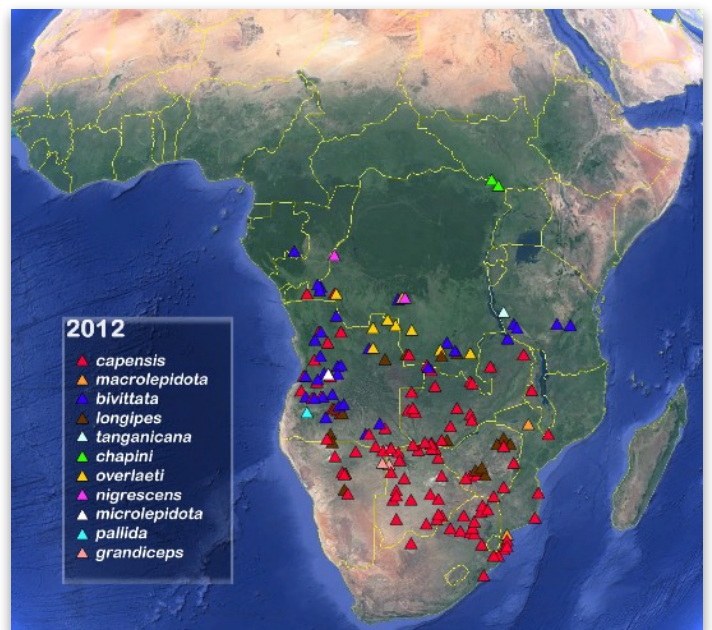


Fig. 204. All records listed up to 2012 with their original (sub)species designation.

The following 2 “sympatric” studies, during preparation unaware of their mutual existence (MAYER pers. comm. ; EDWARDS pers. comm.), came to the same conclusion: *Ichnotropis squamulosa* should be transferred in *Meroles*.

***Ichnotropis capensis* in ENGLEDER et al. (2013)**

Multiple nuclear and mitochondrial DNA sequences provide new insights into the phylogeny of South African Lacertids (Lacertidae, Eremiadinae). - *Journal of Zoological Systematics and Evolutionary Research*, 51 (2): 132-143.

Abstract: Eremiadinae, one of three subfamilies of Lacertidae, are distributed throughout Asia and Africa. Previous phylogenetic studies suggested that one of the main groups of Eremiadinae (the Ethiopian clade) consist of two clades with predominately East-African and South-African distribution. Yet, especially the latter one, which includes the genera *Pedioplanis*, *Meroles*, *Ichnotropis*, *Tropidosaura* and *Australolacerta*, was not well supported in the molecular phylogenetic analysis. In this study, we analysed the phylogenetic relationships among the genera of the ‘South African clade’ to assess whether this group actually forms a highly supported clade and to address questions concerning the monophyly of the genera. We sequenced sections of the widely used mitochondrial genes coding for 16S rRNA, 12S rRNA and cytochrome b (altogether 2045 bp) as well as the nuclear genes *c-mos*, *RAG-1*, *PRLR*, *KIF24*, *EXPH5* and *RAG-2* (altogether 4473 bp). The combined data set increased the support values for several nodes considerably. Yet, the relationships among five major lineages within the ‘South African clade’ are not clearly resolved even with this large data set. We interpret this as a ‘hard polytomy’ due to fast radiation within the South African lacertids. The combined tree based on nine marker genes provides strong support for the ‘South African Clade’ and its sister group relationship with the ‘East African Clade’. Our results confirm the genus *Tropidosaura* as a monophylum, while *Ichnotropis* is paraphyletic in our trees: *Ichnotropis squamulosa* appears more closely related to *Meroles* than to *Ichnotropis capensis*. Furthermore, the monophyly of *Meroles* is questionable as well. Based on our results, *I. squamulosa* should be transferred from *Ichnotropis* into the genus *Meroles*. Also, the two species of *Australolacerta* (*A. australis* and *A. rupicola*) are very distantly related and the genus is perhaps paraphyletic, too. Finally we propose a phylogeographical scenario in the context of palaeoclimatic data and compare it with a previously postulated hypothesis.

Fig. 2. Phylogenetic BI tree based on the combined nc and mt gene sequences. Nodes with maximum support values from BI/Maximum likelihood (ML) are marked with a black spot. Support values below 0.95 (BI) and 50% (ML) are not shown

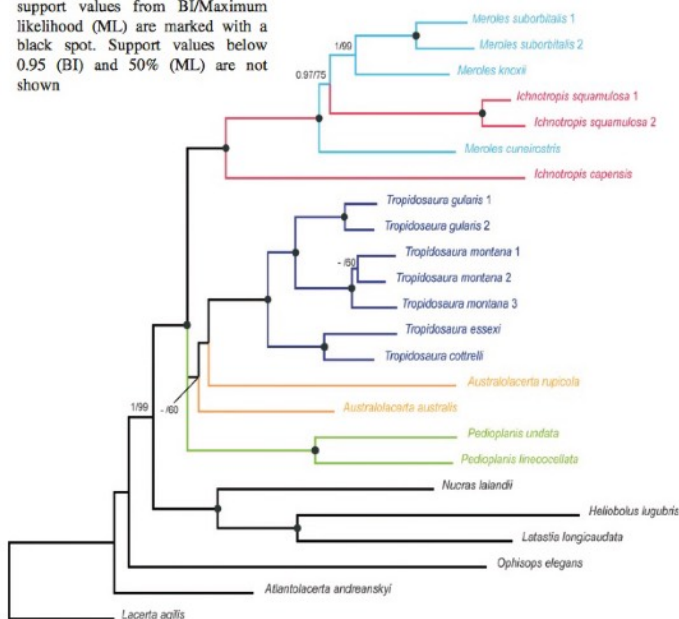


Fig. 205. ANJA ENGLEDER.



Fig. 206. SHELLEY EDWARDS.

***Ichnotropis capensis* and *Ichnotropis bivittata* in EDWARDS et al. (2013)**

Taxonomic adjustments in the systematics of the southern African lacertid lizards (Sauria: Lacertidae). - *Zootaxa*, 3669 (2): 101–114.

Abstract: Molecular phylogenetic analyses of southern African lacertid lizards (Eremiadini) using mitochondrial and nuclear markers revealed two examples of generic assignments incompatible with monophyletic clades. *Australolacerta* ARNOLD 1989, a genus endemic to South Africa and to which two isolated species have been referred, is paraphyletic at the generic level. In addition, the species *Ichnotropis squamulosa* PETERS 1854 was found to be embedded within the genus *Meroles*. To resolve the paralogy in *Australolacerta* we erect a new genus, *Vhembelacerta* EDWARDS, BRANCH, HERREL, VANHOODONCK, MEASEY, & TOLLEY, gen. nov., to accommodate *Lacerta rupicola* FITZSIMONS 1933. To maintain a monophyletic *Ichnotropis* PETERS 1854, *Ichnotropis squamulosa* PETERS 1854 is transferred to *Meroles* GRAY 1838, now named *Meroles squamulosus* comb. nov. Where necessary the genera affected by these actions are re-characterized.

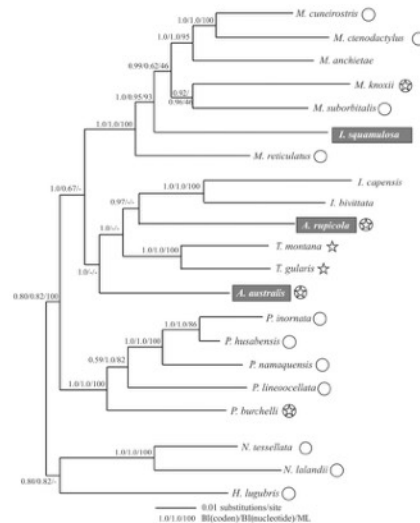


FIGURE 1. Phylogenetic relationships of the southern African clade of lacertid lizards (Lacertidae: Eremiadini) estimated from four mitochondrial and nuclear markers (Bayesian topology estimated using a nucleotide substitution model shown). Nodes that are supported using Bayesian inference (posterior probabilities > 0.95) using nucleotide substitution models and maximum likelihood (bootstrap values > 75%) using GTR+I+G nucleotide substitution model are shown at nodes (post. prob. using nucleotide-substitution model/bootstrap value for ML). A dash indicates that the node was not supported for the particular analysis. Species highlighted in grey are those species which are reclassified in this study. Stars next to species names indicate presence of gular fold; circles indicate presence of collar and a star within a circle indicate the presence of both a gular fold and a collar.

***Ichnotropis* in HERRMANN & BRANCH (2013)**

Fifty years of herpetological research in the Namib Desert and Namibia with an updated and annotated species checklist. - *Journal of Arid Environments*, 93: 94-115.

An updated and annotated species checklist for the Namib Desert and Namibia, with listing of *Ichnotropis capensis* and *Ichnotropis grandiceps*.

***Ichnotropis* in MAYER (2013)**

Kommentierte Lacertiden-Liste für Europa, Afrika, den Nahen Osten inklusive der Arabischen Halbinsel und Asien. - *L@CERTIDAE*, 2013 [7]: 81-141.

MAYER (2013) considers *I. tanganicana* as an invalid species, and *I. microlepidota* as a doubtful species.

Ichnotropis* PETERS 1854; species typica *Ichnotropis capensis
Anmerkung: Die Gattung enthält einige dubiose Arten. Die Hälfte der "Arten" wurde seit ihrer Erstbeschreibung nicht mehr aufgefunden. *I. tanganicana* vom "Ostufer des Tanganyika-Sees", nach einem Jungtier beschrieben und seither (seit etwa 100 Jahren) nicht mehr bestätigt, wird in dieser Liste ganz weggelassen.

***Ichnotropis bivittata* BOGAGE 1866; t.t. Duque de Bragança, N-Angola**
keine Unterarten
Verbreitung: Angola, Demokratische Republik Congo nordwärts bis zur Congo-Mündung und in die Kasai-Region, nördlichstes Sambia und südliches Tanzania.

***Ichnotropis capensis* (SMITH 1838); t.t. Kuruman in der Northern Cape Provinz Südafrikas nahe der Grenze zu Nordwestern Provinz.**
keine Unterarten
Verbreitung: Vom Nordosten Namibias ostwärts durch Botswana in den Nordosten von Südafrika und ins südliche Moçambique, nach Norden zu im Großteil Angolas bis in die Katanga-Provinz der Demokratischen Republik Congo, nach Zimbabwe und ins südwestliche Zambia.

***Ichnotropis chapini* SCHMIDT 1919; t.t. Ada, in der Demokratischen Republik Congo nahe der Grenze zum Süd-Sudan.**
keine Unterarten
Verbreitung: bekannt nur nach 2 Exemplaren vom Typusfundort und einem Exemplar aus Adra [= Adranga ?, ca. 130km südlich der terra typica], das von WITTE (1933) gemeldet worden war. Seither keine neuen Nachweise

***Ichnotropis grandiceps* BROADLEY 1967; t.t. 25 Meilen westlich Mohembo, Botswana, an der Grenze zum Caprivi-Streifen, Namibia.**
keine Unterarten
Verbreitung: Nach den beiden Exemplaren, die der Erstbeschreibung zugrunde liegen, wurden weitere 4 Exemplare von Haacke (1970) aus dem nordostnamibisch-botswanischen Grenzgebiet gemeldet. Seither scheint auch diese Art verschollen.

***Ichnotropis microlepidota* MARX 1956; Fuß des Mt. Moco in Angola.**
Anmerkung: Dubiose Art!
keine Unterarten
Verbreitung: Nur von der terra typica bekannt. Die Typenserie (5 Expl.) stammt aus dem Kropf eines geschossenenen Singhahichts (!). Keine weiteren Exemplare bekannt.

Fig. 207. *Ichnotropis* in MAYER (2013).

***Ichnotropis capensis* in PIETERSEN et al. (2013)**

First herpetological appraisal of the Parque Nacional de Banhine, Gaza Province, southern Mozambique. - *Annals of the Ditsong National Museum of Natural History*, 3: 153-163.

New record: Chigubo (Mozambique).

***Ichnotropis capensis* (A. Smith, 1838)**

A specimen was collected at Chigubo by WDH (TM 29272). This record is 230 km southeast of the nearest population in southeastern Zimbabwe (Branch, 1998) and 235 km southwest of the population on the San Sebastian Peninsula (Jacobsen *et al.*, 2010).

Fig. 208. *I. capensis* in PIETERSEN et al. (2013).

***Ichnotropis capensis* in PIETERSEN (2014)**

New distribution records of herpetofauna in Mozambique south of the Zambezi River, including additional records from Parque Nacional de Banhine. - *Annals of the Ditsong National Museum of Natural History*, 4: 174-180.

New records: Vilanculos and Panda (Mozambique).

***Ichnotropis capensis* (A. Smith, 1838)**

A specimen was collected at Vilanculos (TM 30108), which is 20 km NE (across the bay) of the population on the San Sebastian Peninsula (Jacobsen *et al.*, 2010). An individual was seen and photographed in *Brachystegia* woodland near Panda (24°09'01"S, 34°28'21"E, 80 m a.s.l.) on 23 December 2012 (SARCA no. 8507), approximately 50 km inland of the population known to occur in a narrow strip along the coast as far north as Inhambane (Branch, 1998).

Fig. 209. *I. capensis* in PIETERSEN (2014).

***Ichnotropis bivittatus* in CERÍACO et al. (2014)**

Catalogue of the amphibian and reptile type specimens of the Museu de História Natural da Universidade do Porto in Portugal, with some comments on problematic taxa. - *Alytes*, 31: 13-36.

Letter from ALBERT GÜNTHER to JOSÉ VICENTE BARBOSA DU BOGAGE on 29 June 1866.

Relevant part:

3. *Ichnotropis bivittatus* = *Algiru (Tropidosaura) dumerilii*, Smith, App. p. 7 I have compared your specimen with the type.

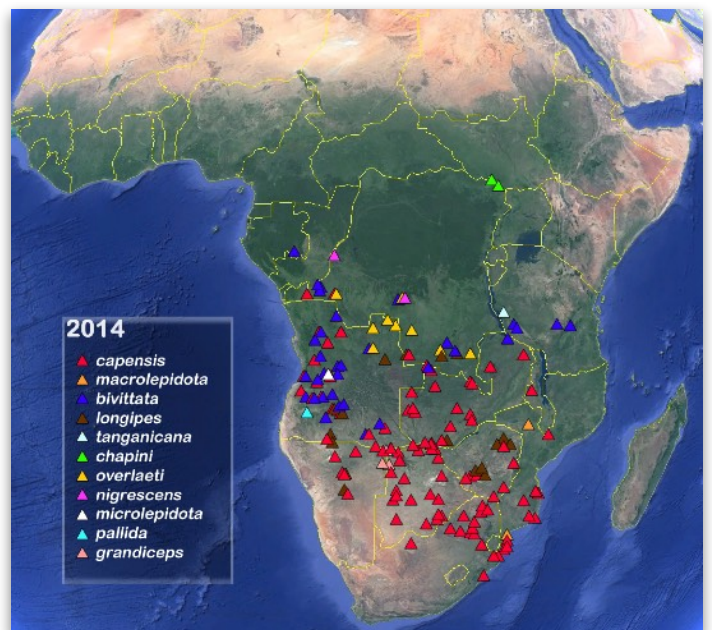


Fig. 210. All records listed up to 2014 with their original (sub)species designation.



Fig. 211. Batéké Plateau in Gabon.

***Ichnotropis capensis* and *Ichnotropis bivittata* in BAECKENS et al. (2015)**

Chemical signalling in lizards: an interspecific comparison of femoral pore numbers in Lacertidae. - *Biological Journal of the Linnean Society*, 114: 44-57.

Abstract: Animals communicate via a variety of sensory channels and signals. Studies on acoustic and visual communication systems suggest that differences in the physical environment contribute to the variety of signalling behaviour, with species investing in those signals that are transmitted best under the local conditions. Whether or not environmental tuning also occurs in chemical communication systems has received much less attention. In the present study, we examined the effect of several aspects of the physical environment on the chemical communication system of lacertid lizards (family Lacertidae). The numbers of femoral pores are used as a proxy reflecting how much a particular species invests in and relies upon chemical signalling. Femoral pores are specialized epidermal structures that function as a secretion channel for the waxy substance produced by glands. In some lacertid species, the secretion carries infochemicals that play an important role in social communication. The number of femoral pores varies considerably among species. We have compiled data on femoral pore numbers for 162 species and tested for the effects of climate and substrate use. After correcting for body size and taking the phylogenetic relationships among the species into account, we found no effect of climate conditions or latitude on species pore numbers. Substrate use did affect pore numbers: shrub-climbing species tended to have fewer femoral pores than species inhabiting other substrates.

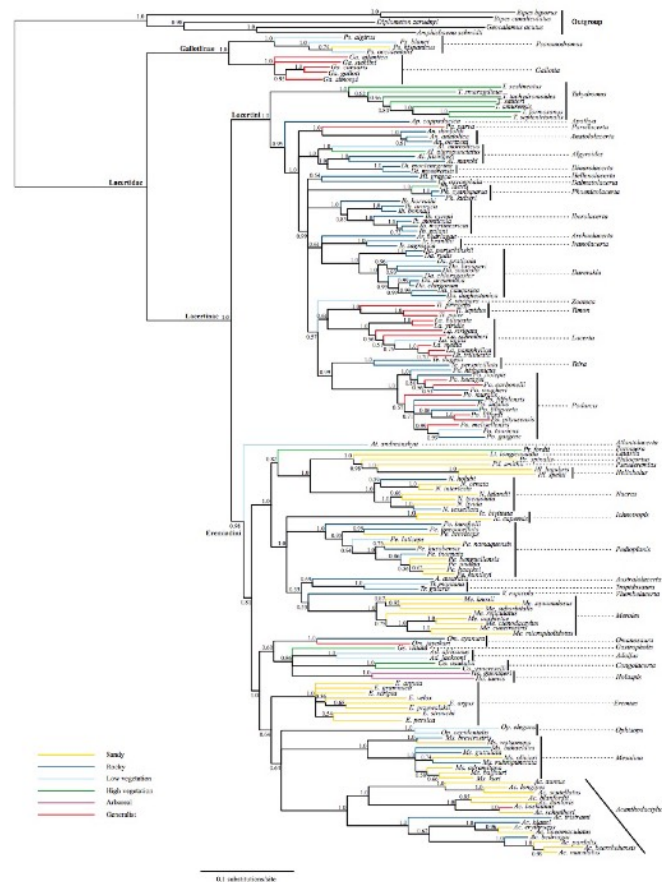


Figure 2. Phylogenetic relationships for 162 species of the lizard family Lacertidae (all genera are included), estimated using a Bayesian analysis. Posterior probabilities > 0.95 are considered supported (shown at the nodes). The species' branch colour refers to the substrate usage of that species: sandy (yellow); rocky (orange); low-vegetation (turquoise); high-vegetation (dark green); arboreal (pink); generalist (red).

***Ichnotropis bivittata* in INEICH & LE GARFF (2015)**

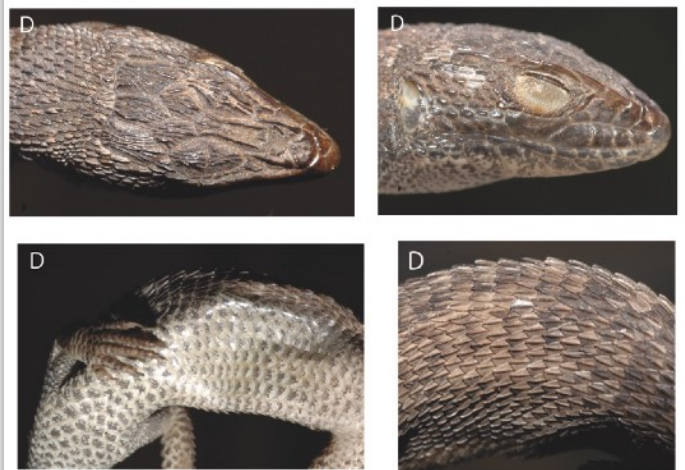
A new lizard species for Gabon, *Ichnotropis bivittata* BOCAGE, 1866 (Squamata, Lacertidae). - *Herpetology Notes*, 8: 471-478.

First (proved) record for Gabon: Batéké Plateau.

In fact our specimen is not the first mention of the species for Gabon but actually it is the first time the country is clearly indicated and demonstrated. BOULENGER (1921) reported a specimen from MNHN-RA collections (no collection number indicated but in fact MNHN-RA 1892.0010) which he mentioned as "Congo français (POBÉGUIN)". POBÉGUIN is not the collect location but refers to CHARLES-HENRI-OLIVIER POBÉGUIN (1856-1951). He was a French official who spent several years in Gabon, part of the former Congo français, and provided Paris Natural History Museum with collections, mostly botanical specimens. He visited Ogooué valley and particularly the Batéké Plateau which is covering part of actual Gabon but also Peoples Republic of Congo (former Congo Brazzaville). That specimen has no collect location but according to the places visited by Pobéguin, it is more likely that the specimen was collected in the same area than our more recent MNHN-RA 2013.1031 specimen, somewhere in the Batéké Plateau area in southeastern Gabon.

Table 1. Morphological comparison of main scalation characters between MNHN-RA 2013.1031 and *Ichnotropis bivittata*, *Adolfus africanus* and *Poromera fordii*. Data after Boulenger (1920, 1921) and Marx (1956). FP: frontoparietal, IP: interparietal, SL: supralabial.

	MNHN-RA 2013.1031	<i>I. bivittata</i>	<i>P. fordii</i>	<i>A. africanus</i>
Enlarged dorsal row	no	no	no	no
Dorsal and lateral scales	similar	similar	lat. smaller	lat. smaller
Ventral scales/plates	smooth cycloid	smooth cycloid	keeled +--	smooth
Contact nostril with SL I	no	no	yes	nearly contact
Subocular	anvil shaped	anvil shaped	rectangular	rectangular
Collar	no	no	yes (weak)	yes (strong)
Cephalic plates	rugous	rugous	rugous	smooth
Dorso-lateral bands	no	often 4	2	2 anterior only
SL anterior to subocular	4	4 (3 to 5)	4 to 6	5 to 6
IP and FP fused	no	no	no	no
Postrisals	2	2	2	1
Pores	8	8 to 14	11 to 14	12 to 17
Ventral scales/plates	rounded	rounded	rounded mucronate	enlarged
Ventral keels	absent	absent	strong and linear	absent



D: *Ichnotropis bivittata* from Gabon, MNHN-RA 2013.1031.

Fig. 212. *Ichnotropis bivittata* in INEICH & LE GARFF (2015).

***Ichnotropis* in LEWIN et al. (2016)**

Patterns of species richness, endemism and environmental gradients of African reptiles. - *Journal of Biogeography*, 43 (12): 2380-2390.

Abstract:

Aim To map and assess the richness patterns of reptiles (and included groups: amphisbaenians, crocodiles, lizards, snakes and turtles) in Africa, quantify the overlap in species richness of reptiles (and included groups) with the other terrestrial vertebrate classes, investigate the environmental correlates underlying these patterns, and evaluate the role of range size on richness patterns.

Location Africa.

Methods We assembled a data set of distributions of all African reptile species. We tested the spatial congruence of reptile richness with that of amphibians, birds and mammals. We further tested the relative importance of temperature, precipitation, elevation range and net primary productivity for species richness over two spatial scales (ecoregions and 1° grids). We arranged reptile and vertebrate groups into range-size quartiles in order to evaluate the role of range size in producing richness patterns.

Results Reptile, amphibian, bird and mammal richness are largely congruent ($r = 0.79-0.86$) and respond similarly to environmental variables (mainly productivity and precipitation). Ecoregion size accounts for more variation in the richness of reptiles than in that of other groups. Lizard distributions are distinct with several areas of high species richness where other vertebrate groups (including snakes) are species-poor, especially in arid ecoregions. Habitat heterogeneity is the best predictor of narrow-ranging species, but remains relatively important in explaining lizard richness even for species with large range sizes.

Main conclusions Reptile richness varies with similar environmental variables as the other vertebrates in Africa, reflecting the disproportionate influence of snakes on reptile richness, a result of their large ranges. Richness gradients of narrow-ranged vertebrates differ from those of widespread taxa, which may demonstrate different centers of endemism for reptile subclades in Africa. Lizard richness varies mostly with habitat heterogeneity independent of range size, which suggests that the difference in response of lizards is due to their ecological characteristics. These results, over two spatial scales and multiple range-size quartiles, allow us to reliably interpret the influence of environmental variables on patterns of reptile richness and congruency.

Binomial	Range Size (km ²)	Quartile	Ecoregions
<i>Ichnotropis bivittata</i>	832508	4	19
<i>Ichnotropis capensis</i>	2581358	4	30
<i>Ichnotropis chapini</i>	2989	1	1
<i>Ichnotropis grandiceps</i>	50924	2	4
<i>Ichnotropis microlepidota</i>	3	1	1
<i>Ichnotropis tanganicana</i>	3	1	1

<i>Ichnotropis bivittata</i>	Aaron Bauer & Don Broadley (pers.obs.); Monard, 1937
<i>Ichnotropis capensis</i>	Aaron Bauer (pers.obs.); Bocage, 1895
<i>Ichnotropis chapini</i>	Laurent Chirio (pers.obs.); Uetz, 2014
<i>Ichnotropis grandiceps</i>	Aaron Bauer & Don Broadley (pers.obs.); Branch, 1988
<i>Ichnotropis microlepidota</i>	Uetz, 2014
<i>Ichnotropis tanganicana</i>	Spawls et al., 2002

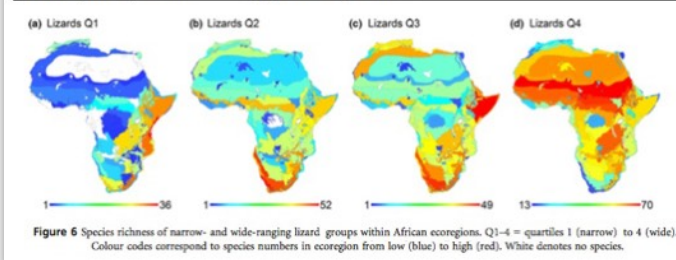


Fig. 213. *Ichnotropis* in LEWIN et al. (2016).

***Ichnotropis bivittata* in CERÍACO et al. (2016)**

Anfíbios e Répteis do Parque Nacional da Cangandala. - Museu Nacional de História Natural e da Ciência / Instituto Nacional da Biodiversidade e Áreas de Conservação, Editor: Museu Nacional de História Natural e da Ciência. 100 pp.

Família Lacertidae

Lagartixa-de-escamas-ásperas-de-Angola

Ichnotropis bivittata Bocage, 1866

Descrição: Tamanho máximo: 80 mm. Lacertídeo elegante de porte médio. Possui uma coloração castanha com manchas escuras ao longo do dorso formando uma linha contínua do topo da cabeça à cauda. Apresenta duas linhas brancas bem distintas nos flancos, a segunda linha cobre o lábio superior desvanecendo chegando à inserção dos membros posteriores. O lábio inferior possui uma linha vermelha ou alaranjada, podendo ser visível na parte lateral do pescoço. O ventre é branco.

Locais de colheita na Província de Malanje: “Bange N’gola” (Boulenger 1905: 110, 1921: 185); “Duque de Bragança” (Bocage 1866a: 43, 1895: 30; Boulenger 1887: 78, 1905: 110, 1921: 185; Ferreira: 1903: 15; Loveridge 1933: 308, 1957: 234; Bauer et al. 1995: 41).



Fig. 214. *Ichnotropis bivittata* in CERÍACO et al. (2016).

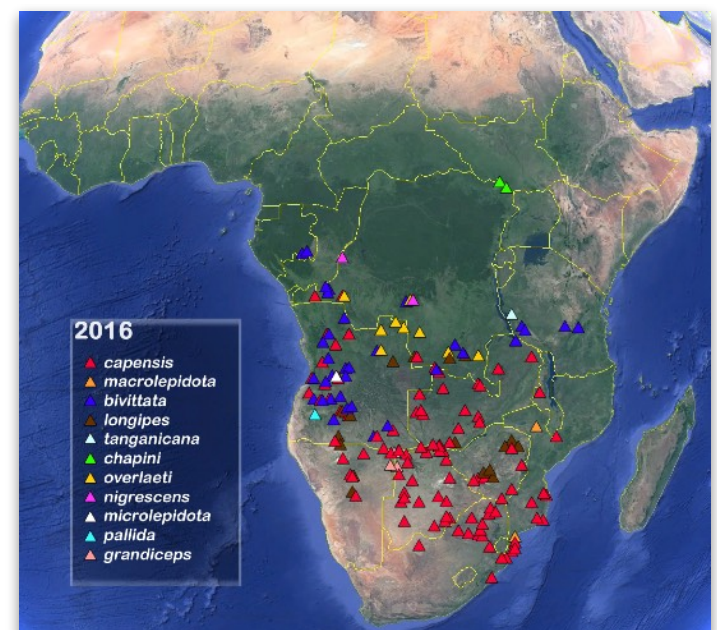


Fig. 215. All records listed up to 2016 with their original (sub)species designation.

***Ichnotropis bivittata*, *Ichnotropis capensis* and *Ichnotropis* ssp.** in CONRADIE et al. (2016)

The herpetofauna of the Cubango, Cuito, and lower Cuando river catchments of south-eastern Angola. - Amphibian and Reptile Conservation, 10 (2): 6-36.

Table 3 (continued). The following are updated species lists for amphibians based on historical records as well as data from the new surveys within the boundaries of the Cubango, Cuito, and Cuando river basin. Type of record: V = Voucher, O = Observation, L = Literature record.

Species	Cubango River	Cuito River	Quando River	Reference
<i>Ichnotropis bivittata</i> Bocage, 1866	L	—	—	Monard 1937b
<i>Ichnotropis capensis</i> (Smith, 1838)	L	—	L	Bocage 1895; Monard 1931, 1937b; Branch and McCartney 1992
<i>Ichnotropis</i> spp.	—	V	—	—

Ichnotropis* spp.*Rough-scaled Lizard**

Material: PEM R20008–9 (25), 20486–8 (30b), 21490 (59), and 21843–5 (55). **Comment:** Branch and McCarthy (1992) referred an adult male (SVL 45 mm) from Cuito-Cuanavale as the first record of *I. capensis* from Angola. Our additional material comprises juveniles and small adults (Fig. 9d, maximum SVL = 45 mm). Broadley (1967) described *I. grandiceps* based on a very small series ($n = 3$) from the Caprivi Strip. He differentiated it from sympatric *I. capensis* based on higher midbody scale counts (44–47), a broader head, five upper labials anterior to the subocular, and an occipital scale that did not protrude past the parietals. In our series the mid-body scale count is low (36–42), upper labials are mostly four (seven out of the 12 examined), and the occipital scale protrudes past the parietals. The specimens thus display a mixture of features intermediate between the two species. Although an adult male with bright yellow flanks (indicative of *I. capensis* male breeding coloration) was observed in the same area as juveniles (Conradie pers.

obs, it was not collected and scalation could not be determined). The genus *Ichnotropis* includes a number of poorly-known northern species, and the lack of recent material of taxa such as *I. grandiceps*, *I. tanganicana*, *I. microlepidota*, *I. bivittata pallida*, etc., has precluded a modern revision. These difficulties are compounded by the annual reproductive strategies of some species (Broadley 1979) that make collection of series of adults and juveniles difficult. A revision of Angolan species, and the description of new taxa, is in preparation.

Ichnotropis grandiceps – Since its description (Broadley 1967) from the Caprivi area, no new material has been discovered. As noted for *Ichnotropis* sp. (above), the status of new Angolan material and the validity of *I. grandiceps* are under investigation.

Fig. 216. *Ichnotropis bivittata*, *Ichnotropis capensis* and *Ichnotropis* ssp. in CONRADIE et al. (2016).



Fig. 217. Vegetation upper Cacuchi River in CONRADIE et al. (2016).



Fig. 218. Dambo on upper Cacuchi River in CONRADIE et al. (2016).

***Ichnotropis* in UETZ (2017)**

Ichnotropis - In: UETZ, P. (editor), The Reptile Database, <http://www.reptile-database.org>, accessed March 6, 2017.

Sauria (Lacertilia) - Lizards

Infraorder Iguania [3]

- Family [Agamidae](#) (Agamas), incl. [Leiocephalidae](#)
- Family [Chamaeleonidae](#) (Chameleons)
- Superfamily Iguanidae s.l. ("Iguanas")
 - Family [Corytophanidae](#) (Casco)
 - Family [Crotaphytidae](#) (Collared)
 - Family [Dactyloidae](#) (Anoles s.)
 - Family [Hopllocercidae](#) (Wood)
 - Family [Iguanidae](#) s. str. (Iguana)
 - Family [Leiocephalidae](#)
 - Family [Leiosauridae](#)
 - Family [Liolaemidae](#)
 - Family [Opluridae](#) (Madagascar)
 - Family [Phrynosomatidae](#) (Earl)
 - Family [Polychrotidae](#) (Anoles)
 - Family [Tropiduridae](#) (Neotropical Ground Lizards)



Fig. 222. PETER UETZ.

***Ichnotropis capensis* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	<i>Ichnotropis capensis capensis</i> (A. SMITH, 1838) <i>Ichnotropis capensis nigrescens</i> LAURENT, 1952
Common Names	Cape Rough-scaled Lizard, Smith's Rough-scaled Sand Lizard
Synonym	<i>Algyra capensis</i> SMITH 1838 <i>Tropidosaura capensis</i> — DUMERIL & BIBEON 1839: 171 <i>Thermophilus capensis</i> — FITZINGER 1843: 21 <i>Tropidosaura Dumerilii</i> SMITH 1849 <i>Ichnotropis microlepidota</i> [a] PETERS 1854: 617 <i>Ichnotropis Dumerilii</i> — BOCAGE 1866: 43 <i>Ichnotropis capensis</i> — BOULENGER 1897: 276 <i>Ichnotropis longipes</i> BOULENGER 1902: 17 (fide LOVERIDGE 1953: 150) <i>Ichnotropis capensis longipes</i> — FITZSIMONS 1943: 354 <i>Ichnotropis capensis</i> — FITZSIMONS 1943: 352 <i>Ichnotropis capensis</i> — AUERBACH 1987: 131 <i>Ichnotropis capensis</i> — HAAGNER et al. 2000 <i>Ichnotropis capensis</i> — EDWARDS et al. 2013
Distribution	From Tanzania (?), Namibia, Zambia, Zimbabwe, Mozambique, Botswana, Republic of South Africa, N/S Democratic Republic of the Congo (Zaire), Angola Type locality: "Sandy deserts around Latakoo, i.e. Kuruman"
Reproduction	<i>Ichnotropis capensis</i> is an 'annual' species, eggs being laid in November or December and hatching in January/March. Few adults survive into their second year (Broadley 1967b, 1974).
Types	Holotype: lost (fide FITZSIMONS 1943)
Comment	Synonymy: The name was originally printed as "microlepidota" in PETERS 1854, but later corrected to "microlepidota" by PETERS 1854. Distribution: Not listed for Tanzania by BROADLEY & HOWELL 1991. Subspecies: FITZSIMONS 1943: 354 also lists (and describes) <i>Ichnotropis capensis longipes</i> BOULENGER 1902. Laurent 1964 lists <i>Ichnotropis capensis overlaeti</i> Witte & Laurent. Type species: <i>Ichnotropis macrolepidota</i> (Peters 1854) [= <i>I. capensis</i> (Smith 1838)] is the type species of the genus <i>Ichnotropis</i> PETERS 1854. Diagnosis (genus): FitzSimons (1943); not modified by EDWARDS et al. 2013 who removed <i>Ichnotropis squamulosa</i> (and placed it in <i>Meroles</i>).

Fig. 219. *Ichnotropis capensis* in UETZ (2017).***Ichnotropis bivittata* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	<i>Ichnotropis bivittata bivittata</i> BOCAGE, 1866 <i>Ichnotropis bivittata pallida</i> LAURENT, 1964
Common Names	Angolan rough-scaled lizard
Synonym	<i>Ichnotropis bivittata</i> BOCAGE 1866: 43 <i>Ichnotropis capensis bivittata</i> — ROBERTSON et al. 1961 <i>Ichnotropis bivittata</i> — HAAGNER et al. 2000 <i>Ichnotropis bivittata</i> — BROADLEY & HOWELL 1991: 18 <i>Ichnotropis bivittata</i> — EDWARDS et al. 2013 <i>Ichnotropis bivittata</i> [sic] — CONRADIE et al. 2016
Distribution	S Tanzania, S Democratic Republic of the Congo (Zaire), Angola, Zambia, N Malawi, Gabon Type locality: Duque de Bragança, Angola.
Reproduction	oviparous
Types	Syntype: ZMB 5827
Comment	Syntypes in Lisbon were probably destroyed by a fire in 1975.
Etymology	Named after "bi-" = two or dual and Latin "vitta, -ae" = band or stripe.

Fig. 220. *Ichnotropis bivittata* in UETZ (2017).***Ichnotropis chapini* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	
Common Names	
Synonym	<i>Ichnotropis chapini</i> SCHMIDT 1919 <i>Ichnotropis chapini</i> — WITTE 1933 <i>Ichnotropis chapini</i> — EDWARDS et al. 2013
Distribution	Congo (Zaire) Type locality: Africa: Belgian Congo: Aha. Uelle Region
Reproduction	oviparous
Types	Holotype: AMNH R10674
Comment	Not listed by BROADLEY & POYNTON 1998 for the Democratic Republic of the Congo (Zaire).

Fig. 221. *Ichnotropis chapini* in UETZ (2017).

Gekkota

- Family [Gekkonidae](#) (Geckoes) W

***Ichnotropis tanganicana* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	
Common Names	Tanzanian rough-scaled lizard
Synonym	<i>Ichnotropis tanganicana</i> BOULENGER 1917: 278 <i>Ichnotropis tanganicana</i> — BROADLEY & HOWELL 1991: 18 <i>Ichnotropis tanganicana</i> — EDWARDS et al. 2013
Distribution	Tanzania (eastern bank of Lake Tanganyika) Type locality: East coast of Lake Tanganyika, Tanzania.
Reproduction	oviparous
Types	Type: BMNH
Comment	Only known from the holotype (fide BROADLEY & HOWELL 1991)

- Family [Iguanidae](#)
- Family [Sauriidae](#)

Fig. 223. *Ichnotropis tanganicana* in UETZ (2017).

- Subfamily [Egermiinae](#) (Social skinks)

***Ichnotropis microlepidota* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	
Common Names	Marx's Rough-scaled Lizard
Synonym	<i>Ichnotropis microlepidota</i> MARX 1956 <i>Ichnotropis microlepidota</i> — EDWARDS et al. 2013
Distribution	Angola Type locality: foot of Mount Moco, Benguela Province, Angola.
Reproduction	oviparous
Types	Holotype: FMNH 74285.
Comment	Diagnosis. An <i>Ichnotropis</i> with a single frontonasal, a single anterior loreal, prefrontals in contact with the second supraocular, a small series of scales separating the second and third supraoculars from the supraoculars, unusually small dorsal scales, and a high number of scales around the middle of the body (from MARX 1956).

- Subfamily [Egerniinae](#) (Social skinks)

Fig. 224. *Ichnotropis microlepidota* in UETZ (2017).

Infraorder Diploglossa (note 1)

- Family [Anguillidae](#) (Glass Lizards and Alligator Lizards: Lateral Fold Lizards) W

***Ichnotropis grandiceps* in UETZ (2017)**

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	
Common Names	Caprivi Rough-scaled Lizard
Synonym	<i>Ichnotropis grandiceps</i> BROADLEY 1967 <i>Ichnotropis grandiceps</i> — AUERBACH 1987: 132 <i>Ichnotropis grandiceps</i> — EDWARDS et al. 2013
Distribution	Botswana, NE Namibia Type locality: 25 miles west of Mhembo, Botswana, on the border of the Caprivi Strip (South West Africa).
Reproduction	oviparous
Types	Holotype: USNM 163989, an adult male.
Comment	

Fig. 225. *Ichnotropis grandiceps* in UETZ (2017).

- Family [Helodermatidae](#) (Gila Monsters) W

Discussion

Similarities and differences in morphology

Initially the distinction between species was determined solely by differences in squamation and relative length of the hindlimb (HEWITT 1910 ; SCHMIDT 1919 ; BOULENGER 1921). Coloration description were made in the early descriptions, but these were at first not used in distinguishing between species. The first key to the species, which covers 5 of the final 11 described forms, was compiled by BOULENGER (1921). In table 1 a representation of the keys are given.

Ichnotropis tanganicana

According these keys *I. tanganicana* has the most resemblances with *I. bivittata*, only differing in the degree of striation of the upper head shields, and the almost absence of supraciliar granules between the supraciliar plates and the supraocular plates. Although LOVERIDGE (1933), who examined the only specimen of *I. tanganicana* in London himself, is confident that the differences between *I. tanganicana* and *I. bivittata* are clearly distinguishable, I tend to the position that a single specimen is above all a single specimen, which might have some deviating characters, but not a species. Add to this the lack of a terra typica, and the absence of additional material, there is no reason to uphold this species, as suggested by MAYER (2013), unless future phylogenetic research might prove differently.

Ichnotropis chapini

More or less the same is applicable to *I. chapini*, which according BOULENGER's keys is most related to *I. capensis* and *I. longipes*, differing in only two keys. The first, what might appear as a big difference, the superposed double anterior loreal plates, could easily be an individual deviation.

- Frontonasal plate(s)
- Subocular plate
- Occipital plate
- Supraciliar plates
- Supraciliar granules
- Supraocular plates
- Anterior of the biggest two supraocular plates
- Prefrontal plates
- Anterior loreal plate(s)
- Posterior loreal plate

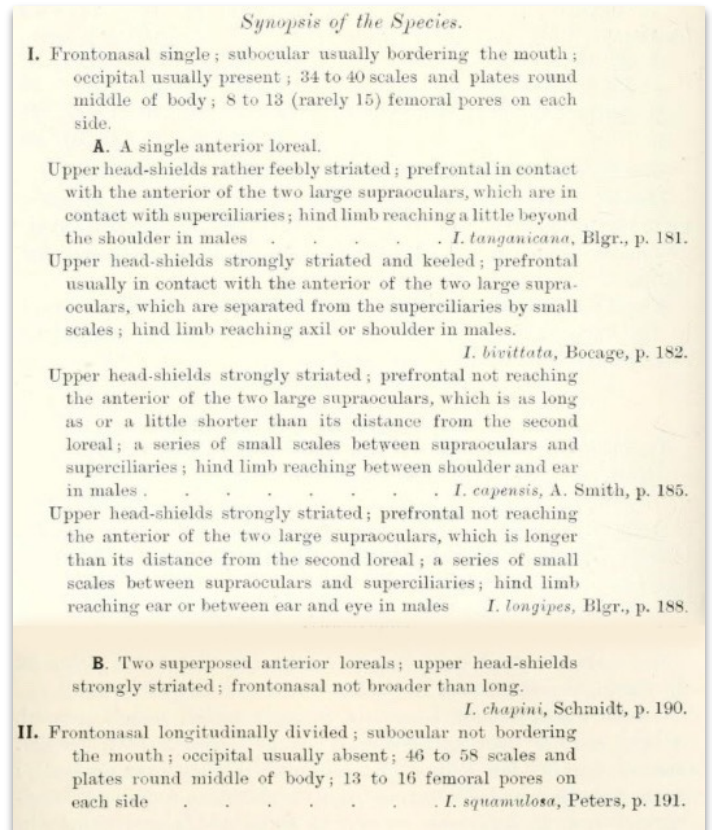


Fig. 226. Key to the species by BOULENGER (1921).

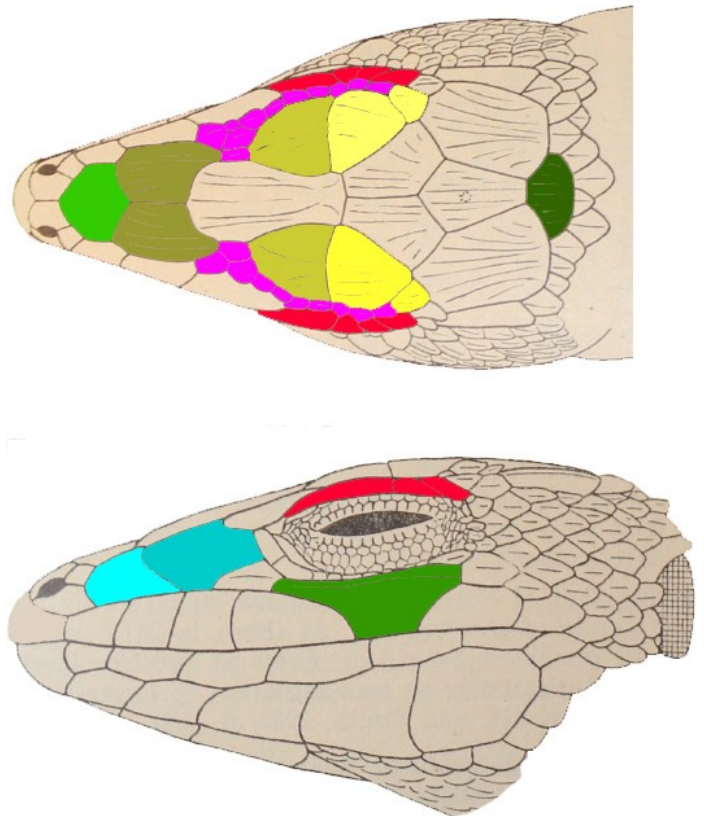


Fig. 227. Dorsal and lateral view of head of *Ichnotropis longipes* (FITZSIMONS 1943), with distinguishing plates indicated.

1921	<i>I. tanganicana</i> n=1	<i>I. bivittata</i> n=21	<i>I. capensis</i> n=11	<i>I. longipes</i> n=4	<i>I. chapini</i> n=1
Upper head shields strongly striated	no	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes	yes
34-40 scales and plates around middle of the body	36	34-40	34-36	36-38	35
8-15 femoral pores	yes	yes	yes	yes	yes
Anterior loreal plate(s)	1	1	1	1	2*
Frontonasal plate broader than long	equal	yes ²	yes	yes	no ¹
Prefrontal plate in contact with anterior of the two large supraocular plates	yes	usually	no	no	no ¹
Large supraocular plates in contact with superciliar plates	yes	no	no	no	no ¹
Hind limbs	short	short	medium	long	short ¹

Table 1. Representation of the key to the species by BOULENGER (1921), completed (1) with data from SCHMIDT (1919), and (2) data from INEICH & LE GARFF (2015). (2*) is referring to two superposed small anterior loreal plates in contrast to one big anterior loreal plate.

The second, the frontonasal plate which is not broader than long, could also easily be an individual deviation, and even less distinct. Compare these plates in the images given for *I. bivittata* and *I. chapini*, are they that different? To base conclusions on such observations, you need at least a few extra specimens, and preferably a lot more. Fortunately LAURENT makes the following remark: “It remains to emphasize the fact, until now passed unnoticed, of the invalidity of the allegedly diagnostic character of *chapini*, namely the existence of two superimposed frenales (=loreal). In the two specimens of Adra, already mentioned in 1933 by G.F. DE WITTE, the anterior frenal is singular.” (LAURENT 1952).

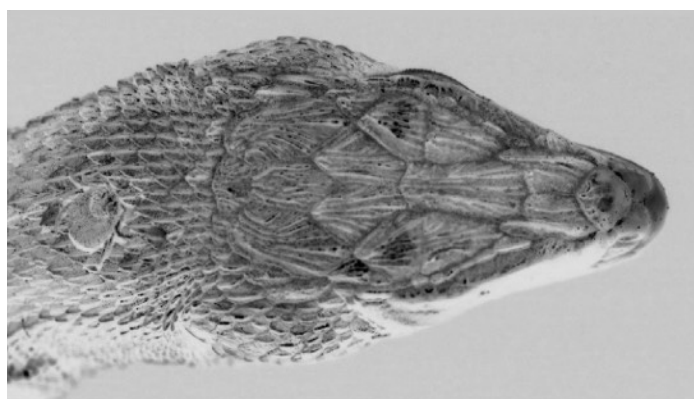


Fig. 228. Dorsal view of *I. bivittata* (INEICH & LE GARFF 2015).

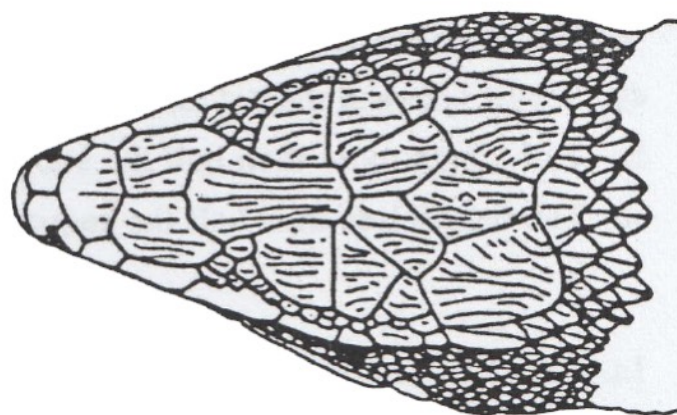


Fig. 229. Dorsal view of *I. capensis* (BROADLEY & HOWELL 1991).

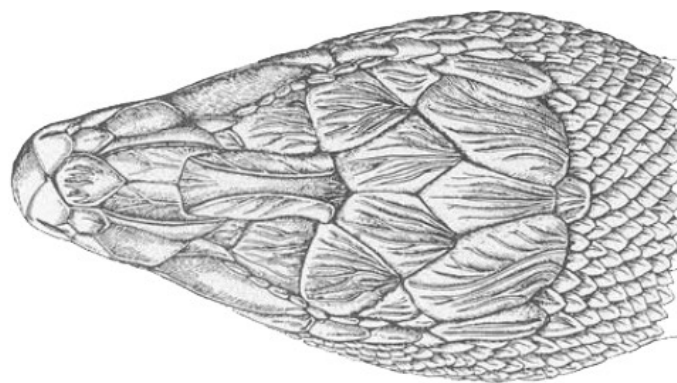


Fig. 230. Dorsal view of *I. chapini* (SCHMIDT 1919).

1942	<i>I. bivittata</i> n=21	<i>I. capensis</i> n=11	<i>I. longipes</i> n=4	<i>I. chapini</i> n=1	<i>I. overlaeti</i> n=5
Upper head shields strongly striated	yes	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes	yes
34-40 scales and plates around middle of the body	34-40	34-36	36-38	35	33-38
8-15 femoral pores	yes	yes	yes	yes	11-12
Frontonasal plate broader than long	yes	yes	yes	no	equal
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	no	no
Large supraocular plates in contact with superciliar plates	no	no	no	no	no
Hind limbs	short	medium	long	short	?

Table 2. Adapted key to the species based on BOULENGER (1921). New “species” *I. overlaeti* is listed (DE WITTE & LAURENT 1942).

Consequently, we have to delete this key (implemented in table 2). However the isolated location of this alleged species, separated from all other known observations of *Ichnotropis* by a large strip of rainforest, might be in favor of a special status. Future phylogenetic research might solve this question too.

Ichnotropis macrolepidota

The position of *I. macrolepidota* is simple: BOULENGER placed this species in the synonymy of *I. capensis* (BOULENGER 1921), what can be supported given the published specifications (PETERS 1854), and confirmed by LOVERIDGE (1953).

Ichnotropis overlaeti

Ichnotropis overlaeti is considered to be a new species by DE WITTE & LAURENT (1942), based on 5 specimens, with a female paratype (R.G. 40) from Kwango, which was earlier described as *Ichnotropis capensis* by BOULENGER (1897). No information was given on the relative length of the hind limb.

According the keys, the only difference with the other *Ichnotropis* forms is the shape of the frontonasal plate.

DE WITTE & LAURENT (1942) are suggesting that this new species is most closely related to *Ichnotropis bivittata* and *Ichnotropis capensis*.

According to the authors *I. overlaeti* is different from *I. bivittata* by the position of the large anterior supraocular plate, separated from the prefrontal by one or more small supraocular plates. (DE WITTE & LAURENT 1942). This argument is the same as the biggest difference between *I. bivittata* and both *I. capensis* and *I. longipes*.

Ichnotropis overlaeti should be different compared to *I. capensis* by the dimension of the large anterior supraocular plate, being longer than the distance that separates it from the posterior frenal (=loreal) (DE WITTE & LAURENT 1942). Subsequently this should become a new key, if we really could believe this would be a valid argument for assigning a new species. We are fortunate that LOVERIDGE (1953) had considered this, and obviously rejected it, by placing *I. overlaeti* in the synonymy of *I. capensis*.

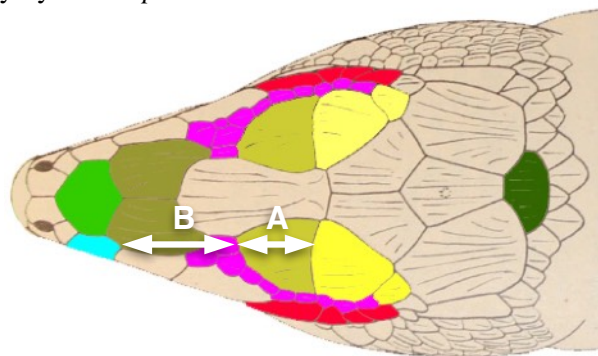


Fig. 231. Difference between *I. overlaeti* and *I. capensis* according to DE WITTE & LAURENT (1942), where A should be longer than B in *I. overlaeti*. (Shown is *I. longipes*).

1953	<i>I. bivittata</i> n=21	<i>I. capensis</i> n=20	<i>I. chapini</i> n=1	<i>I. c. nigrescens</i> n=1 (out of 2)
Upper head shields strongly striated	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes
34-40 scales and plates around middle of the body	34-40	34-38	35	between 33-38
8-15 femoral pores	yes	yes	yes	11 or 12
Frontonasal plate broader than long	yes	yes	no	both
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	no
Large supraocular plates in contact with superciliar plates	no	no	no	no

Table 3. Key to the species adapted to LOVERIDGE (1953). New “subspecies” *I. capensis nigrescens* is listed (LAURENT 1952).

Ichnotropis longipes

Not satisfied by the head/foot ratio of males as key, and given the previously raised doubt by HEWITT & CAMB (1916), LOVERIDGE (1953) reexamined this feature, and came to the conclusion that there is no basis for separation of a zoo-geographical race based on this character. Consequently *I. longipes* disappears in the synonymy of *I. capensis* (LOVERIDGE 1953), which latter fact is implemented in Table 3.

Ichnotropis capensis nigrescens

When describing *Ichnotropis capensis nigrescens* only two collection locations (Bolobo and Luluabourg) are presented (LAURENT 1952). The record for Luluabourg was previously described as *I. overlaeti* (DE WITTE & LAURENT 1942), what enabled me to list *I. c. nigrescens* in table 3, otherwise it would have been impossible, because LAURENT (1952) was focussing in his description on other things, and actually questioning the keys used so far as reliable discriminating factors.

LAURENT (1952) was convinced that geographical (habitat) differences were a more logical way to distinguish between forms. However, this kind of data was previous commonly not included, so LAURENT (1952) had no alternative to admit provisionally a series of races, consequently introducing the odd phenomenon of sympatric subspecies (*I. capensis bivittata* living in the same area of Luluabourg as *I. capensis nigrescens* and probably not separated by different habitat).

LAURENT (1952) introduced one new discriminating character: coloration. He suggested that *I. c. nigrescens* most resembled *I. c. capensis* and *I. c. chapini*, however the coloration of *I. c. nigrescens* was much darker, especially on the ventral side. Additional *I. c. nigrescens* differs from *I. c. overlaeti* by a much larger frontonasal plate (LAURENT 1952).

LAURENT (1952) also focused on the frontonasal plate broader than long key. He compared width/length ratios:

<i>I. c. overlaeti</i>	0.85 - 1.14	n = 4 (used to be 5)
<i>I. c. nigrescens</i>	1.18 - 1.22	n = 2
<i>I. c. chapini</i>	1.11 - 1.43	n = 3

Given the sample size not statistical very convincing data. Moreover, DE WITTE & LAURENT (1942) considered the *I. overlaeti* frontonasal plate broader than long key still as equal. The truth should be found somewhere in the middle.

Are the given characteristics enough to defend the erection of a new subspecies? In 2012 we disregarded all the erected subspecies on www.lacerta.de, including *I. c. nigrescens*, because, in the case of the latter, 2 darker lizards, next to the introduction of sympatric subspecies, was not convincing at all. Unless future phylogenetic research might prove differently, *I. c. nigrescens* will keep the invalid assignation.

1956	<i>I. bivittata</i> n=25	<i>I. capensis</i> n=20	<i>I. chapini</i> n=1	<i>I. microlepidota</i> n=5
Upper head shields strongly striated	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes
32-40 scales and plates around middle of the body ²	32-40	34-38	35	43-50
8-15 femoral pores	yes	yes	yes	10-13
Frontonasal plate broader than long	yes	yes	no	yes ¹
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	yes
Large supraocular plates in contact with superciliar plates	no	no	no	no
Subdigital lamellae under the 4th toe less than 18	18-24	18-24	?	16-17

Table 4. Key to the species adapted to MARX (1956). (!): See figure 232. (?): adjusted for added specimens of *I. bivittata*.

Ichnotropis microlepidota

Probably the best story told in the genus of *Ichnotropis* is the terra typica of *I. microlepidota*; the crop of a shot chanting goshawk at the foot of Mount Moco in Angola (see introduction), in which it appeared together with the 4 paratypes, the only 5 specimens ever recorded. Maybe the *I. bivittata* specimen of PARKER (1936) should have been included in this species.

The differences to *I. bivittata*, which is the most resembling species, and all other species, are clear: Higher number of scales around middle of the body, resulting in smaller dorsal scales, and a slightly lesser count of subdigital lamellae under the 4th toe, which feature is now added to the list of keys.

MAYER (2013) considers this a doubtful species, but for now I will leave it listed for further comparison.

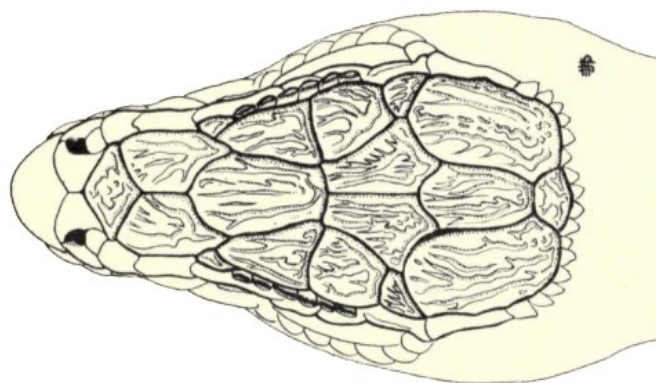


Fig. 232. Holotype of *Ichnotropis microlepidota* (MARX 1956).

1964	<i>I. bivittata</i> n=25	<i>I. capensis</i> n=20	<i>I. chapini</i> n=1	<i>I. microlepidota</i> n=5	<i>I. b. pallida</i> n=1
Upper head shields strongly striated	yes	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes	yes
32-40 scales and plates around middle of the body	32-40	34-38	35	43-50	36
8-15 femoral pores	yes	yes	yes	10-13	11
Frontonasal plate broader than long	yes	yes	no	yes	yes
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	yes	yes
Large supraocular plates in contact with superciliar plates	no	no	no	no	no
Subdigital lamellae under the 4th toe less than 18	18-24	18-24	?	16-17	20

Table 5. Key to the species adapted to MARX (1956). New “subspecies” *I. bivittata pallida* is listed (LAURENT 1964).

Ichnotropis bivittata pallida

Probably LAURENT had been able to read about the biological species concept (MAYR 1942), and must have come to the conclusion that sympatric subspecies was not a very proper taxonomical approach. Consequently he restored the specific status of *Ichnotropis bivittata*, and in the process found even a specimen that could provide a second subspecies; *Ichnotropis bivittata pallida* (LAURENT 1964).

According the list of keys, this is indeed *I. bivittata*; no differences at all. But LAURENT (1964) did find some differences: It looks more pale, which must have been in connection with its sub-desert habitat, the foot a little longer compared to the head, the scales and striated cephalic plates less prominent, the interparietale has curved edges and converging towards the rear, and with a posterior edge situated in front of that of the parietalia, the frontoparietalia rather small and separated from each other by the interparietale, that touches the frontal plate (LAURENT 1964). A very impressive list of differences, most of them visible in figure 233. Too bad we are treated with only one specimen, so we cannot exclude the possibility of individual variation.

In accordance with the situation around *I. c. nigrescens*, and unless future phylogenetic research might prove differently, I regard this specimen as synonym of *I. bivittata*, without extra subspecies designation.

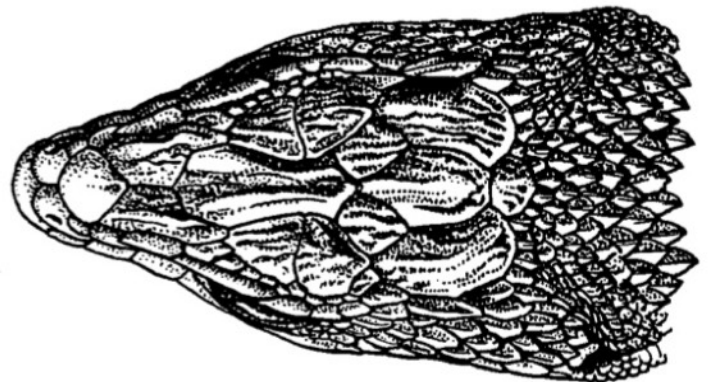


Fig. 233. *Ichnotropis bivittata pallida* (LAURENT 1964).

1967	<i>I. bivittata</i> n=25	<i>I. capensis</i> n=20	<i>I. chapini</i> n=1	<i>I. microlepidota</i> n=5	<i>I. grandiceps</i> n=3
Upper head shields strongly striated	yes	yes	yes	yes	yes
Single frontonasal plate	yes	yes	yes	yes	yes
Subocular plate bordering the mouth	yes	yes	yes	yes	yes
Occipital plate present	yes	yes	yes	yes	yes
32-40 scales and plates around middle of the body	32-40	34-38	35	43-50	44-47
8-15 femoral pores	yes	yes	yes	10-13	12-13
Frontonasal plate broader than long	yes	yes	no	yes	yes
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	yes	no
Large supraocular plates in contact with superciliar plates	no	no	no	no	no
Subdigital lamellae under the 4th toe less than 18	18-24	18-24	?	16-17	23-26

Table 6. Key to the species adapted to MARX (1956). *Ichnotropis grandiceps* is listed (BROADLEY 1967).

Ichnotropis grandiceps

According the list of keys, it looks if *I. grandiceps* is the small scaled variation of *I. capensis*, like *I. microlepidota* is the small scaled variation of *I. bivittata*. This is at least intriguing, and requires additional investigation. Equally intriguing is the absence of new records for both *I. microlepidota* and *I. grandiceps* in recent years.

BROADLEY (1967) described some additional discriminating characters: Relative large head compared to *I. capensis*, less pronounced striation of the upper head shields compared to all listed species, consistently having 4 upper labial plates anterior to the subocular plate, and larger snout-vent length compared to *I. microlepidota*. The first character, the relative bigger head, might be true, but none of the underlying data are presented. The characters regarding striation, and 4 upper labial plates are weak, due to the small sample size. The last given difference with *I. microlepidota*, the number of subdigital lamellae under the 4th toe, is valid,

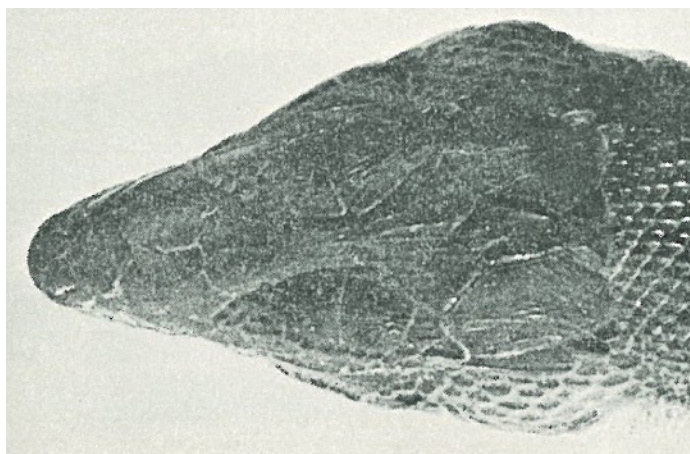


Fig. 234. *Ichnotropis grandiceps* (BROADLEY 1967).

but seen the relative small difference of this key to the range in some of the other species, I will abandon this key. In order to simplify the morphological keys even further, the same is applicable to the frontonasal plate broader than long key, and all other keys which show no distinction within the present genus, and previously

	<i>I. bivittata</i> n=25	<i>I. capensis</i> n=20	<i>I. chapini</i> n=1	<i>I. microlepidota</i> n=5	<i>I. grandiceps</i> n=3
32-40 scales and plates around middle of the body	32-40	34-38	35	43-50	44-47
Prefrontal plate in contact with anterior of the two large supraocular plates	usually	no	no	yes	no

Table 7. Morphological key to the species of *Ichnotropis*, originally based on BOULENGER (1921), adapted to the current findings.

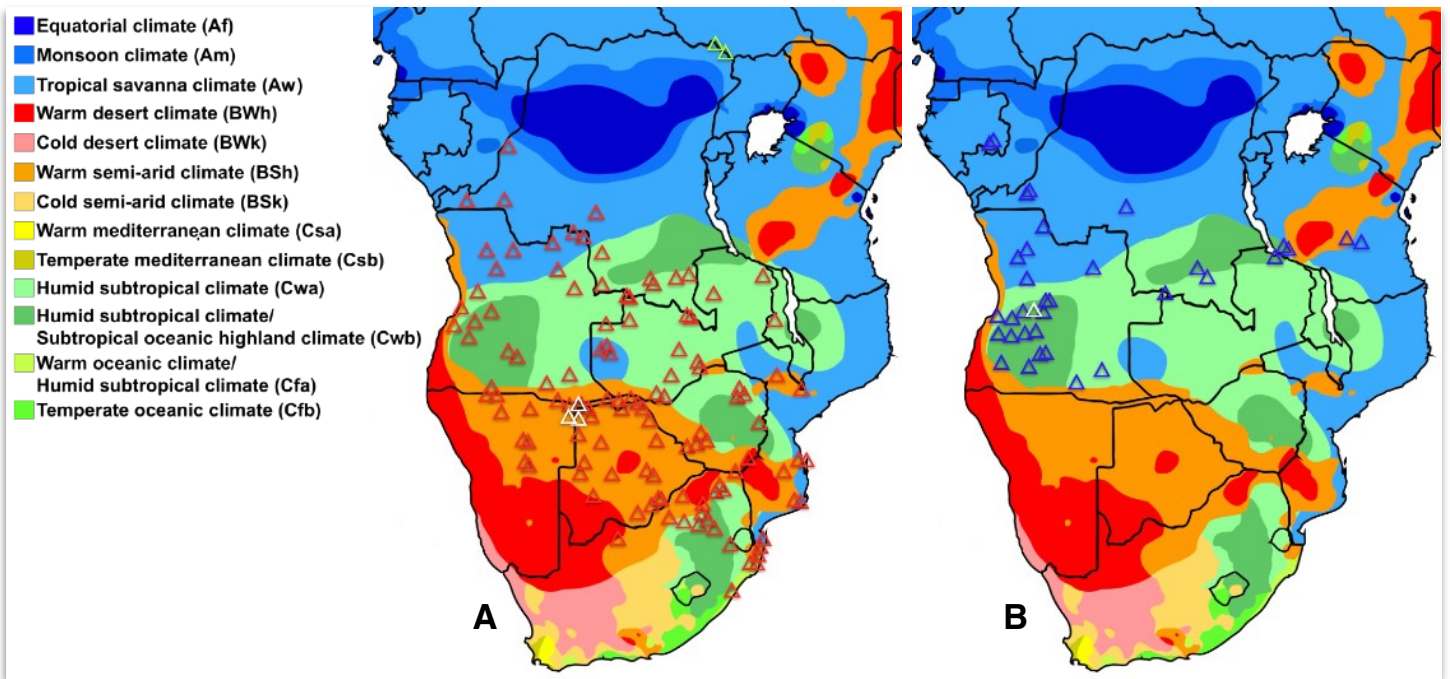


Fig. 235. Gathered distribution records plotted on the KÖPPEN-GEIGER climate classification map (PEEL et al. 2007). **A:** Records for *I. capensis* including synonyms (red), *I. chapini* (green) and *I. grandiceps* (white). **B:** Records for *I. bivittata* including synonym (blue) and *I. microlepidota* (white).

only were necessary to distinguish with *Merolus (Ichnotropis) squamulosa*. The remaining two keys are presented in table 7.

Although the present taxonomy of *Ichnotropis* is not confirmed by breeding experiments nor genetics, EDWARDS et al. (2013) did demonstrate that there are at least two different species within the genus. The used

Ichnotropis SANBI herpbank specimens KTH09-075, assigned to *I. bivittata*, and AMB6001, AMB6007, WP031, all three assigned to *I. capensis*, did show in the constructed phylogenetic tree sufficient basis for speciation (EDWARDS et al. 2013). If there is conformity between genetics and the present morphological keys, remains to be seen. Until more genetic data becomes available, I consider the listed species in table 7 as

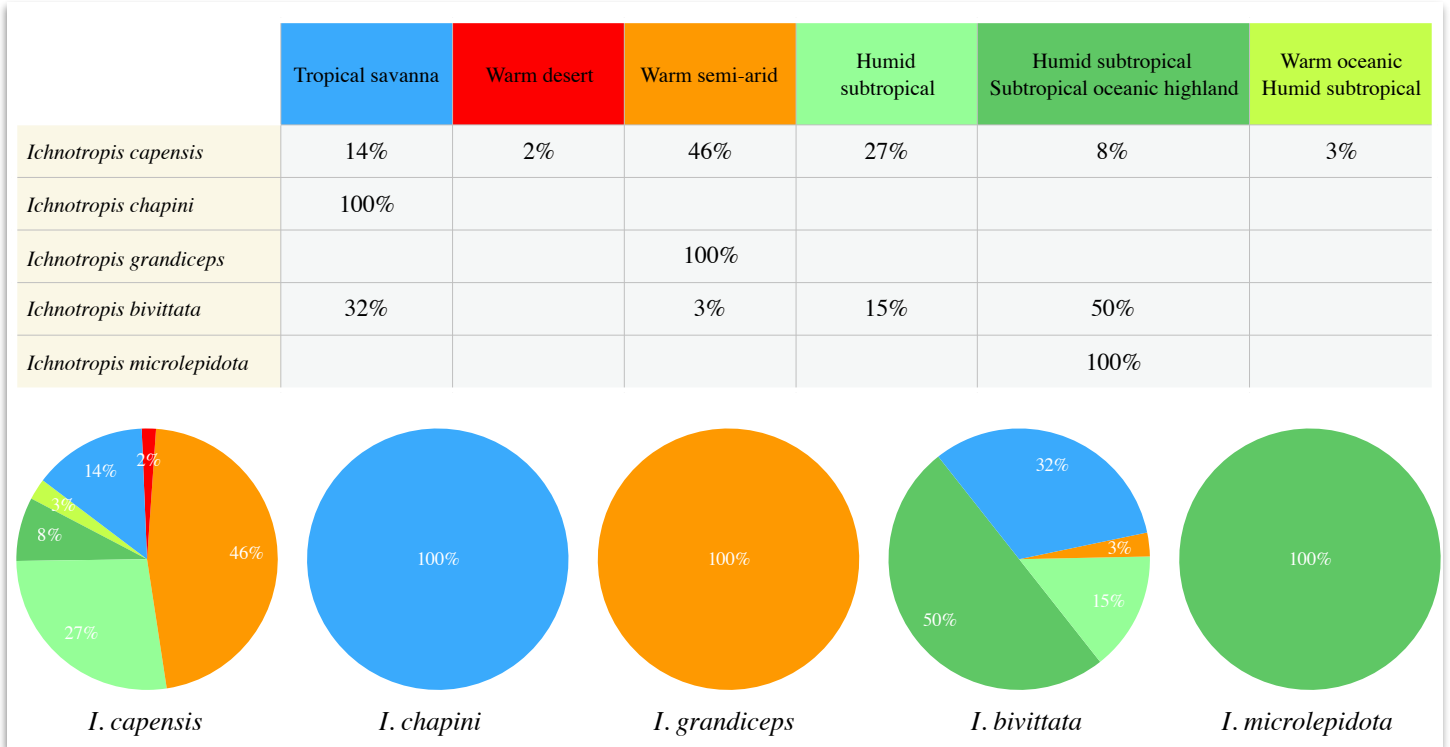


Fig. 236. Distribution across climate zones, compiled from the distribution data in figure 235.

possible species, which, according to the morphological keys, could represent two groups: Group A, including *I. capensis*, *I. chapini* and *I. grandiceps*, and group B, including *I. bivittata* and *I. microlepidota*. I have presented the gathered distribution data of these 5 possible species on the KÖPPEN-GEIGER climate classification map (PEEL et al. 2007), and extracted the data regarding occurrence in different climate zones, presented in figure 235. This data is for illustration of the differences within these possible species only, and might become, after a future genetic based revision of the genus, completely different. However, at least the maps provide a nice overview on the present distribution situation.

Conclusions

1. Taxonomic history

In the early days of the genus, a few demonstrable mistakes were included in the taxonomic history of *Ichnotropis*. From these mistakes, the wrongly identified records of what should have been *Tropidosaura montana*, are usually still listed as a synonym of *Ichnotropis* (UETZ 2017). It is therefore necessary that *Ichnotropis* synonym lists will be stripped of the following records: *Tropidosaura capensis* DUMÉRIL & BIBRON (1839), *Tropidosaura capensis* STEINDACHNER (1867), and *Thermophilus capensis* FITZINGER (1843), all three being a synonym of *Tropidosaura montana* FITZINGER, 1826.

2. Necessary additional research

In order to understand the taxonomy of *Ichnotropis* better than today, it is necessary to perform a phylogenetic investigation of the voucher specimens of all previously described taxa, together with a selection of museum specimens, which have a special interest because of their geographical origin. Regarding the special geographical interest locations we might think of extremities in the expected distribution ranges, possible overleaping areas, and opposed to the usual highland habitats, the lowland collection locations, which are also different by the deviating climate conditions. Such research could provide the answers to many open questions in this poorly understood genus.



Fig. 237. Male *I. bivittata* near Kinshasa.

Higher Taxa	Lacertidae, Sauria, Lacertoidea, Squamata (lizards)
Subspecies	<i>Ichnotropis capensis capensis</i> (A. SMITH, 1838) <i>Ichnotropis capensis nigrescens</i> LAURENT, 1952
Common Names	Cape Rough-scaled Lizard, Smith's Rough-scaled Sand Lizard
Synonym	<i>Algyra capensis</i> SMITH 1838 <i>Tropidosaura capensis</i> — DUMÉRIL & BIBRON 1839: 171 <i>Thermophilus capensis</i> — FITZINGER 1843: 21 <i>Tropidosaura Dumerilli</i> SMITH 1849 <i>Ichnotropis microlepidot[a]</i> PETERS 1854: 617 <i>Ichnotropis Dumerilli</i> — BOCAGE 1866: 43 <i>Ichnotropis capensis</i> — BOULENGER 1897: 276 <i>Ichnotropis longipes</i> BOULENGER 1902: 17 (fide LOVERIDGE 1953: 150) <i>Ichnotropis capensis longipes</i> — FITZSIMONS 1943: 354 <i>Ichnotropis capensis</i> — FITZSIMONS 1943: 352 <i>Ichnotropis capensis</i> — AUERBACH 1987: 131 <i>Ichnotropis capensis</i> — HAAGNER et al. 2000 <i>Ichnotropis capensis</i> — EDWARDS et al. 2013

Fig. 238. Synonym list of *I. capensis* in UETZ (2017).



Fig. 239. Holotype of *Ichnotropis grandiceps* in the National Museum of Natural History.

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