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Autor: Freyvogel, Thierry A.
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Miscellaneum.

Quantity and Toxicity of *Bitis lachesis* venom.

By THIERRY A. FREYVOGEL.
Swiss Tropical Institute, Basle.

Material and methods.

From July to October 1964 17 Puff Adders, *Bitis lachesis* Laurenti, were collected in and around Ifakara, a minor settlement located in the Ulanga Area in southeastern Tanzania. They were "milked" about fortnightly in the usual way by allowing the snake to bite a small size Petri dish and by pressing the venom glands with the thumb and the forefinger until no more venom was given off. The venom was dried for at least 48 hours in an evacuated desiccator on calcium chloride and the weight of the venom was taken for each snake separately. It was then placed in a refrigerator and preserved in a container with concentrated sulphuric acid.

The toxicity tests were carried out subsequently in Basle, on white mice of around 20 g body weight, of the SIM-strain (Sandoz-Inzucht-Maus). The venom was diluted in 0.1 cc physiological saline solution and injected by the intravenous (i.v.), intraperitoneal (i.p.), or subcutaneous (s.c.) route. Although most of the test animals which received a higher than critical dose, died

TABLE 1.

Venom yields (in mg dry weight).

Snake No.	Sex	Body length (cm)	Body weight (g)	Date						Average
				6. 8.	8. 8	19. 8.	4. 9.	16. 9.	1. 10.	
1	M	95	650	45		70	73	75	—	66
2	M	70	435	70	(12)	50	(15)	80	88	72
3	M	85	428			75	75	92	90	83
4	M	77	355			92	60	70	63	71
5	M	70	305				37	75	85	66
6	M		470				68	65	77	70
7	M	78	375				15	65	89	56
8	M	67	285				90	55	69	71
9	M	81	480				15	70	80	55
10	F	80	715				165	62	68	98
11	M							41	—	—
12	F	82	785					58	95	77
13	F		535						65	—
14	juv.	41	65					(2)	(20)	—
15	M	61	265						77	—
16	juv.	42	70						(25)	—
17	M	67	390						75	—

(Figures in brackets are not used in the average.)

within a few hours, those which survived were observed for at least three days. The evaluation of the tests was carried out according to the method of SPEARMAN-KAERBER, as discussed by FINNEY (1964).

Quantity.

Table 1 shows the amount of venom obtained from different animals on several occasions. For adult specimens the average yield was of 71 mg. This figure, however, includes also the yields of newly caught animals, which might have spent some of their venom a short time before capture. If these snakes are excluded and only those considered which have had a fortnight's time to restore the content of their glands, the average yield amounts to 74 mg. The average of the first milking, on the other hand, is of 66 mg. This last figure appears to be the one which should be taken into consideration in connection with human accidents. The single maximum dose extracted (from a newly acquired female) was 165 mg. Such a high quantity seems to indicate, that, if allowed to rest for prolonged periods, the Puff Adders possibly may store considerably larger amounts of venom than is obtainable at fortnightly intervals. DEORAS (1963) showed that such is the case for Indian Kraits and Russel's Vipers. The minimum single dose was of 12 mg (two days after the previous milking).

Toxicity.

Table 2 shows the results of the toxicity tests. It appears that the effect of the venom may vary considerably even among an apparently homogenous group of test animals. The LD₅₀ per gramme body weight amounts to 1 to 2 µg after s.c. as well as i.p. injections and ranges from 0.5 to 1.1 µg after i.v. injections. There is no difference in the susceptibility of male and female mice.

TABLE 2.

The toxicity of Bitis lachesis venom for white mice.

Date	Way of injection	No. of mice per dose	Average body weight of mice (g)	LD ₅₀ in µg	LD ₅₀ per g body weight
5. 11.	s.c.	2	20.5	40.0 (28.0-57.2)	2.0
11. 11.	s.c.	4	22.0	22.5 (18.8-26.8)	1.0
12. 11.	s.c.	3	18.0	29.4 (23.6-36.6)	1.6
12. 11.	s.c.	4	23.0	28.3 (25.2-31.8)	1.2
28. 1.	s.c.	10	19.5	38.2 (33.4-43.7)	2.0
5. 11.	i.p.	2	20.5	20.0 (14.0-28.6)	1.0
11. 11.	i.p.	4	19.9	20.0 (17.0-23.6)	1.0
28. 1.	i.p.	10	19.4	40.0 (35.5-45.1)	2.0
5. 11.	i.v.	2	20.5	10.0 (7.1-14.1)	0.5
11. 11.	i.v.	4	20.5	22.3 (-)	1.1
28. 1.	i.v.	10	19.5	18.2 (16.4-20.2)	0.9

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Literature.

- DEORAS, P. J. (1963). Studies on Bombay Snakes: Snake Farm Venom Yield Records and Their Probable Significance. In KEEGAN, H. L. and MACFARLANE, W. V.: *Venomous and Poisonous Animals and Noxious Plants of the Pacific Region*. — Oxford, London, New York, Paris: Pergamon Press
- FINNEY, D. J. (1964). *Statistical Method in Biological Assay*, 2nd Ed. — London: Charles Griffin & Co. Ltd. pp. 512-533, esp. 524-530.