

## Abstract

One of the most commonly used plant as a medical one for the treatment of different human diseases is *Capparis spinosa* L. the purpose of this study comes to evaluate the activity of *Capparis spinosa* against some pathogenic bacteria. The present work reveals that there is no significant difference  $p < 0.05$  among the three studied extraction methods (magnetic stirrer, Soxhlet, and, Ultrasonic extraction) which have been used to prepare *Capparis spinosa* extracts out of leaves using three solvents (petroleum ether, ethyl acetate and methanol). It is seen that there are a significant differences between the three solvents in the yields of extracts. The yield of the extract of the methanol is high in comparison with ethyl acetate and petroleum ether extracts respectively in all methods used. The crude extract is detected by the phytochemical reagents like thin layer chromatography (TLC) and FT-IR spectrum. TLC shows that there are numerous compounds detected and varied based on the polarity of solvents. TLC revealed that there are several compounds which are different in retention factor ( $R_f$ ). Also, these results are supported up by the FT-IR spectrum to all methods with the same solvent. The crude plant extracts of all solvents are evaluated against three pathogenic bacteria. The results uncover variable effects against all bacteria. The minimum inhibitory concentration is effective at 200 mg/ml on some bacteria and 100 mg/ml concentration to other. The compounds which are isolated from petroleum ether leaves extracts by the column chromatography are identified by TLC, UV-Vis, FT-IR,  $^1H$ ,  $^{13}C$  NMR and mass spectroscopy. Those compounds are: (7,11,15,19)-ethyl 4,8,12,16,20-pentamethyldocosa-7,11,15,19-tetraenoate, methyl 2',15'-dimethyl-5,5'-dioxo-18'-oxaspiro[oxolane,2-14'-pentacyclo-octadecan]7'-ene-9'-carboxylate, methyl 2',15'-dimethyl- 5,5'-dioxo- 18'- oxaspiro[oxolane-2,14'-pentacyclo-octadecan]-7'-ene-9'-carboxylate, and (2, 5)-trideca-2,5-dienedioic acid. The biological activity of isolated compounds is evaluated against five pathogenic bacteria. Results showed that the lower inhibitory concentrations of the first and last compounds were lower than the other compounds isolated against the previous five bacteria.

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## List of abbreviations

| Abbreviation          | Details  |
|-----------------------|--|
| ABC                   | ATP-binding cassette                                     |
| ABTS                  | 2,2- azinobis - (- 3 ethyl benzothiazoline-6 – sulfonate |
| ACE                   | Angiotensin-converting enzyme                            |
| ALP                   | Alkaline phosphate                                       |
| ALT                   | Alanine aminotransferase                                 |
| BC                    | Before Christ  |
| CFU                   | Colony forming unit                                      |
| CRD                   | Completely randomized design                             |
| CSAE                  | <i>Capparis spinosa</i> aqueous extract                  |
| CSF                   | <i>Capparis spinosa</i> fruit                            |
| <i>C. spinosa</i>     | <i>Capparis spinosa</i> Lin.                             |
| CVD                   | Cardiovascular disease                                   |
| DMSO                  | di methyl Sulphoxide                                     |
| DPPH                  | 2,2-diphenyl-1-picrylhydrazyl                            |
| EA                    | Ethyl acetate  |
| E-Coli                | <i>Escherichia coli</i>                                  |
| ELISA                 | enzyme-linked immunosorbent assay                        |
| EO                    | Essential oils   |
| FRAP                  | Ferric Reducing Ability plasma                           |
| FFA                   | Free fatty acid  |
| g                     | gram   |
| GI                    | Gastrointestinal tract                                   |
| HMG-Co reductase      | Hydroxy 3- methyl glutaryl co-enzyme A reductase         |
| HPLC                  | High performance liquid chromatography                   |
| HS-SPME               | Head-space solid – phase micro extraction                |
| KHz                   | Kilohertz  |
| LDL                   | Low density lipoprotein                                  |
| LPS                   | Lipo-poly saccharide                                     |
| Meth                  | Methanol   |
| MHB                   | Mueller-Hinton Broth                                     |
| MHz                   | Mega hertz   |
| MIC                   | Minimum inhibitory concentration                         |
| ml                    | Milliliter   |
| Mol                   | Mole   |
| MRSA                  | Methicillin resistant staphylococcus aureas              |
| NF-KB                 | Nuclear factor- kappa B                                  |
| NMR                   | Nuclear magnetic resonance                               |
| PET                   | Petroleum ether  |
| R <sub>f</sub>        | Retention factor   |
| <i>S. aureas</i>      | <i>Staphylococcus Aureas</i>                             |
| <i>S. Epidermidis</i> | <i>Staphylococcus Epidermidis</i>                        |
| SGOT                  | Serum glutamyl oxalacetate transaminase                  |
| SGPT                  | Serum glutamyl pyruvate transaminase                     |
| TLC                   | Thin layer chromatography                                |
| TMS                   | Tetramethylsilane  |

| <b>Abbreviation</b> | <b>Details</b>                 |
|---------------------|--------------------------------|
| UAE                 | Ultrasound-assisted extraction |
| μl                  | Microliter                     |
| VOC <sub>s</sub>    | Volatile organic compounds     |
| WHO                 | World health organization      |

