ENZYMATIC SYNTHESIS OF A HYDROXYTYROSOL OLEATE

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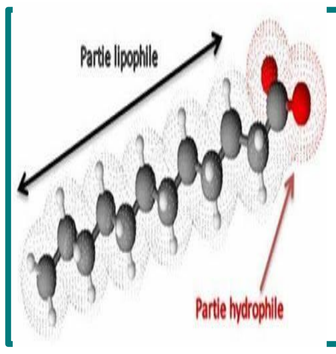
Introduction



Biosurfactants are amphiphilic, surface-active and biologically effective molecules of high biotechnological interest. Many studies have shown that olive oil phenols, in particular oleuropein, hydroxytyrosol and tyrosol, are natural polyphenols with antioxidant activity and known health benefits. In addition, these molecules have been used in enzymatic synthesis . However, lipase has also been reported as a good biocatalyst in synthetic reactions, especially in organic solvents, non-aqueous solvents and in a medium with low water activity so that the thermodynamic equilibrium of the reaction directed to the synthesis reaction instead of hydrolysis.

Leather process

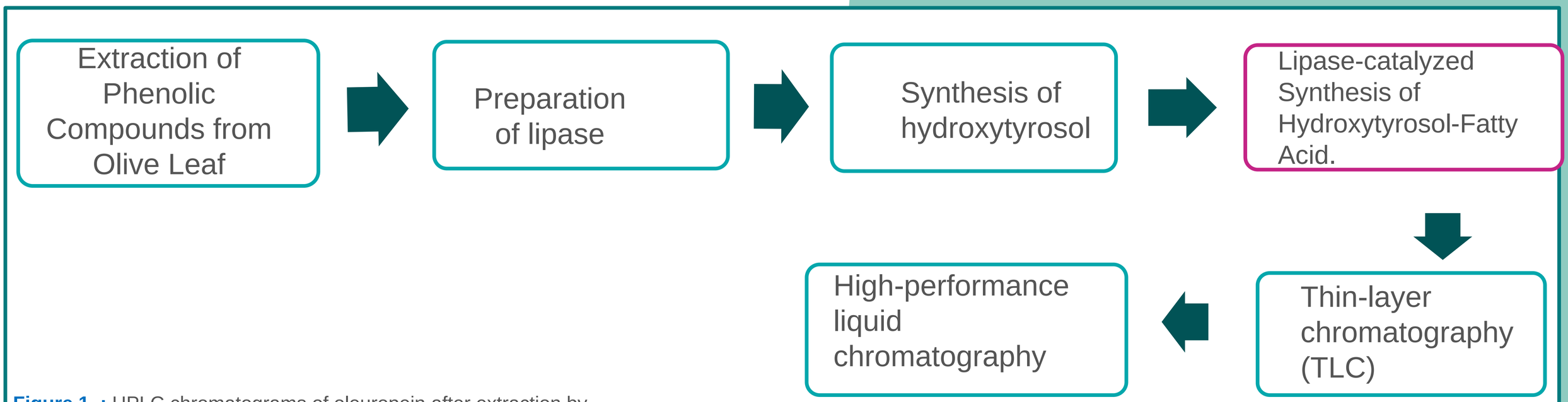


Figure 1 : HPLC chromatograms of oleuropein after extraction by acetate d'ethyl.

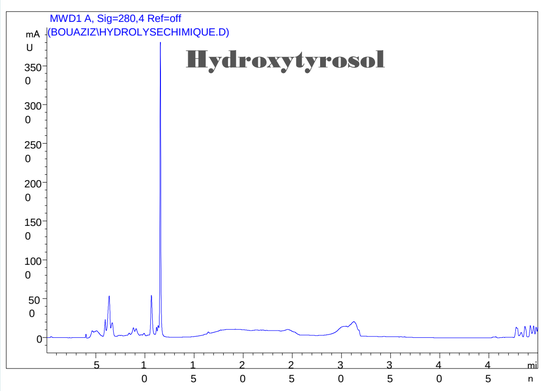


Figure 2 : HPLC chromatograms of hydroxytyrosol chemical hydrolysis products.

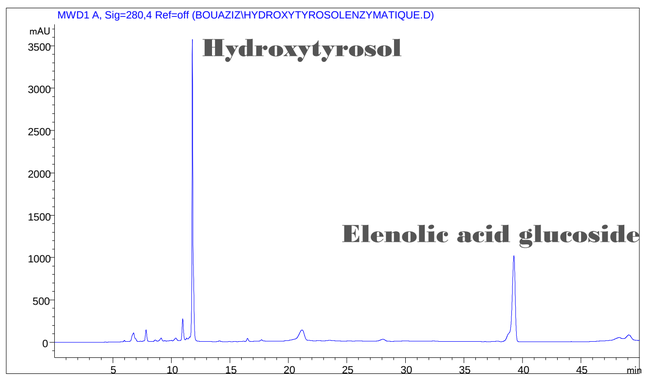
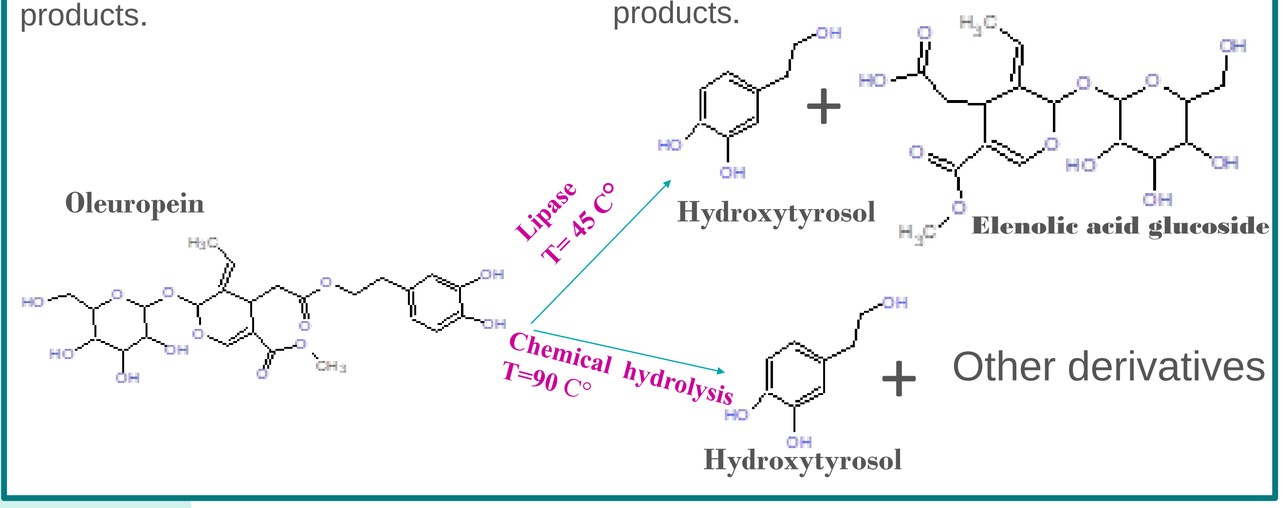


Figure 3 : HPLC chromatograms of hydroxytyrosol enzymatic hydrolysis products.



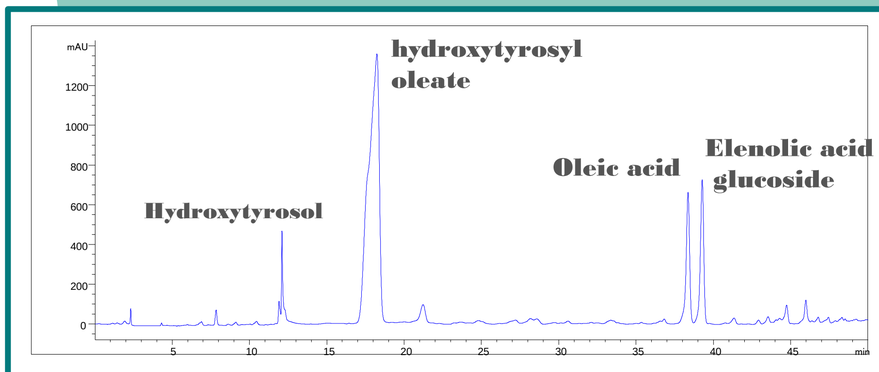


Figure 4 : HPLC chromatograms of hydroxytyrosyl oleate by lipase from Candida antarctica B (Novozym 435) .

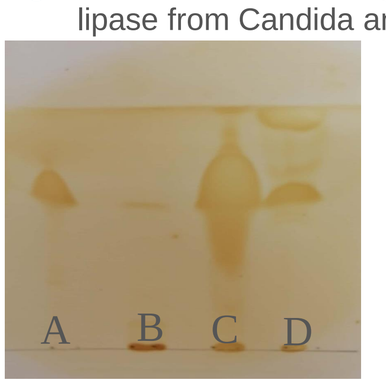


Figure 5: Thin-layer chromatography of hydroxytyrosyl oleate. ane (A) corresponds to the oleic acid ; lane (B) corresponds to the hydroxytyrosol ; lane C corresponds to the product synthesized in presence of serratia sp w3 lipase ; D corresponds to the product synthesized in presence of lipase from Candida antarctica B (Novozym 435).

The synthesis reaction in the presence of serratia sp w3 lipase remains optimized.

Conclusion

In conclusion, in this work we have demonstrated that hydroxytyrosyl oleate know as a semi-synthetic lipophilic derivative of hydroxytyrosol. Furthermore, these two lipase serratia sp w3 and novozyme 435 able to realize esterification reaction between oleic acid and hydroxytyrosol . these resultes are confirmed by HPLC and TLC .

HPLC suggest that hydroxytyrosol and elenolic acid are hydrolysis reaction products and are created from oleuropein . in addition, hydroxytyrosol aleate result by esterification by lipase from candida antarctica B (Novozym 435) .