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NEAR JEDDAH, SAUDI ARABIA.

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ABSTRACT

Observation and sampling of macroalgae and seagrasses from Al-Qasr area, north of Jeddah were made by snorkling and by SCUBA diving during the period from 25th October to 11th November 1982. Five dives were made on the outer slope and in the lagoon of the fringing reef and three dives were made in the outer and inner slopes of the offshore reef systems. Precise description of the distribution of the most important vegetal species and assemblages of the fringing reef, were made by transect-line, the line crossing the reef from the shore line to the outer slope. 58 species of algae and 6 species of seagrass were found. Five new species were recorded.

INTRODUCTION

The knowledge of algae and seagrasses of the Saudi Arabian coasts of the Red Sea is limited. Originating between 1775 (the report of the expedition of Forsskal) and 1900. During this period a small number of species were found, though all the records were lacking of any precise information concerning their range of depth and their geographical distribution.

A true description of the algal flora of the Saudi Arabian Red Sea coast, can be obtained from a limited number of publications:

Papenfuss (1968), Lipkin (1975) and Aleem (1978), and more recently some additional observations were made by Aleem (1981), Baeshin and Aleem (1978), Hulings and Kirkman (1982), Meinesz (1981) and Mohsen (1972a, 1972b, 1972c). However, according to Aleem (1978) the work of Mohsen might include doubtful identifications.

In the present work the macroalgae and seagrasses were described along a transect located in the vicinity of Jeddah, 10 km north of Sharm Obhur. (Fig.1).

Observations and sampling of the algal vegetation and seagrasses were made by SCUBA diving during the period from October, 25th to November 11th, 1982. Five dives were made on the outer slope and in the lagoon of the fringing reef and three dives were made on the outer and inner slopes of the offshore reef systems.

It has been noted that there was a significant difference in the distribution of vegetal population between the fringing reef and the off shore reef.

In order to describe the distribution of the most important species of algae and seagrasses on the fringing reef, the transect-line method has been used. The process was to immerse a line serving as a positioning system which crossed the reef from the shore line to the outer slopes (Figs. 2, 3).

#### DESCRIPTION OF THE VEGETATION

##### \*Distribution of species across the fringing reef

The transect has been divided into several zones according to the depth of these zones and the distance from the shore-line.

a) From 0-5 meters from the shore-line: This zone was mainly sandy and without algae and seagrass.

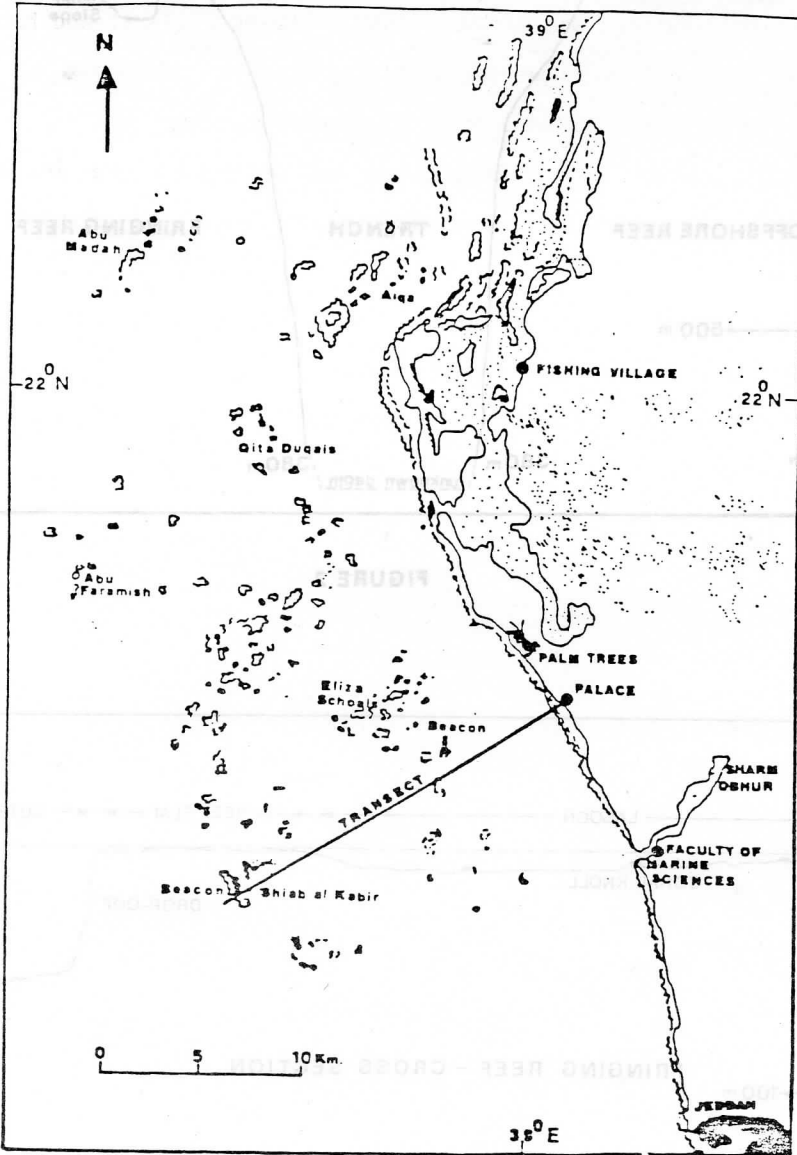


Figure (1)

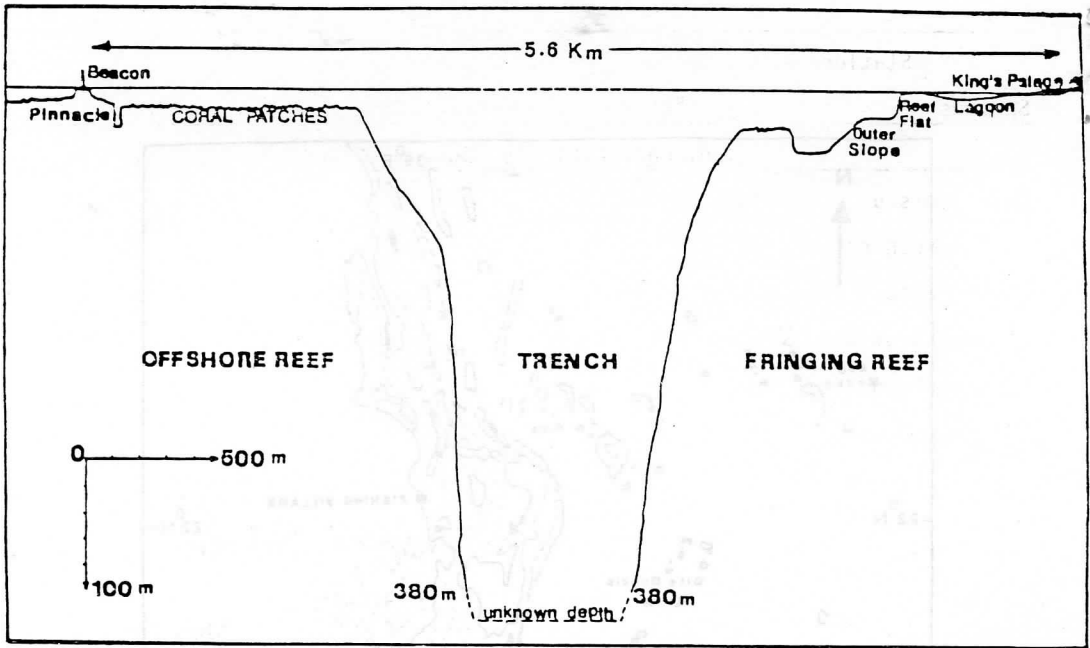


FIGURE 2

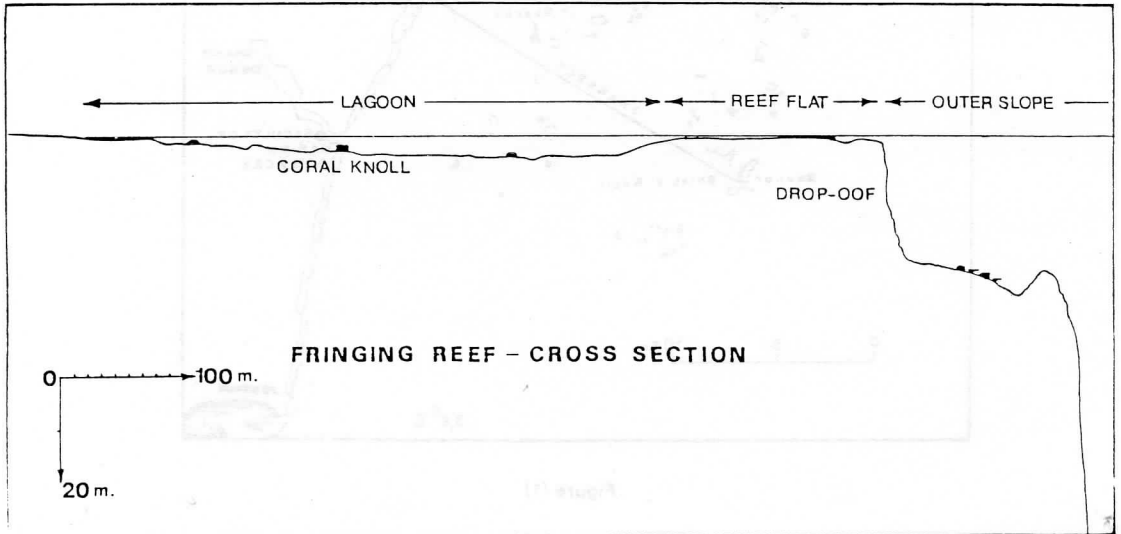


FIGURE 3

b) From 5 to 25 meters from the shore line: This zone was also sandy and shallow water (10 to 50 cm) Only small patches of Cystoseira myrica J.Ag. and Padina pavonica(L.) Thiry , these two species were colonized on pieces of dead corals.

c) From 25 to 50 meters from the shore-line: Only two seagrasses Halodule uninervis (Forssk.) Asherson and Thalassia hemprichii (Ehrenberg) Asherson and Scarce were growing on a very sandy bottom (0.5 to 1.0 m) deep The following algae were associated with them:-  
Avrainvillea amadelpha (Montagne) A. et E.S. Gepp.

Laurencia papillosa (C. Agardh) Greville

Padina pavonica.

The vegetation covers less than 20% of the substrate.

d) From 50 to 420 meters from the shore line: The bottom was covered with very fine sand. The vegetation was only found in the deepest part of the lagoon (from 145 to 420 m). Halodule uninervis and Thalassia hemprichii, Cymodocea rotundata Asch and Schwei, Halophila ovalis R.Br and Halophila stipulacea (Forssk.) Asch. were forming irregular and scattered beds which cover less than 5% of the substrate. In the center of the lagoon some decaying or dead coral patches were colonized by many algae. They were covering less than 30% of the substrate. The most frequent species were Chlorophyceae belonging to the order Caulerpales:

Caulerpa mexicana Sonder et Kutzing

Caulerpa racemosa var. lamourouxii (Turner) Weber-van Bosse

Caulerpa racemosa var. clavifera (Turner) Weber-van Bosse

Caulerpa serrulata (Forssk.) J. Agardh

Halimeda discoidea Decaisne

Halimeda opuntia (Linnaeus) Lamouroux

Microdictyon, agardhianum Decsne.

Pseudochlorodesmis furcellata

The following algae were also frequent.

Dictyosphaeria cavernosa (Forssk.) Boergesen

Dictyopteris sp. Lamour.

Lobophora variegata (Lamour.) Womersley

Pocockiella variegata (Lamour.) Papenfuss

Valonia aegagropila C. Ag.

Valonia macrophysa J. Ag.

Valonia ventricosa J. Ag.

e) From 420-425 meters from the shore-line. The bottom was also sandy, and climbed rapidly toward the reef flat from 5 meters - 1 meter. The vegetation was only existed at the upper part of the slope which was covered by a dense and continuous bed of Halodule univervis, and Syringodium isoetifolium (Aschers.) Dandy.

f) From 425-600 meters from the short-line. This position of the transect corresponds to the reef flat. The inner reef flat extends from 425-530 meters and the outer reef flat from 530-600 meters from the shore-line.

1) The vegetation of the inner reef flat.

This zone exhibits two forms of vegetation.

- Dense patches of Halodule univervis and Thalassia hemprichii extending from 425-440 meters from the shore-line. Caulerpa serrulata was also frequent in this zone.

- Dense beds of Phaeophyceae belonging to the order Fucales (Cystoseira sp., Dictyota sp. (Huds.) Lamour., Hormophysia sp., Sargassum sp. and Turbinaria sp.) These algae were settled on dead coral colonies extending from 440-530 meters from the shore-line. Many small epiphytes were growing on the oldest part of the coral colonies (Ceramium sp. Harv., Dictyota sp. (Huds.) Lamour., Jania sp. Lamour. and Padina sp.). In addition to the Fucales other algae were also found on the dead coral colonies. (Halimeda opuntia and Dictyosphaeria cavernosa) (Forssk.) Boergesen. In this zone the sand was covered with Thalassia hemprichii.

2) The vegetation of the outer reef flat: This zone mainly considered of crustose Corallinaceae covering dead corals and the dead parts of the living coral colonies. The macroalgae growing in this zone were

Avrainvillea amadelpha (Mont.) A. et E.S. Gepp

Boodlea composita Reinb.

Caulerpa fastigiata Mont.

Caulerpa mexicana Sonder et Kutzing

Caulerpa racemosa var. peltata (Lamouroux) Eubank

Caulerpa Selago (Turn.) Ag.

Caulerpa serrulata (Forsskal) J. Agardh

Caulerpa sertularioides (Gmelin) Howe (only one thallus found)

Dictyota sp.

Gracilaria arcuata Zanardini

Halimeda discoidea Decaisne

Halimeda macrolopa Lamour.

Halimeda opuntia (L.) Lamourouxii

Lobophora variegata (Lamouroux.) papenfuss.

Turbinaria triquetra (J.Ag.) J.Ag.

g) Outer slope of the fringing reef.

The vegetation of this zone was very poor. Some isolated algae were found on dead corals; The most frequent species were:

Caulerpa serrulata (was growing on the sandy slope at a depth of 24 meters)

Dictyota sp.

Halimeda discoidea

Lobophora variegata

Tydemania expeditionis Weber-van Bosse

Udotea argentea Zanardini

Udotea javensis (Lamour.) Decsne.

Distribution of species in the off-shore system

1. The inner reef system

A small reef located on the transect at a distance of 5 km from the coast was investigated.

On the outer slope (between 1m and 33m), only isolated algae



found, they were growing on dead corals. They belong to the same species that was found on the outer slope of the fringing reef. Tydemania expeditionis was the most abundant. The sandy area distributed between 6 m and 20 m were colonized by Halimeda cylindracea Decaisne which is a first record for the Red Sea. However, in agreement with to Papenfuss (1968, p.25) we think that Zanardini (1858) Muschler (1908), Harvey - Gibson (1908) and Nasr (1939, 1947) have likely found this Halimida but they have recorded it under the following names, respectively: Halimeda monile (Ellis et Solander) Lamouroux, Halimeda incrassata f. monilis (Ellis et Solander) Barton and Halimeda incrassata f. cylindrica Boergesen.

## 2. The outer Reef System.

The small reef investigated was located on the transect at a distance of 20 km from the coast.

The inner slope (between 2-10 meters) was sandy with large pinnacles growing from the bottom to the surface. The algae found on the pinnacles were the same as those growing on the coral patches of the lagoon of the fringing reef, but with two additional species: Caulerpa lentillifera J. Agardh and Struvea anastomosans (Harvey) Piccone et Grunow. Below 20 meters the algal flora was similar to that of the outer slope of the fringing reef with some additional species.

Actinotrichia fragilis (Forssk.) Borg.

Acetabularia parvula Solms-Laubach (= A. moebii Solms-Laubach)

Bryopsis sp. (Huds.) J. Ag.

Caulerpa ambigua Gkamura

Boergesenia sp. (Harvey) Feldmann

Neomeris annulata Dickie

Rhipiliopsis aegyptica

Digenea simpitex (Wulf) J. Ag.

Gastroclow sp. (Kütz) Kylin.

Gelidium sp. Gaill

Leveilla jungermannioides (Mart. et Harv.) Harv.

Liagora sp. Boerges.

Martesia elegans Harv.

## DISCUSSION

On the studied transect, it was found that the vegetation of the offshore reef and of the outer slope of the fringing reef was poor, and composed of a small number of species. Conversely, the vegetation of the reef flat and of the lagoon of the fringing reef and was rich composed of many species of algae and seagrasses forming dens beds from place to place Table 1.

The most abundant and important vegetation was growing on the reef flat of the fringing reef. The seagrasses Thalassia hemprichii and Halodule uninervis were only present in this area, The algal flora of this area was composed of the following algae belonging to the order Fucales: Cystoseira sp., Hormophysa sp., Sargassum sp. and Turbinaria sp.. They were forming dense beds on the reef flat.

On the lagoon of the fringing reef a peculiar vegetation was constituted by the algae belonging to the order Caulerpales (genera Caulerpa and Halimeda).

Seagrasses were lacking on the outer slope of the fringing reef as well as on the offshore reef system. The very poor vegetation of this area was composed of isolated algae such as Tydemania expeditionis, Halimeda discoidea, Udotea argentea and Caulerpa serrulata.

Five species of algae have been found to be new for the Saudi Arabian coast of the Red Sea:

Acetabularia parvula Solms-Laubach

Caulerpa ambigua Okamura

Halimeda cylindracea Decaisne

Neomeris annulata Dickie

Udotea argentea Zanardini

Table 1. Checklist of Algae and Seagrasses from the vicinity  
of Obhur, Jeddah

## SEAGRASSES

Cymodocea rotundataHalodule uninervisHalophila ovalisSyringodium isoetifoliumHalophila stipulaceaThalassia hemprichii

## ALGAE

## Chlorophyceae

\*Acetabularia parvulaDerbesia sp.Avrainvillea amadelpaDictyosphaeria cavernosaBoodlea composita\*Halimeda cylindracea\*Bryopsis sp.Halimeda discoideaCaulerpa ambiguaHalimeda macrolobaCaulerpa c.f. fastigiataHalimeda opuntiaCaulerpa lentilliferaMicrodictyon agardhianumCaulerpa mexicana\*Neomeris annulataCaulerpa racemosaPseudochlorodesmis furcellavar. claviferaRhipiliopsis aegypticvar. peltataStruvea anastomosansvar. lamourouxiiTydemania expeditionisCaulerpa selago\*Udotea argenteaCaulerpa serrulataUdotea javensisCaulerpa sertularioidesValonia aegagropilaValonia macrophysaValonia Ventricosa

Table 1.(Cont'd)

## Phaeophyceae

Cystoseira sp.  
Cystoseira myrica  
Dictyopteris sp.  
Dictyota sp.1  
Dictyota sp.  
Lobophora variegata  
Padina sp.2  
Padina pavonica  
Pocockiella variegata  
Sargassum sp.1  
Sargassum sp.2  
Sargassum sp.3  
Turbinaria triquetra

## Rhodophyceae

Actinotrichia fragilis  
Boergensenia sp.  
Digenea simplex  
Gastroclonium sp.  
Gelidium sp.  
Gracilaria sp.  
Laurencia sp.  
Laurencia papillosa  
Leveillea Jungermannioides  
Liagora sp.  
Jania sp.  
Martesia elegans  
Rhodophyta sp.1  
Rhodophyta sp.2

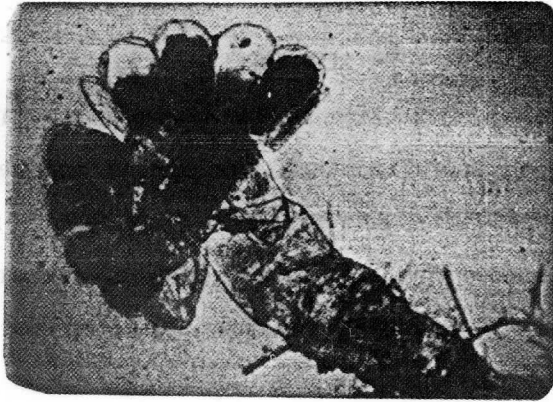
(\*) New recorded species



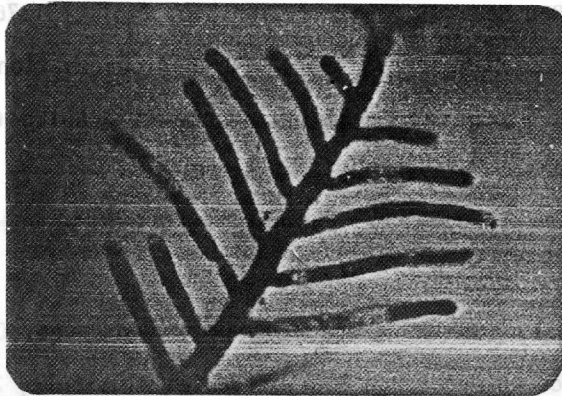
Halimida cylindracea



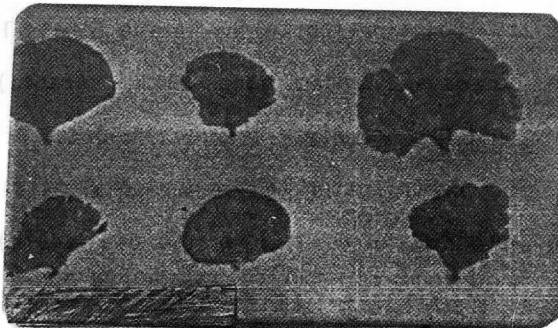
Neomeris annulata



Acetabularia parvula



Caulerpa ambigua



Udotea argentea

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