

## **Marine Algae and Seagrasses of Adana (Mediterranean, Turkey)**

### **Adana Kıyıları Deniz Algleri ve Deniz Çayırları**

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#### **Abstract**

Marine algae and seagrasses were researched in the upper infralittoral zone of Adana (Turkish Mediterranean coasts) in this study. 381 algae and 5 seagrasses (*Liliopsida*) were determined (Total 386 taxa). 27 of them belong to blue-green algae (*Cyanophyceae*), 204 to red algae [*Rhodellophyceae* (2), *Compsopogonophyceae* (2), *Bangiophyceae* (5), *Florideophyceae*(195)], 78 to brown algae (*Fucophyceae*), 72 to green algae [*Chlorophyceae* (7), *Ulvophyceae* (18), *Trentepohliophyceae* (1), *Cladophorophyceae* (22) *Bryopsidophyceae* (22), *Dasycladophyceae* (2)]. *Ceramium siliquosum* (Kützling) Maggs & Hommersend var. *zostericola* f. *zostericola*, *C. tenuicorne* (Kützling) Waern (*Rhodophyceae*), *Bryopsis adriatica* (J. Agardh) Meneghini (*Bryopsidophyceae*) are given as newly record for the Mediterranean shores of Turkey.

**Key Words:** Blue-green algae, red algae, brown algae, green algae, seagrasses, Adana, Mediterranean, Turkey.

#### **Introduction**

The earliest study on Turkish Mediterranean algae was performed by, Apaydın *et al.* (2002) published a new record for The Algal Flora of Turkey: *Chaetomorpha crassa* (C. Agardh) Kützling (Cladophoraceae, Chlorophyceae). Aysel and Gezerler-Şıpal (1996) published the check liste of *Cyanophyceae*, *Chlorophyceae*, *Charophyceae* and *Angiospermae* of Turkish Mediterranean coasts. Additionally Aysel (1997a, b) published the check liste of *Rhodophyta*, *Fucophyceae*

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and *Phaeophyceae* of Turkish Mediterranean coasts. Aysel *et al.* (1998) studied distribution of marine algae on Patara- Kalkan coasts. Aysel *et al.* (2002) published a new record for The Algal Flora of Turkey: *Caulerpa scalpelliformis* (R. Brown ex Turner) C. Agardh var. *denticulata* (Dacaisne) Weber van Bosse (*Caulerpacae*, *Caulerpales*). Muğla was investigated Aysel *et al.* (2003). Aysel *et al.* (2005a,b) studied on distribution of marine macro algae Hatay and Mersin shores. Akkuyu was investigated by Cirik (1986, 1991), Cirik & Öztürk (1991) published about *Caulerpa racemosa* that distribution on Turkish Mediterranean coast. Ertan *et al.* published a new record for The Algal Flora of Turkey; *Caulerpa scalpelliformis* (Brown ex Turner C. Agardh (*Caluerpacae*, *Chlorophyceae*) in 1998. Everset *et al.* (1997) studied macroscopic marine algae from Iskenderun Bay. Okudan & Aysel (2005) investigated distribution of marine algae on Antalya coasts. Öztürk studied distribution of *Cutleriales*, *Sphacelariales*, *Scytosiphonales*, *Dictyotales* (1988), and *Chordariales*, *Sporochnales* (1993), *Fucales* (1996a) and *Punctariales* (1996b) on Aegean Sea and Turkish Mediterranean coast. Öztürk and Güner (1986) investigated *Ectocarpales* (*Phaeophyta*) on Aegean Sea and Turkish Mediterranean coast., Taşkın *et al.* (2000a,b) studied on distribution of *Rhodophyta*, *Cyanophyceae* and *Chlorophyceae* on İskenderun gulf (Hatay coast). Taşkın *et al.* (2001) published three new record for The Algal Flora of Turkey. Turna *et al.* (2000a) published a new record for The Algal Flora of Turkey; *Botryocladia madagascariensis* G. Feldmann (*Rhodymeniaceae*, *Rhodophyceae*). Turna *et al.* (2000b) studied on distribution of *Chlorophyta* on Antalya bay. Turna *et al.* (2002) investigated seasonal Variations in the Biomass of Macro-Algal Communities from the Gulf of Antalya. Turna *et al.* (2003) studied on distribution of Brown algae and Red algae on Antalya bay (Mediterranean). Yağcı & Turna (2002) published a new record for The Algal Flora of Turkey; *Chaetomorpha crassa* (C.Agardh) Kützing (*Cladophoraceae*, *Chlorophyceae*).

## Material and Methods

Collected specimens were fixed by using 4 % formaldehyde. Specimens belonging to *Rhodomelaceae*, *Corallinaceae* and *Halimeda tuna* is identified with 10 % HCl in identification procedures for specific cell wall properties. Adana is situated between 34° 55' 16" and – 35° 55' 31" eastern longitudes (Figure 1).



**Figure 1:** Map of Adana coastline

The distribution of algae on the Turkish marine that new recorded for the Turkish coasts of Mediterranean is given in Figure 2 [Artvin (1), Rize (2), Trabzon (3), Giresun (4), Ordu (5), Samsun (6), Sinop (7), Kastamonu (8), Bartın (9), Zonguldak (10), Düzce (11), Sakarya (12), Kocaeli (13), İstanbul (14), Kırklareli (15), Tekirdağ (16), Edirne (17), Çanakkale (18), Balıkesir (19), Bursa (20), Yalova (21), Gökçeada (22), Bozcaada (23), İzmir (24), Aydın (25), Muğla (26), Antalya (27), Mersin (28), Adana (29), Hatay (30)].

## Results

Taxa distributed in study area are listed in Table 1. In this list, classes and upper categories were arranged according to Van den Hoek *et al.* (1997) and Guiry and Dhonncha (2005). Arrangement of lower categories, presented in the list were followed by specialists (Silva *et al.* (1996) for *Cyanophyta* and *Rhodophyta*, Stegenga (1985) for *Acrochaetiales*, Frederic and Hommersand (1989) for *Gracilariales*, Bressan and Babbini-Benussi (1995, 1996) for *Corallinales*, Gomez Garreta *et al.* (2001) for *Ceramiales*, Ribera *et al.* (1992) for *Fucophyceae*, Gallardo *et al.* (1993) for *Chlorophyceae*. Additionally, the studies of Barbara and Cremades (1996), Ballantine and Aponte (1997) and Hardy and Guiry (2003) were used to create an evolutionary list of taxa above genus level. Taxa in species or below species level are listed alphabetically.

New records for the Turkish Marines and the Turkish coasts of Mediterranean are indicated with asteriks.

**Table 1:** Taxa distributed on Adana (Mediterranean) coast of Turkey  
(\*): Turkish coasts of Mediterranean.

**CYANOPHYTA**

[=CYANOBACTERIA]

**CYANOPHYCEAE**

**CHROOCOCCALES**

**CHROOCOCCACEAE**

*Chroococcus minor* (Kützing)

Nägeli

*C. minutus* (Kützing) Nägeli

**DERMOCARPELLACEAE**

*Sphaenosiphon prasinus* Reinsch

**MICROCYSTACEAE**

*Microcystis halophila* B. Martens  
& Pankow

*M. marina* (Hansgrig *in* Foslie)

Silva

**OSCILLATORIALES**

**OSCILLATORIACEAE**

*Leptolyngbya foveolarum*

(Montagne *ex* Gomont)

Anagnostidis & Komárek

*L. fragilis* (Gomont) Anagnostidis  
& Komárek

*Lynghya agardhii* (P.L. Crouan  
& H.M. Crouan) Gomont

*L. confervoides* C. Agardh

*L. majuscula* (Dillwyn) Harvey

*L. polychroa* (Meneghini)

Rabenhorst

*L. semiplana* (C. Agardh) J. Agardh

**PHORMIDIACEAE**

**PHORMIDIOIDEAE**

*Phormidium autumnale* C. Agardh  
(Gomont)

*P. limosum* (Dillwyn) P.C. Silva

*Porphyrosiphon martensianus*

(Meneghini *ex* Gomont)

Anagnostidis & Komárek

*Symploca hydroides* (Harvey)

Kützing

var. *fasciculata* (Kützing)

Gomont

**PSEUDOANABAENACEAE**

*Spirocoleus tenuis*

(Meneghini)

Silva

**HETEROLEIBLEINIOIDEAE**

**E**

*Heteroleibleinia infixa*

(Frémy)

Anagnostidis & Komárek

**LEPTOLYNGBYOIDEAE**

*Leibleinia gracilis* Meneghini

**SCHIZOTHRICHACEAE**

*Schizothrix tenerrima*

(Gomont)

F.E. Drouet

**NOSTOCALES**

**RIVULARIACEAE**

*Calothrix aeruginea* (Kützing)

Thuret

*C. confervicola* (Roth) C.  
Agardh

*C. contarenii* (Zanardini)

Bornet

& Flahault

*C. parasitica* (Chauvin) Thuret

*Isactis plana* (Harvey) Thuret

*ex* Bornet & Flahault

*Rivularia atra* Roth *ex* Bornet

& Flahault

*R. biasoletiana* (Meneghini)

Bornet

& Flahault

**RHODOPHYTA**

**RHODELLOPHYTINA**

**RHODELLOPHYCEAE**

**STYLONEMATALES**

**STYLONEMATAACEAE**

*Stylonema alsidii* (Zanardini)

K. Drew

*S. cornu-cervi* Reinsch

**COMPSOPOGONOPHYCEAE**

**ERYTHROPELTIDALES**

**ERYTHROTRICHIACEAE**

*Erythrotrichia carnea* (Dillwyn)

J. Agardh

*Sahlingia subintegra* (Rosenvinge)

Kornmann

**MACRORHODOPHYTINA**

**BANGIOPHYCEAE**

**BANGIOPHYCIDAE**

**GONIOTRICHIALES**

**GONIOTRICHACEAE**

*Chroodactylon ornatum*

(C. Agardh) Basson

**BANGIALES**

**BANGIACEAE**

*Bangia atropurpurea* (Roth)

C. Agardh

*Porphyra leucosticta* Thuret in

Le Jolis

f. *leucosticta*

f. *undulata* Schiffner

*P. umbilicalis* (Linnaeus) Kützing

**NEMALIOPHYCIDAE**

**ACROCHAETIALES**

**ACROCHAETIACEAE**

*Acrochaetium crassipes* (Børgesen)

Børgesen

*A. mediterraneum* (Levring)

Boudouresque

*A. microscopicum* (Nägeli

ex Kützing) Nägeli

*A. rosulatum* (Rosenvinge)

Papenfuss

*A. savianum* (Meneghini) Nägeli

*A. secundatum* (Lyngbye) Nägeli

*A. virgatulum* (Harvey) Batters

**COLACONEMATALES**

**COLACONEMATACEAE**

*Colaconema codicola*

(Børgesen)

Stegenka, Bolton & Anderson

*C. daviesii* (Dillwyn) Stegenka

**NEMALIALES**

**GALAXAURACEAE**

*Scinaia furcellata* (Turner)

J. Agardh

*Tricleocarpa cylindrica* (Ellis &

Solander) Huisman & Borowitzka

*T. fragilis* (Linnaeus) Huisman

& Townsend

**LIAGORACEAE**

*Ganonema farinosum*

(Lamouroux)

Fan & Wang

*Liagora viscida* (Forsskål)

C. Agardh

**NEMALIACEAE**

*Nemalion helminthoides*

(Vellay)

Batters

**RHODYMENIOPHYCIDAE**

**GELIDIALES**

**GELIDIACEAE**

*Gelidium corneum* (Hudson)

Lamouroux

var. *corneum*

var. *pectinatum* Ardissonne

& Strafforello

*G. crinale* (Hare ex Turner)

Gaillon

var. *crinale*

*G. minusculum* (Webervan

Bosse)

R.E. Norri

*G. pulchellum* (Turner)

Kützing

*G. pusillum* (Stackhouse) Le

Jolis  
var. *pusillum*  
*G. spathulatum* (Kützing) Bornet  
*G. spinosum* (Gmelin) Silva  
var. *spinosum*  
var. *hystrix* (J. Agardh) Furnari  
var. *luxurans* (P.L. et  
H.M. Crouan) Okudan & Aysel  
*Pterocладиella capillacea* (Gmelin)  
Santelices & Hommersand  
f. *capillacea*  
*P. melanoidea* (Schousboe ex  
Bornet) Santelices  
& Hommersand  
var. *melanoidea*  
var. *filamentosa* (Schousboe  
ex Bornet) Wynne  
var. *gracilis* (Feldmann &  
Hamel) Wynne

#### GELIDIACEAE

*Gelidiella nigrescens* (Feldmann)  
Feldmann & Hamel  
*G. ramellosa* (Kützing) Feldmann  
& Hamel  
*Parviphycus tenuissimus* (Feldmann  
& Hamel) Santelices

#### GRACILARIALES

##### GRACILARIACEAE

*Gracilaria bursapastoris* (Gmelin)  
Silva  
*G. gracilis* (Stackhouse) Steentoft,  
Irvine & Farnham  
var. *gracilis*

#### BONNEMAISONIALES

##### BONNEMAISONIACEAE

*Falkenbergia rufolanosa* (Harvey)  
Schmitz  
*Trilliella intricata* Batters

#### CORALLINALES

##### CORALLINACEAE

##### AMPHIROIDEAE

*Amphiroa beauvoisii*  
Lamouroux  
*A. cryptarthrodia* Zanardini  
*A. rigida* Lamouroux

##### CHOREONEMATOIDEAE

*Choreonema thuretii* (Bornet)  
Schmitz

##### CORALLINOIDEAE

##### CORALLINEAE

*Corallina elongata* Ellis &  
Solander  
*C. panizzoi* Schnetter & U.  
Richter  
*C. pinnatifolia* (Manza)  
Dawson

##### JANIEAE

*Halitilon roseum* (Lamarck)  
Garbary & Johansen  
var. *roseum*  
*H. virgatum* (Zanardini)  
Garbary  
& Johansen  
*Jania longifurca* Zanardini  
*J. rubens* (Linne) Lamouroux  
var. *rubens*  
var. *corniculata* (Linnaeus)  
Yendo

##### MASTOPHOROIDEAE

*Hydrolithon farinosum*  
(Lamouroux) D. Penrose  
& Chamberlain  
var. *farinosum*

##### LITHOPHYLLOIDEAE

*Lithophyllum cystoseirae*  
(Hauck)  
Heydrich  
*L. incrustans* Philippi  
*L. lobatum* M. Lemoine  
*L. tortuosum* (Esper) Foslie  
f. *tortuosum*

*Titanoderma pustulatum*  
(Lamouroux) Nägeli

#### MELOBESIOIDEAE

*Melobesia membranacea* (Esper)  
Lamouroux sensu Chanberline &  
Irvine

*Mesophyllum expansum* (Philippi)  
Cabiocch & Mendoza

*M. lichenoides* (Ellis) Lemoine

*Phymatolithon lenormandii*  
(Areschoug) Adey

#### GIGARTINALES

##### ACROSYMPHYTACEAE

*Acrosymphyton purpuriferum*  
(J. Agardh) Sjøstedt

##### CALOSIPHONACEAE

*Calosiphonia vermicularis*  
(J. Agardh) Schmitz

##### CYSTOCLONIACEAE

*Rhodophyllis divaricata*  
(Stackhouse) Papenfuss

##### DUMONTIACEAE

*Dudresnaya verticillata* (Withering)  
Le Jolis

##### FURCELLARIACEAE

*Halarachnion ligulatum*  
(Woodward) Kützing

##### GIGARTINACEAE

*Chondracanthus acicularis* (Roth)  
Fredericq

##### HYPNEACEAE

*Hypnea musciformis* (Wulfen in  
Jaquin) Lamouroux  
*H. spinella* (C. Agardh) Kützing

##### KALLYMENIACEAE

*Kallymenia requienii* (J. Agardh)

J. Agardh  
*Meredithia microphylla* (J.  
Agardh)  
J. Agardh

##### PEYSSONNELICEAE

*Peyssonnelia bornetii*  
Boudouresque & Denizot

*P. crispata* Boudouresque  
& Denizot

*P. dubyi* P.L. Crouan &  
H.M. Crouan

*P. polymorpha* (Zanardini)  
Schmitz

*P. rosa-marina* Boudouresque  
& Denizot

*P. rubra* (Greville) J. Agardh

*P. squamaria* (Gmelin)  
Decaisne

##### PHYLLOPHORACEAE

*Gymnogongrus griffithsiae*  
(Turner)

Martius

*Schottera nicaeënsis*  
(Lamouroux  
ex Duby) Guiry & Hollenberg

##### RHABDONIACEAE

*Catenella caespitosa*  
(Withering)

Irvine in Parke & Dixon

##### NEMASTOMACEAE

*Nemastoma dichotomum* J.  
Agardh

##### RHIZOPHYLLIDACEAE

*Contarinia*  
*peyssonneliaeformis*

Zanardini

*Contarinia squamariae*  
(Meneghini)

Denizot



**SCHIZYMENIACEAE**

*Platoma cyclocalpa* (Montagne)  
Schmitz

**SPHAEROCOCCACEAE**

*Sphaerococcus coronopifolius*  
Stackhouse

**WURDEMANNIACEAE**

*Wurdemannia miniata* (Sprengel)  
Feldmann & Hamel

**RHODYMENIALES**

**RHODYMENIACEAE**

*Botryocladia borgeseni* Feldmann  
*B. botryoides* (Wulfen) Feldmann  
*B. chiajeana* (Meneghini) Kylin  
*Chrysymenia ventricosa*  
(Lamouroux) J. Agardh  
*Rhodymenia ardissoni* J. Feldmann  
var. *ardissoni*  
var. *spathulata* (Schiffner)  
Okudan & Aysel.  
*R. ligulata* Zanardini

**CHAMPIACEAE**

*Champia parvula* (C. Agardh)  
Harvey  
*Chylocladia verticillata* (Lightfoot)  
Bliding

**LOMENTARIACEAE**

*Lomentaria articulata* (Hudson)  
Lyngbye  
var. *articulata*  
*L. clavellosa* (Turner) Gaillon  
*L. verticillata* Funk

**HALYMENIALES**

**GRATELOUPIACEAE**

*Grateloupia dichotoma* J. Agardh  
*G. filicina* (Lamouroux) C. Agardh

**HALYMENIACEAE**

*Halymenia floresii* (Clemente

y Rubio) C. Agardh

**PLOCAMIALES**

**PLOCAMIACEAE**

*Plocamium cartilagineum*  
Linnaeus  
(Dixon)

**CRYPTONEMIALES**

**CRYPTONEMACEAE**

*Cryptonemia lomation*  
(Bertoloni)  
J. Agardh

**CERAMIALES**

**CERAMIACEAE**

**CALLITHAMNIOIDEAE**

**CALLITHAMNIEAE**

*Aglaothamnion caudatum*  
(J. Agardh) Feldmann  
Mazoyer  
*A. hookeri* (Dilliwyn) Maggs  
& Hommersand  
*A. tenuissimum*  
(Bonnemaïson)  
Feldmann Mazoyer  
var. *tenuissimum*  
*A. tripinnatum* (C. Agardh)  
Feldmann Mazoyer  
*Callithamnion corymbosum*  
(Smith)  
Lyngbye  
*C. granulatum* (Ducluzeau)  
C. Agardh

**GYMNOTHAMNIEAE**

*Gymnothamnion elegans*  
(Schousboe ex C. Agardh)  
J. Agardh

**CERAMOIDEAE**

**ANTITHAMNIEAE**

*Antithamnion cruciatum*  
(C. Agardh) Nägeli  
var. *cruciatum*

## CERAMIEAE

*Ceramium ciliatum* (Ellis)

Ducluzeau

var. *ciliatum*

*C. cimbricum* Petersen

f. *cimbricum*

*C. circinatum* (Kützing) J. Agardh

*C. flaccidum* (Kützing) Ardissonne

*C. rubrum auctorum*

var. *rubrum*

*C. siliquosum* (Kützing) Maggs

& Hommersend

var. *siliquosum*

var. *elegans* (Roth) Furnari

var. *tenuissimum* (Lyngbye)

V Ayse B Dural Tarakçı,

H Erduğan, F Ayse E Türker,

Y Tarakçı

var. *zostericola*

(Feldmann Mazoyer) Furnari

(\*)f. *zostericola*

*C. tenerrimum* (G. Martens)

Okamura

var. *tenerrimum*

var. *brevizonatum* (Peterson)

Feldmann Mazoyer

(\*)*C. tenuicorne* (Kützing)

Waern

*Centroceras clavulatum*

(C. Agardh) Montagne

*Coralophila cinnabarina*

(Grateloup ex Bory) R.E. Norris

## CROUANIEAE

*Crouania attenuata* (C. Agardh)

J. Agardh

## GRIFFITHSIEAE

*Anotrichium barbatum* (C. Agardh)

Nägeli

*A. tenue* (C. Agardh) Nägeli

*Griffithsia devoniensis* Harvey

*G. phyllamphora* J. Agardh

*G. schousboei* Montagne

var. *schousboei*

var. *minor* G. Feldmann

ex Feldmann Mazoyer

## PTEROTHAMNIEAE

*Pterothamnion crispum*

(Ducluzeau) Nägeli

*P. plumula* (Ellis) Nägeli

## SPYRIDIEAE

*Spyridia filamentosa* (Wulfen)

Harvey in W.J. Hooker

*S. hypnoides* (Bory) Peperfuss

## WRANGELIEAE

*Wrangelia penicillata* (C.

Agardh)

C. Agardh

## COMPSOTHAMNIOIDEAE

### COMPSOTHAMNIEAE

*Compsothamnion thuyoides*

(J.E. Smith) Schmitz

## MONOSPOREAE

*Monosporus pedicellatus*

(J.E. Smith) Solier

## SPERMOTHAMNIEAE

*Spermothamnion flabellatum*

Bornet

*S. repens* (Dillwyn)

Rosenvinge

var. *repens*

var. *flagelliferum* (De

Notaris)

Feldmann Mazoyer

## SPONGOCLONIEAE

*Pleonosporium borreri* (J.E.

Smith)

Nägeli

## DASYACEAE

*Dasya baillouviana* (Gmelin)

Montagne  
var. *baillouviana*  
*D. corymbifera* J. Agardh  
*D. hutchinsiae* Harvey in  
W.J. Hooker  
*D. punicea* (Zanardini) Meneghini  
ex Zanardini  
*D. rigidula* (Kützing) Ardissonne  
*Eupogodon planus* (C. Agardh)  
Kützing  
*Heterosiphonia crispella*  
(C. Agardh)Wynne

**DELESSERIACEAE**

**DELESSERIOIDEAE**

**APOGLOSSEAE**

*Apoglossum ruscifolium* (Turner)  
J. Agardh

**HYPOGLOSSEAE**

*Hypoglossum hypoglossoides*  
(Stackhouse) Collins & Harvey

**NITOPHYLLOIDEAE**

**NITOPHYLLEAE**

*Nitophyllum punctatum*

(Stackhouse)Greville

var. *punctatum*

*Radicilingua thysanorhizans*

(Holmes) Papenfuss

**PHYCODRYOIDEAE**

**CRYPTOPLEUREAE**

*Acrosorium ciliolatum* (Harvey)

Kylin

**MYRIOGRAMMEAE**

*Muriogramme minuta* Kylin

**Subfamilia and Tribus not known:**

*Taenioma nanum* (Kützing)

Papenfuss

**RHODOMELACEAE**

**AMANSIEAE**

*Halopithys incurva* (Hudson)

Batters

*Osmundaria* *volubilis*

(Linnaeus)

R.E. Norris

*Rytiphlaea tinctoria*

(Clemente)

C. Agardh

**CHONDRIEAE**

*Acanthophora nayadiformis*

(Delilei) Papenfuss

*Chondria capillaris* (Hudson)

Wynne

var. *capillaris*

*C. dasyphylla* (Woodward)

C. Agardh

**LAURENCIEAE**

*Chondrophycus paniculatus*

(C. Agardh) Furnari

*C. papillosus* (C. Agardh)

Garbary

& J. Harper

*Erythrocystis* *montagnei*

(Derbès

& Solier) Silva

*Laurencia obtusa* (Hudson)

Lamouroux

var. *obtusa*

var. *gracilis* (Kützing)

Hauck

var. *laxa* (Kützing)

Ardissonne

var. *racemosa* Kützing

*L. pyramidalis* Bory de

SaintVincent ex Kützing

*Osmundea* *pelagosae*

(Schiffner)

Nam

*O. pinnatifida* (Hudson)

Stackhouse

## POLYSIPHONIEAE

- Asidium corallinum* C. Agardh  
*A. helminthochorton*  
(Schwendimann) Kützing  
*A. lanciferum* Kützing  
*Boergesenella fruticulosa* (Wulfen)  
Kyllin  
*Digenea simplex* (Wulfen)  
C. Agardh  
*Herposiphonia secunda*  
(C. Agardh) Ambronn  
f. *secunda*  
f. *tenella* (C. Agardh) Wynne  
*Lophocladia lallemandii*  
(Montagne) Schmitz  
*Lophosiphonia cristata* Falkenberg  
*L. obscura* (C. Agardh) Falkenberg  
*L. scopulorum* (Harvey) Womersley  
*L. subadunca* (Kützing) Falkenberg  
*Polysiphonia atra* Zanardini  
*P. deusta* (Roth) Sprengel  
*P. elongata* (Hudson) Harvey in  
Hooker  
*P. flocculosa* (C. Agardh) Endlicher  
*P. furcellata* (C. Agardh) Harvey  
*P. opaca* (C. Agardh) Moris & De  
Notaris  
*P. sertularioides* (Grateloup)  
J. Agardh  
*P. tenerrima* Kützing  
*P. tripinnata* J. Agardh  
*P. variegata* (C. Agardh) Zanardin

## POLYZONIEAE

- Dipterosiphonia rigens* (Shousboei)  
Falkenberg

## PTEROSIPHONIEAE

- Pterosiphonia pennata* (C. Agardh)  
Sauvageau

## OCHROPHYTA

[=HETEROKONTOPHYTA]

## FUCOPHYCEAE

[=PHAEOPHYCEAE]

## ECTOCARPALES

### ECTOCARPACEAE

- Ectocarpus fasciculatus*  
Harvey  
var. *fasciculatus*  
*E. siliculosus* (Dillwyn)  
Lyngbye  
var. *siliculosus*  
*E. virescens* Thuret ex  
Sauvageau  
*Feldmannia caespitula* (J.  
Agardh)  
KnoepfflerPéguy  
var. *caespitula*  
var. *lebelii* (Areschoug ex  
P.L.  
Crouan) KnoepfflerPéguy  
*F. irregularis* (Kützing) Hamel  
*F. globifera* (Kützing) Hamel  
*F. padinae* (Buffham) Hamel  
*Hincksia mitchelliae* (Harvey)  
Silva  
*Streblonema sphaericum*  
(Derbès  
& Solier) Thuret

## CHORDARIALES

### MYRIONEMATACEAE

- Myrionema strangulans*  
Greville

### ELACHISTACEAE

- Halothrix lumbricalis*  
(Kützing)  
Reinke

### LEATHESIACEAE

- Leathesia mucosa* Feldmann

### CORYNOPHLAEACEAE

- Corynophlaea umbellata*  
(C. Agardh) Kützing  
*Myriactula arabica* (Kützing)  
Feldmann  
*M. rivulariae* (Shur) Feldmann

**SPERMATOCHNACEAE**

*Stilophora tenella* (Esper) Silva

**CHORDARIACEAE**

*Cladosiphon mediterraneus*

Kützing

*C. zosteræ* (J. Agardh) Kylin

*Liebmannia leveillei* J. Agardh

*Sphaerotrichia divaricata*

(C. Agardh) Kylin

**RALFSIALES**

**RALFSIACEAE**

*Hapalospongidion macrocarpum*

(Feldmann) León Álvarez

& González

*Ralfsia verrucosa* (Areschoug)

Areschoug

**CUTLERIALES**

**CUTLERIACEAE**

*Cutleria chilosa* (Falkenberg) Silva

*C. multifida* (Turner) Greville

*Zanardinia typus* (Nardo) Furnari

**SPHACELARIALES**

**SPHACELARIACEAE**

*Sphacelaria cirrosa* (Roth)

C. Agardh

f. *cirrosa*

f. *mediterranea* Sauvageau

*S. fusca* (Hudson) S.F. Gray

*S. rigidula* Kützing

*S. tribuloides* Meneghini

**STYPOCAULACEAE**

*Halopteris filicina* (Grateloup)

Kützing

*H. scoparia* Linnaeus Sauvageau

**CLADOSTEPHACEAE**

*Cladostephus spongiosus* (Hudson)

C. Agardh

f. *verticillatus* (Lightfoot)

**DICTYOTALES**

**DICTYOTACEAE**

*Dictyopteris polypodioides*

(De Candolle) Lamouroux

*Dictyota dichotoma* (Hudson)

Lamouroux

var. *intricata* (C. Agardh)

Greville

*D. fasciola* (Roth) Lamouroux

var. *fasciola*

var. *repens* (J. Agardh)

Ardissonne

*D. linearis* (C. Agardh)

Greville

f. *linearis*

f. *divaricatus* (Lamouroux)

Aysel,

Okudan, Erduğan

*D. mediterranea* (Schiffner)

Furnari

var. *mediterranea*

var. *crassa* (Schiffner) V

Ayse

H Erduğan, EŞ Okudan, H

Erk

*D. menstrualis* (Hoyt)

Schnetter,

Hornig & WeberPeukert

var. *menstrualis*

*D. spiralis* Montagne

*Lobophora variegata*

(Lamouroux)

Womersley ex Oliveira

*Padina pavonica* (Linnaeus)

Thivy

*Stypopodium schimperi*

(Buchinger

ex Kützing) Verlaque

& Boudouresque

*Taonia atomaria* (Woodward)

J. Agardh

f. *atomaria*

f. *ciliata* (C. Agardh)

Nizamuddin  
*Zonaria tournefortii* (Lamouroux)  
Montagne

**DICTYOSIPHONALES**  
**MYRIOTRICHACEAE**

*Myriotrichia clavaeformis* Harvey

**GIRAUDIACEAE**

*Giraudia sphaclarioides* Derbès  
& Solier

**ASPEROCOCCACEAE**

*Asperococcus bullosus* Lamouroux  
f. *bullosus*

*A. fistulosus* (Hudson) W.J. Hooker

**PUCTARIALES**

**PUNCTARIACEAE**

*Punctaria latifolia* Greville

**SCYTOSIPHONALES**

**COLPOMENIACEAE**

*Colpomenia sinuosa* (Mertens ex  
Roth) Derbès & Solier

*Hydroclathrus clathratus*  
(C. Agardh) Howe

**SCYTOSIPHONACEAE**

*Petalonia fascia* (Müller) Kuntze

*Scytosiphon simplicissimus*  
(Clemente) Cremades  
var. *simplicissimus*

**FUCALES**

**CYSTOSEIRACEAE**

*Cystoseira amentacea* Bory  
var. *amentacea*

var. *spicata* (Ercégovic) Giaccone

*C. barbata* (Stackhouse) C. Agardh  
var. *barbata*

*C. compressa* (Esper) Gerloff &  
Nizamuddin  
f. *compressa*

*C. corniculata* (Turner) Zanardini

var. *corniculata*  
subsp. *laxior* Hauck  
*C. crinita* (Desfontaines) Bory  
f. *crinita*

*C. crinitophylla* Ercégovic

*C. dubia* Valiante

*C. elegans* Sauvageau

*C. foeniculacea* (Linnaeus)  
Greville

f. *tenuiramosa* (Ercégovic)

A. Gómez Garreta, M.C.  
Barceló

*C. humulis* Schousboe ex  
Kützing

var. *humulis*

*C. mediterranea* Sauvageau

var. *mediterranea*

var. *valiantei* Sauvageau

*C. spinosa* Sauvageau

*C. squarrosa* De Notaris

**SARGASSACEAE**

*Sargassum acinarum*  
(Linnaeus)

Setchell

*S. hornschurchii* C. Agardh

*S. vulgare* C. Agardh

var. *vulgare*

**CHLOROPHYTA**

**CHLOROPHYTINA**

**TETRASPOROPHYTAE**

**CHLOROPHYCEAE**

**PHAEOPHILALES**

**PHAEOPHILACEAE**

*Phaeophila dendroides*

(P. L. Crouan & H. M.  
Crouan)

Batters

**TETRASPORALES**

**PALMELLOPSIDACEAE**

*Palmophyllum crassum*  
(Naccari)

Rabenhorst

## CHLOROCOCCALES

### ENDOSPHAERACEAE

*Gomontia polyrhiza* (Leigerheim)  
Bornet & Flahault

## CHAETOPHORALES

### CHAETOPHORACEAE

*Bolbocoleon piliferum* Pringsheim  
*Entocladia viridis* Reinke  
*Pringsheimiella scutata* (Reinke)  
Höhnelt ex Marchewianka

## SPHAEROPLEALES Haeckel

### SPHAEROPLEACEAE Kützing

*Sphaeroplea annulina* (Roth)  
C. Agardh

## ULVOPHYCEAE

### ULOTRICHALES

### BORODINELLACEAE

*Planophila microcystis* (Dangeard)  
Korrmann & Sahling

## ULOTHRICHACEAE Kützing

*Ulothrix flacca* (Dillwyn) Thuret in  
Le Jolis  
*U. zonata* (Weber & Mohr) Kützing

## ULVALES

### ULVACEAE Lamour ex Dumort.

*Enteromorpha clathrata* (Roth)  
Greville  
*E. compressa* (Linnaeus) Nees  
var. *compressa*  
*E. flexuosa* (Wulfen) J. Agardh  
subsp. *flexuosa*  
*E. intestinalis* (Linnaeus) Nees  
var. *intestinalis*  
*E. kylinii* Bliding  
*E. linza* (Linnaeus) J. Agardh  
var. *linza*  
var. *crispata* (Bertoloni) J. Agardh  
var. *minor* Schiffner  
*E. prolifera* (Müller) J. Agardh

subsp. *prolifera*

*Ulva fasciata* Delile  
*U. lactuca* Linnaeus  
f. *lactuca*  
*U. rigida* C. Agardh  
f. *rigida*

## ULVELLACEAE

*Acrochaete repens* Pringsheim  
*Epicladia flustrae* Reinke  
*Uvella lens* P. L. Crouan & H.  
M.  
Crouan

## TRENTEPOHLIOPHYCEAE

### TRENTEPOHLIALES

### TRENTEPHOLIACEAE

*Chlorotylum cataractarum*  
Kützing

## CLADOPHOROPHYCEAE

### CLADOPHORALES

#### Haeckel

### ANADYOMENACEAE

Kützing  
*Anadyomene stellata* (Wulfen)  
C. Agardh  
*Microdictyon tenuius* J.E.  
Gray

### CLADOPHORACEAE Wille

*Chaetomorpha aerea*  
(Dillwyn)  
Kützing  
*C. linum* (Müller) Kützing  
*Cladophora albida* (Nees)  
Kützing  
*C. coelothrix* Kützing  
*C. dalmatica* Kützing  
*C. glomerata* (Linnaeus)  
Kützing  
var. *glomerata*  
var. *marina* Lyngbye  
*C. hutchinsiae* (Dillwyn)

Kützing

*C. laetevirens* (Dillwyn) Kützing

*C. lehmanniana* (Lindenberg)  
Kützing

*C. mediterranea* Hauck

*C. oblitterata* Söderström

*C. pellucida* (Hudson) Kützing  
f. *pellucida*

*C. prolifera* (Roth) Kützing

*C. sericea* (Hudson) Kützing

*C. trichotoma* (C. Agardh) Kützing

*Rhizoclonium riparium* (Roth)  
Harvey

*R. tortuosum* (Dillwyn) Kützing

#### SIPHONOCLADALES

##### VALONIACEAE Kützing

*Valonia macrophysa* Kützing

*V. utricularis* (Roth) C. Agardh

#### BRYOPSIDOPHYCEAE

##### BRYOPSIDALES Schaffner

##### BRYOPSIDACEAE Bory

(\*)*Bryopsis adriatica* (J. Agardh)  
Meneghini

*B. corymbosa* J. Agardh

*B. duplex* De Notaris

*B. feldmannii* Gallardo & Furnari

*B. flagellata* Kützing

*B. hypnoides* Lamouroux  
var. *hypnoides*

*B. muscosa* Lamouroux

*B. pennata* Lamouroux

*B. plumosa* (Hudson) C. Agardh  
var. *plumosa*

#### DERBESIALES

##### DERBESIACEAE Hauck

*Derbesia tenuissima* (Morris & De  
Notaris) P. L. Crouan & H. M.  
Crouan

*Pedobesia simplex* (Meneghini ex  
Kützing) Wynne & Leliaert

#### CODIALES

##### CODIACEAE Kützing

*Codium adhaerens* C. Agardh

*C. bursa* (Linnaeus) C. Agardh

*C. effusum* (Rafinesque) Delle  
Chiaje

*C. tomentosum* Stackhouse

*C. vermilara* (Olivi) Delle  
Chiaje

#### CAULERPALES

##### CAULERPACEAE Kützing

*Caulerpa ollivieri* Dostal

*C. prolifera* (Forsskål)  
Lamouroux

*C. racemosa* (Forsskål) J.

Agardh

var. *lamourouxii* (Turner)

Webervan Bosse

f. *requienii* (Montagne)

Weber

van Bosse

##### UDOTEACEAE J. Agardh

*Flabellia petiolata* (Turra)

Nizamuddin

*Pseudochlorodesmis furcellata*  
(Zanardini) Børgesen

#### HALIMEDALES

##### HALIMEDACEAE

*Halimeda tuna* (Ellis &  
Solander)

Lamouroux

#### DASYCLADOPHYCEAE

##### DASYCLADALES Bessey

##### DASYCLADACEAE Kützing

*Dasycladus vermicularis*  
(Scopoli)

Krasser

#### ACETABULARIACEAE

*Acetabularia acetabulum*

(Linnaeus) Silva



**TRACHEOPHYTA**  
**[=MAGNOLIOPHYTA]**  
**ANGIOSPERMAE**  
**LILIOPSIDA**  
**CYMODOCEALES**  
**CYMODOCEACEAE**  
*Cymodocea nodosa* (Ucria)  
Ascherson

**POSIDONIALES**  
**POSIDONIACEAE**  
*Posidonia oceanica* (Linnaeus)  
Delile

**ZOSTERALES**  
**ZOSTERACEAE**  
*Zostera marina* Linnaeus  
*Z. noltii* Homermann

**HYDROCHARITALES**  
**HYDROCHARITACEAE**  
*Halophila stipulacea* (Forsskål)  
Ascherson

## Discussion

386 taxa (381 algae and 5 *seagrasses*) have been found in the present study. *Ceramium siliquosum* (Kützing) Maggs & Hommersend var. *zostericola* f. *zostericola*, *C. tenuicorne* (Kützing) Waern, *Bryopsis adriatica* (J. Agardh) Meneghini are new record for the Turkish coasts of Mediterranean. Their distribution of Turkish marines are seen Figure 2. As seen in Table 2, the comparison of the number of algal species of Adana with those of the other Mediterranean coastal cities of Turkey was given

**Table 2:** The number of algae species of Adana and the other the Mediterranean coastal stations (AD: Adana, AD\*(Aysel *et al.*, 1996, Aysel 1997a, 1997b, Everest *et al* 1997i Taşkın *et al* 2000b) MU: Muğla, AN: Antalya, MR: Mersin, HT: Hatay).

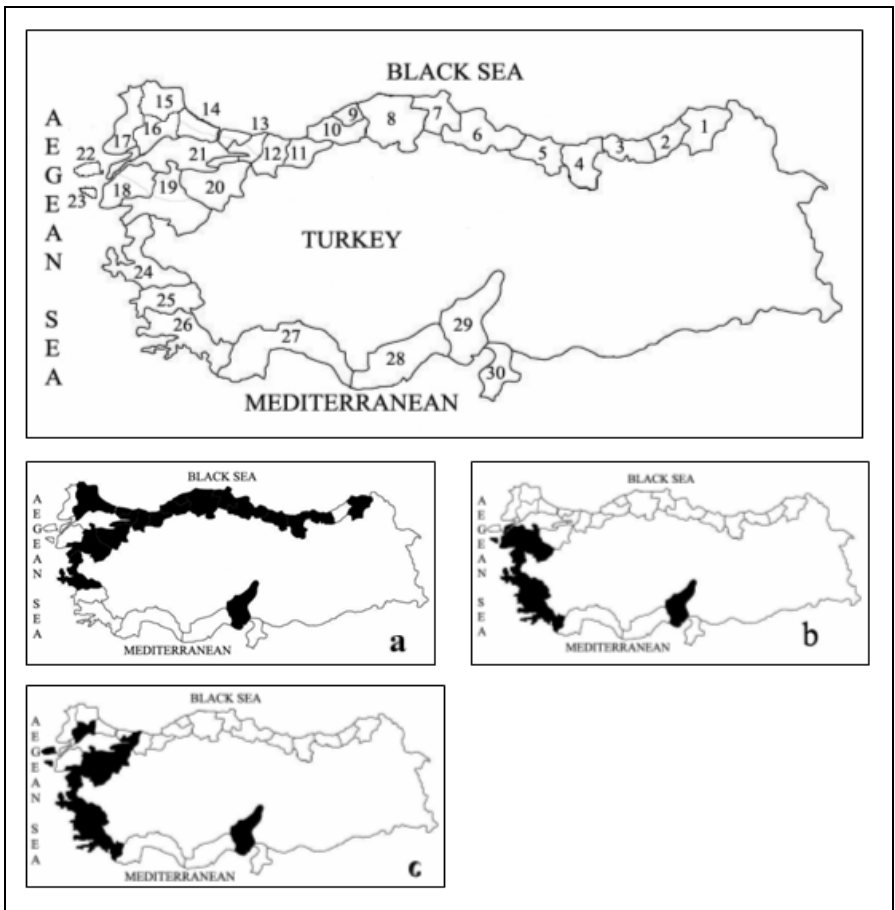
Division	Studied Cities of Turkish Mediterranean Shores					
	AD	AD*	MU	AN	MR	HT
<i>Cyanophyta</i> (Cy)	27	6	40	36	36	30
<i>Rhodophyta</i> (R)	204	61	222	198	204	201
<i>Ochrophyta</i> (O)	78	30	99	74	82	73
<i>Chlorophyta</i> (C)	72	25	73	67	74	73
<i>Magnoliophyta</i>	5	5	5	5	5	5
Total	386	217	439	380	401	382

**Table 3:** Dominancy in division level among northeastern provinces of Turkey

Division	Dominancy as cities in division level from the Mediterranean Shores of Turkey					
	AD	AD*	MU	AN	MR	HT
R/O	2.615	2.033	2.242	2,675	2.487	2.753

R/C	2.833	2.440	3.041	2,955	2.756	2.753
R/CY	7.555	10.166	5.550	5,500	5.666	6.700
O/C	1.083	1.120	1.356	1,104	1.108	1
O/CY	2.888	5.000	2.475	2,055	2.277	2.433
C/CY	2.666	4.166	1.825	1,861	2.055	2.433

Dominancy of taxa depending upon on provinces is summarized in Table 3. In this table, R/O values are relatively close among all provinces and changes between 2,242 and 2,753. According to these data, it can be stated out that Turkish shores of Mediterranean is not polluted heavily.



**Figure 2.** Distribution of algae that new recorded for the Turkish coasts of Mediterranean. *Ceramium siliquosum* (Kützinger) Maggs & Hommersend

var. *zostericola* f. *zostericola* (a), *C. tenuicorne* (Kützing) Waern (b), *Bryopsis adriatica* (J. Agardh) Meneghini (c).

## Özet

Bu çalışmada, Adana (Türkiye Akdeniz kıyıları) kıyılarının üst infralittoral zonunda bulunan deniz algleri ve deniz çayırları çalışılmıştır. 381 alg ve 5 deniz çayırı (*Liliopsida*) tayin edilmiştir (toplam 386 takson). Bunların 27 tanesi Mavi-yeşil bakteriler (*Cyanophyceae*), 204 tanesi kırmızı algler [*Rhodellophyceae* (2), *Compsopogonophyceae* (2), *Bangiophyceae* (5), *Florideophyceae*(195)], 78 tanesi kahverengi algler (*Fucophyceae*), 72 tanesi yeşil alglerdir [*Chlorophyceae* (22), [*Chlorophyceae* (7), *Ulvophyceae* (18), *Trentepohliophyceae* (1), *Cladophorophyceae* (22) *Bryopsidophyceae* (22), *Dasycladophyceae* (2)]. Bunlardan *Ceramium siliquosum* (Kützing) Maggs & Hommersend var. *zostericola* f. *zostericola*, *C. tenuicorne* (Kützing) Waern (*Rhodophyceae*), *Bryopsis adriatica* (J. Agardh) Meneghini (*Bryopsidophyceae*) Türkiye Akdeniz Kıyıları için yeni kayıt olarak verilmişlerdir.

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