

Antibacterial Activity of Triterpene Acids and Semi-Synthetic Derivatives against Oral Pathogens

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Triterpene acids (ursolic, oleanolic, gypsogenic, and sumaresinolic acids) isolated from *Miconia* species, along with a mixture of ursolic and oleanolic acids and a mixture of maslinic and 2- α -hydroxyursolic acids, as well as ursolic acid derivatives were evaluated against the following microorganisms: *Streptococcus mutans*, *Streptococcus mitis*, *Streptococcus sanguinis*, *Streptococcus salivarius*, *Streptococcus sobrinus*, and *Enterococcus faecalis*, which are potentially responsible for the formation of dental caries in humans. The microdilution method was used for the determination of the minimum inhibitory concentration (MIC) during the evaluation of the antibacterial activity. All the isolated compounds, mixtures, and semi-synthetic derivatives displayed activity against all the tested bacteria, showing that they are promising antiplaque and anticaries agents. Ursolic and oleanolic acids displayed the most intense antibacterial effect, with MIC values ranging from 30 $\mu\text{g/mL}$ to 80 $\mu\text{g/mL}$. The MIC values of ursolic acid derivatives, as well as those obtained for the mixture of ursolic and oleanolic acids showed that these compounds do not have higher antibacterial activity when compared with the activity observed with either ursolic acid or oleanolic acid alone. With regard to the structure-activity relationship of triterpene acids and derivatives, it is suggested that both hydroxy and carboxy groups present in the triterpenes are important for their antibacterial activity against oral pathogens.

Key words: *Miconia*, Triterpene Acids, Antibacterial Activity, Oral Pathogens