



RESEARCH ARTICLE

Ethno-Veterinary Treatment of Acariasis Infestation in Rat Snake (*Ptyas mucosa*) Using Herbal Mixture

A Prathipa, K Senthilkumar, S Gomathinayagam and MG Jayathangaraj

Department of Wildlife Science, Madras Veterinary College, Vepery, Chennai, India

ARTICLE INFO

Received: January 20, 2014

Revised: March 06, 2014

Accepted: March 17, 2014

Key words:

Acaricide

Acorus calamus

Allium sativum

Aloe vera

Rat snake

ABSTRACT

A controlled clinical trial was undertaken to assess the efficacy of application of 0.15% herbal mixture comprising of *Acorus calamus*, *Aloe vera* and *Allium sativum* in the ratio of 2:1:1 on rat snakes of Chennai Snake Park Trust, Chennai. Ten rat snakes with tick infestation were randomly allocated into two groups of five, each. Snakes were fed with the usual diet and water was made available *ad libitum*. Ticks were counted carefully by detailed examination of each snake. On Day 0, snakes in Group 1 were treated with 0.15% herbal mixture of *Acorus calamus*, *Aloe vera* and *Allium sativum* in the ratio of 2:1:1. They were sprayed with water and 25ml of the mixture was then applied over the entire coat of the snake. The solution was applied on the floor and side wall of the room and also the same was repeated again on 4th day. Snakes in Group 2 were placed as the controls. Snakes were observed every day, throughout the study period of 30 days. Treatment efficacy was assessed by comparing the mean tick count of treated snakes with that of untreated snakes. The study showed that application of 25ml of 0.15% of herbal mixture containing *Acorus calamus*, *Aloe vera* and *Allium sativum* in the ratio of 2:1:1 to the rat snakes was very effective and it controlled the ticks present on the snakes at the time of application with the efficacy of >90% up to 30 days of treatment, in the serpentine studied.

*Corresponding Author

A Prathipa

prathipa77@gmail.com

Cite This Article as: Prathipa A, K Senthilkumar, S Gomathinayagam and MG Jayathangaraj, 2014. Ethno-veterinary treatment of acariasis infestation in rat snake (*Ptyas mucosa*) using herbal mixture. Inter J Vet Sci, 3(2): 61-64. www.ijvets.com

INTRODUCTION

External parasites like ticks and mites that are found on the snakes pose a real threat to the health of the snakes in captivity. Both ticks and mites feed on blood and severe infestations may cause anemia, leaving the snakes debilitated and weak. This makes the snake far more susceptible to illness, and as ticks and mites also introduce diseases into the snakes blood supply while feeding, the snake will eventually die. Use of chemical acaricides against the infestations in snake and other wild species is discouraged in general because of the possibilities of occurrence of allergic reactions and even death of the animal. Usage of Acaricides like Deltamethrin and cypromethrin directly on the snakes is questionable (Wallach and Boever, 1983) because a different protocol is necessary for snakes. This study was made to deal with the application of ethno-veterinary medicine [i.e. herbal mixture of *Acorus calamus*, *Aloe vera* and *Allium sativum*] against ticks in rat snakes.

The main objectives of this study are: To identify the ticks affecting the Rat snakes (*Ptyas mucosa*) reared under captive conditions, to evaluate effectiveness of herbal mixture against ticks in rat snakes and to determine the efficacy of the drug and cost effectiveness of the treatment.

MATERIALS AND METHODS

This study was carried out in *Ptyas mucosa* (Indian rat snakes) located at Chennai Snake Park Trust, Guindy. A total of ten rat snakes (*Ptyas mucosa*) infested with ticks were selected for the study. They were randomly allocated into two groups, each group containing five snakes. Group 1 was the experimental group and Group 2 was maintained as the control. Snakes were fed with the usual diet and water was also made available *ad libitum*.

Collection and identification of ticks

The ticks were carefully hand plucked from the rat snakes and collected in small sterile containers. The

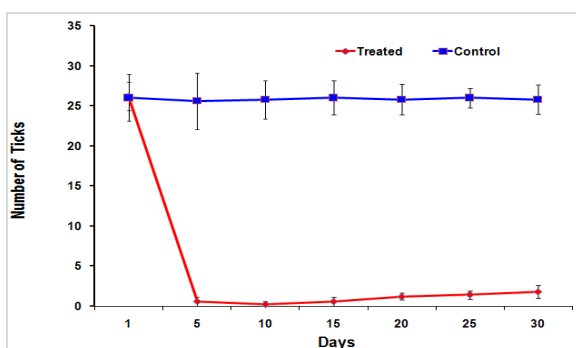


Fig. 1: Graph showing mean value of ticks on snakes kept at treatment and control

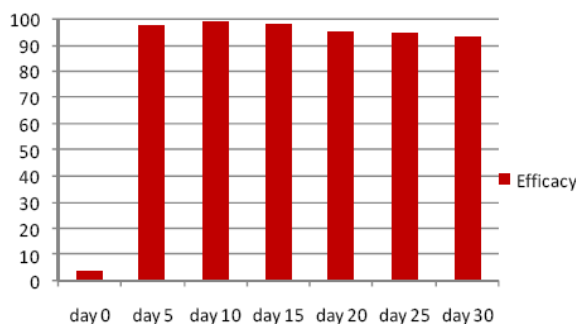


Fig. 2: Efficacy of herbal mixture during the period of study over the ticks in the rat snakes

collected ticks were carefully transported to the laboratory and were subjected to boiling with 10% sodium hydroxide solution. The alkali treated material was later thoroughly washed in water, dehydrated in ascending grades of alcohol and then cleared in phenol.

Tick counting procedure

The ticks present on the snakes were carefully counted by detailed visual examination of the snakes everyday throughout the study period of 30 days ie from Day 0 to Day 30.

Collection and preparation of the herbal mixture

Acorus calamus, *Aloe vera* and *Allium sativum* were obtained from local grocery shop, cleaned, washed and were subsequently dried using hot air oven and powdered separately. The powders were mixed in the ratio of 2:1:1 respectively. Using this herbal powder mixture 0.15% solution was prepared by dissolving it in distilled water and was stored in amber colored sterile bottle.

Application of the herbal mixture

On Day 0 snakes in Group 1 were treated with 0.15 % herbal mixture of *Acorus calamus*, *Aloe vera* and *Allium sativum* in the ratio of 2:1:1. With the help of the animal keeper, the infested snakes were carefully restrained using a snake hook and were immersed into the bucket containing 0.15% herbal mixture solution for 30 seconds. Adequate care was taken to avoid immersion of the head of the snake. Thereafter the herbal mixture was applied over the head of the snake separately using soaked absorbent cotton. In addition, the solution was also applied on the floor and side walls of the room. Subsequently, the snakes were released back into the enclosure and were continuously monitored every day. The same procedure was repeated on the 4th day of the treatment.

Data analysis

The efficacy was calculated by comparison of the mean tick count of the treated snakes with that of the untreated snakes. Efficacy was calculated using the Abbott formula (Abbott, 1925).

Efficacy = $100 \times (a - b) / a$, where a is the mean number of ticks on control rat snakes and b the mean number of ticks on treated rat snakes.

RESULTS AND DISCUSSION

Ticks identified

The ticks were identified as *Aponomma* sp. (Plate 1 and 2) based on vital parasitological keys like presence of ornamental plates, festoons and absence of eyes. In this study, the ticks were found only on the dorsal aspect of the snakes, which was in accordance with the findings of Pandit *et.al.* (2011). It is also in accordance to the findings of Fowler (1986), who stated that the most important hard-bodied genera of ticks infecting reptiles included *Amblyomma*, *Aponomma* and *Hyalomma* and the most significant soft bodied tick infesting the reptiles was *Ornithodoros*.

Tolerance

Adverse effects or local reactions to the 0.15% herbal mixture were not observed in the rat snakes. This is similar to the findings of Burrige *et.al.* (2004), who in his study on control of ticks in komodo dragon using permethrin, found no adverse side effects of the acaricide treatment.

Activity against ticks

Snakes under Group 1 and Group 2, kept in the enclosures (Plate 3) were observed everyday throughout

Table 1: Number of ticks on snakes from Day 0 to Day 30

Period of observation	Treatment					Total No. of ticks	Control					Total No. of ticks
	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	
Day 0	25	24	28	28	26	129	25	23	30	28	24	130
Day 5	1	1	0	0	1	3	26	20	29	28	25	128
Day 10	0	0	0	0	1	1	28	22	27	25	27	129
Day 15	1	0	0	1	1	3	28	23	26	25	28	130
Day 20	1	1	1	2	1	6	26	23	25	27	28	129
Day 25	2	1	1	2	1	7	25	26	28	25	26	130
Day 30	1	2	1	3	2	9	24	26	28	24	27	129

S-Snake



Plate 1: *Aponomma gervaisi* tick



Plate 5: *Acorus calamus*

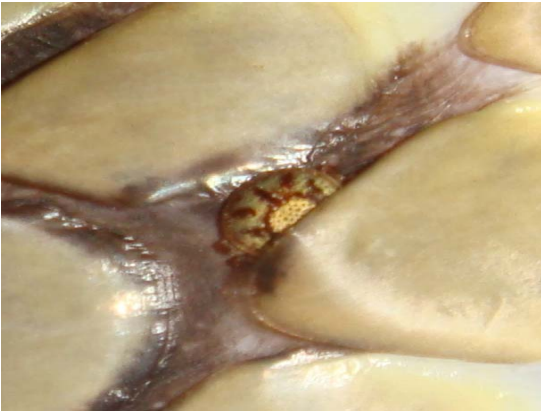


Plate 2: Ticks embedded between the scales of the snake skin



Plate 6: *Aloe vera*



Plate 3: Snake enclosure at Chennai; Snake Park Trust, Guindy



Plate 7: *Allium sativum*



Plate 4: Counting of ticks on the snakes

the study period of 30 days. Number of ticks on snakes observed throughout the period of study was given in Table 1. The efficacy of the treatment was assessed by comparing the mean tick count of treated snakes with that of untreated snakes (Plate 4). The mean value of ticks on snakes kept as treatment and control were given in Figure 1. The study showed that application of 0.15% of herbal mixture containing *Acorus calamus* (Plate 5), *Aloe vera* (Plate 6) and *Allium sativum* (Plate 7) in the ratio of 2:1:1 on the rat snakes was found to be very effective and it controlled the ticks present on the snakes with the efficacy of > 90% (Figure 2). The efficacy of the herbal mixture is in accordance to the findings of Gosh *et.al.* (2011), Massariol *et.al.* (2009), Fajimi and Taiwo (2004) and Deshmukh *et.al.* (1982), who found the extracts of *Acorus*

calamus, *Allium sativum* and *Aloe vera* to be effective against ectoparasites.

Conclusion

This study showed that the application of 0.15% herbal mixture containing *Acorus calamus*, *Aloe vera* and *Allium sativum* in the ratio of 2:1:1 to rat snakes was very well tolerated. It controlled the parasites present on the reptiles at the time of application with an efficacy of >90%.

However in-order to prevent recurrent infestation it was suggested that the substrate in the snake cage has to be changed. Usage of blow gun was also recommended to kill stages of ticks in the crevices noticed commonly in the interior of snake cages. The cost of treatment for this procedure is very cheap when compared with that of conventional medicine. Also no side effects were observed.

From this study, the presence of acaricidal properties in the native herbs (*Acorus calamus*, *Aloe vera* and *Allium sativum*) has been confirmed.

Acknowledgement

The Authors would like to thank The Dean, Madras Veterinary College, Chennai, The Dean, Faculty of Basic Sciences, Madras Veterinary College, Chennai for providing all the facilities needed for the study. The Authors would also like to thank the Director of Guindy Snake Park Trust, Chennai for the help offered by him in conducting this study

REFERENCES

- Abbott WS, 1925. A method of computing the effectiveness of an insecticide. J Econ Entomol, 18: 265-267.
- Burridge MJ, LA Simmons and T Condie, 2004. Control of an exotic tick (*Aponomma komodoense*) infestation in a komodo dragon (*Varanus komodoensis*) exhibit at a zoo in Florida. J Zoo and Wildlife Med, 35: 248-249.
- Chitmanat C, K Tongdonmuan and W Nunsong, 2005. The use of crude extracts from traditional medicinal plants to eliminate *Trichodina* sp, in tilapia (*Oreochromis niloticus*) fingerlings. Songklanakarin J Sci Technol, 27: 359-364.
- Deshmukh PB, SR Chavan and DM Renapurkjar, 1982. A study of insecticidal activity of twenty indigenous plants. Pesticides, 16: 7-10.
- Dwivedi SK and MC Sharma, 1986. Studies on a herbal preparation against scabies in indigenous pigs. Indian J Vet Med, 6: 51-53.
- Fajimi AK and AA Taiwo, 2004. Herbal remedies in animal parasitic diseases in Nigeria: a review. Afric J Biotechnol, 4: 303-307.
- Franc M and MC Cadiergues, 1999. Activity of a deltamethrin shampoo against *Ctenocephalides felis* and *Rhipicephalus sanguineus* in dogs. Vet Parasitol, 81: 341-346.
- Fowler E and RE Miller, 2003. Zoo and Wild Animal Medicine Current Therapy. B Saunders company.
- Ghosh S, AK Sharma, S Kumar, SS Tiwari, S Rastogi, S Srivastava, M Singh, R Kumar, S Paul, DD Ray and AKS Rawat, 2010. In vitro and in vivo efficacy of *Acorus calamus* extract against *Rhipicephalus (Boophilus) microplus*. Parasitol Res, 108: 361-370.
- Pandit P, R Bandivdekar, G Geevarghese, S Pande and O Mandke, 2011. Tick infestation on wild snakes in northern part of Western Ghats of India. J Med Entomol, 48: 504-507.
- Wallach JD and WJ Boever, 1983. Diseases of Exotic Animals-Medical and surgical management. WB Saunders Company.