



Antifungal Activity of Thymol on Planktonic and Biofilm Cells Formed in the Pipes

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In poultry farming, the water used for watering is generally contaminated by mycotoxins, produced by fungi, which have severe chronic and acute effects on animal and human health. They also affect the taste and odor of the water. On the other hand, microorganisms adhere themselves to various surfaces (tanks and pipes) and form biofilms. The high humidity levels and favorable temperature in farm facilities make favorable conditions for fungi development. Biofilms are the cause of numerous poultry diseases causing considerable damage and financial losses in the poultry industry. Living in a biofilm, fungi become extremely tolerant to antifungals and disinfectants.

In this study, the antifungal activity of thymol on reducing fungi load in poultry drinking water samples was firstly assessed *in vitro*. Samples were treated by increasing concentrations (1, 2 and 4g.l⁻¹ of a thymol-based product). Reduction is about one log unit for 1g.l⁻¹, and a total desparation for 4 g.l⁻¹. Secondly, the antifungal activity was tested on biofilms formed on coiled pipes using an experimental arrangement simulating animals watering conditions in poultry farming. Two concentrations (1 and 2g.l⁻¹) were used in two ways, preventive and curative treatment. Data of this experiment have shown that thymol may prevent *C.albicans* and *A.niger* proliferation. After just a week, a significant reduction (P<0.05) was shown with the concentration 1g.l⁻¹. The reduction was much important with the concentration of 2g.l⁻¹. For curative treatment, results showed a significant reduction (P<0.05) of *C.albicans* load after only 24 hours with 1g.l⁻¹. With this same concentration, reduction is more important over

time for both spices (about four log units after a week). A significant reduction was showed in just 24hours of treatment with the concentration of 2g.l^{-1} . This work offers an alternative solution to chemical biocides, which can treat water and disinfect distribution system in poultry farming.

Keywords: Thymol, biofilm, water, *A. niger*, *C. albicans*

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