

## Short Commentary

### Fungal Formulation with the Nematophagous Fungus *Pochonia Chlamydosporia*

Jackson Victor de Araújo\*

Department of Veterinary Medicine, Federal University of Viçosa - UFV,  
Viçosa-MG, 36570-900, Brazil

Healthy foods with high nutritional value and products free of chemical residues present a promising market. This has increased the challenges of worm control. Helminths are a production concern as they affect the general health, welfare and performance of the animals.

*Pochonia chlamydosporia* is a helminth-evacifying, saprophytic and opportunistic fungus, which does not require the presence of helminth eggs to maintain itself in the environment. It belongs to the kingdom of Fungi, phylum Ascomycota, subdivision Pezizomycotina, class Sordariomycetes, order Hypocreales and family Clavicipitaceae [1]. Its enzymatic action is related to the protease-serinoalkine that is present at the beginning of the infection process, being responsible for the extenuation of the yolk membrane of the eggshell. The weakening of the yolk layer is also caused by the action of hydrolytic enzymes, proteases and chitinases and also by the removal of the outermost layer of chitin, along with its degradation. This ovicide action has been successfully tested both in the field and in laboratory conditions, being able to destroy eggs in all embryonic stages of helminth eggs [2,3].

The work published by Fonseca et al., [4] presented a negative result, where the authors concluded that the formulation containing *Pochonia chlamydosporia* was not efficient in the biological control of bovine gastrointestinal nematodes.

However, we must have the following basic knowledge that the gastrointestinal helminth cycle occurs in two phases: a free-living phase occurring in the environment that corresponds to the egg stages until evolving to the infective form and a parasitic life phase that develops in the animal and corresponds to the infective form stages until adult worms [5].

\*Corresponding author: Jackson Victor de Araújo, Department of Veterinary Medicine, Federal University of Viçosa - UFV, Viçosa-MG, 36570-900, Brazil, E-mail: jvictor@ufv.br

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In this work by Fonseca et al. [4] it is stated that: "Present in the environment, nematophagous fungi act in the fecal microenvironment and in the soil. The species used in this study is the ovicidal fungus *Pochonia chlamydosporia* with proven action on Helminths [6,7]. "This study was developed predominantly during the dry season of the year, with the lowest temperatures for this region and the lowest levels of rainfall, which may have contributed to the results found. Due to the ovicidal action of the fungal species used in this experiment, these results may have occurred because of the rapid passage of eggs to the larval stage of gastrointestinal nematodes. The passage of gastrointestinal nematodes in the environment from the egg stage to hatching is rapid, and there may not have been enough time for the fungus to perform its ovicidal action. Despite the results found here, the enzymatic mechanisms of these fungi in egg adhesion and consequent destruction are suggested by several studies additionally, in vitro and in vivo studies have been developed to decrease the number of recurrent gastrointestinal nematode infections in domestic animals using ovicidal fungi [8]. However, a factor that often impairs the effectiveness of these fungi are strategies developed by the parasites themselves, such as the rapid passage from the egg to larva stage mentioned above, which makes interaction with the egg difficult [3]".

Therefore, for a better strategy to control Helminths, we have the knowledge that the fungus *Duddingtonia flagrans* (BioVerm) grown on rice and that was the first Brazilian fungal biological product allied to the control of infective forms of gastrointestinal nematodes of animals raised in pastures and has proven effective in several studies [9].

We conclude that the associated use of the species *Pochonia chlamydosporia* with other important biocontrolling fungi is important, with emphasis on the association between this and *Duddingtonia flagrans* which is a larvicidal fungus [7]. However, the ovicidal fungus *P. chlamydosporia* would act mainly on those helminths that have their stages in the soil and persist in the form of eggs and often the infective phase as Ascaridids, Trichurids, Cestodes and Trematodes. This association is important and, in the future, would aim to strengthen the action of future fungal formulations for the biological control of helminths.

## References

1. Gams W, Zare R (2001) A revision of *Verticillium* sect. Prostrata. III. Generic classification. Nova Hedwigia 73: 329-337.
2. Braga FR, Araújo JM, Silva AR, Araújo JV, Carvalho RO, et al. (2011) Ação ovicida do extrato bruto enzimático do fungo *Pochonia chlamydosporia* sobre ovos de *Ancylostoma* sp. Revista da Sociedade Brasileira de Medicina Tropical 44: 116-118.
3. Braga FR, Araújo JV (2014) Nematophagous fungi for biological control of gastrointestinal nematodes in domestic animals. Applied Microbiology Biotechnology 9: 71-82.
4. Fonseca JS, Ferreira VM, Freitas SG, Vieira IS, Araújo JV, et al. (2022) Efficacy of a Fungal Formulation with the Nematophagous Fungus *Pochonia chlamydosporia* in the Biological Control of Bovine Nematodiosis. Pathogens 11: 695.
5. Taylor MA, Coop R, Wall R (2016) Veterinary Parasitology Fourth Edition Wiley-Blackwell.

6. Mendoza-De-Gives P, Braga FR, Araújo JV (2022) Nematophagous fungi, an extraordinary tool for controlling ruminant parasitic nematodes and other biotechnological applications. *Biocontrol Science and Technology*.
7. Araújo JV, Braga FR, Mendoza-de-Gives P, Paz-Silva A, Vilela VLR (2021) Recent Advances in the Control of Helminths of Domestic Animals by Helminthophagous Fungi. *Parasitologia* 1: 168-176.
8. Li S, Wang D, Gong J, Zhang Y (2022) Individual and combined application of nematophagous fungi as biological control agents against gastrointestinal nematodes in domestic animals. *Pathogens* 11: 172.
9. Braga FR, Ferraz CM, Silva EM, Araújo JV (2020) Efficiency of the Bioverm (*Duddingtonia flagrans*) fungal formulation to control *in vivo* and *in vitro* of *Haemonchus contortus* and *Strongyloides papillosus* in sheep. *3 Biotechnology* 10: 62-68.



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