Ecological and phytochemical evaluation of the halophyte *Aeluropus lagopoides* grows wildly in Jeddah, Saudi Arabia

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Abstract: Halophyte species of Saudi Arabia are a source of unique active phytochemicals, potentially due to the extreme environmental conditions under which the plants grow in the KSA. These phytochemicals make the native halophytes possibly interesting crops for medical uses. GC-MS analysis has been conducted in this study to identify the most abundant phytochemical in *A. lagopoides* roots, leaves and flowers extracts separately. In total, 50 compounds have been identified in the studied extracts. The identified phytochemicals included 10 terpenoids, 8 alkaloids, 7 fatty acids,6 alkanes, 4 steroids, 3 phenols, 2 flavonoid, 2 alcohols, 2 esters, and 2 organic acid. Several compounds with eminent pharmatheotical importance recorded in relatively high percentage in the studied extracts, including phytol, 9-desoxo-9-x-acetoxy-3,8,12-tri-O-acetylingol, dihydroxanthin, cadinol, endrin, colchifoleine, lucenin 2, quercetin and prednisone.

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1. Introduction:

"Halophytes" is a term that refers to plants that can grow naturally in saline environments such as saltmarshes, salt spans and salt deserts (Jefferies, 1981). Those plants are widely distributed throughout several regions of Saudi Arabia due to the presence of coastal saltmarshes along the Red Sea and the Arabian Gulf shores, and inland saltmarshes. According to El Shaer and Ismail (202) halophytes have a wide range of utilizations including; animal feeds, vegetables, in drugs, sand dune fixation, wind shelter, soil cover, cultivation of swampy saline lands, laundry detergents, paper production and many other uses.

Halophytes and their habitats have received special attention for nature conservation especially in Saudi Arabia. Due to the extreme environmental conditions in the KSA, i.e., high temperatures and high salinity of the seawater of the Persian Gulf, it is possible that plants here may have unique compounds not found in other species or in higher concentrations found in other species (Cybulska et al., 2014). Stress response mechanisms in halophytes have been reviewed by Jithesh et al. (2006). They note that salt stress, which affects cellular membranes, enzyme activities and the photosyntethic system, is largely caused by the damage from the production of reactive oxygen species (ROS) (Jithesh et al., 2006). Plants have evolved two antioxidative pathways to combat damage from ROS: an enzymatic pathway, which involves enzymes such as superoxide dismutase, and catalase, and a nonenzymatic pathway which includes antioxidants such as tocopherol, carotenoids, ascorbate, phenolic compounds, alkaloids, glutathione and non-protein amino acids that scavenge free radicals (Gill and Tuteja, 2010).

Many phytochemical classes extracted from halophytes showed various bioactivities. Phenolics compounds including phenolic acid, flavonoids and tannins confer various biological activities; for example: anti-carcinogenic, anti-inflammatory and anti-atherosclerotic activities. It is possible that it is their antioxidant activity that explains such activities (Chung et al., 1998). Furthermore, it also offers cytotoxic and antimalarial activity (Miles et al., 1999) and provides a source of amino acids, fatty acids, inorganic salts, steroids, phytoalexins, triterpenes, iridoid glucosides, alcohol, carbohydrate, hydrocarbons, carboxylic acid, minerals, and vitamins (Hogg and Gillan, 1984; Kanig and Rimper, 1985; Bandaranayake, 2002).

Aeluropus lagopoides (L.) Trin. ex Thw. (Poaceae) is a salt-secreting, rhizomatous halophyte which dominates inundated coastal areas as well as inland saline arid flats all over Saudi Arabia (Basahi, 2018). It has a large habitat range, which spans through Southeast Europe, North Africa from Morocco to Somalia, the Middle East and the Arabian Peninsula and central Asia. Mostly, it inhabits damp, saline soil on the fringes of salt marshes and sulfurous springs, as well as on wasteland (Watson and Dallwitz, 2008). appears to propagate mainly through rhizomes in mono-specific stands or through seed while colonizing open niches (Gulzar and Khan, 2001). It is a good candidate for saline agriculture because of its perennial habit (Torbatinejad et al., 2000). Ecologically, its clonal characteristics also help in reducing soil erosion and could be used to reclaim salinized agricultural and rangeland (Khan and Gul, 1999). Adaptive features of *A. lagopoides* like slow vegetative propagation, vigorous seed production, strong network of roots, epicuticular wax, salt secreting habit and small leaves help the species to survive both in coastal and inland stressful habitats (Mohsenzadeh et al., 2006). Due to its elevated protein content, it be used for forage production on highly saline wastelands (Gulzar et al., 2003).

Review of the literature on *A. lagopoides* reveals a number of reports on its physiological and biochemical responses to salt stress and anatomical features, which make it thrive well in highly saline conditions (Gulzar et al., 2003; Sobhanian et al., 2010; Naz et al., 2013). Other studies indicated that it has been used for healing wounds and as a painkiller and its leaves extract showed anticancer potential (Saleh et al., 2019), but the chemical composition of this plant have been poorly investigated. Therefore, the purpose of the current study is to screen the abundant phytochemicals in ethyl acetate extracts of *Aeluropus lagopoides* collected from south Jeddah coast, Saudi Arabia by gas chromatography–mass spectrometry (GC-MS) that could exhibit additional clues about figuring out the formula of biomolecular therapy in drug studies.

2. Materials and Methods:

The present study was carried out during March, 2018 on *Avicennia marina* and soil samples collected from Shuaibah site in Jeddah city (20°30'28"N 39°44'17"E) which is located in the South Province of the Kingdom of Saudi Arabia.

2.1 Samples collection:

The soil adhering to the roots (about 30 cm deep) was collected in three replicated to analyze physico-chemical characteristics. These samples were then combined to produce a composite sample. This sample was subsequently spread across a sheet of paper, air dried and passed through a 2 mm sieve before packing into plastic bags prior to being analyzed. Some physical and chemical parameters of such soil samples were analyzed. Meanwhile, the *A. lagopoides* plant materials were repeatedly washed by hand using distilled water so that any dust or other residues were removed. These materials were then separated into leaves, roots and fruits before being air dried at room temperature in a shady spot for several days until they had dried out. They were then ground to a fine powder using an electric grinder and stored in tightly sealed bottles for GC-Mass spectrometry.

2.2 Characterization of soil physiochemical properties:

2.2.1 Soil texture

Al-Yamani and Al-Desoki (2006) method was employed to determine the soil texture. A 100 g sample of soil was sieved using meshes varying in size from 0.005mm to 0.5 mm. The United States Department of Agriculture classification was applied to categorise the different sizes of soil particles: <0.002mm (clay), <0.05mm (silt), <0.25mm (fine sand) and <0.5mm (coarse sand). Having weighed the soil samples, they were placed into the top sieve and the sieve shaker was turned on for a period of one hour. When the one of sieving had elapsed, each sieve was weighed to determine the relative percentage of clay, silt, fine sand and coarse sand.

2.2.2 Soil reaction (pH)

Ten grams of the air-dried soil and 50 cm^2 distilled water were placed into a 250 cm^2 glass beaker and left overnight. Following the method described by Klute (1986), a pH meter was used to gauge the soil reaction.

2.2.3 Soil electrical conductivity (EC)

Richards (1954) dS m^{-1} method was applied to confirm the soil's EC. Into a 250 cm^2 glass beaker was placed 10g of soil and 50cm^2 distilled water. Having left this overnight, the soil and water were passed through Whatman 1 filter paper. The electrical conductivity of the soil was determined using an EC meter, producing a result measured in decmins/m for the concentration of anions based on the USDA.

2.2.4 Soil elements analysis

Chloride and sodium ions were analyzed in soil water extract according Williams and Twine (1960) and Hazen (1989).

2.3 Secondary Metabolites Analysis:

2.3.1 Preparation of the plant extracts

In order to obtain plants extract, a modified method of Rasmey and Mahran (2018) was used. 20 g of each plant powder was mixed with 50 ml ethyl acetate. The mixture was left for 24 h on an orbital shaker with a shaking speed 140 rpm. The extracts were sieved through a fine mesh cloth, centrifuged at 4000 g for 20 min, and evaporated and dried at 45 °C under vacuum in a rotary evaporator. The dry crude extracts were stored at 4°C.

2.3.2 GC–MS Analysis

The GC-MS analysis was conducted at the National Research Centre in Egypt. The identification of GC analytes was accomplished at a voltage of 70eV (m/z 50–550; source at 230°C and quadruple at

150°C) using a HP model 6890 GC interfaced to a HP 5791A mass selective detector. In order to facilitate GC, a 30 m x 0.25 mm i.d., 0.25μm film thickness HP-5ms capillary column (J&W Scientific, USA) was employed. The carrier gas was helium which was used at a constant flow rate of 1.0ml/min. The temperature of the injector and MS transfer line was 300°C, while the oven was set to a temperature of 150°C to be used for a period of 2 min, rising at 4°C/min to 300°C and then held at 300°C for 20 min. At a split ratio of 50:1, a volume of 1µl was injected for each individual analysis. Wiley Library for mass spectral data were used as references to identify the separated phytochemicals.

3. Results and discussion:

3.1 Soil Physico-chemical characteristics:

Physical and chemical properties of the study site inhibited by *A. lagopoides* showed in table (1). The soil texture was mainly medium sand and silt particles which represent 43.15, 35.55% respectively, followed by coarse sand (18%) and clay (3.05%). The soil of the studied location was slightly alkaline (pH=7.75) (table 1). Our results tallies with the those reported by Naz et al. (2013), who reported that *A. lagopoides* gown in slightly alkaline condition, where the pH value of all studied sites in the Lesser Cholistan, Pakistan ranged from 8.3 to 8.4.

Electric conductivity (EC) signals the salinity levels of the water. This can also be determined by the number of positive and negative ions in the water as well as the ability to pass an electrical current through the water. In the sample for the current study, the EC was 15.33 dS m^{-1} (Table 1). Our findings are in accordance with the reports of Naz et al. (2013) on *A. lagopoides*. Salinity is the important prime factor which determines the composition of the biological component in the mangrove environment for distributions of living organisms. The fluctuations in salinity affect the biological characteristics of the environment. As indicators for soil salinity, the concentrations of Na and Cl ions were determined in this study. As recorded in table (1) Cl ions showed very high concentration (1585.3 mg l^{-1}) followed by Na (232.2 mg l^{-1}). Comparable values for Cl and Na ions concentration in mangroves soil recorded (Naz et al., 2013). Similar results for all studied physical and chemical soil characters recorded by Pilania and Panchal (2016) in India at Little Rann of Kutch.

Table 1. The Physico-chemical characteristics of the soil around *Aeluropus lagopoides* roots

Soil properties		Values
Soil Texture	Coarse Sand (%)	18.25
	Medium Sand (%)	43.15
	Slit (%)	35.55
	Clay (%)	3.05
pH		7.75 ± 0.07
EC (dS m^{-1})		15.3 ± 0.04
Na^{+} (mg l^{-1})		232.2 ± 7.05
Cl^{-} (mg l^{-1})		1585.3 ±16.76

3.2 GC-MS Analysis:

The medicinal qualities of plants are derived from phytochemicals. In light of this key information several pharmaceutical industries are instituted. Crude extracts of the plants can be used to identify the phytochemical constituents that confer medicinal benefits (Savithramma et al., 2010). In halophytes, the most notable medicinal properties are found in the floral resources. Recognition of the medicinal importance of halophytes has prompted widespread investigations to identify bioactive compounds. Herbal extracts derived from halophytes have been used for medicinal purposes for several centuries. Many halophytes have bioactive compounds that produce unique actions. They exhibit competence in a range of bioactive principles, effective against various disease producing microbial organisms. Indeed, secondary metabolites (e.g. alkaloids, phenols, steroids and terpenoids) have been derived from halophytes that have been found to be of ecological, pharmacological and toxicological importance (Ksouri et al., 2009). Nowadays Analysis has been conducted into the organic compounds of plants and their activity has increased. Combining the best available separation and identification techniques (GC and MS) has resulted in the optimal method for volatile semi-volatile bioactive compound qualitative analysis (Grover and Patni, 2013).

In the current study, the ethyl acetate extracts of *A. lagopoides* were analyzed by GC-MS to detect various compounds with the help of Willy library. The chromatograms of GC-MS analysis of *A. lagopoides* roots, leaves and flowers extracts are given in figures 1, 2 and 3. Relative amounts (% peak area) of each one of the 50 identified compounds are presented in Table 2, according to their elution order. As expected, the overall phytochemicals of roots, leaves and flowers of *A. lagopoides* showed both qualitative and quantitative differences. Anyway, the roots and fruits were similarly characterized by the predominance alkanes (29.84, 85.56% respectively). On the other hand, class of compounds terpenoids represents the highest quantities in the leaves extract (25.66%).

Table 2. Phytochemicals identified in *Aeluropus lagopoides* roots, leaves and flowers extracts

No.	Compound	% Peak area			Chemical class
		Roots	Leaves	Flowers	
1	Chloroform	7.44		1.11	Other
2	11-Octadecenal	3.09	0.83	0.25	Other
3	Cadinol	1.26			Terpenoid
4	Gigantine	2.57			Alkaloid
5	2-[(Benzo[1,3]dioxole-4-carbonyl)-amino]-3-hydrox-propionic acid	2.75	0.46		Organic acid
6	tert-Hexadecanethiol	1.38	0.52	2.29	Alcohol
7	7,9-di-tert-butyl-1-oxaspiro[4.5]deca-6,9-diene-2,8-dione	3.43	3.70	0.59	Other
8	Eicosane	2.59			Alkane
9	9- Octadecenoic acid	0.90	2.44	1.12	Fatty acid
10	Androstane-3,17-dione	0.99	0.57	0.20	Steroid
11	Phytol		11.95	3.04	Terpenoid
12	1-Eicosanol	1.57			Alcohol
13	Dihydroxanthin		3.62		Terpenoid
14	Octadecadien-1-ol acetate		1.69		Fatty acid
15	Docosane	19.05	11.96	8.53	Alkane
16	10-Hydroxy-5,7-dimethoxy-2,3-dimethyl-1,4-anthracenedione			0.44	Phenol
17	14-Oxononadec-10-enoic acid, methyl ester	2.52	0.70		Fatty acid
18	Dasycarpidan-1-methan ol, acetate	2.37	2.58		Alkaloid
19	Hexadecanoic acid,2,3-dihydroxypropyl ester		2.32		Fatty acid
20	DI-2- Benzothiazole Disulfane	5.63	3.03	0.70	Alkaloid
21	Strychane, 1-acetyl-20.alpha.-hydroxy-16-methylene-	1.62			Alkaloid
22	Glycyl-L-histidyl-L-lysine acetate	1.31	1.12	0.15	Organic acid
23	Phytane	1.88		0.46	Terpenoid
24	Quercetin	0.45	1.04	0.52	Flavonoid
25	ISOCHIAPIN B	0.61	3.57	0.66	Others
26	Gibberellic acid		1.43		Terpenoid
27	Phthalic acid, 2,7-dimethyloct-7-en-5-yn-4-yl isobutyl ester	3.01			Ester
28	Prednisone		8.62	0.26	Steroid
29	2-Acetyl-3-(2-cinnamido)ethyl-7-methoxyindole	2.65	4.90	1.11	Alkaloid
30	Octadecane,3-ethyl-5-(2-ethylbutyl)-	6.63	1.16		Alkane
31	Hexanedioic acid,dioctyl ester	3.37			Fatty acid
32	Endrin	2.14			Terpenoid
33	Corlumine		4.92		Alkaloid
34	1,2-Benzenedicarboxylic acid,bis(2-ethylhexyl) ester	4.99			Ester
35	Octacosane			45.87	Alkane
36	Colchifoleine	0.58	1.08	0.85	Alkaloid
37	~~Corchorin~~		2.22		Terpenoid
38	Stigmast-5-en-3-ol		3.51		Steroid
39	Ethyl iso-allocholate	2.61	1.33	0.28	Steroid
40	Trans-2-phenyl-1,3-Dioxolane-4-methyl octadec-9,12,15- trienoate		0.49		Phenol
41	Obscurinervinediol	1.33	0.58		Alkaloid

42	Olean-12-ene-3,16,21,22,28-pentol		2 .65	0.31	Terpenoid
43	Pentatriacontane	1.57		22.45	Alkane
44	Hexatriacontane			8.41	Alkane
45	9-Desoxo-9-x-acetoxy-3,8,12-tri-O-acetylingol	1.05	3. 24		Terpenoid
46	Oleic acid, eicosyl ester	1.36			Fatty acid
47	FLAVONE4'-OH,5-OH,7-DI-O-GL UCOSIDE		0.71		Phenol
48	Carotene,1,1',2,2'-tetrahydro-1,1'-dimethoxy	1.46	0.55		Terpenoid
49	Lucenin 2	3.81	8.62	0.35	Flavonoid
50	Trilinolein		1.85		Fatty acid
Total		**99.97**	**99.97**	**99.98**	

According to the results shown in table (2), the phytochemicals identified in *A. lagopoides* extracts contained 10 terpenoids, 8 alkaloids, 7 fatty acids,6 alkanes, 4 steroids, 3 phenols, 2 flavonoid, 2 alcohols, 2 esters, and 2 organic acid. The most abundant terpenoids in *A. lagopoides* include: 9-Desoxo-9-x-acetoxy-3,8,12-tri-O-acetylingol and Carotene,1,1',2,2'-tetrahydro-1,1'-dimethoxy that identified only in root (1.05%, and 1.46%) and leaves (3.24% and 0.55%) extracts; Phytane that identified only in root (1.88 %) and flowers (0.46 %); Phytol and Olean-12-ene-3,16,21,22,28-pentolthat identified only in leaves (11.95%, and 2 .65%) and flowers (3.04% and 0.31%) extracts; Root extract of *A. lagopoides* characterized by the abundance of 2 extra terpenoids which are Endrin (2.14%) and Cadinol (1.26%), while Corchorin (2.22 %) Gibberellic acid (1.43%) and Dihydroxanthin (3.62%) identified only in *A. lagopoides* leaves extract only.

The most abundant alkaloids in *A. lagopoides* are: DI-2- Benzothiazole Disulfane ,2-Acetyl-3-(2-cinnamido) ethyl-7-methoxyindole and Colchifoleine which recorded in the prepared three extracts in area of (5.63%, 2.65% and 0.58%) in root, (3.03%, 4.90 % and 1.08%) in leaves and (0.70%, 1.11% and 0.85%) in flowers respectively; Dasycarpidan-1-methan ol, acetate (ester) and Obscurinervinediol that recorded only in root (2.37% and 1.33%) and leaves (2.58% and 0.58%) extracts respectively; Strychane, 1-acetyl-20.alpha.-hydroxy-16-methylene (1.62%) and Gigantine(2.57%) recorded in root only; while Corlumine (4.92%) . The identified fatty acids in *A. lagopoides* extracts include: 9- Octadecenoic acid that identified in root (0.90%),leaves (2.44%) and flowers (1.12%) extracts; 14-Oxononadec-10-enoic acid, methyl ester identified in root (2.52%) and leaves (0.70%) extracts; Hexanedioic acid,dioctyl ester (3.37%) and Oleic acid, eicosyl ester (1.36%) recorded in root only; while Hexadecanoic acid,2,3-dihydroxypropyl ester (2.32%), Trilinolein (1.85%) and Octadecadien-1-ol acetate (1.69%) identified only in *A. lagopoides* leaves extract only.

Out of the identified alkanes in *A. lagopoides*, the most abundant one was Docosane which recorded in root (19.05%), leaves (11.96%) and flowers (8.53%); followed by Octadecane,3-ethyl-5-(2-ethylbutyl) that identified only in root (6.63%) and leaves (1.16 %); Pentatriacontane that recorded only in root (1.57%) and flowers (22.45%) ; Eicosane (2.59%) recorded in root only; Hexatriacontane (8.41%) recorded in flowers only, while Octacosane (45.87%) recorded their highest values in flowers extract . The most abundant Steroid in *A. lagopoides* extracts are: Ethyl iso-allocholate and Androstane-3,17-dione which identified in root (2.61% and 0.99 %), leaves (1.33% and 0.57%) and flowers (0.28% and 0.20%) respectively; Prednisone that identified only in leaves (8.62%) and flowers (0.26%); while Stigmast-5-en-3-ol recorded in leaves (3.51%) only.

Only two flavonoids in identified in *A. lagopoides* extracts Lucenin 2 and Quercetin which recorded in the prepared three extracts in area of (3.81% and 0.45 %) in root, (8.62% and 1.04%) in leaves and (0.35% and 0.52%) in flowers respectively. There are 3 phenols identified in *A. lagopoides*, however their abundance was very low including: FLAVONE4'-OH,5-OH,7-DI-O-GL UCOSIDE (0.71%) and Trans-2-phenyl-1,3-Dioxolane-4-methyl octadec-9,12,15- trienoate (0.49%) that identified in leaves extract only; 10-Hydroxy-5,7-dimethoxy-2,3-dimethyl-1,4-anthracenedione recorded in flowers (0.44%) only; No phenols identified in *A. lagopoides* root. Only two alcohols in identified in *A. lagopoides* extracts: tert-Hexadecanethiol recorded in root (1.38%), leaves (0.52%) and flowers (2.29%); and 1-Eicosanol (1.57%) recorded only in root extract. The most abundant esters include: 1,2-Benzenedicarboxylic acid,bis(2-ethylhexyl)ester(4.99%)and Phthalic acid**,** 2**,**7-dimethyloct-7-en-5-yn-4-yl isobutyl ester (3.01%) which recorded only in root extract ,while did not appear in leaves and flowers extracts.The organic acids identified in *A. lagopoides* were: Glycyl-L-histidyl-L-lysine acetate in root (1.31%), leaves (1.12%) and flowers (0.15%); 2-[(Benzo[1,3]dioxole-4-carbonyl)-amino]-3-hydrox-propionic acid in root (2.75%) and leaves (0.46%) .

Many compounds with medical importance have been identified in this study which vary between the studied extracts. The most important identified teprenoids include phytol that recorded in leaves and flowers extracts. Phytol is an acyclic diterpene alcohol that is employed as a precursor when synthetically producing vitamins K1 and E (Daines et al., 2003; Netscher, 2007 Vasanthakumar et al., 2019). Phytol have been reported in previous studies, including its activity against mycobacteria, anticonvulsant, antispasmodic and anticancer activities (Pongprayoon et al.,1992; Lee et al.,1999; Saikia et al., 2010; Costa et al., 2012). Many other terpenoids with anti-microbial and antioxidant activities have been identified in our study including, 9-Desoxo-9-x-acetoxy-3,8,12-tri-O-acetylingol in *A. lagopoides* root and leaves extracts (Chen et al., 2014; Oh et al., 2014; Al-Rubaye et al., 2017). Furthermore, other terpenoids with anticancer activities including dihydroxanthin in leaves extract. Cadinol that recorded in root extract was known to act as anti-fungal (Ho et al., 2011) and as hepatoprotective (Tung et al., 2011). In addition, endrin

That identified in root extract in relatively high percent is used as pesticide as mentioned by Gupta (2018).

Two alkaloids with medical importance have been identified in the current study. Colchifoleine is an important alkaloid identified in studied extracts. It is known to be effective in inflammatory and heart diseases (Mohamed et al., 2014; Hemkens et al., 2016). Dasycarpidan-1methanol, acetate identified only in root and leaves and leaves extracts, is an important alkaloid reported to have anti-inflammatory, anti-bacterial, anti-fungal, anti-diabetic and for cancer treatment (Al-Rubaye et al., 2017). The identified flavonoids include Lucenin 2 and Quercetin. Lucenin 2, that identified in relatively high amount in all sdudied eaxtracts, known to has antimicrobial, antiasthma, anticancer and anti-inflammatory properties (Mohamed et al., 2014; Kim et al., 2016; Morrison et al., 2017; Mizia and Bennett, 2019). Quercetin proved to possess strong antitumor activity and antioxidants, antidiabetic (Li et al., 2009; Zhang et al.,2012). It has also several pharmacological effects in the nervous system as a neuroprotective agent and treatment of Alzheimer's disease (Dajas et al., 2015). Prednisone, is an important steroid identified in leaves and flowers extracts in relatively high amount, was used for many different autoimmune diseases and inflammatory conditions, including asthma, rheumatic disorders, allergic disorders, adrenocortical insufficiency, thyroiditis, laryngitis, severe tuberculosis, nephrotic syndrome, uveitis, and as part of a drug regimen to prevent rejection after organ transplant (Czaja, 2006; Teschke and Danan, 2018).

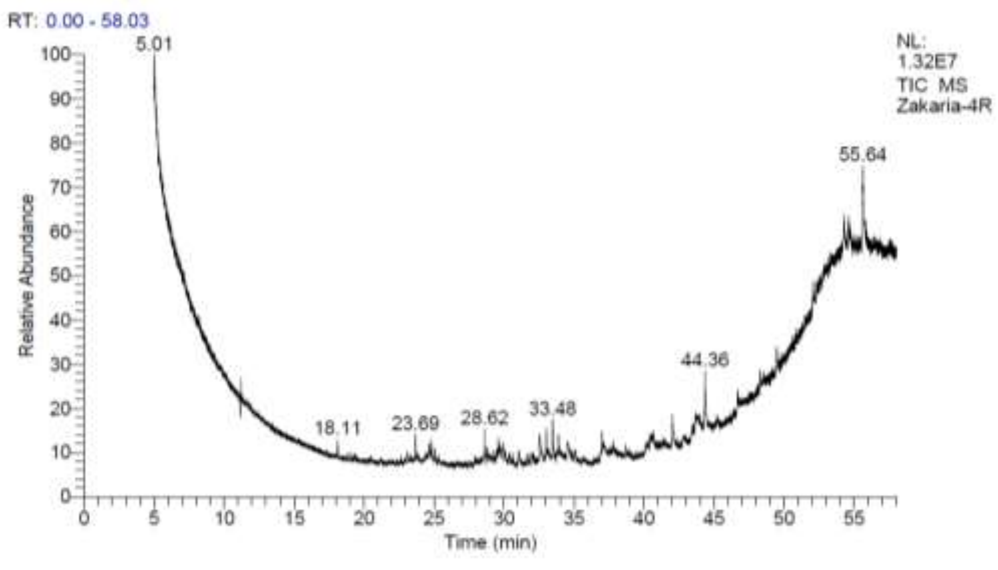

Figure 1. GC-MS chromatogram of *Aeluropus lagopoides* roots extract

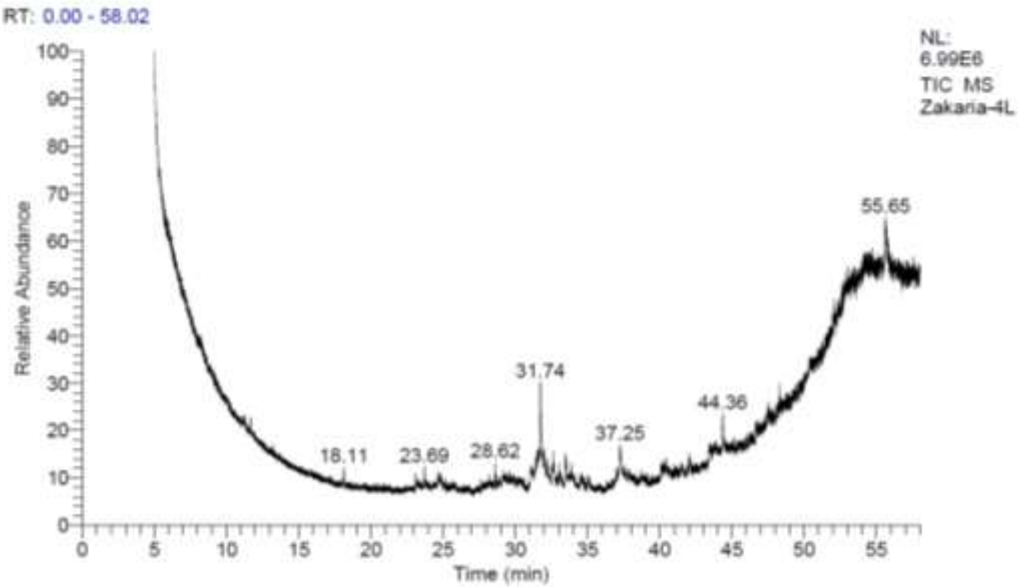

Figure 2. GC-MS chromatogram of *Aeluropus lagopoides* leaves extract

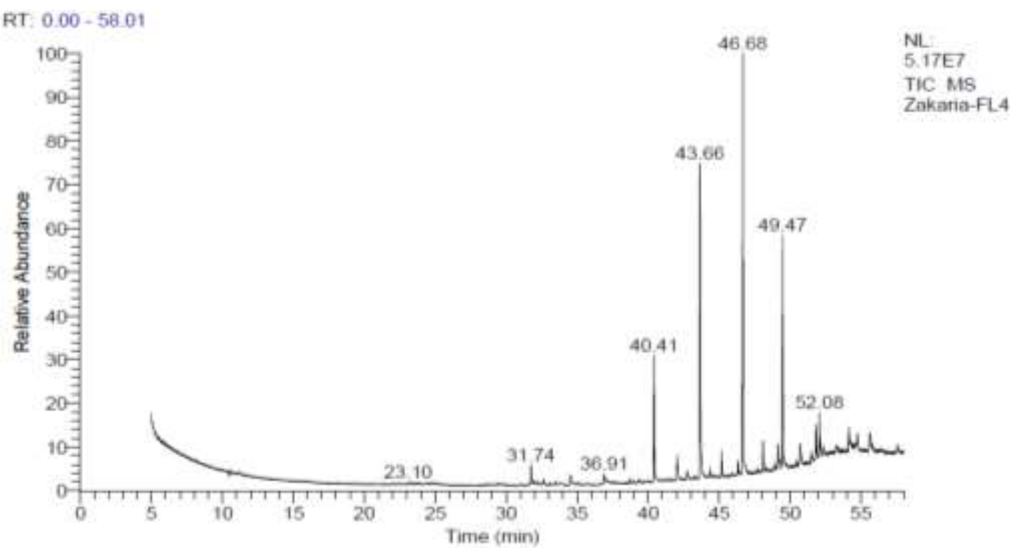

Figure 3. GC-MS chromatogram of *Aeluropus lagopoides* flowers extract

Conclusion:

Aeluropus lagopoides offers a number of bioactive compounds and this explains why the entire plant has been used to treat a range of ailments. These medicinal benefits are likely to be enhanced by isolating individual phytochemical compounds and examining their biological activity. From the results, it could be concluded that *A. lagopoides* roots, leaves and fruits contains various bioactive compounds including as alkaloids, terpenoids, flavonoids, phenols, steroids, alkanes, alcohols, esters, fatty acids and organic acids. Hence, it can be recommended as a plant having phytopharmaceutical importance.

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11/2/2025