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Original article

Determining the Contents of Antioxidants, Total Phenols, Carbohydrate, Total Protein, and Some Elements in *Eucalyptus Gomphocephala* and *Ricinus Communis* Plant Samples

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Chemical Analysis, Eucalyptus gomphocephala, Ricinus Communis.

A comparative chemical study was carried out on two plants (Eucalyptus gomphocephala and Ricinus communis) growing at coastal (Derna city) and Mountain (Al-Bayda city) regions. Leaves and stems of each plant were selected in this study. Some of the chemical constituents (Antioxidant, total phenols, total protein, carbohydrate, minerals, and metals) were estimated. The chemical properties results showed wide variations of the anti –oxidant contents, where high values of (390.90 ppm) were recorded in Eucalyptus gomphocephala growing at Al- Bayda region, On the other side high contents of anti- oxidant of (447.5 ppm) was recorded in leafs of Ricinus communis plant growing in Deran region. Small variations of carbohydrate contents were observed; their contents fluctuated in the range of (0.001 – 0.870 ppm), and the contents of protein ranged between (0.74 – 4.40 ppm). For the mineral contents, the recorded high values of potassium (126 – 447.70 ppm), high values were recorded in leafs comparing with steams of the studied plants, relative high contents of sodium were recorded in coastal regions (44.93 ppm) compared with the Mountain ones (13.85) higher values were recorded in Ricinus communis comparing with Eucalyptus gomphocephala plant. No wide variations were recorded for (iron), (copper), and (Nickel).

Introduction

Many studies were out on different species of *Eucalyptus gomphocephala* and *Ricinus communis* around the world. It was reported that the fundamental oil constituents of *E. gomphocephala* uncovered the presence of α-pinene, β-pinene, limonene, myrcene, 1,8-cineole, all oaromadendrene, and globulol as the vital leaf oil components. A different extent of organic exercises has been detailed for numerous compounds extracted from diverse *Eucalyptus* species, including flavonoids, tannins, phloroglucinol derivatives, and terpenoids. Numerous species of the genus *Eucalyptus* from the Myrtaceae family are utilized in Brazilian society's pharmaceutical for the treatment of different restorative conditions such as cold, cough, fever, and bronchial diseases [1].

It was recorded that Manor Tuart has been utilized for fuel, flooring, surrounding, made sheets, and posts. Tuart being utilized for sand stabilization, wheat belt windbreaks, and forestation in semiarid lands, since it is tolerant to calcareous, saline, and waterlogged soils. In expansion, Tuart blossoms are known to yield great quality nectar, creating light coloured nectar with satisfying enhancement and fine grain [2]. A study [3] recorded that the *Eucalyptus* plant is known to have antioxidant, anti-implantation, anti-inflammatory, anti-diabetic, central pain relieving, anti-tumour, larvicidal & grown-up rise hindrance, anti-nociceptive and anti-asthmatic action. All these employments are due to the presence of certain phyto constituents within the plant. The major phytoconstituents detailed in this plant are rutin, gentistic corrosive, quercetin, gallic corrosive, kaempferol-3-O-beta-d-rutinoside, kaempferol-3-O-beta-d-xylopyranoside, tannins, Ricin A, B & C, ricinus agglutinin, Indole-3-acetic corrosive, and an alkaicinine [4].

The antioxidant action of the examined fundamental oil displayed a potential antioxidant activity. Ricin, a harmful protein (toxalbumin) found within the beanlike seeds of the castor-oil plant (*Ricinus communis*). Ricin, found in 1888 by German researcher Dwindle Hermann Stillmark, is one of the foremost poisonous substances known. It is of uncommon concern due to its potential utilize as an organic weapon. Inadvertent introduction to ricin is uncommon and comes about essentially from the ingestion of castor seeds [5]. The *Ricinus communis* or castor plant has tall conventional and therapeutic esteem for maintaining an infection-free free sound life. Customarily the plant is utilized as purgative, laxative, fertilizer and fungicide etc. though the plant has useful impacts such as anti-oxidant, antihistamic, Anti nociceptive, anti- asthmatic, antiulcer, immunomodulatory, Anti diabetic, hepatoprotective, Anti fertility, hostile to provocative, antimicrobial, central apprehensive framework stimulant, lipolytic, wound mending, insecticidal and Larvicidal and

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numerous other restorative properties [6]. These compounds have illustrated cytotoxic, insecticidal, anti-inflammatory, antioxidant movement, and anti-asthmatic properties, among others [7[. Another study carried out on different of *R. communis* showed the presence of natural products, and roots of *R. communis* for their insecticidal adequacy against M. sacchari, and to recognize dynamic compounds capable for their bioactivity [8]. Basic oil found in its foliage is the foremost critical one and finds broad utilize in nourishment, perfumery and pharmaceutical industry. In expansion, the oil has a wide range of natural action counting anti-microbial, fungicidal, insecticidal/insect repellent, herbicidal, acaricidal and nematicid [9]. Castor plant has tall conventional and restorative esteem for keep up the infection free sound life. Customarily the plant is utilized as purgative, laxative, fertilizer and fungicide etc, while the plant has useful impacts such as anti-oxidant, antihistamic, antinociceptive, antiasthmatic, antiulcer, immunomodulatory, antidiabetic, hepatoprotective, antifertility, hostile to fiery, antimicrobial, central apprehensive framework stimulant, lipolytic, wound mending, insecticidal and Larvicidal and numerous other restorative properties [3]. Besides being utilized as a source of biodiesel, the oil can too be utilized for fabricating candles, cleansers and makeup [10]. The oil has too been utilized as a grease within the inner combustion motors in Airplanes [11]. India is the biggest maker of castor oil, speaking to 60% of the worldwide generation taken after by China and Brazil (FAO, 2006). Generation of castor plants has expanded since the center of the twentieth century [12]. Castor bean (*Ricinus communis L.*) is an imperative non-edible oilseed trim containing 45-58% oil primarily utilized in pharmaceutical, petroleum, biofuels, chemicals and material industry [13].

Climate alter is causing recognizable impacts on the life cycle, dispersion and phyto-chemical composition of the world's vegetation, counting therapeutic and fragrant plants. The changing temperatures and wind designs related with climate alter are influencing precipitation and in this manner plant design, blooming, fruiting, phyto-chemical composition and in situ competition with other species. Subsequently, there's an ought to get it the impact of higher temperature, different precipitation levels and diverse soil dampness and ripeness, by developing them beneath such climates and decide how variety in temperature, dampness and edaphic variables might influence the plants' phenology, supplement, antioxidant and auxiliary metabolites levels [14]. The Preparatory Phytochemical consider of *R. communis* nearness of steroids, saponins, alkaloids, flavonoids, and glycosides the dried clears out of *R. communis* appeared the nearness of alkaloids, ricinine(0.55%) and N-demethylricinine flavones glycosides kaempferol- 3-O kaempferol-3-O-β-D-glucopyranoside, quercetin xylopyranoside, quercetin-3-O-β-D-glucopyranoside, kaempferol O-β-rutinoside and quercetin-3-O-βmonoterpenoids (1,8-cineole, camphor and α sesquiterpenoid (β-caryophyllene), gallic corrosive, quercetin, gentisic corrosive, rutin, epicatechin and ellagic corrosive are the major phenolic compounds confined from takeoff [6]. This study aims to estimate some chemical properties as antioxidant, total phenols, carbohydrate, protein and some of metals and minerals in some plants.

Methods

The area of study

The study area (Figure ,1) is located at Al-Gabal Al-Akhadar Mountain in the eastern regions of Libya and (Derna) and Al-bayda regions. It lies between latitudes 22° 38′ 0 N and 32° 46′ 0″ E. The Derna area has moderate climatic conditions, dominant year-round. As the area is located on the Mediterranean Sea from north and northeast on one side, and high topography on the other, while it is open to the semi-desert topography from its southern direction. Al Gabal Al Akhdar is a limestone plateau 700 to 870 m above sea level with an undulating surface that tips gently to the south stretches between the longitudes 20°, 35′ E to 23°,15′ E and latitudes 30°, 58′ N to 32° 56′ N. The basic configuration of Al-Gabal is a step-like arrangement of alternating benches and escarpments rising to 850 meters above sea level. There are two main escarpments, further apart in the west but drawing gradually closer together eastward, both roughly parallel to the coast. A large portion of the two benches, especially the second, is dissected by wadis, giving the Gabal a predominantly hill to mountainous appearance.

Sampling

Two different plant samples were collected from Al–Gabal Al–Khder and Derna regions during 2023, including (*Eucalyptus gomphocephala* and *Rcinus communis*) plants. The locations were selected as coastal and mountain locations for the selected plants. The collected samples were identified in the *Seliphium* herbarium, Botany Department, Faculty of Science, Omar Al Mukhtar University (Table 1).

Sample preparation

The leaves and stems of the studied plants were separated and washed several times with distilled water. The samples were then dried in a dark and dry place within two weeks. Then the samples were ground by mortar and stored in polyethylene bottles until analysis.

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Figure 1. The studied area.

Table 1. Classification of studied plants:

Kingdom	**Plant**	**Plant**
Family	*Euphorbiaceae*	*Myrtaceae*
Genus	*Ricinus*	*Eucalyptus*
Species	*R. Communis*	*E. gomphocephala*

In recent years, this is due to global climate change. This study is just a case for the effect of different atmospheric conditions between two regions (One coastal and the other mountainous locations) on some chemical and physiological properties. Therefore, we highly recommend studying other plants which grow in two different areas (as semi-desert and coastal or mountain locations), especially of Al–Gabal Al–Akhder region, which has a huge number of these plants.

Chemical studies

In this study, the studied samples were expressed as the following numbers (1 – 8) as given in Table 2:

Table 2. The code of samples in this study.

Sample No	**Sample Type**
1	***Eucalyptus gomphocephala*** leaf (Derna),
2	***Eucalyptus gomphocephala*** stem (Derna),
3	***Ricinus communs*** leaf (Derna),
4	***Ricinus communs*** stem (Derna),
5	***Ricinus commnus*** leaf (AGabal Al Akhdar)
6	***Ricinus communs stems*** (Al Gabal Al Akhdar)
7	***Eucalyptus gomphocephala*** leafs (AlGabal Al Akhdar)
8	***Eucalyptus gomphocephala*** stem (Gabal Al Akhdar)

Determination of antioxidant capacity by the Prussian Blue method

One gram of the sample powder was defatted with petroleum ether. The defatted powder was then extracted sequentially by stirring with 10 mL methanol twice, then with 10 mL 1% hydrochloric acid: methanol(v/v). The three combined extracts were evaporated under vacuum, and the residue was dissolved in 10 mL of methanol. Half ml of the solution was diluted with 3 ml of distilled water, 3 ml (0.008 M) of K3Fe (CN)6 was added,3 ml of 0.1M HCl, and 1 ml of 1% FeCl3. The blue color is allowed to develop for 5 min, and the absorbance is measured at 720 nm against the blank [16-27].

Estimation of total carbohydrates of leaf and stem plant samples:

To estimate total carbohydrates, a known weight of 0.2 g of the dried sample was ground, then 5 mL of sulphuric acid was added. After the samples dissolved, the samples were cooled at room temperature, then a small quantity of Barium carbonate (Ba2CO3) was added, and the mixture was heated again. After cooling, the samples were filtered. One milliliter of solution was taken, then 1 milliliter of 5% phenol was added. The total carbohydrate was determined by a method that involved measuring where the absorbance was measured at a wavelength of 490 nm [23 -25].

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Determination of metals and minerals in plant and soil samples

The metals of (Cu, Fe, and Ni) were determined with an atomic absorption (Perkin Elmer 800) according to the method described by some studies (28 -34). Soluble sodium and potassium contents were measured by a Flame Photometer (JENWAY Flame Photometer) according to the method described by at central lab of the Faculty of Science, Omar El-Mukhtar University. Total phosphorus was determined spectrophotometrically. Where 0.5 g at each sample was designed with 5 ml of nitric acids until near dryness, then 10 ml of distilled water was added, the mixture then heated to reduce the volume, then the samples were filtrated, the volume completed to 100 ml by distilled water, after the contents of sodium and potassium were determined of plant leafs and stems [28-34].

Determination of Phenol Compounds by the Folin-Ciocalteu Method

This method was carried out to determine phenolic compounds in the aqueous extracts, where 10 ml was added to 3 ml of distilled water with Folin-Ciocalteu reagent. According to the method of Slinkard and Singleton, which uses gallic acid as a standard. Samples (leafs and seeds of barley plant) were introduced into test cuvettes, and then 0.5 mL of Folin-Ciocalteu reagent and 2 mL of Na_2CO_3 (20%) were added. The absorbance of all samples was measured at 650 nm using UV–Vis spectrophotometer after incubating for 1 min and then cooled for 15 min. Results were expressed as milligrams of gallic acid equivalent per gram of fresh weight.

Results

Antioxidant Capacity

The results of anti – oxidant capacity of the studied plants showed high variations, where the high contents were recorded in *Eucalyptus gomphocephala (*Albayda) plant comparing with the anti – oxidant capacity of *Eucalyptus gomphocephala (Derna*) plant, the anti- oxidant capacity values of the studied plants were (390.91 and 14.5ppm) for the leafs and stems, respectively, of the *Eucalyptus gomphocephala (*Albyda) plants and the anti-oxidant capacity of the *Eucalyptus gomphocephala* (Derna) plants were (279.6 and 7.43 ppm) for the leafs and stems, respectively. On the other side, the anti-oxidant capacity of the leaves and stems of the *Ricinus communis* of (Derna plant was 447.5 and 31.5 ppm, respectively, and showed high variations between stems and leaves, where the high contents were recorded in the stems *Ricinus communis* (Derna) . But no wide variations in the antioxidant values of leaves and stems were observed in the *Ricinus communis* (Albyda) plant values of 9 5.66 and 41.8 ppm, respectively.

Antioxidant is the substrate that prevents the oxidation of molecules inside a cell. It is a well-known chemical process that allows the removal of electrons or hydrogen from a substance. Free radicals are produced during the biological oxidation reaction. Because the radicals are reactive, they start the chain reaction simultaneously. This can lead to the damage or even the death of a cell. Hence, antioxidant agents are capable of terminating a chain reaction by eliminating free radical intermediates. They perform the antioxidant behavior by being oxidized, hence, antioxidants can be considered reducing agents. Some examples are ascorbic acid, thiols, or polyphenols. Antioxidants are commonly used as supplements in food and have been examined for inhibition of diseases such as heart disease and cancer [35]. Anti-oxidative action is one of the prime physiological functions that protect living organisms from oxidative damage caused by reactive oxygen species. Reactive oxygen species are a term used to describe several reactive molecules and free radicals derived from molecular oxygen. During daily activities and with advanced age, oxidative substances and free radicals accumulate in cells, affecting various organs and systems in our body. Reactive oxygen and nitrogen species are free radicals that are a common outcome of normal aerobic cellular metabolic processes [36].

Medicinal plants contain a wide variety of free radical scavenging molecules such as phenolic compounds (phenolic acids, flavonoids, catechins, proanthocyanidins, quinones, coumarins and tannins etc.), nitrogen compounds (alkaloids, amines and betalains etc.), vitamins, terpenoids, carotenoids and other secondary metabolites which are reported to have antioxidant activity. In this study, the antioxidant of *Eucalyptus gomphocephala* plants growing in the selected locations showed high values of (390.9 ppm), and in stems of Ricinus *communis (Derna)* value of (447.5 ppm) (Table 3).

Table 3. Antioxidant Capacity of the studied plants.

Plant	Anti-oxidant(µg/g)
Eucalyptus gomphocephala (Leafs) (derna)	279.6
Eucalyptus gomphocephala (Stems (derna)	7.43
Ricinus communis (Leafs) (Derna)	447.5
Ricinus communis (Stems) (Derna)	31.5
Ricinus communis (Leafs) (Albyda)	5.66
Ricinus communis (Stems)	41.8

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Eucalyptus gomphocephala (Leafs) (Albyda)	14.5
Eucalyptus gomphocephala (Stems)(Albyda)	390.9
Average ± SD	113 ±185

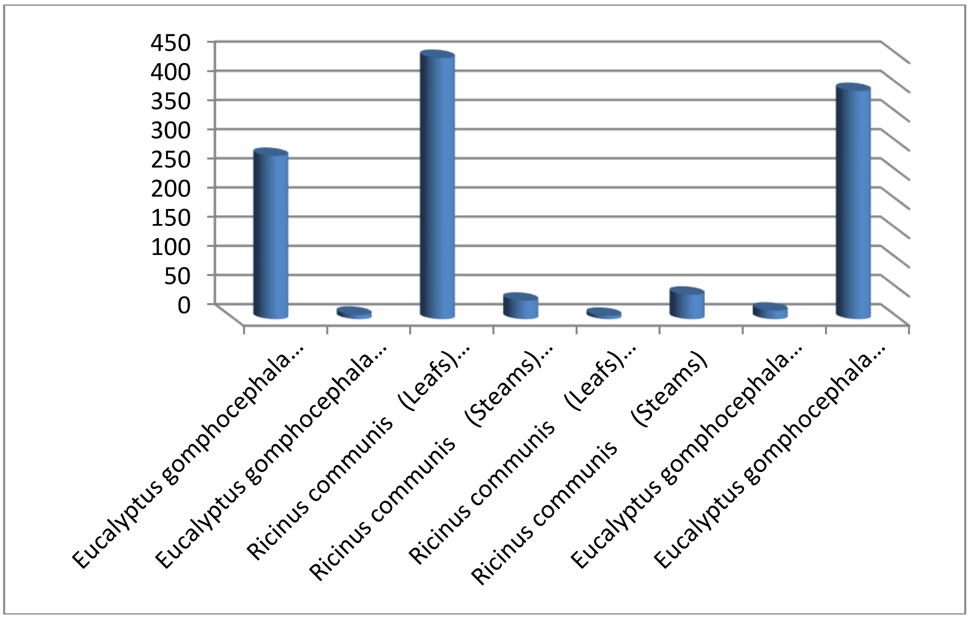

Figure 2. Anti-oxidant contents of the studied samples (μg/g).

Total carbohydrate content of leaves and stems of the studied plant samples

The carbohydrate contents showed variations in the plant samples, where the higher contents of carbohydrate were recorded in the plants of Algabal Al-Akhadar (Al-Bayda), which gave the carbohydrate contents of (0.980 and 0.919 μg/g) of leaves of *Eucalyptus gomphocephala*, and leaves of *Ricinus communis*, respectively. Generally, the carbohydrate contents in leaves are higher than their contents of stems samples (Table 4).

It was stated that the climatic factors affect quantitatively and qualitatively the secondary metabolites, and the results of the climatic data analysis showed a difference between the climate of the two studied regions. Also, the Plant cells produce carbohydrates by the fixation of carbon dioxide during photosynthesis. In higher plants, however, not all cells are photosynthetically active: the roots, reproductive structures, developing organs, and storage tissue rely entirely on the import of carbohydrates synthesized elsewhere in the plant. Mature leaves are the predominant sites of photosynthesis in a higher plant: they produce a surplus of carbohydrates, which is exported to other parts of the plant. Carbohydrate exporting tissue is often referred to as 'source tissue' and the importing tissue as 'sink tissue, which may result from energy being diverted towards accelerated levels in divers sites of metabolism or nutrient accumulation evoked under stress. Sugar content reduction concluded of the climatic factors, may inhibit photosynthesis activity and/ or increase the partial utilization of carbohydrates into other metabolic pathways [37]

Some studies recorded that many carbohydrates can comprise such as monosaccharides (glucose and fructose), disaccharides (sucrose), polysaccharides (starch and fructans), oligosaccharides (raffinose) and sugar alcohols (inositol, sorbitol and mannitol) [38] Sucrose, fructose and glucose are generally, but not always, the predominant soluble sugars, and starch is the pivotal non-soluble longer-term storage compound [39].

Total protein of leafs and stems of plant samples

Regarding the protein contents of the plant, the highest contents were found in the leafs and stems of the *Ricinus communis* (Derna) plant, respectively, of values of [4] relative decrease were recorded in the leaves of *Eucalyptus gomphocephala* (Albyda) plant and the leafs of *Ricinus communis* of (Albyda) plant, and its contents were (3.38 and 2.27). On the other hand, the protein content was reduced in the stems of *Ricinus communis* (Albyd), a plant, the stems of *Eucalyptus gomphocephala* (Albyda), the stems of *Eucalyptus gomphocephala* (Derna), and leafs *Eucalyptus gomphocephala* (Derna), protein contents were as following (2.23, 2.22, 1.47, and 1.16), respectively. Proteins are also important structural components of the cell wall. Because proteins and their building blocks, amino acids, form such a large component of plant life, plants serve as an important dietary source of the eight to ten essential amino acids [40]. Protein degradation

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under a Climate change growth environment is reasoned as due to a decrease in protein synthesis resulting from the denaturation of responsible enzymes, or an enhancement in proteases enzymes, proline accumulation is an appreciable marker for plant response to Climate change. Proline increases in plants may be an adaptive mechanism for reducing (i) the level of accumulated NADH, and (ii) the acidity; $2NADH^{+}$,$2H^{+}$ is used for synthesizing each molecule of proline from glutamic acid.It has been assumed that the accumulation of organic solutes, including proline, in response to Climate change was involved in protection mechanisms, such as restoration of cell volume and turgor, reduction of cell damage induced by free radicals [41], and protection and stabilization of enzymes and membrane structure [42]. Moreover, the accumulation of proline was found to be a highly regulated process, which is in turn controlled by both synthesis and degradation. Plant proteins meet the needs of the emerging seedling in terms of nutrition and growth, through their enzymatic, structural, functional and storage functions Plants contain several specific types of proteins not found in other living organisms, and these have certain functions most plants have some kind of storage organ (seeds, tubers etc.).

for reproduction, where different nutrient sources are stored so that the new plant will have the resources to grow during the coming season. Proteins, carbohydrates, and oils are different types of nutrient sources accumulated in plant storage organs. Such proteins are normally described as storage proteins. Their primary function is to be broken down into amino acids, to form the necessary building blocks for emerging proteins in the next generation of growth. The plant cell contains several organelles, including the chloroplast, which is responsible for photosynthesis. Plants also have a specific protein, the enzyme RuBisCO, for catalyzing the transfer of solar energy to chemical energy that can be used by the plant through CO2 fixation. Plant cells contain low levels of protein in comparison with animal cells, mainly because of the high amount of carbohydrate (cellulose and others) that compose most of a plant's structure. However, the importance of proteins and amino acids, the building blocks for proteins, cannot be overlooked. Besides their role as protein constituents, amino acids are also involved in a plethora of cellular reactions and therefore they influence several physiological properties [43].

Table 4. The contents of Carbohydrate and protein of the studied samples.

Samples	Carbohydrate	Protein
1	0.820	1.16
2	0.457	0.74
3	0.847	4.31
4	0.850	4.4
5	0.014	2.27
6	0.870	2.23
7	0.432	2.22
8	0.080	3.38
Average	0.546	2.58
±SD	0.355	1.346

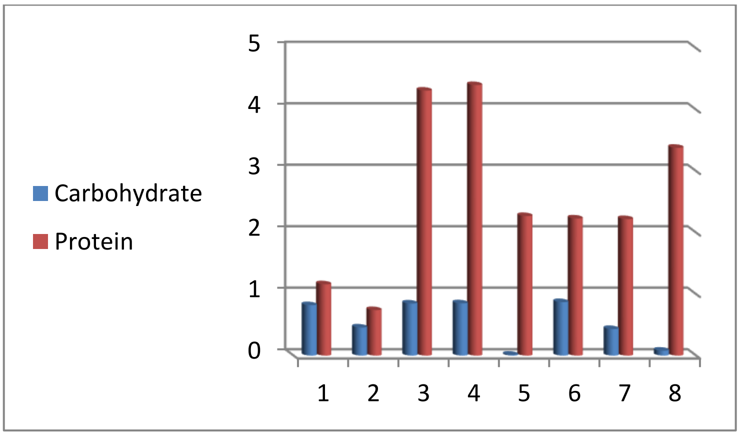

Figure 3. The contents of Carbohydrate and protein of the studied plant samples.

Mineral and metal contents of the studied plants

The minerals and metal contents of the studied plants were shown in Table 5 and Figure 4 The concentrations of the elements of the studied plants were fluctuated as following: The high sodium content (44.93ppm) was recorded in leaf of *Ricinus communis* (Derna) followed by the other samples of stems of

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Ricinus communis (Derna) , leafs of *Eucalyptus gomphocephala* (Derna), leaf *Eucalyptus gomphocephala* (Albyda), stems *Eucalyptus gomphocephala* (Derna), stems of *Ricinus communis* (Albyda), stems of *Eucalyptus gomphocephala* (Albayda), leaf of *Ricinus communis* (Albyda) and leafs of *Eucalyptus gomphocephala* (Albayda) where the sodium contents were as following: (44.93, 27.85, 26.18, 26.18, 19.13, 13.06, 7.64 and 5.97 ppm), respectively. On other side the higher concentrations of potassium of (447.7ppm) were recorded in leafs of *Ricinus communis* (Derna) followed by stems of *Ricinus communis* (Derna), leafs of *Ricinus communis* (Albayda) stems of *Ricinus communis* (Albyda), leaf *Eucalyptus gomphocephala* (Derna), leafs of *Eucalyptus gomphocephala* (Albyda), stems *Eucalyptus gomphocephala* (Derna), stems of *Eucalyptus gomphocephala* (Albyda) which their contents were as following: (447.7, 333.4, 290.5, 190.5, 126, 47.71, 47.17 and 33.4 ppm), respectively.

The results of phosphors contents showed high concentration of total phosphorus (12.7ppm) which recorded in leafs of *Ricinus communis* (Albyda) followed by their contents in stems of *Ricinus communis* (Derna), leafs of *Ricinus communis* (Derna), leafs of *Eucalyptus gomphocephala* (Derna), stems of *Ricinus communis* (Albyda), leafs of *Eucalyptus gomphocephala* (Albyda), stems of *Eucalyptus gomphocephala* (Albyda) and stems of *Eucalyptus gomphocephala* (Derna), where their contents were as following: (12.7, 10.9, 6.17, 6, 3.95, 3.65, 2.86 and 2.86 ppm*),* respectively. While the Nitrogen showed different levels, higher concentration of nitrogen was recorded in leafs of *Ricinus communis* (Derna) (0.704 ppm) followed by stems of *Ricinus communis* (Derna), leafs of *Eucalyptus gomphocephala* (Albyda), leafs of *Ricinus communis* (Albyda) stems of Ricinus communis (Albayda), stems *Eucalyptus gomphocephala* (Albyda), stems of *Eucalyptus gomphocephala* (Derna) and leaf of *Eucalyptus gomphocephala* and (Derna), their contents were (0.691, 0.542, 0.364, 0.358, 0.356, 0.236,.and 0.187 ppm), respectively.

The higher concentrations of the Copper was present in leafs of *Eucalyptus gomphocephala* (Albayda) (3.77ppm) following by stems of *Eucalyptus gomphocephala* (Albayda), stems of *Ricinus communis* (Albayda), leafs of *Ricinus communis* (Albayda), leaf Eucalyptus gomphocephala (Derna), leafs of *Ricinus communis* (Dearn), stems of *Ricinus communis* (Derna), stems *Eucalyptus gomphocephala* (Derna) (3.77, 3.26, 3.26, 3, 2.57, 2.22, 1.88 and 1.86 ppm).

The Nickel was present in higher concentration of stems of *Eucalyptus gomphocephala* (Albayda), (16.10 ppm) followed by leafs of *Ricinus communis* (Dearn), stems of *Ricinus communis* (Albayda), leafs of *Eucalyptus gomphocephala* (Albayda), stems of *Ricinus communis* (Derna), leafs of *Ricinus communis* (Albayda), leaf *Eucalyptus gomphocephala* (Derna), stems *Eucalyptus gomphocephala* (Derna) (11.13, 11.10, 10.26, 9.13, 7.44, 2.57 and 1.86ppm).

The iron was present in higher concentration was found, stems of *Ricinus communis* (Derna), was (0.395ppm) following by in were stems of *Ricinus communis* (Albayda), stems *Eucalyptus gomphocephala* (Derna) leaf *Eucalyptus gomphocephala* (Derna), leafs of *Ricinus communis* (Albayda), leafs of *Eucalyptus gomphocephala* (Albayda), stems of *Eucalyptus gomphocephala* (Albayda), leafs of *Ricinus communis* (Dearn), (0.245, 0.245, 0.215, 0.72, 0.25, 0.25 and 0.095ppm) , respectively. On other side the higher concentrations of calcium (58.66ppm), stems of Eucalyptus gomphocephala (Albayda), following by leafs of *Eucalyptus gomphocephala* (Albayda), leafs of *Ricinus communis* (Dearn), leafs of *Ricinus communis* (Albayda), leaf *Eucalyptus gomphocephala* (Derna) stems of Ricinus communis (Derna), stems *Eucalyptus gomphocephala* (Derna), stems of *Ricinus communis* (Albayda), which their contents were as following: (52.94, 50, 47.2, 32.8, 30, 27.23 and 13.65ppm).

Table 5. The mineral and metal contents of studied plant samples. (µg/g).

Element	K	Na	p	Fe	Cu	Ni	Ca
1	126	26.18	6	0.215	2.57	6.35	32.8
2	47.17	19.31	2.69	0.245	1.86	5.41	27.23
3	447.7	44.93	6.17	0.095	2.22	11.13	50
4	333.4	27.85	10.9	0.395	1.88	9.13	30
5	290.5	7.64	12.7	0.027	3	7.44	47.2
6	190.5	13.06	3.95	0.245	3.26	11.10	13.65
7	33.4	5.97	2.86	0.25	3.26	16.10	58.66
8	47.71	26.18	3.65	0.25	3.77	10.26	52.94
Average	189.54	21.39	6.115	0.215	2.72	9.615	39.06
±SD	154.15	12.77	3.767	0.111	0.705	3.386	15.444

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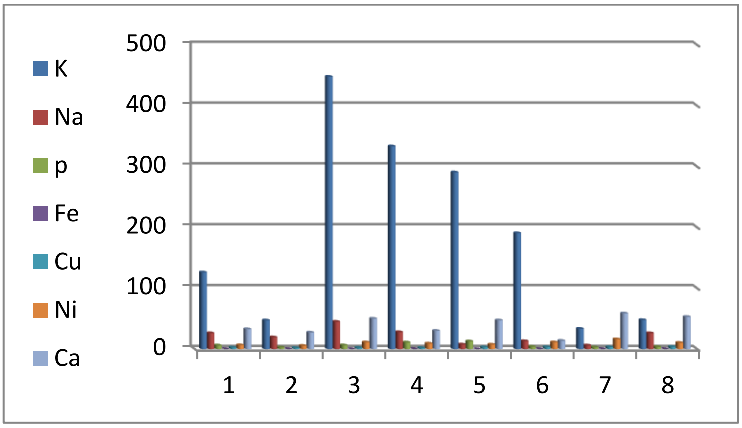

Figure 4. The contents of minerals and metals of the studied plant samples.

Also, the contents of Nitrogen of the plant samples were shown in Table 6 and Figure 5

Table 6. The Nitrogen contents of the studied samples (ppm).

Samples Plant	Nitrogen
1	0.187
2	0.236
3	0.704
4	0.691
5	0364
6	0.358
7	0.356
8	0.542
Average	45.88
±SD	128.53

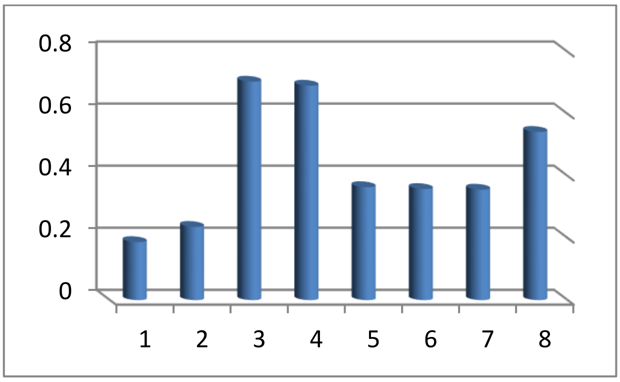

Figure 5. The contents of Nitrogen of the studied plant samples.

Conclusion

According to the results recorded in this study, there is variations in some chemical constituents as Anti – Oxidants, total phenols in the studied plants in this study (*Eucalyptus gomphocephala* and *Ricinus communis*) by comparing the two plants collected from coastal region (Derna) Mountain region (Al –Bayda), also the results showed small variations of the metal and minerals contents by comparing the results obtained for the coastal and mountain samples. No wide variations of amino acid contents of leafs and stems samples of the both plants at the both regions were observed. For the physiological properties of leaves area , dry weight, plant length, colour leafs and Stems diameter , the results showed differenation of the leafs color by comparing between the two plants , where the leafs of *Eucalyptus gomphocephala* was taken dark green color comparing to green reddish color of *Ricinus communis* for Derna and Al-Bayda samples, also there are relative increase in stems diameter of Al-Bayda *Eucalyptus gomphocephala* samples comparing with the samples of Derna of the same plant. The same observation was recorded for the *Ricinus communis* plant. On the other side the leaf area of Deran *Ricinus communis* plant was bigger than the Al—Bayd

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samples. Generally, the study concluded that the changes in the physiological and chemical contents mainly attributed to the effect of changes in temperature, pressure, the locations and soil types. The studies which designed on the climate changes are taken place analysis for this study.

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