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Antibacterial Activity of Different Crude Extract of *Phlomis cashmeriana*

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In this study, methanol, ethyl acetate, chloroform and water extracts of *Phlomis cashmeriana* were evaluated for antibacterial activity against the most frequent skin pathogens. The antibacterial effect of this plant was tested by agar well diffusion method. The antibacterial activities with the highest zone of inhibition resulted were 20 mm by ethyle acetate extract fallowed by 19 mm by the *n*-Hexane extracts of *Phlomis cashmeriana* against *Klebsella*. All other extracts showed significant results.

Key words: Antimicrobial activity, phytochemicals, *Phlomis cashmeriana*.

The genus *Phlomis* (Lamiaceae) consists of about 100 species [1, 2]. Some of which are used as tonics and stimulants in Anatolian folk medicine [3]. *Phlomis* species are described by Dioscorides as herbal drugs, and are used ethno-pharmacologically in herbal medicine for respiratory tract diseases and for local treatment of wounds. Some *Phlomis* species are used in folk medicine for their analgesic and antidiarrheal properties, and for the treatment of ulcers and hemorrhoids. There are few reports about the pharmacological and biological effects of *Phlomis*. Some studies have shown various activities such as anti-inflammatory, immuno-suppressive, antimutagenic, anti-nociceptive, antifibriel, free radical scavenging, anti-malarial, and anti-microbial effects[4].

Infectious diseases and global antibiotic resistant pathogens are an increasing public health problem. The lack of development of new antimicrobial agents in the last decades, associated with their misuse, led to the emergence of multiresistant microorganisms[5]. Many efforts have been made to discover new antimicrobial compounds from various species of medicinal plants. Medicinal plants are heavily and worldwide used in folk medicine. Screening of such plants may result in the discovery of novel effective compounds against pathogenic microorganisms. The compounds that can either inhibit the growth of pathogens or kill them and have no or least toxicity to host cells are considered candidates for developing new antimicrobial drugs[6]. The world health organization (1985) estimates that, 80% of the people living in developing countries almost exclusively use traditional medicine for their primary health care needs. However, the effectiveness of the majority of the herbal remedies that are used today is yet to be validated. Limited knowledge, as well as lack of scientific studies on the practices of local herbalists has led to the neglect of potentially valuable drug containing plants[7]. Screening of such plants may result in the discovery of novel effective compounds against pathogenic microorganisms

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METRIALS AND METHODS

Phlomis cashmeriana is a common plant and grows in different parts of Pakistan. It was collected in March- June in flowering season and was identified by the help of plant taxonomist.

Antibacterial activity

The antibacterial activity was determined by agar well diffusion method. A loopful of a 104-106 suspension of 24 h old broth of each bacterium was streaked on the surface of Mueller-Hinton agar

(BBl-USA) plates. Wells were dug in the agar with the help of sterile dimethyl sulfoxide (DMSO). Dilutions of the stock solution containing 50,100, 150 and 200 µg were prepared in DMSO and 100 µl of each dilution was added in the respective wells. The plates were then incubated at 37°C for 24 h and zone of inhibitions were measured in millimeters (mm) and compared with the control[8]. Ampicillin, Tobramycin and Amoxacilline were used as standard drugs.

RESULTS AND DISCUSSION

The current study was initiated because of the increasing resistance to antibiotics of many skin pathogens including bacteria and fungi. Plant extracts and compounds are of new interest as antiseptics and antimicrobial agents in dermatology[9]. As a result, the antibacterial activity of *Phlomis cashmeriana* was screened against the most common skin pathogens. Table 1 showed that *n*-hexane extract showed significant result against *Klebsella* 19 mm zone of inhibition. Similarly ethyle acetate crude extract showed significant result against *Klebsella* 20 mm zone of inhibition. Highest zone of inhibition 17 mm resulted by chloroform extract against *Salmonella*. Ethye acetate crude fraction showed highest zone of inhibition fallowed by n-hexane and then chloroform fraction.

This plant species can be use as a source for isolation of different classes of natural product including Flavonoids, Saponins, Antraquinone, Terpenoids, Tannins, Reducing Sugar and Cardiac glycosides.

Table 1. Antibacterial activities of *Phlomis cashmeriana*

Bacteria	*n*-Hexane[a]	EtOAc[a]	$CHCl_3$[a]	H_2O[a]	Std drug
E. coli	11	11	12	10	30
Staph.	13	9	11	-	36
Klebsiella	19	20	11	-	30
Salmonella	11	-	17	14	35

a = Zone of Inhibition in mm

CONCLUSION

Studies showed that the antibacterial activity of medicinal plant is due to presence of various secondary metabolites[10]. Hence, these plants can be used to discover bioactive natural products that may serve as leads in the development of new pharmaceuticals research activities.

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