

Antimicrobial Activity of *Pulicaria dysenterica* L.

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Abstract

Three extracts of *Pulicaria dysenterica* were examined for antibacterial activity using the agar disk-diffusion method against six bacterial strains. Some of these extracts were found to be active against some bacterial strains. The methanolic extract exhibited a superior level of antibacterial activity. All of the extracts were active against *Vibrio cholera*.

Keywords: *Pulicaria dysenterica*; Compositae; Antimicrobial activity; Medicinal plants.

Introduction

Infectious diseases, particularly those involving the GI tract, are a serious problem worldwide, mainly among third world children (1). On the other hand, some of the drugs currently in use result in adverse side effects (2). Therefore, the search for new antimicrobial substances exhibiting minimal side effects is warranted (1-3). One of the most promising areas in the search for new biologically active compounds are the plants used in traditionally medicine (4).

Pulicaria dysenterica (Compositae) is one of the valuable medicinal plants used in Iranian's folk medicine. The aerial parts of the plant are used as an antidiarrhoeal agent (5).

The present work was carried out to investigate the antimicrobial activity of different extracts of *Pulicaria dysenterica*.

Experimental

Pulicaria dysenterica herb was collected

during the summer of 1994 from the Eastern region of Tehran. A specimen was deposited in the herbarium of the Faculty of Pharmacy, Tehran University of Medical Sciences.

Preparation of extracts

Aqueous extract: 100g of dry powdered *Pulicaria dysenterica* herb were infused in distilled water until complete exhaustion and evaporated under reduced pressure at 50 °C using a rotavapor apparatus.

Methanolic extract: 100g of dry powdered *Pulicaria dysenterica* herb were macerated in 80% methanol and concentrated as described above.

Chloroformic extract: 100g of dry powdered *Pulicaria dysenterica* herb were extracted with chloroform in a Soxhlet apparatus and the extract obtained was concentrated as described above.

Microbial strains

The microorganisms used in this study were *Shigella dysenteriae*, *Salmonella typhi*, *Escherichia coli*, *Vibrio cholera*, *Staphylococcus aureus* and *Bacillus cereus*.

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Table 1. In vitro antibacterial activity of *Pulicaria dysenterica*.

Extract	Microorganism					
	<i>Shigella dysenterica</i>	<i>Salmonella typhi</i>	<i>Escherichia coli</i>	<i>Vibrio cholera</i>	<i>Staphylococcus aureus</i>	<i>Bacillus cereus</i>
Aqueous	-	-	-	+	-	+
Methanolic	-	-	-	+	+	+
Chloroformic	-	-	-	+	+	-

Microbiological assay

The antimicrobial activity of the extracts was evaluated by the paper disk-agar diffusion method (6). Test plates were prepared with Mueller-Hinton agar (Difco) and inoculated on the surface with a cell suspension in sterile dissolution of 0.9% saline. In all cases, the concentration was adjusted to 1.5×10^8 CFU/mL. About 14 mg of each extract was dissolved in solvent (0.5-1mL). Paper disks (6.4mm) were impregnated with the resulting solutions and then deposited on the surface of inoculated plates. After 24h of incubation at 37 °C, positive results were established by the presence of clear zones of inhibition around active extracts. Disks of Chloramphenicol (25µg), Gentamicin (10µg), Co-trimoxazole (25µg) and Erythromycin (15µg) were used as positive antibacterial controls. All the assays were carried out in triplicate.

Results and Discussion

The data presented in Table 1 indicate that the extracts from *Pulicaria dysenterica* herb inhibit the growth of some of the tested microorganisms to various degrees. The methanolic extract was found to be the most effective antimicrobial agent. *Vibrio cholera* appeared to be the most sensitive organism and all of the extracts were active against it.

Over all, the Gram-positive bacterial strains were more sensitive than the Gram-negative ones. These results may provide a basis for the isolation of compounds of biological interest from *Pulicaria dysenterica*.

References

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