EVALUATION OF VENOM EXTRACT FROM THE COBRA SNAKES (NAJA NAJA) OF THREE DIFFERENT WEIGHTS AND SIZE GROUPS.

Pages with reference to book, From 278 To 280

Zafar Ali, Muintaz Begum (Biological Production Division, National Institute of Health, Islamabad.)

Abstract

The results of this experiment indicate that large and heavy snakes provide more venom extract as compared to snakes of medium and small sizes and weight. The large sized snakes are tougher and remain healthy throughout experimental period as compared to snakes of lesser size and weight.
For the purpose of collection of crude venom for production of anti snake venom, large and heavy snakes are preferred. If properly maintained, these snakes would survive for at least 2-21/2 months under standard captive conditions.
After initial five weekly extraction of freshly caught snakes fortnightly subsequent extractions are proposed for obtaining reasonable quantity of venom extract(JPMA36:278, 1986).

INTRODUCTION

This study has been done to determine the amount of crude venom that could be extracted from various sizes of the Cobra snake species found in Pakistan and to find the optimum size of snake which is economically feasible to obtain and manage in our snake farm (serpentary) for venom production and extraction. Therefore, it is, deemed necessary to find out whether different sizes of these snakes produce different volumes or quantity of venoms.

MATERIALS AND METHODS

Atotalof 30 Cobra snakes (Naja naja species) of Pakistan origin were selected from the stock of snakes supplied to this institute during the month of April, 1984. These snakes were divided into three different sizes and weight groups.
Group I consisted of 10 snakes measuring 45-50inches in length and weighing between 850-900 gm, group II, 10 snakes measuring 35-40 inches in length and weighing between 500-600gm and group III, 10 snakes measuring 25-30 inches in length and weighing 325-40 gm.
Each group was kept separately in 3 cages. Extraction of venom from each snake of all the three groups was separately carried out by manual handling of snakes and squeezing /pressing the venom glands situated on both sides of the upper maxill[1] and fixing the venom fangs on the edge of a preweighed cleaned dry wine glass. The weight of the liquid venom was determined by deducting the weight of the wine glass.
The empty weight of each wine glass was determined on a metlar balance and then the weight of liquid venom was determined after collecting venom from all the 10 snakes in each group in their respective wine glasses.
Five extractions were made after an interval of one week for five consecutive we eks,purificat ion of venom was done by the method of Nakai[2] and Hayashi[3]. The venom was dried at 4°C in a vacuum desicator. The weight of dried venom in the form of crystals was determined for every extraction of corresponding week.
Thereafter the percentage content of dry weight per animal was calculated and recorded in respective

table. Total of five extractions of each group was done and tabulated (Table I-III)

TABLE – 1

Extraction of Crude Venom from Cobra (Naja Naja) Snakes of Group I of 45–50" in Size having 850–900 gm Body Weight.

Weekly Intervals	No. of Extractions	Total wet Weight in gms.	Total dry Weight in (Percentage)	Dry Weight content (Percentage)	Dry Weight per Snake
O	10	3.6520	2.3760	65.05	6.505
1	9	0.7920	0.2290	34.58	3.84
2	8	0.5690	0.1600	28.47	3.056
3	7	0.5070	0.1380	27.00	3.85
4	6	0.5240	0.1530	29.2	4.86
Total Weekly 5 Intervals	40	6.0440	3.056	50.59	4.532

TABLE – II

Extraction of Crude Venom from Cobra (Naja Naja) Snakes of Group II of 35–40" having Weight from 500–600 gm Body Weight.

Weekly Interval	No. of Extractions	Total wet Weight in gms.	Total Dry Weight in gms.	Dry Weight content (Percentage)	Dry Weight per Snake (Percentage)
0	10	1.6890	1.1380	67.32	6.732
1	9	0.7230	0.2070	28.63	3.180
2	7	0.4940	0.1110	22.47	3.210
3	6	0.2560	0.0540	21.10	3.500
4	5	0.2190	0.0700	31.96	6.390
Total 5 Weekly Intervals	37	3.3810	1.5800	46.73	4.602

TABLE – III

Extraction of crude Venom from Cobra (Naja Naja) Snakes of Group III of 25–30 in size having 325–400 gms Body Weight.

Weekly Interval	No. of Extractions	Total Wet Weight in gms.	Total Dry Weight in gms.	Dry Weight content (Percentage)	Dry Weight per Snake (Percentage)
0	10	0.4530	0.2960	65.34	6.532
1	8	0.2010	0.0395	19.65	2.46
2	7	0.4120	0.1020	24.75	3.12
3	6	0.1860	0.038	20.43	3.81
4	5	0.2170	0.0490	22.58	4.51
Total 5 Weekly Intervals	36	1.4690	0.5245	35.704	4.086

for each size and weight group of snakes.

RESULT & DISCUSSION

The weight of liquid venom and dried venom extract from three different groups (I,II & III) of Cobra species of Pakistan origin is presented in table I, II and Ill. The mean crude dry weight content per snake was 4:523 gm percent for the large sized animals of group I weighing 800-900 gm. For medium sized snakes of group II weighing between 500-600 gm the mean dry weight content per snake was 4.606 gm percent while the mean crude dry weight content per snake was 4.086 gm percent for group III snakes weighing between 300400 gms. This is in agreement with the finding of Lim.[4]

There appears to be a difference between the weight of the venom at initial and subsequent extraction at weekly intervals. This difference is consistent in all these groups studied. Similar differences were reported by Ganjully.[5]

The crude dry weight of venom obtained from snakes in group I was 3.0580 gm (table I) as compared to 1.580 gm (table II) and 0.5245 gm (table III) in group II & III Cobra snakes.

The yield of crude dry weight of venom extract from snakes in group I was therefore 5 0.59% for group 11,46.73% and for group III 35.70% that indicate that large heavy snakes yield more venom as compared to snakes of medium and small size and less weighed snakes[6]

This study also shows that the snakes of smaller size and lesser weight do not survive for more than over five extractions as compared to large and medium sized group of snakes. Another study showed similar findings .[7] It is therefore, recommended that as far as possible snakes of larger size and heavier weight should be used to reduce the cost of venoms despite the fact that small snakes may yield a higher dry weight per gram of the body weight.

However it is not known at this stage that whether the extract from the smaller snakes are as potent as that from the larger snakes. It is also not clear that the venom content from eath extraction is the same. Work related to these points is to be carried out.

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