Impact of seasons and different microhabitat on *Thelandros* infections in the house lizard (*Hemidactylus flaviviridis*) of Jodhpur district, Rajasthan

Harshvardhan Singh[1] and Pankaj Nama[2]
[1]Department of Zoology, Faculty of Science, Jai Narain Vyas University, Jodhpur, India.
[2]Department of Zoology, Faculty of Science, Jai Narain Vyas University, Jodhpur, India.

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ABSTRACT *The influence of seasons and different microhabitat on the infectivity of the nematode, Thelandros in Hemidactylus flaviviridis was evaluated for one annual cycle in Jodhpur district, Rajasthan. Seasonal study consequences the incidence of Thelandros was higher in the rainy season (60.29%) whereas lowest during winter (20%). Microhabitat wise study shows that hosts trapped from university residential areas and urban areas have the high infection rate of 54.71% and 48.78% respectively. Whereas hosts trapped from village houses and farmhouses have the least infectivity of 39.47% and 38.46% for the same. The study hence indicated that the seasons and different habitats act as the most influencing extrinsic factors for Thelandros infections in H. flaviviridis in the Jodhpur district, Rajasthan.*

Keywords: *Thelandros, Microhabitats, Seasonal variations, Hemidactylus flaviviridis.*

Introduction

Various types of reptiles are found in hot atmospheres everywhere throughout the world. House lizards (*H. flaviviridis*) are generally found in human houses and are intently connected with them. Wall lizards are typically nocturnal, great quick climbers and near the human residence, where they mostly feed on insects. Domrow *et al.* (1980) reported that house lizards, as other vertebrates, are suspectible to parasitic infections in their living space. Rataj *et al.* (2011) have shown that contamination with different parasites assumes a key part in reptiles and numerous components add to the development and spread of parasites. Mihalca *et al.* (2007) showed that reptiles have an extensive variety of endoparasites. Ameh *et al.* (1991) reported that parasites of house lizards represent a hazard to human and other residential animals. Sharma and Pathak (1976) reported that the wall lizards play a fundamental role of a reservoir for *Salmonella*. In this manner, immediate and indirect contact with local house lizards is clearly a hazard to human wellbeing.
The parasitic fauna of Indian reptiles has been considered by a few workers. Saxena and Nama (1978) detailed numerous reptile nematodes from Rajasthan. Manohar and Rajeshwara (1996) reported that poikilothermic hosts are effectively affected by climatic components. Sinha (2005) and Chandra *et al.* (2006) considered the impacts of the seasons on helminthic contaminations in reptiles. Bhaskar and Gupta (2008) reported that the levels of parasitic infections in the hosts do not depends just on characteristic factors yet additionally on ecological variables. Recently, Gambhir *et al.* (2013) demonstrated the seasonal dynamics of the *Thelandros maplestonei* in the house lizards in relation to temperature and rainfall.
Various examinations have been directed to discover environmental impacts on helminth contaminations, however, almost no data is accessible on the impact of various microhabitats and seasons on *Thelandros* infection in wall lizards. The present examination deals with seasonal variation, incidence and distribution of the *Thelandros* infectivity in wall lizards in relation to different microhabitats in the locale of Jodhpur district.

Materials and methods

For the present examination, *H. flaviviridis* were captured with hand nets arbitrarily from the distinctive microhabitats of Jodhpur region amid March 2016 to February 2017. The captured hosts were brought to the research laboratory for parasitological examination. The house lizards were euthanized with chloroform-drenched cotton and the gastrointestinal tract prodded carefully for the recovery of nematodes. Obtained nematodes were washed in normal saline, at that point fixed in glycerine-alcohol. For additionally handling and slides prepared by the methods of Gibson (1984). Nematodes were identified under the compound microscope. Just sexually develop nematodes were checked in the present examination.

Results and discussion

During the study, it was observed that *H. flaviviridis* is suspectible to the endoparasite infestation in all seasons with different infectivity levels. Out of 158 individuals, a total of 248 *Thelandros* were recovered from 74 house lizards with the incidence of 46.83% as shown in Table 1.

The seasonal incidence study showed that *Thelandros* parasitize host during the study year, however, variations do occur in different seasons. The incidence of *Thelandros* infection was extensively high during the rainy season (60.29%) and lowest during the winter (20%) showed in Table 1. In another hand microhabitat wise study reveals that hosts caught form University residential areas have the highest infection of 54.71%, while hosts trapped at farmhouses have the lowest infectivity of 38.46% (Table 2).

Temperature influences a wide variety of expansion and development processes of parasites (Esch *et al.*, 1977). Sinha (2005) reported that the intensity of nematode to be relatively higher during pre-monsoon. Fontes *et al.* (2003) also reported that lizards get more infections during the wet season. Gambhir *et al.* (2013) opined that temperature and rainfall plays a vital role for nematode infections in house lizard and recorded the highest prevalence in monsoon. High infection in the monsoon may be due to more feeding accessibility for the host. The lower incidence of infection in winter may be due to fewer chances of fresh infection and hibernation of the host (Rajeshwari, 2005). Therefore, the present study has an agreement with Gambhir *et al.* (2013) in relation to the seasonal influence of nematodes. Chandra *et al.* (2006) showed the helminth fauna of amphibian and reptiles, concluded that *H. flaviviridis* had 92.59% total prevalence of *Thelandros.* Since the present outcomes are in consensus with workers mentioned above, still the dissimilarity in seasonal variation can be ascribed to the lacking accessibility of intermediate host and ecological conditions of territory. The present study in relation to microhabitat, demonstrates that different habitat for host has a significant impact on nematode infections and distribution. *Thelandros* infection was recorded highest in intense human population areas like university residential areas (54.71%) and urban residential areas (48.78%). In low-density population areas, hosts were less infected with *Thelandros* like village houses (39.47%) and farmhouses (38.46%). On the basis of data observed, it was concluded that hosts found in dense human populating areas are subjected to high infection of nematodes as compared to low population density areas. This may be due to feeding habitat, food availability and higher population of the host in urban areas thus they can easily infect each other and can transmit nematodes effortlessly. Apart from nematodes as was found in the present study, house lizards are also associated with *Salmonella* (Sharma and Pathak, 1976). Therefore house lizards in human habitations have been found to be harmful to humans.

Table 1. Season-wise incidence % and total worm burden.

seasons	host examined	host infected	% infection	total worm	mean worm burden
summer	45	21	46.6666667	71	3.380952381
rainy	68	41	60.2941176	143	3.487804878
autumn	25	8	32	23	2.875
winter	20	4	20	11	2.75
Total	158	74	46.835443	248	3.351351351

Table 2. Structure wise incidence % and worm burden

microhabitat	host examined	host infected	% infection	total worm burden	mean worm burden
university residential	53	29	54.71698113	104	3.586206897
urban residential	41	20	48.7804878	62	3.1
village houses	38	15	39.47368421	48	3.2
Farmhouses	26	10	38.46153846	34	3.4

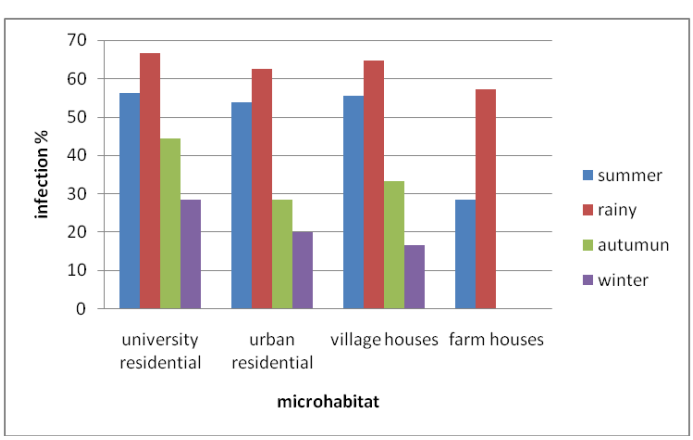

Figure 1. Microhabitat wise infection % in different seasons

Conclusion

The present investigation demonstrates that house lizards are usually tainted with *Thelandros* in all seasons consistently. This study reveals that seasons, distinctive living space, a high incident of host and dense human population significantly affect the infectivity of the host. The house lizards being found in human residence expressed that man can be tainted through unhygienic food and water which can be infected by faeces, salivation or incidentally ingesting the egg. In this manner, this calls for health awareness against house lizards in human residence.

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References

1. Ameh IG, Ajayi JA, Onwuliri COE and Audu-Ten W (1991) Some pasrasites of the house gecko A health risk to man and domestic animals; proceedings of the 7th annual conference biotechnology society Nigeria, pp: 8-11.
2. Bhaskar M and Gupta N (2008) Seasonal occurrence of helminths in the wall lizard Hemidactylus flaviviridis (Abstract) In: National. Zoology Congress, 19th All India Congress of Zoology, Gauhati University 2008 (29-31 Dec), 189.
3. Chandra P, Gupta N and Bhaskar M (2006) The incidence of helminth parasites in amphibian and reptilian population from Rohilkhand region. India J Curr Sci, 9(1): 185-190.
4. Domrow R, Health AC and Kennedy C (1980) Two new species of Ophionyssus (Acari: Dermanyssidae) from Newzealand lizards. Newzealand Journal of Zoology, 7: 291-297.
5. Esch GW, Hazen TC and Aho JM (1977) Parasitism and r- and k selection. In: Esch GW (ed) Regulation of parasite populations. Academic Press INC, New York, pp: 9-62.
6. Fontes AF, Vincente JJ, Kiefer MC and Sluys MV (2003) Parasitism by helminths in Europhosaurusnanuzae (Lacertilia: Tropiduridae) in an area of rocky outcrops in Minas Gerais State, Southeastern Brazil. J Herpetol 37(4): 736-741.
7. Gambhir RK, Oniam S and Laxmipyari W (2012) Seasonal dynamics of Thelandros maplestonei infections in the wall lizard, Hemidactylus flaviviridis in Imphal velley, Manipur, India. J Parasit Dis, 37(2): 192-195.
8. Gibson DI (1984) Technology as applied to museum collection: the collection, fixation and conservation of helminthes. Syst. Parasitol. 6: 241-255.
9. Manohar RS and Rajeshwara RV (1996) Influence of temperature and rainfall on the helminth infection and relative density of helminth parasites in Congress talabonoides (Bleeker). Uttar Pradesh J Zoology, 16(1):46–48.
10. Mihalca AD, Gherman C, Ghira I and Cozma V (2007) Helminth parasites of reptiles. Reptilia in Romania. Parasitology Research. 101: 491-492.
11. Rajeshwari AL (2005) Influence of annual seasons on nematode population in two earthworm hosts. Uttar Pradesh J Zoology, 25(2): 205-207.
12. Rataj AV, Lindtner-Knific R, Vlahovic K, Mavri U and Dovc A (2011) Parasites in pet reptiles. Acta Veterinary Scandinavia, 53: 33.
13. Saxena A and Nama HS (1978) Some reptilian nematodes from Rajasthan. Geobios, 5(1): 25-26.
14. Sharma SK and Pathak RC (1976) Note on wall-lizard (Hemidactylus flaviviridis) as a source of Salmonella infection (Veterinary Aspect). Pantnagar J Res, 1: 152-153.
15. Sinha P (2005) Effect of seasonal variations on incidence and intensity of helminth infection of Calotes versicolor in and around Patna. Proc Zoolog Soc India, 4(2): 83-88.