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Scientific Letters

II TOXRUN
International Congress 2023
27-28 April, 2023 | Porto, Portugal

Poster 6

In vitro antibacterial and cytotoxic activity of *Laurobasidium lauri* extracts

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Abstract

Background: Plants and mushrooms have been used as medicines for many years, as a source of antibiotics, antineoplastics, among others [1]. Research have been conducted on the medicinal uses of Portuguese plants, however, the therapeutic potentials of some of these plants used in traditional medicine, has remained unexploited. **Objective:** This study aims to evaluate antibacterial and cytotoxic activities, *in vitro*, of *Laurobasidium lauri*, a well-known fungus used in folk medicine on Madeira Island. **Methods:** An experimental study was performed using two extracts (aqueous and ethanolic 55% (V/V)) of the fungus isolated and in combination with three medicinal plants (*Parietaria judaica*, *Polygonum aviculare*, and *Peperomia galioides*). The antibacterial activity was evaluated against *Escherichia coli* and *Staphylococcus aureus*, through disc diffusion and broth microdilution methods. Cytotoxicity was evaluated using MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay. **Results:** Regarding the disc diffusion method *E. coli* was not susceptible to any of the extracts, except for the antibiotic (41.0 ± 1.0 mm). However, *S. aureus*, when subjected to 10 mg/ml of the ethanolic extracts of *L. lauri* (isolated and in combination) exhibited an inhibition with a diameter of 16,3 ± 2,5 mm and 12,0 ± 1,7 mm, respectively, when compared to the control, ciprofloxacin (24,0±1,0 mm). Also, the ethanolic extract of the isolated fungus had the best value of minimum inhibitory concentration (MIC) for *S. aureus* (MIC = 0.078125 mg/mL). The ethanolic extract of the fungus in combination with medicinal plants showed greater cytotoxic action on lung cancer cells A549 (IC_{50} = 48.3±1.0 µg/mL). **Conclusions:** The fungus presented cytotoxic and antibacterial potential, and the results observed may be related to some bioactive compounds (e.g., costunolide and dehydrocostuslactone, two natural sesquiterpene lactones present in *Laurus* trees, where the fungus grows) [2]. However, more research is needed to confirm these biological activities and mechanisms of action.

Keywords: *Laurobasidium lauri*; antibacterial activity; cytotoxicity

Acknowledgments

This research received no external funding.

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