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Successful treatment of *Oochoristica* spp. tapeworm in two monitor lizards (*Varanus bengalensis*)

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Abstract

Two Injured Monitor lizards were seized from Amravati Forest Division, Wadali and were sent to Wildlife Research and Training Centre, Nagpur for further treatment, care and management. On examination all the lizards showed injury and fracture of various bones. The animals were kept under quarantine for 3 months. During this quarantine period, the monitor lizards displayed symptoms of loose faeces and anorexia for 5 days. Further examination confirmed a positive diagnosis for *Oochoristica* spp. The lizards were effectively treated with Praziquantel. To evaluate the worm load, eggs per gram (EPG) assessments were conducted on Day 0, and faecal sample examination was carried out again on Days 3, 7, 14 and 21 day post-deworming. The sample came negative on day 21st day which resulted into uneventful recovery.

Keywords: Monitor lizard, *Oochoristica* spp., Praziquantel, EPG

Introduction

At the start of this century, the illegal trade in endangered species ranked as the third most profitable illicit activity globally, trailing only behind drug and arms trafficking. This trade may be even more lucrative for two additional reasons: the demand for culinary delicacies and traditional medicinal products derived from exotic animals. Moreover, the introduction of non-native species into our ecosystems disrupts fragile environments, potentially leading to the extinction of indigenous species. Ineffective capture methods, along with substandard shipping practices, often result in the death of numerous reptiles before they arrive at pet stores. Approximately 90% of wild-caught reptiles perish within their first year in captivity due to physical injuries sustained prior to sale or because their owners are unable to fulfil their intricate dietary and habitat requirements (Rataj *et al.*, 2011) ^[11].

Reptiles are among the most poorly treated animals within the pet trade due to their specific dietary and habitat requirements. For numerous species, the fundamental needs for nutrition and living conditions remain largely unknown, making pet reptiles particularly vulnerable to metabolic disorders. In their natural environments, reptiles seldom encounter their own waste or leftover food, a situation that is frequently observed in captivity. Additionally, the presence of parasites significantly impacts their health. The stress of confinement, high animal density, and the coexistence of various species in limited spaces contribute to the proliferation and transmission of parasites, which in the wild typically coexist harmoniously with their hosts. These conditions weaken the immune response in reptiles, thereby increasing the likelihood of infections caused by viruses, bacteria, yeast, and fungi. Furthermore, reptiles can harbor diseases that may be transmitted to other animals, different species, and even humans.

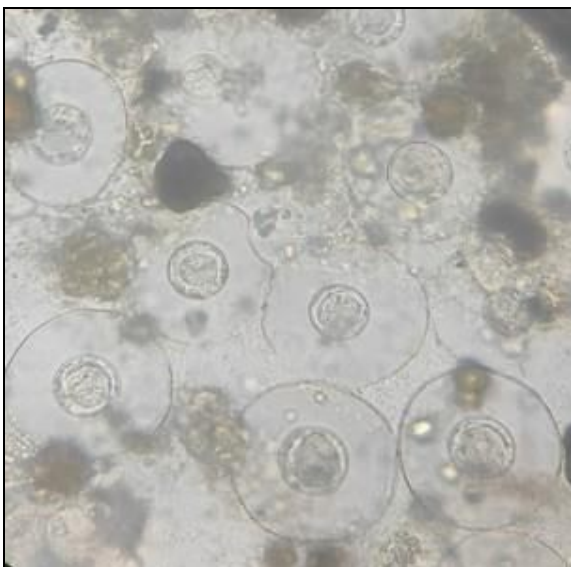
The Common Indian Monitor Lizard, scientifically known as *Varanus benghalensis* and referred to as 'Ghoh' or 'Ghor' in Hindi or 'Ghorpah' in Marathi, is a medium-sized reptile characterized by its dark brown coloration and widespread presence across the Indian subcontinent. Unfortunately, the population of this species has significantly declined throughout the nation, primarily due to overexploitation of adults for their prized skin, habitat destruction, and a lack of awareness regarding their diseases, management, and treatment (Shrivastav *et al.*, 2003) ^[13].

Reptiles are known to host a wide variety of internal parasites, which include numerous species of protozoans, nematodes, cestodes, pentastomids, acanthocephalans, and trematodes (Wolf *et al.*, 2014) ^[15].

The genus *Oochoristica* was established by Luhe in 1898, with *Oochoristica tuberculata* designated as the type species, which has been identified in *Latera varanus* from Europe and Morocco (Patil *et al.*, 2024) ^[10]. *Oochoristica* sp., a type of tapeworm, is a cestode that infects over 56 species of reptiles and mammals (Ghaffar *et al.*, 2015) ^[5]. Research has examined the evolution of host life history traits in relation to parasitic load, as these parasites often exert significant selective pressures. The small intestine serves as the habitat for the cestode (*Oochoristica* sp.), which typically lacks a digestive system and resides in the small intestine of vertebrates, an area abundant in soluble nutrients conducive to absorption (Robert *et al.*, 2020) ^[12]. Consequently, the interactions between these parasites and their hosts affect various ecological aspects. The prevalence and intensity of parasitic populations offer essential insights into the status and potential effects of parasites on wildlife populations in their natural environments (Omonona *et al.*, 2019) ^[8]. Parasites are significant contributors to elevated mortality rates in wild animal populations (Anderson and Gordon, 2009). This study discusses the parasitic load of *Oochoristica* sp. observed in monitor lizards and the effective therapeutic strategies employed for its management.

Observation and Treatment

Two Monitor lizards after being rescued from poachers were received at the Rescue Centre, Gorewada, Nagpur. The lizard had multiple lacerated wounds and fractures at various parts of body. After being rescued, they were treated for fracture and were kept in quarantine for three months during which they showed greenish diarrhoea. Faecal samples were examined and it was found positive for *Oochoristica* tapeworm. EPG was done as per standard procedure and it was found to be 3100 and 3400 respectively on Day 0. Faecal samples were reevaluated on 3rd day, 7th day, 14th day and 21st day. Both the Monitor Lizard were given Praziquantel @ 8 mg/Kg single dose and repeated at 14th day. Both the monitor lizards came negative on Day 21st onwards post deworming.



Egg of *Oochoristica* sp. in Monitor Lizard-1



Eggs of *Oochoristica* Sp. in Monitor Lizard 2

Discussion

Endoparasites can cause different clinical outcomes depending on the species and their life cycle, habitat conditions, infection severity, and the host (age, sex, and health) (Pasman *et al.*, 2008) ^[9]. Although mild helminth infections are generally well tolerated by reptiles, severe infections can result in clinical pathology, especially in young or immunocompromised animals (Zajac *et al.*, 2021) ^[16].

Wild reptiles are frequently infected with various endoparasites, many of which are minimally pathogenic. However, once in captivity, stress, improper husbandry, and poor sanitation can lead to serious diseases and eventually to death in heavily parasitized individuals (Wilson and Carpenter, 1996) ^[14]. The severity of the disease depends on the host's immunity and the number of parasites in their bodies and the environment (Luz *et al.*, 2012) ^[7].

Wild reptiles often carry a variety of internal parasites, most of which cause little harm in their natural environments. However, when these animals are brought into captivity, factors such as stress, inadequate husbandry, and poor hygiene can lead to severe parasitic infections that may result in illness or even death in heavily infested individuals (Wilson & Carpenter, 1996) ^[14]. The severity of such diseases depends largely on the reptile's immune status and the concentration of parasites both within the host and in their surroundings (Luz *et al.*, 2012) ^[7].

Cestodes such as *Acanthotaenia*, *Bothridium*, *Ophiotaenia*, and *Spirometra* are also common and cause malnutrition, enteritis, and imbalance of the intestinal microbiota. Several anthelmintics can be used for treatment such as ivermectin, thiabendazole, fenbendazole, pyrantel pamoate, praziquantel, and levamisole. (Luppi *et al.*, 2007) ^[6]. Parasitic disease is a major problem for captive maintenance and breeding. Therefore, establishing deworming protocols and appropriate treatments is important for successful maintenance. Ivermectin and praziquantel as deworming protocols were effective for adult and juvenile reptiles (Araoz *et al.*, 2018) ^[2].

Cestodes like *Acanthotaenia*, *Bothridium*, *Ophiotaenia*, and *Spirometra* are frequently encountered and are known to cause conditions such as enteritis, malnutrition, and disturbances in the intestinal microbiota. Treatments typically involve the use of anthelmintic drugs such as ivermectin, thiabendazole, fenbendazole, pyrantel pamoate, praziquantel, or levamisole (Luppi *et al.*, 2007) ^[6]. Parasitic infections represent a major obstacle in the management and

breeding of captive reptiles, highlighting the need for effective deworming programs. Studies have shown that ivermectin and praziquantel are particularly effective in deworming both adult and juvenile reptiles (Araoz *et al.*, 2018) [2].

Praziquantel exhibits broad-spectrum efficacy against both cestode and trematode infections (Chai *et al.*, 2013). At lower concentrations, it enhances muscular activity in the parasite by facilitating calcium ion influx, which triggers sustained muscle contraction and spastic paralysis through increased sodium permeability and inhibition of potassium efflux. The drug is reversibly absorbed by the parasite, resulting in vacuolization and eventual disintegration of the tegument (Chan *et al.*, 2012) [4]. Furthermore, praziquantel disrupts the parasite's carbohydrate metabolism, leading to energy depletion and death by starvation (Araoz *et al.*, 2018) [2].

This case study mentions about successful treatment of *Oochoristica* tapeworm with praziquantel.

Conclusions

Parasites play a crucial role in increasing mortality rates among wild animal populations. To determine the necessity for deworming, it is essential to assess the number of eggs per gram, as a single dose of praziquantel may not eliminate the entire worm burden. In these instances, administering the medication after an interval of two weeks may be necessary to ensure thorough deworming. This study examines the parasitic load of *Oochoristica* sp. found in monitor lizards and the effective treatment strategies implemented for its control.

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