

Marine Flora of Kastamonu (Black Sea, Turkey)

Kastamonu Deniz Florası

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Abstract

In this research, marine algae and seagrasses in the upper infralittoral zone of the Black Sea, coast of Kastamonu, was investigated. A total of 259 algae and 3 seagrasses taxa were determined. These are the blue-green bacteria (22 taxa), red algae (133 taxa), the brown algae (56 taxa), the green algae (48 taxa) and the flowering plants (3 taxa). *Eupogodon planus*, *Spermothamnion repens* (*Rhodophyceae*), *Planophila microcystis* and *Stromatella monostromatica* (*Fucophyceae*) are new records for Black Sea and Turkish black sea shores.

Key words: Blue-green bacteria, red algae, brown algae, green algae, seagrasses, Kastamonu, Black Sea, Turkey.

Introduction

The earliest study on Turkish algae was performed by Buxbaum (1740), Tchichatcheff (1860), Sperk (1869) and Zernow (1913) (Zinova 1964). Additionally, Agardh (1851-1876), Fritsch (1899), Dratjuyan (1894-1895), Woronichin (1908a, b), Stockmayer (1909), Güven (1971), Zeybek (1973), Cirik & Cihangir (1987), Öztürk (1988), Altındağ (Cirik) (1990), Aysel & Erduğan (1995), Aysel *et al.* (1990, 1996, 1997, 1998, 2004, 2005 (in press), Özer & Köksal (1993), also Erduğan (1996), Erduğan *et al.* (2003), have performed floristic studies on Black sea coasts of Turkey

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Material and Methods

Collected specimens were fixed using 4 % formaldehyde for long term preservation. Specimens belonging to *Rhodomelaceae* and *Corallinaceae* were exceptionally treated with 10 % HCl because of their specific cell wall properties in identification procedures.

Kastamonu, having approximately 135 km. coast line in Black Sea, is situated between $32^{\circ} 43' 45''$ and $34^{\circ} 13' 31''$ eastern longitudes (Figure 1). The coastal zone is almost linear and has no deep innovations except Inebolu Harbour. Minimum marine temperature is 5°C (january-april) while maximum is $24,6^{\circ}\text{C}$ (August). Averaged temperature is $13,4^{\circ}\text{C}$ (Meteorology bulletin 1974).

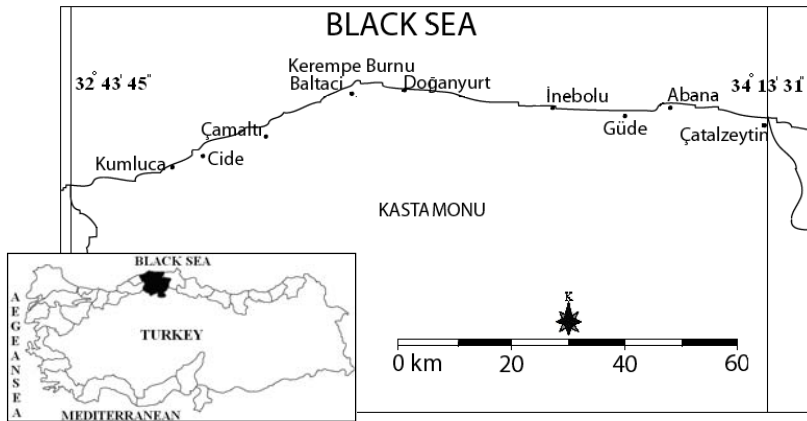


Figure 1: Map of the studied shores

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). 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 & Hommersand (1989) for *Gracilariales*, Bressan & Babbini-Benussi (1995, 1996) for *Corallinales*, Gomez Garreta *et al.*, (2001) for *Ceramiales*, Ribera *et al.*, (1992) for *Ochrophyta*, Gallardo *et al.* (1993) for *Chlorophyta* and Guiry & Dhoncha (2005)]. Additionally, the studies of Barbara & Cremades (1996), Ballantine & Aponte (1997) and Hardy & 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 Black Sea and Turkish shores of the Black Sea are indicated an asteriks (*).

Table 1. Taxa distributed on Kastomonu (black sea) coasts of Turkey

**CYANOPHYTA
(=CYANOBACTERIA)**

CYANOPHYCEAE

CHROOCOCCALES

CHROOCOCCACEAE

Chroococcus dimidiatus (Kützing)
Nägeli

DERMOCARPACEAE

Dermocarpa acervata (Setchell &
Gardner)
Pham Hoàng Hô
D. cladophorae (Tilden) P. C. Silva

MERISMOPEDIACEAE

GOMPHOSPHAERIOIDEA

Gomphosphaeria aponina Kützing
Microcystis halophila B. Martens &
Pankow
M. marina (Hansgrig) P.C. Silva

OSCILLATORIALES

OSCILLATORIACEAE

Lyngbya adriae Ercégovic
L. aestuarii (Mertens) Liebmann
L. confervoides C. Agardh *ex*
Gomont
L. majuscula (Dillwyn) Harvey *ex*
Gomont

PHORMIDIACEAE

PHORMIDIOIDEAE

Phormidium ambiguum Gomont
P. autumnale C. Agardh *ex* Gomont
P. breve (Kützing) Anagnostidis &
Komárek
var. *breve*
P. corallinae (Kützing) Anagnostidis
&
Komárek
Porphyrosiphon martensianus
(Meneghini *ex* Gomont)
Anagnostidis & Komárek

PSEUDOANABAENACEAE

Spirocoleus tenuis (Meneghini) P.C.
Silva

LEPTOLYNGBYOIDEAE

Planktolynghya subtilis (G.S. West)
Anagnostidis & Komárek

NOSTOCALES

RIVULARIACEAE

Calothrix aeruginea (Kützing)
Thuret
C. confervicola (Roth) C. Agardh *ex*
Bornet & Flahault
C. crustacea Thuret
C. scopulorum (Weber van Bosse &
Mohr) C. Agardh
Rivularia polyotis (J. Agardh)
Hauck

PLANTAE

BILIPHYTEA

RHODOPHYTA

RHODELLOPHYTINA

RHODELLOPHYCEAE

STYLONEMATALES

STYLONEMATAACEAE

Stylonema alsidii (Zanardini)
K. Drew
S. cornu-cervi (Reinsch) Hauck

COMPSOPOGONOPHYCEAE

ERYTHROPELTIDALES

ERYTHROTRICHIACEAE

Erythrotrichia carnea (Dillwyn) J.
Agardh
Sahlingia subintegra (Rosenvinge)
Kornmann

MACRORHODOPHYTINA

BANGIOPHYCEAE

BANGIOPHYCIDAE

GONIOTRICHALES

GONIOTRICHACEAE

Chroodactylon ornatum (C. Agardh)

Basson

BANGIALES

BANGIACEAE

Bangia atropurpurea (Roth) C. Agardh

Porphyra leucosticta Thuret in Le Jolis

f. *leucosticta*

P. minor Zanardini

P. umbilicalis (Linnaeus) Kützing

FLORIDEOPHYCIDAE

NEMALIOPHYCIDAE

ACROCHAETIALES

ACROCHAETIACEAE

Acrochaetium crassipes (Børgesen)

Børgesen

A. hallandicum (Kylín) G. Hamel

A. humile (Rosenvinge) Børgesen

A. leptonema (Rosenvinge) Børgesen

A. microscopicum (Nägeli) ex Kützing

Nägeli

A. moniliforme (Rosenvinge) Børgesen

A. parvulum (Kylín) Hoyt

A. rosulatum (Rosenvinge) Papenfuss

A. secundatum (Lyngbye) Nägeli

A. savianum (Meneghini) Nägeli

A. virgatulum (Harvey) Batters

COLACONEMATALES

COLACONEMATACEAE

Colaconema codicola (Børgesen),

H. Stegenka, J. J. Bolton &

R. J. Anderson

C. daviesii (Dillwyn) Stegenga

C. membranaceum (Magnus)

Woelkerling

NEMALIALES

LIAGORACEAE

Liagora viscida (Forsskål)

C. Agardh

NEMALIACEAE

Nemalion helminthoides (Velley)

Batters

RHODYMENIOPHYCIDAE

GELIDIALES

GELIDIACEAE

Gelidium corneum (Hudson)

J.V. Lamouroux

var. *pectinatum* Ardissonne & Strafforello

G. crinale (Turner) Gaillon

var. *crinale*

var. *corymbosum* (Kützing)

J. Feldmann et G. Hamel

G. pulchellum (Turner) Kützing

G. spathulatum (Kützing) Bornet

G. spinosum (S.G. Gmelin) P.C.

Silva

var. *spinosum*

var. *hystrix* (J. Agardh) Hauck

Pterocladia capillacea (S.G.

Gmelin) Santelices &

Hommersand

f. *capillacea*

f. *crinita* (Hauck) V. Aysel,

H. Erduğan, B. Dural-

Tarakçı, E. Ş. Okudan,

A. Şenkardesler, F. Aysel

P. melanoidea (Schousboe ex

Bornet) Santelices &

Hommersand

var. *melanoidea*

var. *flamentosa* (Schousboe)

V. Aysel, H. Erduğan,

B. Dural-Tarakçı, E. Ş.

Okudan,

A. Şenkardesler, F. Aysel

GELIDIELLACEAE

- Gelidiella nigrescens* (Feldmann)
Feldmann & G. Hamel
G. ramellosa (Kützing) Feldmann &
G.
Hamel
Parviphycus antipai (Celan) B.
Santelices

GRACILARIALES

GRACILARIACEAE

- Gracilaria dura* (C. Agardh) J.
Agardh
G. gracilis (Stackhouse) Steentoft,
L.M.
Irvine & Farnham
var. *gracilis*

CORALLINALES

CORALLINACEAE

AMPHIROIDEAE

- Amphiroa rigida* J.V. Lamouroux

CHOREONEMATOIDEAE

- Choreonema thuretii* (Bornet) F.
Schmitz

CORALLINOIDEAE

CORALLINEAE

- Corallina elongata* Ellis & Solander
C. officinalis Linnaeus

JANIEAE

- Haliptilon virgatum* (Zanardini)
Garbary &
H.W. Johansen
Jania rubens (Linne) J.V. Lamouroux
var. *rubens*
var. *corniculata* (Linnaeus) Yendo

MASTOPHOROIDEAE

- Hydrolithon farinosum* (J.V.
Lamouroux)
D. Penrose & Y.M. Chamberlain
var. *farinosum*

- Pneophyllum confervicola* (Kützing)
Y.M. Chamberlain

LITHOPHYLLOIDEAE

- Lithophyllum corallinae*
(P.L. Crouan & H.M. Crouan)
Heydrich
L. cystoseirae (Hauck)
Heydrich
L. orbiculatum (Foslie) Foslie
Titanoderma pustulatum (J.V.
Lamouroux) Nägeli

MELOBESIOIDEAE

- Melobesia membranacea* (Esper)
J.V. Lamouroux
Phymatolithon lenormandii (J.E.
Areschoug) W.H. Adey

GIGARTINALES

HYPNEACEAE

- Hypnea musciformis* (Wulfen in
Jaquin) J.V. Lamouroux

PEYSSONELICEAE

- Peyssonnelia rosamarina*
Boudouresque & Denizot
P. rubra (Greville) J. Agardh
P. squamaria (S.G. Gmelin)
Decaisne

PHYLLOPHORACEAE

- Coccotylus truncatus* (Pallas) M.J.
Wynne & J.N. Heine
f. *truncatus*
Gymnogongrus griffithsiae (Turner)
C.F.P. Martius
Phyllophora crispa (Hudson) P.S.
Dixon
f. *crispa*
P. pseudoceranoïdes (S.G. Gmelin)
Newroth & A.R.A. Taylor

RHODYMENIALES

RHODYMENIACEAE

Chrysymenia ventricosa (Lamour)

J. Ag.

CHAMPIACEAE

Chylocladia verticillata (Lightfoot)

Bliding

LOMENTARIACEAE

Lomentaria articulata (Hudson)

Lyngbye

var. *articulata*

L. clavellosa (Turner) Gaillon

HALYMENIALES

GRATELOUPIACEAE

[=**HALYMENIACEAE**]

Grateloupia dichotoma J. Agardh

CERAMIALES

CERAMIACEAE

CALLITHAMNIOIDEAE

CALLITHAMNIEAE

Callithamnion corymbosum (Smith)

Lyngbye

C. granulatum (Ducluzeau) C. Agardh

Seirospora graudyi (Kützing) De Toni

CERAMOIDEAE

ANTITHAMNIEAE

Antithamnion cruciatum (C. Agardh)

Nägeli

var. *cruciatum*

A. heterocladum Funk

A. tenuissimum (Hauck) Schiffner

CERAMIEAE

Ceramium arborescens J. Agardh

C. ciliatum (Ellis) Ducluzeau

var. *ciliatum*

var. *robustum* (J. Agardh)

G. Mazoyer

C. circinatum (Kützing) J. Agardh

C. codii (H. W. Richards) Feldmann-

Mazoyer

C. deslongchampsii Chauvin ex Duby

C. gaditanum (Clemente) Cremades

var. *gaditanum*

C. rubrum auctorum

var. *rubrum*

var. *implexo-concortum* Solier

C. secundatum Lyngbye

C. siliquosum (Kützing) Maggs &

Hommersend

var. *siliquosum*

var. *elegans* (Roth) G. Furnari

var. *lophophorum* (G. Feldmann

-Mazoyer) Serio

var. *zostericola* (Feldmann-

Mazoyer) G. Furnari

f. *zostericola*

f. *minusculum* (Feldmann

-Mazoyer) A. Gomez

Garreta, T. Gallardo,

M.A. Ribera, M.

Cormaci, G. Furnari,

G. Giaccone and

C.F. Boudouresque

C. tenerrimum (Martens) Okamura

var. *tenerrimum*

var. *brevizonatum* (Peterson)

G. Feldmann-Mazoyer

PTEROTHAMNIEAE

Pterothamnion plumula (Ellis)

Nägeli

subsp. *plumula*

COMPSOTHAMNIOIDEAE

COMPSOTHAMNIEAE

Compsothamnion thuyoides (J.E.

Smith) F. Schmitz

SPERMOTHAMNIEAE

Spermothamnion flabellatum Bornet

**S. repens* (Dillwyn) Rosenvinge

var. *repens*

DASYACEAE*Dasya baillouviana* (S.G. Gmelin)

Montagne

var. *baillouviana**D. corymbifera* J. Agardh*D. hutchinsiae* Harvey in

J.W. Hooker

D. ocellata (Grateloup) Harvey**Eupogodon planus* (C. Agardh)

Kützing

Heterosiphonia plumosa (Ellis)

Batters

DELESSERIACEAE**DELESSERIOIDEAE****APOGLOSSEAE***Apoglossum ruscifolium* (Turner) J.

Agardh

NITOPHYLLOIDEAE**NITOPHYLLEAE***Nitophyllum punctatum* (Stackhouse)

Greville

var. *punctatum***RHODOMELACEAE****CHONDRIEAE***Chondria capillaris* (Hudson) Wynnevar. *capillaris*var. *patens* (Schiffner) V. Aysel,

H. Erduğan, E.Ş. Okudan, H. Erk

C. dasyphylla (Woodward) C.

Agardh

LAURENCIEAE*Chondrophyucus paniculatus* (C. Agardh)

G. Furnari

C. papillosus (C. Agardh) Garbary &

J. Harper

Laurencia obtusa (Huds.) J.V.

Lamouroux

var. *obtusa*var. *gracilis* (Kützing) Hauckvar. *laxa* (Kützing) Ardissonne*Osmundea pinnatifida* (Hudson)

Stackhouse

POLYSIPHONIEAE*Alsidium corallinum* C. Agardh*Herposiphonia secunda* (C. Agardh)

Ambronn

f. *secunda*f. *tenella* (C. Agardh) Wynne*Lophosiphonia obscura* (C. Agardh)

Falkenberg

L. subadunca (Kützing) Falkenberg*Neosiphonia elongella* (harvey)

M.S. Kim & I.K. Lee

Polysiphonia biasoletiana J. Ag.*P. breviarticulata* (C. Ag.) Zanardini*P. brodiei* (Dillwyn) Sprengel*P. denudata* (Dillwyn) Greville*P. elongata* (Hudson) Harvey in

Hooker

P. fucoides (Hudson) Greville*P. opaca* (C. Agardh) Zanardini*P. paniculata* Montagne*P. sertularioides* (Grateloup)

J. Agardh

P. tenerrima Kützing*P. tripinnata* J. Ag.*P. variegata* (C. Agardh) Zanardini**POLYZONIEAE***Dipterosiphonia rigens* (Shousboei)

Falkenberg

PTEROSIPHONIEAE*Pterosiphonia pennata* (Roth)

Falkenberg

CHROMISTA**HETEROKONTA****OCHROPHYTA**

[=HETEROKONTOPHYTA

FUCOPHYCEAE

[=PHAEOPHYCEAE,

PHAEOZOOSPOROPHYCEAE]**ECTOCARPALES****ECTOCARPACEAE**

Acinetospora crinita (Carmichael ex Harvey) Sauvageau
Ectocarpus siliculosus (Dillwyn) Lyngbye
var. *siliculosus*
var. *arctus* (Kützing) Gallardo
var. *dasycarpus* (Kuckuck) Gallardo
var. *hiemalis* (P.L. Crouan ex Kjellman) Gallardo
var. *penicillatus* C. Agardh
Feldmannia caespitula (J. Agardh) Knoepffler-Péguy
var. *caespitula*
var. *lebelii* (Areschoug ex P.L. Crouan) Knoepffler-Péguy
F. irregularis (Kützing) G. Hamel
F. padinae (Buffham) Hamel
Hincksia sandriana (Zanardini) P.C. Silva
Kuetzingiella battersii (Bornet ex Sauvageau) Kornmann
Microsyphe polysiphoniae Kuckuck
Streblonema sphaericum (Derbès & Solier) Thuret

CHORDARIALES

MYRIONEMATACEAE

Ascocyclus orbicularis (J. Agardh) Kjellman
Myrionema strangulans Greville

ELACHISTACEAE

Halothrix lumbricalis (Kützing) Reinke

CORYNOPHLAEACEAE

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

SPERMATOCYNACEAE

Stilophora nodulosa (C. Agardh) P.C. Silva
S. tenella (Esper) P.C. Silva

CHORDARIACEAE

Eudesme virescens (Carmichael ex Berkeley) J. Agardh
Litosiphon laminariae (Lyngbye) Harvey

CUTLERIALES

CUTLERIACEAE

Zanardinia prototypus Nardo

SPHACELARIALES

SPHACELARIACEAE

Sphacelaria cirrosa (Roth) C. Agardh
var. *cirrosa*
var. *mediterranea* Sauvageau

STYPOCAULACEAE

Halopteris filicina (Grateloup) Kützing
H. scoparia Linnaeus Sauvageau

CLADOSTEPHACEAE

Cladostephus spongiosus (Hudson) C. Agardh
f. *spongiosus*
f. *verticillatus* (Lightfoot) Prod'homme van Reine

DICTYOTALES

DICTYOTACEAE

Dictyopteris polypodioides (A.P. de Candolle) J.V. Lamouroux
Dictyota fasciola (Roth) J.V. Lamouroux
var. *fasciola*
var. *repens* (J. Agardh) Ardissonne
D. linearis (C. Agardh) Greville
f. *linearis*

D. menstrualis (Hoyt) Schnetter,
Hornig & Weber-Peukert
var. *menstrualis*
Padina pavonica (Linnaeus) Thivy

DICTYOSIPHONALES

MYRIOTRICHACEAE

Myriotrichia clavaeformis Harvey

GIRAUDIACEAE

Giraudia sphacelarioides Derbès &
Solier

STRIARIACEAE

Striaria attenuata (Greville),
Greville
f. *attenuata*

ASPEROCOCCACEAE

Asperococcus bullosus Lamouroux
f. *bullosus*
A. ensiformis (Delle Chiaje) M.J.
Wynne
A. fistulosus (Hudson) Hooker

PUNCTARIACEAE

Punctaria plantaginea (Roth)
Greville

SCYTOSIPHONALES

SCYTOSIPHONACEAE

Petalonia zosterifolia (Reinke) O.
Kuntze
Scytosiphon simplicissimus
(Clemente)
Cremades
var. *simplicissimus*

FUCALES

CYTOSEIRACEAE

Cystoseira barbata (Stackhouse) C.
Agardh
var. *barbata*
f. *aurantia* (Kützing) Giaccone
C. compressa (Esper) Gerloff &
Nizamuddin

f. *compressa*
C. corniculata (Turner) Zanardini
var. *corniculata*
C. crinita (Desfontaines) Bory
f. *crinita*
f. *bosporica* (Sauvageau.) Zinova
&
Kalugina
C. foeniculacea (Linnaeus) Greville

SARGASSACEAE

Sargassum acinarum (Linnaeus)
Setchell
S. hornschuchi C. Agardh
S. vulgare C. Agardh
var. *vulgare*

CHLOROPHYTA

CHLOROPHYCEAE

PHAEOPHILALES

PHAEOPHILACEAE

Phaeophila dendroides (P. L.
Crouan & H. M. Crouan)
Batters

CHAETOPHORALES

CHAETOPHORACEAE

Bolbocoleon piliferum Pringsheim
Entocladia viridis Reinke
Pringsheimiella scutata (Reinke)
Höhnelt ex Marchewianka
**Stromatella monostromatica* (P.
Dangeard) Kornmann & Sahling

ULVOPHYCEAE

ULOTRICHALES

BORODINELLACEAE

**Planophila microcystis* (P.
Dangeard) Kornmann & Sahling

ULOTRICHACEAE

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

ULVALES

ULVELLACEAE

Ulva lens P. L. Crouan &
H. M. Crouan

ULVACEAE

Blidingia marginata (J. Agardh)
P. Dangeard *ex* Bliding
B. minima (Nägeli *ex* Kützing) Kylin
var. *minima*
Enteromorpha ahleriana Bliding
nom. *illeg*
E. 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* Schiffneri
E. muscoides (Clemente) Cremades
E. prolifera (O.F. Müller) J. Agardh
subsp. *prolifera*
Ulva fasciata Delile
U. fenestrata Postels & Ruprecht
U. rigida C. Agardh
f. *rigida*

CLADOPHOROPHYCEAE

CLADOPHORALES

CLADOPHORACEAE Wille

Chaetomorpha aerea (Dillwyn)
Kützing
C. linum (O.F. Müller) Kützing
Cladophora albida (Nees) Kützing
C. flexuosa (O.F. Möller) Kützing
C. fracta (O.F. Müller *ex* Vahl)
Kützing
C. glomerata (Linnaeus) Kützing
var. *glomerata*
var. *marina* Lyngbye

C. hutchinsiae (Dillwyn) Kützing
C. laetevirens (Dillwyn) Kützing
C. lehmanniana (Lindenberg)
Kützing
C. pellucida (Hudson) Kützing
f. *pellucida*
C. prolifera (Roth) Kützing
C. sericea (Hudson) Kützing
C. trichotoma (C. Agardh) Kützing
Rhizoclonium riparium (Roth)
Harvey
R. implexum (Dillwyn) Kützing
R. tortuosum (Dillwyn) Kützing

BRYOPSISIDOPHYCEAE

BRYOPSISDALES Schaffner

BRYOPSISIDACEAE Bory

Bryopsis corymbosa J. Agardh
B. flagellata Kützing
B. hypnoides J.V. Lamouroux
var. *hypnoides*
B. plumosa (Hudson) C. Agardh

CODIALES

CODIACEAE Kützing

Codium tomentosum Stackhouse

MAGNOLIOPHYTA

LILIOPSIDA

ALISMATIDAE

POTAMOGETONALES

CYMODOCEACEAE

Cymodocea nodosa (Ucria)
Ascherson

ZOSTERACEAE

Zostera marina Linnaeus
Z. noltii Homermann

Discussion

In the present study, 262 taxa as Magnoliophyta (3), *Chlorophyta* (48), Ochrophyta (56), *Rhodophyta* (133) and *Cyanophyta* (22) have been found.

A comparison is made for the number of algae species between Kastamonu and remaining provinces of the region is presented in Table 2.

As seen in table 2, the species of *Cyanophyta* is relatively lower in the provinces such as Trabzon, Rize and Artvin than the other provinces of the area having almost equal number of species (*Cyanophyta*) possibly as a result of ignorance this group by previous researchers.

Table 2. A comparison, in terms of number of algae species between Kastamonu and remaining provinces of the region (KS: Kastamonu, KR: Kırklareli, KSD: Kocaeli, Sakarya, Düzce, ZN: Zonguldak, BR: Bartın, SN: Sinop, SM: Samsun OR: Ordu, TR: Trabzon, RA: Rize, Artvin).

Division	Studied Stations of Turkish Black Sea Shores									
	KS	KR	KSD	ZN	BR	SN	SM	OR	TR	RA
<i>Cyanophyta</i> (Cy)	22	23	30	20	12	22	20	14	1	3
<i>Rhodophyta</i> (R)	133	71	126	100	116	136	106	93	23	43
<i>Ochrophyta</i> (O)	56	24	50	42	43	52	27	27	8	15
<i>Chlorophyta</i> (C)	48	30	46	43	39	55	22	26	23	27
<i>Magnoliophyta</i>	3	3	3	3	3	3	3	4	3	3
Total	262	151	255	208	213	268	178	164	58	91

Phycologically, Kastamonu, is one of the richest province of northeastern Turkey compared with the other cities of Black Sea.

Species of *Cystoseira*, *Sargassum* and *Stilophora* are the most encountered algae along sea shore . *Acrochaetium parvulum*, *Callithamnion corymbosum*, *Ceramium siliquosum* var. *siliquosum*, *Dasya ocellata*, *Herposiphonia secunda* f. *secunda*, *Laurencia obtusa*

var. *obtusa*, *Polysiphonia elongata*, *P. sertularioides* (Rhodophyta), *Ectocarpus siliculosus* var. *siliculosus*, *Feldmannia irregularis* (Ochrophyta), *Blidingia marginata*, *Enteromorpha linza* var. *linza*, *E. prolifera* subsp. *prolifera*, *Ulva rigida* f. *rigida* and *Cladophora albida* (Chlorophyta) are common of the area.

As seen in Table 3, number of *Cyanophyta* species is low in Artvin, Rize and Trabzon provinces. These taxa prefer asidic habitats and it means that Black Sea region of Turkey has no dangerous problem regarding asidification of sea water. *Rhodophyta* is represented three times more than *Chlorophyta* and *Ochrophyta* in all provinces.

While common taxa of the seagrasses *Zostera* and *Cymodocea* are also found in Kastamonu shores, some algae, such as taxa of *Polysiphonia*, *Ceramium*, *Ectocarpus*, *Enteromorpha* and *Cladophora* are common.

Dominancy of taxa in the provinces are summarized in table 3. In this table, R/O values are relatively close among all the provinces varying between 2,37 and 3,44. According to the data, it can be stated that Turkish shores of Black Sea are not polluted heavily.

Table 3. Dominancy in division level among northeastern provinces of Turkey

Division	Dominancy in division level from the Black Sea Shores of Turkey									
	KS	KR	KSD	ZN	BR	SN	SM	OR	TR	RA
R/O	2,37	3	2,52	2,4	2,7	2,60	3,92	3,44	2,9	2,9
R/C	2,77	3,7	2,73	2,3	3	2,50	4,81	3,58	1	1,6
R/CY	6,04	3,1	4,2	5	9,7	6,50	4,3	6,64	23	14,3
O/C	1,16	0,8	1,08	1	1,1	0,96	1,22	1,04	0,3	0,6
O/CY	2,54	1	1,66	2,1	3,6	2,50	1,35	1,93	8	5
C/CY	2,18	1,3	1,53	2,2	3,3	2,59	1,1	1,86	23	9

Eupogodon planus, *Spermothamnion repens*, *Planophila microcystis* and *Stromatella monostromatica* are new records for Black Sea and Turkish black sea shores.

Özet

Bu arařtırmada, Kastamonu (Karadeniz) kıyılarının üst infralittoralinde yayılıř gösteren deniz algleri ve deniz ayırları alıřılmıřtır. Toplam 262 takson tayin edilmiřtir. Bunlar Mavi-yeřil bakteriler (22 takson), kırmızı algler (133 takson), kahverengi algler (56 takson), yeřil algler (48 takson) ve iekli bitkilerdir (3 takson). *Eupogodon planus*, *Spermothamnion repens* (Rhodophyceae), *Planophila microcystis* ve *Stromatella monostromatica* (Fucophyceae) Karadeniz ve Trkiye Karadeniz kıyıları iin yeni kayıttır.

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Received: 15.12.2004

Accepted: 29.12.2004