

Case Report / Olgu Sunumu

Efficiency of ivermectin solution against Hirstiellosis in green iguanas- case report

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Abstract: Interest in green iguanas (*Iguana iguana*) as pet animals is increasing day by day. Compared to other pet animals, the diagnosis and treatment methods of reptilian diseases are limited. Considering that these diseases will also concern public health, new research is required. Hirstiellosis is a zoonotic ectoparasitic disease seen in green iguanas (*Iguana iguana*). Recommended therapies are mostly empirical, some of which can be low-impact or toxic. The objective of this study is to determine the effectiveness of ivermectin solution (5 mg/l) in the treatment of hirstiellosis and to provide preliminary data for further studies. Ivermectin solution was found to be effective in the treatment of three iguanas with the aforementioned disease, and no clinical side effects were found in the control examinations made at regular intervals.

Keywords: Hirstiellosis, iguana, ivermectin.

Yeşil iguanalarda Hirstiellosis'e karşı ivermektin solüsyonunun etkinliği-olgu sunumu

Özet: Pet hayvan olarak yeşil iguanalara (*Iguana iguana*) olan ilgi gün geçtikçe artmaktadır. Diğer pet hayvanlara kıyasla reptil hastalıklarının tanı ve tedavi yöntemleri sınırlıdır. Bu hastalıkların toplum sağlığını da ilgilendireceği göz önüne alındığında yeni araştırmalar yapılması gerekmektedir. Hirstiellosis yeşil iguanalarda (*Iguana iguana*) görülen zoonotik karakterde ektoparaziter bir hastalıktır. Önerilen tedaviler çoğunlukla ampiriktir ve bazıları düşük etkili veya toksik olabilmektedir. Bu çalışmanın amacı ivermektin solüsyonunun (5 mg/l) Hirstiellosis tedavisindeki etkinliğini belirlemek ve daha sonraki çalışmalar için ön veri sağlamaktır. Söz konusu hastalığa sahip üç iguanada yapılan tedavide ivermektin solüsyonu etkili bulunmuş, belirli aralıklarla yapılan kontrol muayenelerinde klinik yan etkiye rastlanmamıştır.

Anahtar sözcükler: Hirstiellosis, iguana, ivermektin.

In recent years, the growing interest in reptiles in our country has made it necessary to carry out more research into the diseases of these animals. Diagnosis and treatment methods in reptiles are quite limited compared to other spp. (11). Most of the reptiles that are brought uncontrolled from natural habitats can be infested by parasites and some of these parasites may be of zoonotic significance and closely related to public health (6). Parasites can transmit serious diseases, especially in reptiles living in poor sanitary and stress conditions (3).

Ectoparasites, especially mites, are important factors causing skin diseases in reptiles. The genus *Hirstiella* (*Acari, Prostigmata: Pterygosomatidae*) is common ectoparasites of green iguanas (*Iguana iguana*). The mites

are mostly localized around the eyes, neck, under the chin, axilla, inguinal area, tail and folded areas of the skin (7). These mites cause anemia, itching, crusting, dysecdysis and ulcerative skin lesions (3). Clinical symptoms such as anorexia, depression and lethargy are also found in the affected animals (2). Some species act as a vector for protozoal infections and some species may also infect humans (3). These mites are known to cause the transmission of pathogens such as *Leishmania sp.* and *Haemogregarins sp.* (6). In intensive infestation, mites are visible. Samples taken with adhesive tape in mild infestations can be examined under a light microscope (10). Repeated applications of fipronil and ivermectin are effective in treatment (8).

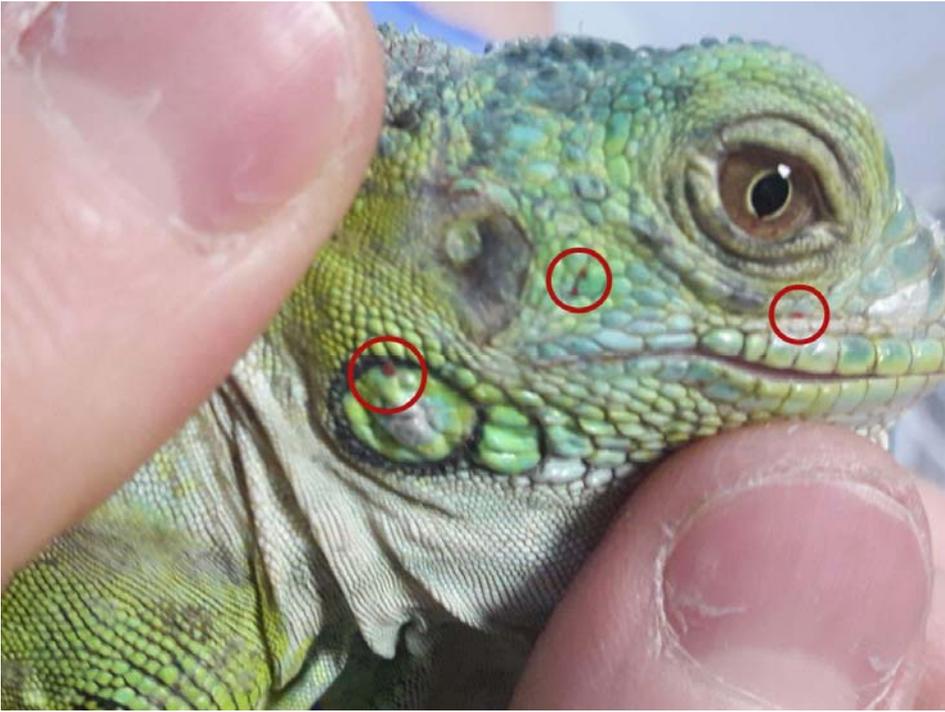


Figure 1. Red mites around eyes.



Figure 2. Dysecdysis in the dorsal area.

In our first case, a two years old green iguana was brought to Ankara University Animal Hospital with the complaint of itching, discoloration of the skin, loss of appetite and weakness. In the examination, it was observed that there were red mites around the eyes, under the neck and tail (Fig. 1). *Hirstiella sp.* was detected in the microscopic examination of the sample taken with adhesive tape. Topical ivermectin-water solution (5 mg/L, Vilmectin®) was applied every 4 days for 2 weeks for treatment (5). Ivermectin solution was also used for environmental disinfection. Two weeks later, it was found that the complaints were gone and recovery started. No clinical side effects such as anorexia and nervous system symptoms were found in the control examination performed after 1, 6 and 12 months.

In our second case, one year old green iguana was brought to hospital with the complaint of skin discoloration and dysecdysis (Fig. 2). It was observed that color changes intensified especially in the folded areas of the skin. Mites were detected in samples taken from suspicious areas. In microscopic examination, *Hirstiella sp.* was diagnosed (Fig. 4). Topical ivermectin-water solution (5 mg/L) was applied every 4 days for 2 weeks for treatment (5). Ivermectin solution was also used for environmental disinfection. It was observed at the end of the second week that the patient recovered. No clinical side effects such as anorexia and nervous system symptoms were found in the control examination performed after 1, 6 and 12 months.



Figure 3. Red mites around eyes and neck.

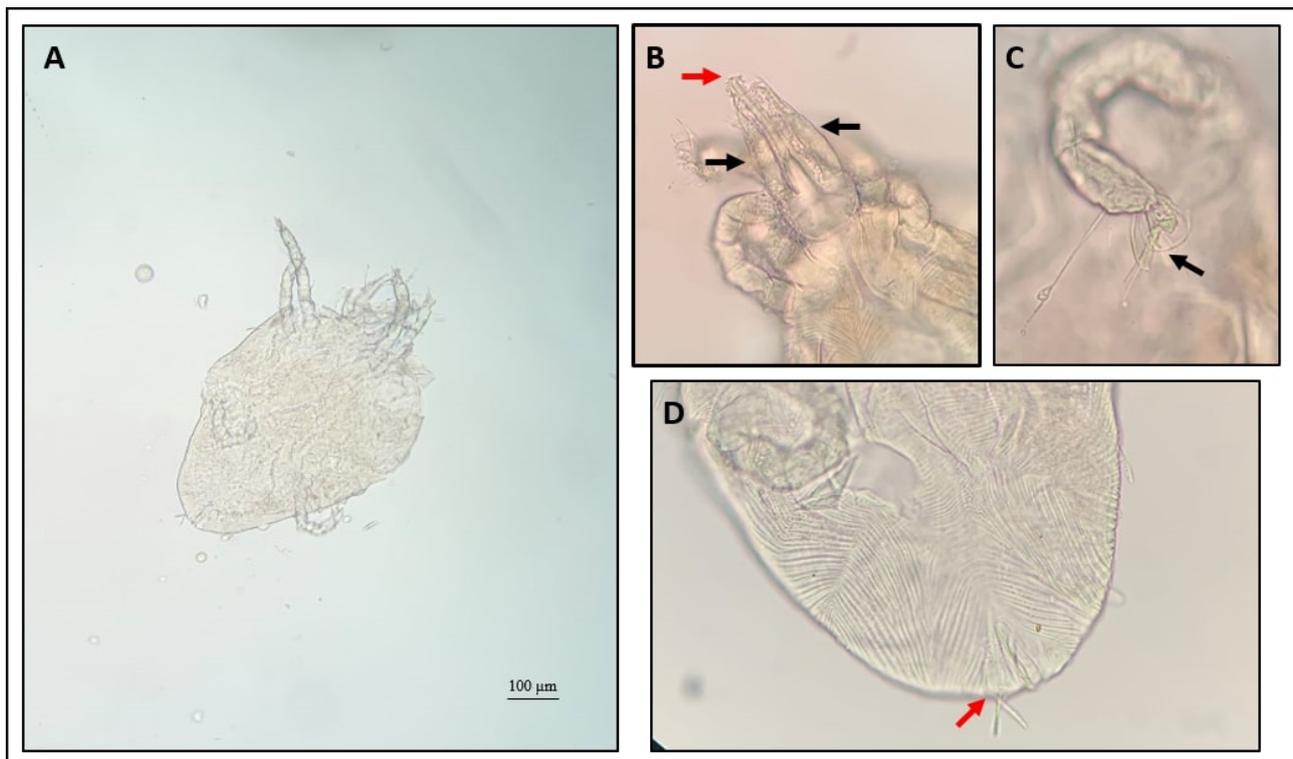


Figure 4. **A,** *Hirstiella* sp, ventral view; **B,** gnathosoma, black arrow: palps, red arrow: chelicerae; **C,** details of tarsus I, black arrow: claw; **D,** red arrow: details the anogenital area in ventral view.

Our third case, five years old green iguana was brought to hospital with complaint of itching (Fig. 3). The owner reported that the complaints started after putting the piece of wood they brought from outside into the terrarium. Upon skin examination, color changes,

erythema, dysecdysis in the dorsal area and red mites were observed. In the microscopic examination, *Hirstiella* sp. was diagnosed. Topical ivermectin-water solution (5 mg/L) was applied every 4 days for 2 weeks for treatment. Ivermectin solution was also used for environmental

disinfection and a piece of wood was removed. It was observed that recovery started at the end of the second week. No clinical side effects such as anorexia and nervous system symptoms were found in the control examination performed after 1, 6 and 12 months.

The family of *Pterygosomatidae* parasites live on reptiles. The nine genera of mite include *Cyclurobia*, *Geckobia*, *Geckobiella*, *Hirstiella*, *Ixoderma*, *Pterygosoma*, *Scaphotrix*, *Equisistilana*, and *Zonurobia* known to infest reptiles (7). *Hirstiella sp.* is more common in reptiles (9). *Hirstiella sp.* has been reported from as first Türkiye, Iran, Florida and Italy (2, 4, 7, 12).

In studies of external parasite infections of reptiles, most of the time *Hirstiella* has been found in green iguanas. (3, 6, 9). The mites are mostly localized around the eyes, neck, under the chin, axilla, inguinal area, tail and folded areas of the skin (7). In all our cases, it was determined that mites were dense, especially in the folded areas of the skin. These mites cause anemia, itching, crusting, dysecdysis and ulcerative skin lesions (3). Itching was the first symptom to be noted by patient owners. In clinical examination, skin discoloration and dysecdysis were identified as common symptoms in all cases.

In intensive infestations, while mites can be detected visually, in cases where the number of parasites is low, examination of skin scraping under a light microscope is required (9). In two of our cases, mites were detected visually, while one was diagnosed with microscopic examinations.

Whole body application of olive oil, organophosphates, carbamates, pretrin or pretroid sprays/shampoos, ivermectin injection/spray and fipronil (%0.25) were used in the treatment (2, 6, 9). There are very few studies on the effects, safety and toxic effects of the drugs in the treatment protocol (5). Some drugs are even known to be toxic to lizards (1, 11). Farmaki et al. (6) used fipronil solution for the treatment of mite in green iguanas, found it effective and did not encounter any side effects. Gazyağcı et al. (7) have used fipronil solution in treatment and have been successful. Not much is known about the efficacy and reliability of the ivermectin. In a case report, it was reported to be effective in treatment (2). In our cases, ivermectin solution (5 mg/L) was used in treatment every 4 days for 2 weeks and provided clinical improvement (5). This solution has also been used in environmental disinfection. No side effects were encountered in follow up examinations.

It was concluded that the ivermectin solution (5 mg/L) can be used for the treatment of *Hirstiella sp.* for both green iguanas and their environments (5). However, we also believe that more comprehensive studies are needed to understand the therapeutic effect of ivermectin solution.

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Ethical Statement

This study does not present any ethical concerns.

Conflict of Interest

The authors declared that there is no conflict of interest.

References

1. **Adeyemi IG, Adedeji OB** (2006): *Acute toxicity of acaricide in lizards (Agama agama) Inhabiting dog kennel in Ibadan, Nigeria: An environmental hazard in urban vector control.* Environmentalist, **26**, 281–283.
2. **Altınok Yipel F** (2014): *The Infestation of Ectoparasites (Hirstiella spp.) Treatment with Ivermectin Solition In a Green Iguana: Case Report.* Kocatepe Vet J, **7**, 85–87.
3. **Cervone M, Fichi G, Lami A, et al** (2016): *Internal and External Parasitic Infections of Pet Reptiles in Italy.* J Herpetol Med Surg, **26**, 122–130.
4. **Corn JL, Mertins JW, Hanson B, et al** (2014): *First Reports of Ectoparasites Collected From Wild-Caught Exotic Reptiles in Florida.* J Med Entomol, **48**, 94–100.
5. **Diethelm G** (2012) *Antiparasitic agents used in reptiles, Exotic Animal Formulary, 4th ed./ James W. Carpenter (ed). Published by Elsevier . pp: 66.*
6. **Farmaki R, Simou C, Koutinas A, et al** (2013): *Effectiveness of a single application of 0.25% fipronil solution for the treatment of hirstiellosis in captive green iguanas (Iguana iguana): An open-label study.* Parasitology, **140**, 1–5.
7. **Gazyagcı S, Aktaş M, Sari B** (2011): *The first record of the mite (Hirstiella sp.) on a green iguana from Turkey and its therapy with fipronil - a case report.* Vet Arh, **81**, 793–797.
8. **Hellebuyck T, Pasmans F, Haesebrouck F, et al** (2012): *Dermatological diseases in lizards.* Vet J, **193**, 38–45.
9. **Hoppmann E, Barron HW** (2007): *Dermatology in Reptiles.* J Exot Pet Med, **16**, 210–224.
10. **Pasmans F, Blahak S, Martel A, et al** (2008): *Introducing reptiles into a captive collection: The role of the veterinarian.* Vet J, **175**, 53–68.
11. **Széll Z, Sréter T, Varga I** (2001): *Ivermectin toxicosis in a chameleon (Chamaeleo senegalensis) infected with Foleyella furcata.* J Zoo Wildl Med, **32**, 115–117.
12. **Tavassoli M, Javadi S, Khazaei K, et al** (2017): *Hirstiella sp. (Acari: Pterygosomatidae) infestation in green iguana (Iguana iguana) from Urmia, Iran.* Persian J Acarol, **6**, 63–65.