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Section:

ANTIMICROBIAL PROPERTIES OF EUGENIA SPP.: ACTIVITY AND MECHANISMS AGAINST BACTERIAL AND FUNGAL PATHOGENS

Patryne L. da S. Dantas[1*], Leticia Bachmann[1], Alysson C. Blaese[2], Raquel Oppermann[1]; Adrielli Tenfen[2]; Tatiani K. R. Botelho[1], **Michele D. Alberton[1,2]**

michele@furb.br

1- Programa de Pós-Graduação em Biodiversidade, Universidade Regional de Blumenau. 2- Programa de Pós-Graduação em Química, Universidade Regional de Blumenau, Rua Antônio da Veiga 140, Blumenau, SC, Brazil, 89030-903.

The antimicrobial activity of the hydroalcoholic extracts of *Eugenia mattosii*, *E. astringens*, *E. catharinensis*, *E. involucrata*, *E. brasiliensis*, and *E. platysema* was evaluated against *S. aureus*, *E. coli*, *K. pneumoniae*, *P. aeruginosa*, *Salmonella* sp. (clinical strain), *S. aureus* MRSA (clinical strain), *S. epidermidis* (clinical strain), *C. albicans*, *C. parapsilosis*, and *C. krusei* (clinical strain), following CLSI (2012) and CLSI (2017) protocols. The project is registered in SISGEN under number A7519AA. *E. astringens* showed the most potent antimicrobial activity, with MIC values of 14 µg/mL against *S. aureus*, MRSA, and *S. epidermidis*. *E. brasiliensis* and *E. mattosii* also exhibited activity, particularly against Gram-positive strains (MIC 125–250 µg/mL). Among the tested yeasts, *E. astringens*, *E. brasiliensis*, and *E. mattosii* displayed the strongest antifungal effects, notably against *C. parapsilosis* (MIC 31, 31, and 62 µg/mL, respectively). The fractionation of *E. astringens* and *E. mattosii* confirmed their antimicrobial potential. For *E. astringens*, the insoluble fraction exhibited the strongest activity against *S. aureus* and MRSA (MIC < 7 µg/mL), while the aqueous fraction was highly active against *S. epidermidis* (MIC < 7 µg/mL). The aqueous fraction of *E. mattosii* was the most active, with MIC of 31 µg/mL against *C. parapsilosis*. The ethyl acetate and insoluble fractions also presented activity, with MIC values ranging from 62 to 125 µg/mL against *S. aureus* and *C. parapsilosis*. The addition of exogenous ergosterol markedly increased the MIC or completely abolished the antifungal activity of *E. astringens* and *E. mattosii* against *C. parapsilosis*. This behavior parallels the control amphotericin B, whose MIC increased from 3.9 µg/mL to 500 µg/mL when ergosterol was present. Together, these findings strongly suggest that the antifungal action of *E. astringens* and *E. mattosii* is associated with interactions at the fungal cell membrane, likely involving ergosterol binding. No evidence of fungal cell wall involvement was observed in the sorbitol assay. The study is ongoing with the phytochemical characterization of the evaluated extracts.

Keywords: *Eugenia; Antimicrobial activity; Fungal Cellular Membrane*