Preclinical evaluation of luffa operculata and its main active principle on the treatment of bacterial rhinosinusitis

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The prevalence of rhinosinusitis in the general population is quite high. It is estimated that each adult has, on average, two to five episodes of viral rhinosinusitis per year, while each child of school age suffers from seven to ten annual events. It is estimated that about 70% of upper respiratory tract infections are viral, which means that approximately 300 million episodes of bacterial rhinosinusitis may occur in the U.S. annually. Data from 2002 account for 9% of all antibiotics prescribed to the pediatric population and 21% of the total prescribed for the adult population are due to rhinosinusitis. This makes it the fifth most common disease for which this type of medication is prescribed in the U.S., resulting in expenditures of about $5.8 billion a year. Despite the widespread use of antibiotics for rhinosinusitis, there are other forms of treatment, involving several medications for systemic use and local application. Including fitotherapy. For treatment of rhinosinusitis, perhaps the most widely used herbal medicine in Brazil is Luffa operculata. Chemical analysis of Luffa operculata shows that it contains among its components glucosides, saponin, resin, free sterols, aliphatic esters, quinones, organic acids and phenols. And that does not contain tannins and flavonoids. On the resin are found elaterin A, B and D and isocucurbitacine B.

AIM: The present study aimed to evaluate the efficacy of topical nasal solution of the extract of Luffa operculata at various concentrations, compared to the application of saline for the treatment of bacterial rhinosinusitis in an experimental model in rabbits, determining whether there is inherent toxicity to its use and identifying the most probable active principles presented in the extract. The study was conducted in five groups constituting 3 to therapeutic evaluation in three different concentrations of luffa operculata who were followed for three different time periods, a control group that received only nasal saline solution and one that received the luffa operculata to investigate its toxicity in three concentrations. Each group had twenty animals for each follow-up time. The extract used was evaluated through chromatographic analysis and analytical scale in Shymadzu liquid chromatographer with reverse phase column. Elution was performed in a gradient, at a flow rate of 1.0 mL/min and UV detection at 254 nm. The quantitative analysis used external standard method, and the marker purified was properly identified and used as standard. The substance corresponding to major peak observed in the chromatograms obtained from HPLC-DAD for the aqueous extract was chosen as a marker phytochemical and isolated by fractionation of the extract by solid phase extraction and reverse-phase HPLC-purified following preparative C18. The purified substance obtained as an off-white solid, was identified as dicaffeoylgricaric acid, substance still not identified in the literature. The chromatographic purity of this pattern was determined to be equal to 86.97%. The active principle and the extract of luffa were used for in vitro inhibition of bacterial colonies usually found in rhinosinusitis. No difference in the growth of oxasensitive and resistant Staphylococcus aureus colonies was found in plates of Muller-Hinton, but there was a significant difference in bacterial growth of Streptococcus pyogenes on blood-agar plates when under the influence of both the extract and the active substance. The higher the concentration of the extract of luffa operculata and dicaffeoylgricaric acid, the greater the inhibition of bacterial growth and the samples with the isolated active ingredient were more effective than the samples with extract of Luffa in their concentrations. The animals treated with luffa intranasal showed better clinical conditions during the period of illness. Statistically significant difference (p>0.10) between the treated group and the control group Luffa operculata was observed in the histological evaluation for inflammatory pattern in samples taken from the nasal mucosa of rabbits. These histological results were consistent with the results of the WBC, which also showed differences between the study and control groups during treatment.

Keywords: luffa operculata. Dicaffeoyl acid. Rhinosinusitis. Streptococcus pyogen.