



Environmental Survey of Terrestrial Plants in Al-Qurna District, North of Basrah, Iraq

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Abstract:

This study was conducted monthly in the Al-Qurna district, north of Basra, from October 2023 to July 2024. The purpose was to conduct an environmental survey of the ground plants *Suaeda aegyptiaca*, *Alhagi agrorum*, *Tamarix aucherina*, and *Cressa cretica* in Basra Governorate. Three stations were selected for the study: Nahr al-Ezz Station, Al-Khas area, and Shallah Beit Akab area, located 75 km from the center of Basra. The morphological characteristics of the above-mentioned plants, the environmental factors affecting them, and the quantitative characteristics of these plants were studied. The plant species associated with these plants were also recorded, and the physical and chemical characteristics of the soil and plants were studied, including air temperature, air humidity, soil moisture, pH, salinity, and plant organic matter.

In this study, there are variations in air temperature, with the highest recorded being 45°C at Nahr Al-Ezz station in the summer and the lowest being 10.5°C at the same station and in the winter. The highest air humidity was recorded at 71.5% and 71% in the cold seasons at the first and second stations, and the lowest at 4.1% at the third station (Shalhat Beit Akab) in the hot seasons. As for soil moisture, the highest recorded was 53.84% in the winter at the first station, and the lowest was 12.86% in the summer at the third station. The highest pH value was recorded at 7.60 at the first station in the autumn, and 7.00 at the second station in the winter. As for salinity, the highest concentration was recorded at 3.999 mg/L in the summer at the third station, and the lowest was 1.25 mg/L in the summer at the same station. The organic matter (soil organic carbon) reached the highest rate of 0.332 0.14 g/1 g of soil was recorded at the second station in the fall, and the lowest was 0.14 g/1 g at the third station for the same season. As for the organic matter in the plant, the highest rate was recorded at 0.9 g/1 g at the second station in the summer, and the lowest was 0.18 g/1 g at the first station in the fall.

Keyword: Environmental, Al-Qurna, density, Coverage, Terrestrial Plants

Introduction

Ecology is an integrated field that studies ecosystems and the interactions between living organisms and their environment. This science is fundamental to the management of Earth's resources because it deals with the interactions associated with biological systems, of which humans are an integral part, along with nonliving components. A system is in a stable state if there is no imbalance in the system's inputs and outputs over time. Temporal and spatial changes are a natural aspect of ecosystem dynamics. For example, even under stable conditions, plant growth varies from summer to winter and between wet and dry years (Sebastian *et al.*, 2011; Wang *et al.*, 2023).

Biodiversity change leads to changes in ecosystem functions, such as the transfer of carbon, water, and nutrients and the maintenance of ecosystem stability. The ability to produce materials such as carbohydrates or nutrients is one of the main characteristics of ecosystems, but changes in climate elements and rates of natural habitat disturbance have a major impact on ecological succession (Mooney *et al.*, 2012).

Numerous studies have examined the impact of human activities on biodiversity, highlighting the risk of mass extinctions that could lead to the loss of half of Earth's species by the middle of this century. These studies indicate evidence of loss of genetic and functional diversity, environmental degradation, destruction of natural habitats,

population declines, the spread of invasive species, shifts in community structure, and rapid environmental changes. These changes often have unforeseen negative consequences for the functioning of ecosystems, and human well-being is closely linked to the goods and services provided by diverse and resilient ecosystems (Pereira *et al.*, 2010).

Hussein (2015) confirmed in his study on vegetation cover and plant biodiversity, which addressed the quantitative and qualitative characteristics of vegetation cover, soil characteristics, and air quality at twelve stations in the southern desert of Basra Governorate. He recorded 185 species belonging to 136 genera distributed across 41 families. He also indicated in his study that the Astarceae family is one of the largest families in the studied area.

Al-Mayah *et al.* (2018) reported in their study on plant biodiversity and vegetation cover in the Al-Tayeb area, northeast of Amara, 27 species belonging to 101 genera belonging to 37 families of the most common annual and perennial plants in the study area were identified. Al-Kanaani (2019) also studied indicators of biodiversity in the same area and demonstrated differences in the frequency, density, and coverage of plants at their study stations. Al-Mayah *et al.* (2020) recorded. Six new species for Basra Governorate, including species from different families, namely *Atriplex holocarpn*, *Achillia conferta*, *Vaccarria hispanica*, *Descurainia Sophia*, *A-Micrantha*, and *Centauriam*

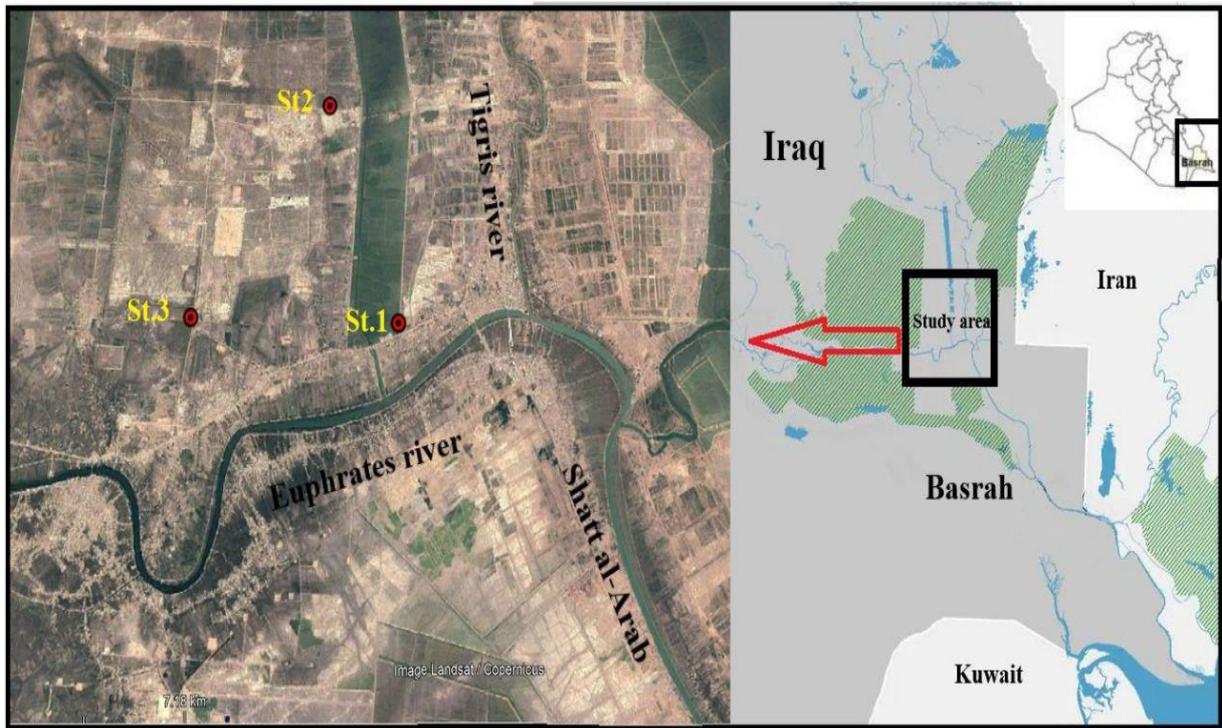
tenuiflorum, were identified. Their taxonomic and ecological characteristics, as well as their geographical distribution, were explained.

Al-Saadi's (2023) study examined the influence of some environmental factors on the distribution of wormwood in the southern desert of Basra Governorate. It demonstrated the morphological characteristics of wormwood, the environmental factors affecting it, and the quantitative characteristics of this plant. It also examined the chemical and physical characteristics of the soil, including air and soil temperature, moisture, soil texture, pH, salinity, and organic matter. It also documented the influence of heavy metals on plant growth and distribution. Approximately 12 plant species associated with wormwood (*Airbemisia* and *Scoparia*) were also recorded. In his study on climate change and its impact on plant biodiversity, Mahoud (2023) found negative effects on the most important natural resources, namely crops and natural vegetation cover in Basra Governorate. The study shed light on the effects of these changes on plant biodiversity by examining and analyzing the changes in climatic elements and their effects. The study aimed to clarify the classification of quantitative results in the form of statistical and mathematical relationships and formulas that reflected the reality of temporal variation.

Materials and Methods

Description of the Study Area

The Al-Qurna district is located north of Basra Governorate, approximately 74 km² from its center. It is considered one of the richest regions in the world in oil resources, containing the West Al-Qurna oil field. It is also influenced to the south by the Nahran Bin Omar oil fields and to the east by the Majnoon oil fields. The district covers an area of 2,073 km² and represents the confluence of the Tigris and Euphrates rivers. It is a growing area for many crops, such as wheat, barley, and date palms, as well as for most vegetables. Its lands are characterized by heavy to mixed clay soils rich in nutrients. It also provides pasture for many dairy animals, especially cows and buffalo. The Al-Qurna district includes the Al-Dayr and Al-Thaghr sub-districts (Al-Mayah and his group, 2016). (Map No. 1). After conducting comprehensive scientific tours of the Qurna district areas, three stations were chosen close to the polluted areas. The first station is the Ezz River, the second is the private station, and the third is the Shallah Akab station, based on the presence of wild plants. Scientific trips were conducted monthly from October 2023 to June 2024, and the results were calculated quarterly (Fig. 1, 2, and 3).



Map (1): Study stations



Fig. (1): The first station contains emissions of combusted gases from the West Qurna oil field.



Fig. (2): The second station shows the smoke columns from the burning oil emitted.



Fig. (3): The third station shows the emissions of oil combustion as well as overgrazing of the vegetation cover.

Materials and Methods

Sample Collection

Plant and soil samples were collected from each study station during the period from October 2023 to June 2024. The plants selected for the study, namely *A. agrachorum*, *T. aucheriana*, *S. aegyptiaca* and *C. cretica*, were collected, as were soil samples. Field measurements were also conducted directly in

the field. The plants found in the Qurna district were also recorded through a comprehensive survey.

Field Measurements

Air Temperature and Humidity

Air temperature at the study stations during the study period was estimated using a mercury thermometer with a scale from 0 to

100°C. The temperature was measured in shaded areas, and the results were expressed in °C. The percentage of air humidity in the field and at all study stations was measured using a digital humidity meter. Soil Samples.

Soil samples were randomly collected from the study stations each semester. Samples were taken at depths ranging from 20 to 30 cm, placed in labeled plastic bags, and transported to the laboratories of the Department of Environment, College of Science (Plant Ecology Laboratory). They were air-dried for several days under laboratory conditions. They were then cleaned of plant debris and large stones using a sieve with a 2 mm diameter. The samples were collected and placed in plastic containers for the required chemical and physical analyses.

Physical and Chemical Tests of Soil Samples:

Measuring Soil Moisture Percentage

Soil moisture was measured by weighing 5 grams of soil from each study station each semester. These samples were placed in glass dishes of known weight and then transferred to a Chinese-made FNoos oven at 105°C for 24 hours. The heating process continued until the weight stabilized. The soil moisture percentage was estimated according to the following equation (El-Shieken and Abbadi, 2004):

Amount of moisture = weight of soil before drying - weight of soil after drying

Moisture percentage = amount of moisture (g) / weight of moist soil (g) 100%

Estimating pH and Salinity

The pH of the soil at the study stations was measured seasonally according to the method of Estefan *et al.* (2013), 25 grams of pre-dried soil was placed in a 500 ml glass beaker, to which 75 ml of distilled water was added. The mixture was stirred until the solution was homogeneous. The mixture was left to stand for 24 hours, after which the prepared samples were filtered using filter paper. The filtrate was then taken to estimate the pH using a pH meter. Soil salinity at the study stations was also estimated from the same solution prepared above, using electrical conductivity. The electrical conductivity of the soil samples was determined using a German-made SD320 Con device. The salinity was calculated using the following equation: The results were expressed in mg/L.

Soil salinity = electrical conductivity × 0.64

Organic matter

Organic matter was measured by taking one gram of dried and sieved soil from each study station each season. The soil was placed in a ceramic bowl of known weight and placed in a laboratory furnace at a temperature of approximately 550°C for 48 hours. The soil was then placed in a moisture extraction

device and weighed several times until the weight was constant. The amount of organic matter was calculated using the equation below, and the result was expressed in grams according to the method (El-Sheikh *et al.*, 2006). Organic matter (g) = soil weight before burning - soil weight after burning (less the weight of the sapling)

Environmental Vegetation Survey

A comprehensive survey was conducted across all areas of Al-Qurna District, including the study stations, to determine the distribution and prevalence of plant species and to identify the species, genera, and plant families prevalent in the area. Quantitative characteristics of vegetation cover, density, and abundance were also determined for the stations selected in this study using the quadrat method and the transect method, with five replicates for each reading. Environmental parameters were calculated using the aforementioned method (Shaltout, 2002, and Rabie, 2008). Vegetation cover was calculated using the (Braun-Blanquet method (1932).

Quantitative Characteristics of Vegetation

Cover

Density

Density is defined as the number of individuals of a species per unit area (individual/m²) and is calculated according to the following equation:

Density = Total number of individuals of a species / Total number of studied quadrants. $D = ni/A$

ni: Total number of individuals of a species

A: Total number of quadrats studied

Abundance

Abundance expresses the number of individuals of a single species per number of quadrats in which that species occurs.

Abundance = Total number of individuals of a species / Number of quadrats in which the species occurs.

Cover

Is the amount of land covered by plants relative to the total land area. It is estimated using the quadrat (m²).

Coverage ratio = (Area of plant species covered / Total area) x 100

Results and Discussion

Air Temperature

Figure 1 shows the seasonal variations in air temperature at the study stations. Temperature variations were observed across all stations. The highest temperature, 45°C, was recorded in the summer at the first station (Nahr al-Ezz), followed by the second station (Al-Khas), which reached 44°C for the same season. A decrease in air temperature was observed for all stations in the winter, with the lowest reaching 10.5°C at the first station. Temperature is an important factor affecting

biodiversity and ecosystems. It impacts most metabolic activities and important processes in plants, such as transpiration, respiration, photosynthesis, germination, and plant distribution and spread. These results, with variations in temperature, are consistent with many studies, including those by Maleh

(2015), Al-Saadi (2023), and Al-Otaibi (2023). The temperature variations in the current results may lead to harsh environmental conditions that affect plant species and their development in the ecosystem, thus affecting the vegetation cover, leading to... Changes in the entire ecosystem occur (Hammody, 2021).

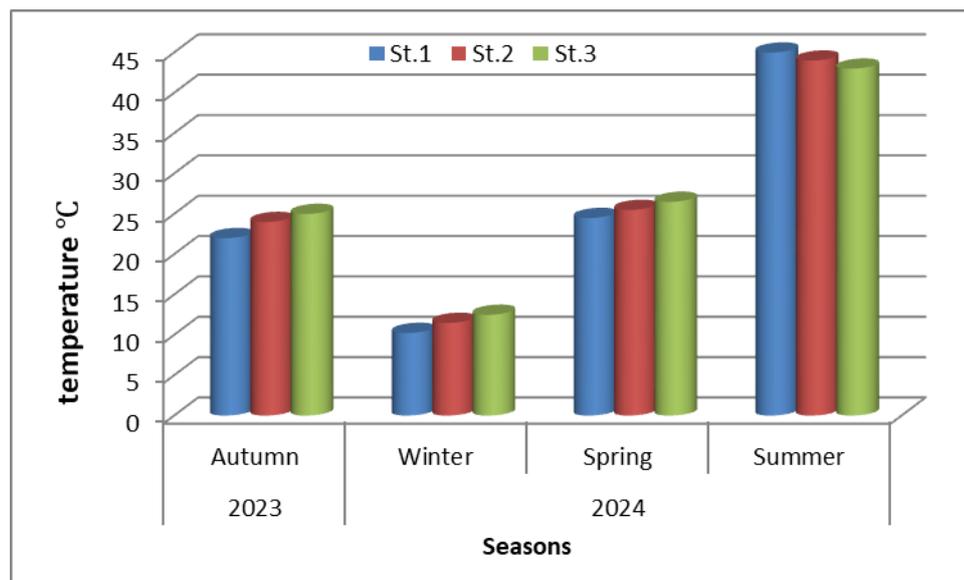


Fig. (1): Seasonal changes in average temperatures at the study stations

Air Humidity

Figure (2) shows the seasonal changes in air humidity at the study stations. The current study found significant variations in air humidity percentages between seasons. Air humidity increased during the cold seasons and decreased during the hot seasons, reaching a maximum of 71.5% and 71% at the second and first stations, respectively, and a minimum of 4.1% in the summer at the third station (Shalhat Akab). The difference in air humidity percentages is due to the relationship between them and temperature. Air humidity increases with increased rainfall

in the winter and decreases with rising temperatures in the summer. This leads to the formation of ecosystems devoid of vegetation, which in turn causes desertification in these ecosystems. Iraq's climate is also affected by its geographical location between two regions where drought and low air humidity are prevalent. Because the study stations are located within these regions, humidity was observed to increase in the winter and decrease in the summer. These results are consistent with (Al-Saadi, 2023; Al-Otaibi, 2023; and Al-Mahoud, 2023).

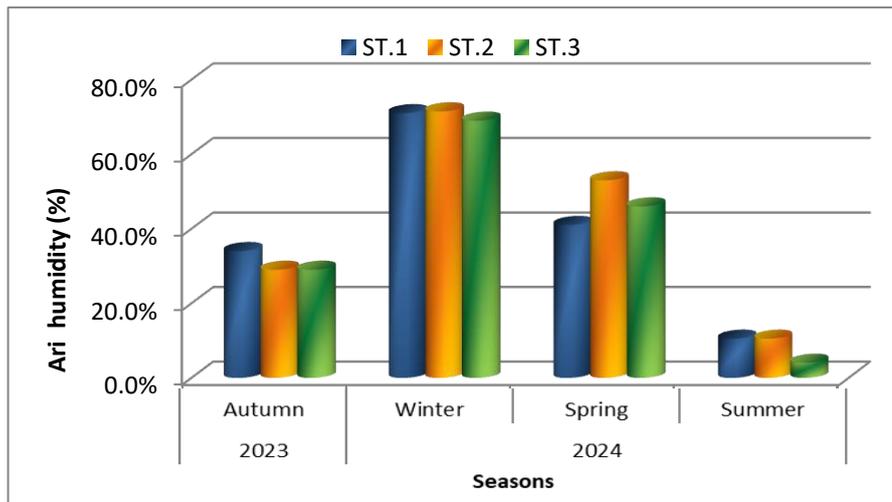


Fig. (2) Seasonal changes in relative humidity rates at the study stations

Soil Moisture

Figure (3) shows the seasonal changes in soil moisture percentage at the study stations. The highest moisture percentage, 53.84%, was recorded in winter at station one, and the lowest, 12.86%, in summer at station three. The results showed significant differences in soil moisture percentage between the cold and dry seasons (summer and fall). This is due to

rainfall in winter and a lack of rainfall in summer and fall, coupled with high temperatures and fast, dry winds, which lead to soil dryness. Furthermore, increased water absorption by roots in summer also reduces soil moisture, consistent with the results of (Maleh, 2016). The highest soil moisture rate, 53.84%, was recorded in winter, and the lowest, 12.86%, was recorded in summer.

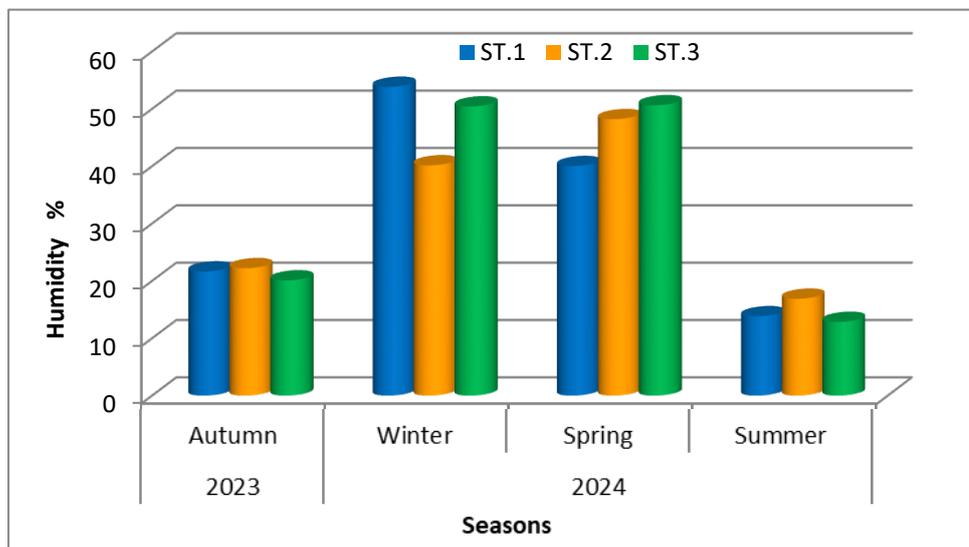


Fig. (3): Seasonal changes in soil relative humidity at the study stations

Soil pH

Figure (4) shows the seasonal changes in pH values at the study stations. It was observed that all soil pH values were in the alkaline direction, a characteristic of Iraqi soil. The highest value was recorded at 7.60 at the first station during the fall season, and the lowest was 7.00 at the second station during the winter season. Most plants can grow at moderate pH levels. The study results indicated that pH values were in the alkaline direction due to low soil moisture and decreased activity of living organisms, coupled

with increased evaporation. This leads to increased salt concentrations and, consequently, increased pH. pH decreased in the winter season with increased soil moisture due to rain, which gives living organisms the opportunity to increase their activity by decomposing organic matter in the soil, thus reducing the amount of salts in the soil. This is consistent with the studies of Al-Kanaani (2019) and Al-Saadi (2023). The highest pH was 7.60 in the fall, and the lowest was 7.00 in the winter.

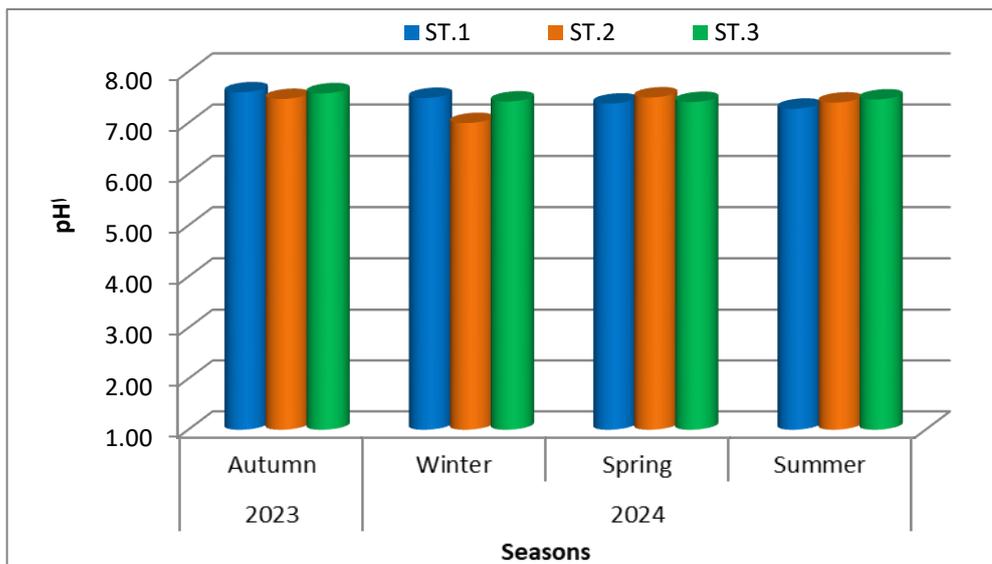


Fig. (4) Seasonal pH Changes at Study Stations

Salinity

Figure (5) shows the seasonal changes in salinity rates at the study stations. The highest salinity rate reached 3.9 mg/L in the summer at Station 3, and the lowest reached 1.25 mg/L in the summer at the same station. The reason

for the high salinity in the summer is the lack of rain and high temperatures, which reached 43°C at Station 3, leading to increased evaporation. The lack of vegetation cover during the same season also leads to the accumulation of salinity in the soil due to the

high extraction of soil water by plants. Station 3 is also located in a low-lying area, which leads to the accumulation of salts resulting

from the washing away of the surrounding highlands. This is consistent with the study by Al-Saadi (2023).

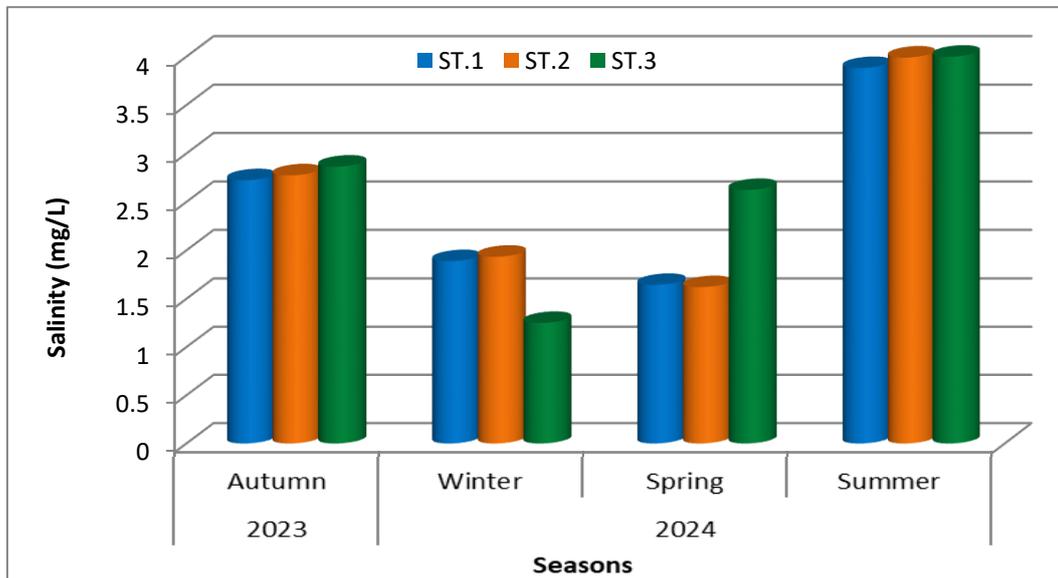


Fig. (5) Seasonal changes in soil salinity at the study stations

Soil organic matter

Figure (6) shows the seasonal changes in organic matter levels at the study stations. The highest level was 0.33 g/1 g of soil at the second station during the fall, followed by 0.31 g/1 g of soil at the third station during the same season, and the lowest was 0.14 g/1 g at the third station during the winter. Organic matter is what plants leave behind after the death of their leaves, stems, roots, and the remains of living organisms. It contributes significantly to soil fertility because it increases the content of nutrients necessary for plant growth (Maleh, 2015). The results showed that organic matter levels were low in

most seasons of the year at the study stations. This is due to the low vegetation coverage in the summer and winter, which leads to a decrease in organic matter. Furthermore, the decomposition rates of organic matter and dead animal remains during these two seasons are low. The increase in organic matter at the second station during the fall may be due to the presence of grazing animals, which add high levels of organic matter to the soil through biological processes. (Dung) These results are consistent with (Al-Shmsi *et al.* (2016), Al-Maliki (2021), and Al-Saadi (2023).

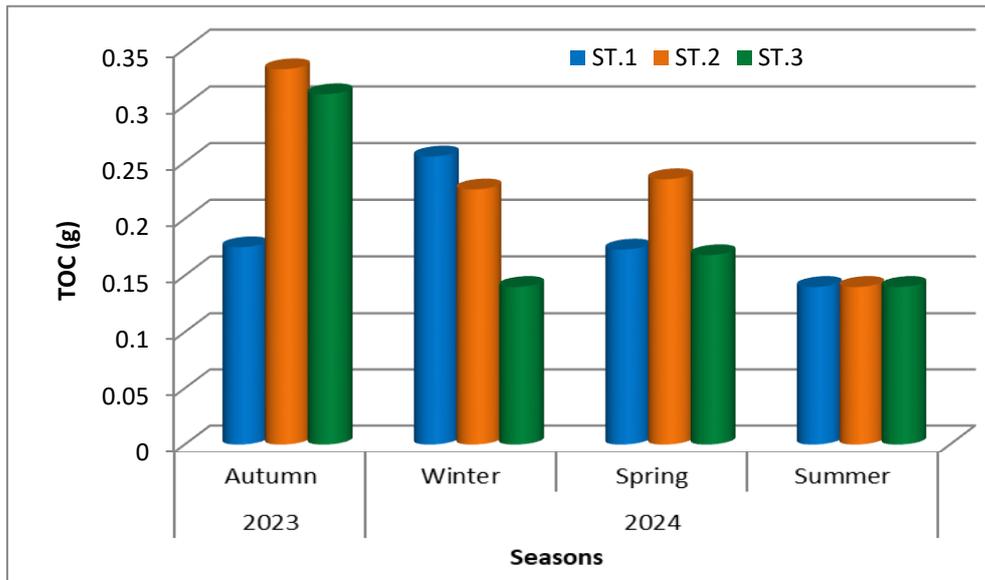


Fig. (6) Seasonal changes in soil organic matter at the study stations

Environmental Survey

Figure (8) shows the change in the number of species recorded at the study stations throughout the year. The highest number of species at the study stations was recorded at approximately 32 and 30 plant species at the first and second stations in the spring, respectively. The lowest number was recorded at the third station in the fall of 2023, where the number of species reached approximately 6 plant species, most of which were perennial

halophytes. The number of species in any ecosystem represents its state of diversity. The greater the number of species and individuals, the higher the plant diversity, and vice versa if the species are few. The reason for the low number of species at the third station is that the region experienced a very hot and dry summer, which affected plant availability until the fall, which was an extension of this drought.

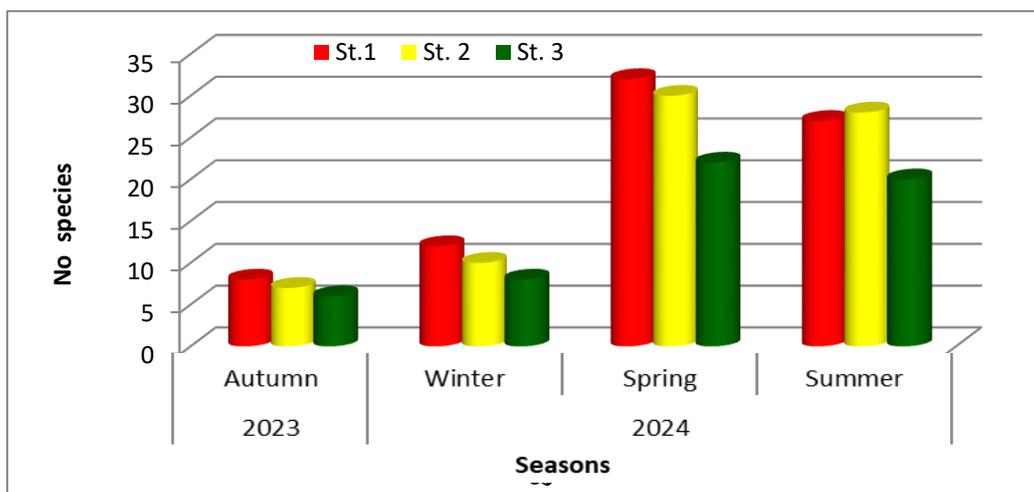


Fig. (8): Number of plant species recorded at study stations throughout the year.

The comprehensive environmental survey of Al-Qurna District (Table 2) recorded approximately 94 wild plant species belonging to 25 plant families. These species are few compared to what Al-Mayah *et al.* (2016) recorded in their study of the environment and plants of Basra, which recorded approximately 129 species in the same area. This may be due to low atmospheric humidity and high temperatures, in addition to scarce rainfall. The dry climate also increases soil salinity, which affects plant distribution.

The majority of plants in the study area were herbaceous plants belonging to the

Poaceae family, which numbered about 26 species, which are monocotyledonous plants. As for dicotyledonous plants, the highest species recorded in the study area were belonging to the Asteraceae family, which numbered 12 species, followed by the Chenopodiaceae family, which numbered 11 species, most of which are halophytes. These two families are considered among the largest factors of spread in Iraq, and most studies on plant biodiversity recorded the highest species for them, such as (Maleh, 2015, Al-Kanaani, 2018, and Al-Saadi, 2023). This study is consistent with what they have reached.

Table (2): Types of plants recorded in Al-Qurna District

No.	Family	Scientific Name
1.	<i>Aizoonanthemum hispanicum</i> (L.) Hart.	Aizoaceae
2.	<i>Aizoonanthemum canariense</i> L.	
3.	<i>Mesembryanthemum nodiflorum</i> L.	
4.	<i>Sesuvium portulacastrum</i> (L.)L	
5.	<i>Amaranthus graecizans</i> L.	Amaranthaceae
6.	<i>A. viridis</i> L.	
7.	<i>Ammi majus</i> L.	Asteraceae
8.	<i>Aster subulatus</i> Michx.	
9.	<i>Calendula tripterocarpa</i> Rupr.	
10.	<i>Carthamus tinctorius</i> L.	
11.	<i>Centaurea iberica</i> Trev. ex Spreng	
12.	<i>Conyza bonariensis</i> (L.) Cronq.	
13.	<i>Conyza dioscoridis</i> (L.) Desf.	
14.	<i>Eclipta alba</i> (L.) Hausskn.	
15.	<i>Erigeron Canadensis</i>	
16.	<i>Pluchea tomentosa</i> DC.	
17.	<i>Sonchus asper</i> (L.) Vill.	
18.	<i>Urospermum picroides</i> (L.) Schmidt	
19.	<i>Daucus carota</i> L.	Apiaceae
20.	<i>Torilis stocksiana</i> (Boiss.) Drude	
21.	<i>Arabidopsis pumila</i> (Steph.) Busch	Brassicaceae
22.	<i>Diplotaxis eruroides</i> (L.) DC	
23.	<i>Hymenolobus procumbens</i> (L.) Fourr.	

No.	Family	Scientific Name
24.	<i>Capparis spinosa</i> L.	Capparidaceae
25.	<i>Polycarpon diandra</i> (Cuss.) Heldr.	
26.	<i>Polycarpon tetraphyllum</i> (L.) L.	Caryophyllaceae
27.	<i>Spergula arvensis</i> L.	
28.	<i>Spergularia marina</i> (L.) Griseb.	
29.	<i>Ceratopteris thalictroides</i> (L.) Brong.	Ceratopteridaceae
30.	<i>Atriplex hastata</i> L.	Chenopodiaceae
31.	<i>A. tatarica</i> L.	
32.	<i>Bassia hyssopifolia</i> (Pall.) O. Kuntze	
33.	<i>Bromus tectorum</i> L.	
34.	<i>Caroxylon imbricatum</i> (Forssk.) Maq.	
35.	<i>Chenopodium murale</i> (L.) Fuentes	
36.	<i>Clemacoptera iraqensis</i> Botsch.	
37.	<i>Salsola crassa</i>	
38.	<i>Suaeda aegyptiaca</i> (Hasselq.) Zohary	
39.	<i>S. fruticosa</i> Forssk. ex J.F. Gmel.	
40.	<i>S. monoica</i> Forssk. ex J.F. Gmel.	
41.	<i>Convolvulus arvensis</i> L.	Convolvnlaceae
42.	<i>Cressa cretica</i> L.	Cuscutaceae
43.	<i>Cuscuta campestris</i> Yuncker	
44.	<i>C. pedicellata</i> Ledeb.	Cyperaceae
45.	<i>Cyperus alopecroides</i> Rottb.	
46.	<i>C. difformis</i> L.	
47.	<i>C. iria</i> L.	
48.	<i>C. michelianus</i> (L.) Del.	
49.	<i>C. rotundus</i> L.	
50.	<i>Schoenoplectus litoralis</i> (Schrad.) Palla	Euphorbiaceae
51.	<i>Chrozophora tinctoria</i> (L.) Raf.	
52.	<i>Euphorbia prostrate</i> Ait.	Fabaceae
53.	<i>Alhagi graecorum</i> Boiss	
54.	<i>Coronilla scorpioides</i> (L.) W.D.J. Koch	
55.	<i>Vicia monantha</i> Retz	Frankeniaceae
56.	<i>Frankenia pulverulenta</i> L.	
57.	<i>Erodium cicutarium</i> (L.) L`Her.	Geraniaceae
58.	<i>Erodium malacoides</i> (L.) Willd.	
59.	<i>Geranium dissectum</i> L.	
60.	<i>Juncus</i>	Juncaceae
61.	<i>Lycopus europaeus</i> L.	Lamiaceae
62.	<i>Malva parviflora</i> L.	Malvaceae
63.	<i>Oxalis corniculata</i> L.	Oxalidaceae
64.	<i>Plantago lanceolata</i> L.	Plantaginaceae
65.	<i>Aegilops kotschy</i> Boiss. Var. <i>Kotschi</i>	Poaceae
66.	<i>A. triaristata</i> Willd.	
67.	<i>Aeluropus lagopoides</i> (L.) Trin.ex Thw.	

No.	Family	Scientific Name
68.		<i>Alopecurus myosuroides</i> Huds.
69.		<i>Avena fatua</i> L.
70.		<i>Cynodon dactylon</i> (L.) Pers.
71.		<i>Dactyloctenium aegyptium</i> (L.) P. Beauv.
72.		<i>Dichanthium annulatum</i> (Forssk.) Stapf.
73.		<i>Dinebra retroflexa</i> (Vahl) Panz.
74.		<i>Diplachne fusca</i> (L.) P. Beauv.
75.		<i>Echinochloa colonum</i> (L.) Link
76.		<i>E. crusgalli</i> (L.) P.Beauv.
77.		<i>Eragrostis cilianensis</i> (All.) Vign.- Latut.
78.		<i>E. diarrhea</i> (Schlt.) Steud.
79.		<i>Lophochloa pumila</i> (Desf.) Bor.
80.		<i>Phragmites australis</i> (Cav.) Trin. ex Staud.
81.		<i>Sclerochloa woronowii</i> (Hack) Tzvelev
82.		<i>Stipagrostis lanata</i> (Forssk.) de Winter
83.		<i>Persicaria salicifolia</i> Assenov.
84.		<i>Polygonum argyrocoleum</i> Steud.
85.		<i>P. aviculare</i> L.
86.		<i>P. corrigioloides</i> Jaub. & Spach
87.		<i>Rumex dentatus</i> L.
88.		<i>Potamogeton crispus</i> L.
89.		<i>Anagallis arvensis</i> L.
90.		<i>Salix acmophylla</i> Boiss.
91.		<i>Lycium barbarum</i> L.
92.		<i>Tamarix aralensis</i> Bge.
93.		<i>T. pycnocarpa</i> DC.
94.		<i>T. ramosissima</i> Ledeb.







plate (1) showing the number of plant species recorded as a result of the environmental survey.

Conclusions

1. The terrestrial vegetation cover in Al-Qurna District suffers from significant deterioration due to extreme high temperatures, low rainfall,

and overgrazing. The number of plants recorded in this study was very small compared to other studies.

2. It was found that most of the plants recorded in this study were annual grasses and succulent halophytes.

3. Most of the studied areas were characterized by high soil salinity and the prevalence of swede, tarfa, and shuwail plants, which belong to the salt marshes group.

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مسح بيئي للنباتات الارضية في قضاء القرنة شمال البصرة - العراق

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الخلاصة:

أجريت هذه الدراسة شهريا في قضاء القرنة من شمال البصرة بدءا من شهر تشرين الاول عام 2023 الى شهر تموز عام 2024 لغرض إجراء مسح بيئي للنباتات الارضية *Suadae aegyptiaca*, *Alhagi agracorum*, *Tamarix aucherina*, *Cressa cretica* في محافظة البصرة، إذ تم اختيار ثلاث محطات للدراسة وهي محطة نهر العز ومنطقة الخاص ومنطقة شلهة بيت عكاب تبعد عن مركز البصرة (75 كيلومتر) تم دراسة الصفات المظهرية للنباتات اعلاها والعوامل البيئية المؤثرة عليها ودراسة الصفات الكمية لهذي النباتات كذلك تم تسجيل الانواع النباتية المصاحبة لهذي النباتات، ودراسة الصفات الفيزيائية والكيميائية للتربة والنبات منها درجة حرارة الهواء ورطوبة الهواء ورطوبة التربة والأس الهيدروجيني والملوحة والمادة العضوية للنبات.

يلاحظ في هذه الدراسة هنالك تباينات في حرارة الهواء إذ سجل أعلاها 45 °م في محطة نهر العز في فصل الصيف وادناها 10.5 °م في نفس المحطة وفي فصل الشتاء ، كما سجلت اعلى رطوبة للهواء 71.5 % و 71 % في الفصول الباردة في المحطتين الاولى والثانية ، وادناها 4.1 % في المحطة الثالثة (شلهة بيت عكاب) في الفصول الحارة، اما رطوبة التربة فقد سجلت اعلاها 53.84 % في فصل الشتاء في المحطة الاولى ، وادناها 12.86 % في فصل الصيف في المحطة الثالثة، وسجلت أعلى قيمة للأس الهيدروجيني 7.60 في المحطة الاولى لفصل الخريف، 7.00 في المحطة الثانية لفصل الشتاء ، اما الملوحة إذ سجلت أعلى تركيز 3.999 ملغم/لتر في فصل الصيف لمحطة الثالثة ، وادناها بلغت 1.25 ملغم/لتر في فصل الصيف ولنفس المحطة ، كما بلغت المادة العضوية (الكاربون العضوي في التربة) أعلى معدل 0.332 غم/1غم تربة في المحطة الثانية في فصل الخريف، وادناها 0.14 غم/1غم في المحطة الثالثة ولنفس الفصل، اما المادة العضوية في النبات إذ سجلت اعلى معدل 0.9 غم/1غم في المحطة الثانية في فصل الصيف، وادناها 0.18 غم/1غم في المحطة الاولى في فصل الخريف.