

## VALORIZATION AND OPTIMISATION BY EXPERIMENTAL DESIGN OF THE EXTRACTION TANNINS FROM THE BARK OF THE CORK OAK OF QUERCUS L

LAKEHAL Imane <sup>\*1</sup>, SEFFAH Karima <sup>1</sup>, OURIECHE Hadjer <sup>2</sup>

<sup>1</sup>University Algiers1-Ben Youcef Benkhadda, science of matter department, faculty of sciences, Algiers, Algeria.

<sup>2</sup> University Blida 1, Natural and life Sciences department, faculty of sciences, Blida, Algeria.

Code CCO15

Email\*: [i.lakehal@univ-alger.dz](mailto:i.lakehal@univ-alger.dz)

### Introduction & Objectives:

Tannins are substances of plant origin, widely used in the medical field for their pharmacological activities as active principle (anti-inflammatory skin, hemostatic, etc. ...), we chose to highlight an oak, and not least because it is the cork oak which is common in Algeria and present throughout the Mediterranean basin. Indeed we are interested in the content of total tannins in the bark of cork oak.

### Methodology (Material and methods):

The total tannins, was the main objective of this study. They will be used to verify the antidiabetic activity. Three extraction methods were studied: maceration, infusion and decoction. The experimental design was used to determine the influence of the following factors: ethanol ethanol concentration, temperature and ratio (mass:volume), as well as the effects of interactions to optimize the extraction by decoction, the experiments were organized according to a factorial design with three factors at two distinct levels, using the statistical software JMP 8.0.

### Results and Discussion:

The results that the highest tannin content is 0.6787 g/l associated with the decoction followed by the infusion which has a content of 0.3523 g / l, as regards maceration, water or ethanol, the tannin content obtained is negligible compared to the previous methods (0.0455g/l and 0.0157 g/l). The total tannin contents of the experiments are studied according to the full factorial design, the regression of the model and statistical tests of the experimental responses against the predictions showed that the square correlation coefficients  $R^2$  and adjusted  $R^2$  were equal to 0.996133 and 0.969068. Only 0.1% of the total variance could not be explained by the model used. The high values of these two coefficients (almost 1) and their significant agreement quality of the model. The student test showed that all the coefficients are not significant except for X2, this result was verified by the Pareto Chart test.

### Conclusion:

In this study we extracted total tannins from cork oak bark by different extraction methods different extraction methods, trying to find the method with the highest content of total tannins quantified by UV-visible spectroscopy is the highest, which led to the choice of choose the decoction. A mathematical model was assigned to the extraction of total tannins using the full factorial design that allowed us to determine the maximum desirability and the optimal conditions to have the best total tannin content of bark of cork oak.

**Keywords:** *Quercus suber* L, bark, valorisation, extraction, Tannins and experimental design.

