

A Check-List of Marine Seaweeds of the Mediterranean and Atlantic Coasts of Morocco.

I. Chlorophyceae Wille *s. l.*

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A check-list of Moroccan marine Chlorophyceae, based on both literature records and some original data, is given. The distribution of each taxon for this region (13 Mediterranean and 25 Atlantic localities) is reported. Using present-day taxonomy, 102 species, infraspecific taxa and stadia are accepted for the Moroccan coasts. A new combination is proposed: *Blidingia tuberculosa* (P. Dangeard) Benhissoune, Boudouresque *et* Verlaque.

Introduction

Several attempts have been made to produce a check-list of Moroccan marine seaweeds. Some of these are blatantly out-of-date (*e. g.* Bornet 1892, Debray 1897, Gattefossé and Werner 1935, Gayral 1961 b). Others only concern the Mediterranean coast (Navarro and Gallardo 1989, Gallardo *et al.* 1993, González-García and Conde-Poyales 1994), while the recent check-list of Riadi and Kazzaz (1998) appears to be incomplete and uncritical.

If biogeographical comparisons are to be made between Moroccan provinces as well as between Morocco and neighboring countries, on the basis of recent check-lists (*e. g.* South and Tittley 1986, Lawson and John 1987, Burrows 1991 and Gallardo *et al.* 1993), an updated and critical check-list needs to be drawn up.

The present paper is part of a check-list intended to be a catalogue of benthic pluricellular algae of the Moroccan coasts, including only the Chlorophyceae *s. l.*, Fucophyceae (Phaeophyceae) and Rhodophyta. This first part comprises the marine Chlorophyceae *s. l.*

Materials and Methods

In this paper, the Moroccan coasts correspond to geographical Morocco, *i. e.* they include the Spanish territories of Ceuta, Melilla and the Chafarinas Islands. We have considered 38 localities (Fig. 1), of which 13 are in the Mediterranean Sea (M; from East to West: Saaïdia, Chafarinas Islands, Nador, Melilla, Al Hoceïma, Jabha, Tamernoute, M'diq, Cabo-Negro, Tetouan, Ceuta, Ksar-Sghir, Oued Lao) and 25 are found along the Atlantic coast (A; from North to South: Tanger (Tangiers), Azila, Larache, Salé, Rabat, El Harhoura, Temara, Sable d'Or, Moham-

media, Casablanca, El Jadida, Oualidia, Safi, Djorf-el-Yhoudi, Sidi Boulbra, Essaouira, Cap Ghir, Agadir, Tifnit, Aglou, Mirleft, Sidi Ifni, Tan-Tan, Moroccan Sahara and Cap Blanc). The toponymy is that of the MARCUS map (1/1400000) edited in 1980 by the National Topographical Center of Morocco.

The accepted name of a taxon is followed (between square brackets) by the basionym, by other synonyms used by various authors and, in a few cases, by a synonym of very common utilization although not usually cited by authors. Taxa not validly described are taken in consideration in the check-list when we consider them good species, whereas they are included in *taxa inquirenda* in the reverse case. Incompletely determined taxa were not taken into account. The taxa (genera and species) are arranged alphabetically. When infraspecific taxa are listed, the autonym, if present, is cited first. Delineation of the orders follows that used by Silva *et al.* (1996). For each taxon and each locality, the numbers between brackets refer to the references. A question mark after the reference number signifies that the taxon was mentioned with doubt; '*' means that the taxon was collected by one of the authors of the present study (S. B.).

Results

The present check-list encompasses 102 items (species, infraspecific taxa and stadia). A new combination is proposed: *Blidingia tuberculosa* (P. Dangeard) Benhissoune, Boudouresque *et* Verlaque. A number of taxa (6) are listed here, despite the fact that they do not appear to be validly described. In addition, 5 taxa are considered as *taxa excludenda* and 17 as *taxa inquirenda*.

Check-List of Chlorophyceae

Ctenocladales

Entocladia viridis Reinke [= *Phaeophila viridis* (Reinke) Burrows, *Acrochaete viridis* (Reinke) R. Nielsen, *Endoderma viride* (Reinke) De Toni]. **M:** Nador (55), Melilla (55), Al Hoceima (55). **A:** Mohammedia (2, *), cosmopolitan (21).

Pringsheimiella scutata (Reinke) Höhnelt *ex* Marchewianka [= *Pringsheimia scutata* Reinke]. **M:** Chafarinas Islands (55), Nador (55), Melilla (55), Al Hoceima (55). **A:** Agadir (21).

Pseudopringsheimia confluens (Rosenvinge) Wille [= *Ulvella confluens* Rosenvinge]. **M:** Chafarinas Islands (55, 71), without locality (33).

Ulvella lens P. L. Crouan *et* H. M. Crouan. **A:** Temara (2), Mohammedia (2).

Ulvella setchellii P. Dangeard. **A:** Temara (2), Sables d'Or (2), Mohammedia (2), Casablanca (21, 90), El Jadida (21), Essaouira (90), without locality (20).

Ulotrichales

Ulothrix flacca (Dillwyn) Thuret [= *Conferva flacca* Dillwyn, *Ulothrix pseudoflacca* Wille]. **M:** Cabo-Negro (71), Tetouan (55, 71), without locality (33). **A:** El Harhoura (17), Temara (2), Sables d'Or (2, *), Mohammedia (2, *), Casablanca (21).

Ulothrix implexa (Kützing) Kützing¹ [= *Hormidium implexum* Kützing, *Hormiscia implexa* (Kützing) Rabenhorst]. **M:** Saaidia (*), Nador (*), M'diq (*).

Ulothrix oscillatoroides (C. Agardh) Trevisan [= *Conferva oscillatoroides* C. Agardh, *Ulothrix oscillatorina* Kützing]. **A:** Tanger (10, 28, 36).

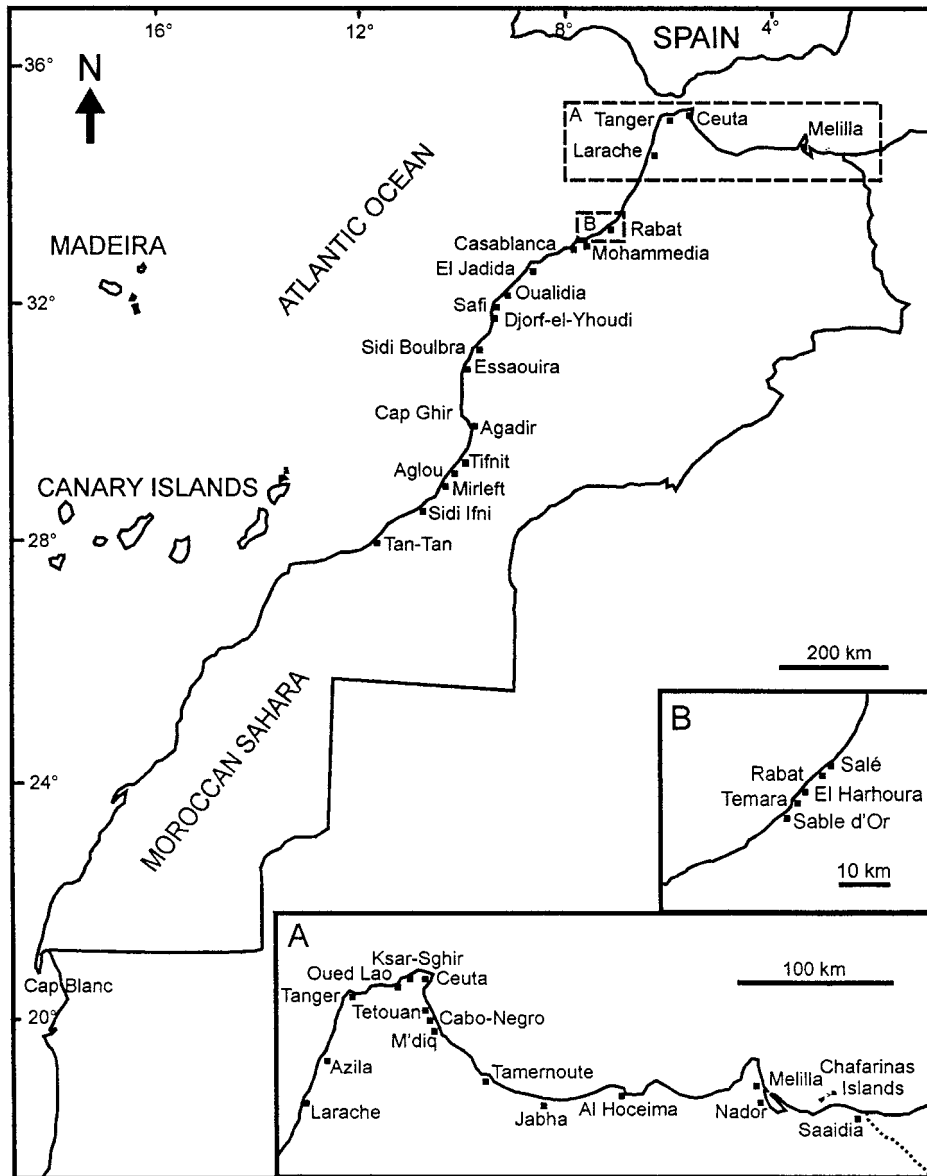


Fig. 1. Map of Moroccan localities.

Ulothrix subflaccida Wille¹. M: Saaidia (*), Al Hoceima (55), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (55, *), Ksar-Sghir (*). A: Tanger (*), Temara (*), Sables d'Or (*), El Jadida (*), Oualidia (*), Essaouira (*), Tifnit (*), Mirleft (*), Sidi Ifni (*), Tan-Tan (*).

Ulothrix zonata (Weber et Mohr) Kützing² [= *Conferva zonata* Weber et Mohr]. A: Tanger (36).

Phaeophilales

Phaeophila dendroides (P. L. Crouan et H. M. Crouan) Batters [= *Ochlochaete dendroides* P. L. Crouan et H. M. Crouan]. M: Nador (55), Al Hoceima (55).

Ulvales

Blidingia marginata (J. Agardh) P. Dangeard ex Bliding [= *Enteromorpha marginata* J. Agardh]. M: Saaidia (*), Chafarinas Islands (19, 71), Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Jabha (*), M'diq (*), Tetouan (*), without locality (33). A: Tanger (*), Azila (*), Salé (50, 69), Rabat (23, 42, 50), Temara (2, *), Sables d'Or (2), Mohammedia (2, 73), Casablanca (36), El Jadida (21, *), Oualidia (*), Essaouira (*), Agadir (*), Mirleft (*).

Blidingia minima (Nägeli ex Kützing) Kylin [= *Enteromorpha minima* Nägeli ex Kützing, *E. compressa* (Linnaeus) Nees [var. *minima* (Nägeli ex Kützing) Hamel] f. *micrococca* (Kützing) Hamel sensu Hylmö, *E. micrococca* Kützing sensu Hylmö]. M: Saaidia (*), Chafarinas Islands (55), Nador (53, 55, 56), Tamernoute (64), M'diq (*), Cabo-Negro (64), Tetouan (*), Ksar-Sghir (64), without locality (33). A: Tanger (10, 28, 36), Salé (21, 69), Rabat (21, 23, 26, 42, 47), El Harhoura (17), Temara (2, 89), Sables d'Or (2, *), Mohammedia (2, 73, 74, *), El Jadida (3, 21), Essaouira (36), Cap Ghir (*).

Blidingia tuberculosa (P. Dangeard) Benhissoune, Boudouresque et Verlaque comb. nov.³ [= *Enteromorpha tuberculosa* P. Dangeard, *Rhizenteron tuberculosum* (P. Dangeard) P. Dangeard]. A: Rabat (21, 23, 42, 90).

Enteromorpha clathrata (Roth) Greville [= *Conferva clathrata* Roth]. M: Nador (53, 55, 56), Melilla (55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). A: Tanger (10, 28, 36, 90), Azila (*), Salé (69), Rabat (21, 36, 87, 90), El Harhoura (17), Temara (2, 21, 35, 90, *), Sables d'Or (2, *), Mohammedia (2, 73), Casablanca (90), El Jadida (3, 21, 90, *), Essaouira (90, *), Tifnit (*), Mirleft (*).

Enteromorpha compressa (Linnaeus) Nees [= *Ulva compressa* Linnaeus, *Enteromorpha clathrata* (Roth) Greville f. *linkiana* (Greville) Areschoug]. M: Chafarinas Islands (19, 71), Nador (53, 55, 56), Melilla (11, 54), Tamernoute (64), Cabo-Negro, (64), Tetouan (71), Ksar-Sghir (64, *), without locality (33). A:

Tanger (10, 28, 36, 90, *), Azila (*), Larache (*), Salé (29), Rabat (12, 13, 21, 29, 47, 90, *), Temara (2, 34, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 74, 90, *), Casablanca (21, 36, 81, 90), El Jadida (3, 21, 36, 90, *), Essaouira (81, 90, *), Tifnit (6), Mirleft (*).

Enteromorpha fasciculata P. Dangeard. A: Rabat (23), Casablanca (21, 23).

Enteromorpha flabellata P. Dangeard [= *Enteromorpha flabellata* var. *mytilorum* P. Dangeard nom. inval.⁴]. A: Salé (39, 69), Rabat (16, 18, 22, 23, 39, 42, 47, 48, 87), El Harhoura (17), Sidi Boulbra (4, 5).

Enteromorpha flexuosa (Wulfen) J. Agardh subsp. *flexuosa* [= *Ulva flexuosa* Wulfen, *Enteromorpha lingulata* J. Agardh, *E. tubulosa* (Kützing) Kützing]. M: Saaidia (55), Chafarinas Islands (55), Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tetouan (55, 71), Ceuta (55), without locality (33). A: Tanger (10, 28, 36, 90), Rabat (23, 47), El Jadida (21), Essaouira (37), Agadir (21, 90).

Enteromorpha flexuosa (Wulfen) J. Agardh subsp. *paradoxa* (C. Agardh) Bliding [= *Ulva paradoxa* C. Agardh, *Enteromorpha erecta* (Lyngbye) Carmichael]. M: Chafarinas Island (55, 71), without locality (33). A: Tanger (10, 28, 36).

Enteromorpha gayraliae P. Dangeard nom. inval.⁵. A: Rabat (23, 42, 87).

Enteromorpha hendayensis P. Dangeard et Parriaud⁶ nom. inval. [= *Enteromorpha hendayensis* var. *salsensis* Gayral nom. inval.]. A: Rabat (41, 42).

Enteromorpha intestinalis (Linnaeus) Nees var. *intestinalis* [= *Ulva intestinalis* Linnaeus, *Enteromorpha compressa* (Linnaeus) Nees var. *intestinalis* (Linnaeus) Hamel]. M: Saaidia (55), Chafarinas Islands (19, 55, 71), Nador (53, 55, 56), Melilla (11, 36, 54, 55, 71, 90), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Tetouan (55), Ceuta (55), Ksar-Sghir (64), without locality (33). A: Tanger (6, 28, 36, 90), Larache (*), Salé (21, 29, 50), Rabat (6, 21, 29, 36, 50, 90, *), El Harhoura (17), Temara (2, 6, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 90, *), Casablanca (21, 90), El Jadida (3, 21, 36, 90, *), Oualidia (21, 81, 90), Essaouira (52, 90), Tifnit (6), Aglou (*), cosmopolitan (38).

Enteromorpha intestinalis (Linnaeus) Nees [var. *asexualis* Bliding] f. *cornucopiae* (Lyngbye) J. Agardh [= *Scytosiphon intestinalis* (Linnaeus) Lyngbye var. *cornucopiae* Lyngbye]. A: Tanger (10, 36).

Enteromorpha kylinii Bliding. M: Melilla (55).

Enteromorpha linza (Linnaeus) J. Agardh [= *Ulva linza* Linnaeus, *Enteromorpha crispata* (Bertoloni) Piccone]. M: Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). A: Tanger (10, 28, 36, 90), Salé (50, 69), Rabat (12, 13, 21, 23, 50, 90, *), Temara (2, *), Mohammedia (2, 73, *), El Jadida (2, 3), Essaouira (52), cosmopolitan (38), without locality (20).

Enteromorpha longissima P. Dangeard nom. inval.⁷. A: Rabat (23, 42, 87).

Enteromorpha multiramosa Bliding. **M:** Saaidia (55), Chafarinas Islands (55), Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tetouan (55), Ceuta (55), without locality (33).

Enteromorpha muscoides (Clemente y Rubio) Cremades [= *Ulva muscoides* Clemente y Rubio, *Enteromorpha clathrata* (Roth) Greville var. *crinita* (Nees) Hauck, *E. compressa* (Linnaeus) Nees var. *caespitosa* (Le Jolis) Rabenhorst, *E. crinita* Nees, *E. ramulosa* (J. E. Smith) Carmichael, *E. ramulosa* var. *spinosa* Kützing (subsequently changed to *E. spinescens* Kützing, 1856)]. **M:** Chafarinas Islands (19, 55, 71), Nador (55), Melilla (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33), **A:** Tanger (10, 28, 36⁸, 90, *), Azila (*), Larache (*), Salé (50, 69), Rabat (21, 23, 50, 90, *), El Harhoura (17), Temara (2, 90), Sables d'Or (2, *), Mohammedia (2, 73, *), Casablanca (21, 36, 81, 90), El Jadida (3, 21, 28, 36, *), Oualidia (21, 81), Sidi Boulbra (4, 5), Essaouira (10, 90), Cap Ghir (90), Agadir (21, 90), cosmopolitan (38).

Enteromorpha prolifera (O. F. Müller) J. Agardh ssp. *prolifera* [= *Ulva prolifera* O. F. Müller, *Enteromorpha compressa* (Linnaeus) Nees var. *prolifera* (O. F. Müller) Greville]. **M:** Saaidia (55), Chafarinas Islands (55), Nador (53, 55, 56), Melilla (55), Al Hoceima (55), Cabo-Negro (71), Tetouan (55, 71), Ceuta (55), without locality (33). **A:** Tanger (10, 36), Salé (50, 69), Rabat (23, 50, 87, 90), El Jadida (36).

Enteromorpha ralfsii Harvey. **A:** Salé (50, 69), Rabat (23, 42, 50).

Enteromorpha rivularis P. Dangeard nom. *inval*⁹. **A:** Rabat (23, 42).

Enteromorpha scopulorum (P. Dangeard) Villot comb. *inval*¹⁰. [= *E. flabellata* P. Dangeard var. *scopulorum* P. Dangeard nom. *inval*¹⁰]. **A:** Rabat (18, 23, 42, 87), El Harhoura (17).

Enteromorpha simplex (K. L. Vinogradova) Korman et C. Hoek [= *E. prolifera* (O. F. Müller) J. Agardh f. *simplex* K. L. Vinogradova]. **M:** Chafarinas Islands (55, 71), Tetouan (55, 71), without locality (33).

Enteromorpha stipitata P. Dangeard var. *stipitata*¹¹ nom. *inval*. **A:** Rabat (23, 42).

Enteromorpha torta (Mertens) Reinbold [= *Conferva torta* Mertens]. **M:** Nador (53), Melilla (54), Cabo-Negro (71), Tetouan (71), without locality (33).

Gayralia oxysperma (Kützing) K. L. Vinogradova ex Scagel et al. [= *Ulva oxysperma* Kützing, *Monostroma oxycoccum* Thuret]. **A:** Salé (50, 69), Rabat (42), El Jadida (21).

Monostroma grevillei (Thuret) Wittrock [= *Enteromorpha grevillei* Thuret, *Ulvopsis grevillei* (Thuret) Gayral]. **A:** Temara (2, *), Sables d'Or (2, *), Mohammedia (2, *).

Monostroma obscurum (Kützing) J. Agardh [= *Ulva obscura* Kützing, *Ulvaria obscura* (Kützing) Gayral]. **A:** Temara (44), Sidi Boulbra (4, 5), Essaouira (21), Mirleft (21).

Percursaria percursa (C. Agardh) Rosenvinge [= *Conferva percursa* C. Agardh, *Enteromorpha percursa* (C. Agardh) J. Agardh]. **A:** Tanger (10, 36), Casablanca (36, 81), El Jadida (36), Oualidia (81).

Ulva bifrons Ardré. **A:** Azila (*), Temara (*), Sables d'Or (*), Mohammedia (*), El Jadida (*), Oualidia (*), Sidi Boulbra (4, 5), Essaouira (*), Agadir (*), Mirleft (*), Sidi Ifni (*).

Ulva curvata (Kützing) De Toni [= *Phycoseris curvata* Kützing, *Ulva dangeardii* Gayral et Seizilles de Mazancourt]. **M:** Chafarinas Islands (55, 71), without locality (33). **A:** Salé (42, 49, 50, 69), Rabat (23, 45, 49, 50).

Ulva elegans Gayral nom. *inval*¹². **A:** Salé (42), Rabat (40, 45), El Harhoura (17).

Ulva fasciata Delile [= *Phycoseris fasciata* (Delile) Montagne]. **M:** Saaidia (*), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*). **A:** Tanger (*), Azila (*), Larache (*), Rabat (16, 23, 47, 87, *), El Harhoura (17), Temara (2), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida (3, *), Oualidia (*), Essaouira (*), Agadir (*), Tifnit (*), Mirleft (*), Sidi Ifni (*), Tan-Tan (*).

Ulva lactuca Linnaeus¹³ [= *U. lactuca* f. *cribrosa* (J. Agardh) De Toni, *U. myriotrema* (Kützing) P. L. et H. M. Crouan]. **M:** Chafarinas Islands (71), Tamernoute (64), Cabo-Negro (64), Ceuta (6, 28, 36, 55, 71, 90), Ksar-Sghir (6, 64, *). **A:** Tanger (10, 28, 36, 42, 78, 90, *), Azila (*), Larache (*), Salé (29, 50, 69), Rabat (12, 13, 18, 21, 29, 36, 47, 50, 81, 90, *), El Harhoura (17), Temara (2, 34, 35, 90, *), Sables d'Or (2, 70), Mohammedia (2, 73, 74, *), Casablanca (21, 36, 81, 90), El Jadida (3, 21, 28, 36, 81, 90, *), Safi (90), Sidi Boulbra (4, 5), Essaouira (21, 90, *), Cap Ghir (90, *), Agadir (90), Aglou (*), Mirleft (*), Moroccan Sahara (67), cosmopolitan (38), without locality (61).

Ulva linearis P. Dangeard. **A:** Salé (39, 42, 47), Rabat (16, 22, 23, 39, 47, 48).

Ulva olivascens P. Dangeard [= *U. olivacea* P. Dangeard, non *U. olivacea* Hornemann]. **M:** Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), without locality (33). **A:** Tanger (41, 42, 43).

Ulva rigida C. Agardh¹⁴. **M:** Saaidia (55), Chafarinas Islands (19, 55, 71), Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64, 71), Tetouan (55), Ceuta (55), Ksar-Sghir (64, *), without locality (33). **A:** Tanger (6, 10, 36, 41, 43, 90, *), Azila (*), Larache (*), Rabat (6, 21, 23, 90, *), Temara (2, 6, *), Sables d'Or (2, *), Mohammedia (2, 73, 74, *), Casablanca (21, 90), El Jadida (3, 36, 90, *), Sidi Boulbra (4, 5), Essaouira (52, *), Cap Ghir (*), Agadir (*), Tifnit (6, *), Aglou (*), Mirleft (*), cosmopolitan (38).

Acrosiphoniales

Urospora laeta (Thuret ex Bornet) Børgesen [= *Ulothrix laeta* Thuret ex Bornet]. **M:** Tamernoute

(64), Cabo-Negro (64), Ksar-Sghir (64). **A:** Tanger (10, 21, 28, 36, 59, 90), Rabat (21, 90), Temara (2), Sables d'Or (2), Mohammedia (2, 73).

Cladophorales

Chaetomorpha aerea (Dillwyn) Kützing¹⁵ [= *Conferva aerea* Dillwyn]. **M:** Chafarinas Islands (71), Nador (53), Melilla (54), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64, *), without locality (33). **A:** Tanger (10, 21, 28, 36, 59, *), Rabat (6, 12, 13, 21, 26, *), El Harhoura (17), Temara (2, 34, *), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida (3, *), Sidi Boulbra (4, *), Tifnit (6), Aglou (*), Mirleft (*), Moroccan Sahara (67), without locality (20, 26).

Chaetomorpha gracilis Kützing [= *Lola gracilis* (Kützing) V. Chapman]. **M:** Chafarinas Islands (71), Nador (55), Melilla (55), Al Hoceima (55), Tamernoute (*), Cabo-Negro (*), Ksar-Sghir (*), without locality (33). **A:** Tanger (*), Rabat (*), Temara (*), Sables d'Or (*), Mohammedia (*), El Jadida (*), Sidi Boulbra (4, *), Aglou (*), Mirleft (*).

Chaetomorpha linum (O. F. Müller) Kützing¹⁵ [= *Conferva linum* O. F. Müller, *Rhizoclonium linum* Turner var. *elasticum* Thuret]. **M:** Saaidia (55, *), Chafarinas Islands (55), Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Tamernoute (*), M'diq (*), Cabo-Negro (*), Tetouan (55, *), Ceuta (55), Ksar-Sghir (*), without locality (33). **A:** Tanger (28, 36, 59, *), Rabat (12, 13, *), Temara (2), Sables d'Or (2), Mohammedia (2, 36, *), El Jadida (*), Essaouira (*), Cap Ghir (*), Agadir (*), Mirleft (*), Sidi Ifni (*).

Chaetomorpha mediterranea (Kützing) Kützing¹⁶ [= *Spongopsis mediterranea* Kützing, *Rhizoclonium capillare* Kützing, *Chaetomorpha capillaris* (Kützing) Børgesen nom. illeg.]. **M:** Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64). **A:** Tanger (10, 28, 36, 59), Temara (2), Sables d'Or (2), Mohammedia (2, 73, *), El Jadida (3, 21).

Chaetomorpha pachynema (Montagne) Kützing [= *Conferva pachynema* Montagne]. **M:** Saaidia (*), Tamernoute (64, *), M'diq (*), Cabo-Negro (64, *), Tetouan (*), Ksar-Sghir (64, *). **A:** Tanger (36, *), Rabat (6, 21, 90, *), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida (3, *), Essaouira (*), Cap Ghir (*), Agadir (*), Tifnit (6), Mirleft (*), Sidi Ifni (*), without locality (20).

Cladophora albida (Nees) Kützing [= *Annulina albida* Nees, *Cladophora magdalena* Harvey]. **M:** Saaidia (*), Chafarinas Islands (55, 71), Tamernoute (64, *), M'diq (*), Cabo-Negro (64, *), Tetouan (*), Ksar-Sghir (64, *), without locality (33). **A:** Tanger (10, 28, *), Rabat (36, *), Temara (2), Sables d'Or (2), Mohammedia (2), Casablanca (36, *), El Jadida (3, *), Sidi Boulbra (4, 5), Essaouira (*), Cap Ghir (*), Agadir (*), Mirleft (*), Sidi Ifni (*).

Cladophora coelothrix Kützing [= *Conferva repens* J. Agardh nom. illeg.]. **M:** Saaidia (55), Chafarinas Islands (55), Nador (53, 55, 56), Melilla (54, 55), Al

Hoceima (55), Tetouan (55), Ceuta (55), without locality (33). **A:** Rabat (26), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, *), El Jadida (21).

Cladophora dalmatica Kützing. **M:** Saaidia (55), Chafarinas Islands (55, 71), Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Tetouan (55), Ceuta (55), without locality (33).

Cladophora echinus (Biaioletto) Kützing [= *Conferva echinus* Biaioletto]. **M:** Saaidia (*), Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*), without locality (33). **A:** Tanger (*), Azila (*), Larache (*), Temara (*), Sables d'Or (*), El Jadida (*), Oualidia (*), Agadir (*), Mirleft (*), Sidi Ifni (*), Tan-Tan (*).

Cladophora globulina (Kützing) Kützing [= *Conferva globulina* Kützing]. **M:** Nador (53, 55, 56), Melilla (54), without locality (33). **A:** Tanger (28).

Cladophora hutchinsiae (Dillwyn) Kützing [= *Conferva hutchinsiae* Dillwyn]. **M:** Melilla (54, 55), Al Hoceima (55). **A:** Tanger (10 ?), Sidi Boulbra (4, 5).

Cladophora laetevirens (Dillwyn) Kützing [= *Conferva laetevirens* Dillwyn]. **A:** Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, 74, *).

Cladophora lehmanniana (Lindenberg) Kützing [= *Conferva lehmanniana* Lindenberg, *Cladophora punica* Hamel, *C. ramulosa* Meneghini, *C. utriculosa* Kützing]. **M:** Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 90), Salé (21, 29, 36, 69, 90), Rabat (21, 36, 81, 90), Temara (2, *), Sables d'Or (2), Mohammedia (2, 73, *), Casablanca (21, 36, 81, 90).

Cladophora pellucida (Hudson) Kützing [= *Conferva pellucida* Hudson]. **M:** Chafarinas Islands (71), Nador (53, 55, 56), Melilla (55), Al Hoceima (55), Cabo-Negro (71), Tetouan (55), without locality (33). **A:** Tanger (10, *), Rabat (12, 21, 29, 36, 81, 90, *), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, *), Casablanca (21, 36, 81), El Jadida (3), Sidi Boulbra (4, 5), Essaouira (*).

Cladophora prolifera (Roth) Kützing [= *Conferva prolifera* Roth]. **M:** Chafarinas Islands (19, 71), Nador (53), Melilla (11, 54), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 90), Azila (*), Salé (21, 36, 81), Rabat (6, 21, 36, 90, *), El Harhoura (17), Temara (2, 6, 90, *), Sables d'Or (2, *, 90), Mohammedia (2, 73, 74, *), Casablanca (21, 36, 81, 90), El Jadida (3), Essaouira (*), Agadir (21).

Cladophora rupestris (Linnaeus) Kützing [= *Conferva rupestris* Linnaeus, *Cladophora ramosissima* (Draparnaud ex Kützing) Kützing]. **M:** Chafarinas Islands (19, 55, 71), Nador (55), Melilla (55), Al Hoceima (55), without locality (33). **A:** Rabat (12, 13, *), El Harhoura (17), Temara (2), Sables d'Or (2, *), Mohammedia (2, 73, *), Casablanca (21), El Jadida (3, 21), Sidi Boulbra (4, 5).

Cladophora sericea (Hudson) Kützing [= *Conferva sericea* Hudson, *Cladophora hirta* Kützing]. **M:** Mel-

illa (55), Al Hoceima (55). **A:** Tanger (36), Salé (69), Temara (2), Sables d'Or (2, *), Mohammedia (2, 36, 73, *).

Cladophora vadorum (Areschoug) Kützing [= *Conferva vadorum* Areschoug]. **M:** Nador (53, 55, 56), Melilla (11, 54, 55). without locality (33).

Cladophora vagabunda (Linnaeus) C. Hoek [= *Conferva vagabunda* Linnaeus, *Cladophora expansa* (Mertens) Kützing]. **M:** Saaidia (*), Nador (53), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*), without locality (33). **A:** Tanger (*), Azila (*), Larache (*), Temara (36, 89, *), Sables d'Or (*), Mohammedia (*), El Jadida (*), Oualidia (*), Essaouira (*), Agadir (*), Tifnit (*), Mirleft (*), Sidi Ifni (*), Tan-Tan (*).

Cladophoropsis membranacea (Hofman Bang ex C. Agardh) Børgesen [= *Conferva membranacea* Hofman Bang ex C. Agardh, *Siphonocladus membranaceus* (Hofman Bang ex C. Agardh) Bornet ex Askenasy]. **A:** Casablanca (36, 81).

Rhizoclonium tortuosum (Dillwyn) Kützing¹⁶ [= *Conferva tortuosa* Dillwyn, *Chaetomorpha implexa* Kützing *nom. illeg.*, *Lola implexa* (Dillwyn) Hamel, *Rhizoclonium kernerii* Stockmayer, *R. kochianum* Kützing, *R. riparium* (Roth) Kützing ex Harvey]. **M:** Saaidia (55), Chafarinas Islands (55, 71), Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Tetouan (55, 71), Ceuta (55), without locality (33). **A:** Tanger (10, 28, 36, 50), Salé (69), Rabat (36, 42), Mohammedia (21), Casablanca (36, 81), El Jadida (21), Sidi Boulbra (4, 5).

Valonia macrophysa Kützing. **M:** Saaidia (*), Chafarinas Islands (55, 71), Nador (55), Melilla (55), Al Hoceima (55), Jabha (*), M'diq (*), Cabo-Negro (*), Ksar-Sghir (*), without locality (33). **A:** Tanger (*), Azila (*), Larache (*), Rabat (21), Temara (2), Sables d'Or (2), Mohammedia (2), Agadir (*), Tifnit (*), Mirleft (*), Sidi Ifni (*).

Valonia utricularis (Roth) C. Agardh [= *Conferva utricularis* Roth]. **M:** Saaidia (55), Chafarinas Islands (19, 55, 71), Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (55, 64), Tetouan (55), Ceuta (6, 55), Ksar-Sghir (6, 64), without locality (33). **A:** Tanger (10, 28, 36, 59, *), Azila (*), Rabat (6, 21), El Harhoura (17), Temara (2, 21, *), Sables d'Or (2), Mohammedia (2, 21, 73, 74, *), Casablanca (21), El Jadida (3).

Ventricaria ventricosa (J. Agardh) Olsen et J. A. West [= *Valonia ventricosa* J. Agardh]. **M:** Chafarinas Islands (55, 71), without locality (33).

Bryopsidales

Bryopsidella neglecta (Berthold) Rietema [= *Derbesia neglecta* Berthold]. **M:** Saaidia (*), Nador (55), Melilla (55), Al Hoceima (55), Tamernoute (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*). **A:** Tanger (10, 36), Rabat (21, 23), Temara (89), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida

(3), Essaouira (36), Cap Ghir (*), Agadir (21, 38), Mirleft (*), Sidi Ifni (*).

Bryopsis adriatica (J. Agardh.) Frauenfeld [= *B. cupressina* J. V. Lamouroux var. *adriatica* J. Agardh]. **M:** Saaidia (*), Tamernoute (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*). **A:** Tanger (10, 36, 90, *), Salé (21), Rabat (21, 90, *), Temara (90, *), Sables d'Or (*), Mohammedia (*), El Jadida (*), Essaouira (36, *), Cap Ghir (*), Agadir (*), Mirleft (*), Sidi Ifni (*).

Bryopsis corymbosa J. Agardh. **M:** Nador (55), Melilla (55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64). **A:** Tanger (36, 58, 90, *), Larache (*), Rabat (21, 90, *), El Harhoura (17), Temara (2, *), Sables d'Or (2), Mohammedia (2, 73, *), El Jadida (3, *), Sidi Boulbra (4, 5), Safi (21, 90), Essaouira (21, 90, *), Aglou (*), Mirleft (*).

Bryopsis duplex De Notaris¹⁷ [= *B. balbisiana* J. V. Lamouroux *sensu* J. Feldmann, *B. disticha* (J. Agardh) Kützing]. **M:** Melilla (55), Al Hoceima (55), Tamernoute (64, *), Cabo-Negro (64, *), Ksar-Sghir (64, *). **A:** Tanger (10, 28, 36, 90, *), Azila (*), Rabat (21, 90, *), El Harhoura (17), Temara (2, 21, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, *), Casablanca (21, 90, *), El Jadida (3, *), Aglou (*), Mirleft (*), without locality (20).

Bryopsis feldmannii Gallardo et G. Furnari [= *B. cupressoides* J. Feldmann *nom. illeg.*]. **M:** Melilla (28, 55).

Bryopsis hypnoides J. V. Lamouroux [= *B. monoica* Berthold ex Funk]. **M:** Melilla (54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64). **A:** Temara (2, 42, *), Sables d'Or (2), Mohammedia (2, 73, 74, *).

Bryopsis muscosa J. V. Lamouroux. **M:** Nador (55), Melilla (11, 54, 55), Al Hoceima (55). **A:** Tanger (10, 36), Temara (2, 42), Sables d'Or (2, *), Mohammedia (2, 73, 74, *).

Bryopsis pennata J. V. Lamouroux var. *minor* J. Agardh. **M:** Saaidia (*), Tamernoute (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ksar-Sghir (*). **A:** Tanger (*), Rabat (21, 90, *), Temara (42, *), Sables d'Or (*), Mohammedia (*), El Jadida (*), Oualidia (*), Essaouira (*), Cap Ghir (*).

Bryopsis plumosa (Hudson) C. Agardh [= *Ulva plumosa* Hudson]. **M:** Saaidia (55), Chafarinas Islands (55, 71), Nador (53, 55, 56), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (55, 64, 71), Tetouan (55), Ceuta (6, 55), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 58, 90), Azila (*), Larache (*), Rabat (17, 21, 90, *), El Harhoura (17), Temara (2, 89, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 74, 89, 90, *), Casablanca (21, 81, 89, 90), El Jadida (3), Essaouira (*), Aglou (*), Mirleft (*).

Caulerpa prolifera (Forsskål) J. V. Lamouroux [= *Fucus prolifer* Forsskål]. **M:** Saaidia (*), Nador (53, 55, 56), Melilla (11, 54), Jabha (*), M'diq (*), Tetouan (*), without locality (33). **A:** Tanger (36, 58, 60, *), Azila (*).

Caulerpa racemosa (Forsskål) J. Agardh [= *Fucus racemosus* Forsskål]. **A:** Tanger (78).

Codium adhaerens C. Agardh. **M:** Nador (55), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Tetouan (55), Ceuta (36, 71, 90), Ksar-Sghir (6, 64), Oued Lao (*), without locality (33). **A:** Tanger (10, 28, 36, 90), Azila (*), Rabat (21, 36, *), El Harhoura (17), Temara (2, 6, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 89, 90, *), Casablanca (21, 36, 89, 90), El Jadida (3, *), Oualidia (90), Essaouira (37), Cap Ghir (90), Agadir (21, 90), Aglou (*, 90), Mirleft (90, *), without locality (31).

Codium bursa (Linnaeus) C. Agardh [= *Alcyonium bursa* Linnaeus]. **M:** Saaidia (*), Chafarinas Islands (32), Nador (55), Melilla (11, 54, 55), Al Hoceima (55), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (42, *), Ksar-Sghir (*). **A:** Tanger (10, 28, 36, 58, 61, *), without locality (25).

Codium decorticatum (Woodward) Howe [= *Ulva decorticata* Woodward, *Codium elongatum* (Turner) C. Agardh]. **M:** Nador (55), Melilla (11, 54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ceuta (83), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 58, 83, 90, *), Salé (69), Rabat (21, 24, 36, 83, 90, *), El Harhoura (17), Temara (2, 6, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 89, 90, *), Casablanca (21, 36, 81, 90), El Jadida (3, 21, 36, 90), Safi (90), Djorf-el-Yhoudi (88), Sidi Boulbra (4, 5), Essaouira (37), Cap Ghir (88, 90), Agadir (21, 90), Tifnit (6), Aglou (*), Mirleft (*), Moroccan Sahara (67), Cap Blanc (81), without locality (25, 31, 61).

Codium effusum (Rafinesque) Delle Chiaje [= *Myrsidrum effusum* Rafinesque, *Codium difforme* Kützinger]. **M:** Nador (53, 55, 56), Melilla (54, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). **A:** Rabat (21, 90), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73), Casablanca (21, 24, 36, 81, 90), El Jadida (3, 21, 36, 90), Safi (21, 24, 90), Cap Ghir (21, 90), Agadir (21, 90), Mirleft (21, 90), Tan-Tan (*), Cap Blanc (81).

Codium fragile (Suringar) Hariot¹⁸ [= *Acanthocodium fragile* Suringar]. **M:** Melilla (54, 55).

Codium tomentosum Stackhouse. **M:** Nador (55), Melilla (11, 55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Tetouan (55), Ceuta (36, 71, 90), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 58, 90, *), Azila (*), Rabat (24, 36, 42, 90, *), El Harhoura (17), Temara (6, 34, 90, *), Sables d'Or (*), Mohammedia (73, 74, 89, 90, *), Casablanca (36, 81, 89, 90), El Jadida (3, 28, 90, *), Sidi Boulbra (4, 5), Essaouira (*), Agadir (90), Mirleft (*), without locality (25, 42, 61, 88).

Codium vermilara (Olivieri) Delle Chiaje [= *Lamareckia vermilara* Olivieri]. **M:** Chafarinas Islands (19, 71), Nador (55), Melilla (55), Al Hoceima (55), Tamernoute (64), Cabo-Negro (64), Ceuta (36, 90), Ksar-Sghir (64), without locality (33). **A:** Tanger (36, 90,

), Azila (), Rabat (24, 36, 42, 90, *), Temara (2, 90, *), Sables d'Or (2, *), Mohammedia (2, 73, 89, 90, *), Casablanca (36, 89, 90), El Jadida (3, 90, *), Sidi Boulbra (4 ?), Essaouira (*), Agadir (90), Mirleft (*), without locality (25, 42).

Derbesia tenuissima (Moris et De Notaris) P. L. Crouan et H. M. Crouan [= *Bryopsis tenuissima* Moris et De Notaris]. **M:** Nador (53), Melilla (54), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 58), Rabat (21, *), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida (*), Agadir (21).

Flabellia petiolata (Turra) Nizamuddin [= *Ulva petiolata* Turra, *Udotea petiolata* (Turra) Børgesen]. **M:** Saaidia (*), Chafarinas Islands (55, 71), Nador (55), M'diq (*), Ceuta (6), without locality (33).

'*Halicystis parvula* Schmitz ex G. Murray' stadium¹⁹. **M:** Saaidia (*), Nador (55), Melilla (55), Al Hoceima (55), Jabha (*), Tamernoute (64), M'diq (*), Cabo-Negro (64, *), Tetouan (*), Ksar-Sghir (64, *). **A:** Tanger (*), Azila (*), Larache (*), Rabat (21, 38, *), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, *), El Jadida (*), Oualidia (*), Essaouira (*), Agadir (*), Tifnit (*), Mirleft (*), Sidi Ifni (*), Tan-Tan (*).

Halimeda tuna (Ellis et Solander) J. V. Lamouroux [= *Corallina tuna* Ellis et Solander]. **M:** Saaidia (*), Chafarinas Islands (55), Nador (55), Jabha (*), M'diq (*), Cabo-Negro (*), Tetouan (*), Ceuta (6), Ksar-Sghir (*). **A:** Tanger (10, 36, 58, *), Azila (*), Larache (*).

Pedobesia lamourouxii (J. Agardh) J. Feldmann et al. [= *Bryopsis balbisiana* J. V. Lamouroux var. *lamourouxii* J. Agardh, *Derbesia balbisiana* (J. V. Lamouroux) Hamel, *D. lamourouxii* (J. Agardh) Solier]. **M:** Nador (53, 55, 56), Melilla (55), Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64), without locality (33). **A:** Tanger (10, 28, 36, 58), Rabat (21, *), El Harhoura (17), Temara (2, *), Sables d'Or (2, *), Mohammedia (2, 73, 74, *), Casablanca (21), Mirleft (*), without locality (20).

Pedobesia solieri Feldmann ex Abelard et Knoepfler-Péguy. **M:** Saaidia (55), Nador (55), Melilla (55).

Pseudochlorodesmis furcellata (Zanardini) Børgesen [= *Bryopsis furcellata* Zanardini]. **M:** Tamernoute (64), Cabo-Negro (64), Ksar-Sghir (64). **A:** Sables d'Or (2, *), Mohammedia (2, 73, *).

Dasycladales

Acetabularia acetabulum (Linnaeus) P. Silva [= *Madrepora acetabulum* Linnaeus, *A. mediterranea* J. V. Lamouroux nom. illeg.]. **M:** Saaidia (55, *), Chafarinas Islands (55, 71), Nador (53, 55, 56), Melilla (11, 54, 55), Jabha (*), M'diq (*), Tetouan (*), without locality (33).

Acetabularia calyculus J. V. Lamouroux. **M:** Nador (55).

Dasycladus vermicularis (Scopoli) Krasser [= *Spongia vermicularis* Scopoli, *Dasycladus clavaeformis* (Roth) C. Agardh]. M: Nador (55), Melilla (54).

Polyphysa parvula (Solms-Laubach) Schnetter *et* Bula-Meyer [= *Acetabularia parvula* Solms-Laubach, *A. moebii* Solms-Laubach]. M: Nador (55), Melilla (11, 54, 55).

Notes

¹ We follow Lokhorst (1985) and Gallardo *et al.* (1993) in considering *Ulothrix implexa* and *U. subflaccida* as two different taxa. However, Burrows (1991) considers these to be synonyms.

² This species is present in the Black Sea (Zinova, 1967), the Baltic Sea (Starmach, 1972) and Sicily (Giaccone *et al.*, 1986), both in fresh and sea waters. Its presence in Morocco needs to be confirmed.

³ According to Gayral (1967: 211, footnote 2), who obtained the whole development of this species in culture, all the features that characterize the genus *Blidingia* are present in *Rhizenteron tuberculosum* (P. Dangeard) P. Dangeard. For this reason, she proposed the new combination *Blidingia tuberculata* (*sic*). However, she did not mention the basionym and failed to indicate the reference and place of its valid publication (see Article 33.2 of the ICBN, Greuter *et al.*, 1994). Here, we validly publish this new combination: *Blidingia tuberculosa* (P. Dangeard) Benhissoune, Boudouresque *et* Verlaque *comb. nov.* (*Enteromorpha tuberculosa* P. Dangeard, 1949: 111–113, fig. 3 o, p, q, r, s (type locality: Rabat).

⁴ *Enteromorpha flabellata* was validly published by Dangeard (1957, 1958 a), but *E. flabellata* var. *mytilorum* P. Dangeard is a *nom. inval.* since it was not accompanied by a latin description or diagnosis when published (Dangeard, 1958 a: 36–38), as required by Art. 36.2 of the ICBN.

⁵ Since the epithet honours Mrs Paulette Gayral it should be spelled *gayraliae* in accordance with Rec. 60 C. 1(b) of the ICBN. Moreover, since neither direct nor indirect reference to type material was made, the species was not validly published (Articles 37.1 and 37.3 of the ICBN).

⁶ When Dangeard and Parriaud (1960) described *Enteromorpha hendayensis* they did not provide either a Latin diagnosis or designated the type material. Therefore, this taxon was not validly published (Articles 36.2, 37.1 and 37.3 of the ICBN). According to Art. 43.1 of the ICBN neither is *E. hendayensis* var. *salensis* Gayral (1961 a) valid.

⁷ In his description of *Enteromorpha longissima*, Dangeard (1958 a) did not mention, directly or indirectly, the type material. As a result, the description was not validly published (Articles 37.1 and 37.3 of the ICBN).

⁸ Gattefossé and Werner (1935) mentioned '*Enteromorpha compressa* (L.) Greville var. *caespitosa* Le Jol.' [*i. e.* *Enteromorpha compressa* (Linnaeus) Nees

var. *caespitosa* (Le Jolis) Rabenhorst]. According to Bliding (1963: 119), Le Jolis herbarium specimen N° 148, named *Enteromorpha compressa* var. *caespitosa*, has to be referred to *E. ramulosa* (J. E. Smith) Carmichael [now *E. muscoides* (Clemente y Rubio) Cremades].

⁹ In his description of *Enteromorpha rivularis*, Dangeard (1958 a) did not mention, directly or indirectly, the type material. As a result, the description was not validly published (Articles 37.1 and 37.3 of the ICBN).

¹⁰ The combination *Enteromorpha scopulorum* was proposed by Villot (1963) but invalidly according to Art. 33.2 of the ICBN. Moreover, it should be noted that also the intended basionym (*Enteromorpha flabellata* var. *scopulorum* P. Dangeard) is invalid according to Articles 37.1 and 37.3 of the ICBN, since Dangeard (1958 a: 38–40) did not mention, directly or indirectly, the type material.

¹¹ In his description of *Enteromorpha stipitata*, Dangeard (1958 a) did not mention, directly or indirectly, the type material. As a result, the description was not validly published (Articles 37.1 and 37.3 of the ICBN).

¹² Gayral (1960) described a new species of *Ulva* (*U. elegans* Gayral) closely related to *U. fasciata*. In her description, Gayral (1960) failed to provide any figures or to indicate the type material. Subsequently, Gayral (1962 b) mentioned a type specimen (without any further indications) in her herbarium, and isotypes in the 'Institut Scientifique de Rabat', 'Rijksherbarium of Leiden' and 'Muséum National d'Histoire Naturelle, Paris'. As a result, this species was not validly published (Articles 37.3 and 39.1 of the ICBN).

¹³ González-García and Conde-Poyales (1994) and Navarro and Gallardo (1989) mention Schousboe's record of *Ulva lactuca* f. *cribrosa* (J. Agardh) Bornet [= *U. rigida* f. *cribrosa* J. Agardh], from Bornet (1892) under *Ulva cribrosa* (*sic*), a name erroneously attributed to 'Schousboe ex Bornet'.

¹⁴ According to Phillips (1988), all Mediterranean records of *Ulva rigida* C. Agardh *sensu* Bliding (1968) should be referred to as *Ulva laetevirens* Areschoug. However, we follow here Gallardo *et al.* (1993) in not changing this nomenclature, pending a study of Mediterranean and Moroccan specimens.

¹⁵ According to Blair (1983), *Chaetomorpha aerea* and *C. linum* are different species, an opinion not shared by Burrows (1991). We follow here the treatment of Gallardo *et al.* (1993) and Silva *et al.* (1996).

¹⁶ We follow here the nomenclatural treatment of Gallardo *et al.* (1993), rather than that of Silva *et al.* (1996).

¹⁷ The names *Bryopsis balbisiana* J. V. Lamouroux and *Derbesia balbisiana* (J. V. Lamouroux) Hamel were applied to specimens now referred to as either *Bryopsis duplex* De Notaris or *Pedobesia lamourouxii* (J. Agardh) J. Feldmann *et al.* (see Hamel, 1931 b and Feldmann, 1937). As a result, some of the older cit-

ations may be confusing (*e. g.* Gattefossé and Werner 1935).

¹⁸ The authors of this citation (González-García 1994, González-García and Conde-Poyales 1994) do not indicate the sub-species. However, considering the geographical distribution of the sub-species of *C. fragile* in Atlantic and Mediterranean waters (Burrows 1991, Gallardo *et al.* 1993), these last authors were probably in the presence of *C. fragile* ssp. *tomentosoides* (Van Goor) P. Silva.

¹⁹ '*Halicystis parvula* Schmitz *ex* G. Murray' stadium is the gametophytic stage of *Derbesia tenuissima* (Moris *et* De Notaris) P. L. Crouan *et* H. M. Crouan.

Taxa excludenda

Cladophora catenata Hauck *nom. illeg.* [= *Conferva catenata* C. Agardh *nom. illeg.*]. A: Tanger (10). According to Hoek (1963), this name has usually been applied to Mediterranean specimens of *C. lehmanniana* (Lindenberg) Kützing.

Cymopolia barbata (Linnaeus) J. V. Lamouroux [= *Corallina barbata* Linnaeus]. A: Tanger (60). Washed ashore on a Tanger beach; of unknown origin.

Halimeda opuntia (Linnaeus) J. V. Lamouroux. A: Tanger (61). Washed ashore on a Tanger beach; of unknown origin.

Ulothrix tenerrima (Kützing) Kützing [= *Conferva tenerrima* Kützing]. A: Tanger (36). The presence of this cold and fresh water species (Lokhorst, 1985), present in the Black Sea (Zinova, 1967) and Baltic Sea (Starmach, 1972), is unlikely.

Ulothrix tenuissima Kützing. A: Tanger (36). We consider that the presence of this cold water species, only known to occur in the Black Sea (Zinova, 1967) and the Baltic Sea off Poland (Starmach, 1972), is unlikely in Morocco.

Taxa inquirenda

Bryopsis implexa De Notaris. A: Tanger (10, 28). We adopt the conclusions of Pignatti (1962), who places this taxon [type locality: Genoa, Italy] among '*species minus notae vel excludendae*'. It has been also men-

tioned to occur in the Indian Ocean (Silva, *et al.*, 1996).

Cladophora crispata (Roth) Kützing. M: Tetouan (36). A: Tanger (36), Casablanca (36). Specimens referred to as *Cladophora crispata* in older studies actually belong to a variety of species (see Hoek, 1963).

Enteromorpha clathrata (Roth) Greville var. *rothiana* (Le Jolis) Chalon. A: Casablanca (36, 81), El Jadida (36), Oualidia (81), Essaouira (81).

Enteromorpha clathrata (Roth) Greville f. *foeniculacea* (Le Jolis) Chalon. A: Tanger (36).

Enteromorpha compressa (Linnaeus) Nees var. *blidingioides* P. Dangeard. A: Salé (42), Rabat (23), cosmopolitan (38). This taxon was described by Dangeard (1958 a) as a small form of *Enteromorpha compressa* (Linnaeus) Nees. Its taxonomic value requires further investigations.

Enteromorpha compressa (Linnaeus) Nees var. *capillaris* Le Jolis. A: El Jadida (36).

Enteromorpha compressa (Linnaeus) Nees var. *nana* (Le Jolis) Rabenhorst. A: Tanger (36), Rabat (81), Casablanca (81), Oualidia (81).

Enteromorpha intestinalis (Linnaeus) Nees f. *crispa* Le Jolis. A: Tanger (10).

Enteromorpha linza (Linnaeus) J. Agardh var. *interrupta* P. Dangeard. A: Agadir (21).

Enteromorpha prolifera (O. F. Müller) J. Agardh var. *tubulosa* Dangeard. A: Rabat (23, 42). Dangeard (1958 a) described *E. prolifera* var. *tubulosa* as a new variety. In the absence of a Latin diagnosis, figures and mention of type material, this taxon is a *nomen invalidum* (Articles 36.2, 37.1 and 37.3 of the ICBN). It is also illegitimate being a later homonym of *E. prolifera* var. *tubulosa* (Kützing) Batters.

Enteromorpha ramulosa (J. E. Smith) Carmichael var. *uncinata* Le Jolis. A: El Jadida (81).

Pilinia rimosa Kützing. A: Casablanca (21), El Jadida (21). According to Hooper *et al.* (1987) and O'Kelly (1989), the holotype of this species is a Fuco-phyceae. However, its assignment to a definite species remains unclear (see Silva *et al.* 1996, for a review).

Rhizoclonium hieroglyphicum (C. Agardh) Kützing ssp. *tortuosum* (Dillwyn) Stockmayer. A: Salé (42, 50, 69).

Ulva crispa (P. Dangeard) P. Dangeard *nom. inval.* AA: Salé (21), Rabat (23, 87), Casablanca (21), Es-

Table I. Number of items (species, infraspecific taxa and *stadia*) recorded in Morocco and in adjacent regions or countries. Heteromorphic stages (*stadia*), when present, are treated here as different taxa. tw = this work (* infraspecific taxa and *stadia* not taken into consideration; ** Balearic Islands and North African Territories excluded).

Mediterranean regions	No of items	Reference	Atlantic regions	No of items	Reference
Algeria	69	33	Azores	34	79
Algeria	79	75	British Isles	79*	14
Balearic Islands	78	33	Canary Islands	109*	15
Mediterranean Spain**	121	33	Cape Verde Islands	42	80
Sicily	120	33	Portugal	60	1
Tunisia	64	33	Portugal	57	85
Mediterranean Morocco	77	tw	Atlantic Morocco	83	tw

saouira (21, 52). Dangeard (1949) described *Ulva lactuca* Linnaeus f. *crispa* P. Dangeard from Morocco. Subsequently, Dangeard (1958a) elevated this form to the species level. *Ulva crispa* (P. Dangeard) P. Dangeard is an illegitimate later homonym of *Ulva crispa* Lightfoot [*Prasiola crispa* (Lightfoot) Kützinger] (Article 53.1 of the ICBN).

Ulva gayraliae R. Cauro *nom. inval.* A: Salé (16, 42), Rabat (16, 42). This species, described by Cauro (1958) as '*Ulva gayralii*' was named in honour of Mrs Paulette Gayral. Therefore, an orthographic change is proposed here (Article 60C1 c of the ICBN). Furthermore, neither direct nor indirect reference to type material was made, and the author did not provide a Latin diagnosis. As a result, the species does not appear to be validly published (Articles 36.2, 37.1 and 37.3 of the ICBN). The taxonomic value of this taxon, closely related to *U. fasciata*, requires further investigation.

Ulva lactuca Linnaeus f. *consociata* P. Dangeard. A: El Jadida (21).

Ulva schousboei Bornet [= *U. contorta* Schousboe ms.]. A: Tanger (10, 28, 36).

Discussion and Conclusion

Although the marine flora of Morocco has not been extensively studied, when compared to that of *e. g.*

Britain or Spain, the diversity of the Moroccan green algae appears to be rather high (Table I). The reason for this could reside in the fact that the Moroccan coasts belong to three biogeographical provinces: the western Mediterranean, the temperate Atlantic and the tropical Atlantic (Moroccan Sahara), the latter of which is currently poorly explored. However, many taxa belonging to *Ulva* and *Enteromorpha* have been accepted here, although they are only known from their original description. Some of these require further investigations and could prove to belong to already known species. It is therefore probable that such investigations will reduce the number of Moroccan green algal taxa.

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