

SNAKE VENOM - FACTS FIGURES AND SOCIAL PERSPECTIVE**R. D. Bendbhar¹, B. P. More¹, M. K. Malve¹, S. S. Pingale² and B.R. Khot³**

¹Regional Forensic Science Laboratory Nashik, Opposite Vidyut Nagar, Dindori Road,
Nashik- 422004, Maharashtra,

²P.G. Department of Chemistry, *Gramonnati Mandal's* Arts, Com. & Sci. College,
Narayangaon, Pune 410504 (Affiliated to University of Pune)

³Department of Chemistry, C T Bora College Shirur, Pune (Affiliated to University of Pune).

Article Received on
06 July 2014,

Revised on 30 July 2014,
Accepted on 24 August 2014

Correspondence for Author*Dr. Shirish S. Pingale,**

Department of Chemistry,
Gramonnati Mandal's Arts,
Com. & Sci. College,
Narayangaon, Pune 410504
(Affiliated to University of
Pune) Maharashtra, India.

ABSTRACT

Forensic science laboratories in Maharashtra receive many samples for the detection of snake venom under Cr. Pc.174. Maharashtra having largest number of deaths reported due to snake bite¹. The author of this paper has brought light on negative results for the presence of snake venom. With the help of empirical and statistical studies, this paper highlights various parameters responsible for the negative results of snake venom samples received in laboratories. Forensic serologist has to carry out analysis of different body fluids in murder and rape cases. Though snake venom analysis is the less priority case but is having different social dimension. This paper reviews the social perspective in this regard.

KEY WORD: Snake Venom, Cr. Pc.174, Serologist, Body fluids .Social Perspective.

INTRODUCTION**CHEMISTRY OF SNAKE VENOM**

Snake venom is highly modified saliva that is produced by special glands of certain species of snakes. The gland which secretes the zootoxin is a modification of the parotid salivary gland of other vertebrates, and is usually situated on each side of the head below and behind the eye, invested in a muscular sheath. It is provided with large alveoli in which the venom is stored before being conveyed by a duct to the base of the channeled or tubular fang through which it is ejected. Snake venom is a combination of many different proteins and enzymes. Many of these proteins are harmless to humans, but some are toxins. Snake venom consists of

proteins, enzymes, substances with a cytotoxic effect, neurotoxins and coagulants. The effects of some of the constituents of snake venom are as follows:-

1. Phosphodiesterases are used to interfere with the prey's cardiac system, mainly to lower the blood pressure.
2. Phospholipase A2 causes hemolysis through esterolysis of red cell membranes and promotes muscle necrosis.
3. Snake venom inhibits cholinesterase to make the prey lose muscle control.
4. Hyaluronidase increases tissue permeability to increase the rate that other enzymes are absorbed into the prey's tissues.
5. Amino acid oxidases and proteases are used for digestion. Amino acid oxidase also triggers some other enzymes and is responsible for the yellow color of the venom of some species.
6. Snake venom often contains ATPases which are used for breaking down ATP to disrupt the prey's energy fuel use.

The Characteristics Of Different Types of Snake Venom^[3]

1. Neurotoxic venom-elapid venom
2. Vasculotoxic venom -viper venom
3. Myotoxic venom-sea snake venom

Fatal dose

1. 15 mg of dried cobra venom
2. 20 mg of viper venom
3. 06 mg of krait venom
4. 08 mg of saw scaled viper venom

FORENSIC RESULTS STATISTICS

A total number of 478 cases were referred to biology section of Regional Forensic Science Laboratory Nashik, during 2006-2010

Table 1: Cases and Samples Received Year Wise Under Cr.Pc.174

Year	Cases	Samples	Negative %	Positive %
2006	018	32	100	0
2007	104	202	98	2
2008	113	222	97	3
2009	125	254	94	6
2010	118	224	90	10

2011	104	210	92	8
2012	98	198	90	10
2013	89	180	88	12

The highlighting parameters of 100 cases have been considered for empirical statistical studies-

Table 2: Time Factor

Variable	Category	Frequency	Negative results %	Positive results %
Samples received in laboratory	Within 7 days	5	91	9
	8-15 days	15	94	6
	16-30days	10	96	4
	After 1 months	70	99	1
	Total	100		

Table 3: Victim's Profile

Variables	Category	Frequency	Negative results %	Positive results %
Nature of samples received in laboratory	Having confirm snake bite history	10	94	6
	Medical officers remark of snake bite	10	91	9
	Having no history	5	100	0
	Having no remark of medical officer	5	100	0
	Medical treatment received	70	99.99	0.01
	Total	100		

RESULTS AND DISCUSSION

1. Table 1 concludes that 94 % of the samples received for detection of snake venom are found to be negative.
2. Table 2 shows that 80% samples received after one month found to be negative for the presence of snake venom.
3. Table 3 confirms that 99% samples shows negative result for the presence of snake venom case of victim received the medical aid.

Collection of Snake bite deaths in different states of India

Sl. No.	State/UT	No. of Cases	Poisoning (Snake Bite/Animal Bite)			No. of Persons Died			%Share to Total Deaths (Col.205/268)×100
			No. of Persons Injured					Total	
(1)	(2)	(3)	Male	Female	Total	Male	Female	Total	(206)
STATES:									
1	ANDHRA PRADESH	883	14	11	25	629	253	882	3.1
2	ARUNACHAL PRADESH	1	0	0	0	1	0	1	0.3
3	ASSAM	8	0	0	0	7	1	8	0.2
4	BIHAR	48	2	0	2	29	19	48	0.7
5	CHHATTISGARH	686	0	0	0	378	308	686	5.4
6	GOA	2	0	0	0	1	1	2	0.2
7	GUJARAT	682	26	38	64	381	236	617	3.0
8	HARYANA	48	0	0	0	40	8	48	0.5
9	HIMACHAL PRADESH	11	0	0	0	9	2	11	0.5
10	JAMMU & KASHMIR	5	1	3	4	1	0	1	0.1
11	JHARKHAND	25	0	1	1	13	12	25	0.7
12	KARNATAKA	642	5	4	9	421	237	658	3.3
13	KERALA	73	0	0	0	55	18	73	0.7
14	MADHYA PRADESH	2033	7	5	12	1167	866	2033	6.6
15	MAHARASHTRA	2512	897	466	1363	725	430	1155	2.0
16	MANIPUR	0	0	0	0	0	0	0	0.0
17	MEGHALAYA	0	0	0	0	0	0	0	0.0
18	MIZORAM	0	0	0	0	0	0	0	0.0
19	NAGALAND	0	0	0	0	0	0	0	0.0
20	ORISSA	477	44	19	63	326	152	478	5.5
21	PUNJAB	43	0	0	0	35	10	45	0.7
22	RAJASTHAN	298	4	1	5	191	107	298	1.6
23	SIKKIM	0	0	0	0	0	0	0	0.0
24	TAMIL NADU	419	0	0	0	319	100	419	1.8
25	TRIPURA	0	0	0	0	0	0	0	0.0
26	UTTAR PRADESH	104	7	4	11	77	23	100	0.4
27	UTTARAKHAND	3	0	0	0	3	0	3	0.1
28	WEST BENGAL	322	85	57	142	126	76	202	1.6
TOTAL (STATES)		9325	1092	609	1701	4934	2859	7793	2.5
UNION TERRITORIES:									
29	A & N ISLANDS	0	0	0	0	0	0	0	0.0
30	CHANDIGARH	1	0	0	0	1	0	1	0.3
31	D & N HAVELI	3	0	0	0	3	0	3	1.4
32	DAMAN & DIU	0	0	0	0	0	0	0	0.0
33	DELHI (UT)	14	2	0	2	8	4	12	0.2
34	LAKSHADWEEP	0	0	0	0	0	0	0	0.0
35	PUDUCHERRY	16	0	0	0	9	7	16	1.5
TOTAL (UTs)		34	2	0	2	21	11	32	0.4
TOTAL (ALL INDIA)		9359	1094	609	1703	4955	2870	7825	2.5

SOCIAL PERSPECTIVE

The "Social Perspective" is a way of looking at society. It sees society as something over and above the people who are in that society. It is a scientific construct- social science. As a construct, it is like a model of the atom or of a solar system. You cannot see society as a whole, but only some elements of it at a time. It requires analysis of you, the observer. A community, which is the object of your intervention (as a mobilizer) is a social organization, equally a construct, and which requires the social perspective to see and understand. If you

want to effectively empower a community, or stimulate its development, you need to have the social perspective. The duty of forensic expert is to carry out analysis and give justice to the victim. As an expert one must think of 100% positive results for the analysis he performed. During 2006-2010 RFSL Nashik reported 10% cases having positive result for the presence of snake venom. But this result for the cases of unfortunate victim of snake bite who could not received timely medical treatment. On the contrary 90% cases having negative results for the presence of snake venom are of those who get medical aid.

Government of Maharashtra gives compensation of rupees 1,00,000 under the personal accident insurance scheme (PAIS). In such case of snake bites In order to detect the snake venom if victim get medical aid quantity of snake venom found is below the detectable limit .90% cases though confirm history of snake bite ,victims' relatives confront many difficulty in insurance claim under this scheme as the forensic report are negative results for the presence of snake venom .Forensic science for justice but this cases it seldom go with justice. Thus the analyzer must have such social perspective to look beyond the analysis.

ACKNOWLEDGMENT

Authors are thankful to Dr. M. K. Malve, Director, Directorate of Forensic Science Laboratories, Vidyanagari, Kalina, and Mumbai-400098. Maharashtra for his kind helps in carrying out this work.

REFERENCES

1. Crime in India 2008 table no.1.1 National bureau of crime, Home Ministry Government of India.
2. http://en.wikipedia.org/wiki/Snake_venom.
3. Dr. C.K. Parikh's, text book of medical jurisprudence and toxicology, 1990, V edition, CBS publisher and distributors.
4. <http://www.scn.org/cmp/key/key-s.htm>.