

IV. Snakes

by

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The emphasis on the collection of amphisbaenians makes it not surprising that the most interesting snakes belonged to burrowing species. The series of typhlopids permitted the first demonstration of the existence of *Typhlops braminus* in the Somali Republic, as well as the description of a new species and of a new race. An open problem is posed by the discovery of a specimen of "*Crotaphopeltis hotamboia*" with markedly distinct hemipenes.

The material also provided confirmation that the patterns of variation of many wide-ranging African species are as yet very poorly understood and that it is not useful at present to apply trinominals.

We are grateful to Miss Charlyn RHODES and to Mr. Aaron M. TAUB for technical assistance, to Dr. Alan K. BRUCE for advice regarding X-ray techniques and to Dr. V. CUMMINGS for illustrations.

ACCOUNT OF THE SPECIES

Leptotyphlops cairi (DUMÉRIL and BIBRON)

Bedawanak, 6 miles south of, 14-i-62, M. C. Z. 74163 (C. F. HEMMING).

Remarks: PARKER's (1949, p. 19) comments about the "very unsatisfactory taxonomic state" of the snakes of this genus still apply today. Yet there is probably enough material in various, particularly Italian, museums to permit a preliminary sorting of the north-east African forms. Not even the ventral and caudal counts have been published for most of the types, so that the identification above is uncertain.

The head is rounded, the rostral reaches to the ocular, there is a supraocular on each side, and the ocular reaches the labial edge between two supralabials, the anterior one very small (cf. JAN and SORDELLI, 1860, pl. 6, fig. 6). The nasal is partially divided and there are 5 infralabials. There are (approximately) 339 scales along the back, of which 32 pass along the tail, which ends in a small spine. 14 rows of scales surround the body. Total length is 97 mm, midbody diameter 1.3 mm, and caudal length 7 mm, giving values of 74.5 and 13.8 for the commonly cited ratios. The dorsal surfaces are faintly pigmented with brown stipple. The ocular, the edges of the dorsal scales, and the ventral surfaces show no color in preservative.

Typhlops braminus CUVIER

Mogadiscio, 6-viii-61, M. C. Z. 74450.

Remarks : This specimen represents the first record for the Somali Republic, but the range extension is hardly surprising in view of the wide distribution of the species, cited by LOVERIDGE (1957, p. 245) from the coastal zone of Kenya and Tanganyika. It was taken during the early morning amid the roots of grasses on sandy soil, within 1 km of the ocean.

Description : Head rounded. Trunk dark brown, slightly countershaded, except for whitish distal tip of tail. 348 scales along back, of these 12 along tail (ventral counts 340 + 15). Tail plus trunk vertebrae (from X-rays, cf. GANS and TAUB, 1965) 193. Snout-vent plus tail length 155 + 5 mm, midbody diameter 3.2 mm. Midbody diameter 50 times in length. Tail length 32 times in length.

Comparative materials : Tanganyika : Dar-es-Salaam, M. C. Z. 24008. Lundi, M. C. Z. 48049-50. Liwale, M. C. Z. 52626. Mauritius : Moka, M. C. Z. 51640.

Typhlops cuneirostris (PETERS)

Remarks : This species is easily identifiable by its peculiar head shape (fig. 10) and by the color pattern which consists essentially of a dark pigmentation of the margin of middorsal rows of scales. This pattern gives the impression of a series of dark longitudinal lines, one more than the number of dark-margined scales. In life these specimens are pink with a light brown back. The body is relatively short, stout, and of oval cross section. The tail is extremely short, ends in a curved spine and is difficult to measure accurately.

Comparison of the data (table 4) from the south coastal specimens with material from the northern territories suggests that the two groupings are sampled from different populations. The samples differ in number of vertebrae and in the related number of vertebral scales. A secondary difference concerns the average number of lines along the back though variation within the northern population seems to mask this. The northern and inland population also differs in the greater range and average values of the length-diameter (L/D) ratio. Such factors as the extensive overlap and ontogenetic variation make this character non-diagnostic. All specimens agree in such characteristics as head shape, general appearance, major features of head scalation, and number of scale rows around the body.

Three specimens, respectively one from Lugh, inland Somali Republic, and two from Dolo, Ethiopia, are intermediate between the two populations. They fall at the bottom end of the range of the northern (and inland) populations in number of scales along the back and number of vertebrae, agree with the coastal population in

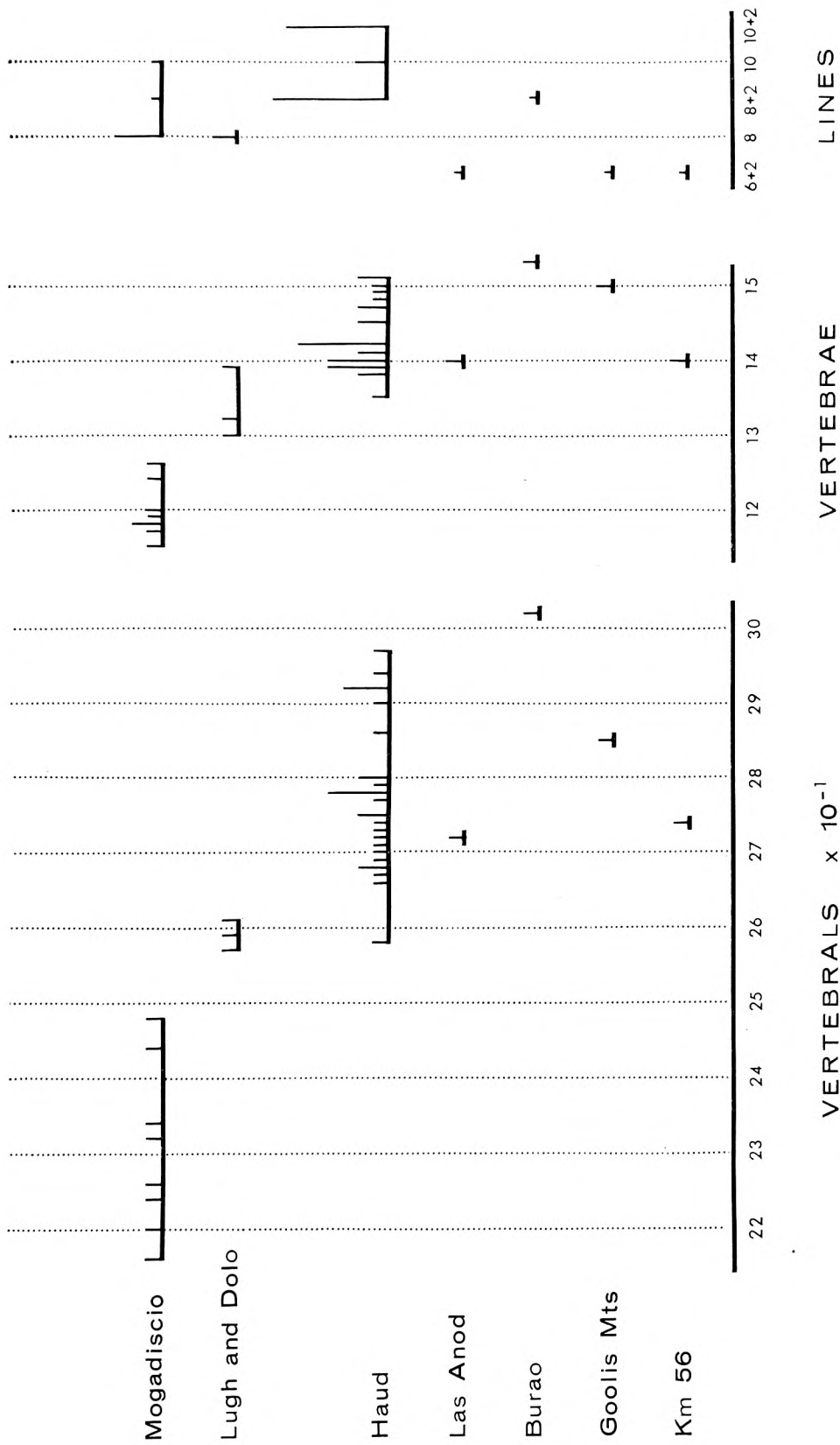


Fig. 10. — *Typhilops cuneirostris*. Variation of numbers of vertebral scales, vertebrae, and dorsal lines in samples from various portions of the range. The shortest vertical line in the bar histogram stands for a single specimen.

TABLE 4
DATA FOR *TYPHLOPS CUNEIROSTRIS* (1).

Museum and number	Number of lines	Number of vertebrals	Number of vertebrae	Rows of scales	Total length	Midbody diameter	L/D ratio
<i>cuneirostris</i>							
M.C.Z. 74463	8-10	216 ?	118	22-24	134	5.2	25.8
M.C.Z. 74464	8	226	118	22	125	4.9	25.5
M.C.Z. 74466	8	248	126	22	143	6.1	23.4
M.C.Z. 74467	8	224	119	22	105	4.3	24.4
M.C.Z. 74451	8	220	115	22	132	5.5	24.1
M.C.Z. 74452	8	234	117	22	148	6.2	23.9
M.C.Z. 74453	8	232	124	22	138	5.5	25.1
M.C.Z. 74454	10	244	120	22	135	5.5	24.6
<i>calabresii</i>							
M.C.Z. 74465	6+2	274	140	22	149	5.0	29.9
M.C.Z. 51294	10+	292	151	22	165	5.8	28.5
M.C.Z. 51295	10	279	145	22	177	5.5	32.1
B.M. 1949.2.1.13	10+2	278	140	22	159	6.5	24.5
B.M. 1949.2.1.14	10	271	138	22	154	5.5	28.0
B.M. 1949.2.1.15	10+	258	135	22	109	6.0	18.2
B.M. 1949.2.1.16	8+2	274	139	22	153	6.0	25.5
B.M. 1949.2.1.17	10+2	266	141	20	138	5.5	25.1
B.M. 1949.2.1.18	8+2	292	147	22	168	5.0	33.7
B.M. 1949.2.1.19	10+2	269	141	22	130	4.5	28.9
B.M. 1949.2.1.22	10+2	267	139	22	141	5.0	28.2

B.M. 1949.2.1.23	8+2+	275	142	22	163	7.0	27.0
B.M. 1949.2.1.24	8+2	294	151	22	189	7.0	23.3
B.M. 1949.2.1.25	10+2	290	150	22	107	4.5	23.8
B.M. 1949.2.1.26	10+2	278	140	22	144	5.5	26.2
B.M. 1949.2.1.27	10	297	149	22	173	6.0	28.9
B.M. 1949.2.1.29	10+	272	142	22	181	6.5	27.9
B.M. 1949.2.1.30	10+2	278	142	22	156	6.0	26.0
B.M. 1949.2.1.32	8+2	270	140	22	135	5.5	24.5
B.M. 1949.2.1.33	8+2	280	145	22	92	4.2	21.9
B.M. 1949.2.1.34	10+2+	280	144	22	90	4.0	22.5
B.M. 1949.2.1.35	8+2	277	144	22	127	4.5	28.2
B.M. 1949.2.1.36	8+2	286	147	22	164	5.5	29.9
B.M. 1949.2.1.37	10	292	148	22	180	6.0	30.0
B.M. 1949.2.1.38	8+2	278	142	22	138	4.5	30.7
B.M. 1949.2.1.39	8+2	275	142	22	132	5.0	26.4
B.M. 1949.2.1.40	10+2	273	140	22	152	7.0	21.7
B.M. 1949.2.1.41	10+	268	138	22	158	5.5	28.7
B.M. 1949.2.1.42	8+2	277	142	22	103	3.5	29.4
B.M. 1958.1.6.21	6+2	272	140	22	137	4.5	30.5
B.M. 1949.2.1.12	8+2	302	153	22	167	5.5	30.4
B.M. 98.5.2.126	6+2	285	150	22	84	4.0	21.0
subspecies							
B.M. 96.5.30.8A	8	261	130	22	122	4.0	30.5
B.M. 96.5.30.8B	8	257	132	22	114	5.5	20.7
B.M. 98.1.28.12	8	259	139	22	118	4.5	26.2

(1) When the vertebral count could not be made because the specimen was too small or damaged the other data were also omitted.

number of lines along the back, and are intermediate in length-diameter ratio. It is not clear whether they would present intergrades or whether they are samples from a third, inland, but southern population, as is suggested by the drastic ecological differences.

The type of *T. cuneirostris* was collected in Brava and the data of the original description agree with those of the southern population. We here propose to recognize the northern population as a new subspecies and to name this for Dr. Enrico CALABRESI, author of the earliest modern reviews of the Somali herpetofauna.

KEY TO THE RACES OF *TYPHLOPS CUNEIROSTRIS*

1. 115 to 126 vertebrae; 216 to 248 vertebral scales; generally 8, occasionally 10, dark lines along back (southern districts of Somali Republic) *Typhlops c. cuneirostris*.
2. 130 to 153 vertebrae; 257 to 302 vertebral scales; generally 10, occasionally 8 or 12 dark lines along back, the lateral ones often broken (northern districts of Somali Republic, ex-Somaliland) *Typhlops cuneirostris calabresii*.

Typhlops c. cuneirostris PETERS

Afgoi, 10 km south of [Mogadiscio, 40 km south of], on sand dune road, 22-vii-61, M. C. Z. 74462-64. Mogadiscio, 31-vii-61, M. C. Z. 74466, M. C. Z. 74467; 16-viii-61, M. C. Z. 74451-52; v-62, M. C. Z. 74453-54 (F. SAVAGE).

Field Notes: The Afgoi specimens were dug up from a depth of 50 to 70 cm beneath two dead and decaying thorn bushes. *Mochlus vincinguerrae* (M. C. Z. 71893-94) were also taken here. The Mogadiscio specimens were taken in the early morning among the roots of bushes some 1 km from the ocean.

Typhlops cuneirostris calabresii new sub. species

Holotype: M. C. Z. 74465, collected 56 miles from Hargeisa, on Berbera road, Northern Territory, Somali Republic, on xii-61 by C. F. HEMMING.

Paratypes: M. C. Z. 51294-95, taken in the Haud, border between Somali Republic and Ethiopia, between 45° and 46° 30' E, at an elevation of 2,500 ± feet, by R. H. R. TAYLOR [specimens formerly in the British Museum (Natural History)].

B. M. 1949.2.1.13-27 and B. M. 1949.2.1.29-43, taken in the Haud, border between Somali Republic and Ethiopia, between 45° and 46° 30' E, at elevations between 2,100 and 3,000 feet, by R. H. TAYLOR. B. M. 1958.1.6.21 taken at Las Anod, 3,000 feet, by A. R. TRIBE.

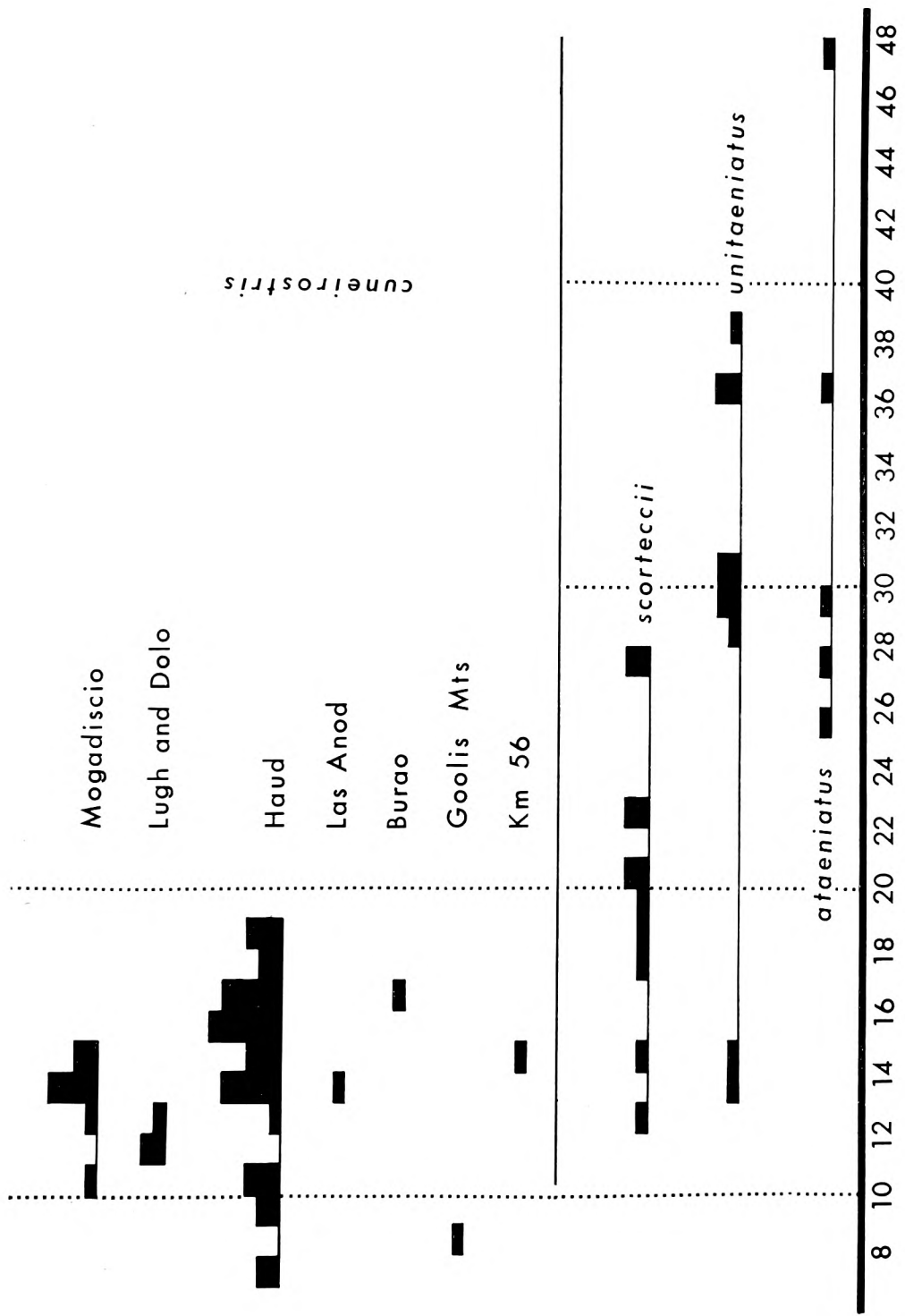


Fig. 11. — *Typhlops*. Size distribution of the several samples discussed in the text. The shortest vertical distance in the histogram stands for a single specimen.

B. M. 1949.2.1.12, from Burao, Northern Territory, Somali Republic. B. M. 98.5.21.26 from the Goolis Mountains, inland of Berbera, Northern Territory, Somali Republic.

Diagnosis : A race of *T. cuneirostris* characterized by 135 to 151 vertebrae and 258 to 230 vertebral scales arranged in 22 (exceptionally 20) rows around the trunk. Eight to 12, mostly 10, dark lines along the back, and a ratio of total length to body width of 18.2 to 31.1. Specimens seem to average slightly larger than those of the nominate subspecies.

***Typhlops scorteccii* new species**

Holotype : M. C. Z. 74455, collected 10 km south of Afgoi [40 km south of Mogadiscio], on the sand dune road to Merca, Benadir Province, Somali Republic, on 25-vii-61 by Carl GANS.

Paratypes : M. C. Z. 74456-59 collected with the holotype. M. C. Z. 74460 collected at Mogadiscio, Benadir Province, Somali Republic on 2-viii-61 by J. WALKER; M. C. Z. 74461-62 collected same locality on 30-viii-61 by Carl GANS. B. M. 1963.420 and C. M. 38719 collected in Benadir Province, on v-62 by F. J. SAVAGE.

Diagnosis : A species of *Typhlops* characterized by a dorsally rounded, ventrally flattened, wedge-shaped head with a horizontal rostral edge (fig. 12). Specimens have 226 to 255 vertebrae, 352 to 390 scales from the back of the head shield to the caudal tip, 23 to [generally] 27 scale rows ringing the body in the anterior, 23 to [generally] 25 in the midbody and 23 to 26 [generally 25] in the posterior region. The color is a very dark to blackish brown dorsally, slightly lighter ventrally, with a bright yellow stripe running from the dorsal surface of the head along the anterior half to three-quarters of the back.

Remarks : Data for the available specimens are given in table 5.

This new form suggests the danger of relying upon body proportions and coloration in typhlopoid systematics. Early records refer to coastal Somalia material as *T. unitaeniatus*, a species in which the dorsal yellow stripe stretches from nape to cloaca. SCORTECCI (1930, p. 15) comments on a specimen from Mogadiscio in which the yellow dorsal stripe extends along only one half of the body, and he and PARKER (1949, p. 22) consider this and other individuals as possible intergrades since they have *unitaeniatus* coloration anteriorly and *ataeniatus* coloration posteriorly. Since the mid-dorsal scale and vertebral counts of the coastal sample are far lower than those of either of the other two forms, it is most unlikely that they represent intergrades, and this simple scheme has to be rejected.

Reevaluation of the data furthermore raises some question regarding the relations of the two hook-beaked forms customarily referred to as *T. unitaeniatus*

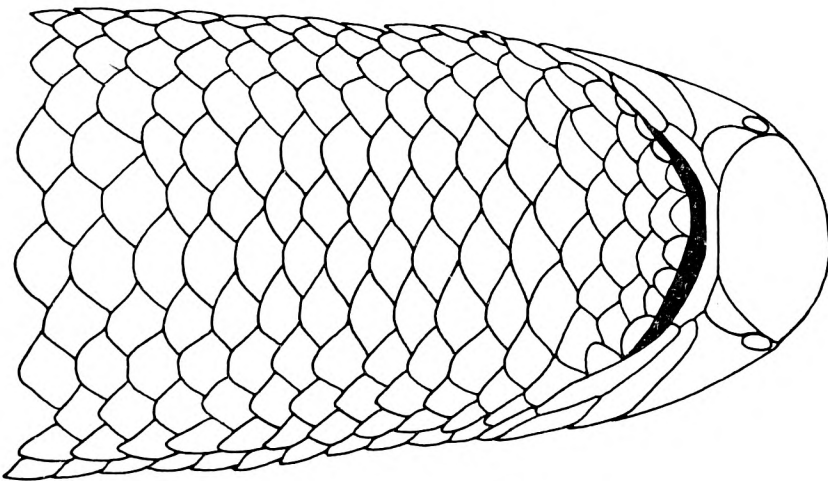
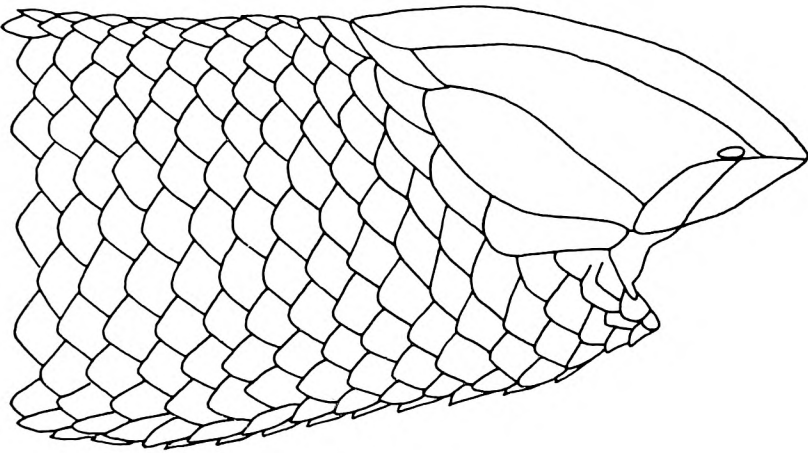
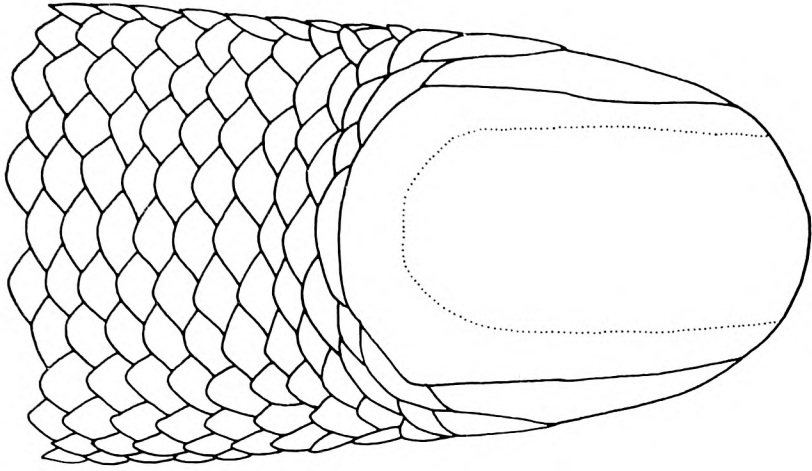


Fig. 12. — *Typhlops scorteccii*. Dorsal, lateral, and ventral views of the head of the holotype, M. C. Z. 10039, to show scale details (V. CUMMINGS, del.).

TABLE 5
DATA FOR SPECIMENS OF *TYPHLOPS SCORTECCII*.

Museum and number	Number of vertebrae	Number of vertebrals	Rows of dorsals			Total length	Midbody diameter	Ratios	
			Front	Midbody	Rear			L/D	Stripe
M.C.Z. 74455	255	390	27	25	25	221	3.65	60.6	.439
M.C.Z. 74456	233	359	27	25	25	207	4.0	51.8	.643
M.C.Z. 74457	239	361	27	23	23	198	4.2	27.2	.581
M.C.Z. 74458	235	352	25	24	25	180	3.8	47.4	.584
M.C.Z. 74459	248	374	27	25	25	148	2.4	61.6	.724
M.C.Z. 74460	248	360	27	25	25	228	4.4	51.8	.658
M.C.Z. 74461	226?	357	23	25	25	126	2.8	45.0	.738
M.C.Z. 74462	239	374	25	23	23	176	2.4	73.4	.710
B.M. 1963.420	236	389	26	24	26	275	5.9	46.6	.818
C.M. 38719	227	356	27	24	24	203	4.3	47.2	.760

PETERS and *T. ataeniatus* BOULENGER. *T. unitaenatus* is characterized by high numbers of vertebrae and vertebral scales as well as a complete yellow stripe. Specimens are known from Uganda, Tanganyika, Kenya, and possibly from Lugh in the Somali Republic. *T. ataeniatus* is characterized by lower counts and a completely uniform brown coloration. It has been recorded from the Northern Frontier Province of Kenya and from the Northern Territory of the Somali Republic. An interesting situation is posed by a completely dark-colored specimen reported by CALABRESI (1918) from Gelib or Margherita in southern coastal Somali Republic. He referred the specimen to *T. somalicus* BOULENGER (1895), but PARKER (1949) referred it to *T. unitaenatus ataeniatus*. The available records for the new form cluster along the coastal region north of the Juba River.

The three populations are certainly quite distinct (table 6). They differ in number of vertebrae and vertebral scales, rows of scales around the body, curvature of the head, adult size, and coloration. They are similar in general head shield arrangement, and in the ratio between number of vertebrae and vertebral scales (cf. GANS and TAUB, 1965, fig. 1). There are some marked differences in body lengths, though the L/D ratios again turn out to be undiagnostic.

Two specimens tentatively assigned to *unitaenatus*, because of their color pattern and vertebral numbers, show puzzling deviations from the population means. The first one, from Malindi, has a vertebral scale (but not number of vertebrae) count some 60 higher than any other specimen, and also has a peculiar greenish rather than yellow-colored dorsal stripe. The second, one from Lugh, is almost twice as thick as a correspondingly-sized individual from Kenya. These deviations from population mean are not in the direction of one of the other forms and the specimens have for the moment been retained in *T. unitaenatus* (and their values listed in parentheses in table 6).

The geographical distribution permits at least two systematic assignments, that there are three replacing races with a northeast southwest sequence *scorteccii-ataeniatus-unitaenatus*, or that there are three apparently allopatric replacing species. We prefer the second, because (1) the populations differ more sharply and clearly than do the clearly conspecific populations of *T. cuneirostris*, (2) the several characters represent a checkerboard of variation rather than a series of continuous clines, and (3) the actual localities from which records are available suggest that the three forms may well turn out to be sympatric in a probably quite restricted zone.

We take pleasure in naming the new species for Dr. Guiseppe SCORTECCI, author of numerous studies on the fauna of the Somali Republic.

Field Notes: The Afgoi series was taken at a depth of 30 to 60 cm in sandy country from beneath a mat of thorns marking the former site of a long defunct thorn bush. The first Mogadiscio specimen was brought in by Mr. J. WALKER, who found it crawling down a street in the afternoon after a torrential downpour. The others were taken by hoeing up grasses in sandy soil during the early morning.

TABLE 6
COMPARISON OF CHARACTERISTICS FOR LONG-BODIED SPECIES OF
TYPHLOPS FROM THE HORN OF AFRICA.

<i>Character</i>	<i>scorteccii</i>	<i>ataeniatus</i>	<i>unitaeniatus</i>
Chin region	Plane	Concave	Concave
Maximum length (mm)	275	385	470+
Yellow dorsal stripe percent of total length	44-82	0	95-97
Number of vertebrae	227-255	297-307	315-334
Number of vertebral scales	352-390	457-476	496-536 (593)
Rows of scales :			
Front	23-27	25-28	25-27
Midbody	23-25	24	23-24
Precloacal	23-26	22-24	22-24
Length-diameter ratio	47-73	46-60	(43) 58-88

Comparative materials: Typhlops unitaeniatus: Uganda, Taru, B. M. 97.11.17.18. Tanganyika, Tanga township, B. M. 1960. 1.6.29. Amboni estate, near Tanga, M. C. Z. 48058. Kenya, Kibwezi, B. M. 93.11.21.42, M. C. Z. 18175. Voi, M. C. Z. 40079-40080. Mombasa, B. M. 90.1.20.2. Malindi, M. C. Z. 40081. Ithumba, B. M. 1963.433. Saka, Tana River, B. M. 1952.1.6. 46. Somali Republic, Lugh (= Lugh Ferrandi), B. M. 98.1.28.13.

Typhlops ataeniatus: Somali Republic, Haud, 46° E × 8° 26' N, 2,100 ft., B. M. 1949.2.1.1. Haud, 45° 43' E × 8° 26' N, 2,350 ft., B. M. 1949.2.1.2. Haud, 45° 34' E × 8° 29' N, 2,600 ft., B. M. 1949.2.1.3. Haud, 46° 30' E × 8° 10' N, 3,000 ft., B. M. 1949.2.1.4. Kenya, Malca Murri, 1,200 ft., by Dana River, B. M. 1952.1.8.88.

***Eryx somalicus* SCORTECCI**

Mogadiscio, 3 km north of, 26-viii-61, M. C. Z. 72038.

Remarks: This specimen has the coloration described as typical by SCORTECCI (1939, p. 269). The form is adapted for burrowing by its recessed lower jaw, wedge-shaped head, and the grouping of small segments surrounding the cloaca posterior to the single cloacal shield. The scales are smooth anteriorly and

keeled posteriorly. There are 159 ventrals, 25 single caudals terminating in a rounded spine, and 36 anterior, 38 midbody and 23 precloacal dorsals. It is interesting to note two integumentary peculiarities of this taxon. The first is that the last ventral and the precloacal each have the extreme edge divided off into a separate scale, the scales separated from the precloacal being larger. Secondly, there is both increase and reduction of dorsal scale rows, as well as the intercalation of additional scales within the dorsal rows. The latter occurs commonly in the second and third lateral rows, and the additional scales are found in all rows dorsal to the row in question. The 159 ventrals thus correspond to 204 scales along the mid-dorsal line. The head scales fall within the pattern described by SCORTECCI and by PARKER (1949, p. 27), being 5 between the eyes and 11 ringing each eye.

It should be noted that the upland (3,500 ft) record, whose counts are cited by PARKER, has 193 rather than 159 ventrals. This suggests the presence of a distinct high altitude (or northern ?) population.

The Mogadiscio specimen was taken on the bench above the beach at an altitude of 5 m, some 10 m from the breaker zone. It was coiled in a small space in sand between two rocks. On first sight its color pattern was reminiscent of the *Dasyveltis* found in the same zone, but the individual did not engage in defensive behavior.

***Coluber brevis* (BOULENGER)**

Darin, 18-viii-61, M. C. Z. 71861.

Remarks: This small specimen had been killed with a mattock some hours before, apparently while it was crossing an open area during the daytime. We assign it to this species without taking a position on its subspecific status, although its counts confirm PARKER's remarks (1949, p. 29) about the possible existence of a northeastern subspecies (cf. LANZA, 1963).

The male specimen has 9 supralabials of which the fifth and sixth contact the eye, 8 infralabials, 2 pre- and 2 postoculars, and 2 first and 2 second temporals. The nostril lies between 2 nasals. Ventrals number 167, caudals 87 in double series and dorsals 22-17-13. The dorsals are smooth, symmetrical, distally rounded, subequal with 2 scale organs. Approximate snout-vent plus tail length is 330 + 131 mm.

***Coluber rhodorhachis subnigra* (BOETTGER)**

Candala, vicinity of, 21-viii-61, M. C. Z. 71862.

Remarks: This snake was caught in one of the stony canyons near Candala and sold to me.

The male specimen has 9 supralabials of which the fifth and sixth contact the eye, 11 infralabials, 2 pre- and 2 postoculars, and 2 first and 3 second temporals. The nostril lies between 2 nasals. Ventrals number 212, caudals 130 in double series and dorsals 19-19-13. The dorsals are smooth, pointed with the extreme tip round, subequal with 2 tiny terminally placed scale organs. Snout-vent plus tail length is 474+199 mm.

Boaedon lineatus DUMÉRIL and BIBRON

Mogadiscio, 27-viii-61, M. C. Z. 71847. Mogadiscio, 5 km north of, 27-viii-61, M. C. Z. 71849. Villagio Sguss, 28-viii-61, M. C. Z. 71848.

Remarks : We retain this name, which has been in constant use for a century, as LOVERIDGE's (1957, p. 251) substitution of *fuliginosus*, represents an undocumented opinion without argument. We would also agree with PARKER (1949, p. 52) that the recognition of subspecies is premature.

These specimens were dark brown above and lighter below in life. The double light lines on the head are very distinct on the juvenile (male ?) and present only as a series of light dots in the two females. Both lines are very faint or absent in the temporal region, but the two lateral stripes on the sides of the trunk would seem to represent their continuation. These light lines on the trunk are clearly apparent, while specimens from central Kenya seem to lack them. The specimens have eight (M. C. Z. 71849 has nine unilaterally) supralabials of which the fourth and fifth (M. C. Z. 71847 also the third, M. C. Z. 71849 also the sixth, both unilaterally) contact the eye, 11 infralabials, a loreal, one pre- and two postoculars, and one first and two to three second temporals. The nostril is pierced in a nasal and opens dorsad. The dorsals are smooth, symmetrical, posteriorly angled to a rounded distal tip, and each bear two scale organs. The precloacal shield is single. Other data are :

Museum Number M. C. Z.	Sex	Ventrals + caudals	Dorsals			Snout-vent + tail length
			Front	Midbody	Rear	
71847	♀	222 + 53	32	— 33	— 23	382 + 59
71849	♀	211 + 54	32	— 31	— 21	388 + 65
71848	Juv.	201 + 67	30	— 28	— 21	211 + 43

M. C. Z. 71849 regurgitated a partially digested *Mabuya hildebrandti* while in the collecting bag.

Telescopus dhara somalicus (PARKER)

Balad, 11-viii-61, M.C.Z. 72042.

Remarks: We assign this specimen to PARKER's race but suggest that the extensive range of variation of the eastern Somali material cited by him may imply geographic variation within his subspecies. The classification of this form, as of most wide ranging African species, might usefully be reexamined on the basis of the material already accumulated in museums.

The head is very distinct from the neck and the specimen (female) has an elliptical pupil. There are ten supralabials of which the fourth, fifth and sixth contact the eye, 14 infralabials, a loreal, and one pre- and two postoculars, and two first and three second temporals. The nostril is inserted into a single nasal. Scales are smooth, lack noticeable scale organs, are asymmetrical, and decrease in size toward the enlarged midvertebrals. There are 222 ventrals up to the undivided precloacal, followed by 57 caudals in double series. Dorsal rows number 19 anteriorly, 22 at midbody, and 14 in front of the vent. Snout-vent plus tail length is 516+86 mm, only the extreme tip of the tail is missing, so that not more than three caudal scales and up to 10 mm may have to be added. The specimen bears a very large tick just posterior to the head. The tick has severely damaged the skin.

Crotaphopeltis hotamboeia (LAURENTI)

Audegle, 1961 (J. WALKER), M. C. Z. 74308; 5-viii-61, M. C. Z. 71863. Balad, 9-viii-61, M. C. Z. 71867. Villagio Sguss, 4-viii-61, M. C. Z. 71864; 9-viii-61, M. C. Z. 71865-66; 11-viii-61, M. C. Z. 71868-70; 16-viii-61, M. C. Z. 71871-73; 28-viii-61, M. C. Z. 71874.

Remarks: This series poses several problems, the most important of which concerns M. C. Z. 71871, a male with everted hemipenes. These differ drastically from those of three other males from the same locality by being 50% longer (and more slender), having the small spines organized into clearer rows, and lacking the three enlarged basal spines stated by BOGERT (1940, p. 62) to be diagnostic of this species. The *lepidosis* of the specimen shows no other differences, except for the bilateral fusion of loreal and preocular, also shown by a juvenile (M. C. Z. 71865) from the same locality, and the presence of 9/10 rather than 11 or 12 infralabials. The dentition is also remarkably similar. The remaining series of this common form should be assembled and reviewed. We propose to deal with this matter at a later time.

MERTENS (1955, p. 57) has recently divided the species into four races. He referred specimens from Tanganyika to *C. h. bicolor* (LEACH), a name that was based on material from Fantel, Ghana. The subspecies is characterized by the

TABLE 7

TABLE OF DATA FOR *CROTAPHOPELTIS HOTAMBOEIA*.

Museum Number M. C. Z.	Sex	Ventrals plus caudals	Rows of dorsals			Supralabials (contacting eye)	Infralabials	Snout-vent plus caudal length
			Front	Midbody	Rear			
74304	♀	168+57	17	— 19	— 15	8 (4, 5)	/	435+93
71863	♀	167+52	19	— 19	— 15	8 (4, 5)	/	448+84
71864	♂	163+60	19	— 19	— 15	8 (3, 4, 5)	11/11	310+74
71866	♂	162+49	17	— 19	— 15	8 (3, 4, 5) 8 (4, 5)	12/12	543+110
71870	♂	163+51	17	— 19	— 15	8 (4, 5)	12/12	507+108
71876	♂	172+60	17	— 19	— 15	8 (4, 5)	9/10	479+114
71869	♀	167+x	17	— 19	— 17	8 (3, 4, 5)	11/11	512+x
71865	Juv. ♀	169+57	19	— 19	— 15	8 (4, 5)	11/11	153+29
71868	Juv. ♀	167+47	17	— 19	— 15	8 (4, 5)	11/11	278+50
71872	Juv. ♀	173+53	19	— 19	— 15	9 (3, 4, 5)	11/12	171+32
71873	Juv.	164+49	17	— 19	— 15	8 (4, 5)	12/12	174+32
71874	Juv.	169+49	17	— 19	— 15	8 (3, 4, 5)	12/12	181+33
71867	♀	172+45?	—	— 19	— 15	8 (4, 5) 8 (3, 4, 5)	12/12	477+78

combination of 19 rows of midbody dorsals and a white to grey upper lip. Quite apart from the propriety of recognizing subspecies based primarily upon labial coloration, we feel that published counts in the literature indicate sufficient variation to invalidate his simple scheme. Thus LOVERIDGE (1953, p. 268) lists caudal counts of 29 to 46 for a Nyasaland series, and counts of 33 to 48 for a series from Tanganyika and Uganda (1942, p. 288). MERTENS (*op. cit.*) cites (27 ?) 39 to 41 for Tanganyika, LOVERIDGE (1936, p. 257) cites 32 to 54 for a mixed series from inland and coastal Kenya, while SCORTECCI (1929, p. 276) gives 41 to 56 for a series of 15 from Villabruzzi, Somali Republic. Our series ranges from 49 to 60. The combination of records suggests some sort of north-south trend to lower counts, or possibly a high count population in the coastal Kenya - Somali Republic region. Yet all of these are based on specimens with white supralabials and presumably with 19 rows of dorsals. Our decision that recognition of subspecies should await a review of the species as a whole should not imply prejudgment of the status of the seemingly distinct *C. tornieri* WERNER.

The present specimens are dark dorsally and light tan ventrally. The juveniles exhibit a scattering of white spots across the dorsal surface. The two specimens from Audegle differ from the remainder of the series in the blue-violet brown rather than olive brown tone to their dorsal coloration. The specimens have a distinct head and elliptical pupils, and the nostril is inserted between two nasals followed by a loreal that sometimes fuses with the preocular. There are a single pre- and two postoculars, followed by one first and two second temporals. Scales are smooth with some faint keeling along the posterior third of the body, asymmetrical, and posteriorly rounded. The preloacal shield is single, and the caudals lie in a double row. Other data are tabulated. The body proportions are the only characteristic showing clear sexual dimorphism.

The specimens were collected in the fields fringing the Uebi Scebeli river. The Villagio Sguss series was severely parasitized by a tiny pit mite, possibly a new species of the genus *Ophioptes* (RADFORD, 1950, p. 378). Most of the lesions were on scales of the chin and head region, though a few could be found scattered over the body.

***Brachiophis r. revoili* MOCQUARD**

Mogadiscio, 4-viii-61, M. C. Z. 71850; v-62 (F. SAVAGE), M. C. Z. 74306-07.

Remarks: These crepuscular snakes were dug up in the early morning from sandy areas within 1 km of the ocean. This species, so rare in most collections, is easily recognized (WITTE and LAURENT, 1947, p. 95) by its compressed spatulate head, peculiar head scale arrangement and astonishingly short tail. The female specimens have 111, 114, and 114 ventrals (respectively), 10, 11, and 10 undivided caudals, a terminal spine on the tail, divided preloacal shields, and

15 rows of dorsal scales from neck to cloaca. The scales are smooth, terminally rounded, symmetrical and decrease in size to the middorsal line. Snout-vent plus tail length is 254+14, 227+14, and 209+11 mm respectively. It is interesting to note a series of small segments posterior to the cloacal slit, which are apparently characteristic of sand-dwelling forms. M. C. Z. 74306 shows an umbilical scar on ventrals 101-103.

Aparallactus lunulatus (PETERS)

Villagio Sguss, 16-viii-61, M. C. Z. 71851(2).

Remarks: These small snakes were collected in fields near the Uebi Scebeli river. Both have damaged tails. The larger specimen contained a large green centipede (8++ cm) the diameter of whose segments almost equalled that of the snake.

These are small snakes with the head scarcely distinct from the neck. There are six supralabials (the seventh scale in line may be enlarged), the third and fourth touch the eye, and the fifth contacts the parietal. The scales are smooth, symmetrical, decreasing in size to the middorsal line. There is a single pre- and a postocular, the latter separated from the first temporal by the contact between fifth supralabial and parietal. There is one first and one second temporal. Nasals and preoculars are not in contact except for a point contact on the right side of the female specimen. The male has a snout-vent plus (partial) tail length of 261+85, the female of 184+22 mm. Ventral counts are 152 and 151, and (partial) caudal counts 59 and 21 respectively. 15 rows of dorsal scales from neck to cloacal region. The color of the back is uniform brownish, lightening toward the sides. The ventral surface is clear. The smaller female has a clearly marked nuchal collar of dark brown with the color extending anteriorly onto the dorsal surface of the head. The larger male shows the collar less distinctly.

PARKER (1949, p. 82) erected the substitute name *scorteccii* for *boulengeri* SCORTECCI, preoccupied. He had no material from Somalia, but believed the form a valid race. However, our material differs on the supposedly diagnostic characteristics of absence of nuchal collar and high frequency of naso-preocular contact.

Hemirhagerrhis kelleri BOETTGER

Villagio Sguss, 9-viii-61, M. C. Z. 72037.

Remarks: This pretty snake has an elongate snout with sharply angled canthus rostralis, and the head poorly set off from the neck. There are eight supralabials of which the fourth and fifth contact the eye. The nostril is inserted

in a single nasal, but a suture connects it to the ventral scale edge. There are 11 infralabials, a loreal, one pre- and two postoculars, and two first and three second temporals. The dorsal scales are smooth, symmetrical, lozenge-shaped (at mid-body), and bear a single scale organ. The female specimen has 149 ventrals, a divided precloacal, 78 caudals to the caudal spine, and 17-17-13 rows of dorsal scales. Snout-vent plus tail length is 258+88 mm.

Certain aspects of the coloration and also pupil shape (in the preserved specimen) differ from the description in PARKER's key (1949, p. 78). The pattern of the trunk appears to be based on a more or less expressed double stripe down the midline of each scale. Those of the seventh dorsal (counting from the ventrals) are heavily pigmented and fused, forming the "straight edge" of the middorsal line. The area between these (i.e. the three middorsal rows) is a mottled brown, though the individual double stripes can still be discerned. The double stripes of the fourth, fifth and sixth dorsals are very faint, but those of the second and third are strongly expressed, probably equivalent to PARKER's "lateral stripe" as the area between them is slightly darker. The first row of dorsals bears a clear double stripe, paralleled by an equivalent one on the lateral edge of the ventrals, and a weaker one between the latter and the ventral midline. The ventrals thus bear four, not three (as stated by PARKER). The pupil is clearly round.

***Psammophis b. biseriatus* PETERS**

Mogadiscio, 29-vii-61, M. C. Z. 72039-40.

Remarks: These specimens are in good agreement with LOVERIDGE's description (1940, p. 60). They are easily recognizable by the very elongate loreals and frontal, by the high caudal counts, and by the peculiar maxillary dentition.

The nostril lies between two nasals, and the loreal is followed by two (not one as in LOVERIDGE) pre- and postoculars, and two first and second temporals. There are nine supralabials of which the fifth and sixth contact the eye, and twelve infralabials. The male (M. C. Z. 72040) and female (M. C. Z. 72039) specimens have 140 and 143 ventrals respectively, followed in each case by a divided precloacal. The scales are smooth, posteriorly angled to a rounded tip, asymmetrical, and bear a single scale organ. Dorsals are in 17-15-11 rows. The tail of the female is truncated, that of the male has 122 caudals in two series. Snout-vent plus tail length for the male is 470+317, for the female 517+x mm.

***Dasypeltis scabra* (LINNÉ)**

Mogadiscio, 5 km north of, 29-viii-61, M. C. Z. 71877; young hatched from eggs, M. C. Z. 71875-76.

Remarks: The only earlier records of *Dasypeltis scabra* from the Somali

coastal plain north of the Giuba river were given without description (and thus cited *incertae sedis* by GANS, 1959, p. 162, which see for definition of characters and discussion of variation). A check of various Italian collections has now turned up specimens of this species from Magadi (M. S. N. M. 2148), near Afgoi (M. Z. U.F.-M4900C1118, and M4901C1133), Mogadiscio (M. S. N. G.-C. E. 30411), and the Mahaddei-Itala road (M. Z. U. F.-M4894C1134), as well as another record from Lugh (M. S. N. G.-C. E. 28808) on the Ethiopian border. No additional specimens of *D. medici lamuensis* were encountered, suggesting that the latter form does not extend north beyond the mouth of the Giuba. Data for all specimens are listed in table 8.

The adult female was collected from within the brush roof of a nomad hut located some 100 meters from the breaker zone. The area had a sparse cover of 5 to 30 cm high shrubs, with many bare patches. The nearest stand of dense, taller (<3 m) bush was at least 1 km distant (cf. itinerary).

The specimen was kept alive. It laid three eggs (not measured) on 25 September 1961, two of which (C. G. 2214, 2215) hatched on 10 and 11 January 1962, respectively. The clutch size is quite a bit smaller than others laid in this laboratory (Buffalo: 8 and 11 for *atra*, in 1959) or reported in the literature (10 for *scabra*, in SHAW, 1962, 1963).

The scale counts of the Somali material are highly interesting. The ventral counts suggest a condition intermediate between the material from Kenya and that from the [former] British Somaliland but very distinct from the inland [and highland] specimens from Ethiopia. There is some evidence for changes in the means of meristic characters for young born in captivity (FOX, 1948). Yet it still seems significant that the hatchlings had quite low counts, in agreement with those of the material from the northern territories.

The caudal and dorsal counts show no trends, nor do number of pattern cycles. All of the Somali specimens have pitted frontals, extending the distribution of this character south along the Kenya-Somali coast (map 23, GANS, *op. cit.*). The interprefrontal suture is never sunk; and there are always seven supralabials of which three and four contact the eye. The number of first temporals is higher than expected, again extending a step cline along the Kenya-Somali coast (map 25, GANS, *op. cit.*). The hatchling umbilical scars represent the only records for this low a number of ventrals. They fit the extension of the curve plotted for *D. scabra* hatchlings (*op. cit.*, fig. 30).

All specimens have a sharply defined "scabra" pattern with the lateral bars not linked (5N). The equilateral dorsal saddles form a parallel sided series, with the posterior and exterior sides of two saddles in series parallel (pl. VII), though the lateral edges still show traces of spreading. The pattern thus forms an extension of the Egypt-Ethiopia sequence. The saddles are expressed in various shades of brown and the entire dorsal surface is covered with a reddish stipple.

TABLE 8
DATA FOR SPECIMENS OF *DASYPELTIS SCABRA* FROM NEAR MOGADISCIO, S. R.

Collection and number	Sex	V + C	MB	L	A	Form	BL + TL	PC
M. S. N. M. 2148 . . .	♀	217 + 57	24	3 +	F	1 2 2 3	485 + 82	55
M. Z. U. F. - M4900C1118	♀	216 + 56	25	3 +	F	1 2 3 3	178 + 30	57
M. Z. U. F. - M4901C1133 .	♀	228 + 64	24	4	F	1 2 3 3	335 + 56	53
M. S. N. G. - CE3041 . . .	♀	218 + x	25	4	Y	1 2 3/2 4/3	520 + x	49
M. C. Z. 71877	♀	213 + 56	24	4	F	1 2 3 3	505 + 79	55
M. C. Z. 71875	Juv.	202 + 68*	23	4	F	1 2 2 3	172 + 33	48
M. C. Z. 71876	Juv.	197 + 60**	25	4	F	1 2 2 3	163 + 29	45
M. Z. U. F. - M4894C1134 .	♂	209 + 63	22	3	Y	1 2 2 3	447 + 87	52
M. S. N. G. - CE28808 . . .	♀	226 + 57	26	3	F	2 2 3/4 3	425 + 70	56

* Umbilical scar at 180-83.

** Umbilical scar at 175-78.

The adult and both juveniles engaged in the typical C-coil warning reaction (GANS, 1961, p. 74) whenever sufficiently disturbed. The juveniles started the behavior within a week of birth. The reaction, as well as the color pattern, is similar to that of the East African specimens of *Echis carinatus*, a form that is supposedly allopatric (PARKER, 1949, p. 106). It seems suggestive that the juvenile specimen of *Eryx somalicus*, taken within a kilometer of the *Dasypeltis* had a markedly similar pattern.

Causus resimus (PETERS)

Villagio Sguss, 11-viii-61, M. C. Z. 74468; 16-viii-61, M. C. Z. 71842.

Remarks: The data for these specimens, taken in fields near the Uebi Scebeli River, are in good agreement with those given by SCORTECCI (1931a, p. 214). The larger specimen (M. C. Z. 71842) is a male, the smaller a female. Ventral plus caudal (in two rows) counts are 139 plus 24(+?) and 143 plus 21 respectively, midbody dorsal rows 21 and 22 and snout-vent plus tail length is 510+52 and 274+24 mm. Both specimens have two small preoculars, and an elongate infraocular joined by a small postocular, as well as 7 supra- and 10 infralabials.

The color in life is a dark green with the pattern but faintly apparent.

Bitis lachesis somalica PARKER

Afgoi, 27-viii-61, M. C. Z. 71843.

Remarks: This female specimen was collected while crossing the road at dusk. Its characters are in good agreement with those given in PARKER's original description (1949, p. 101) and by CAPOCACCIA (1955). The specimen has 143 ventrals, 34 rows of dorsal scales at midbody, and 19 pairs of caudals of which the terminal ten are ventrally keeled.

Echis carinatus (SCHNEIDER)

Garire, 23 miles south of, 9-i-62, M. C. Z. 71841 (C. F. HEMMING).

Remarks: This juvenile specimen should probably be assigned to the subspecies *E. c. pyramidum* (GEOFFREY), described from Egypt. However, we prefer to follow PARKER (1949, p. 106) and retain the binominal designation, at least until the pattern of variation is described and the races are characterized in an adequate manner.

The specimen has 159 ventrals (preceded by four enlarged scales in series), plus 35 single caudals and 27 rows of dorsal scales at midbody. Snout-vent plus tail length is 158+18 mm, and the umbilical scar is still open on ventrals 143 to 145. The dorsal scales are strongly keeled with the lateral scales and keels running sharply ventrad.

V. The amphisbaenian genus

Agamodon PETERS

by

Carl GANS and Hemchandra PANDIT

INTRODUCTION

The amphisbaenian genus *Agamodon* seems to represent one of the two adaptive peaks of the Trogonophinae (GANS, 1960). Three species, *anguliceps* PETERS, *compressus* MOCQUARD and *arabicus* ANDERSON, have been described. The first two of these are very distinct and occur sympatrically (though with different range limits) in the southern Somali Republic. The first species has been exceedingly uncommon in collections and only the Italian museums had a near adequate sample. Only three specimens of the second species have been mentioned in the literature to date. The third species, apparently quite similar to the first, is known from only a single specimen collected in Yemen. In consequence there exists no statement of the variation, and the one described race of *Agamodon anguliceps* (*immaculatus* CALABRESI) was erroneously assigned to *A. compressus* by LOVE-RIDGE (1941).

It was the desire of obtaining materials toward a more detailed knowledge of the adaptive pattern of this group that prompted the present trip. The 207 specimens collected for anatomical and behavioral studies (to be reported on elsewhere) aggregate several times the number previously reported on. Together with some materials from various Italian collections ⁽¹⁾, they permit us to refine the species diagnoses, to make some remarks about variability and range, and to comment on the status of *A. a. immaculatus*.

We are grateful to Miss Charlyn RHODES for technical assistance and to Dr. Virginia CUMMINGS for figuring the specimen.

METHODS

The nomenclature used by GANS and ALEXANDER (1962) was followed wherever practical. Certain departures were forced by the peculiar scale arrangements of these animals. Earlier remarks on the limitations of the terminology (GANS, 1960, p. 139 ff) are still true.

Counts of body annuli were made from the angle of the mouth along the side of the trunk, up to and including the lateral group of segments that ended ventrally

(1) Specimens whose museum number is preceded by an asterisk were not counted and are cited only as locality records.

opposite the ventral segments that bear the precloacal pores. In certain specimens of *A. compressus* it also proved impossible to identify the first complete postcloacal annulus. Thus all caudal counts in this species are taken from the cloacal slit and include two or three laterals (this emphasizes, but does not account for the higher number of caudals in this species).

The pre- and postcloacals tend to break up and are so confused that we did not bother to tabulate them. The tail of the several species is hooked and terminates in a downward curving point. This introduces an error when the specimens are measured by stretching them along a scale, and the tails were consequently measured separately with calipers.

An earlier report (GANS, 1960) accepted the suggestion that lack of precloacal pores might be a female characteristic in this genus. This has not been confirmed by this material.

DISCUSSION

The new material provides evidence on several points unclear in the earlier literature. Figures 13 and 14 show some of the characteristics graphical form.

(1) *A. anguliceps* exhibits marked non-geographical variation in the southern region. The ranges of meristic data from the large sample from Mogadiscio in particular overlap the individual values of the smaller scattered samples.

A similar variation occurs in the color pattern (plate IX). Among some two hundred specimens seen alive there was one with a pink dorsal surface, and two with a yellow dorsal surface only faintly speckled with brown. The others showed every conceivable kind of blotch size and shape with no discernible regularity. This is particularly interesting since all specimens were taken within a relatively confined region near the center of the city.

Our material is insufficient to evaluate geographic variation of meristic characters in the southern region. However, the unicolored specimen from Afghedud clearly differs from the remainder of the available sample, at least in the number of body annuli and segments to a midbody annulus. It also differs in degree of body compression and possibly in body proportions and color pattern. These differences and the 500 kilometer hiatus in the range suggest that it has been sampled from a distinct population which is probably conspecific with *A. anguliceps* from the south. The name *immaculatus* should be resurrected.

(2) *A. compressus* differs strikingly from the strictly sympatric species *A. anguliceps*. Both were taken within meters of each other, a situation that will be discussed elsewhere. The implication of the differences is sufficient to suggest subgeneric separation. They leave no doubt that we are dealing with two distinct species. They also confirm the earlier decision (GANS, 1960) that *A. a. immaculatus* may under no circumstance represent a specimen of *A. compressus*.

(3) Little can be added to the previous discussion of *A. arabicus* ANDERSON. In number of body annuli, number of caudal annuli, and body compression it represents an extreme extrapolation of the cline from *A. a. anguliceps* to *A. a. immaculatus*. However, there is a reversal of the cline for number of segments to a midbody annulus and for body proportions. The color pattern reminds of a rare variant of *A. a. anguliceps*. This checkerboard of characters does not suggest that the samples are conspecific. It would indeed be astonishing to find representatives of the same amphisbaenid taxon in Yemen and the southern Somali Republic, particularly since the African form seems, at present, to be excluded from the shores of the Gulf of Aden.

KEY TO THE SPECIES OF *AGAMODON*

1. Cephalic shields plane; body compressed or not, in cross section sub-triangular, dorsally rounded and with a deep midventral groove; tail markedly reduced in height from that of trunk; pattern present or not; 124 to 161 body annuli, 10 to 18 caudal annuli; 0 to 6 precloacal pores; tail much shorter (fig. 13) 2.

Cephalic shields strongly upturned at their edges; body markedly compressed, its sides parallel, midventral groove present but often not apparent; tail slightly or not reduced in height from that of trunk; no pattern (specimens pinkish red in life, whitish in preservative); 147 to 157 body annuli; 22 to 24 caudal annuli; 0 to 2 precloacal pores; tail longer (fig. 13) *A. compressus*.

2. Body slightly compressed; a pattern of small brownish dots on individual dorsal segments; 161 body annuli; 18 caudal annuli; 55 segments to a midbody annulus; 0 precloacal pores *A. arabicus*.

Body compressed faintly or not; a pattern of various shaped and sized brown blotches may be present on a saffron to muddy yellow background (that fades out in preservative), ventral surface pink; 124 to 144 body annuli; 10 to 16 caudal annuli (*A. anguliceps*) 3.

3. Body slightly compressed; no dorsal pattern; 144 body annuli; 15 caudal annuli; 38 segments to a midbody annulus; two precloacal pores; tail slightly longer (fig. 13) *A. anguliceps immaculatus*.

Body not noticeably compressed, sub-triangular in cross section; a dorsal pattern of brownish blotches almost always present; 124 to 138 body annuli; 10 to 16 caudal annuli; 42 to 55 segments to a midbody annulus; 0 to 6 precloacal pores; tail slightly shorter (fig. 13) *A. a. anguliceps*.

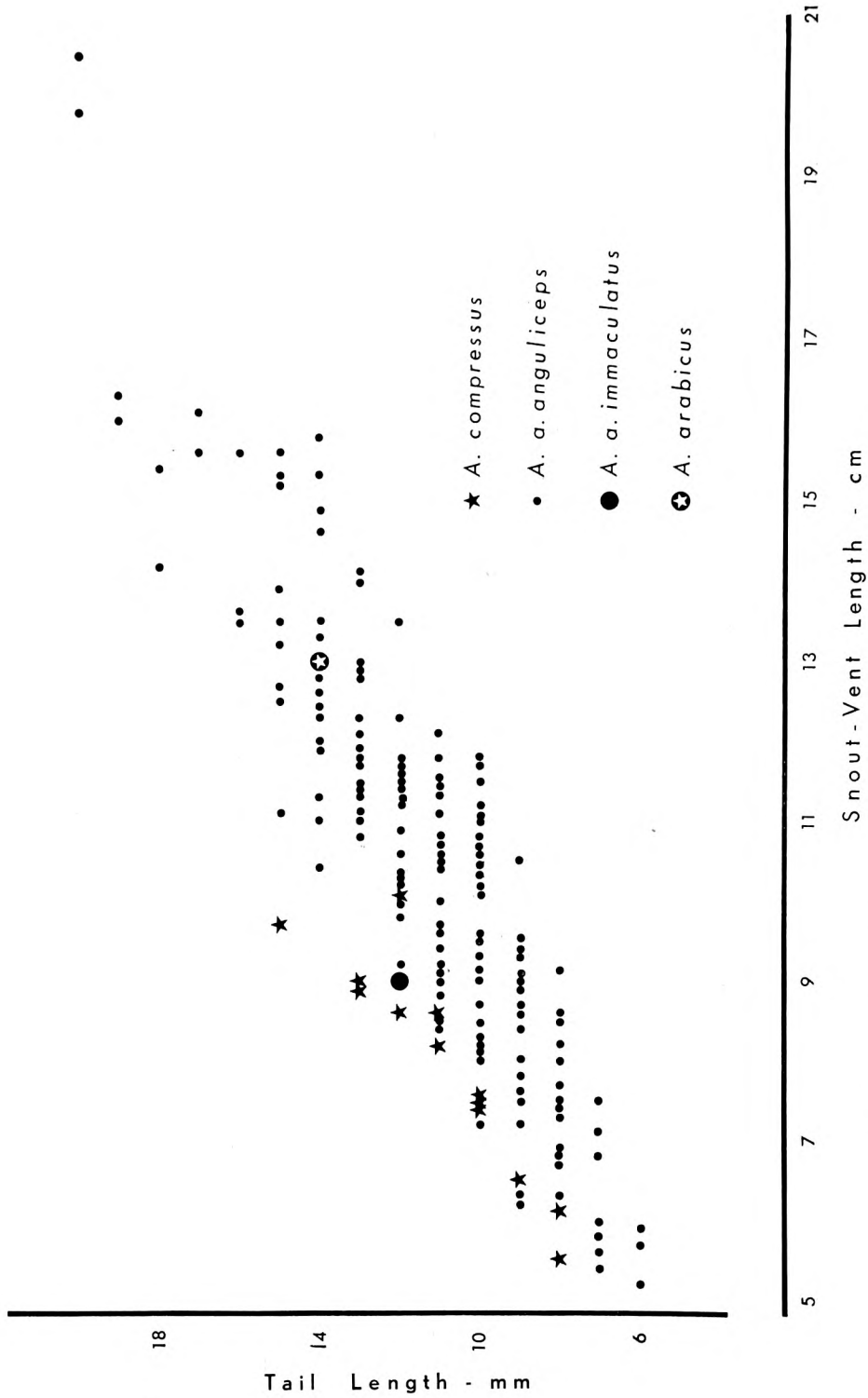


Fig. 13. — *Agamodon*. Scatter diagram of tail length versus snout-vent length for the available specimens and the literature record of *A. arabicus*.

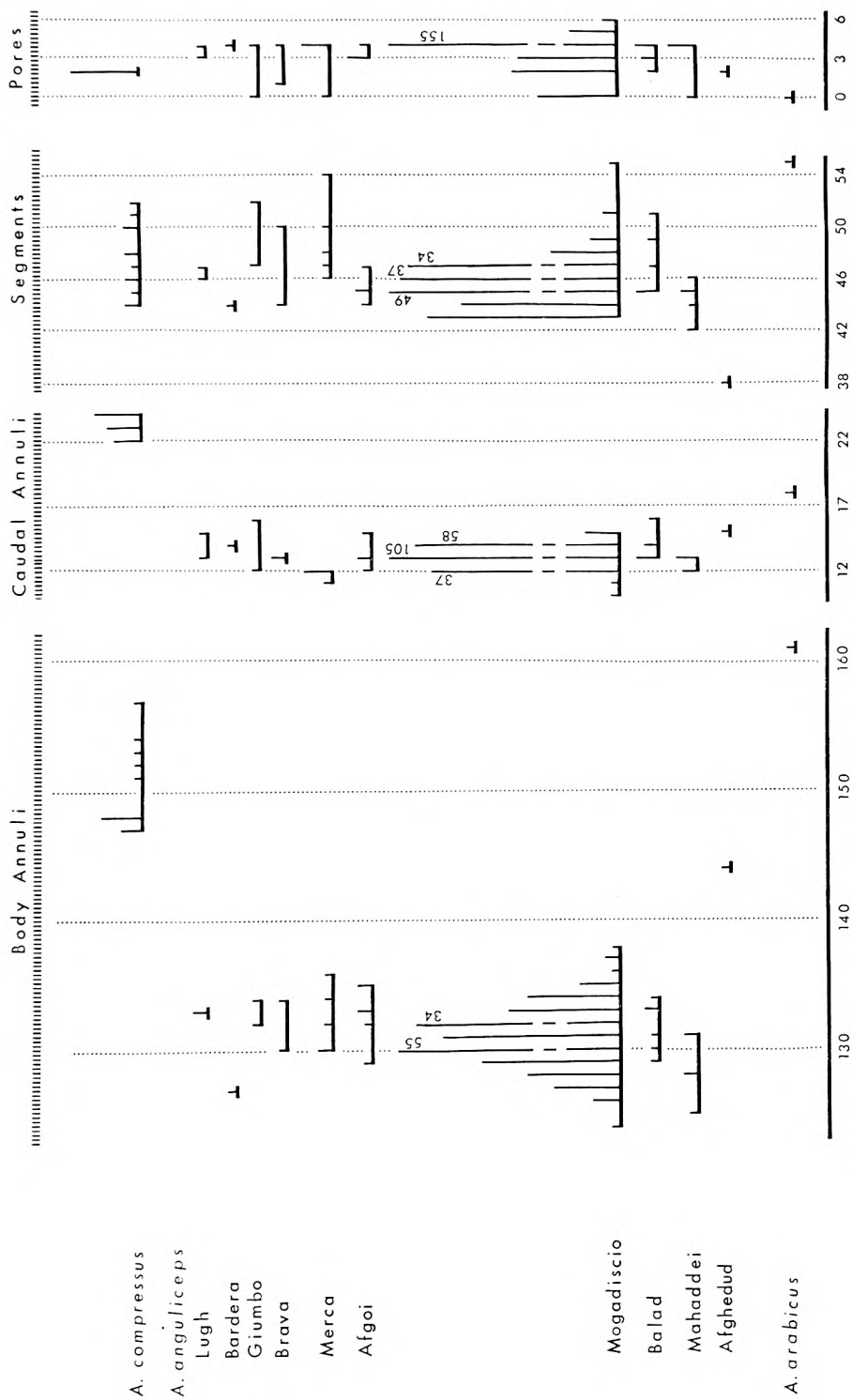


Fig. 14. — *Agamodon*. Bar diagram of the available specimens and the literature record of *A. arabicus* showing the values for body annuli, caudal annuli, segments to a midbody annulus and precloacal pores. The numbers next to broken vertical lines indicate the number of specimens for values the frequency of which was too high to permit plotting them within the confines of the graph.

Agamodon compressus MOCQUARD

Agamodon compressus MOCQUARD, 1888, p. 133. Terra typica : "Çomalis" (= Somali Republic). Holotype : M. H. N. P. 84-690.

Diagnosis : A form of *Agamodon* with the lateral edges of the two azygous head shields sharply projecting and curved outward as spade-like processes. Rostral edges bent out laterally anterior to the recessed nostril, in two semicircular projecting points on each side. Edges of fused prefrontal-frontal bent dorsally into a diagonal semilunar projection above each eye. Postmental on a central pedestal, with free lateral and posterior projecting edges. Relatively faint keratinization of head shields. Body strongly compressed; segments of the dorsal and ventral surfaces rounded or imbricated by the diagonal overlap of the intersecting continuations of the lateral sections of the annuli. The tail is very markedly compressed and curves sharply ventrad to a point on the level of the ventral surface. Specimens have 147 to 157 annuli on the body, 22 to 24 posterior to the cloacal slit, and 44 to 52 segments to a midbody annulus. Precloacal pores 2 when present. Color pink in life, whitish in preservatives.

Description : Figure 15 shows dorsal, lateral and ventral views of the head. Plate VIII presents photographs of oblique views of the head, as well as dorsal and ventral views of midbody, and lateral and ventral views of the cloacal region and tail. Table 9 gives the meristic data for this species and figures 13 and 14 compare these to those of the other forms.

TABLE 9
TABLE OF DATA FOR *AGAMODON COMPRESSUS*

<i>Museum and number</i>	<i>Annuli Trunk + tail</i>	<i>Segments Dorsal + lat. + vent.</i>	<i>Precloacal pores</i>	<i>Snout-vent + tail length</i>
M. S. N. G. CE 28552 .	157 + 23	10 + 18/19 + 4	2	65 + 9
M. Z. U. F. M-4893 . .	148 + 23	10 + 18/18 + 6	2	86 + 12
M. Z. U. F. M-4900 . .	148 + 22	8 + 16/16 + 4	2	76 + 10
C. G. 1965	151 + 24	8 + 17/17 + 4	2	86 + 11
C. G. 1966	152 + 23	—	?	55 + 8
C. G. 1967	154 + 22	8 + 17/16 + 4	2	90 + 13
C. G. 1983	148 + 22	- + 18/18 + -	?	97 + 15
C. G. 10149	152 + 22	10 + 18/16 + 4	2	82 + 11
C. G. 10296	148 + 24	10 + 17/16 + 5	2	82 + 11
I. M. Z. U. T. A	147 + 23	10 + 16/16 + 4	2	101 + 12
I. M. Z. U. T. B	147 + 24	10 + 16/16 + 5	2	89 + 13
I. M. Z. U. T. C	148 + 24	10 + 17/17 + 5	?	64 + 9
I. M. Z. U. T. D	148 + 23	10 + 17/16 + 5	?	61 + 8
M. C. Z. 66455	153 + 24	10 + 18/18 + 4	2	74 + 10
M. Z. U. F.	147 + 22	8 + 16/16 + 4	2	75 + 10

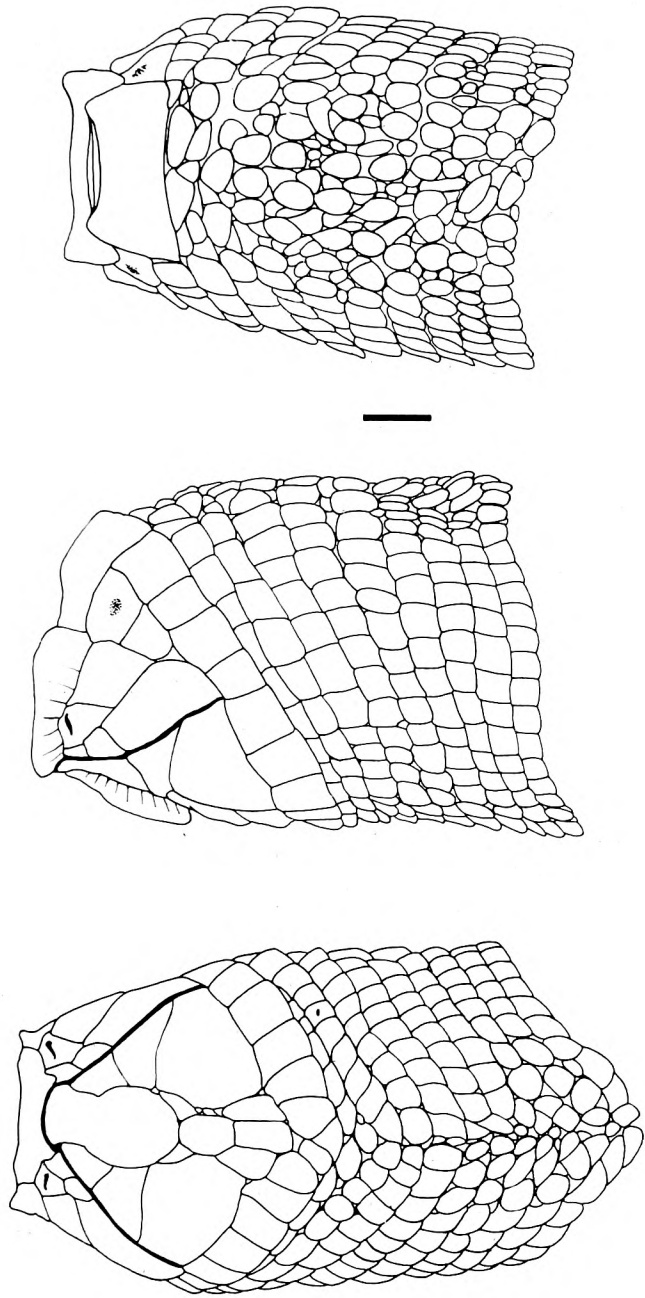


Fig. 15. — *Agamodon compressus*. Dorsal, lateral, and ventral views of the head of M. Z. U. F. M 4893 from Afgoi, Somali Republic. Drawn by Dr. V. CUMMINGS.

The living specimens of this small, compressed-body form were a uniform bright pink in life; only the cephalic "horns" were whitish. The color faded shortly after death and preserved individuals are a uniform white, without trace of color pattern or ventral countershading. The trunk is rectangular in cross section, three times as high as wide and, depending upon the separation of the distal rib ends, may show a marked midventral groove.

The head shape of this species is the most peculiar of any described amphibaenian. There are two sharp ascending keels on each side of the antero-dorsal surface, and a similar modification of the edges of the postmental. The photographs show the head in three-quarter views, permitting visualization of the surface modification. The head segmentation is characterized by two enormous azygous shields on the anterior surface of the animal and by the lozenge-shaped mental, all of which have sharply projecting edges. The resting position of the anterior shields is almost vertical. The body annulation projects rostrad beyond the angulus oris, the edges of the annuli here angling at less than 45° to the long axis of the animal.

The rostral is clearly the largest head shield. It covers the rostral edge, which is slightly concave ventrally, and laterally turns dorsad at almost a right angle, passing upward around a pair of half-moon shaped projections and terminating just anteroventral to the ocular. The second median, azygous shield, here interpreted as a fused prefrontal-frontal, covers the supraorbital crests and abuts middorsally onto the but faintly modified segments of the second body annulus. There are three supralabials. The first and second are exceedingly tiny and contact the divided nasal within which lies the elongate nostril. A pair of relatively large segments lies dorsal to the very large third supralabial, excluding it from contact with the ocular. A row of segments pertaining to the first body annulus runs immediately posterior to the angulus oris, providing a row of four segments, the dorsalmost of which abuts onto the edges of the prefrontal. The diagrams and photographs confirm that none of these segments have straight edges. The surfaces are divided by a system of complex curves subject to a maximum of individual variation.

The mental is a very large segment. Anteriorly it forms a pair of wings along the tip of the infralabial edge, and posteriorly it covers all of the lozenge-shaped shield and its constricted pedestal. The first two infralabials are small and triangular, contacting the mental medially. The third infralabials are the largest shields on the lower jaw. They are kept from contact with the mental by a pair of small segments. The postmental is a small oval segment lying posterior to the mental along the ventral midline. A series of three larger postgenials lies posterior to this and between the medial edges of the third infralabials. There are no malars or postmalars.

The first body annulus includes 3 rounded, rather than rectangular, segments

along the midventral line; the central one of these is oval and has its long axis at right angles to that of the animal. The following 3 (nuchal) annuli are somewhat narrower, even when the head of the specimen is preserved in the straight position. The first 15 annuli incline rostrad; most posterior ones pass through an anteriorly convex curve on the animal's sides. The lateral two halves of an annulus form a posteriorly open angle. 16 to 18 trapezoidal segments lie in the regular lateral portion of a trunk annulus. This abuts dorsally and ventrally onto the bands of modified rounded and smaller segments. The dorsal surface is covered by a band comprising 4 to 6 rows of longitudinally oval or circular segments. The ventral surface is filled with 8 to 10 rows of lozenge-shaped, wider than long segments that cover the region in which the ventral groove forms. Numerous tiny segments lie in the spaces between the larger ones; they have not been counted. The ventral groove represents a smooth (long radius) infolding of the skin between the muscle masses shielding the ribs ends, rather than a sharply defined crease.

There are 147 to 157 annuli counting from the one behind the angulus oris up to and including the annulus whose postero-ventral edge coincides with the posterior edge of the precloacal shield. Determination of the latter point involves an unusual degree of uncertainty, because of the irregular arrangement of the band of midventral segments within which the cloaca lies. Supernumerary dorsal half-annuli are rare.

The cloacal region is characterized by two round, often but faintly apparent, precloacal pores, borne by midventral segments immediately preceding the precloacal shield. Some juvenile specimens do not show pores. The cloacal region proper is circular, comprising a row of 8 (the lateral ones tiny) radially arranged elongate precloacal segments and a variable number of smaller postcloacals, most of which tend to be broken and complexed, which makes repeatable counts difficult. There are 22 to 24 caudal annuli posterior to the trunk annuli and up to but not including the caudal tip. The bands of modified middorsal and midventral segments drop out some distance (generally 5 to 6 annuli dorsally and 3 to 4 annuli ventrally) posterior to the cloaca. Here the lateral sections of rectangular segments contact each other at both levels. The tail then becomes extremely compressed and its dorsal and ventral edges show a ventrad curvature. The distal tip lies somewhat below a line tangent to the ventral surface of the animal.

There is no caudal autotomy.

Distribution records: Somali Republic: —, (MOCQUARD, 1888); *M. H. N. P. 84-690 (holotype). Brava, (BOULENGER, 1897; CALABRESI, 1927); M. S. N. G. CE 28552. Afgoi, vicinity of, M. Z. U. F. M-4893, M-4900. Mogadiscio, (CALABRESI, 1915); C. G. 1965-1967, 1983, 10149, 10296 ⁽¹⁾; I. M. Z. U. T. A-D; M. C. Z. 66455; M. Z. U. F. unnumbered.

⁽¹⁾ C. G. numbers preceded by a 10 are field numbers for specimens that have not yet been recatalogued.

Agamodon anguliceps PETERS

Agamodon anguliceps PETERS, 1882, p. 580. Terra typica : " Barava ", = Brava, Somali Republic. Syntypes : Z. M. U. 10189-10190.

Diagnosis : A form of *Agamodon* with the two azygous head shields forming a faintly concave, keratinized surface, with projecting lateral edges, that occupy most of the anterior aspect when the animal is at rest. The mental and post-mental segments are slightly raised. The cross section of the trunk is subtriangular, with dorsal surface rounded, the sides sloping outward and the wide ventral surface with a deep smooth midventral groove. The segments of the dorsal and ventral surfaces are rounded or imbricated by the diagonal overlap of the intersecting continuations of the lateral sections of the annuli. The tail is slightly compressed and rapidly reduces in size to a pointed tip. Specimens have 124 to 138 body annuli; 10 to 16 caudal annuli; 42 to 55 segments to a midbody annulus, and generally 4 (range 0 to 6) precloacal pores. Color in life : generally bright yellow dorsally, blotched with brown saddles and dots of varying sizes and shapes, bright pink ventrally. A very few specimens lack the brown; one lacked all dorsal pigmentation. In preservative the color fades to white with brown markings.

Description : Figures 4G to 4I (in GANS, 1960) depict the head scalation. Plate IX shows six variants of the dorsal color pattern. Plate X presents photographs of oblique views of the head, as well as dorsal and ventral views at mid-body, and lateral and ventral views of the cloacal region. Figures 13 and 14 compare the meristic data to those of other forms.

The living specimens of this medium-sized, stoutbodied form were a bright yellow dorsally, and a bright pink ventrally. In a few specimens the yellow dorsal color was a fainter, muddy brownish yellow; one specimen (C. G. 10436-C) lacked all yellow pigment. The dorsal and lateral surfaces were marked by a vivid light to dark brownish pigment that formed a diversity of saddles, speckles, blotches, and other markings across the back. There is often diversification of the middorsal region, either as a series of dark blotches, or as an unpigmented zone. In the same way the ventro-lateral edge may or may not be accentuated by pigmentation. The head shields are generally immaculate, though occasional specimens bear asymmetrical blotches on them. The pink and yellow colors fade rapidly in preservative, leaving the specimens an off-white with brown dorsal markings that remind only faintly of the rich color of living specimens.

The trunk is almost triangular in cross section. The sides rise sharply and curve to meet each other across a bluntly rounded middorsal region. The ventral surface is margined by a pair of blunt, longitudinal muscle ridges, between which infolds the smooth concave midventral sulcus.

The head of the species is covered by the smooth, slightly concave shield that runs dorsad from the rostral ridge not quite to the level of the angulus oris. The

shield's lateral edges are produced, forming a marked canthus rostralis that projects laterally beyond and shields the nostril and eye. A similar edge runs ventrad from the horizontal rostral keel passing the level of the mouth, ventral to which it is continued by the edge of the raised mental. The photographs may help visualization of the complex head shape. The head segmentation is characterized by two enormous azygous shields on the anterior surface of the animal, and by the lozenge-shaped mental, all of which have faintly projecting edges. The anterior shield lies at 75° to the long axis when the animal is in resting position, and the rostral keel is held at a level near 25% of the height of the animal (fig. 4 in GANS, 1960, is wrong in this respect). The body annuli project rostrad to the level of the angulus oris; the edges of the annuli here angling at 60° to the long axis of the animal.

The rostral is the second largest head shield. It covers the rostral edge, passing dorsad along the straight flaring canthi; it terminates just antero-ventral to the ocular. The second, median, azygous shield, here interpreted as a fused prefrontal-frontal, is the largest segment of the head, and abuts middorsally onto the but faintly modified segments of the second body annulus. There are four (rarely and asymmetrically three or five) supralabials. The first, second and third are exceedingly tiny and contact the half (occasionally entirely) divided nasal within which lies the elongate, half-moon-shaped nostril. A pair of large segments, the first almost twice the area of the second, lies dorsal to the second and third labials, excluding them from contact with the trapezoidal ocular. A row of segments pertaining to the first body annulus passes anterodorsad immediately posterior to the angulus oris, providing a row of four rectangular segments, the dorsal-most of which abuts onto the lateral edge of the prefrontal.

The mental is the largest segment of the lower jaw. Anteriorly it forms a pair of wings covering the tip of the infralabial edge, and posteriorly it covers all of the lozenge-shaped shield, including the slightly projecting edges. There are three infralabials. The first is small, and triangular. Its posterior edge forms an obtuse angle with the edge of the jaw. The second is three times its size, its sutures form two acute angles with the edge of the jaw, and its tip contacts the mental. The third is almost twice the size of the second and pentagonal. It is kept from contact with the mental by a row of large, and a second row of small, segments on each side. There are no malars, nor is there a clear postmental, and the segments of this "postgenial" region show considerable individual variation.

Ventrally the first body annulus includes a group of 3 rounded, rather than trapezoidal, segments along the midventral line. The following 5 (nuchal) annuli are somewhat narrower, even when the specimen is preserved in a straight position. The first 8 to 10 annuli incline rostrad; most posterior ones pass through a smooth, anteriorly convex curve on the animal's sides. 15 to 20 rectangular to trapezoidal segments lie in the regular lateral portion of a trunk annulus. Dorsally and

ventrally the curving annuli run into the bands of modified rounded and smaller segments, which suggests that these modified zones are formed by a continuation of the interannular suture lines across this region. The dorsal band comprises 4 to 6, generally 5, rows of longitudinally oval, but generally circular segments. The ventral surface, which covers the region in which the ventral groove forms, is filled with 7 to 10, generally 8, rows of rounded segments. Numerous irregularly shaped tiny segments lie in the folding spaces between the larger ones; they have not been included in the counts. The ventral groove represents a smooth (long-radius) infolding of the skin between the muscles shielding the rib ends, rather than a sharply defined crease.

There are 124 to 138 body annuli, counting from the one posterior to the angulus oris, up to and including the annulus bearing the precloacal pores. Supernumerary dorsal half-annuli occur occasionally in the first and last ten of this series. The position of the cloacal region corresponds to 3 to 6 lateral annuli.

The cloacal region is characterized by 0 to 6, generally by 4, precloacal pores, that are often but faintly apparent, and are borne by midventral segments immediately preceding the precloacal shield. The cloacal region proper is oval, comprising a row of 4 to 10, generally 6 (with the lateral ones tiny) radially arranged, elongate precloacal segments, and a variable number of smaller postcloacals often arranged in multiple rows, broken, and complexed, which makes repeatable counts difficult. There are 10 to 16 caudal annuli, from after the cloacal shield up to but not including the caudal tip. The bands of middorsal and midventral segments drop out very sharply, almost immediately posterior to the cloaca. Here the lateral sections of rectangular segments contact each other at both levels. Just anterior to the cloacal region the trunk shows a marked dorso-ventral and lateral size reduction. The tail reduces further, a reduction that continues toward the caudal tip which shows some lateral compression. The dorsal and ventral edges of the tail show a ventrad curvature, so that the caudal tip lies somewhat below a line passing tangent to the ventral surface of the animal.

There is no caudal autotomy.

Distribution records : Somali Republic : —, (MOCQUARD, 1888; GANS, 1960); M. C. Z. 10784. Lugh Ferrandi, (BOULENGER, 1897); M. S. N. G. CE 28809. Lugh Ferrandi or Brava, M. S. N. G. CE 28535. Bardera, P. U. M. 111. Giumbo, (BOULENGER, 1909); M. S. N. G. CE 28297, CE 29138. Chisimaju, (SCORTECCI, 1929); B. M. 1924.2.19.1; *M. S. N. M. 1222 (2 spec.). Mofi, near Chisimaju, (LÖNNBERG and ANDERSSON, 1913). Alessandra, (SCORTECCI, 1931); *M. S. N. M. 1262. Brava, (PETERS, 1882; BOULENGER, 1897; ANDERSON, 1901); B. M. 96.9.24.16; I. M. Z. U. T. 2231; *Z. M. U. 10189-10190 (syntypes). Merca, I. M. Z. U. T. (3 spec.); M. S. N. M. 3000; M. S. N. G. CE 27824A. Merca-Gelib road, M. S. N. G. CE 27824B-CE 27824C. Afgoi, 30 km south of, C. G. 10293. Afgoi, M. S. N. M. 3003 (3 spec.). Mogadiscio, (SCORTECCI, 1940);

C. G. 1599-1616, 1817, 2390-2395, 2397-2400, 2402-2432, 10012 ⁽¹⁾, 10014-10028, 10102-10117, 10120-10125, 10142-10147, 10185-10192, 10200-10207, 10296 (A-AA, 27 spec.), 10333, 10347, 10361 (1-37), 10436 (12 spec.); M. S. N. M. 3004 (2 spec.), 3006, 3007; M. Z. U. F. M4852-C963. Mogadiscio, inland of, (CALABRESI, 1915; GANS, 1960; SCORTECCI, 1931); M. C. Z. 38697. Balad, C. G. 10078; M. Z. U. F. M4854 (5 spec.). Mahaddei, (CALABRESI, 1927); M. S. N. M. 3001-3002, *(+3 spec.); M. Z. U. F. M4852-C942 (2 spec.). Ethiopia : —, (GANS, 1960); *N. M. B. 13480.

Agamodon anguliceps immaculatus CALABRESI

Agamodon anguliceps immaculatus CALABRESI, 1927, p. 27. Terra typica : "Afghedud", Somali Republic. Holotype : M. Z. U. F. (unnumbered).

Diagnosis : A form of *Agamodon* with the azygous head shields forming a faintly concave, keratinized surface, with projecting lateral edges, that occupy most of the anterior aspect when the animal is at rest. The mental and postmental segments are slightly raised. The cross section of the trunk is sub-triangular, with the dorsal surface rounded, the sides sloping outward, and the ventral surface with a deep smooth midventral groove. The segments of the middorsal and midventral zones are rounded or imbricated by the diagonal overlap of the intersecting continuations of the interannular raphe. The posterior portion of the trunk and particularly the tail are slightly compressed and rapidly reduced in diameter toward the caudal tip. The type has 144 body and 15 caudal annuli, and 38 segments to a midbody annulus. There are two preloacal pores. The color of the type is completely uniform and shows no trace of pattern or countershading.

Description : The form was adequately characterized by CALABRESI. Its general character pattern is that of a specimen of *A. a. anguliceps* and the following description of the unique specimen emphasizes those characteristics in which it differs. Data for the specimen are included in figures 13 and 14.

The medium-sized specimen lacks any trace of color pattern or ventral countershading. The trunk is triangular in the anterior three quarters of its length. It becomes gradually narrower and more compressed, with the sides of the animal almost parallel on the level of the cloaca. The ventral surface is relatively narrower than that of specimens of *A. a. anguliceps*.

The head scalation shows no significant differences from that of the nominate subspecies. There are 4 supra- and 3 infralabials, and the nostril is inserted in a partially divided nasal.

(1) C. G. numbers preceded by a 10 are field numbers for specimens that have not yet been recatalogued.

The annulation and segmentation of the trunk is as in specimens of the typical form. 14 trapezoidal to rectangular segments lie in the regular lateral portion of a trunk annulus and there are 4 dorsal, and 6 ventral rows of rounded segments, as well as a trace of a middorsal row of much smaller segments. There are 144 body annuli, followed by 5 laterals and 15 caudal annuli. The 2 midventral elements of the last body annulus are enlarged and each bears a faintly apparent precloacal pore (whose presence could be confirmed by staining). The precloacal shield contains 8 elongate radial segments, the lateral ones of which are relatively slim. The segments fringing the postcloacal rim number more than 12.

Snout-vent plus tail length is 90 plus 12 mm.

Distribution records: Somali Republic : Afghedud, (CALABRESI, 1927); M. Z. U. F. (unnumbered).