

## ***The in Vitro Efficacy of Cinnamon (Cinnamomum Verum) Bark Oil against Prototheca Spp Isolated from Canine and Bovine Clinical Cases***

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Prototheca is the only algae causing diseases in humans and animals. Among them, prototheca mastitis in cattle causes severe economic losses and canine disseminated protothecosis mostly has a fatal outcome. Currently there are no effective treatments against protothecosis. This study *in vitro* efficacy of cinnamon bark oil against *Prototheca spp* isolated from a bovine mastitis case and a dog with disseminated disease. The experiments were conducted in 1.5 mL microcentrifuge tubes containing 500 µL of potato dextrose broth (pH 6.4), 500 µL of 0.5 McFarland standard inoculum prepared from each prototheca isolate and varying concentrations of cinnamon bark oil dissolved in ethanol (range 10 - 0.156 µL/mL). Additionally, each experiment included two culture tubes with itraconazole (30µg/mL) and fluconazole (30µg/mL), positive and negative controls and an additional control with inoculum and ethanol. The cultures were incubated at 37°C for 24 hrs with shaking (100 rpm). All experiments were duplicated. Viability of the cultured organisms was assessed by inoculating 30 µL from each tube on potato dextrose agar plates (37°C for 72 hrs). In addition, the morphological changes of the organisms were assessed using Gram-stained smears prepared from culture tubes. No colonies were detected in the plates corresponding to cultures with 10-1.25 µL/mL of cinnamon bark oil. Very few colonies were observed in plates corresponding to cultures with 0.625 and 0.315 µL/mL of cinnamon bark oil. No growth inhibition was observed in plates corresponding to lowest concentration (0.156 µL/mL) of cinnamon bark oil, itraconazole, fluconazole or the control with ethanol compared to the positive control. The capsule of the organisms was either absent or distorted in the cultures with 0.625 and 0.315 µL/mL cinnamon bark oil compared to the positive control. These results confirm that cinnamon bark oil has an excellent *in vitro* activity against prototheca that may be used for prophylaxis.

**Keywords:** Prototheca, Cinnamon Bark Oil, Canine, Bovine Mastitis, Prophylaxis