Life Science Informatics Publications

Research Journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences

Journal Home page http://www.rjlbpcs.com/

RJLBPCS

ISSN 2454-6348

Original Research Article **DOI - 10.26479/2017.0302.03**

PHYTOCHEMICAL SCREENING AND BIOLGICAL EVALUATION OF SOME POTENTIAL CONSTITUENTS OF *SERIPHIDIUM OLIVERIANUM*

Nusrat Shafiq*[1], NailaRafiq[2], Muhammad Saleem[3], Maryam Rashid[1]

1. Department of chemistry, Government College women University, Madina Town, Faisalabad-38000, Pakistan

2. Department of Chemistry, Baghdad-ul-Jadeed Campus, The Islamia University of Bahawalpur, Pakistan.

3. Department of Biochemistry, Government College Women University, Faisalabad-38000, Pakistan,

ABSTRACT: In our present study we focus on the analysis of genus *Seriphidium* species belong to family Asteraceae which has been utilized in folk medicines extensively. Plant *Seriphidium oliverianum* belong to family Asteraceae was investigated for their chemical constituents as well as for their biological potential. The plant collected from Quetta, dried under shade, chopped, grinded to coarse powder and soaked in different solvents (Methanol, Chloroform, water, ethanol) for different chemical tests. Filtrates were concentrated under reduced pressure to avoid thermal decomposition on rotary evaporator. Tests were performed for tannins, alkaloids, saponins, steroids, flavonoids, glycosides and anthraquinones. From all tests, it has been concluded that the plant *S. oliverianum* contains alkalloids, saponins, tanins, steroids, flavonoids, cardiac glycosides, anthraquonone, phenolic compounds as their chemical constituents as well as defense tools. The crude extract of *S. oliverianum* was checked for different biological activities and found to contain biological potential as anti-urease, anti-bacterial, anti-oxidant, seed germination inhibition.

KEYWORDS: Anti-bacterial, anti-urease, anti-oxidant, Secondary Metabolites, Seed germination inhibition, *Seriphidium oliverianum*

***Corresponding Author: Dr. Nusrat Shafiq** Ph.D.

Department of chemistry, Government College women University, Madina Town, Faisalabad-38000, Pakistan* Email Address: gqumarin@gmail.com

1.INTRODUCTION

A large number of the different species of the Genus *Seriphidium* are extensively used as food, forage, ornamentals, soil stabilizers in disturbed areas etc,. Moreover these are also utilized in folk medicine systems [1]. *Seriphidium* species are used as a cure for the diseases like diabetes, high blood pressure and gastrointestinal disorders in Middle East country like Turkey as medicines. For example, a drug called as artemisinin was isolated from two species *Seriphidium annua*and *Seriphidium indica* which acting asanti-malarial. Some other species of the genus *Seriphidium* known as S. *dubia* has been used to cure asthma and skin diseases like scabies and furthermore as anti-ulcer and purgative agents. Another species called as *S. absinthium*L. has been utilized as ethno-medical and biological source as it contains anthelmintic, antifungal and antimicrobialpotentials. Similarly, another plant also used as anthelmintic agent in the ethno-veterinary medicine system of Pakistan known as *S. brevifolia* [2] *S. kurramense*is commercially very important plant of genus *Seriphidium*, which has used as medicinally and is transported to other countries for the extraction of a very important component called as santonin acting as essential oil. Moreover, a large number of plants of genus *Seriphidium* are beneficent due to α-thujone 1,8-cineole β-caryophyllene and β-thujone as major constituents [3]. In our present study, we have been selected the *Seriphidium oliverianum* which are very important from economic, medicinal point of view. *Seriphidium oliverianum* of the family Asteraceae is occurred widely in Iran, Afghanistan, Central Asia and Pakistan. In Pakistan it is wildly distributed in sandy-clay soils on small hills of Baluchistan [4]. The *seriphidium oliverianum* is used to cure the disease caused by overproduction of radicals. This is due to presence of anti-oxidants in leaves of *Seriphidium oliverianum* [5].

2. MATERIALS AND METHODS

Collection and Identification of Plant Material: *Seriphidium oliverianum* Besser was collected from District Ziarat, Baluchistan in September 2010 and was identified by Prof. Dr. Rasool Bakhsh Tareen, Plant Taxonomist, Department of Botany, University of Baluchistan, Quetta, where the voucher specimen (SO/RBT-211-12) has been deposited in the herbarium.

Preparation of sample*:* The collected plant material was derided under shade for one week. The deride plant was chopped, grinded to coarse powder.

Extraction of Plant: The deride plants materials were soaked in different solvents (Methanol, Chloroform, water, ethanol) for 07 days to prepare different extracts for different chemical tests. After soaking, extracts were filtered and filtrates were concentrated under reduced pressure to avoid thermal decomposition on rotary evaporator.

Preparation of wagner's reagent: Wagner' s reagent was prepared by dissolving 5 g potassium iodide and 1 g iodine in water [6, 7].

Preparation of dragnedroff's reagent

A). 0.85 mg of bismith-nitrate in 10 ml of glacial acetic acid and 40 ml of water [6, 7].

B). 8 g potassium iodide in 20 ml of water.

A + B ⟶ dragnedroff' s reagent.

Analysis of extracts from the plant *Seriphidium oliverianum:* Following tests were performed to determine the secondary metabolites in extract of *S. oliverianum*.

2.1.5.1. Test for tannins: In a test tube 2 ml of water extract was taken and 2 ml freshly prepared $FeCl_3$ solution was added to it. The appearance of blue-black precipitates confirmed the presence of tannins [8-10].

2.1.5.2. Tests for alkaloids: In a test tube 2 ml of methanolic extract was taken and 1 ml of HCl and 6 drops of wagner' s reagent were added to it. The brownish-red precipitates confirmed the alkaloids in extract of *S. oliverianum* [8,9].

In another test tube, 2 ml of MeOH extract was taken and 6 drops of dragnedrff's reagent was added to it. The appearance of yellow precipitates indicated the presence of alkaloids [8, 9].

Test for Saponins: 0.5 ml water extract was taken in a test tube and 1 ml glacial acetic acid + 3ml $FeCl_3$ soln. + 3 ml conc. H_2SO_4 were added to it. Green-blue colour indicated the presence of Saponins [8, 9].

Test of steroids: In a test tube, 1 ml chloroform extract was taken. Then 2 ml acetic anhydride and 1 ml conc. H_2SO_4 were added to it. Blue-green ring formation indicated the presence of steroids [8-10]

Test of flavonoids: 2 ml methanolic extract was taken in a test tube. 5 ml conc. HCl + 0.5 mg Mg ribbon were added to it. Pink tomato red colour indicated the presence of flavonoids [8, 9].

Test for cardiac glycosides: In a test tube 2 ml ethanolic extract was taken. 1 ml glacial acetic acid, 2 ml $FeCl_3$ soln. and 1 ml conc. H_2SO_4 was added to it. Green-blue colour confirmed the presence of cardiac glycoside [8-10].

Test of Anthraquinones: 1ml of methanolic extract of plant was taken in a test tube and 10 % HCl was added to it and boiled for few minutes on water bath. Then it was filtered and cooled. Then a small volume (approx. equal) chloroform and 10 % NH_3 were added to the filtrate and heated it. Appearance of rose color indicated the presence of anthraquinones [8,9].

Bioassays

Anti-bacterial Assay: To check the anti-bacterial potential of the extracts, disk diffusion method has been used [11].

Anti-urease assay: To check the anti-urease activity of samples "Berthelot" method has been used [12].

3. RESULTS AND DISCUSSION

From all tests which were performed to check the presence of different classes of the natural products/ secondary metabolites in the under study plant, it has been confirmed that the chemical constituents of plant *S. oliverianum* were found to occur in them were alkalloids, saponins, tanins, steroids, flavonoids, cardiac glycosides, anthraquonone and also phenolic compounds.

Table: Phytochemical analysis of the plant *S. oliverianum*

Sample	Test For	Results
S. oliverianum	Alkalloids	+
	Saponins	+
	Tanins	+
	Steroids	+
	Flavonoids	+
	Cardiac glycosides	+
	Anthraquinones	+

Biological Studies on ethyl acetate fraction of *S. Oliverianum*

The ethyl acetate fraction of methanolic extract of *S. oliverianum* showed anti-oxidant activity in *vitro* assay and this property is due to thepresence of flavonoids and their derivatives. Ethyl acetate fraction exhibit75 % and 98.5 % anti-oxidant activity at a concentration of 50µg/µl and 250µg/µl respectively which is excellent. The ethyl acetate fraction also showed anti-urease and seed germination inhibitory assay at different concentrations as in table.

Table. 1: Anti-oxidant, anti-urease and seed germination inhibition activities of ethyl acetate fraction

Test Fraction	Activities	Conc.	%age inhibition
Ethyl acetate	Anti-oxidant	50 µg/µl	75.0 %
		250 µg/µl	98.5 %
	Anti-urease	50 µg/µl	40.0 %
		250 µg/µl	43.57 %
	Seed germination inhibition	100 µg/µl	60.0 %
		1000 µg/µl	90.0 %

Table 2: Anti-bacterial % age inhibition of ethyl acetate fraction%

Test Fraction	Conc.	*E. Coli*	*Bacillus*	*Salmonella*	*Staphlococcus*	*Shigella*	*Pseudomonas*
Ethyl acetate	50 µg/ml	95.5 %	87.9 %	28.8 %	0	69.0 %	38.66 %
	250 µg/ml	96 %	96 %	65.0 %	10.0 %	80.0 %	69.0 %
Control	0	0	0	0	0	0	0
Standard	50 µg/ml	-	90.47 %	90.47 %	90.47 %	90.47 %	90.47 %
	250 µg/ml	-	82.94 %	82.94 %	82.94 %	82.94 %	82.94 %

CONFLICT OF INTEREST

The authors have no conflict of interest.

REFERENCES

1. Hayat MQ, Ashraf M, Khan MA, Yasmin G, Shaheen N, Jabeen S. (2009). Diversity of foliar trichomes and their systematic implications in the genus artemisia (asteraceae). *International Journal Of Agriculture & Biology,* 11: 542-546.
2. Mahmood T, Hassan N, Nazar N, Naveed I. (2011). Phylogenetic analysis of different artemisia species based on chloroplast gene rps11. *Archives of Biological Science, Belgrad,* 6: 661-665.
3. Gilani SA., Fujii Y, Sugano M, Watanabe K N. (2010). Chemotypic variations and phytotoxic studies of essential oils of endemic medicinal plant, Seriphidium kurramense, from Pakistan. *Journal of Medicinal Plants Research,* 4: 309-315.
4. Bremer K., Humphries. (1991). *Bulletin of Botanical Laboratory of North-Eastern Forestry Institute,* 11: 18-18.
5. Ho S.-T, Tung Y.-T, Chen Y.-L, Zhao Y.-Y, Chung M.-J, Wu J.-H. (2012). Antioxidant Activities and Phytochemical Study of Leaf Extracts from 18 Indigenous Tree Species in Taiwan. *Evidence-Based Complementary and Alternative Medicine,* 2012: 8-8.
6. Yadav M, Chatteri S, Gupta SK, Watak G. (2014). Preliminary Screening of six medicinal plants used in traditional medicine. *International Journal of Pharmacy and pharmaceutical sciences,* 6: 539-542.
7. Vaghasiya Y, Dave R, Chanda S. (2011). Phytochemical analysis of some medicinal plants from western region of India. *Research journal of medicinal plant,* 10: 1-10.
8. Yadav RNS, Agarwala M. (2011). Phytochemical analysis of some medicinal plants. . *Journal of Phytology,* 3: 10-14.
9. Wadood A, Ghufran M, Jammal SB, Naeem M, Khan A, Ghaffar R. (2013). Phytochemical analysis of medicinal plants occurring in local area of Mardan. *Biochemistry and analytical Biochemistry,* 2: 1-4.
10. Sharma P, Ahirwar P, Mangal S, Kirar A, Vishwakarma S. (2014). Phytochemical analysis of citrus limonum and citrus sinensis peels and identification of beta carotene pigment using ethanolic extract. *Int. Res. J. Pharm.*,5: 789-791.
11. Patel AK., Patel RJ, Patel KH, Patel RM. (2009). Synthesis, characterization, thermal properties and antimicrobial activity of acrylic copolymer derived from 2,4-dichlorophenyl acrylate. *Journal of Chilean Chemical Society,* 54: 228-233.
12. Ghous T, Akhtar K., Nasim, F.-U.-H, Choudhry MA. (2010). Screening of selected medicinal plants for urease inhibitory activity. *Biology and Medicine,* 2: 64-69.