

Antimicrobial spectrum, cytotoxicity in 3D culture model and toxicity *in vivo* in *Galleria mellonella* of ethanol extract *Syzygium cumini* (L.) Skeels.

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Prospecting studies for the development of new drugs without toxicity and with antimicrobial activity mainly due to the appearance of resistant microorganisms are extremely relevant. Brazil is the largest producer of biodiversity in the world and as part of this biodiversity arises the interest of study in *Syzygium cumini* (L.) Skeels, popularly known in Brazil as Jambolão, Jamelão ou Azeitona-Roxa, by its biological properties. In this way the aim of this study is to evaluate the antibacterial and antifungal activity, as well as *in vivo* cytotoxic and toxicological activity in alternative model of *Galleria mellonella* of fruits ethanol extract of *Syzygium cumini* (L.) Skeels. The MIC and MEC (minimum inhibitory concentration and minimum eradication concentration) was evaluated to fungal strains (*Candida* spp., *Trichophyton rubrum*, *T. mentagrophytes*) and bacterial strains (*Staphylococcus aureus*, *S. epidermidis*, *Pseudomonas aeruginosa* e *Cutibacterium acnes*), all the strains used were ATCC (American Type Culture Collection). The evaluation of susceptibility from microorganisms was performed according to the CLSI (Clinical and Laboratory standards Institute) (M27 A2, 2008) for the yeasts, (M38-A, 2003) for the filamentous fungi (M07A10, 2015 and M11A8, 2012) for the bacterial aerobic and anaerobic respectively. The cytotoxicity assay was performed using 3D culture model in HaCaT (Human Keratinocyte Cell), using sulforhodamine B 0.1%. For the toxicological evaluation was used the alternative model with *Galleria mellonella*. The statistical analysis was performed considering $p < 0.05$. The ethanol extract *Syzygium cumini* (L.) Skeels showed a strong antifungal activity MIC (7.8 µg/mL to 15.6 µg/mL) and MEC de (31.3 µg/mL to 125 µg/mL) to strains of *Candida* spp. and *Trichophyton* spp. The evaluation of antibacterial activity showed MIC and MEC values between (500 µg/mL and >500 µg/mL). The extract under study did not show cytotoxicity from the highest concentration tested of 500 µg/mL, reaching 100% of cell viability in the concentration of 31.3 µg/mL. In the assay in *Galleria mellonella* was not observed toxicity on laves survival test in the concentration of 4.000 µg/mL. We concluded that the extract under study presented a high antimicrobial activity, without cytotoxicity and without *in vivo* toxicity, proving that it can become a very promising alternative for the treatment of the large spectrum.

Keywords: *Syzygium cumini*, antimicrobial activity, *Galleria mellonella*, 3D culture model.

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