

## Checklist of the Marine Macroalgae of Algerian West Coast (Ain Témouchent site)

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Macroalgae are very abundant organisms in the Algerian coastal zone and not well-known on the west coast of Algeria. The research aimed to identify marine macroalgae in Ain Témouchent littoral (northwest Algeria). A checklist of macroalgae, based on new collections, is given. Using present-day taxonomy, sampling species of macroalgae have been identified to date. The results showed that 32 marine macroalgae were found and identified. They are divided into 3 taxa: Chlorophyta (4 orders, 5 families, 7 genera, 8 species), Ochrophyta (4 orders, 4 families, 6 genera, 8 species) and Rhodophyta (9 orders, 11 families, 13 genera, and 16 species). Some species are remarkable for their endemism and their character as indicators of disturbance of the marine environment, and others of its good quality, excellent protection, and preservation. We annotated the presence of the *Cystoseira stricta*, which is reliable indicator of a healthy marine environment. We concluded that the invasive species are rarely present in this area.

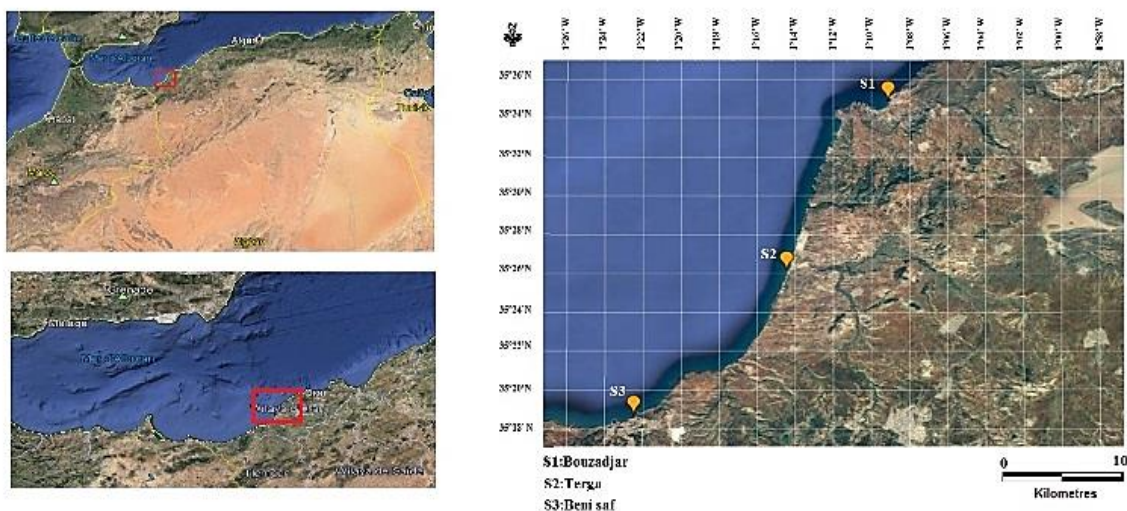
**Keywords:** Macroalgae, checklist, marine environment, invasive species, Ain Temouchent, Algerian coastal zone.

### Introduction

The macroalgae are essential elements in the food chain of marine and coastal ecosystems. Generally, the aquatic macroalgae are not well-known on the west coast of Algeria (Traiche etnd al., 2018). Most of the inventories conducted in the benthic flora of the continental shelf of the west coast of Algeria have not been updated (Bentallah and Kerfouf, 2013; Borsali et al., 2020). The absence of synthesis work led us to consider the census and update the checklist of marine macroalgae presented in Ain Temouchent littoral on the west coast of Algeria (Ballesteros et al., 2007).

### Materials and methods

Three stations (Bouzedjar, Terga, and Beni Saf) are chosen according to the state of the coastal ecosystem, whether or not it is subject to anthropogenic pressure due to urban, industrial, and port activities (Fig. 1).



**Fig. 1.** The geographical location of the studied area.

These coastal zones concentrate numerous resources, and they are exposed to the pollutions and other deteriorations resulting from the development of multiple socio-economic activities: urbanization, desalination unit, touristic complex (Remili & Kerfouf, 2013, Kies & Kerfouf, 2014). Marine hydrology of this study area is characterized by turbulent circulation along the coast, which supports the dispersion of possible sources of pollution and enriched the entire chain food surface (Millot, 1989; Ghodbani & Bougheira, 2019; Kies et al., 2020). The marine algae were isolated, and each of its individuals was identified according to several determination keys, such as Boudouresque & Seridi (1989), Birje et al. (1996), Cabioc'h et al. (2006), Fischer et al. (2007), Ramdani et al. (2015), and AlgaeBase (Global Algal Database of Taxonomic, Nomenclatural and Distributional Information).

## Results and discussion

The sampling campaign made it possible to inventory macroalgae of Ain Témouchent littoral (western Algerian coast). Thirty-two species were harvested. They are divided into three taxa: Chlorophyta, Ochrophyta, and Rhodophyta:

### 1. Chlorophyta (4 order / 5 families / 7 genera / 8 species),

#### 1.1. Class: Ulvophyceae

**Order:** Ulvales

**Family:** Ulvaceae

**Genus:** Ulvaria

**Species:** *Ulvaria obscura* (Gayral ex Bliding, 1969).

**Genus:** Ulva

**Species:** *Ulva lactuca* (Linnaeus.C. 1753).

**Genus:** Ulva

**Species:** *Ulva rigida* (C. Agardh, 1823).

**Genus:** Enteromorpha

**Species:** *Enteromorpha intestinalis* (Linnaeus) Nees 1820.

**Order:** Bryopsidales

**Family:** Codiaceae

**Genus:** Codium

**Species:** *Codium decorticatum* (M. A. Howe, 1911)

**Order:** Cladophorales

**Family:** Cladophoraceae

**Genus:** Cladophora

**Species:** *Cladophora laetevirens* (Dillwyn Kützting, 1843).

**Family:** Caulerpaceae

**Genus:** Caulerpa

**Species:** *Caulerpa racemosa* (Forsskal) J. Agardh 1873.

**Order:** Ulotrichales

**Family:** Ulotrichaceae

**Genus:** Spongomorpha

**Species:** *Spongomorpha aeruginosa* (Linnaeus) Hoek 1963.

### 2. Ochrophyta (4 order / 4 family / 6 genus / 8 species)

#### 2.1. Class: Phaeophyceae

**Order:** Sphacelariales

**Family:** Stygocaulaceae

**Genus:** Halopteris

**Species:** *Halopteris scoparia* (Linnaeus) Sauvageau, 1904.

**Species:** *Halopteris filicina* (Grateloup) Kützting 1843.

**Order:** Dictyotales

**Family:** Dictyotaceae

**Genus:** Dictyota

**Species:** *Dictyota dichotoma* (Hudson) J.V. Lamouroux 1809.

**Genus:** Padina

**Species:** *Padina pavonica* (Linnaeus) Thivy 1960.

**Order:** Fucales

**Family:** Sargassaceae

**Genus:** Cytoseira

**Species:** *Cytoseira compressa* (Esper) Gerloff, Nizamuddin 1975.

**Species:** *Cytoseira stricta* (Carl Von Linné, 1758).

**Genus:** Sargassum

**Species:** *Sargassum muticum* (Yendo) Fensholt 1955.

**Order:** Ectocarpales

**Family:** Scytosiphonaceae

**Genus:** Colpomenia

**Species:** *Colpomenia sinuosa* (Mertens ex Roth) Derbès & Solier 1851.

### 3. Rhodophyta (9 order / 11 family / 13 genus /16 species)

#### 3.1. Class: Florideophyceae

**Order:** Ceramiales

**Family:** Rhodomelaceae

**Genus:** Halopitys

**Species:** *Halopitys incurvus* (Hudson) Batters 1902.

**Genus:** Osmundea

**Species:** *Osmundea osmunda* (K.W.Nam & Maggs, 1994).

**Species :** *Osmundea pinnatifida* (Hudson) Stackhouse 1809. !!

**Order:** Ahnfeltiales

**Family:** Ahnfeltiaceae

**Genus:** Ahnfeltia

**Species:** *Ahnfeltia plicata* (Hudson) E.M.Fries 1836.

**Order:** Gigartinales

**Family:** Gigartinaceae

**Genus:** Chondracanthus

**Species:** *Chondracanthus acicularis* (Roth) Fredericq 1993

**Family:** Phylloporaceae

**Genus:** Phyllophora

**Species:** *Phyllophora crista* (Hudson) P.S Dixon 1964.

**Family:** Cystocloniaceae

**Genus:** Hypnea

**Species:** *Hypnea spinella* (C.Agardh) 1847.

**Species:** *Hypnea musciformis* (Wulfen) J.V. Lamouroux 1813.

**Order:** Corallinales

**Family:** Corallinaceae

**Genus:** Corallina

**Species:** *Corallina elongata* (Ellis & Solander, 1786).

**Species:** *Corallina granifera* (J.Ellis & Solander, 1786).

**Order:** Peyssonneliales

**Family:** Peyssonneliaceae

**Genus:** Peyssonnelia

**Species:** *Peyssonnelia squamaria* (S.G.Gmelin) Decaisne ex J.Agardh 1842.

**Order:** Gélidiales

**Family:** Pterocladaceae

**Genus:** Pterocladia

**Species:** *Pterocladia capillacea* (S.G.Gmelin) Bornet 1876.

**Order:** Bonnemaisoniales

**Family:** Bonnemaisoniaceae

**Genus:** Asparagopsis

**Species:** *Asparagopsis armata* (Harvey, 1855).

**Genus:** Falkenbergia

**Species:** *Falkenbergia rufolansa* (Harvey) F.Schmitz 1897.

**Order:** Rhodymeniales

**Family:** Faucheaceae

**Genus:** Gloioclada

**Species:** *Gloioclada repens* (C.Agardh) N.Sanchez &Rodriguez-Prieto 2007.

**Order:** Plocamiales

**Family:** Plocamiaceae

**Genus:** Plocamium

**Species:** *Plocamium cartilagineum* (Linnaeus) P.S Dixon 1967.

## Discussion and Conclusion

We found that the variation in the average recovery rate of species over the four seasons does not obey a specific rule, as it is still influenced by several biotic and abiotic factors, which was also reported by Rodriguez-Prieto & Polo (1996). We suggested that the presence of a Pheophyceae at all stations could indicate the good environmental condition with presence of *Cystoseria stricta* (Ramdani et al., 2020), and *Caulerpa racemosa*, which is not widely represented in this area (Boudouresque et al., 2002; Bachir et al., 2010). The augmentation of the pollution flows bonded to the urban development of the last years and the growing economic activities, will lead to time disturbances on the phytobenthic community in quantitative and qualitative domains, which was mentioned by Bachir (2012). We believed that our study should be continued over several annual cycles to understand the evolution of intertidal macroalgae better.

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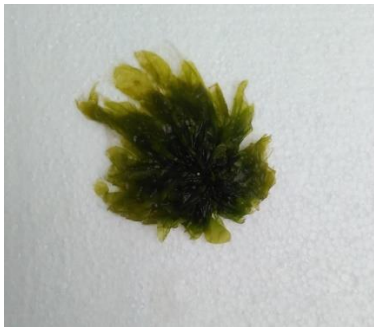
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*Ulvaria obscura*



*Ulva rigida*



*Codium decorticatum*



*Enteromorpha intestinalis*



*Cladophora laetevirens*



*Spongomorpha aeruginosa*



*Ulva lactuca*



*Caulerpa racemosa*

**Photo board 1**  
(*Chlorophyta*) (© Hellal, 2021)



*Halopteris scoparia*



*Cystoseira stricta*



*Halopteris Filicina*



*Padina pavonica*



*Dictyota dichotoma*



*Sargassum muticum*



*Cytoseira compressa*



*Colpomenia sinuosa*

**Photo board 2**  
(Ochrophyta) (© Hellal, 2021)



*Halopitys incurvus*



*Peyssonnelia squamaria*



*Hypnea musciformis*



*Coralina elongata*



*Phyllophora crispera*



*Osmundea osmunda*



*Ahnfeltia plicata*



*Corallina granifera*



*Pterocladia capillacea*



*Chondracanthus acicularis*



*Osmundea pinnatifida*



*Falkenbergia rufolansa*



*Asparagopsis armata*



*Gloiocladia repens*



*Hypnea spinella*



*Plocamium cartilagineum*

**Photo board 3**  
(Rhodophyta) (© Hellal, 2021)