

## Impact of different extraction solvents and concentrations on the total phenolics content and bioactivity of the Algerian lemongrass (*Cymbopogon citratus*) extracts

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**Abstract.** Due to its widespread range and great variety of applications, *Cymbopogon citratus* (DC. ex Nees) Stapf. (Poaceae) is one of the most commercially important plants in the world. In this investigation, for the proper analysis of the phenolic compounds present in plant tissues, it is essential to understand how solvent concentration and type affect the extraction process. Three different extraction solvents such as acetone, ethanol, and methanol were used at different concentrations ranging from 20% to 100% each to assess both the total phenolic (TPC) and total flavonoid content (TFC) present in each extract of *C. citratus*. Antibacterial activity against Gram-positive and Gram-negative bacteria, as well as two different types of fungus, was evaluated using the disc diffusion method. The stable 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical was used as a proxy for antioxidant capacity. The antimicrobial activity results showed that the acetone 60% extract was most effective against *Pseudomonas aeruginosa* (IZ = 17 mm), while the acetone 80% extract was more effective against *S. cerevisiae* (IZ = 18 mm). When tested against *Candida albicans* and *Saccharomyces cerevisiae*, the highest effective antifungal activity was found in the 80% acetone and 80% methanol extracts, respectively. The highest DPPH-RSA IC<sub>50</sub> value reported was 19.22 for ethanol at 60% concentration which is correlated mainly to its greatest total flavonoid content (58.7 mg QE/100 g) in addition to (300.1 mg GAE/100 g) as a TPC followed by acetone (80%) with IC<sub>50</sub> value 21.16. A quantitative analysis revealed that the greatest concentrations of polyphenolic compounds were found in 80% acetone (370.2 mg GAE/100 g) and 60% acetone (353.9 mg GAE/100 g), while the greatest values for total flavonoid concentration were found in 60% ethanol (58.7 mg QE/100 g) followed by 80% and 60% methanol, with 57.1 and 55.2 mg QE/100 g, respectively. In conclusion, the plant under study included a number of bioactive compounds that may be put to use in a range of unique medical and aesthetic preparations.

**Keywords:** *Cymbopogon citratus*; Poaceae; antioxidants; antimicrobial activity; antifungal agents; flavonoids.

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