ENZYMATIC TRANSESTERIFICATION OF FLAVONOIDS

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Introduction. Has been evidence that flavonoids have beneficial health properties, however, the use of flavonoids in several domains is limited by their low stability and solubility in the fatty and aqueous phases. One solution to improve their hydrophobic nature is its esterification; this chemical reaction leads to a mixture of products. To overcome this problem, enzymatic catalysis is an option for its regioselectivity. The lipases are capable of promoting the synthesis of the ester, when the reaction is carried out in a low water activity.
The objective of this work is to transform flavonoids via a transesterification reaction with acids activated with lipases

Methods. Three methods were tested for the enzymatic reaction, in this methods varied, concentration of enzyme, of flavonoid and the ratio of acylating agent. In a typical experiment was carried with 50 mg of lipase, were added to the reaction mixture, which consisted of 70mg of flavonoid, 5ml solvent and 210mg fatty acid [1-3] using naringin and rutin. Incubation was carried out at 50 ◦C under magnetic stirring, in the presence of molecular sieves. Acids were chosen based on those reported in [4-5]. Esters were purified by chromatography on silica gel preparative and identification was realized according to what reported in [4]

Results. The best conversion reaction was observed using method 3. The choice of method was made only in a qualitative analysis by TLC.

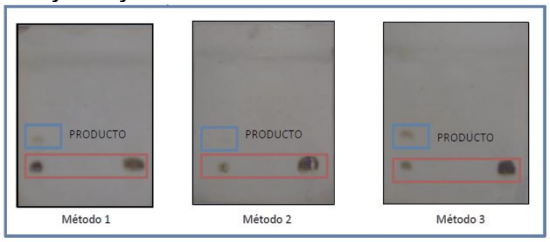

Fig.1 Thin layer chromatography of the three methods used

With conditions found it was observed that the reaction is carried with all the tested fatty acids (octanoic acid, decanoic acid, palmitic acid and castor oil)

Two lipases were tested *C. cylindracea* and enzyme cocktail Sternzym EFX Mega (esterases and hemicellulases).
The results were not observed to carry out the reaction with the enzymes tested, only the lipase from *C. antarctica* which is already known from previous studies.

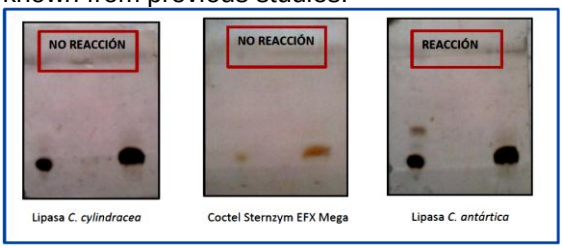

Fig.2 Thin layer chromatography obtained for enzyme were tested.

The products were purified, their Rf similar to data reported in [1], were evaluated by a nuclear magnetic resonance analysis to verify that the desired products.

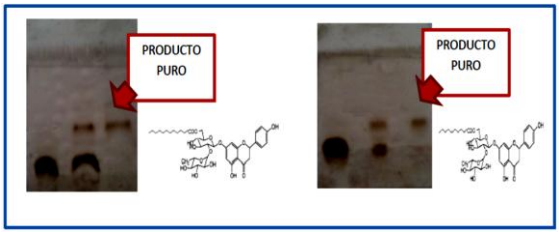

Fig.3 Thin layer chromatography obtained from the purification of the products

Conclusions. Lipase of *C. antarctica* is capable of carry out the esterification reaction of flavonoids naringin and rutin with fatty acids used. With the purification of the products and their identification is observed regioselectivity of the enzyme reaction.

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