Essential Oil composition of the Medicinal Plant *Phlomis cashmeriana*

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Abstract: The present study was undertaken to analyze the chemical constituents of the essential oil of *Phlomis cashmeriana* using GC-MS spectrophotometer. From the GC-MS analysis of the *P. cashmeriana* has 11 different compounds were identified belonging to various functional groups. The concentration of five main volatile oil chemical components obtained from *P. cashmeriana* using GC-MS were o-Cymene 53.8%, Sabinene 24%, alpha-Citral 5%, beta-Pinene 4.97%, Cineole 4.4%. The rest of the analytes were around 1% . The present study was therefore carried out to explore the chemical constituents of essential oil which may play a key role in the pharmaceutical industry and for the herbal practioners.
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1. Introduction

The selection of crude plant extracts for screening programs is potentially more successful in initial steps than the pure compounds (Kasamota et al 1995). Such screening of various plant extracts has been previously studied by many workers (Parek *et al* 2006, Jain and Defilipps 1991). Economically important medicinal plants not only providing raw materials for pharmaceuticals, perfumery, flavor and cosmetic industries but also protecting and curing human against certain diseases. The use of plant materials to prevent and treat infection diseases successfully over the years has attracted the attention of scientists worldwide (Afolayan 2003). Essential oils and plants extracts have been screened for their potential uses as alternative remedies for the treatment of many infection diseases, (Kasamota 1995]. Essential oils have been shown to possess anti-bacterial, anti-fungal, antiviral, insecticidal and anti-oxidant properties (Parek *et al.*, 2006, Jain and Defilipps 1991).

Phlomis cashmeriana belong to the family Labiatea. It is a herb found in most part of hilly area of the KPK Pakistan. And showed different pharmacological activities.

Keeping in view the wide applications of *P. cashmeriana*, the present study was therefore carried out to explore the chemical constituents and anti bacterial activity and to provide a scientific data base which will be very helpful for pharmaceutical consumers and for the local practitioners.

2. Material and Methods

The whole plant of *Phlomis cashmeriana* were collected from Swat area of Khyber Pakhtunkhwa. The identity was checked by plant taxonomist.

Isolation of essential oil

The essential oil from the of *Phlomis cashmeriana* was obtained by hydro-distillation for 2 h. The oil obtained was dried over anhydrous Na_2CO_3, filtered and stored at + 4 °C until analysis.

Gas Chromatography-Mass Spectrometry

Reagents: Dichloromethane, HPLC grade

GC/MS analysis was performed using a Shimadzu Model QP 2010 plus, Injector temperature: 240 °C, Ion source temperature (EI): 240 °C, Interface Temperature: 240 °C, Pressure: 80 KPa, Carrier gas: helium, Split ratio: 1:50

Column oven programming:

Rate (°C/min)	Temperature	Hold (minutes)
-	40	0
3	90	0
10	240	15

GC programme time:

46.67 minutes total, Solvent cut time: 2.5 minutes, MS start time: 3 minutes, MS end time: 46 minutes, Acquisition mode: Scan M/Z: 40 – 500, Volume injected: 1 µl.

Column Specifications

Length: 30 m, id: 0.25 mm, thickness: 0.25 µm, (95% Dimethyl-5% diphenyl polysilphenylene; DB-5MS, Agilent technologies, USA).

Sample preparation:

Dilute approximately 40 mg of oil samples, weighed accurately up to 0.1 mg, with 2 mL of dichloromethane and filtered through 0.45µm - membrane filter and injected 1µl to GC-MS using auto injection system. The compounds were identified by comparison of their retention time with their retention indices (RI) (Martindale 2009), retention times (RT) and mass spectra with those of authentic samples and /or the NIST/NBS, NIST02, Wiley 575 spectra library and published literature.

3. Results and discussion

From the GC-MS analysis of *P. cashmeriana* 11 different compounds were identified belonging to various groups including alkenes (alpha-Pinene, Sabinene, beta-Pinene, o-Cymene, D-Limonene, alpha-Curcumene), alcohol (Cineole, 1-Terpene-4-ol), aldehyde (alpha-Citral), ketone (3-Thujanone), oxide (Limonene oxide, cis). The concentration of five main volatile oil chemical components obtained from the leaves of *P. cashmeriana* using GC-MS were o-Cymene 53.8%, Sabinene 24%, alpha-Citral 5%, beta-Pinene 4.97%, Cineole 4.4%. The rest of the analytes were around 1% . The results obtained from the GC-MS analysis is depicted in **Table-1**.

The chemical composition of the essential oil has been noted to depend upon different geo-environmental conditions including climatic conditions, Seasonal, geographical, soil, irrigation, harvesting time and scientific distillation techniques (Jazbi et al., 1999, Cook and Hokard 1966) .

Table-1. Quantitative results of the GC-MS of essential oil from the leaves of *P. cashmeriana*

Peak No	Name	Area	Conc.%	R. Time
1	alpha-Pinene	1422	1.25	8.57
2	Sabinene	2860	24. 294	10.21
5	beta-Pinene	4894	4.973	10.39
11	o-Cymene	6506	53.810	12.68
14	D-Limonene	2066	1.566	12.87
15	Cineole	4213	4.420	13.03
22	3-Thujanone	3155	3.450	17.16
25	1-Terpene-4-ol	1681	1.254	19.37
42	alpha-Citral	5141	4.173	21.85
62	alpha-Curcumene	3622	2.451	25.26
71	Limonene oxide, cis	3245	2.5214	26.41

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Refrences

a. Afolayan AJ, (2003). Extracts from the shoots of *Arctotis artotoides* inhibit the growth of bacteria and fungi. *Pharm. Biol*, **41**: 22-25.
b. Cook Wb, Hokard AS (1966). The essential oil of *Illicium anisatum*. *Can J Chem.* **44**: 2461-2464.
c. Jain SK, Defilipps RA (1991). Medicinal Plants of India, Vol. 1. Michigan, USA: Reference Publications Inc. pp- 92.
d. Jazbi AR, (1999). Phytochemical investigation of some medicinal plants from the families' euphorbiaceaand lamiacea dissertation submitted at HEJRIC, University of Karachi75270, Pakistan.
e. Kasamota IT, Nakabayasi T, Kida H (1995). Screening of various plant extracts used in Ayurvedic medicine for inhibitory effects on human immune deficiency virus type I (HIV-protease). *Phytotherpy Research*. **9**: 180-184.
f. Martindal (1972). The extra Pharmacopeia. The pharmaceutical Press, London.
g. Parek J, Karathia N, Chandra S, (2006). Screening of some traditionally used medicinal plants for potential antibacterial activity. *Indian Journal of Pharmaceutical Sciences*, **68**(6): 832-834.

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