

Screening of Selected Medicinal Wild Plant Extracts Antibacterial Effect as Natural Alternatives

Ghadeer Omar

Plant Taxonomy, Department of Biology & Biotechnology, Faculty of Science, An-Najah National University, Nablus, P.O.Box 7, Palestine

Lubna A. Abdallah

Biotechnology, Department of Biology & Biotechnology, Faculty of Science, An-Najah National University, Nablus, P.O.Box 7, Palestine

Shurooq Ismail

Microbial Botany, Department of Biology & Biotechnology, Faculty of Science, An-Najah National University, Nablus, P.O.Box 7, Palestine

Motasem Y. Almasri

Medical Microbiology, Department of Biology & Biotechnology, Faculty of Science, An-Najah National University, Nablus, P.O.Box 7, Palestine

Corresponding author Email: ghader.omar@gmail.com

ABSTRACT

The aim of the present study was to evaluate the antimicrobial potential of aqueous and ethanol extracts of *Thymbra spicata* L. (Lamiaceae), *Nepeta curviflora* Boiss. and *Paronychia argentea* Lam. (Caryophyllaceae) against six Gram negative bacteria and one Gram positive bacterium. Agar well diffusion method was adopted to examine the antimicrobial activity of all plant extracts being studied. Out of the seven bacterial isolates, a clinical isolate of *Proteus mirabilis* (II) was the most susceptible one for all the examined plant extracts except for *N. curviflora* ethanol extract. Moreover, the ethanol extract of *P. argentea* exhibited the highest antimicrobial potential against most of the tested bacteria except for *Klebsiella pneumoniae* and *Escherichia coli*. On the other hand, all investigated ethanol plant extracts displayed antibacterial effect against the other clinical isolate of *Proteus mirabilis* (I), which showed resistance against the broad spectrum antibiotic Gentamycin. Further more, micro-broth dilution method was used to measure the minimum inhibitory concentration (MIC) of the effective plant extracts. The examined ethanol plant extracts demonstrated higher MIC values than the aqueous extracts ranging from 1.56 to 50 mg/ml. Accordingly, the obtained results form the platform for further phytochemical and pharmacological studies which are invited to purify and characterize the active ingredient (s) of the studied plant species by the future focus on their extracts fractionation in hope of identifying the active components.

Keywords- Antibacterial effect, plant extract, *Thymbra spicata*, *Nepeta curviflora*, *Paronychia argentea*, West Bank.

1. INTRODUCTION

Plants defend themselves chemically against grazing or infection via the production of a host of bioactive molecules such as tannins, terpenoids, alkaloids and flavonoids

([1], [2]). Some plants are known as medicinal because they contain active substances that cause certain reactions from relenting to the cure of human diseases [3]. Therefore, different countries used plants medicinally as a source of many potent and powerful drugs [4] from different plant parts including root, stem, flower, fruit, twigs and modified plant organs [5]. Medicinal plants play a key role in health care with about 80% of the world's populations relying on the use of traditional medicine, which is predominantly based on plants [6]. Bacterial genetic ability to transmit and acquire resistance to drug and therapeutic agents created a global problem of antimicrobial resistance [7]. This obstacle can be resolved through the new and innovative antimicrobials from plants [8].

Medicinal plants are important element of the indigenous medical system of developing countries as well as Palestine [9]. The utilization of complementary and alternative medicine in Palestine is very common [10]. Due to the rapid increase of antibiotic resistance in our region, plants which have been used as medicines over hundreds of years, constitute an obvious choice for study. It is interesting to determine whether their traditional uses are supported by actual pharmacological effects or merely based on folklore [11]. Several studies in Palestine have been published concerning many plant extracts biological active properties such as antibacterial, antitumor, antifungal and antioxidant of wild plants ([5], [12]-[17]). Nevertheless, Documentation of scientific information about the efficacy and safety of wild plants in West Bank, Palestine is one of our research goals based on their accurate taxonomical identification. Systematic screening of folk medicine plants may result in the discovery of novel effective compounds and natural alternatives for disease treatment. As well, some medicinal herbs for some reasons have not found wider application. Taking into account the increasing demand for the natural ingredients that might be used as food additives, preventing plant diseases and nutraceuticals as well as for other applications, it is reasonable to