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## A NEW POPULATION OF CARPET VIPERS *ECHIS CARINATUS* FROM NORTHERN KENYA

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In July 1971, during a herpetological survey of northern Kenya for the National Museums of Kenya and the California Academy of Sciences, R.C.D. collected a series of red Carpet Vipers, *Echis carinatus* (Schneider), from Wajir, Northeastern Province, Kenya. Additional field work has led us to believe that the population is isolated. Comparison with specimens from Turkana District, Lake Baringo and Moille Hill, Kenya, and with data on *E. c. pyramidum* (Geoffroy) from Egypt revealed differences which appear to be of sufficient significance to justify the description of a new taxon:

### *Echis carinatus aliaborri* ssp. nov.

**HOLOTYPE:** CAS 130648, adult male, collected by R. C. Drewes, 15 July 1971, in a limestone area approximately 8 km north of Wajir, Wajir District, Kenya. We take pleasure in naming this taxon for Ali Ismael Haji Yussuf of Wajir.

**PARATYPES** (9 ♂♂, 11 ♀♀) CAS 130643-130652 collected at the type locality, 5 and 15 July 1971, by R. C. Drewes, Nicholas Boyd, John Miskell and Ali Ismael Haji Yussuf; CAS 130653-130658, taken between 9 and 14 July 1971, by Ali Ismael Haji Yussuf; and CAS 130662, 131677-131680 in Wajir town, vicinity of Catholic Mission, 24 June and 22-23 July 1971, by Stephen Spawls.

The holotype and 12 paratypes are to remain at the California Academy of Sciences; 8 paratypes will be sent to the National Museum, Nairobi.

**DIAGNOSIS:** A medium-small Carpet Viper, differing from other populations in vivid darkened colouration and possession of enlarged supraoculars on both sides.

### **DESCRIPTION OF HOLOTYPE:**

**Measurements** (in mm). Head length 24; snout 5.5; diameter of eye 4; body length (snout to vent) 373; total length 419.

**Scale Counts.** Mid-body scale rows 30; ventrals 166; subcaudals 36; anal plate entire; 10 upper labials; 12 lower labials; scales around eye 15-14; enlarged supraoculars.

**Colour in Life.** Dorsal ground colour deep laterite red; eyes orange-red; ventral surface ivory with one or two small red spots per scute. (Based on colour slide of CAS 130644, holotype not photographed. Colour matched with plate 5, "Brick-dust red", ILL, *A Dictionary of Color*, A. Maerz & M. R. Paul, McGraw-Hill, 1930.)

**Colour in preservative** (75% ethyl alcohol). Dorsal ground colour brownish-red; ventrum as *in vivo*.

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Fig. 1. Holotype of *Echis carinatus aliaborri*, CAS 130648. Photo: Richard B. Hansen.

**Pattern.** The head is mottled dorsally with two vague median light markings. The anterior mark begins between the posterior limits of the eyes; the posterior mark is directly behind it but unconnected. A reddish brown blotch extends vertically from beneath the eye to the lower jaw; another reddish brown blotch extends diagonally from the posterior base of the eye to the eighth, ninth and tenth lower labials. An oblong dark blotch lies at the symphysis of the jaws. A mid-dorsal longitudinal dark zone, one to two scale rows in width, runs the length of the body. Within the zone, from the nape to above the vent, is a series of 31 irregular ivory spots. Dark reddish brown saddles connect ateral ivory spots to the mid-dorsal spots and outline both. Beneath each lateral ivory

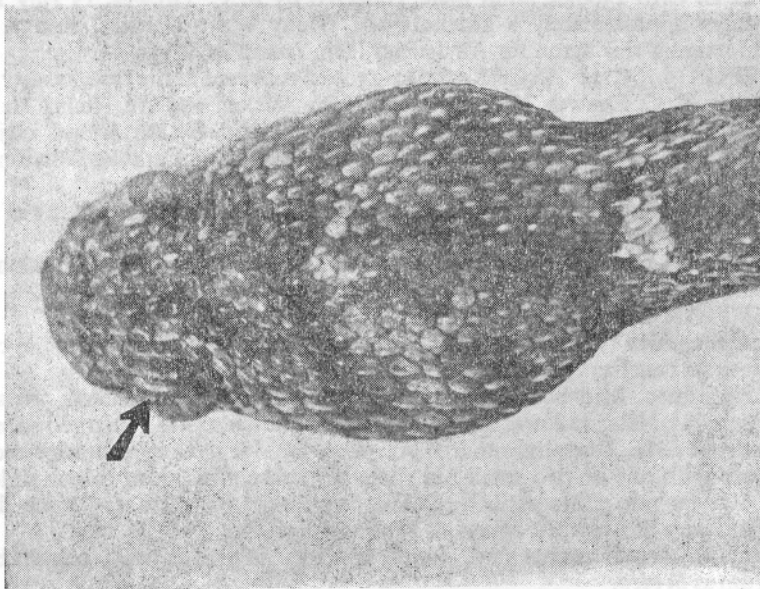


Fig. 2. Close view of head of holotype *Echis carinatus aliaborri* showing enlarged supraoculars. Photo: Richard B. Hansen.

spot is a corresponding dark reddish spot of equal or slightly larger size. Two longitudinal rows of small staggered reddish brown spots run the length of the body at the level of the first and second scale rows.

**Variation.** The ground colour of CAS 130650, 130651 130653 and 130657 appears slightly darker and browner than that of the holotype. The same is true of CAS 131677, 131678 and 131680 which were not collected and preserved by R.C.D. Pattern on the head varies considerably but is usually made up of two light elements: an anterior "Y", "X" or "Λ" and a posterior oblong "T" or cross. The arms of the latter, if distinct, may be elongate and curved caudally although one or the other may be absent or very indistinct. The dorsal pattern varies little except in intensity of colour and number of complete narrow saddles between the nape and beginning of the tail (28-35). Several individuals have incomplete saddles which extend up one side of the body only. Eleven of the paratypes have immaculate venters. Measurements and counts are listed in Table I.

TABLE I  
Data on *Echis carinatus aliorborri*

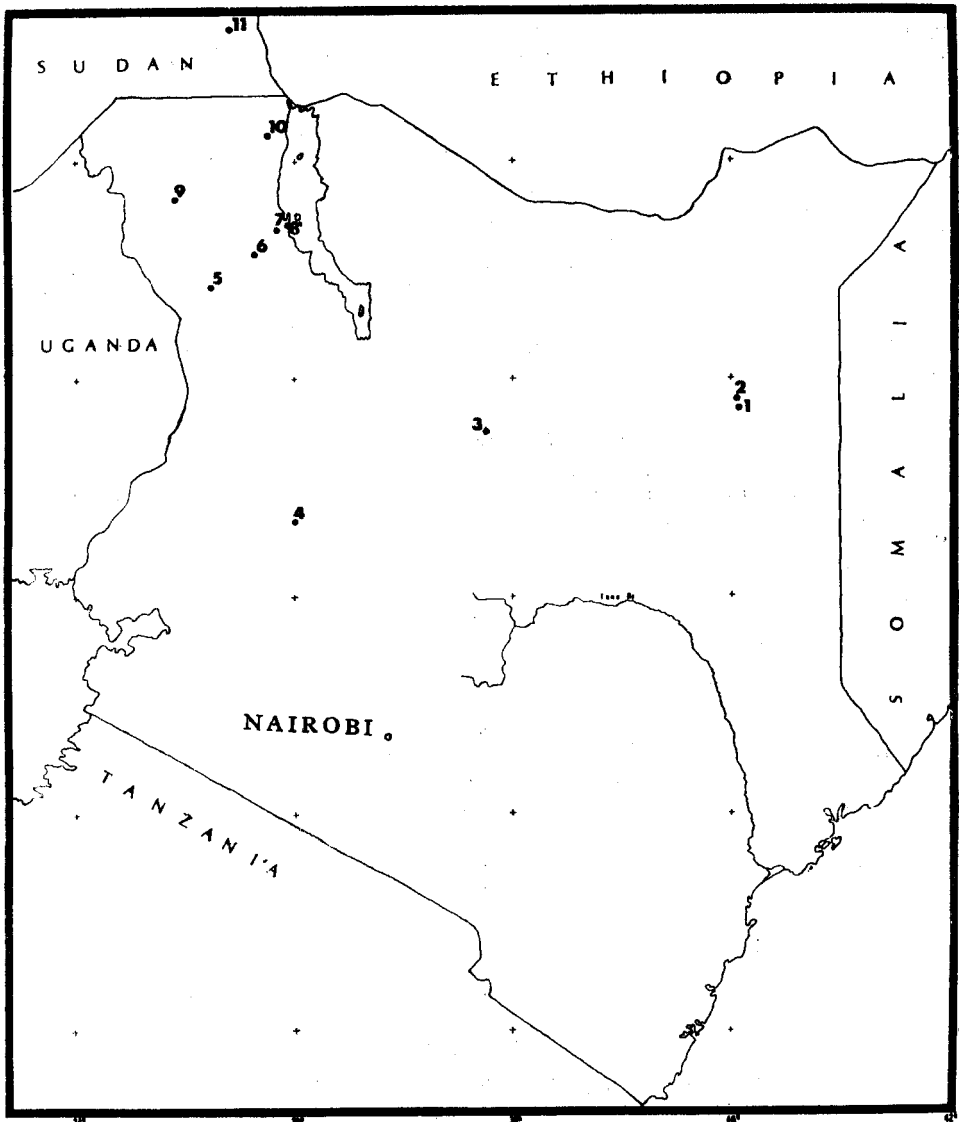
	Total length (mm)	Mid body scale rows	Ventrals	Sub caudals	Scales around eye	Interocular scale rows
♂♂						
CAS 130646	438	29	163	37	15-15	8
130648	419	30	166	36	15-14	8
130650	364	29	163	37	14-13	8
130655	438	30	162	32	14-15	8
130656	468	30	165	38	15-15	7
130658	417	27	162	35	15-16	9
131677	497	30	176	36	15-14	8
131678	507	30	164	35	15-15	7
131679	512	30	166	37	15-14	9
131680	394	29	165	32	16-15	8
♀♀						
130643	410	30	173	33	16-15	9
130644	467	30	182	30	15-14	8
130645	361	31	174	33	13-14	9
130647	451	30	174	34	14-13	9
130649	427	31	178	33	16-16	9
130651	286	30	175	30	14-14	8
130652	469	31	175	32	15-15	9
130653	498	29	181	32	15-15	8
130654	402	29	178	34	13-13	9
130657	378	31	178	35	15-15	9
130662	514	30	172	31	15-15	7

### HABITAT

The area north of Wajir from which the holotype and most of the paratypes were taken is characterized by low bushes (cf. *Acacia turnbulliana* Brenan), scattered trees and low outcrops of weathered grey limestone. All specimens collected in this area were found under large limestone rocks against which (after capture) they were quite conspicuous. Of the specimens from Wajir town, CAS 130662 and CAS 131678 were taken under piles of thornbush, CAS 131677 under a dried cowhide, CAS 131679 and CAS 131680 on open sand and in a rock pile respectively.

### FOOD

Seven of the vipers from the locality north of Wajir had scorpion remains in their stomachs, and another contained a tail of the scincid *Riopa*. One of the Wajir town specimens contained the remains of a lacertid, probably *Latastia*; another contained a partially digested *Riopa*. We are informed by the collector, Stephen Spawls, that CAS 131680 regurgitated a blind snake (Typhlopidae), similar to *Typhlops cuneirostris* (Peters), a



Map of localities in text. (1) Wajir, Wajir Dist.— $01^{\circ}45'N.$ ,  $40^{\circ}04'E$ ; (2) 8 km north of Wajir, Wajir Dist; (3) Moille Hill, Marsabit Dist.— $01^{\circ}31'N.$ ,  $37^{\circ}44'E$ ; (4) Kampi-ya-Samaki (Lake Baringo), Baringo Dist.— $0^{\circ}36'N.$ ,  $36^{\circ}01'E$ ; (5) Lorugumu, Turkana Dist.— $02^{\circ}56'N.$ ,  $35^{\circ}25'E$ ; (6) Lodwar, Turkana Dist.— $03^{\circ}07'N.$ ,  $35^{\circ}36'E$ ; (7) vicinity of Eliye Springs, Turkana Dist; (8) Eliye Springs, Turkana Dist.— $03^{\circ}15'N.$ ,  $35^{\circ}57'E$ ; (9) Kakuma, Turkana Dist.— $03^{\circ}43'N.$ ,  $34^{\circ}42'E$ ; (10) Lokitaung, Turkana Dist.— $04^{\circ}16'N.$ ,  $35^{\circ}45'E$ ; (11) Lokomarinyang, Ilemi Triangle, Sudan— $05^{\circ}02'N.$ ,  $35^{\circ}37'E$ .

Somali form hitherto unknown from Kenya. Although the *Typhlops* was not retained, he caught another at Wajir (CAS 131687) which is at hand, along with six collected by R. C. D. in Mandera, Kenya (CAS 130301-130304, 131681-131682), all identified as *T. Cuneirostris* (Peters).

## DISCUSSION

The various populations of *Echis* in Kenya are poorly known and collections are scarce. Stemmler & Sochurek (1969) described *E. carinatus leakeyi* from Baringo and Moille Hill (see map), comparing their specimens with *E. c. pyramidum* from Egypt only, and suggesting that the range of *leakeyi* is limited to northern Kenya.

During the summer of 1971 R.C.D. collected extensively in northern Kenya, including Turkana District, that portion of Kenya west of Lake Rudolf and north of the type locality of *leakeyi*, an area particularly interesting as it is geographically between the *leakeyi* type locality and Egypt (except for four specimens, we lack material from the Sudan). Therefore, the 62 specimens from Turkana were examined in order to determine whether they were *leakeyi*, *pyramidum* or an intermediate, and thus how they are related to *aliaborri*. Data on the Turkana specimens is summarized in Table 2 with specimens of less than 200 mm total length excluded. Comparison of *pyramidum*, *leakeyi* and *aliaborri* is summarized in Table 3. All data on *pyramidum* were taken from Stemmler & Sochurek (*op. cit.*).

It was found that the populations of *Echis* are virtually the same from Lokomari-nyang, Sudan, south to Lake Baringo, Kenya (an approximate distance of 400 km), which would suggest that this form is a fairly recent entrant into Kenya from the north-west, via the Ilemi Corridor (Drewes 1972). In addition, because there is considerable overlapping of characters, it is possible that *leakeyi* may be an extension of *pyramidum*, at the terminus of a cline which extends from Egypt through the Sudan to Kenya. However, it is impossible to speculate further in this regard without material from the Sudan. Thus, until further studies are made we refer the Turkana material to *leakeyi*.

The fact that *aliaborri* is isolated (R.C.D. failed to find *Echis* at Buna, Ramu, Mandera, El Wak, Garba Tula and intervening territory) and is obviously diverging leads us to the conclusion that this population is old and the remnant of a larger group which may have reached Kenya from the northeast, via Somalia.

Although we lack concrete evidence at the moment, we feel that Stemmler & Sochurek erred in including the Moille specimens in the type series in the original *leakeyi* description. While it is impossible to separate the Moille counts and measurements from their description, they cite variations in colour and other parameters which we attribute mostly to the Moille population. Since all the *Echis* we have examined from Turkana District (due north of Lake Baringo, the type locality of *leakeyi*) to the Sudan border are similar, it seems likely that the Moille Hill population is the errant element. We have only three adult specimens (plus one juvenile) from Laisamis (approximately 16 km north of Moille); all are much lighter in colour than any of our material from Turkana, tending towards light yellowish-brown, and differing slightly in counts and measurements. Since Moille, Laisamis and Wajir are east of the Rift Valley, and Turkana District is to the west of it, we suggest the possibility that the Moille/Laisamis group is another remnant of a much earlier Somali expansion like *aliaborri*, and that studies of the group will show that it also is significantly different from *leakeyi*.

TABLE 2  
Comparison of *Echis carinatus leakeyi* and *Echis* from Sudan and Turkana District, Kenya

Localities	Mid-body scale rows	Ventrals	Subcaudals	Scales around eye	Inter-ocular scale rows	% enlarged supra-oculars
Lokomarinyang (Sudan)	♂♂ 29(1)	161(1)	36(1)	14-15.5-17(3)	8-8.3-9(3)	66.7(3)
Lokitung	♀♀ 29-30-31(2)	172-173.5-175(2)	32-33.5-35(2)			
	♂♂ 27-28.3-30(8)	160-165.4-171(8)	34-36-39(8)	12-15.4-19(52)	8-8.3-9(26)	69.2(52)
Kakuma	♀♀ 28-28.5-31(18)	172-175.2-180(18)	28-31.6-35(18)	13-15.6-18(34)	8-8.8-9(17)	35.3(34)
	♂♂ 27-27.4-29(9)	159-163.6-169(9)	32-35.7-41(9)			
Near Hliye Springs	♀♀ 27-28.8-31(8)	169-173.1-181(8)	29-31.5-34(8)			
	♂♂ 25-27.7-30(8)	164-169.2-176(8)	34-35.6-37(8)	14-15.8-17(26)	7-8.0-9(13)	42.3(26)
Lodwar	♀♀ 25-28-31(5)	173-175.6-179(5)	31-32.6-36(5)	14-14.2-15(4)	8(2)	100.0(4)
Lorugumu	♂♂ 27-28-29(2)	161-163.5-166(2)	35(2)	15(2)	8(1)	50.0(2)
<i>E. leakeyi</i> ♂♂ (Baringo and Molle)	♂♂ 27(1)	169(1)	39(1)			
	♀♀ 25-29.1-31(36)	155-163-176(18)	29-32.4-34.5(18)	11-15-18(74)	7-8.5-11(37)	88.5(52)
	♂♂ 167-174-180(18)		27-28.6-31(18)			

TABLE 3

Comparison of three *Echis carinatus* subspecies.

	<i>E. c. aliiaborri</i>	<i>E. c. leakeyi</i>	<i>E. c. pyramidum</i>
Mid-body scale rows	27-29.8-31	25-29.1-31(SS)* 25-28.4-31	26-29.9-32
Ventrals	162-171.0-182	155-168-180(SS) 159-170.6-181	164-175-182
Subcaudals	30-33.9-38	27-30.5-34.5(SS) 28-33.7-44	28-33.3-40
Scales around eye	13-14.5-16	11-14.9-18(SS) 12-15.3-19	14-16.9-19
Upper labials	10-10.4-12	9-10.6-13	10-11.5-13
Interocular scale rows	7-8.3-9	7-8.4-11	7-9.0-10
% enlarged supra-oculars	100	64.3	29.5

\*SS = Stemmler & Sochurek specimens, impossible to collate with ours.

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