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STUDY A NEW MACRO ALGAE OF MARINE GREEN IN THE NORTH-WEST OF ARABIAN GULF

Feryal H. Ibrahim

Department of Marine Chemistry, Marine Science Center, University of Basra, Iraq.
E-Mail: Feryal07@yahoo.com

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ABSTRACT

This study was carried out to study species of marine green algae (Chlorophya) collected from six stations along, Iraqi coast in the north-west of Arabian Gulf, at different depths and seasons during the year 2013.Eighteen species of Chlorophyta were recorded during this work, twelve of them were recorded for the first time in Iraqi marine coastal water. Four species (*Codium tomentosum*, *Monostroma grevillea*, *Prasiola calophylla,* and *Prasiola stipitata*) are new for Arabian Gulf region.

Key words: Chlorophyta, Arabian Gulf, Iraq, macro algae

INTRODUCTION

The Arabian Gulf extended from the Strait of Hormuz in the south to Shatt Al-Arab in the north. The Arabian Gulf is a shallow sea with water depth less than 100m and average depth of 35m, covers the Arabian shelf platform. It is semi–enclosed sea surrounded by semi-arid and arid zone affected by semi-tropical or tropical temperature. The annual water temperature of coastal water ranging between10–36ºC (Basson *et al.*, 1977) and the annual rainfall which is usually in winter season less than 50mm. Salinity ranging between 37 to 42ppt. The Arabian Gulf showed semi-diurnal fluctuation (El-Gindyand Hegazi. 1996). The geological formations of the Gulf area belong to Miocene periods and consist of green-gray marl and limestone and coral reef at some area of the intertidal region. 103species of marine algae were recorded by Borgoson (1939) from seashores at the north of Arabian Gulf. Nizamuddin and Gessner (1970) mentioned 67 species of macro algae from the Arabian Gulf and coast of the Oman sea. The ecology and taxonomy of the Arabian Gulf macro algae were studied by many workers as (Basson1979a, b and 1992; Basson *et al.*, 1977; Basson*et al*.,1989; Jones 1986; Al-Hasanand Jones1989; DeClerckand Coppajan's 1996). The marine phytoplankton of Iraqi coastal water were studies by many researchers as (Al-Handel and Abdullah,1995; Al-Handel 2009; Al-Handel and Al-Rekabi,1994; Al-Handel *et al*., 1991; Al-Saadi*et al*., 1976., Ibrahim and Al-Shawi, 2015, 2017), but these studies were concentrated on microalgae and neglected the macro algae flora of this area. The only study of the marine benthic flora of this area so far was carried by Hadi*et al*., (1993), in which six taxa only were recorded of Chlorophyta from north-west Arabian Gulf. It was found that it is of great important to study the biodiversity, ecology of Chlorophyta in our coastal marine water which suffer from the lack of information. This study will lead for studies that are more extensive on the Chlorophyta of Iraqi marine water in the future.

MATERIALS AND METHODS

The study was carried out at six stations along the coast of north-west Arabian Gulf, Iraqi side. The stations cover the different coastal area (Map1). The samples collected from supra-tidal to sub-tidal zones of the intertidal regions of the selected stations. The sampled were carried out at different months during the year 2013. 4% formalin were added into the collected specimens to fix them, some of the samples were mounted on herbarium sheet for further identification. The references used for the classification as follow: Silva *et al*., (1996); Sohrabipour and Rabiei (1999); Sohrabipour *et al*., (2004); Sohrabipour and Rabiei (2007); Gharanjik and Rohani-Ghadikolaei (2011); John and Al-Thani (2014) and Kotabi and Zadi (2015). The species are listed in alphabetical order, sign showed the species are new for Iraq flora and ** are new for Iraq and the Arabian Gulf flora. The www.algaebase.org designed by Guiry (2015) were used to check the scientific names and taxa. The floristic descriptions of the newly reported species are mentioned below.

Fig1: Sites of sampling stations.

RESULTS

Species recorded in this study

BRYOPSIDACEAE

*Bryopsis pennata J.V,Lamourex

Bryopsis plumose (Hudson) C. Agardh

CLADOPHORACEAE

Cladophora glomorata (L.) Kg,

***Cladophorapsis membranaca* (Hofman Bang ex.C.AgardhBorgeston)

CODIACEAE

**Codium fragile (*Surngar) Hariot

**Codium papilalatum* C.K.Tsong&W.J.Gilbert

**Codium stimulant* Setchell&N,L,Gardner

**CodiumTomentosum Stackhon

PRASIOLACEAE

***Prasiola calophylla*(Carmichael ex Greville) Kutzing

***Prasiola stipitata*Suhr Ex Jessen

ULVALACEAE

Ulva Clathrata (Roth) Grev.=*Enteromorpha clatherata*

Ulva compressa(L) = *Enteromorpha compressa*(L.) Nees

**Ulva intestinalis*(L)=*Enteromorpha intestinlis*(Linaeus)Link

Ulva lactuca(L)

**Ulva linza*Linnaeus = *Enteromorpha linza(L)J,Agardh*

Ulva prolifera(O. F. Muller) J.Agardh

*Ulva rigida C.Agardh

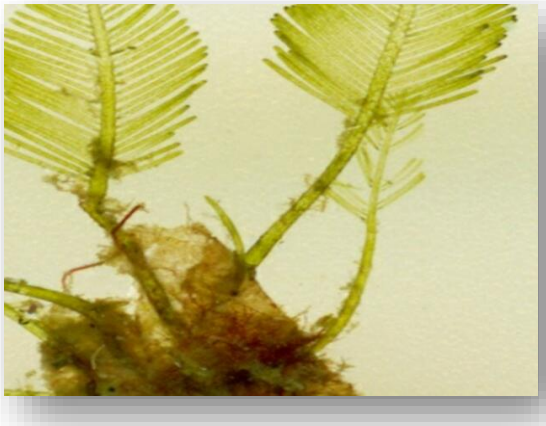
MONOSTROMATACEAE

** *Monostroma grevillea* (Thuret) Wittrock

Bryopsis pennataJ.V.Lamouroux, 1809

Description: Filamentous, 10 cm high, 12 mm wide, pinnately branched; lateral branches of almost the same length. Branchlets with two opposite rows at the upper half of branch, and bare at the lower. Colour is dark green in female plants and yellow in males.

Distribution in Arabian Gulf: Dubai (UAE): Dipper Herbarium; Iran: Sohrabipourand Rabiei 2007. New record for Iraq.



Cladophoropsis membranacea (Hofma Bang ex C.Agardh) Borgesen, 1905

Description: Dark green, filamentous of 5 cm long, slender irregular branch. The secondary holdfast up to 400 mm across septate or not across it. et al. 1996, Sohrabipour&Rabii 1996, 1999a, 1999b, Sohrabipo

Distribution in Arabian Gulf: Iran: Abdel-Kareem 2009a, Dadolahi-Sohrab *et al*., 2011; Rabiei *et al*.,2005; Rizk *et al*.,1999; Silva *et al*., 1996,

Sohrabipour and Rabii 1996, 1999a, 1999b; Sohrabipour and Rabiei 2007; Sohrabipour*et al*,.2004; Saudi Arabia: Abdel-Kareem 2009a; Silva *et al*., 1996.New record for Iraq.

Codium fragile (Suringar) Hariot, 1889
Synonym*:* *Acanthocodiumfagile*Suringar, 1867.
Description: A spongy, branched green alga, no flattening at the forks of the branches. It has some of subspecies, in various parts of the world. This - green algae is dark green in color and appear as fussy patch of tubular fingers. The fingers are branched up to a 1 cm wide and over 35 cm long. It found in ponds in upper and mid-shores.
Distribution in Arabian Gulf: Iran: Abdel-Kareem 2009a, Sohrabipourand Rabiei 2007; Saudi Arabia: Abdel-Kareem 2009a .New

Codium papillatum C.K.Tseng and W.J. Gilbert, 1942)
Synonyms: Are not currently included in Algae Base. **Description**: Spongy green thalli, about 7 cm, dichotomously branched. Utricles length (800) micrometer, and diameter (200) micrometer, avoid, have few conical papillae at vertical view.It grows in tidal and sub-tidal area.
Distribution in Arabian Gulf*:* Kuwait; Rizk et al.,1999; Silva et al., 1996; Iran; Silva et al., 1996; Sohrabipour and Rabii 1999a,1999b; Sohrabipourand Rabiei 2007; Sohrabipour et al., 2004. New record for Iraq**.**

Codium simulans Setchelland N.L.Gardner, 1924

Description: Mainly cylindrical fronds, irregularly branched, up to 6 cm long and 4 mm in diameter. Thethallus is connected to the several green fronds. The plant has cylindrical utricles, 200-250 µm in diameter.
Distribution in Arabian Gulf: Saudi Arabia: Abdel-Kareem 2009a. New record for Iraq.

CodiumtomentosumStackhou, 1779

Synonyms:Codiumdichotomumvar. B m1arginiferum S.F. Gray

FucusTomentosus var. marginifer Turner. 1811

Spongiadichotoma Hudson, 1762.

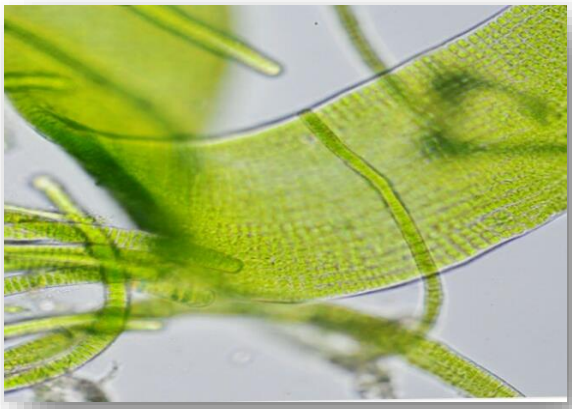
Description: A spongy, dark green dichotomously branched alga without distinct flattening at the forks of the branchlets has solid or spongy

fronds and covered with colorless hairs. The holdfast is saucer-shaped, with woven threats. It found on rocks in the seashore.
Distribution in Arabian Gulf: New record for Iraq and Arabian Gulf region.

Monostroma grevillea (Thuret) Wittrock, 1866

Description: Sac-like when young, becoming sheet-like, light green, 100 mm. Abundant in spring on rock pools and on rock from mid-tide.
Distribution in Arabian Gulf: New record for Iraq and Arabian Gulf.

Pasiola calophylla (Carmichael ex Greville) Kutzing
Description: Small (10-20 mm long and 2-300 µm wide), ribbon-like often expanding to form V-shaped, bright and adhere to surfaces when dry. Commonly seen in spring and early summer; surviving and re grown in the following winter, forming an irregular sward.
Distribution in Arabian Gulf: New record for Iraq and Arabian Gulf



Prasiola stipitata Suhr Ex Jessen, 1848
Synonym: *prasiolacornucopia*J.Agardh 1883:
Description: Small (1-5 mm long 2-5 mm wide), lettuce-like fronds when wet, bright and adhere to rock surfaces when dry. Commonly seen in spring and early summer, Surviving and re grow in winter.
Distribution in Arabian Gulf: New record for Iraq and Arabi**an** Gulf.

Ulva intestaina Linnaeus
Synonym: *Enteromorphaintestinalis*(Linnaeus) Nees
Description: Bright grass-green color, with inflated, hollow fronds. It looks like the large intestines of mammals. Found on Rock pools mammals in the upper intertidal and salt marshes.
Distribution in Arabian Gulf: Abu Dhabi (UAE): Al Abdessalaam 2007, John 2005; Bahrain: Abdel-Kareem 2009a, Rizk *et al.*,1999, Silva *et al.*, 1996; Dubai: Lehmann 1993; Iran: Dadolahi-Sohrab *et al*., 2011, Sohrabipourand Rabii 1999b, Sohrabipourand Rabiei 2007, Sohrabipour *et al.*, 1996; Kuwait: Abdel-Kareem 2009a, Rizk *et al.*, 1999, Silva *et al*., 1996; Qatar: Dorgham 1990; Saudi Arabia: Abdel-Kareem 2009. New record for Iraqi water.

Ulva linza Linnaeus

Description: Thallus is green sheet like, hard at the base and softer near and at the growing edges, up to 280 cm long, sometimes with irregular elliptical holes, found on rocks all over the year as epiphyte.

Distribution in Arabian Gulf: Iran: Sohrabipourand Rabiei 2007; Kuwait: Rizk *et al.*, 1999; Silva *et al*., 1996. New record to Iraq.

Description: Bright grass with branchless ribbon-like frond up to 30 cm long, generally with a frilled or scalloped margin; hollow at the top but gradually tapered below. Found **on** pools rocks and growing in sand on shells at the mid and lower intertidal.

Recorded in Arabian Gulf: Iran: Abdel-Kareem 2009a, Sohrabipourand Rabii 1999a, 1999b, Sohrabipourand Rabiei 2007; Saudi Arabia: Abdel - Kareem 2009a.New record for Iraq.

Ulva rigida C. Agardh, 1823

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