Introduction

Medicinal plants comprise an immense potential for producing new drugs of great benefit to mankind and represent a rich source of antimicrobial agents. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. Different parts of medicinal plants were used for extract as raw drugs and they possess various medicinal properties (Mahesh and Satish, 2008). The rising failure of chemotherapeutics and antibiotic resistance exhibited by pathogenic microbial infectious agents has led to the screening of numerous medicinal plants for their prospective anti-microbial activity.

Additionally, the developing countries, synthetic drugs are not only expensive and insufficient for the treatment of diseases but also have deception and side effects (Elizabeth, 2005) The kind of this situation stresses need to search a novel drug for treating such disease (Sieradzki et al., 1999). Therefore, researchers are gradually turning their consideration to natural products in search of new leads to develop superior drugs against the infection of microbes (Saravanan, et al., 2011). A lot of remedial plants have been used as nutritional supplements and as well in the treatment of several diseases lacking proper data of their function.

Several spices, herbs and herb extracts have been shown to possess antimicrobial properties. By now, garlic, onion, ginger, mustard and pepper have been documented as antimicrobial activity against several types of bacteria (Al Mofleh, 2010).

In previous study, different extracts of twenty-seven medicinal plants collected from different localities belong to eighteen different plant families and tested for their ability to induce NAD(P)H: quinoneoxidoreductase in murine hepatoma cells grown in microtiter plate wells (Shahat, et al., 2013, Shahat et al., 2016).

Antioxidant activity of six medicinal plants Asteraceae family collected from different areas of Kingdom of Saudi Arabia was evaluated (Shahat, et al., 2014, Shahat et al., 2015). The current study was carried out to describe preliminary screening to demonstrate the existence of bactericidal (Gram-positive) and bacteriostatic (Gram-negative) activities in the 80% extracts of twenty-four Saudi Arabian medicinal plants.
Materials and Methods

Plant Materials

Twenty-four species of 16 plant families used in the traditional medicine by Saudi Arabian people were collected from different localities in April 2013. Identification of the plants was done by the Plants Taxonomy and Herbarium Unit. Voucher specimens have been deposited at the Herbarium of the Faculty of Pharmacy, King Saud University, Riyadh, Saudi Arabia (Table 1).

Table 1: Medicinal plants used in this study

| Index | (Voucher number) | Plants (Family) | Yield (%) |
|-------|------------------|-----------------|-----------|
| SY-175 | 15930            | Teucrium oliverianum (Lamiaceae) | 20        |
| SY-176 | 15931            | Echium arabicum (Boraginaceae) | 14.5      |
| SY-177 | 15932            | Haplophyllum tuberculatum (Rutaceae) | 19.6  |
| SY-178 | 15933            | Senna italic (Caecalpiniaceae) | 14.9      |
| SY-179 | 15934            | Pulicaria crispa (Asteraceae) | 6.7       |
| SY-180 | 15935            | Rhabararium epapposum (Asteraceae) | 3.1     |
| SY-181 | 15936            | Rumex vasicanus (Polygonaceae) | 13        |
| SY-182 | 15937            | Ducrosia anethifolia (Aplaceae) | 26        |
| SY-183 | 15938            | Heliotropium ramosissimum (Boraginaceae) | 2.58  |
| SY-184 | 15939            | Picris cyanocarpa (Asteraceae) | 19.5      |
| SY-185 | 15940            | Anthemis deserti (Asteraceae) | 10.8      |
| SY-186 | 15945            | Cleome ambiocarpa (Cleomaceae) | 14.9      |
| SY-187 | 15946            | Zida spinosa (Brassicaceae) | 13.5      |
| SY-188 | 15947            | Ziziphus nummularia (Rhamnaceae) | 11.6     |
| SY-189 | 15949            | Neurada procumbens (Neuradaceae) | 8.6      |
| SY-190 | 15951            | Trigonella hamosa (Papilionaceae) | 22       |
| SY-191 | 15952            | Achillia fragrantissima (Asteraceae) | 6.2     |
| SY-192 | 15953            | Convolvulus prostates (Convolvulaceae) | 15.3   |
| SY-193 | 15954            | Citrullus colocynthis (Cucurbitaceae) | 14.2   |
| SY-194 | 15955            | Emex spinosa (Polygonaceae) | 16.8      |
| SY-195 | 15957            | Rhazya strict (Apocynaceae) | 22        |
| SY-196 | 15958            | Scrophularia hypericifolia (Scrophulariaceae) | 12.12  |
| SY-197 | 15959            | Caylusea hexagyna (Resedaceae) | 13.04     |
| SY-198 | 15960            | Artemisia monosperma (Asteraceae) | 16.4     |

Extracts Preparation

100 gm of the dried aerial part of the plants were macerated twice in 300 mL aqueous methanol (80%) for 72 h at room temperature. The extracts were filtered and concentrated under reduced pressure at 40°C using a rotary evaporator. The obtained dry extract was weighed and the percentage yield was expressed in terms of air dried weight of plant materials.

Material for Antimicrobials

The bacterial, fungal and yeast strains were personally obtained from the microbiology Lab, Botany Dept., Fac. of Sci. (Al- Azhar Univ. Assiut, Assiut Univ. and Minia Univ.).

| No | Microorganisms | Source |
|----|----------------|--------|
| 1 | Klebsiella pneumonia (Kp) | Department of Botany, Faculty of Sciences, Al-Azhar University, Assiut, Egypt. |
| 2 | Proteus vulgaris (Pv) | Department of Botany, Faculty of Sciences, Al-Azhar University, Assiut, Egypt. |
| 3 | Pseudomonas aeruginosa (Pa) | Department of Botany, Faculty of Sciences, Al-Azhar University, Assiut, Egypt. |
| 4 | Serratiamarcescens (Sm) | Department of Botany, Faculty of Sciences, Al-Azhar University, Assiut, Egypt. |

| No | Microorganisms | Source |
|----|----------------|--------|
| 1 | Bacillus cereus (Bc) | Department of Botany, Faculty of Sciences, Al-Azhar University, Assiut, Egypt. |
| 2 | Micrococcus luteus (Mi) | Department of Botany, Faculty of Sciences, Minia University, Minia, Egypt. |
| 3 | Micrococcus roseus (Mr) | Department of Botany, Faculty of Sciences, Minia University, Minia, Egypt. |
Methods of antibacterial activity

Determination of antibacterial activity:

The agar well diffusion method was used to test the antibacterial activity of the prepared extracts (Oke et al., 2009). Of all tested bacteria, stock cultures were grown in nutrient broth for 18 h. Final cell concentrations were standardized until $10^7$–$10^8$ cfu/ml. One milliliter of this inoculum was added to each plate containing nutrient agar. When the agar was solidified, 4 wells (6 mm diameter) were formed in every plate. Crude extracts were prepared at a concentration of 10 mg/ml with dimethyl sulphoxide (DMSO) as solvent; 50μl of each extract was applied into each well. The control sample was prepared using DMSO and Cephradine (CE); 30μg/disk and cefotaxime (CTX) 30μg/disk were used as standard antibacterial agent. After 12–15 min of diffusion time at room temperature, the plates were incubated at 37 °C for 48 h. At the end of the incubation period the antibacterial activity was evaluated by measuring the inhibition zones. The diameter of the inhibition zone was measured in 3 directions and the average values were tabulated. The experiment was made in three replications.

Antifungal activity

According to Ndukwe et al. (2004), the antifungal activity was assayed using method of agar well diffusion. Aliquot of 100 μl spores suspension (1x10^8 spores/ml) of each testing fungi were streaked in radial patterns on the surface of complete media plates (potato dextrose agar (PDA) media). A six mm in diameter wells were performed in the media, and then each well is filled with definite concentration (10 mg/ml) with dimethyl sulphoxide (DMSO) as solvent of each tested extract. We used the DMSO as control for the extracts and the DMSO as negative control for the extracts and Nystatin (30 μg /disk) was used as positive control. The cultured plates were incubated at 20ºC for 3-5 days. Radius of the zone of inhibition was measured in two directions at right angles to each other. Three replicates per treatment were carried out and each treatment was repeated at least twice.

Results and Discussion

Data in Table (2) showed preliminary screening of the Antimicrobial activities of some selected traditional Saudi Arabian medicinal plants. The data appeared that extracts of (SY-176, SY-180, SY-181 SY-188, SY-197 and SY-198) have antmicrobial activity against most of tested bacteria, fungi and yeast. Whereas, the extracts of (SY-175, SY-187, and SY-195) have poor activity against tested bacteria, fungi and yeast.
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