Inhibition of growth and peptidase activity of Rhizopus oryzae by the essential oil of Eugenia candolleana DC

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Eugenia candolleana DC. (Myrtaceae), commonly known as "Plum of the forest", “murta” or “murtinha” and occurs mainly in the Atlantic Forest regions of the Brazilian Northeast. The infusion obtained from the leaves is used for treating fever and pain by population, with anti-inflammatory activity already have confirmed scientifically, but there are no reports of studies showing the antimicrobial activity.

Zygomycosis (mucormycosis) is a rare infection oportunistic however highly invasive and fast progress caused by fungi of the *Mucorales* order being *Rhizopus* genus mainly *R. oryzae* the species of the major significance. This mycose is usually associated in diseases haematological, diabetes, organ transplantation, wherein the clinical presentation greater frequency are rinocerebral and pulmonary zygomycosis, may progress to disseminated form. Due to its ability angioinvasive this mycose is characterized by causing infarct and consequently necrosis of the adjacent tissues.

One way this fungus interact with the host causing zygomycosis is through the action of extracellular peptidases, enzymes that besides being essential for fungal growth and survival have been described as factors involved in the infectious process.

Based on the deficiency therapeutic options for the treatment of zygomycosis, the aim of this study was to evaluate the possible the growth and activity of extracellular peptidades R. oryzae inhibition by E. candolleana DC essential oil (EO).

Therefore, was evaluated the *E. candolleana* DC EO antifungal potential, by performance the minimum inhibitory concentration (MIC) based on M38-A2 protocol (CLSI). The MIC obtained for *R. oryzae* was 19.53 ug/ml, what the oil showing a fungistatic effect on this species. In order to find a possible target justifying its antifungal activity, peptidase activity assay was performed [ref] at different pH values, to detect in which ones peptidase action would display, before to be perform the specific pH inhibition. These trials led to inhibition nearly 50% (concentration equivalent to the MIC) for extracellular peptidase activity at pH 3.

The results suggest that the *E. candolleana* DC EO has the potential inhibition of growth of *R. oryzae*, being a target of inhibition the peptidase activity, which stimulate further study to others prime fungal survival factors, as well as the possible (s) constituent (s) bioactive (s) involved contained in this EO, aiming a new therapeutic alternative for the treatment of zygomycosis.

Keywords: peptidase activity, essential oil, *Rhizopus oryzae*, *Eugenia candolleana* DC.

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