

Isolated and nanoencapsulated naringin induce significant mortality on *Leishmania amazonensis* strain

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ABSTRACT

INTRODUCTION: *Leishmania amazonensis* (*L. amazonensis*) is one of the main agents of cutaneous leishmaniasis in Latin America, leading to chronic and potentially severe lesions. Conventional treatments are commonly associated with significant toxicity and limited efficacy, especially in cases of drug-resistant strains. The use of natural compounds represents an emerging alternative therapeutic strategy, with the citrus flavonoid naringin standing out due to its anti-inflammatory and antioxidant properties. However, the compound's clinical application is limited by poor solubility and bioavailability, which can be improved by its nanoencapsulation. **OBJECTIVE:** Evaluate the release profile and antileishmanial activity of free (FNAR) and nanoencapsulated naringin (NNAR) against *L. amazonensis*. **METHODS:** Nanocapsules were produced using the nanoprecipitation method, and the *in vitro* release profile of FNAR and NNAR was evaluated over 8 hours in simulated nasal fluid. Toxicity assays were performed against *L. amazonensis* (MHOM/BR/73/M2269 strain) at concentrations of 0.1, 1, 10, 50, and 100 $\mu\text{g}\cdot\text{mL}^{-1}$ for FNAR, NNAR, and blank nanocapsules (BNC), and evaluated by promastigote counting in a Neubauer chamber. **RESULTS:** The release profile indicated a burst release effect of NNAR, with 80.45% of naringin released over 8 hours. Regarding the toxicity assays, all tested samples induced significant *L. amazonensis* mortality at all concentrations after 48 hours of treatment. Additionally, at 100 $\mu\text{g}\cdot\text{mL}^{-1}$, NNAR and BNC exhibited leishmanicidal activity comparable to that of amphotericin B (positive control). **CONCLUSION:** The proposed nanoformulation demonstrated promising antileishmanial potential; however, further studies are needed using different *Leishmania*

strains, as well as investigations into the leishmanicidal mechanisms of action of naringin and the nanoformulation observed in this study.

Keywords: Flavonoid; cutaneous leishmaniasis; nanotechnology.