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### Gas chromatography–Mass Spectrometry and Antimicrobial Activities Of Aqueous Red Onion (*Allium cepa*) Extracts Against *Escherichia coli* and *Staphylococcus aureus*

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## Gas chromatography–Mass Spectrometry and Antimicrobial Activities Of Aqueous Red Onion (*Allium cepa*) Extracts Against *Escherichia coli* and *Staphylococcus aureus*

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### ABSTRACT

Onion (*Allium cepa*) plant has been used for multiple purposes both for modern and traditional medicine. The study evaluates the atomic absorption spectroscopy (AAS), Gas chromatography–mass spectrometry (GC-MS) and antimicrobial activities of aqueous red onion (*Allium cepa*) against *Staphylococcus aureus* and *Escherichia coli*. The qualitative, AAS and GC-MS analysis of *Allium cepa* extract were determined using standard procedure. The antimicrobial activity was evaluated by disc diffusion and agar well diffusion method. The minimum inhibitory concentrations (MIC) and minimum bactericidal concentration (MBC) were determined using standard procedures. Aqueous extract of *Allium cepa* shows the presence of secondary metabolites like: saponin, tannins, alkaloids, flavonoids,, phenolic etc. 56 compounds were identified using GC-MS analysis with 9, 12-octadecadienoic acid (Z,Z)- being the most abundant with peak area of 50.50% and retention time of 16.563. Mineral analysis shows that red onion contains essential and non-essential minerals. The results revealed that aqueous *A. cepa* extract with concentration of 250 mg/ml was sensitive to both organism with zone of inhibition of  $22.67 \pm 1.585$  and  $28.18 \pm 1.689$  against *S. aureus* and *E. coli* respectively. Both organisms were susceptible and resistant to different antibiotic tested. The MIC of the aqueous red onion extract on *S. aureus* and *E. coli* were 500 and 250 mg/mL while their MBC values were 1.0 and 0.50 g/ml respectively. The onion has potential as natural therapeutic agents and may prevent pathogenic diseases caused by *S. aureus* and *E. coli*.

**Keywords:** Antimicrobial activity, red onions, GC-MS, *Escherichia coli* and *Staphylococcus aureus*