

## A Description of Some Ectoparasites of the Wall Gecko

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**Abstract:** Of seventy sacrificed wall geckos examined for ectoparasites, 18 (25.7%) were infested with soft ticks, 28 (40.0%) with hard ticks and 44 (62.9%) with mites, in mixed infestations of the affected reptiles. On the whole 49 (70.0%) of the geckos were infested with these acarines and except for their smaller size, parasites seen were morphologically indistinguishable from species of genera *Argas*, *Aponoma*, *Margaropus* and *Trombicula*, respectively. The ectoparasites were indeed all minute organisms measuring from 0.4x0.25 mm to 0.60x0.45 mm on the average. They were bloated in appearance, probably because they were apparently engorged, in host blood and fluid. The acarines seen were generally similar in appearance to the ectoparasites of higher vertebrates but differ in their small size, orange-red appearance and membranous tegument. The habitat of these parasites, in relation to their host abode however, pose a possible risk of zoonosis, if organisms are able to infest man and domestic animals. Feeding of parasites on the blood of gecko also points back to the evolutionary origin of the development of blood feeding habit by ectoparasitic acarine.

**Key words:** Ectoparasites, wall gecko, zoonosis

### INTRODUCTION

Wall geckos are a group of small lizards which have become established in the vicinity of man in the tropics<sup>[1]</sup>. In Nigeria these reptiles inhabit dark abode of the home, where they are seen, often crawling across walls and ceilings and other surfaces of building. They move with remarkable agility, usually in search or pursuit of insect preys. Like all vertebrates, these reptiles are also susceptible to parasitism in their niche<sup>[2,3]</sup>. In this study some ectoparasites recovered from the body of some wall geckos are described. A study of the ectoparasites of the wall gecko is desirable because of the co-habitation of these lizards with man and livestock in the domestic environment. This is important because some parasites of the lizards have the potential to infest mammals<sup>[4]</sup>. The significance of a possible zoonotic involvement of parasites seen in this study is also indicated.

### MATERIALS AND METHODS

Specimen of gecko studied were collected from Jos, Plateau State, which is located between 10° 30'-09° 00" North and 09°30'-08°30" East, about Central Nigeria. Animals were caught with the aid of a sweep-net or a locally made straw-basket trap. Captured animals were put in separate clean covered collecting-trays in which some cotton wool sprinkled with chloroform had been placed. Sacrificed animals were transferred to small glass trays and each lizard was examined systematically under the dissecting microscope. Ectoparasites seen were carefully

extracted using tweezers, scalpel or fine combs. The location of parasites on the body of host animal was noted and recorded. An extracted parasite was transferred into a drop of paraffin lubricating oil on a microslide and examined under the compound microscope<sup>[5]</sup>. For the purpose of identification, ectoparasites were preserved in caustic potash, dehydrated in graded series of alcohol and mounted for closer observation of detail structures<sup>[6]</sup>.

### RESULTS

Ectoparasites recovered from the wall gecko were all acarines, including ticks and mites. Host lizards were parasitized in a mixed infestation. Parasites seen were generally microscopic or just visible with the naked eye as tiny specks. They possessed membranous tegument and distinct capitulum with no obvious divisions between the cephalothorax and the abdominal region. 381 (73.3%) of the parasites recovered (n = 520), occurred on the back part of 49 (70.0%), out of the 70 host animals examined (Table 1). Parasites also occurred (n = 520) on the head (25 or 4.8%), neck (33 or 6.65%), limbs (46 or 8.85%) and eye-shield (31 or 5.96%) of infested animals (Table 1). In all cases they were found with capitulum partially buried just beneath the scales and were all engorged, obviously with host blood and fluid. This is because host blood cells, as seen under the microscope, were identical with blood cells squeezed from abdomen of ectoparasites extracted from the body of the host animals. Acarines isolated from host gecko were identified<sup>[4,7,8]</sup> as follows:

(i) Trombiculid ectoparasites which infested 45 or 76.3% (n = 70) of parasitized host lizards were the only type of mites found on the animals examined (Table 2). Engorged adult and larval mites measured on the average 0.4-0.25 mm and 0.3-0.24 mm on the average (Fig. 1 and 2). They were pale orange-red, almost transparent and velvet-skinned minute acarines with hair-like protuberances covering most of the body. The parasites were identified as species of the genera *Trombicula* because they had blade-like chelicerae and the coxae of the four-pairs of legs in the adult were incorporated into the ventral surface.

Table 1: Percentage anatomical distribution of acarine on gecko body

Gecko anatomical site	No. of ticks (%)	No. of mites (%)	Total acarine distribution (%)
Head	19(3.7)	6(1.2)	25(4.8)
Eye-shield	20(5.5)	11(2.1)	31(6.0)
Neck	23(4.4)	10(1.9)	33(6.4)
Back	261(50.2)	120(23.1)	381(73.3)
Limb	31(6.0)	15(2.9)	46(8.9)
Abdomen	0	0	0
Tail	3(0.6)	1(0.2)	4(0.8)
Total	357(68.7)	163(31.3)	520

Figures in brackets are percentages

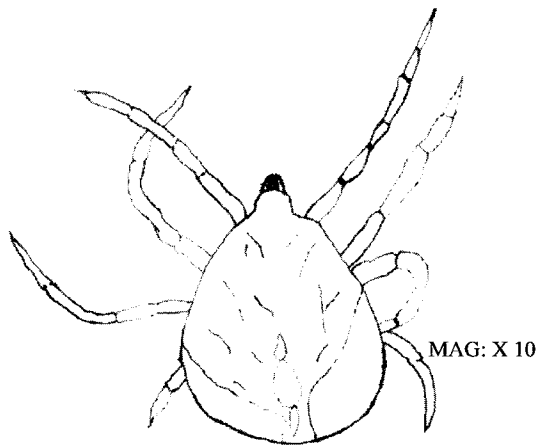


Fig. 1: *Trombicula* spp. (adult)

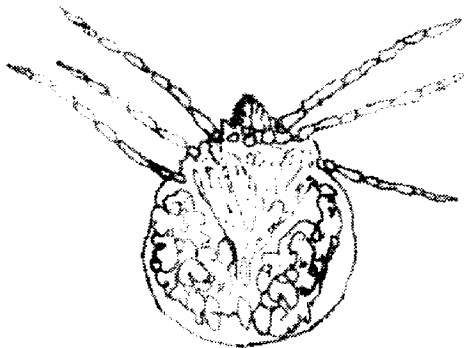


Fig. 2: *Trombicula* spp. (larva)

(ii) Argasid (soft) ticks which were the other ectoparasites seen occurred on 18 or 30.5% (n = 70) of the parasitized geckos (Table 2). At full engorgement parasites were swollen into rotund pale yellow ticks with legs which were short in proportion to the body (Fig. 3). Organisms had inferior capitulum, no scutum and structurally wider than they were long (Fig. 3 and 4). The ectoparasites measured 0.45-0.48 mm on the average and most likely belong to the genera *Argas* because they had spherical cuticular discs and fine hair-like dorso-integumental protuberances which were indistinct dorsally but regularly spaced at the lateral margin of the body (Fig. 3 and 4).

(iii) Ixodid (hard) ticks were also found to infest 28 or 47.5% (n = 70) of the geckos examined (Table 2). The parasites appeared translucent and colorless with thin, shiny dorsal shield which was convex rather than broadly rounded at the posterior margin. The capitulum was prominent, with the basis capituli well developed extending laterally, but the anal groove was indistinct and scutal festoons absent (Fig. 5). Organism measured 0.60-0.45 mm on the average and identified as species of the genera *Aponoma*. Inference was based on organism's second palpal segment which was much longer than wide (Fig. 5).

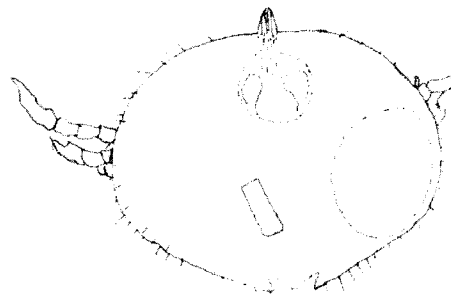


Fig. 3: *Argas* spp.

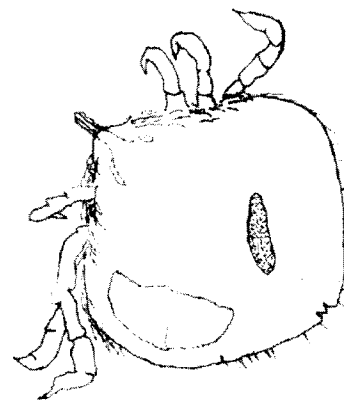


Fig. 4: *Argas* spp.

Table 2: Percentage number of gecko parasitized by acarines

Gecko	No. examined	No. parasitized by soft ticks (%)	No. parasitized by hard ticks (%)	No. parasitized by mites (%)	No. parasitized by acarines (%)
Male	33	10(30.3)	18(54.5)	26(78.8)	27(81.8)
Female	31	8(25.8)	10(32.3)	18(58.1)	21(67.7)
Juvenile	6	0	1(16.7)	0	1(16.7)
Total	70	18(25.7)	28(40.0)	44(62.9)	49(70.0)

Figures in bracket are percentages



Fig. 5: *Aponomma* spp.



Fig. 6: *Margaropus* spp.

A few of the ixodid ticks found on the geckos were probably species of *Margaropus* because the pre-anal plates of each organism continued as two prongs, one on either sides of the anal region (Fig. 6). Organism's 4th pairs of legs were notably enlarged compared with the other pairs of legs.

### DISCUSSION

Ticks and mites are distributed the world over on a wide range of vertebrate hosts<sup>[8]</sup>. It is therefore inferred from this study that the wall gecko is one of such animal ectoparasitized. Other lizards are commonly infested by an acarine fauna similar in morphology and bio-ecology to

those which attack the wall gecko<sup>[4,7]</sup>. Such similarities seen among the acarines is useful in the understanding of related ectoparasites of medical and veterinary significance<sup>[8,9]</sup>. A major difference however is that ectoparasites of the gecko in this study were generally minute in size and possessed membranous tegument, as compared with the leathery covering of the larger acarines which infest other higher vertebrates<sup>[8]</sup>. Nevertheless the gecko acarines resemble those of other vertebrates by their blood ingesting habit. Indeed previous studies had shown that ticks and mites of cold-blooded animals also infested warm-blooded vertebrates<sup>[8]</sup>, including man and livestock<sup>[4,9]</sup>. For instance *Trombicula splendens* and *T. alfreddugesi* are partial to reptiles, attacking snakes and lizards, but also parasitize birds and domestic animals<sup>[7]</sup>. It is therefore likely that acarines of the gecko as observed in this study may feed on man and livestock and by the virtue of their blood feeding habit also transmit diseases of the gecko<sup>[2,10,11]</sup> to man or domestic animals<sup>[4,7]</sup>. It had been suggested that parasites of the wall gecko are of possible zoonotic significance<sup>[12]</sup>. The co-habitation of this reptile with man and livestock in a common domestic abode may therefore easily enhance the developmental or parasitic life-cycle of the gecko ectoparasites. In another light, studies have shown that some species of *Aponoma* ticks live mainly on reptiles in the tropics and also show preference for monotreme mammals<sup>[13]</sup>. This affinity to such an archaic host may be of additional importance in the understanding of ixodid evolution of parasitism<sup>[14,15]</sup>.

### REFERENCES

1. Thistleton, G.F., 1961. Senior Rural Education Officer of Defunct Western Region-Nigeria: Nature Study for African Reptiles. Pub: Evans Brothers Ltd., London.
2. Telford, S.R., (jr.), 1979. Evolutionary implications of Leishmania amastigote in circulating blood cells of lizards. Parasitology, 79: 317-324.
3. Domrow, R., A.C. Heath and C. Kennedy, 1980. Two new species of Ophionyssus (Acari: Dermanyssidae) from New Zealand Lizards. New Zealand J. Zool., 7: 291-297
4. Hoogstral, H., 1978. Biology of Ticks. In: Tick-borne Diseases and Their Vectors. Wilde, J.K.H. (Ed.). Pub: Edinburgh University Press, pp: 3-14.

5. Kemp, A.B. and V. Margret, 1978. *Veterinary Clinical Parasitology*. 5th Edn. Pub: Iowa state university press, Ames Iowa.
6. Iwuala, M.O.E. and O. Ikedinachukwu, 1978. Studies on the ectoparasitic fauna of Nigeria livestock: Types and distribution pattern on host. *Anim. Hlth. Proc. Afric.* (Unpublished Document).
7. Wolfenbarger, K.A., 1952. System and biological studies on North American chiggers of the genus *Trombicula*: Subgenus *Eutrombicula*. *Ann. Entomol. Soc. Am.*, 45: 645- 677.
8. Fuller, H.S., 1956. *Veterinary and medical acarology*. *Ann. Rev. Entomol.*, 1: 347-366.
9. Kette, D.S., 1993. *Medical and Veterinary*. Pub: CAB International. 4th Edn., pp: 351-448.
10. Arthur, D.R., 1965. Feeding in ectoparasitic acari with special reference to ticks. *Adv. Parasitol.*, 3: 249-298.
11. Miyata, A., I. Miyagi and M. Tsukamoto, 1978. Haemoprotozoa detected from cold blooded (Gekkonidae) animals in Ryukyu islands. *Trop. Med. Nagasaki*.
12. Ameh, I.G., J.A. Ajayi, C.O.E. Onwuliri and N. Audu-Tanwia, 1991. Some parasites of the house gecko: A health risk to man and domestic animals? 7th Ann. Natl. Conf. Biotec. Soc. Nig., 8-11 (Makurdi) Sept. 1991.
13. Pollitzer, R., 1960. Epidemiological studies of plague in India. 2: The changing pattern of rodents and fleas in Calcutta and other cities. *Bull. WHO.*, 23: 293-300.
14. Ball, G.H., 1943. Parasitism and evolution. *Am. Naturalist*, 77: 745-364.
15. Price, P.W., 1977. General concepts on the evolutionary biology of parasites. *Evolution*, 31: 405- 420.