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CYANOHYDRINE DERIVATIVES FROM URIDINE VIA BIOTRANSFORMATION WITH OXYNITRILASES

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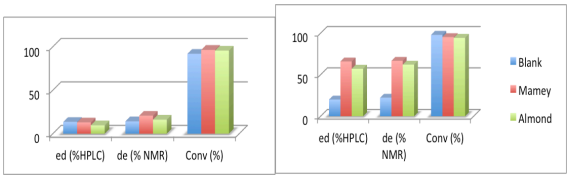
Introduction. Biocatalysis is a continously growing area since it represents a better option for green synthesis. Indeed, this is clean, non-polluting and stereo- and regioselective methodology.
Nowadays, biocatalysis is a tool used for synthesizing chiral compounds in an enantiomeric pure form where the traditional synthesis fails or when they are high value products such as some drugs (1).
Oxynitrilases is a kind of enzymes not so exploited in organic synthesis, and proved increasingly interesting, due to optically active cyanohydrins which can be intermediates of many compounds of industrial interest, an example can be uridine derivatives as a building blocks for many other compunds with pharmacological properties such as antitumoral, antiviral, antifungal, antibiotic and anthelmintic (2).
In this work we demostrated the asymmetric synthesis of cyanohydrine uridine derivatives using oxynitrilases from several natural sources as biocatalysts.

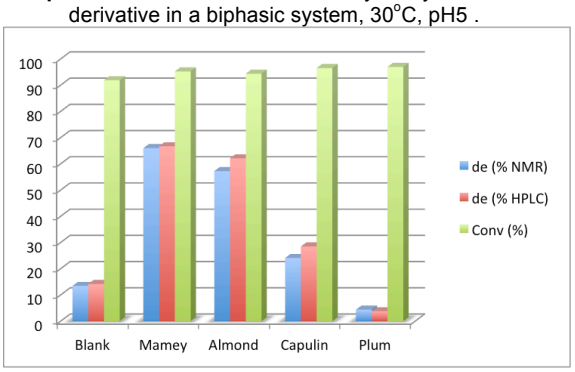
Methods: The biocatalysts were prepared as crude acetone dried powders from almond (*Prunus dulcis*), plum (*P. domestica*), capulín (*P. serotina var. capuli)* and mamey (*Pouteria sapota*), used without further purification (3).
^{1}H NMR spectra were recorded on a Varian 400 MHz instrument, in $CDCl_3$ using tetramethylsilane as internal reference; HPLC analysis was performed on an Agilent 1100 liquid chromatograph with a diode array detector, using a Chiracel OJ-H column.

Results: The biotransformation results are presented in the Graphics 1 and 2.

Graphic 1. Comparative results from biotransformation of uridine with pH4 and pH5 using almond and mamey biocatalysts, 30°C.



Graphic 2. Diasteromeric excess of cyanohydrin uridine derivative in a biphasic system, 30°C, pH5 .



Conclusion: The best results were from mamey and almond powders when used as a biocatalysts and pH5 at 30°C in a biphasic system.

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References:

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