

A prevalence Study of ectoparasites on the long-eared hedgehog (*Hemiechinus auritus*) in AL-Muthanna province-Iraq

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Abstract

This study was carried out in AL-Muthanna province during the period from November 2014 to May 2015. A (41) animals of long eared hedgehog *Hemiechinus auritus* (27 male, 14 female) were collected from different area of Al-Muthanna Province (Rural and Urban regions). A total number of 41 hedgehogs, 19 were infested with ticks (46.34%). All ticks were belonged to *Rhipicephalus turanicus* species, also the fleas of the species *Archaeopsylla. erinacei* were found on 12 hedgehog of 41 (29.26%) examined hedgehog. Also the results showed, that the rates of infestation with *R. turanicus* and *A. erinacei* were difference significant ($P < 0.05$) between the sexes (male and female) of hedgehogs that the rate of infestation with ticks was 12(44.44%) for male and 7(50%) for female, while the fleas was 8(29.62%) for male and 4(28.57%) for female. Highest occurrence of infestation in both tick and flea was in April 62.5%. Prevalence of ectoparasite in March, April and May was 50% and 59.1%. While there are no infection in November, December, January and February. The significant variations were no observed among months in both ectoparasite species ($P > 0.05$).

Keyword: Ectoparasites, long-eared hedgehog, *Hemiechinus auritus*, Iraq.

Introduction:

The long - eared hedgehog (*Hemiechinus auritus*) belong into phylum: Chordata and Class: Mammalia also into order: Eulipotyphla and Family: Eerinaceidae (1). The long-eared hedgehog (*Hemiechinus auritus*) is a species of hedgehog native to Central Asian countries and some countries of the Middle East. The family Erinaceidae ser genera and fifteen species distributed in Africa and Asia including certain parts of Indo-Malaysia (2). Harrison and Bates (3) indicated that there are two Sub species of *Hemiechinus auritus*, *H. acalligoni* and *H. aaegyptis* recognized in Arabia. The long-eared hedgehog lives in burrows that it either makes or finds and is distinguished by its long ears. It is considered one of the smallest Middle Eastern hedgehogs (4). The long-eared hedgehogs inhabit a few different types of dry steppes, semi-deserts and deserts. It prefers dry river valleys, gullies, forest shelterbelts, abandoned irrigation ditches and shrubby areas, and often settle in oases and around human settlements (sometimes in cultivated habitats) (5). They live in burrows that they dig under bushed with a length of

45 cm long with only one opening. They may also inhabit abandoned burrows of other small mammals. They are nocturnal solitary hedgehogs. During the day, they are found resting under rocks, hollows or rock piles (6). This Hedgehog is insectivorous (7). However, may also feed on small vertebrates and plants (4) in captivity they may live as long as 7.6 years. (8). Since the long-eared hedgehog is naturally parasite prone and can carry diseases as bad as plague, it is highly recommended that, if kept as pet, it should be purchased from a respected dealer. Wild hedgehogs have been found to carry *Rhipicephalus sanguineus*, the brown dog tick, which can transmit Boutonneuse fever. (9). the hedgehogs are consider as host of a wide variety of different parasites and pathogens (10). Hedgehog can carry several ticks and fleas species (11). Parasitic infections that causes severe anemia and transmission of infectious diseases, tumors, gingivitis, and bacterial and fungal diseases are factors that have jeopardized the life of this species (12,13). *Hemiechinus auritus* is widely distributed throughout the desert of

sistan-baluchistan north khorassan, Tehran, Gorgan and Khuzistan provinces (14). Long-eared hedgehog lives in countries such as Iran, Iraq, Egypt, Syria, China, and Uzbekistan. This species is mostly insectivorous but may also feed on vegetables and small plants (7,4). In Iraq, there are little authors indicated the hedgehog *Hemiechinus auritus* such as (15) in Baghdad province and (16) in Basrah province. Our study was a distribution and identify of hedgehog ectoparasites.

Materials and Methods:

This study was carried out in AL-Muthanna Province during the period from November 2014 to May 2015. Forty one animals of long eared hedgehog *Hemiechinus auritus* (27 male, 14 female) were collected from different area of Al-Muthanna Province (Rural and Urban regions) by some metal traps and direct catching during the night (Activation period) (Figure 1). In the next day the live animals were brought to the laboratory in college of science after anaesthetized by using ether or chloroform

then all animals examined by naked eye that the ectoparasites taken by thumb forceps and kept in test tubes contain 70% ethanol and some drops of glycerin for clearing it, then all necessary information were registered (animal weight, sex, location) in questionnaire paper. After that the ectoparasites are taken and examined by dissecting microscope to diagnosis it. (17).



Fig. (1): long eared hedgehog *Hemiechinus auritus* which used in the study.

Results:

A total number of 41 hedgehogs, 19 were infested with ticks (46.34%). All ticks were belonged to *R. turanicus* species, also the fleas of the species *A. erinacei* were found on 12 hedgehog of 41 (29.26%) examined hedgehog (Fig. 2, 3) (Table1).

Table (1): Prevalence of Ectoparasites species on Hedgehogs

NO	Ectoparasites species.	Total no. of Examined Animals (Hedgehogs)	Prevalence (%)
1	<i>Rhipicephalus turanicus</i>	41	19 (46.34%)
2	<i>Archaeopsylla erinacei</i>		12 (29.26%)



Fig. (2): A) Female of *R. turanicus* tick. B) Male *R. turanicus*, broad caudal appendage (Arrow)



Fig. 3: A) Female hedgehog flea; *A. erinacei*, genal and pronotal ctenidia (Arrow). B) Male *A. erinacei*,

Also the results showed, that the rates of infestation with *R. turanicus* and *A. erinacei* were difference significant ($p < 0.05$) between the sexes (male and female) of hedgehogs

that the rate of infestation with ticks was 12(44.44%) for male and and 7(50%) for female, while the fleas was 8(29.62%) for male and 4(28.57%) for female. (Table2).

Table (2):Prevalence of Ectoparasites infestation in relation to Sex of Hedgehogs

NO	Ectoparasites species	Total Infestation %	Sex of Hedgehogs	
			Male (27).	Female (14).
1	<i>Rhipicephalus turanicus</i>	19(46.34 %).	12(44.44%)*.	7(50%).
2	<i>Archaeopsylla erinacei</i>	12(29.26 %).	8(29.62%)*.	4(28.57%).

*Significant differences at level ($P < 0.05$)

Highest occurrence of infestation in both tick and flea was in April (Tab.3). Prevalence of ectoparasite in March and May was 9.75% and 17.07%. While there are no infection in

November, December, January and February. The significant variations were no observed among months in both ectoparasite species ($P > 0.05$).

Table (3): Prevalence of ectoparasites infestation in relation to Study months.

No	Months	Total No. of examined Hedgehogs	Infected No. of mixed infestation (Ticks and Fleas)	Prevalence (%).
1	November	6	0	0
2	December	13	0	0
3	January	0	0	0
4	February	3	0	0
5	March	4	2	50%
6	April	8	5	62.5%
7	may	7	4	59.1%
Total		41	11	26.8%

Non-Significant differences at level ($P > 0.05$).

Discussion:

Our results suggest that infestation rate with ticks and fleas were high in hedgehog population. All examined hedgehog were belonged to *Hemiechinus auritus* species. Tick species, which was found in the present survey, was *R. turanicus* in infestation rate 19(46.34 %) and this study is disagreement with (18) that they found infestation rate of tick *R. turanicus* was 66.66% which infested on east hedgehog (*Erinaceus concolor*) in

turkey, in iran also this study is disagreement with (19) they he found the infestation rate of *R. turanicus* was 68.08% ,while in the Ninevah district, (20) that he found the hedgehog was heavily infested with the following ixodid ticks, the vectors of serious animal and human diseases: *Boophilus annulatus*, *Rhipicephalus sanguineus*, *Haemaphysalis erinacei*, *Hyalomma detritum*. Moreover, (21) they found more

infestation ticks were *Hyalomma* sp., *Rhipicephalus leparis* and *Rhipicephalus turanicus* with high infestation (76.19%). *Archaeopsylla erinacei* is the hedgehogs fleas, it is also hosted by cats and dogs other than hedgehogs and it may be transferred from hedgehogs through direct contact, adult animal fleas may attack and bite humans, human cases with fleabite eruption reported in some countries (22, 23). The present study found the infestation rate of *A. erinacei* was (29.26 %), Also this study is disagreement with (24) that they found prevalence of *A. erinacei* in hedgehogs was detected 55.90 % in Iran, neighboring country of Iraq this may be due to that the examined animals is more than our study .And also this study is disagreement with (22) that found the most species that infestation on the hedgehog was *A. erinacei* ,also this study is agreement with (25,17) that they recorded infestation rate of fleas (*A. erinacei*) with rate 8.3%,24% in united kingdom and India respectively also this differences in infestation rate into captured animals is less that this animals are nocturnal feeding and difficulty for capturing. In table (2), the present study

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found significant differences at level ($P<0.05$) between male and female infestation rate of ticks and fleas 12(44.44%), 7 (50%) and 8(29.62%), 4(28.57%) respectively and this study is disagreement with (24) that they found no significant differences between male and female in infestation. The present study also showed that the higher infestation rate of tick and flea in April and May was 62.5% ,59.1% respectively , this is agreement with (24) and (19) that found the higher the higher infestation rate of tick and flea was in April – June(spring –summer) this may be due to providing of favorable condition for ectoparasites reproduction.

Conclusion:

The results of the present study revealed that the infestation rate of ectoparasites in hedgehog population was high and due to zoonotic importance of the transmission of some important pathogens, more studies are needed to find out hedgehog ectoparasites in other parts of Iraq.

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