

**EFFECT OF HYDRO-ALCOHOL SOLVENT POLARITY ON THE  
ANTIOXIDANT, ANTIBACTERIAL AND ANTI-INFLAMMATORY  
ACTIVITIES OF FOUR MOROCCAN LETTUCE VARIETIES  
(*Lactuca sativa* L.): A COMPARATIVE STUDY**

**Badr Zekkori<sup>1</sup>, Amar Bentayeb<sup>1</sup>, Abdelaziz Ed-Dra<sup>2</sup>, Fouzia Rhazi Filali<sup>2</sup>, Aissam Sbai<sup>1</sup>,  
Nisrine Chlif<sup>1</sup>, Mohamed El Omari<sup>1</sup> and Farid Khallouki<sup>3</sup>✉**

<sup>1</sup> Department of Chemistry, Team of Physical-Chemistry of Condensed Matter, Moulay Ismail University,

<sup>2</sup> Team of Microbiology and Health, Laboratory of Chemistry-Biology Applied to the Environment, Moulay Ismail University Faculty of Sciences, BP. 11201 Zitoune Meknes, Morocco

<sup>3</sup> Team of Ethnopharmacology and Pharmacognosy, Faculty of Sciences and Techniques Errachidia, Moulay Ismail University, BP 509, Boutalamine, Errachidia, Morocco

✉ [farid\\_khallouki@yahoo.fr](mailto:farid_khallouki@yahoo.fr)

<https://doi.org/10.34302/crpjfst/2021.13.4.11>

**Article history:**

Received:

8 August 2021

Accepted:

24 August 2021

**Keywords:**

*Lactuca sativa* L.;

Solvent polarity;

Antioxidant activity;

Antibacterial activity;

Anti-inflammatory activity.

This research work aimed to find a correlation between solvent polarity on the extraction yield, on the content of polyphenols and flavonoids as well as on the antioxidant, antibacterial and anti-inflammatory potencies of two red and two green varieties of *Lactuca sativa* L. hydroalcoholic extracts.

The results showed that extraction with polar solvent (H<sub>2</sub>O, 100%) presented maximal yields while the alcohol alone gave the lowest yields. Furthermore, the mixture between these two solvents with different proportions (alcohol with water) showed more other interesting characters than alcohol or water taken separately. Phytochemical contents were affected by varying solvent polarity, within, the extraction with solvent polarity 5.8 (H<sub>2</sub>O 25% /Ethanol 75%) showed the highest content of total polyphenols while the polarity of 7.3 (H<sub>2</sub>O 50% / Ethanol 50%), was specifically richer in flavonoids. Our results further showed that the extracts of the two red varieties (*capitata* L *nidus tenerrima* and *crispa*) exhibited a broad spectrum of bioactivities more significantly than the two green varieties (*longifolia* and *capitate* L *nidus jaggeri*). The hydro-alcoholic extracts of polarity 5.8 were the most effective *in vitro* and *in vivo* in the evaluation of the antioxidant, antibacterial and also anti-inflammatory capacities with the best activity against DPPH was recorded for the red variety *Lactuca sativa* var. *crispa*, moreover, this same extract at 1 mg / ml showed a maximal inhibitory activity of 80.8% on the bovine serum albumin denaturation, it showed also a comparable anti-inflammatory effect to dexamethazone which is achieved at high concentrations (2 to 4 g / Kg).