

# Silymarin extraction from *Silybum maritimum* seeds using Pressurized Liquid Extraction as a green and efficient technology.

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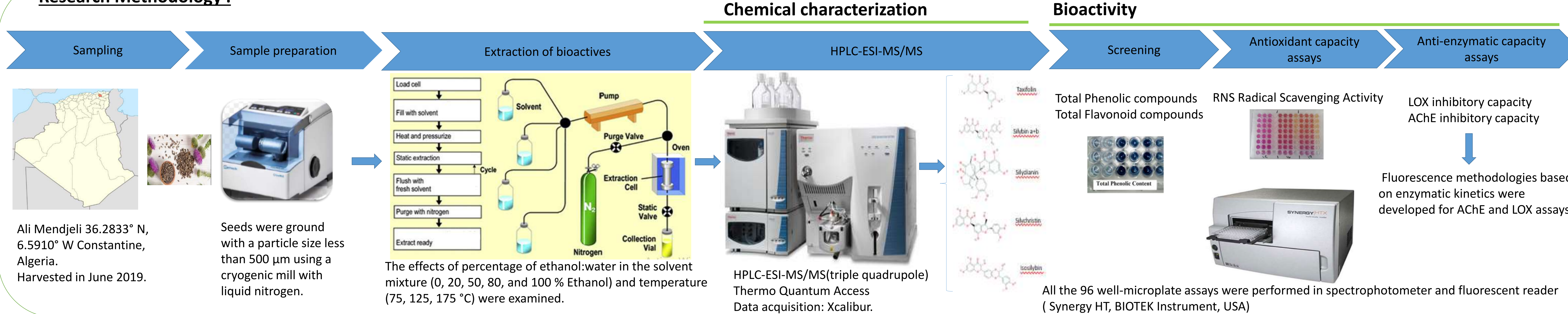
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## Introduction:

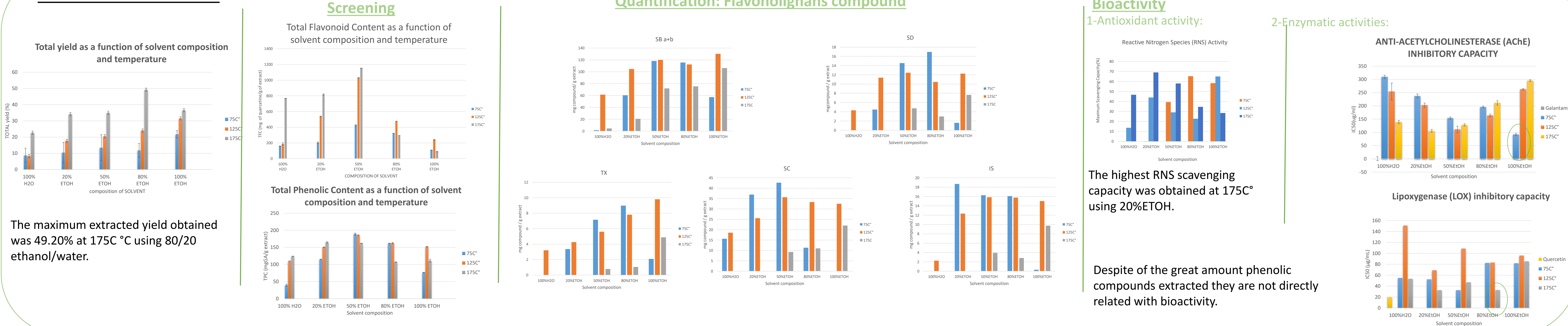
It well-known that Silymarin complex (a mixture obtained from the seeds of milk thistle, *Silybum maritimum*) display a wide range of biological activities, including antioxidant, anti-inflammatory, cytoprotective and neuroprotective properties [1]. The classic method to isolate the Silymarin, consist of two steps, one to remove the lipids using hexane for 5 to 7 hours, followed by an organic solvent extraction. However, this process has many drawbacks such as long operation time, large solvent volume, inadequacy for thermolabile compounds.

Many green extraction methods of bioactive molecules using, for example, supercritical fluid extraction [2], ultrasound assisted extraction [3], pressurized liquid extraction [4], enzyme assisted [5] or microwave assisted [6] extractions. In the present research, we focused on PLE, which is an innovative technique to get natural extracts from plants with high quality that combines elevated temperature and pressures with solvents to achieve fast and efficient extraction with a wide range of compounds polarities [7]. The aim of this study was to develop a PLE process using green solvents followed by the analytical characterization using UHPLC-ESI-MS/MS to maximize the extraction of different Flavonolignans from *Silybum maritimum* seeds. Furthermore, bioassays were performed to evaluate the evaluation of antioxidant, anti-inflammatory and anti-Alzheimer activities of the extracts as a function of the extraction conditions.

## Research Methodology :



## Results and discussion:



## Conclusion :

The PLE procedure presented here is a green and efficient method for extraction and quantification of Silymarin compounds. The neuroprotective potential of the extract obtained was confirmed by the strong in vitro inhibition capacity of both Lipoxygenase (LOX) and Acetylcholinesterase (AChE). In addition, the good antioxidant activity, as confirmed by the Reactive Nitrogen Species (RNS). Further work must be done to correlate bioactivity with composition. The knowledge gained from this study should contribute to the further development and application of this plant. The work shown here is an initial step in the development of bioprospecting of bioactive compounds from endemic plants of Algeria and North Africa.

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