BIOCONVERSION OF $\alpha$-PINENE AND $\beta$-PINENE FOR THE PRODUCTION OF NEW FLAVOR COMPOUNDS BY FUNGAL ENDOPHYTES

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Fungal endophytes represent a potential source of novel natural products for medicinal, agricultural and industrial uses, such as antibiotics, anticancer agents, biological control agents, and other bioactive compounds. Despite the great potential of these microorganisms, their potential has not been investigated for the biotransformation of terpenes. Therefore, the aim of the present work was to investigate the biotechnological potential of five fungal endophytes isolated from Baru (Dipteryx alata Vog.) and, accordingly, it was proposed the biotransformation of the monoterpenes $\alpha$-pinene and $\beta$-pinene for the production of new flavor compounds. The preliminary results showed that the fungal strains LBBR01, LBBR02 and LBBR04 bioconverted $\alpha$-pinene into verbenol (85% similarity in MS results and confirmed with commercial standard), after 24 hours of contact with the terpene. Although this product was recurrent from three fungal strains, the highest concentration of this compound was achieved by LBBR02. Quantification of verbenol showed a maximum production around 72 hours, reaching 80 mg.L$^{-1}$, and its production occurred based on the biochemical reaction of hydroxylation of $\alpha$-pinene. The strain LBBR05 produced verbenone from the biotransformation of $\alpha$-pinene and accumulated $\alpha$-terpineol when $\beta$-pinene was used as substrate. The products achieved in this paper are of great industrial interest and the biotransformation of pinenes by fungal endophytes appeared as a promising alternative for commercial production of these bioflavors. Thus, this work demonstrates a partial use of these microorganisms in biotechnological processes and their potential as source of new flavor compounds from the biotransformation of terpenes.