



Original Article

Prevalence of Parasites in House Gecko (*Hemidactylus frenatus*) in Al-Hilla City, Babylon Province

Ahmed Mohammed Abbas*, Israa Nadhim Habeeb

College of Dentistry, University of Babylon, Microbiology Department, Hilla, Iraq

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ABSTRACT

The house gecko (*Hemidactylus frenatus*) is one of the unique lizards, which is characterized by being nocturnal activity and has great ability to climb. It is widely found in human homes and feeds on insects, spiders and worms. Like the rest of the vertebrate animals, it is exposed to many pathogens, including parasites. The aim of the study is to identify the prevalence of parasites in house gecko (*Hemidactylus Frenatus*) in Al-hilla city, Babylon province. A total of 200 geckos were seized from the walls of several houses in separate neighborhoods of Babel governorate, Iraq, using the sticky paper method, after which they were kept in plastic boxes until they were transferred to the laboratory to perform the necessary tests to detect external and internal parasites. The results of the current study showed that 45% (90) of geckos were infected with external parasites. The injury included three undiagnosed species that belonged to genera *Ixodes*, *Angasid* and *Trombicula*, with rates of infection of 27.5%, 13.5% and 4%, respectively. The incidence of external parasites in males (50 %) was greater than that of females (38.8%). The incidence of internal parasites was 52.5% (105) in gecko. The internal parasites included parasites of nematodes and tapeworms and are as follows with infection rates: *Parapharyngodon malplestomi* (17.5%), *Hedyris hanleyae* (18.5%), and *Onchonistica javaensis* (16.5%). As is the case with external parasites, the infection rates for internal parasites in male geckos (54.5 %) are greater than those of females (50.0 %). Through the present study it appeared that gecko is one of the most important vital pathways in transporting parasites from gecko to humans, which may appear too many people as a friendly and harmless animal, but we have proven otherwise.

GRAPHICAL ABSTRACT



* Corresponding author: Ahmed Mohammed Abbas

✉ E-mail: Email: sabahmijbil22@gmail.com

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Introduction

Gecko is one of the lizards that belongs to the sub-order Gekkota, and prevails in warm environments all over the world [1]. It ranges from 1.6 cm to 60 cm in length, and it is unlike other lizards, because it is nocturnal and has huge potential for attachment. Geckos appear in multiple colors and shapes, and are one of the most common lizards in nature [2]. Rogner [3] explained that this genus includes approximately 20 species spread in Africa, the Middle East, and the Canary Islands, but it has few species in Europe and Equatorial America.

Geckos are distinguished among other lizards by producing distinctive sounds, which are social behaviors that work to interact among members of Gecko itself. Southeast Asia and the northern parts of Africa are the original habitats of Gecko, and then it has been introduced and spread in other countries [4].

Hemidactylus frenatus is an adaptive animal that can hide and getting out of narrow and small spaces to pounce on its prey, which are insects and spiders, and it coexists with people in his home on the ceilings, walls and shelves of the house, and enjoys active movement at night [5]. Like all vertebrates, Geckos are affected by several pathogens, including parasites. The parasites have severe damage to animal and human health alike as their effect may be directly or indirectly by causing hematological, histological, and biochemical changes in the host body [6-9]. Geckos are infested by ticks, mites and helminthes. Direct and indirect contacts with geckos obviously represent an extensive risk to human health, also, some types of ticks that affect gecko transmit certain pathogens to humans, so

house gecko is a risk factor that threatens a human and is one of the important factors in transmitting animal diseases [10]. So, the importance of the current study came to identify the parasites that infect this unique creature in the study area.

Materials and methods

Collection of samples

This current study was carried out in Al-Hilla city, Babylon province from November 2018 till February 2019. A total of 200 wall geckos (110 Males and 90 Females). The geckos were caught using the sticky paper available in the local market by gluing them on the walls of several houses in separate areas in Babylon province, and after reporting them by the homeowners they were transferred to the advance parasitology lab. in college of science for women/Babylon University for parasitological examination. Initially, a magnifying glass was used to examine the external parasites on the skin, after that the presence of parasites was confirmed using the dissection microscope, and for internal parasites geckos were anesthetized by using cotton immersed in ether and placed in a closed container after which it was dissected using a sharp blade and scissors and extracting all the internal contents in a plastic dish and samples from these internal viscera were placed on slides with little normal saline for the purpose of examination with a compound microscope. The observed parasites were isolated and stored in separate villas depending on the parasite's shape for the purpose of future diagnosis and species sorting.



Figure 1: Revealed the geckos before dissection and after dissection

Identification of parasites

External and internal parasite samples were diagnosed by specialists in the Museum of Natural History/ University of Baghdad after transferring of these samples by bottles added 10% formalin for each sample. The diagnosis of external parasites was relied on Kemp and Margret [11], while diagnosis of internal parasitic species was based on Cruz and Mills [12].

Statistical analysis

The data acquired in the study were analyzed by the use of Chi-square test on the excel program.

Results and Discussion

Tables (1 and 2) show the external parasite infestation on wall gecko greater than *Ixodes* spp. (27.5%), followed by means of *Argasid* spp. (13.5%). The hard tick load was significantly exceptional (*Trombicula* spp. (4%) compared with other external parasites ($P \leq 0.05$).

Table 1: The species of external parasite detected in the sampled wall geckos (*Hemidactylus frenatus*)

Parasite name	Infected No.	(%)
<i>Trombicula</i> spp.	8	4.0
<i>Ixodes</i> spp.	55	27.5
<i>Argasid</i> spp.	27	13.5
Total	90	45.0

Examined No. = 200

Table 2: The external parasite in the sampled wall geckos *Hemidactylus frenatus* and relationship with gender

Gender	Examined No.	Infected No.	(%)
Males	110	55	50
Females	90	35	38.8
Total	200	90	45.0

Tables (3 and 4) reveal the internal parasite infestation on wall gecko greater than *Hedruris hanleyae* (18.5%), followed by means of *Parapharyngodon malplestoni* (17.5%), and

Oochoristica javaensis as the lowest (16.5%). But no significant differences were observed ($P \geq 0.05$) when comparing these three species.

Table 3: The species of internal parasite that detected from *Hemidactylus frenatus*

Parasite name	Infected No.	(%)
<i>Parapharyngodon malplestoni</i>	35	17.5
<i>Hedruris hanleyae</i>	37	18.5
<i>Oochoristica javaensis</i>	33	16.5
Total	105	52.5

Examined No. = 200

Table 4: The internal parasite detected from *Hemidactylus frenatus* and relationship with gender

Gender	Examined No.	Infected No.	(%)
Males	110	60	54.5
Females	90	45	50.0
Total	200	105	52.5

Table 5 shows the overall parasite in *Hemidactylus frenatus* by 97.5%,

While the external parasite and internal parasite load showed 46.1% and 53.8 %, respectively.

Table 5: Evaluation of parasite and its rate of infection in *Hemidactylus frenatus* and relationship with gender

Geckos	External parasite	Internal parasite	Total	(%)
Male	55	60	115	59.0
Female	35	45	80	41.0
Total	90	105	195	100
	(46.1 %)	(53.8%)	(97.5%)	

H. frenatus are prone to both external and internal parasite infection. This was found in this study. The parasite load was once extra amongst adult males (59.0%) and females (41.0%), which supports past research [13,14]. On the other hand, it suggests that person geckos occupy more favorable areas in the place they come in contact with the parasites and their vectors. The juvenile geckos perhaps were limited to suboptimal areas via older ones to keep away from competition for preys. In the external parasite infestation, ticks, showing difficult (27.5%) and tender (13.5%) were more ordinary than mites (4.0%) in the infested *H. frenatus*. This, however, is in line with the findings by Ameh [15]. This might be that geckos have favorable pores and skin cover for their attachment and feeding method as voracious blood feeders. Tables (3 and 4) reveal the internal parasite infestation on wall gecko greater from *Hedruris hanleyae* (18.5%), followed *Parapharyngodon malplestoni* (17.5%) and *Oochoristica javaensis* as the lowest (16.5%). But there were no significant differences ($P \geq 0.05$) when comparing these three species. The internal parasite infection was found in nematodes and cestodes, which is in line with those of Ameh *et al.* [16] and Obi *et al.* [17]. This may be based totally on the feeding habits of the geckos concerning insect vectors of these parasites. Apart from external parasites and internal parasites (helminths), as found in the study, geckos are linked with Salmonella [18]. The geckos being found in human habitation suggests that man can be infected via contaminated meals and water by feces and saliva of the reptile or via eating the egg of these animals [19,20].

Conclusion

The current study indicates that gecko is infected with many external and internal parasites, which can pose a risk to human life. Although gecko is useful in catching insects in human homes, it may be a source of danger to human. Therefore, awareness should be raised to combat Gecko at homes. In addition, further studies should be conducted to identify the relationship between human and gecko to develop appropriate solutions to control it.

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Authors' contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

Conflict of Interest

The authors declare that they have no competing interests.

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