Enzymatic cleavage of tannins to obtain valuable catechin-type substances

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INTRODUCTION:

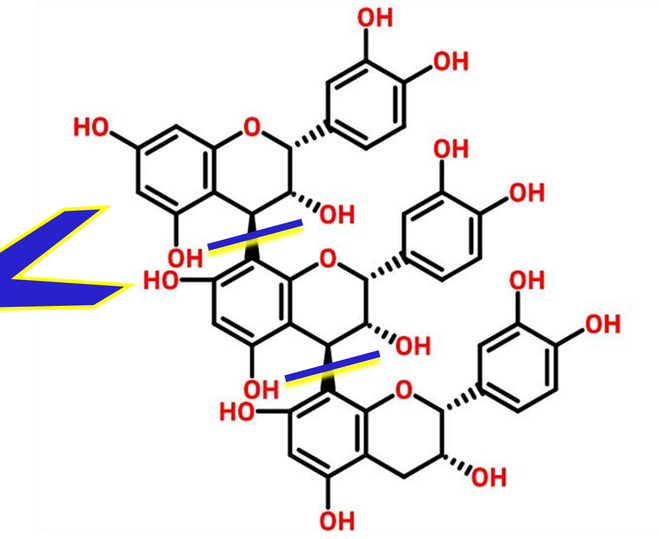
Tannins are getting more attention by taking part in diverse traditional and potential hybrid applications[1,2]. A lot of work has been done on smaller units (monomers), howerer, there is only a limited amount of studies on polymeric proanthocyanidins (condensed tannins) due to their high structural variability[3]. Moreover, standards for their analysis are either not available or ranging in hundreds of euros for a few miligrams for getting a pure and well-defined substance.

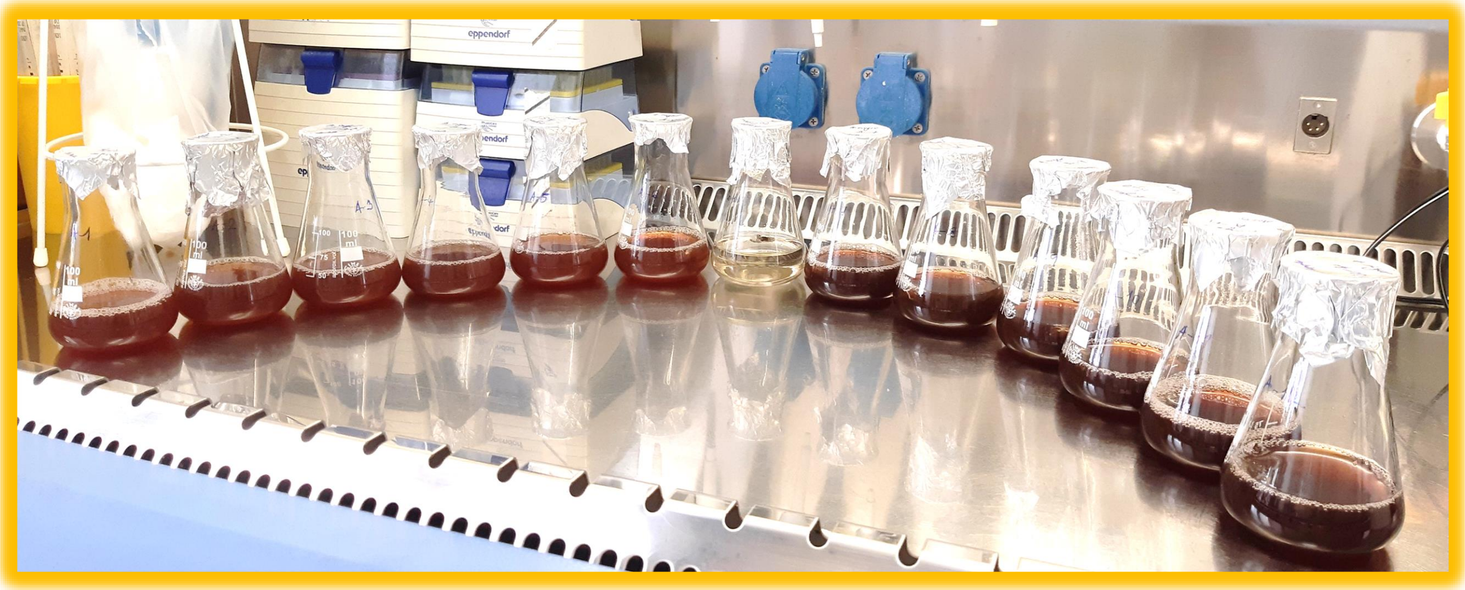
Dixon *et al.*[4] described the tannin condensation reactions as a “black box”. Since then, the current trend goes towards achieving a clear understanding of the complex, polymeric proanthocyanidins by depolymerization[3]. Such attempts to purify and fractionate condensed tannins have been recently made by simple and sequential solvent extractions[5,6]; in acid[7] and alkaline environments[8]. In order to continue with eco-friendly approach, whereas enzymes might react even more specific than chemicals, this research aims to:

i) develop an enzymatic procedure for cleavage of condensed tannins;
ii) develop a separation method by high-performance liquid chromatography (HPLC); and
iii) characterize the products by newly developed separation method (HPLC) and optimized assays using UV-VIS spectrophotometry.

MATERIALS AND METHODS:

- three independent series for enzymatic cleavage of condensed tannins
- products separation and analysis by high-performance liquid chromatography
- enzymatic activities determination





RESULTS AND NEXT STEPS:

- cultivation was successfully completed
- growth parameters and cultivation conditions were compared
- enzymatic activity is currently studied
- combined HPLC-method for products determination will soon be optimized
- efficiency of selected parameters relating to fractionation will be explained

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