

Cinnamon Bark Oil (*Cinnamomum zeylanicum*) Inhibits the Growth of *Prototheca zopfii* at Canine Gastric pH

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Protothecosis is a potentially severe and often fatal disease in dogs, caused by the parasitic algal genus *Prototheca*. The condition typically presents as a disseminated infection, primarily occurring via ingestion of contaminated food or water. Among these species, *Prototheca zopfii* is one of the most frequently reported causes of disseminated protothecosis in dogs. Antifungal agents and/or antibiotics have shown limited efficacy as treatment options for disseminated protothecosis in dogs. According to previous studies, *P. zopfii* can survive and proliferate in environments with pH levels ranging from 5 to 12. The gastric pH in dogs is typically acidic, ranging from approximately 2.0 to 3.5, and the average gastric transit time is between 2-5 hours. It is currently unknown whether *P. zopfii* can survive canine gastric pH for the duration of gastric transit. This study aimed to assess the viability of four *P. zopfii* isolates from dogs diagnosed with disseminated protothecosis after exposure to cinnamon bark oil (*Cinnamomum zeylanicum*) for 5 hours and canine gastric pH (pH 2.0). A known concentration (OD 600 of 0.5 in 3 mL tryptic soy broth) of pre-characterized *P. zopfii* isolates was incubated for 5 hours, both with and without Cinnamon bark oil (1 µL/mL), at pH 2.0. Aliquots were collected from both test and control groups at one-hour intervals, streaked onto Potato Dextrose Agar plates, and incubated for 24 hours. In all control samples, dense growth of *Prototheca* colonies was observed, whereas test samples treated with Cinnamon bark oil showed no colony formation by the end of the incubation period. The experiments were triplicated. These results indicate that the combination of gastric pH (pH 2.0) and cinnamon bark oil exerts a synergistic inhibitory effect on the growth of *P. zopfii*.

Keywords: *Prototheca zopfii*, canine gastric pH, cinnamon bark oil

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