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Syncephalastrum racemosum BIOTRANSFORMATION UNDER PROCAINE EPIGENETIC MODULATION OF NEROL LEADS TO *α*-TERPINEOL

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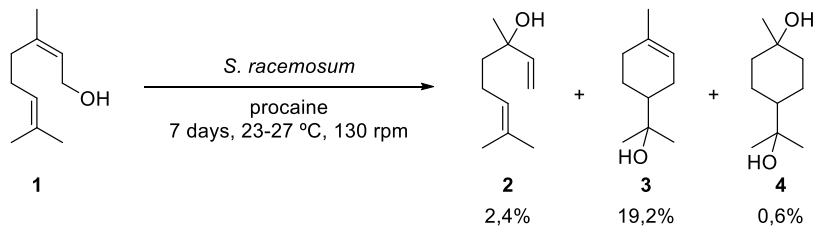
Novel approaches to fungal biotransformation can be a potential strong tool for the acquirement of a wide variety of organic structures. Epigenetics describe modifications in gene expression without alterations in the DNA sequence, and epigenetic modulation is the study of chemical modifications in biosynthetic gene clusters located in inaccessible regions of chromosomes. In this sense, the incorporation of epigenetic modifications to fungal strains under biotransformation processes could help optimize yields and lead to the production of compounds not found in non-modulated processes. Given the importance of monoterpenoids to the flavor and fragrances industry, they are widely employed as substrates for biotransformations. To evaluate the effects of the epigenetic modulator procaine hydrochloride on the biotransformation of nerol (**1**) by the filamentous fungus *Syncephalastrum racemosum*, biotransformation assays were conducted with and without procaine. The assays were performed in triplicate with nerol (**1**) added to grown cultures of *S. racemosum*, under 130 rpm orbital shaking at 23-27 ºC. In the epigenetic modulated assays, procaine hydrochloride was added to the culture media during inoculation. After 7 days, the assays were extracted with ethyl acetate and submitted to analyses by gas chromatography coupled to mass spectrometry (GC-MS). Linalool (**2**), *α*-terpineol (**3**), geraniol, 1,4-mentane-1,8-diol (**4**) were identified as biotransformation products, and there were four unknown products. It was observed that the conversion rate of *α*-terpineol (**3**) increased from 1,2% to 19,2% in the presence of procaine hydrochloride, while the minor products were obtained between 0,6% and 2,4%. The conversion rates of products without epigenetic modulation did not surpass 6%. Thus, the presence of procaine as an epigenetic modulator not only improved the conversion of products but also made the transformation more selective. These results represent unprecedented data on alterations in the biotransformation pathways of filamentous fungi through the incorporation of epigenetic modifiers.



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