# STUDIES ON THE FRESHWATER CYANOBACTERIA AND ALGAE OF MAKKAH AREA, SAUDI ARABIA

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The composition and distribution of freshwater Cyanobacteria and algae in Makkah area of Saudi Arabia were investigated. The total number of recorded species was 107, 37 Cyanobacteria, 34 Bacillariophyta, 29 Chlorophyta, 6 Euglenophyta and one species Pyrrohophycophyta

The most common genera were **Oscillatoria** (14 spp.), **Spirogyra** (8 spp.), **Navicula** (7 spp.), **Nitzschia** (7 spp.), **Gloeocapsa** and **Euglena** (each with 4 spp.). On the other hand, the most widely distributed species in the investigated area were **Merismopedia** elegans, **Oscillatoria amphibia** and **O. tenuis.**

Al-Taif locality was characterized by having large number of Cyanobacterial and algal species (64 spp.).

Among the dominant algae in Makkah area, the green alga **Oedogonium gracilis** was chemically investigated. The pharmacopoeial constants, phytochemically screening and total amino acids were detected. **O. gracilis** was characterized by having high amount of ash and protein. 17 amino acids were identified and determined. The predominant amino acids were glutamic acid, alanine, aspartic acid and leucine.

## INTRODUCTION

Saudi Arabia is located in the arid province of the world (Thornthwaite, 1943 and 1948) where the climate is generally hot and dry. Rainfall is expected in Saudi Arabia in all months of the year but the amounts and seasons vary greatly in the different regions and in the different years (Zahran, 1983).

A review of the previous literature revealed that the algal flora of Saudi Arabia is relatively little known. Most of these studies were dealt with the marine algae (Forskal, 1775; Borgesen, 1932; Mohsen, 1972; Aleem, 1978 and 1981; Dowidar et al., 1978).

In general, a little attention has paid to the freshwater algae. In this connection, Abdel-Mohsen and Bokhary (1969 a & b) studied the distribution and periodicity of fresh-water algae in Riyadh area and

revealed some physiological aspects concerning four algae grown under controlled conditions. Seasonal variations in soil algal microflora and their activities in Riyadh region were examined by Abu-Zinada and El-Hussaeini (1975). Khoja et al. (1984) studied the algal flora of Al-Baha area (Southern region).

With the exception of the work of Mohsen and Al-Amoudi (1989) on the occurrence of Cyanobacteria and their possible toxicity in Makkah province, the information on the taxonomic composition and distribution of Cyanobactria and algae in Makkah area is lacking. In order to fill this gap in our knowledge, the present work was initiated to describe the composition and distribution of freshwater Cyanobacteria (Cyanophyta) and algae (Eukargotic algae) in Makkah area.

During the collection period of the samples, one of the most noticeable observations was the presence of green alga. **Oedogenium gracilis** in large quanities in Bahrah locality. Therefore, the attention was focused on the study of phytochemical evaluation of this local alga and introduce some necessary information needed in chemotaxonomic purposes.

## MATERIAL AND METHODS

Makkah area is located in the western region of Saudi Arabia. The variations are quite evident in geology, topography and environmental conditions in this area (Abdel-Rahman and Balegh, 1974; Zahran, 1983).

Four localities in Makkah area were selected for study throughout the period from October 1988 to May 1989. These localities (Fig. 1) were:

1. Bahrah (about 33 km west of Makkah).
II. Al-Jumum (about 28 km north of Makkah).
III. Al-Sharayi (about 30 km east of Makkah).
IV. Al-Taif (about 80 km south of Makkah).

The water in these localities except Al-Taif, is pumped from wells and stored temporarily in concrete reservoirs for irregation. Water samples were taken from such reservoirs and irrigation ducts. At the time of sampling, water temperature was recorded. PH values were also estimated by portable Beckman PH-meter (model 72).

Samples taken from the above localities were preserved in 4% neutralized formaline. The small microflagellates were distorted by formaline and so difficult to identify. Living material was, therefore, always observed to ensure correct identification. The present taxa (living and preserved) were identified according to Zabelina et al. (1951), Popova (1955), Desikachary (1959), Prescott (1962 & 1978),

Philipose (1967), Aleem et al. (1982), Mefferet (1987) and Komarek and Anagnostidis (1989). Diatoms were examined in the cleaned frustules preparation (Jouse et al., 1949) with a suitable quantity of mountant of sufficiently high refractive index (R.I. = 1.66) (Hanna, 1949; Eliashev, 1957).

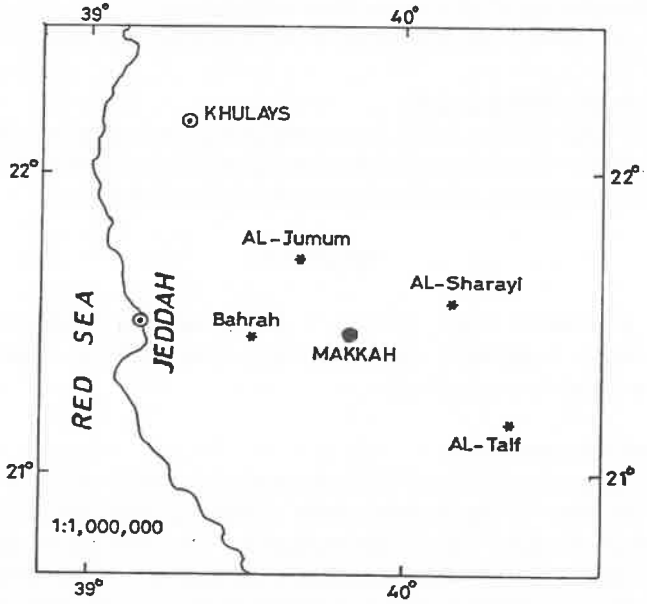


*Fig. 1. Sketch map of the western Region of Saudi Arabia showing the studied localities (*) at Makkah area.*

Densities of various organisms (El-Naggar, 1977) are expressed by numbers as follows:

| | Number of individuals |
|---|---|
| 1-Single | 1-5 examples in all preparations. |
| 2- Very rare | 10-15 examples in all preparations. |
| 3- Rare | 25-30 examples in all preparations. |
| 4- Common | 1-5 examples in each row of coverslip. |
| 5-Very common | 5-15 examples in each row of coverslip. |
| 6-Mass or abundant | 1 or more examples in each microscopic field. |

**Phytochemical Evaluation:**

**a) Collection and preparation of material:**

Samples of Oedogonium gracilis (Wittr) Triffany were collected from Bahrah during January 1989. The samples were purified, dried in air and ground to fine powder.

**b) Determination of constants:**

Ash, water soluble ash, acid insoluble ash, protein, crude fibre and total lipids were determined according to Humphries (1956), Ward and Johnson (1962), A.O.A.C. (1975) and El-Naggar (1980).

**c) Preliminary phytochemical screening:**

It was carried out adopting the procedure of Wall et al. (1954).

**d) Total amino acids:**

The total amino acids were extracted according to Block and Bolling (1951). The identification and estimation of amino acids were carried out using Amino Acid Analyzer Beckman 118 CL.

## RESULTS

It is evident from Tables 1 & 2 that the composition and distribution of freshwater Cyanobacteria and algae in Makkah area differed greatly from site to site.

**Bahrah Locality:**

Thirty one species of Cyabobacteria and algal were recorded in Bahrah locality. It is evident from Table 2 that the qualitatively dominating division was Cyanobacteria. The principal species of Cyanobacteria were **Merismopedia tenussima**, **Aphanozamenon flos-aquae**, and **Chrocccocus giganteus** were very common during the period of investigation. On the other hand, **Oscillatoria** (4 spp.) was recorded as highest represented genus (Table 1).

From Chlorophyta, there were certain species as **Oedogonium gracilis, Spirogyra ellipsospora, S. aequinoctialis** and **Cosmarium margaritatum** were common during the period of material collection.

Further consideration of Tables 1 and 2 reveal that Bacillariophyta was recorded as least represented division (4 spp.)

**Al-Jumum Loclaity:**

Tables 1 and 2 show that the total number of species in Al-Jamum was 28, 12 Cyanobacteria, 9 Bacillariophyta, 5 Chlorophyta and 2 Euglenophyta.

Table 1. Occurrence and density of Cyanobacteria and algae in different localities of Makkah area.
(1 = single 2 = very rare 3 = rare 4 = common 5 = very common)

| Species \ Locality | Bahra | Al-Jumum | Al-Sharayi | Al-Taif |
|---|---|---|---|---|
| PH | 7.9 | 8.2 | 8.6 | 6.6 |
| Water temperature | 31°C | 28°C | 30°C | 20°C |
| Cyanobacteria | | | | |
| Synechococcus elongatus Naeg | 2 | | 3 | 1 |
| Chroococcus minor (Kütz.) Naeg. | | 3 | | |
| C. minutus (Kütz.) Naeg. | 1 | 2 | 4 | |
| C. giganteus W.West | 4 | | | |
| Merismopedia elegans A. Braun | 3 | 2 | 3 | 4 |
| M. Tenuissima Lemm. | 5 | | | |
| Gloeocapsa alpina (Naeg.) emend | 4 | | | 1 |
| G. Aeruginosa (Carm.) Kütz. | | | 3 | |
| G. punctata Naeg. | | | | 1 |
| G. sp. | | | | 1 |
| Aphanocapsa rivularis (Garm.) Rabenhorst | 4 | 2 | | |
| A. grevillei (Hass.) Rabenhorst | 2 | | | |
| Microcystis aeruginosa Kütz. | | | | 1 |
| Aphanotheca gelatinosa (Henn). Lemm. | | 2 | | |
| Gomphosphaeria aponina Kütz. | 3 | | | 1 |
| G. Lacustris Chodat | | | | 3 |
| Coelosphaerium dubium Grunow | 2 | | | |
| Oscillatoria amphibia Ag. | 3 | 2 | 1 | 1 |
| O. okeni Ag. | 4 | | | |
| O. limsoa Ag. | 1 | | | 4 |
| O. tenuis Ag. | 1 | 2 | 3 | 1 |
| O. angusta Koppe | | 2 | | |
| O. sancta (Kütz.) Gomont | | 3 | | |
| O. acutissima Kutferath | | | | 1 |
| O. angustissima West & West | | | | 3 |
| O. amoena Gomont | | | | 2 |
| O. limoetica Lemm. | | | 6 | |
| O. terebriformis (Ag.) Elenk emend | | 2 | 2 | 2 |
| O. rubescens De Cand | | | 3 | |
| O. sp. 1 | | | 3 | |
| O. sp. 2 | | | 2 | |
| Spirulina princeps (W. &W) West | | 3 | 1 | 1 |
| Lyngbya major Meneghini | 3 | | 2 | |
| L. martensiana Meneghini | | 3 | | 4 |

| | | | | |
|---|---|---|---|---|
| L. sp. | | | 1 | |
| Anabaena sp. | 4 | | | |
| Aphanizomenon flos-aquae (L.) Ralfs | 5 | | 5 | |
| Eukkaryotic algae | | | | |
| Chlorophyta | | | | |
| Chlamydomonas globosa Snow | 2 | | | 5 |
| Shroederia setigera (Schroed) Lemm. | | | | 1 |
| Ankistrodesmus falcatus (Corda) Ralfs. | | | | 2 |
| A. falcatus var. tumidus (W. w.) G.S. West | | | | 3 |
| Actinastrum hantzschii lagerheim | | | | 1 |
| Scenedesmus bigugatus (Turbin) Kütz | | | | 3 |
| S. quadricauda var. quadrispina | | | | 1 |
| (Chodat) G.M. Smith | | | | |
| Ulothrix tenerrima Kütz. | | | | 6 |
| Schizomeris leibleinii Kütz. | | 3 | | |
| Stigeoclonium lubricum (Dillw.) Kütz. | | 6 | | |
| Cladophora glomerata (L.) Kütz. | | | | 6 |
| C. fracta (Dillw.) Kütz | | | | 2 |
| Rhizoclonium heiroglyphicum (C.A. Ag.) Kütz. | | 6 | | 3 |
| Oedogonium giganteun Kütz. | | | | 1 |
| O. gracilis (Wittr) Triffany | 6 | | 4 | |
| O. sp. | | | | 3 |
| Entransia dichloroplasts Press | 1 | | | |
| Spirogyra gratiana Transeau | 2 | | 3 | |
| S. ellipsospora Transeau | 5 | | | |
| S. aequinoctialis G.S. West | 4 | | | |
| S. rhizobranchialis Jao | | | 6 | |
| S, jucllebornci Schmidle | | | | 6 |
| S. micropunctata Transeau | | | | 3 |
| S. sp. 1 | 3 | | | |
| S. sp. 2 | | | | 3 |
| Mougeotia sp. | | 4 | | |
| Cosmarium margaritatum (Lund.) | 4 | | 4 | 2 |
| Roy & Biss. | | | | |
| C. panamense Presc. | 2 | 3 | 5 | |
| C. sp. | 3 | | 3 | |
| Euglenophyta | | | | |
| Euglena proxima Dang. | | 2 | | 1 |
| E. minuta Prescott | | | 1 | |
| E. gracilis Klebs | | | 1 | |
| E. oxyuris var. minor Prescott | | | 1 | |
| Phacus accuminatus Stokes | | 2 | | |

| | | | | |
|---|---|---|---|---|
| Trachelomonas robusta Swirenko | | | | 1 |
| Pyrrhophyta | | | | |
| Stylodinium globosum Klebs | | | | 3 |
| Bacillariophyta | | | | |
| Cyclotella meneghiniana Kütz. | | 5 | 2 | 1 |
| C. comta (Ehr.) Kütz. | | | | 3 |
| C. comta var. paucipunctata Grun | | | | 1 |
| Stemphanodiscus astraea (Ehr.) Grun | | 2 | | 3 |
| S. hantzschii Grun | | | | 2 |
| Cocconeis placentula Ehr. | | | | 2 |
| C. pediculus Ehr. | | | | 1 |
| Achanthus coarctata Breb. | | | | 4 |
| Fragilaria brevistriata Grun. | | | | 3 |
| Asterionella formosa Hass | | | | 3 |
| Synedra ulna (Nitzch) Ehr. | | | | 5 |
| S. nitzschoides Grun | | | | 3 |
| Stauroneis anesps Ehr. | 2 | | | |
| Navicula pygmea Kütz. | 3 | | | 4 |
| N. noruhumbrica A.S. | | | 1 | |
| N. radioa Kütz. | | 1 | | |
| N. scutum Schamann | | | 1 | 1 |
| N. serians Breb. | | | | 1 |
| N. lovenii Nov. | | | | 1 |
| N. sp | 1 | | | |
| Amphora ovalis Kütz. | | | | 4 |
| Cymbella latens Krasske | | 1 | | 1 |
| C.cistula (Hemp.) Grun. | | | | 1 |
| Gomphonema olivaceum (Lyngb.) Kütz. | 2 | 4 | | |
| G. parvulum (Kütz.) Grun | | 3 | | |
| G. sp. | | | | 3 |
| Gomphoneis herculeana (Ehr.) Cleve. | | | | 3 |
| Nitzschia palea (Kütz.) W. Smith | | 3 | | 4 |
| N..amphibia Grun | | | | 5 |
| N. Lanceolata W. sm. | | | | 4 |
| Namphioxys | | 2 | | |
| N. salinicola Aleem & Hust. | | 3 | | 1 |
| N. sinuata (W. Sm) Grun | | | | 1 |
| N. sigmoidea (Ehr.) W. Sm | | | | 1 |

**Table 2. Floristic composition of different localities of Makka area**

| Division | No. of taxa | | | |
|---|---|---|---|---|
| | Bahrah | Al-Jumum | Al-Sharayi | Al-Taif |
| Cyanobacteria | 17 | 12 | 15 | 17 |
| Eukaryotic algae | | | | |
| Chlorophyta | 10 | 5 | 6 | 17 |
| Euglenophyta | 0 | 2 | 3 | 2 |
| Pyrrohophytacophyta | 0 | 0 | 0 | 1 |
| Bacillariophyta | 4 | 9 | 3 | 27 |
| Total | 31 | 28 | 27 | 64 |

Quantitatively, Chlorophyta members were dominant. The high density of green algae was mainly due to the preponderance of **Rhizoclonium heiroglyphicum** and **Stigeoclonium lubricum**. The density of Cyanobacteria was present as rare and very rare (Table 1). Also, the density of Bacillariophyta individuals during the period of investigation was relatively low. But, it has been found that a considerable growth was manifested by **Cyclotella meneghiniana** and **Gomphonema olivaceum** (Table 1).

**Al-Sharayi Locality:**

Of 27 species identified in Al-Sharayi, Cyanobacteria (15 spp.) was dominant. Bacillariophyta and Euglenophyta were recorded as least represented divisions (Tables 1 & 2).

Although the number of species of Chlorophyta (6 spp.) was relatively low, yet they were quantitiatively abundant during the period of study. The characteristic species of green algae were **Spirogyra rhizobranchialis**, **Cosmarium panamense**, **Oedogonium gracilis** and **Cosmarium margaritatum** with high density (Table 1).

The maximum density of Cyanobacteria in this locality was mainly due to high growth of **Oscillatoria limnetica**, **Aphanozamenon flos-aquae** and **Chroococcus minutus** (Table 1).

In general, the obtained results showed that **Oscillatoria** (7 spp.) was the most frequent genus followed by **Cosmarium** and **Euglena** (each with 3 spp.)

**Al-Taif Locality:**

Compared with other locations, a significant increase in number of species was recorded in Al-Taif (Tables 1 & 2). Population of Al-Taif was composed of 64 taxa, belonging to Bacillariophyta (27 spp.), Cyanobacteria (17 spp.) Chlorophyta (17 spp.), Euglenophyta (2 spp.), and Pyrrohophycophyta (one species).

Although the number of species of Bacillariophyta was very high, yet the floristic density of this locality appeared mainly dependent on the growth of certain species of green algae. These species were **Ulothrix tenuissima, cladophora glomerata, Spirogyra jucllebornci** and chlamydomonas globosa. On the other hand, Spirogyra (3 spp.) was the most frequent genus followed by **Scenedesmus**, **Cladophora**, **Oedogonium** and **Ankistrodesmus** (each with 2 spp.) (Table1).

The density of Bacillariophyta was mainly due to the high growth of **Syndra ulna** and **Nitzschia amphibia**, this being followed by **Achnanthes coarctata**, **Navicula pygmea, Amphora ovalis, Nitzschia palea**, and **N. lanceolata**, (Table 1).

Concerning the Cyanobacteria, the dominating genus was **Oscillatoria** (7 spp.) followed by **Gloeocapsa** (3 spp.). **Merismopedia elegans**, **Oscillatoria limosa** and **Lyngbya martensiana** were found in high growth.

**Phytochemical Evaluation:**

Results of pharmacopoeial constants of **Oedogonium gracilis** are listed in Table 3. Among the constants, ash showed the highest value followed by protein and crude fibres.

Phytochemical screening of this alga revealed the presence of alkaloids, carbohydrates, glycosides, tannins, saponins and unsaturated sterols. Flavonoids were absent. This is in agreement with observation of El-Naggar (1977).

Results presented in Table 4 indicate the presence of 17 amino acids in the protein hydrolyzate of the algal material.

**Table 3. Mean values of pharmacopoeial constants of O. gracilis. Each value is a mean of three determinations.**

| Different constants | % |
|---|---|
| Ash | 26.423 |
| Water-soluble ash | 4.932 |
| Acid-insoluble ash | 2.098 |
| Total protein | 19.029 |
| Total lipid | 2.986 |
| Crude fibre | 9.003 |

**Table 4. Amino acid composition of O. Gracilis. (Values expressed as g amino acid/100g total amino acids).**

| Amino acid | Concentration |
|---|---|
| Alanine | 11.3 |
| Arginine | 3.8 |
| Aspartic acid | 10.2 |
| Cystine | 0.5 |
| Glutamic acid | 13.4 |
| Glycine | 6.6 |
| Histidine | 0.8 |
| Isoleucine | 4.7 |
| Leucine | 9.0 |
| Lysine | 6.9 |
| methionine | 3.8 |
| Phenylalanine | 5.5 |
| Proline | 4.0 |
| Serine | 5.9 |
| Threonine | 6.3 |
| Tyrosine | 2.4 |
| Valine | 4.3 |

The principal amino acids were glutamic acid, alanine, aspartic acid and Leucine. Valine, isoleucin, phenylalanine, serine, threonine, glycine and lysine occured in amounts ranging from 4.3 to 6.9% of the total amino acids. Histidine and cystine were present at lower levels as compared with other amino acids.

## DISCUSSION

This investigation showed that the total number of Cyanobacterial and algal taxa in Makkah area during the period of study was composed of 107 species and 47 genera. This includes 37 species and 14 genera in Cyanobacteria, 34 species and 14 genera in Bacillariophyta, 29 species and 15 genera in Chlorophyta, 6 species and 3 genera in Euglenophyta and one species and one genus in Phyrrohophycophyta (Table 1). Of these the most common genera were **Oscillatoria** (14 spp.), **Spirogyra** (8 spp.), **Navicula** (7 spp.), **Nitzschia** (7 spp.), **Gleocapsa** and **Euglena** (each with 4 spp.).

The present study showed an interesting and obvious wide range of variations in floristic composition of Makkah area. The populations of Bahrah, Al-Jumum and Al-Sharayi were qualitatively composed of Cyanobacteria as a main division throughout the period of study. The presence of high numbers of Cyanobacterial Species in these locations as compared to algal species may be attributed to these organisms were found to flourish under PH value of more than 7 and they are intolerant to low pH conditions (Lund, 1962; Jurgensen and Davey, 1968; Brock, 1973; Salama and Kobbia, 1982). The pH values in these localities varied between 7.9 and 8.6.

Another picture has been found in Al-Taif. The qualitatively dominating division was Bacillariophyta. Canale and Vogel (1974) reported that as temperature increased, the algal groups with the highest growth rate, changed from diatom to green algae to blue green algae (Cyanobacteria). The lowest range of temperature was recorded in Al-Taif. Moreover, in this locality, snow and ice are common in the highest places e.g. Al-Hada. This may explain the presence of numerous Bacillariophyta species. In conformity with this conclusion, El-Naggar (1977) stated that diatoms contributed largest number in habitats of low temperature.

It is evident from the present study that Al-Taif contributed largest number of species (64 spp.) This may be attributed to abundant rains and relatively low temperature. The average amount of rains received by this locality is 156.2 mm (Zahran, 1983).

During the period of investigation, the total number of Euglenophyta did not exceed 6 species. Moreover, Euglena species were not found in Bahrah. The density of Euglenophyta was very low throughout the period of study. All members were present as very rare and record. This limited number of Euglena species is a reflection of low pollution of water. As we know. Euglena flourish in water of high organic matter.

The most widely distributed species in the investigated area were Merismopedia elegans, Oscillatoria amphibia and O tenuis, followed by Synechococcus **elongatus**, **Chroococcus minutus**, **Oscillatoria terebriformis**, **Spirulina princeps**, **Cosmarium margaritatum, C. panamense** and **Cyclotella meneghiniana**. Many species recorded in the present study have been, previously, reported from similar environments by Aleem et al. (1982), Khoja et al. (1984) and Mohsen and Al-amoudi (1989).

**Phytochemical Evaluation:**

The data presented in this paper showed that amino acid pool of

green alga **Oedogonium gracilis** follow the same trends as those reported for **Chamydomonas** sp. (Chau et al., 1967) and Scenedesmus **obliquus** (El-Ashwah et al., 1976). All of which show alanine, aspartic acid, Leucine and glutamic acid to be the predominant amino acids in green algae.

A comparison of essential amino acids occurring in **O. gracilis** with those occurring in FAO provisional amino acid pattern (1957) revealed that this alga can be used a source for production of protein. The FAO pattern represented a good approximation of an ideal protein for human nutrition. According to this pattern the essential amino acids are leucine and iso-leucine (9%), lysine (4.2%), methionine (2.2%), cystine (2.0%), phenylalanine (2.8%), threonine (2.2%), valine (4.2%), Tryptophane (1.4) and histidine (0.0%). These values expressed as gm/100 protein.

Besides the above aspect, the presence of alkaloids, carbohydrates, glycosides, tannins, saponins and sterols indicates that this alga can be also considered among commercial and beneficial algae in feeding and medical purposes.

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# الثقافة العالمية


تصدر عن :
المجلس الوطني للثقافة
والفنون والآداب - الكويت




## قواعد النشر :

ترحب المجلة كل الترحيب باسهام كل مثقف عربي وكل قارىء ومتابع لافاق الفكر العالمي في اغنائها ودعم رسالتها الثقافية وتدعوهم لتزويد المجلة:

● بكل بحث اجنبي يختارونه ويجدونه جديرا بالترجمة والنشر.

● بكل بحث يترجمونه للنشر عن اي لغة اجنبية.

يشترط في البحوث المختارة او المترجمة:

اولا : ان تكون مما نشر في الدوريات العالمية خلال الاشهر الستة الاخيرة من تاريخ الارسال للمجلة في الحد الاقصى.

ثانيا : ان تكون مما يدخل ضمن خطة المجلة في المستوى الفكري والعلمي الرفيع.

● يرسل البحث المختار او المترجم بنصه الاجنبي الكامل في نسخة المجلة التي نشرته او مصورا عنها في حالة خلو المقال من الصور او المخططات الملونة مع صورة الصفحة الاولى للمجلة التي تحمل التاريخ والفهرس.

● تدفع المجلة مكافاة قدرها ٥ دنانير عن كل بحث اجنبي يرسل اليها وتقبله للترجمة والنشر. فان تكرر وصول البحث من اكثر من جهة دفعت المكافاة للسابق في الوصول.

● تدفع المجلة مكافاة عن المقالات المترجمة التي تقبلها للنشر بمعدل ١٥ دينارا كويتيا عن كل ١٠٠٠ كلمة (او ما يعادلها) من الاصل الاجنبي فإن تكرر وصول البحث المترجم من اكثر من جهة دفعت المكافاة للترجمة الاكثر جودة وصحة.


سعر النسخة :

| | | | |
|---|---|---|---|
| الكويت : ٥٠٠ فلس | ليبيا : دينار ونصف | اليمن : ٤٠٠ فلس | |
| السعودية : ٧ ريالات | المغرب : ١٥ درهما | السودان : ٢٥ جنيها | |
| الأردن : دينار ونصف | تونس : دينار ونصف | البحرين : نصف دينار | |
| سوريا : ٥٠ ليرة | الجزائر : ١٥ دينارا | قطر : ٥ ريالات | |
| لبنان : ٨٠٠ ليرة | مصر : جنيهان | عمان : نصف ريال | |

الإمارات العربية الموحدة : ٥ ريالات

| الاشتراكات (للمؤسسات - فقط) | | المراسلات |
|---|---|---|
| في الكويت | ٦ دنانير كويتية | توجه باسم السيد الأمين العام للمجلس الوطني للثقافة |
| في الوطن العربي | ٨ دنانير كويتية | تلكس: ٢٣٩١٩٦ ـ ص.ب ٤٨٧٣٦٩٤ |
| خارج الوطن العربي | ٤٠ دولارا أمريكيا | الصفاة 13000 ـ الكويت |

الآراء المعروضة في الأبحاث تعبر عن وجهة نظر كتابها ولا تعبر بالضرورة عن رأي المجلس.