STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 197

THE LESSER ANTILLEAN SCORPIONS OF THE GENUS CENTRUROIDES

by

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The Lesser Antillean scorpions of the genus *Centruroides* Marx are revised. *C. eustatius* Armas, 1976, is synonymised under *C. barbudensis* (Pocock), and *C. antiguensis* Armas, 1976, is considered to be a subspecies of *C. barbudensis*. *Centruroides b. barbudensis* is recorded from Barbuda, St. Eustatius, St. Martin, Anguilla and Sombrero, *C. b. antiguensis* from Antigua, *C. hummelincki* from Saba, and *Centruroides* spp. from Guadeloupe and La Désirade.

The buthid scorpions of the genus *Centruroides* are widely distributed in the Antillean area. They are also the most common scorpions in the majority of these islands. Nevertheless they remained almost forgotten until recently (STAHNKE 1970; ARMAS 1976, 1977, 1980, 1981, 1982; FRANCKE & SISSOM 1980).

For the purpose of this paper the Lesser Antilles are defined as the islands situated between the Virgin Islands and Trinidad & Tobago, according to BOND's 1978 zoogeographical point of view.

This paper deals with the Lesser Antillean *Centruroides*, excluding *C. testaceus* (De Geer).

I am very grateful to Dr. P. WAGENAAR HUMMELINCK (Utrecht) for the loan of his Lesser Antillean material, and for providing the photographs. I extend my gratitude to Dr. OSCAR F. FRANCKE (Texas Tech University) for his information regarding *C. testaceus*; as well as to Dr. HERBERT W. LEVI (Museum of Comparative Zoology, Harvard University), NORMAN I. PLATNICK (American Museum of Natural History), and to DIOMEDES QUINTERO, Jr. (Universidad de Panamá) for providing some photocopies. ORLANDO H. GARRIDO (Instituto de Zoología, La Habana) helped me with the correction of the English text.

HUMMELINCK's material has been presented to the Rijksmuseum van Natuurlijke Historie at Leiden (including those specimens which were indicated formerly as being deposited in Utrecht), with the exception of 3 ♀♀ from St. Martin, 1 ♀ from Saba, and 1 ♀ from Antigua, which have been deposited at the Cuban Academy.

Centruroides barbudensis barbudensis (Pocock)

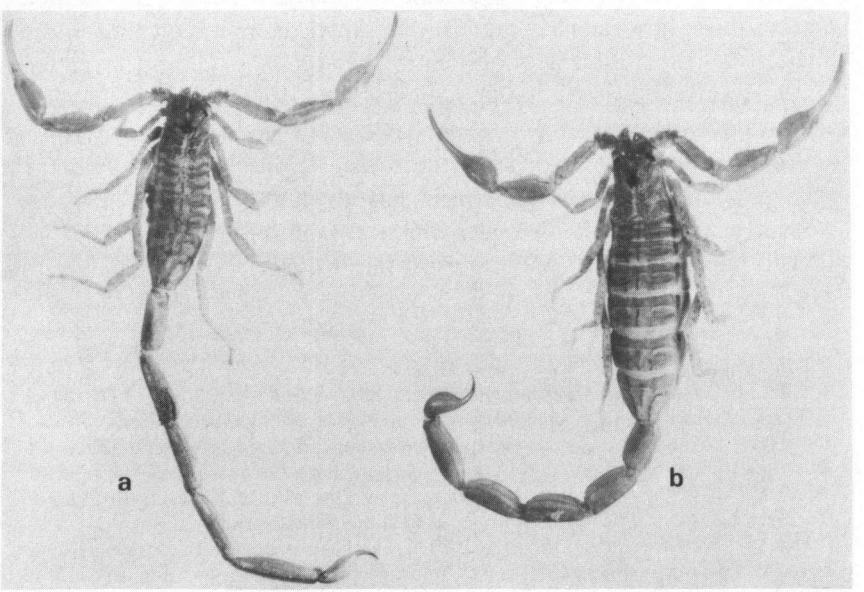
(Figs. 15–17, 19, 20)

Centrurus barbudensis POCOCK, 1898: 386.
Centrurus insulanus barbudensis, KRAEPELIN 1899: 91.
Centruroides barbudensis, ARMAS 1976: 53, 54.
Centruroides insulanus barbudensis, STAHNKE & CALOS 1977: 118.
Centruroides eustatius ARMAS, 1976: 55. [New synonymy]

Diagnosis. A medium sized *Centruroides*. General color yellowish, with two dark bands on tergites I–VI. Carapace finely granular, with well developed keels on caudal segments. Caudal vesicle ovate. Pectines with 19–23 teeth.

Female

Base yellowish-brown. Carapace, pedipalps and legs with dark brown spots. Chelicerae with brown reticulation. Tergites with three longi-



Figs. 15 & 16. *Centruroides barbudensis barbudensis* (Pocock), from Barbuda, Martello Tower beach, 8.VII.1955; male (a) and female (b) specimen.

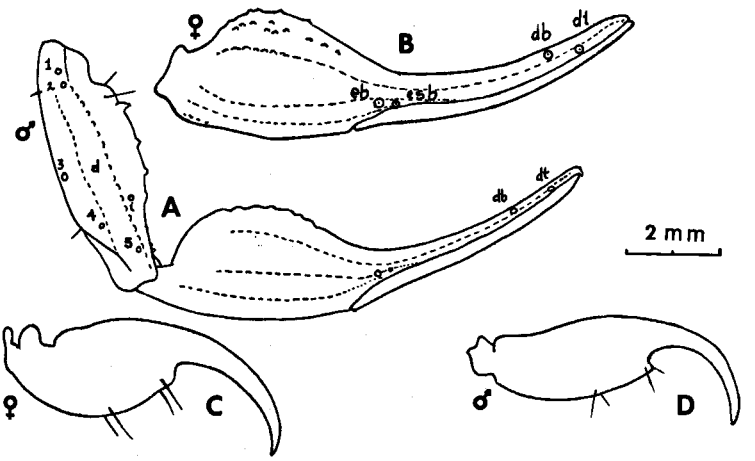


Fig. 17. *Centruroides barbudensis barbudensis.* A. ♂ pedipalp with tibia and chela; B. ♀ telson; C. ♀ telson; D. ♂ telson.

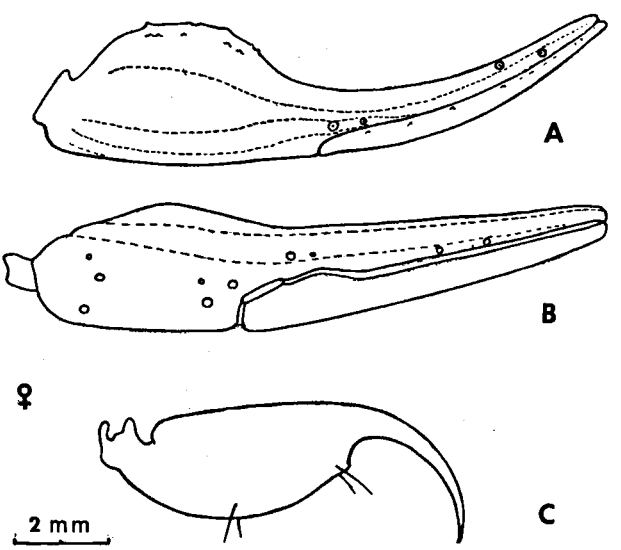


Fig. 18. *Centruroides barbudensis antiguensis* Armas. A. ♀ chela, dorsal view; B. ♀ chela, external view; C. ♀ telson.

TABLE 1

Measurements (in mm) of *Centruroides barbudensis barbudensis* from Barbuda and St. Martin, *C. barbudensis antiguensis* from Antigua, *C. hummelincki* from Saba, and *Centruroides* sp. from Guadeloupe.

(The length includes the telescopic portion. The female specimens from Antigua and Saba are holotypes.)

	BARBUDA		ST. MARTIN		ANTIGUA	SABA		GUADELOUPE	
	♀	♂	♀	♂	♀	♀	♀	♀	♂
Carapace length	5.75	5.00	5.25	4.95	6.35	5.06	5.10	7.30	5.50
Anterior width	3.40	2.80	3.10	2.86	3.90	3.00	3.00	4.15	3.15
Posterior width	5.50	4.75	5.50	4.50	6.75	5.00	5.15	7.25	5.60
Pedipalp length	20.00	20.40	18.91	21.70	24.60	19.35	19.25	25.20	22.60
Femur length	5.00	5.25	4.86	5.50	6.25	4.85	4.75	7.00	6.00
— width	1.43	1.30	1.36	1.25	1.75	1.30	1.35	1.85	1.30
Tibia length	5.50	5.65	5.50	6.00	6.75	5.50	5.50	7.60	6.60
— width	2.20	2.00	2.16	1.86	2.85	2.00	2.20	2.50	2.00
Pince length	9.00	9.50	8.55	10.20	11.70	9.00	9.00	11.60	10.00
Hand length	3.50	3.80	3.25	3.50	4.25	3.25	3.25	4.35	3.80
— width	2.45	2.25	2.25	2.16	3.00	2.00	2.20	2.87	2.30
— depth	2.20	1.80	1.90	2.00	2.65	1.90	1.95	2.50	2.15
Movable finger length	6.55	6.55	6.36	6.25	8.50	6.50	6.25	8.50	6.75
Pectine length	4.00	4.00	3.75	3.86	4.75	3.50	3.65	5.00	4.65
Mesosoma length	15.55	13.30	14.52	14.17	17.25	14.25	13.90	20.90	16.40
Tergite VII length	4.00	4.00	3.75	4.00	4.65	3.50	3.75	5.70	4.90
— — width	5.70	4.35	5.50	4.00	6.50	5.25	5.00	8.30	5.25
Metasoma length	34.64	39.50	31.15	42.76	40.75	30.85	30.85	45.40	44.90
I length	4.75[a]	5.50	4.35	6.00	5.75[a]	4.25	4.35	6.00[a]	6.00
— width	3.00	2.12	2.60	2.12	3.12	2.34	2.45	3.50	2.50
II length	5.65	6.75	5.00	7.40	6.50	5.00	5.00	7.25	7.50
— width	2.73	2.00	2.45	1.90	3.00	2.20	2.40	3.25	2.25
III length	6.00	7.00	5.40	8.00	7.00	5.25	5.25	7.50	8.00
— width	2.73	2.00	2.45	1.90	2.86	2.20	2.34	3.25	2.25
IV length	6.00	7.00	5.40	8.00	7.00	5.25	5.25	7.50	8.00
— width	3.65	1.95	2.30	1.85	2.86	2.20	2.20	3.25	2.25
V length	6.75	8.00	6.00	8.36	7.75	6.00	6.00	9.00	9.20
— width	2.60	1.95	2.30	1.90	2.86	2.08	2.16	3.25	2.30
Telson length	5.50	5.25	5.00	5.00	6.75	5.10	5.00	8.25	6.20
Vesicle length	3.05	3.25	3.00	3.75	4.00	3.00	3.00	5.15	4.70
— width	2.00	1.75	1.80	1.90	2.25	1.68	1.72	2.80	2.25
— depth	2.08	1.75	1.80	1.75	2.34	1.88	1.80	2.70	2.18
Total length	55.95	57.80	50.92	61.88	64.35	50.16	49.85	73.60	67.20

tudinal light bands separated by two dark brown ones. Metasoma with a dark brown ventral surface. Sternite VII with brown spots.

Carapace finely granular with some granules of moderate size on the interocular triangle and the posterior half. Superciliary keels slightly granular principally on the anterior half. Posterior submedian keels slightly developed. Ratio of carapace length to telson length, 1.03.

Pedipalp. Femur with well-developed and granular keels; intercarinal spaces very finely granular. Tibia with finely granular dorsal intercarinal space; with about five large spinous granules in the interior surface; keels well developed; with small granules on the exterior keels (dorsal, median, and ventral). Ratio of hand length to movable finger length, 0.51. With about ten conic medium sized granules (as well as other smaller ones) on the interior surface of hand. Movable finger with eight rows of granules; basal lobule well developed.

Pectines with 19–21 teeth. Ratio of external margin pectines length to dentate margin, 1.10. Basal plate with posterior margin arched.

Tergites finely granular. Median keel well developed. Ratio of tergite VII length to pectine length, 1.07.

Sternites smooth; posterior half of V, punctate. With some fine granules and two pairs of keels (the internal one almost vestigial) on VII.

With intercarinal spaces of caudal segments almost smooth, furnished with some very fine granules. Metasonal keels well developed and granular. Ventral submedian keels less developed on I than on the remaining segments. Lateral supramedian keels less developed on IV than those on I–III. Ratio of metasoma length to carapace length 6.07. Caudal vesicle ovate and almost smooth. Ratio of vesicle width to caudal segment V width 0.78. Measurements, see Table 1.

Male

Very similar to the female but differing in: posterior width of the carapace a little smaller than its length. Tibia of pedipalp slender: hand longer and more slender than in female. Tergites narrower. Caudal vesicle longer and more slender. Ratio of metasome length to carapace length 8.27.

Type locality: Barbuda, Lesser Antilles.

BARBUDA: Martello Tower beach, in wood-shed at night, 8.VII.1955 (2 ♂♂ 1 ♀, Figs. 15 and 16). Southern part of Goat Island, Sta. 601, 10.VII.1955 (subadult). Darby's Cave, 10.VII.1955 (subadult).

ST. EUSTATIUS: Glass Bottle, W slope of The Quill, in decaying tree, Sta. 431A, 12.VII.1949 (1♀ with 10 nymphs II on back, Fig. 20, holotype of *C. barb. eustatius* Armas; 1 subadult).
ST. MARTIN: Near Philipsburg, 17.V.1949 (1♀), 22.V.1949 (1♀ with *Isometrus maculatus*), 28.V.1949 (8 spec. with *Isometrus*); St. Peter, Cul-de-Sac, 20.IX.1946 (3 spec. with *Isometrus*); Corner Hill near Simson Bay, Sta. 473, 7.V.1949 (1 subad.), IX.1981 (1♂ 1♀ J. Vliegen coll.); Low Lands near Cupecoy Bay, Sta. 080, 23.VI.1973 (1♀ with *Isometrus*); Princess Quarter, Belvedère, V.1981 (3♂♂ with *Isometrus*, Vliegen coll.); St. Maarten, 1.II.1962 (9 spec., John Roumon coll.).
ANGUILLA: Anguilla, VII.1949 (2 adult and 1 subadult specimen, A. MacDonald coll.; Fig. 19).
SOMBRERO: Sombrero, 15.VII.1949 (1 adult and 1 subadult specimen, A. MacDonald coll.).

According to POCOCK (1898) this species occurs on Bird's Island (W of Dominica). The present author did not examine specimens from that locality.

Centruroides barbudensis antiguensis Armas

(Figs. 18 and 21)

Centruroides antiguensis ARMAS, 1976: 53.

Diagnosis. A moderate size subspecies of *C. barbudensis*, differing from *C. b. barbudensis* as follows: Caudal vesicle more ovate; body longer;

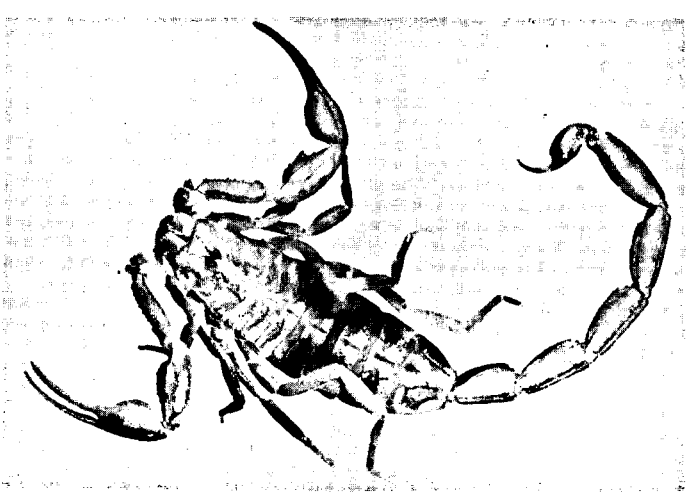


Fig. 19. *Centruroides barbudensis barbudensis*, from Anguilla, July 1949; female.

hand more powerful. The following adult ratios (female) indicate additional differences:

	barbudensis	*antiguensis*
$\frac{\text{caudal segment I length}}{\text{caudal segment I width}}$	1.58	1.80
$\frac{\text{caudal segment III length}}{\text{caudal segment III width}}$	2.19	2.43
$\frac{\text{vesicle length}}{\text{vesicle width}}$	1.52	1.77

Measurements given in Table 1.

Male unknown.

Type locality: Antigua, Lesser Antilles.

ANTIGUA: Near Bat's Cave, E of Nelson's Dockyard, below limestone rocks, Sta. 591, 13.VII.1955 (1♀, holotype of *C. antiguensis* Armas; Fig. 21). Parham Hill, among limestone debris with xerophytic shrubs, Sta. 593, 14.VII.1955 (1 spec.). Yepton Mill, Sta. 595, 17.VII.1955 (1 juv.).

Centruroides hummelincki Armas

(Figs. 22–24)

Centruroides hummelincki ARMAS, 1976: 54.

Diagnosis (based on females). A medium size species of *Centruroides*, differing from *C. barbudensis* (which is closely related) by: caudal segments with keels more developed and granular; vesicle more ovate; body smaller; hand as wide as tibia pedipalp; basal plate of pectines with straight posterior edge; movable finger with basal lobule slightly developed.

Female, redescription of holotype.

Base color yellowish-brown. Carapace, pedipalps and legs densely spotted with dark brown. Tergites with three longitudinal bands separat-

ed by two dark brown ones; median keel furnished with brown. Sternites III–VI pale yellowish; V, heavily spotted with ligth brown. Caudal segment I all spotted in dark brown principally on ventral surface; II, spotted on ventral surface; III, spotted on median intercarinal space of ventral surface; IV, spotted on the base of central surface; V, not spotted. Vesicle pale yellowish.

Carapace finely granular. Superciliary and submedian posterior keels granular, well developed. Anterior median and posterior median furrows well developed. Ratio of carapace length to tibia pedipalp length, 0.92.

Pedipalp. Femur granular with well developed keels; intercarinal spaces finely granular. Tibia with intercarinal spaces very finely granular;

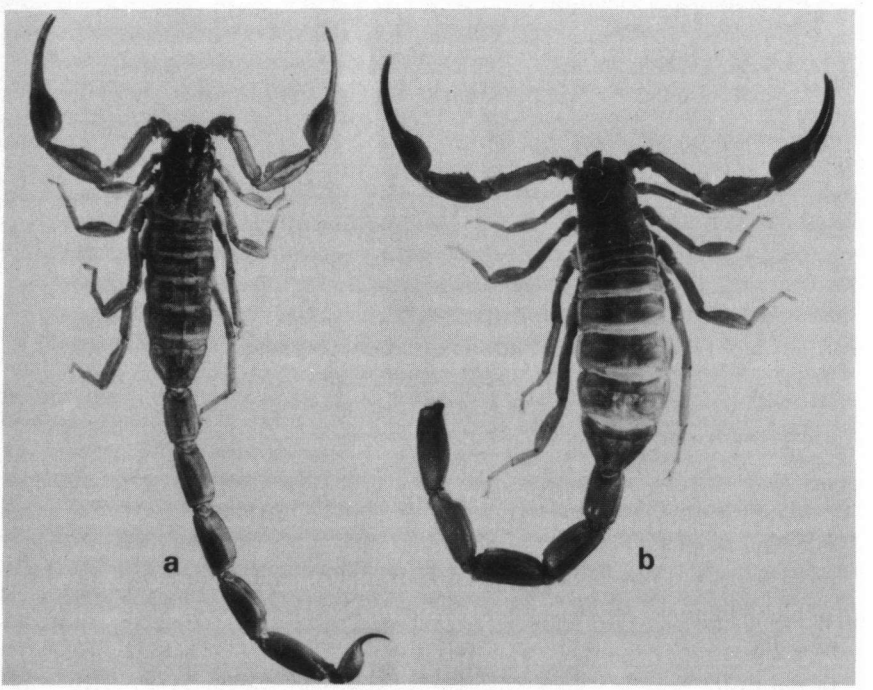


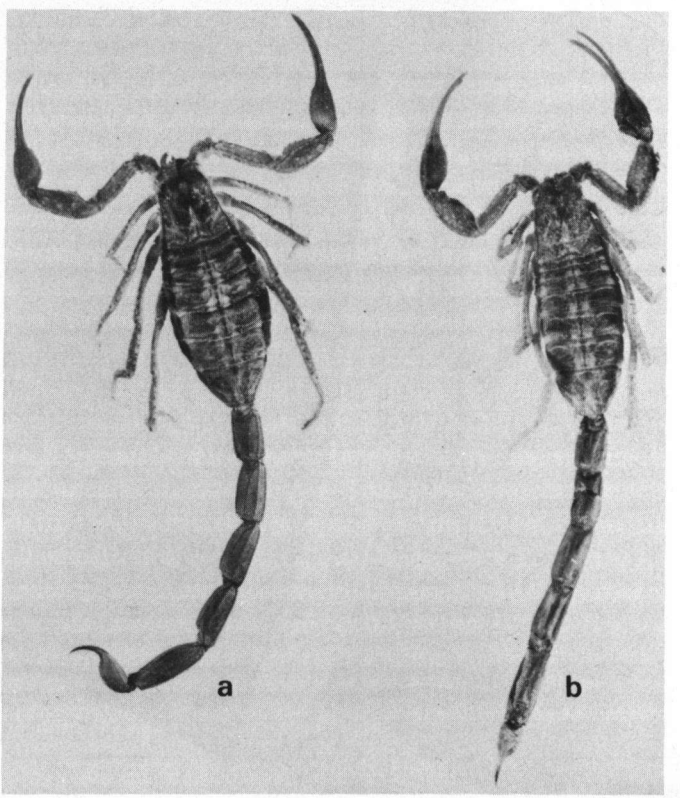
Fig. 20. *Centruroides barbudensis barbudensis*, from St. Eustatius, Glass Bottle, 12.VII.1949; female (a), holotype of *C. eustatius* Armas.

Fig. 21. *Centruroides barbudensis antiguensis* Armas, from Antigua, near Nelson's Dockyard, 13.VII.1955; female (b), holotype.

dorsal interior and ventral interior keels well developed, granular; dorsal median, dorsal exterior, median exterior, and ventral exterior keels well developed, finely granular. Interior surface with about five large spinous granules. Hand ovate, as wide as tibia pedipalp; dorsal surface with slightly developed keels; internal surface with about ten medium sized granules. Movable finger with small basal lobule.

Pectines with 20/20 teeth. Basal plate rectangular, with straight posterior edge.

Tergites granular, with granules more developed on posterior margin.



Figs. 22 & 23. *Centruroides hummelincki* Armas, from Saba, The Bottom, 6.III.1962; female (a), holotype, and female (b) paratype.

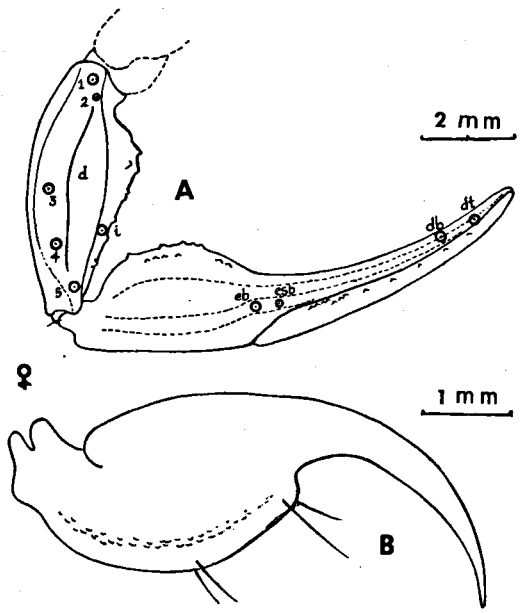


Fig. 24. *Centruroides hummelincki*. A. ♀ pedipalp with tibia and chela, dorsal view; B. ♀ telson, lateral view.

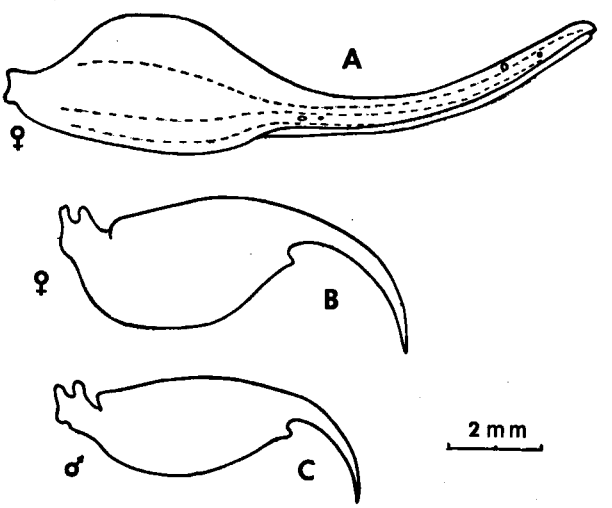


Fig. 25. *Centruroides* sp. from Guadeloupe. A. ♀ chela, dorsal view; B. ♀ telson, lateral view; C. ♂ telson, lateral view.

Ratio of tergite VII length to tergite VII width, 0.66. Median keel well developed.

Caudal segments I–IV with granular and well developed keels, except the ventral submedian keels which are poorly developed. Segment V with well developed and granular keels. I–IV with intercarinal spaces furnished with some fine granules; V, finely granular. Vesicle ovate; subaculear tubercle vestigial. Ratio of metasoma length to carapace length, 6.29. Measurements given in Table 1.

Male unknown.

Type locality: Saba, Lesser Antilles.

SABA: The Bottom, 6.III.1962 (1 ♀, holotype; Fig. 22; J. J. Beaujon coll.); 20.VII.1949 (1 ♀, paratype; Fig. 23). Road to The Bottom, among debris of andesitic rock, Sta. 298C, 6.X.1963 (1 ♀, paratype).

Centruroides sp. A

(Fig. 25)

This species is a new taxon, to be described by Dr. OSCAR F. FRANCKE.

Female

Body almost uniformly yellowish-brown; legs, femur pedipalp, and dorsal surface of metasoma lighter; caudal segments with tenuous brown spots on ventral surface.

Carapace densely granular. Superciliary keels well developed and finely granular. Anterior median, posterior median, posterior marginal, and lateral posterior furrows deep and well developed. Ratio of carapace length to caudal segment II length, 1.00.

Pedipalp. Femur with well-developed keels; intercarinal spaces finely granular, with some large granules on internal and external surfaces. Tibia with well-developed and finely granular keels; internal surface with about seven large spinous granules. Hand ovate; with finely granular and slightly developed dorsal keels; intercarinal species very finely granular. Movable finger with eight rows of granules; basal lobule well developed.

Pectines with 20/20 teeth; basal plate with median pit.

Tergites densely covered with conic granules. Median keel well developed and granular. Ratio of tergite VII width to gergite VII length, 1.44.

Sternite III finely granular on their sides; IV–V, smooth; VI–VII, finely granular; VII, with two pairs of granular keels.

Caudal segments with intercarinal spaces finely granular. Dorsal lateral keels on I–IV granular and well developed, but with less developed granules on I–II. Lateral supramedian keels granular and well developed on I–IV. Lateral inframedian keel granular and well developed on I. Ventral lateral keels, well developed on I–IV. Ventral submedian keels well developed and granular on I–IV. Ventral median keel slightly developed on V, with small granules. Vesicle ovate, almost smooth; subaculear tubercle small and spinous. Measurements given in Table 1.

Male

Differing from the female, which is very similar, by: trunk, caudal vesicle, and caudal segments slender; basal plate of pectines rectangular; pectines with 23/23 teeth.

GUADELOUPE: Anse Lagourde, 10.II.1975 (1 ♂ 2 ♀♀; F. Chalumeau coll.). Anse à l'Eau, 16.III.1975 (1 ♀; F. Chalumeau coll.).

Centruroides sp. B

Nymph I

Pedipalp uniformly yellow; trunk brownish, spotted with black. Legs yellow on basal half of femora and the rest pale brown. Metasoma yellowish-brown, with dark brown band on ventral surface of segments I–IV. Pectines with 21/22 teeth. Caudal segments with well-developed and granular keels. Total length 16 mm.

LA DÉSIRADE: Grande Anse, among debris of limestone, Sta. 732, 23.I.1964 (1 juv. specimen).

Discussion

The genus *Centruroides* is widely distributed on the Lesser Antilles with the exception of the islands located South of Guadeloupe, where so far it has not been discovered.

The Lesser Antillean centrurid scorpions seem to form a very homogeneous (monophyletic) group of species. Nevertheless, the genus *Centruroides* is very complex. Studying single specimens or a few ones it is almost impossible to arrive at any trustworthy conclusion. Moreover male specimens show great morphometric variation within the same species.

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