TITLE: EXPERIMENTAL INFECTION AND TREATMENT WITH POLYPYRROLE SOLUTION OF MASTITIS BY *Prototheca bovis* IN GOATS

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ABSTRACT:

Among the infectious eukaryotic microorganisms of importance for One Health, the algae of the genus *Prototheca* stand out. Infections by these algae have often been reported in recent years in humans, pets and farm animals. The species most involved in health and economic issues in world dairy production are *Prototheca bovis* and *Prototheca blaschkeae* mainly, associated with severe cases of mastitis unresponsive to intramammary antimicrobials approved for use in dairy animals. The economic losses in livestock have been increasing due to the rising number of *Prototheca* sp. infections combined with the absence of effective treatment, consequently leading to the disposal of infected animals. Therefore, effective alternatives for the treatment and control of *Prototheca* spp. infections are urgently needed. In this sense, our research group obtained promising results by testing *in vitro* efficiency of a highly soluble polypyrrole (Ppy) molecule against isolates of *Prototheca bovis* from bovine mastitis. Thus, the present study aimed to evaluate a Ppy solution in an experimental intramammary infection by *P. bovis* in goats. We tested a novel protocol of intramammary infection by *P. bovis* in a small ruminant model (CEUA nº 7487041119). Firstly, the females (n=04) were submitted to a lactation induction protocol using a hormonal protocol (estrogen, progesterone and prednisolone). Subsequently, the lactating goats received an inoculum (10^6 CFU) of *P. bovis* intramammary. After 48 h of inoculation, three goats were treated daily with 2 mL of Ppy solution (300 µg mL^{-1}) intramammary. One female received no treatment and was kept as control. To monitor, whether infection reduction had been achieved, milk samples were collected daily for microbiological culture assays. The microbiological results showed an important reduction in *P. bovis* CFU count in goats treated with Ppy solution. The control animals for the infection and not treated with Ppy solution presented high values of CFU of *Prototheca* spp. The initial analysis of the research project indicates that this alga is capable of infecting the mammary glands of small ruminants, as well as the protocol of experimental of intramammary infection of goats by *Prototheca* sp. can be used in upcoming studies to evaluate various aspects of infection by this important pathogen in an animal model. Additionally, the Ppy solution presents promising results for the treatment of infections caused by *Prototheca* spp.

Keywords: protothecosis, algae, polypyrrole, mastitis

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