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BIOTHERAPEUTIC BLEND: AN ALTERNATIVE FOR THE TREATMENT OF ENDOPARASITES

ORIGINAL ARTICLE

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ABSTRACT

Parasitic diseases affecting companion animals include various etiological agents, ranging from protozoa to helminths and arthropods. This variety makes it difficult to develop treatments, which is directly associated with the zoonotic potential of some parasitosis, also posing a risk to the human population. To develop alternatives, diluted, dynamized and natural medicines are being developed, above all to overcome resistance to the usual drugs and represent a sustainable therapy. The aim of this study was to report on the efficacy of a biotherapeutic blend for treating endoparasitosis in different animal species. To this end, after confirming endoparasitosis by fecal examination, the animals were treated with 10 drops of the biotherapeutic blend for 30 consecutive days. To confirm the effect of the treatment, fecal examinations were carried out after 7, 15 and 30 days. A total of 27 animals from 6 different species were included in the study: *Canis lupus familiaris*, *Oryctolagus cuniculus*, *Felis silvestris catus*, *Nymphicus hollandicus*, *Sapajus* sp., *Mesocricetus auratus*. Among the species, the animals were diagnosed with 8 endoparasites in total: *Toxocara* sp., *Isospora* sp., *Eimeria* sp., *Ancylostoma* sp., *Ascaridia* sp., Cestoda, Coccidio, *Trichuris* sp. Treatment with the biotherapeutic blend was able to negate the presence of endoparasites in the feces of different animals, and depending on the type of parasite, the indicated treatment can vary between 30 and 60 days. Thus, the use of this type of biotreatment is an alternative for controlling different endoparasitoses, which makes it a sustainable option with low ecotoxicity.

Keywords: Biotherapeutic, Case report, Endoparasitosis, Parasitic diseases.

1. INTRODUCTION

Arthropods, helminths and protozoa are of veterinary importance because they are widely distributed throughout the world and can cause disease in domestic animals. However, it is important to highlight that some of these parasites have zoonotic potential, also contaminating the owners of these animals (Pereira *et al.* 2016).

The breeding of non-traditional or exotic pets has been growing in popularity around the world, raising ethical concerns about whether the animal poses any danger, such as in the case of disease transmission (Schuppli *et al.* 2014). Some of the intestinal parasites in domestic or domesticated animals can affect humans through contamination of the environment by parasite larvae and eggs, as well as close contact with animals; however, many owners are unaware of this risk (Raza *et al.* 2018). The zoonotic potential of these parasites is exacerbated by the lack of national policies to control the stray animal population and promote responsible ownership, as well as veterinary public health programs (Kamani *et al.* 2021).

The frequent and inappropriate use of antiparasitic drugs has led to failures in their effectiveness, culminating in a global problem of anthelmintic resistance, by example (Salgado; Santos, 2016; Fissiha; Kindi, 2021). However, diluted and dynamized medicines are part of a scenario in which there is a search for natural, healthy, and less aggressive treatments, aimed at animal welfare and sustainability.

The process of dynamization makes it possible to release energy that is different from the pure substance, which can be measured using physical methods for detecting energy fields. The energy acts on the body by stimulating vital balance, which helps in the healing process and maintenance of organic homeostasis (Braccini *et al.* 2019). Among the various categories of dynamized medicines are biotherapeutics, which are prepared from the etiological agent itself, known as

nosodes (Schmidt, 2021). Nosodes can be obtained from biological products such as secretions, excretions, tissues, organs, products of microbial origin, parasites, and allergens. The use of biotherapeutics as a treatment or prophylaxis for infectious and parasitic diseases has been investigated (Almeida *et al.* 2008).

Considering that parasites share the same environment as animals and humans, it is possible to contribute to One Health by disseminating the use of a natural treatment against internal parasites in different animal species that do not cause risk to humans, animals, or the environment. The aim of this study was to report on the efficacy of using a biotherapeutic blend to treat endoparasitosis in different animal species.

2. CASE REPORT

This report was authorized by the people responsible for its publication, with a free informed consent form signed in agreement with all the ethical parameters. The study included animals of different species that, after routine veterinary care, had endoparasitosis confirmed by parasitological analysis of feces using direct examination in lugol, flotation and precipitation, with tests carried out in the same clinical pathology laboratory (Table 1).

Table 1. Animals included in the case report and their respective stool parasitology results

Scientific name	Common name	No. of animals	Fecal parasitology
Canis lupus familiaris	Dog	4	*Toxocara sp.* *Isospora sp.*
Oryctolagus cuniculus	Rabbit	15	*Eimeria sp.*
Felis silvestris catus	Cat	2	*Ancylostoma sp.* *Toxocara sp.* *Isospora sp.*
Nymphicus hollandicus	Cockatiel	3	*Ascaridia sp.*

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			Cestoda Coccidio
Sapajus sp.	Capuchin monkey	2	*Ancylostoma sp.*
Mesocricetus auratus	Hamster	1	*Trichuris sp.*
Total number of animals			27

Source: Prepared by the authors, 2023.

After confirming the presence of internal parasites, the animals were treated with a biotherapeutic blend consisting of nosodes of *Amblyomma cajanense*, *Ancylostoma* spp, *Boophilus microplus*, *Bunostomun* sp., *Ctenocephalides* spp, *Dipylidium* sp, *Eimeria* spp, *Hemonchus contortus*, *Isospora* spp, *Pulex* spp, *Nematodius* sp, *Ostertagia ostertagi*, *Rhipicephalus sanguineus*, *Strongyloides* sp., *Toxocara* spp., *Trichuris* sp., *Tricostrongylus* sp. (ãC12).

The animals were treated with 10 drops added to the water every day for 30 days. The owners were instructed to avoid being near electrical appliances, and strong-smelling products and not to expose them to the sun, heat, and humidity.

On the advice of the veterinarian in charge, the parasitological analysis of the feces was repeated for the cockatiels after 30 days of treatment and, for the other species, the parasitological analysis of the feces was carried out at 7 days, 15 days, and 30 days of treatment for follow-up purposes.

3. RESULTS AND DISCUSSION

The main gastrointestinal parasites found in the fecal parasitology of the animals included in this report were *Toxocara* sp. which is common in dogs and cats, as well as *Eimeria* sp. in rabbits. These results corroborate a screening study of pets carried out in the city of Moscow for intestinal parasitic diseases. The study carried out on dogs, cats, chinchillas, ferrets, guinea pigs, rabbits, primates, reptiles, and hedgehogs over a period of 6 years found that toxocarosis was the most frequent

helminthic infection in dogs and cats, as was *Eimeria* sp. in rabbits (Kurnosova *et al.* 2019). Table 2 shows the results of the tests over the treatment period of up to 30 days.

Table 2. Identification of the animals included in the case report.

Identificação	**Nome cientifico**	**Sexo**	**Fezes dia 0**	**Fezes dia 7 dias**	**Fezes dia 15 dias**	**Fezes dia 30 dias**
Jade	*Canis lupus familiaris*	F	*Toxocara* sp. (+/3+)	Negative	Negative	Negative
Vitória	*Canis lupus familiaris*	F	*Toxocara* sp. (+/3+)	Negative	Negative	Negative
Bebela	*Canis lupus familiaris*	F	*Toxocara* sp. (+/3+)	Negative	Negative	Negative
Pipoca	*Canis lupus familiaris*	M	*Toxocara* sp. (+/3+)	Negative	Negative	Negative
Alerquina	*Oryctolagus cuniculus*	F	*Eimeria* sp. (+/3+)	Negative	Negative	Negative
Luluca	*Oryctolagus cuniculus*	F	*Eimeria* sp	*Eimeria* sp	Negative	Negative
James	*Oryctolagus cuniculus*	M	*Eimeria* sp (++/3+)	*Eimeria* sp (+/3+)	Negative	Negative
Vitor	*Oryctolagus cuniculus*	M	*Eimeria* sp	*Eimeria* sp	Negative	Negative
Chantilly	*Oryctolagus cuniculus*	F	*Eimeria* sp	*Eimeria* sp	Negative	Negative
Dálmata	*Oryctolagus cuniculus*	M	*Eimeria* sp (+/3+)	*Eimeria* sp (+/3+)	Negative	Negative
Fumaça	*Oryctolagus cuniculus*	M	*Eimeria* sp. (++/3+)	*Eimeria* sp. (++/3+)	Negative	Negative
Lui	*Oryctolagus cuniculus*	M	*Eimeria* sp. (rare)	*Eimeria* sp. (rare)	Eimeria sp. (rare).	Negative
Jorge	*Oryctolagus cuniculus*	M	*Eimeria* sp. (+/3+)	Eimeria sp. (+/3+)	Eimeria sp. (+/3+)	Negative
Yulk	*Oryctolagus cuniculus*	M	*Eimeria* sp (+/3+)	Negative	Negative	Negative

Meg Pi	*Oryctolagus cuniculus*	F	*Eimeria* sp. (+/3+)	Negative	Negative	Negative
Siamês	*Oryctolagus cuniculus*	F	*Eimeria* sp. (rare)	Negative	Negative	Negative
Osvaldo	*Oryctolagus cuniculus*	M	*Eimeria* sp. (+/3+)	*Eimeria* sp. (+/3+)	*Eimeria* sp. (one cyst)	Negative
Shadow	*Oryctolagus cuniculus*	M	*Eimeria* sp (rare)	*Eimeria* sp (rare)	Negative	Negative
Milk Shake	*Oryctolagus cuniculus*	M	*Eimeria* sp (+/3+)	*Eimeria* sp (+/3+)	*Eimeria* sp (one cyst)	Negative
Gnar	*Felis catus*	M	*Ancylostoma* sp. eggs (+/3+)	Negative	Negative	Negative
Sophie	*Felis catus*	F	Ovos de *Toxocara* sp. (+/3+)	Negative	Negative	Negative
Jair	*Sapajus* sp.	M	*Ancylostoma* sp. eggs	Negative	Negative	Negative
Sérgio	*Sapajus* sp.	M	*Ancylostoma* sp. eggs (rare)	*Ancylostoma* sp. eggs (rare)	Negative	Negative
Gigi	*Mesocricetus auratus*	F	*Trichuris* sp. eggs	Negative	Negative	Negative
Mercedes	*Nymphicus hollandicus*	F	*Ascaridia* sp	-	-	Negative
Babi	*Nymphicus hollandicus*	F	Presence of coccidia	-	-	Negative
Dólar	*Nymphicus hollandicus*	M	Cestode eggs	-	-	Negative

Legend: M: Male. F: Female. Negative: No helminth eggs or larvae or protozoan cysts were observed in the material examined. (+/3+): moderate intensity of parasites identified in the coprological examination. (++/3+): marked intensity of parasites identified in the coprological examination.

Source: Prepared by the authors, 2023.

Considering the animals that initially tested positive for *Toxocara* sp. and *Trichuris* sp., it was observed that after 7 days of treatment, the parasitological stool samples were negative, as were the samples from 15 and 30 days of treatment, showing the

sensitivity of these endoparasites to biotherapeutic treatment. *Toxocara* is the zoonotic etiological agent with the highest morbidity in developed and developing countries, mainly affecting children and, despite its widespread distribution, it is considered a neglected infection (Carlin; Tyungu, 2020).

A study carried out in Lavras, MG, with the aim of verifying contamination by *Toxocara* sp. and *Ancylostoma* sp. in soil samples collected from public squares and children's play areas, showed that public squares are the area's most at risk of potential infection by *Toxocara* sp. and *Ancylostoma* sp. This factor was linked to the large population of stray dogs, as well as those that are taken out for walks by their owners (Guimarães *et al.* 2005). Considering that 58% of *Ancylostoma* sp. and 23% of *Toxocara* sp. eggs were found and that these are potentially zoonotic agents, the importance of endoparasitic treatment for dogs and cats should be considered, since this is a situation found in several cities in the country.

It was observed that, after 15 days of treatment, most of the rabbits (n=10) remained with the presence of *Eimeria* sp. in the fecal parasitology. Species of the genus Eimeria do not infect humans, however, they are of great importance in rabbit breeding, since these coccidias can destroy intestinal cells, causing diarrhea, leading to decreased organic resistance and weight loss, predisposing animals to secondary bacterial infection and, in severe cases, death (Monteiro, 2017). For slaughter rabbits, *Eimeria* sp. infections are of economic importance as they can lead to major losses in meat production (Szkucik *et al.* 2013).

It is therefore important to carry out biotherapeutic treatment for *Eimeria* sp. in rabbits for more than 30 consecutive days, suggesting 60 days of treatment. It should be borne in mind that rabbits coprophagize and that oral infection occurs through the ingestion of sporulated oocysts that may be present in their drinker or feeder. In addition, it is recommended that feeders and drinkers are sanitized daily and that they are placed in such a way as to prevent the animals from defecating inside them,

and that the floors of empty cages help to prevent the accumulation of feces and urine (Monteiro, 2017).

The cockatiels treated with the Blend biotherapeutic had different gastrointestinal parasites such as ascarids, coccids, and cestodes, and after 30 days of treatment the results were negative in all cases. It was not possible to check when the animals tested negative, as the veterinarian in charge only indicated that samples should be taken on day 0 and 30 days after treatment.

The presence of *Ancylostoma* sp. was found in the capuchin monkeys. After 15 days of treatment, the stool test was negative, and this continued in the 30-day sample.

In Spain, dairy farmers have been encouraged to use unconventional treatments to reduce the use of chemical substances, actions that are promoted by regulations imposed by the principles of organic farming (Orjales *et al.* 2016). The use of diluted and dynamized medicines has been studied as an alternative in the treatment and control of diseases in animals. Some authors claim that anthelmintic resistance has made it difficult to control worms, which justifies the increase in the number of studies to find alternatives to nematode control (Pacheco *et al.* 2019).

The bond with pets has changed and has a positive effect on human health. However, this change in behavior can have negative effects, such as the increased risk of transmitting zoonotic infections due to the proximity of animals to humans, such as sleeping with animals and contact with the animals' care environment. The close relationship between humans and animals has led to the One Health initiative, which is a global strategy to expand healthcare for humans, animals, and the environment (Overgaauw *et al.* 2020). In this sense, the need for deworming is emphasized, which can be done by adopting responsible pet ownership in health education, where the frequency of deworming can be aligned with the risk factor, through clear instructions.

One health is the interconnection of several spheres, considering human health, animal health and the environment. It should be considered that the use of chemical treatment parasiticides on animals can have ecotoxic impacts, as these treatments can penetrate the wider environment and affect non-target species. The use of a biotherapeutic blend proved to be effective in this case report, as feces tests showed the absence of endoparasites in the different animal species. The use of biotherapies aims to use effective, natural and healthy medicines, taking care of animal welfare, human health and sustainability.

4. CONCLUSION

The use of the biotherapeutic blend has proved effective in controlling endoparasites in different animal species, making it a natural and sustainable treatment option. The use of this medicine aims to reduce the impact of ecotoxicity already recognized with the use of chemical products in the treatment of endoparasitosis, which are excreted into the environment.

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