

Microbial Hydroxylation of Tedonodiol with Cultures of *Aspergillus Niger*

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Abstract: Microbial hydroxylation of tedonodiol, an eremophilane alcohol, was carried out with *Aspergillus niger* cultures, yielding the 2 α - hydroxyderivative.

Introduction

Since 1986, we have performed a project enclosed in an extraction of carbonyl α,β -unsaturated compounds from natural sources and chemical transformations of them, in order to provide metabolites to be tested as gastrointestinal cytoprotective agents [1]. In this context we have carried out biotransformation reactions of tedonodiol, an eremophilane alcohol, isolated from *Tessaria dodoneaeifolia* [2]. Several *Aspergillus niger* strains were used with this purpose.

Experimental

Culture media

Modified Czapek broth [3] was used for performed bioconversions assays, and agar Czapek was used to maintain the strains.

Strains

Aspergillus niger ATCC 11394, *Aspergillus niger* Buenos Aires and a regional *Aspergillus niger* strain isolated from leaves of *Artemisia douglassiana* Besser.

Culture conditions

Biotransformations were carried out by two steps fermentation procedure [4]. Fermentations were performed in conical flasks (3 x 125 ml) with 25 ml of culture medium, on shaken at 180 r.p.m. and incubated at 28°C. Substrate was dissolved in DMSO and added to 72 h old cultures (final concentra-

tion $1\text{mg}\cdot\text{mL}^{-1}$). The process was continued for 7 days. Biotransformation product was recovered from the broth by liquid - liquid extraction with Et_2O . Extracts were concentrated, and the solid was purified by C.C. with *n*-hexane - EtOAc mixtures of increasing polarity.

Results and Discussion

Only the fermentation process carried out with *Aspergillus niger* Buenos Aires yield a more polar product than tedonodiol in the fraction *n*-hexane - EtOAc (20 : 80). By the comparison of the substrate and product ^1H - NMR spectra it was possible determined that an α - hydroxyl group incorporated on C-2. A new signal at δ 4.12 *ddd* ($J_1=J_2= 2.9$ Hz y $J_3= 3,8$ Hz) corresponding to the new allylic oxygenated methine group, confirm this fact.



Usually, microbial hydroxylation shows high *regioselectivity* on molecules with activated positions [5], like tedonodiol C-2 allylic position.

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References and Notes

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