

GCMS analysis, antimicrobial assay of volatile and non volatile components and physico chemical evaluation of *Cuminum cyminum*

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The objective of the present study was the identification, characterization and antimicrobial assessment of the volatile oil and non volatile extract components of *Cuminum cyminum* (CC) from Pakistan. Results from the proximate study confirmed ash, moisture, crude fat, crude fiber, carbohydrates and proteins in CC sample. Mineral analysis values in mg/L by atomic absorption spectroscopy (AAS) displayed Ca (3.836), Mg (1.069), Fe (1.045) and Mn (0.981) as the predominant elements. While the concentration of Zn, Ni, Cu and Cr were recorded as 0.718, 0.655, 0.149 and 0.131 mg/L respectively. Flavonoids, steroids, terpenoids, and tannins were detected as major phyto-constituents of the plant. Essential oil, extracted by hydro-distillation, was characterized by gas chromatography coupled with mass spectrometry (GC-MS). 2-methyl-3-phenylpropanal (30.84%), γ -terpinene (22.18%), o-Cymene (16.30%), β -pinene (14.13%) 2-Caren-10-al (12.99%) were quantified as the major compounds, while α -pinene, α -phellandrene, Bicyclo [3.1.0] hexane, 4-methylene-1-(1-methylethyl), tricyclo [2.2.1.0(2,6)] heptane-1,1,3-trimethyl, β -myrcene and eucalyptol were recorded less than 1%. Antimicrobial activities, determined by agar diffusion method, were observed against six gram negative [*Agrobacterium tumefaciens* (AT), *Erwinia carotovora* (ET), *Escherichia coli* (EC), *Klebsiella pneumoniae* (KP), *Pneumococcus auroginosa* (PA), *Salmonella typhi* (ST)], three gram positive [*Bacillus atrophoeus* (BA), *Bacillus subtilis* (BS), *Staphylococcus aureus* (SA)] and a fungal strain *Candida albicans* (CA). Volatile oil extract results recorded maximum zone of inhibitions (ZI) against the test microbes. KP (ZI=29 mm) was found to be the most susceptible followed by BS (23 mm), EC (21 mm), ET (20 mm) and CA (19 mm). Among the crude extracts ethanolic extract exhibited promising activities against AT and EC and PA (ZI=16). The overall evaluation of the present approach concludes significant nutritive and mineral values of CC. The antimicrobial efficacy of oil and solvent extracts validates and provides a scientific basis for future use of CC as a lead source in new effective drug formulations.

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