

Phytochemical Screening, Antimicrobial and Antioxidant Activities of *Sonchus Oleraceus* l (Leaves) Extracts

Mahdi Abd Elmageed Mohammed¹, Yagoub Abdella Ali², Tuhami Elzein Hagr³ Sawsan Yosif Altay⁴, Rahma Abubakr Musa⁵ and Hatim MY Hamadnalla^{6*}

^{1,4,5}Department of Biology and Technology, College of Applied and Industrial Sciences, University of Bahri, P. O. Box1660, Khartoum, Sudan

²Department of biology, Faculty of Education University of Zalingei

^{3,6}Department of Chemistry and Industrial Chemistry, College of Applied and Industrial Sciences, University of Bahri, Sudan

ABSTRACT

The objective of this study to examine phytochemical analysis of *sonchus oleraceus* l, (asteraceae) (moliata) extracts which were extracted by four solvents, petroleum ether, chloroform, methanol and distill water and to assess their potential antibacterial against four standard bacteria gram-positive and gram-negative (*bacillus subtilis* *staphylococcus aureus*, *salmonella typhi*, and *psuedomona aeruginosa*) and antioxidant activities. (moliata) extracts using cold maceration method to extract *sonchus oleraceus* l, (asteraceae) locally known as (moliata) extracts, where dpph assay and paper disc diffusion assay were employed to evaluate the antioxidant and antibacterial activities respectively. The results showed that tannins, triterpenes, a sterols, flavonoids and cardiac glycosides compounds were present in the *sonchus oleraceus* l, (asteraceae) lives (moliata) extracts. The methanol extract of leaves showed high antioxidant potential (77 ± 0.03 %) and chloroform showed low antioxidant potential activity (4 ± 0.09) compare with propyl gallate as standard (93 ± 0.010 %) against dpph. Chloroform extract was effective and give moderate zone of inhibition against *staphylococcus aureus*. Methanol extract was effective and showed moderate zone of inhibition against *staphylococcus aureus*, *bacillus subtilis*, *salmonella typhi* and *pseudomonas aeruginosa*.

*Corresponding author

Hatim MY Hamadnalla, Department of Biochemistry, College of Applied and Industrial Sciences, University of Bahri, Sudan. Email :hamadnalla2009@yahoo.com

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Introduction

Since prehistoric decades, human being used plants as their sources of food and later consumed it for medicinal purposes to cure different ailments and diseases [1]. known of medicinal plant is plant that contains one or more of the numerous associates on chemical substances, one or more and low or high in concentration, and it has biological ability to inhibit or at any rate reduce the symptoms of the disease [2]. The use of medicinal plants has gained much attention in the last decade, and among those plants commonly used as medication in folk medicine, various extracts have been the subject of many pharmacological studies [3,16]. In previous studies it was reported that this plant contains the biologically activities of luteolin-7-glucoside, it was showed antiviral, pesticidal activity, cytotoxic, antitumor, fungicide and herbicide scopoletin, in addition the studies reported the presence of sesquiterpene glycosidebn [2]. Leaves of *s. Oleraceus* contain vitamin c, carotenoids, oxalic acid, various elements and Short chain fatty acid [3,4]. The aerial parts of *sonchus oleraceus* are used mostly in salad, infusions or decoctions, and are administered orally to treat stomach pain, hepatitis, infections [5]. *Sonchus oleraceus* l. Is a dietary and traditional medicinal plant in chinese folk culture that can be cooked and eaten to treat inflammatory

disease. Currently, studies have indicated that the extract have many bio-activities, including antioxidant, antibacterial motion, headaches, general pain, rheumatism, and even as a general tonic, anxiolytic, antinociceptive, anti-ageing, antitumour and anti-inflammatory properties [1,5-7,8,15]. A previous phytochemical investigation of *sonchus oleraceus* resulted in the isolation of flavonoids and terpene based on the traditional claims surrounding, the aim of this study to determine phytochemical screening, and antibacterial of *sonchus oleraceus* leaves, to evaluating the scientific basis for the traditional use of *sonchus oleraceus* [9,17]. In sudan, people have been tapping their herbal remedies for time immemorial [10].

Distributions: for this purpose used a vast variety of plant ranging from the rain forest vegetation in the south to the desired vegetation of north from the semi-mediterranean climatic zone of the red sea to the rich savanna of the west [11].

Methodology

Experimental Materials

Plant material collected from region of alfaw area-aldararif state –eastern of sudan in rainy season of 2018. The identification of the plants was carried out at biology & technology department, faculty of applied science and industrial, bahri university, sudan.

Sampling of plant material

The crude provisions of medicinal plants was kept in small dark plastic bags with proper labeling for further use.

Preparation of crude extract

50g of leaves plant material (molaita) were extracted by petroleum ether, chloroform, methanol and distill water for 24 hours at room temperature. The extracts were filtered by filter paper and were air dried after extraction. The final volume was adjusted to give the specific concentration. Yield of all extract was respect to dry starting materials.

Phytochemical screening

Phytochemical evaluates for various constituents of the extracts were undertaken using standard qualitative methods 12-18. The extracts were screened with the presence of biologically active compounds like alkaloids, glycosides, steroids, diterpenes, flavonoids, saponnins, phenolic, tannin, etc.

Detection of tannins

The extracts (4 ml) were boiled for 10 mins in 20 ml of water in a test tube. A few drops of 5% ferric chloride were added, observed for 10 min for a brownish green or a blue black coloration.

Detection of saponnins

The extracts (10 ml) were shaken and heated to boil. Frothing (appearance of creamy mass of small bubbles) shows the presence of saponnins.

Detection of alkaloids

About 4 ml each of the extracts were stirred with 10 ml of 1% aqueous hydrochloric acid on a steam bath for 10 mins. 1 ml of the extract was treated with a few drops of mayer's reagent.

Precipitation with these reagents was seen as evidence for the presence of alkaloids.

Detection of flavonoids

The extracts (5 ml) were treated with few drops of sodium hydroxide solution. Formation of intense yellow color, which becomes colorless the moment dilute acid was added indicates the presence of flavonoids.

Results and discussion

Results:

Extract properties and yield of *sonchus oleraceus*:

Four solvent was used to extract the secondary metabolites from the plant under investigation and their properties were reported in table (1).

Table 1: Shows the extracts properties and yield of *Sonchus oleraceus* L

Solvents of extraction	Characteristic	Color	Weight	Yields %
Petroleum Ether	Glairy	Yellow	0.6	83.3%
Chloroform	Glairy	Dark brown	1.2	41.6%
Methanol	Glairy	Dark green	2.4	20.8%
Distill Water	Glairy	Brown	3.1	16.1%

Phytochemical screening activity of *sonchus oleraceus* L leaves.

The presence of secondary metabolite materials of extracted was carried out using the standard methods described of constituents in extract cited as the summarize table (2):

Table 2: phytochemical screening of *Sonchus oleraceus* leaves

	Secondary metabolites		Tests	Successive method of extraction			
			Petroleum Ether	Chloroform	Methanol	istill Water	
Alkaloids	Acid	Drogndroff's	++	-	-	-	
		Mayer's	-	-	-	-	
		Hager's	++	-	-	-	
		Wagner's	-	-	-	-	
	Base	Drogndroff's	++++	++++	++++	++	
		Mayer's	++++	++++	++++	++	
		Hager's	++++	++++	++++	++++	
		Wagner's	++++	++++	++++	++++	
		KOH	-	+++	+++	-	
	Flavonoids	NH ₃ OH	-	+++	+++	-	
		AlCl ₃	-	+++	+++	-	
		Mg	-	-	+++	-	
Saponins Tannins	Foam test	-	-	-	-		
	Ferric chloride	-	-	++++	-		
	Gelatin	-	-	++	-		
Triterpenes and Sterols	Salkowski	++++	++++	++++	++++		
	Liebormann	++++	++++	++++	++++		
Glycosides	Anthraquinone	-	-	-	-		
	Cadiac glycosidic	-	+++++	++++	-		

Key: High = (++++), moderate = (+++), Trace = (++) , amounts (+) and absent (-).

Antimicrobial activity

The crude extracts of sonchus oleraceus leaves at different concentration (50, 25, 12.5, 6.25) were subjected to antimicrobial assays by use cup method and the inhibition zones were measured in (mm) against four bacterial organisms (two gram positive; bacillus subtilis, staphylococcus aureus and two gram negative; pseudomonas aeruginosa and salmonella typhi), the results were shown in table (3). Sensitive > (mizd), intermediate= (mizd) and resistance < (mizd)

Table 3: Antimicrobial activities of Sonchus oleraceus leaves

Extract	Concentration mg / ml	Zone of inhibition in diameters (mm)			
		Ps	\Sal		Sa
Methanol	100	18	19	24	23
	50	13	14	12	11
	25	-	-	-	-
Chloroform	100	17	17	16	20
	50	15	--	--	-
	25	14	-	-	-
Petroleum ether	100	16	16	14	20
	50	13	12	11	13
	25	-	-	-	-
water	100	17	19	23	22
	50	12	12	11	12
	25	-	-	-	-

Staphylococcus aureus (Sa), Bacillus subtilis (Bs), Salmonella typhi (Sal) and Pseudomonas aeruginosa (Ps).

Antioxidant activity results:

According to dpph scavenging activity was calculated (table5). The methanol extract of leaves showed high antioxidant potential 77 ± 0.03 % and chloroform showed low antioxidant potential activity (4 ± 0.09) comparable to that of propyl gallate (standard) 93 ± 0.01 g/ml against dpph.

Table 4: Antioxidant activities of Sonchus oleraceus leaves

No	Sample code	% RSA \pm SD (DPPH)
1	Methanol	77 ± 0.03
2	Chloroform	38 ± 0.09
3	Petroleum ether	16 ± 0.08
4	Distilled water	4 ± 0.09
5	Propyl Gallate	93 ± 0.01

Discussion

The phytochemical screening of sonchus oleraceus. L leaves explained that the petroleum ether extract was showed high triterpenes and sterol, alkaloid high in base and glycoside high in cardiac. Chloroform was showed high alkaloid in base, moderate flavonoid test and high concentration triterpenes and sterols, methanol high in flavonoid, alkaloid sterol. Distill water high concentration in tannins. All solvents were given good result in antioxidant and very high antioxidant in methanol extract. Chloroform extract was effective and give moderate zone of inhibition against staphylococcus aureus. The methanol extract showed high activity at concentrations (100) against bacillus subtilis and staphylococcus aureus, low activity against staphylococcus aureus (11) at concentration (50%) respectively as well as bacillus subtilis, and no activity about all species in all extraction at concentration (25%) the species pseudomonas aeruginosa. the results of this study have been agreed with the results of a study where the greater phenolic content increased antioxidant activity [11],[12]. the extracts of "s. Oleraceus" were

effective may explain the mechanism of action of the antipyretic effects of this plant reported in rats [13]. Various bioactive composites were known in the leaves of "s. Oleraceus" together with flavonoids, alkaloids, terpenes, steroids, tannins and phenols [12],[14]. However, the possibility of "s. Oleraceus" usage had incomplete to an insufficient quantity, for instance, medication, where it is an active component in the field of phototherapy owing to its antioxidant activity [15].

Conclusion

sonchus oleraceus has many uses as herb in traditional medicine to heal many aliment. This study to investigate the phytoconstituents which are responsible for different plant pharmacological activities.

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