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Seaweeds of the Greek coasts. I. Phaeophyceae

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Abstract

An updated checklist of the brown seaweeds (Phaeophyceae) of Greece is provided, based on both literature records and new collections. The total number of species and infraspecific taxa currently accepted is 107. The occurrence of each taxon in the North Aegean, South Aegean and Ionian Seas is given. In addition, 17 *taxa* pending confirmation of their presence, 11 *excludenda* and 8 *inquirenda* are briefly discussed.

Keywords: Aegean Sea, brown algae, checklist, Ionian Sea, seaweeds.

Introduction

With its vast coastline (16,000 km in length) and particular geographical position, Greece has attracted numerous naturalists. Greville (1827) and Bory (1832) were first to describe several new taxa from the Ionian and S. Aegean Seas, on the basis of collections made in the Ionian Islands and the Peloponnese. By the end of the 19th century other researchers, such as Mazziari (1851), Grunow (1861), Raulin (1869), Schmitz (1879), Reinbold (1898), and Candargy (1899) had also been studying seaweeds from the Ionian and Aegean Seas. From the early 20th century, Politis (1925, 1932, 1953), Katsikopoulos (1939) and Diannelidis (1935, 1950, 1953), also contributed to seaweed research along the Greek coasts. However, the most important studies have been carried out after the 1970s, mainly in the Aegean Sea (Anagnostidis, 1968; Nizamuddin & Lehnberg, 1970; Coppejans, 1974; Diannelidis *et al.*, 1977; Haritonidis, 1978; Tsekos *et al.*, 1982; Athanasiadis, 1987; Lazaridou, 1994; Chrysovergis, 1995; Catra & Giardina, 2009; Tsiamis *et al.*, 2010a), but less in the Ionian Sea (Haritonidis & Tsekos, 1976; Schnetter & Schnetter, 1981; Tsirika & Haritonidis, 2005).

The major part of these phycological studies provided checklists from the areas surveyed as well as scattered records, without any morphological descriptions or illustrations of the reported taxa, frequently resulting in taxonomic confusion. In addition, several studies dur-

ing the last decades have dealt either with physiological mechanisms or ecological aspects of marine vegetation, such as the use of seaweeds as biondicators (Orfanidis, 1992; Panayotidis *et al.*, 2004). A few reviews were also published, such as those by Diannelidis (1950), Gerloff & Geissler (1974) and finally Athanasiadis (1987, for the Aegean Sea). The annotated checklists of the Mediterranean seaweed flora by Ribera *et al.* (1992), Gallardo *et al.* (1993) and Gómez Garreta *et al.* (2001a) included seaweeds occurring in Greece.

Our scope is to update the knowledge of the Greek seaweed flora. This work is focused exclusively on the brown algae (Phaeophyceae) and is intended to be followed by separate works on the green and red algae (Chlorophyceae, part II, and Rhodophyceae, parts III and IV).

Materials and Methods

From the early 19th century until the present day 13 PhD theses and about 130 research papers have been published on seaweeds from Greece. Master and Bachelor Degree dissertations as well as conference contributions have not been taken into account. Brown algal taxa reported in all other publications have been critically reviewed from present-day taxonomic and nomenclatural aspects, taking also into account the on-line data provided by Silva (2012) and Guiry & Guiry (2012).

Taxa have been grouped in four categories: accepted, pending confirmation of their presence, *excludenda* and

inquirenda. Taxa are listed alphabetically, in order to make their detection easier. The distribution of each accepted taxon is given for the three major biogeographic regions: North Aegean, South Aegean and Ionian Sea (Fig. 1). Due to space limitation, only one reference is given for each region, giving priority to publications that include descriptions and/or illustrations. Additional references are available from the authors on request. New records are based on the collections of the senior author, as a part of his PhD thesis. Material relating to the new records has been deposited at the Athens University (Department of Botany) herbarium database.

Results

This checklist recognizes at least 107 brown algal taxa to occur in Greece (Table 1). *Cystoseira compressa* f. *plana* is reported for the first time (S. Aegean), while new regional records include *Cystoseira foeniculacea* f. *tenuiramosa* (in the N. Aegean and Ionian Seas), *Lobophora variegata* (in the N. Aegean Sea), *Padina di-tristromatica* (in the Ionian Sea), *Sporochnus pedunculatus* (in the S. Aegean and Ionian Seas) and *Taonia pseudociliata* (in the N. Aegean Sea). Information on these six new records follows:

Cystoseira compressa* f. *plana (Ercegovič) Cormaci, G. Furnari, Giaccone, Scammacca & Serio (Fucales, Sargassaceae)

DESCRIPTION: Thalli caespitose, erect, brown-blackish, rigid, to 10 cm high (Fig. 2A); 3-5 primary trunk-like axes, to 1 cm long, simple, attached to the substratum through a holdfast, 0,5-0,9 mm wide; apices of axes

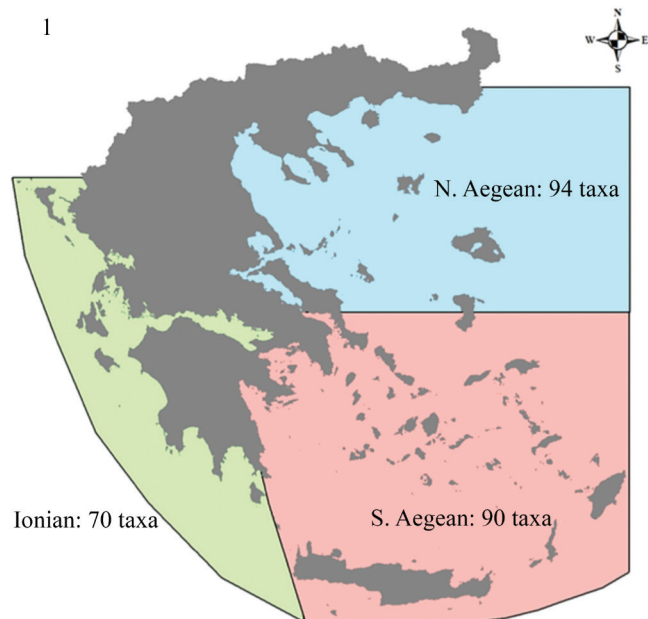


Fig. 1: Accepted brown algal taxa within each biogeographic region.

slightly prominent and smooth; primary branches flattened, 3-4 mm wide; secondary branches distichous, flattened, 2-3 mm wide; all branches arranged in one plane, with inconspicuous midrib and 2 parallel rows of cryptostomata; spinose ramuli (leaves), tophules and aerocysts absent; terminal receptacles, to 1,5 mm long, fusiform-cylindrical, smooth, simple or occasionally branched. All measurements were taken from dried specimens.

HABITAT: A few thalli were collected at 2 m depth on rocky substratum of a semi-exposed shore.

LOCALITY: Tsigrado beach, Milos Island, S. Aegean Sea, June 2011, coll. K. Tsiamis.

DISTRIBUTION: Sicily, Adriatic Sea and Spain (Gómez Garreta *et al.*, 2001b; Taskin *et al.*, 2012).

NOTE: Despite being reported from deeper habitats (30-40 m depth, Gómez Garreta *et al.*, 2001b), our specimens were collected only in 2 m depth and exhibited slightly narrower primary branches.

Cystoseira foeniculacea* f. *tenuiramosa (Ercegovič) Gómez Garreta, Barceló, Ribera & Rull Lluç (Fucales, Sargassaceae)

DESCRIPTION: Thalli erect, caespitose, brown-blackish, rigid, to 18 cm high (Fig. 2B); 3-8 primary trunk-like axes, to 7 cm long, simple or branched, covered by spines and scars, attached to the substratum through a discoid holdfast, to 3 cm in diameter; apices of axes prominent and spiny; primary branches cylindrical, 1 mm in diameter, densely covered by spines (Fig. 2C); secondary and higher order branches filiform; spinose ramuli (leaves), tophules and aerocysts absent; terminal receptacles small, to 2 mm long, fusiform-cylindrical, simple or occasionally branched. All measurements were taken from dried specimens.

HABITAT: Several thalli were found at 0-1 m depth on small stones and pebbles of well protected shores.

LOCALITIES: Fava, Sithonia, N. Aegean Sea, August 2008, coll. K. Tsiamis; Keri, Laganas Bay, Zankintos Isl., Ionian Sea, April 2008, coll. K. Tsiamis.

DISTRIBUTION: Spain, Balearic Islands, Corsica, Sardinia, Sicily, Adriatic and Turkey (Gómez Garreta *et al.*, 2001b; Taskin *et al.*, 2012). Reported also by Giaccone (1968a, as *C. discors* f. *tenuiramosa*) from the S. Aegean Sea.

?*Lobophora variegata* (J.V. Lamouroux) Womersley ex E.C. Oliveira (Dictyotales, Dictyotaceae)

DESCRIPTION: Thalli were decumbent and partly erect, flabellate, brownish with yellowish margin, irregularly branched, narrow and stipose below, up to 2,5 cm long (Fig. 2D); margin without hairs, not curved, ending to a fringing line of darker cells (meristem); in cross section medullary cells rectangular, 30-50 µm thick, placed in ordinal rows, covered by smaller pigmented cortical cells, placed in pairs for each medullary cell; no reproductive

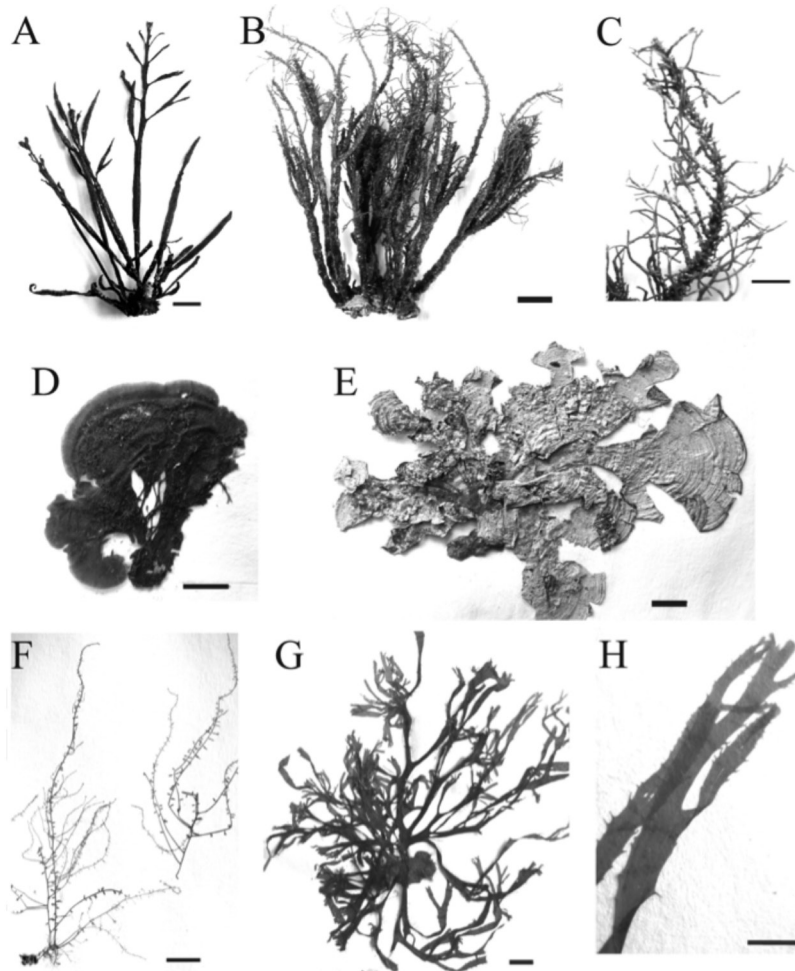


Fig. 2: Brown algae new to the North Aegean, South Aegean and/or Ionian Seas. Fig. A. *Cystoseira compressa* f. *plana* (herbarium habit). Figs B-C. *Cystoseira foeniculacea* f. *tenuiramosa* (B, herbarium habit; C, detail of primary spiny branch). Fig. D. *Lobophora variegata* (herbarium habit). Fig. E. *Padina di-tristromatica* (herbarium habit). Fig. F. *Sporochnus pedunculatus* (herbarium habit). Figs G-H. *Taonia pseudociliata* (G, herbarium habit; H, detail of upper branches bearing marginal spines). Scale bars: Figs A, B, E, F, G = 1 cm; Figs C, D, H = 5 mm.

structures observed. All measurements were taken from dried specimens.

HABITAT: A few thalli were collected from a rocky substratum in 15 m depth, at a semi-exposed shore.

LOCALITY: Porto Coufo, Sithonia, N. Aegean Sea, May 2012, coll. K. Tsiamis.

DISTRIBUTION: commonly met in the Mediterranean Sea (Ribera *et al.*, 1992) and widely reported from tropical and subtropical regions. In Greece, it has been reported previously from the S. Aegean Sea (Lazaridou, 1994) and the Ionian Sea (Schnetter & Schnetter, 1981).

NOTE: Due to the lack of reproductive structures and the small amount of material available, we report our record with reservations.

Padina di-tristromatica Ni-Ni-Win & H. Kawai (Dictyotales, Dictyotaceae)

DESCRIPTION: Thalli were erect, flabellate, brownish-whitish, to 8 cm high and 11 cm wide (Fig. 2E), arising from a small holdfast through a short stipe; thallus shal-

lowly to deeply split into fanshaped segments; calcification strong, particularly on the upper portions, alternation of calcified zones and uncalcified hair lines on both surfaces; margin entire; thallus composed of two cell layers at the margin, 40-70 μm thick, and a mixture of two and three cell layers in the lower portions, 75-120 μm thick; in the two layered parts cells of the upper side are twice as thick as those of the lower side, whereas in the three layered portions, all layers are equally thick; in surface view, cells rectangular, measuring 50-90 x 20-30 μm ; oogonial sori form either short lines or patches, adjacent to the hair lines, covered by a persistent indusium, clavate to obovate, measuring 130 x 85 μm . All measurements were taken from dried specimens.

HABITAT: A few thalli were found in the upper sublittoral zone on rocky substratum, of a semi-exposed shore.

LOCALITY: Vasiliki, Mesologhi, Ionian Sea, August 2012, coll. K. Tsiamis.

DISTRIBUTION: Italy and Turkey. In Greece, previously reported from Lesbos in the N. Aegean Sea (Ni-Ni-Win *et al.*, 2011).

Sporochnus pedunculatus (Hudson) C. Agardh (Sporochnales, Sporochnaceae)

DESCRIPTION: Thalli erect, slender, olive-brownish, rather soft in texture, terete, wiry, much branched, to 24 cm high, arising from a small holdfast (Fig. 2F); main axis distinct, 0,3 mm wide, branching spirally to irregularly to one order; axes with numerous lateral short branches of limited growth, clavate to pyriform, to 1 mm long and 0,1 mm wide, terminating to a dense tuft of pigmented hairs; hairs to 5 mm long, uniseriate, simple, each one 20-25 µm thick, with basal meristem; in cross section axis pseudoparenchymatous, consisting of large thick-walled colorless medullary cells, rounded or irregular, enclosed by 1-2 layers of small pigmented rounded cortical cells; in surface view cells longer than broad, rather rectangular, measuring 30-65 x 10-17 µm each and placed in longitudinal rows; no reproductive structures observed.

HABITAT: Thalli were commonly met in the sublittoral zone, in 10-30 m depth, epilithic to stones, pebbles and shells, during spring months.

LOCALITIES: MAVTO Lithari, Saronikos Gulf, S. Aegean Sea, April 2011, coll. K. Tsiamis; Tsohis, Korinthiakos Gulf, April 2011, coll. K. Tsiamis.

DISTRIBUTION: commonly met in the Mediterranean Sea (Ribera *et al.*, 1992) and in the North Atlantic Ocean. In Greece, it has been previously reported only from the N. Aegean Sea (Athanasiadis, 1987).

Taonia pseudociliata (J.V. Lamouroux) Nizamuddin & Godeh (Dictyotales, Dictyotaceae)

DESCRIPTION: Thalli membranous, brownish-greenish, erect, to 15 cm high (Fig. 2G), arising from a basal holdfast, 1,5 cm wide; branches flattened, 4 mm wide and 200 µm thick at the lower parts, tapering at the upper parts and terminating to a marginal row of apical cells; branches subdichotomously ramified, with characteristic spines along their margin, particularly at the upper parts (Fig. 2H); spines short and slender, to 1 mm long; in cross section branches composed of 3-4 layers of colourless medullary cells, rectangular to irregular, surrounded by smaller pigmented cortical cells; no sharp difference in size between medullary and cortical cells; in surface view cells elongated, measuring 60-110 x 13-18 µm; phaeophyceal hairs to 0,5 mm long and 16 µm wide, located on the upper thallus surfaces at rather regular concentric bands; tetrasporangia scattered on both surfaces, partially embedded on the thallus, rounded, to 100 µm in diameter.

HABITAT: Several thalli were met in the upper sublittoral zone, down to 2 m depth, on rocky substratum, during spring months.

LOCALITIES: Geras Gulf, Lesvos Isl., N. Aegean Sea, March 2009, coll. K. Tsiamis; Kalamos Bay, Evvoia Isl., N. Aegean Sea, April 2012, coll. K. Tsiamis; Porto Cou-

fo, Sithonia, N. Aegean Sea, May 2012, coll. K. Tsiamis.

DISTRIBUTION: Balearic Islands, Italy, Tunisia, Morocco and Turkey [Ribera *et al.*, 1992, as *Taonia atomaria* f. *ciliata* (Kützing) Nizamuddin]. Reported previously from the S. Aegean Sea by Nizamuddin [1981, as *T. atomaria* f. *ciliata* (C. Agardh) Nizamuddin].

Taxa pending confirmation of their presence

Asperococcus fistulosus (Hudson) W.J. Hooker
= *Ulva fistulosa* Hudson

= *Asperococcus echinatus* (Mertens ex Roth) C. Agardh
= *Solenia fuscata* Bory de Saint-Vincent (*nom. illeg.*)

Anagnostidis (1968) reported '*A. echinatus* (Mertens) Greville forma?' from the North Aegean, and Diapoulis (1983) '*A. echinatus* (Mertens) Hooker' from Saronikos Gulf. Previously, Bory (1832) had described *Solenia fuscata* from several localities in Peloponnese, including *Ulva fistulosa* Hudson in the list of synonyms and rendering *S. fuscata* a nomenclatural synonym. On the other hand, *S. fuscata* was included as a taxonomic synonym of *Scytosiphon lomentaria* by later authors (Agardh, 1848; Ardissonne, 1886-1887; De Toni, 1895). Because the two other Greek records also lack sufficient documentation, the occurrence of *A. fistulosus* is pending confirmation taking into account its frequent report from the Turkish coasts during the 1990s (Taskin *et al.*, 2008).

Botrytella micromora Bory de Saint-Vincent
= *Sorocarpus micromorus* (Bory de Saint-Vincent) P.C. Silva
= *Sorocarpus uvaeformis* (Lyngbye) Pringsheim

Athanasiadis (1987) excluded the record of Politis (1936, as *Sorocarpus uvaeformis* Pringsheim) from Attica, since this cold-temperate alga was not known elsewhere in the Mediterranean. *Botrytella micromora* was previously reported in the Ionian Sea by Haritonidis & Tsekos (1976) and Tsekos & Haritonidis (1977, as *Sorocarpus micromorus*), but without descriptions or illustrations. Since then, this North Atlantic-Arctic species has been reported from the strait of Dardanelles (Taskin, 2008, Fig. 2), where a second apparently introduced species of the genus was also found recently (Taskin & Pedersen, 2012).

Corynophloea flaccida (C. Agardh) Kützing
= *Leathesia flaccida* (C. Agardh) Endlicher

Corynophloea umbellata (C. Agardh) Kützing

There is both uncertainty and confusion surrounding the identity of these two taxa, and their relationship to the NE Atlantic *Microcoryne ocellata* Strömfelt. According to Agardh (1882), Kützing who transferred the species to *Corynophloea* attributed the identities inversely (Kützing, 1843, pl. 18 fig. 4; 1858, pl. 4 fig. 2). More-

Table 1. Accepted brown algal taxa in the North and South Aegean, and the Ionian Seas. For each taxon a basic reference is provided together with previously applied synonyms.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|---|---------------------------------------|----------------------------------|-----------------------------|
| <i>Acinetospora crinita</i> (Carmichael) Sauvageau = <i>Acinetospora vidovichii</i> (Meneghini) Sauvageau | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Arthrocladia villosa</i> (Hudson) Duby | Athanasiadis, 1987 | | |
| <i>Asperococcus bullosus</i> J.V. Lamouroux = <i>Asperococcus turneri</i> (Dillwyn ex J.E. Smith) W.J. Hooker | Athanasiadis, 1987 | Sartoni & De Biasi, 1999 | Schnetter & Schnetter, 1981 |
| <i>Choristocarpus tenellus</i> Zanardini | Athanasiadis, 1987 | Diapoulis, 1983 | |
| <i>Cladosiphon cylindricus</i> (Sauvageau) Kylin = <i>Castagnea cylindrica</i> Sauvageau | Panayotidis, 1979 | Diapoulis, 1983 | |
| <i>Cladosiphon irregularis</i> (Sauvageau) Kylin = <i>Castagnea irregularis</i> Sauvageau | Panayotidis, 1979 (with reservations) | Diapoulis, 1983 | |
| <i>Cladosiphon lubricus</i> (Sauvageau) Kylin = <i>Gontrania lubrica</i> Sauvageau | Athanasiadis, 1987 | | |
| <i>Cladosiphon mediterraneus</i> Kützing = <i>Castagnea fistulosa</i> (Zanardini) Derbès & Solier | Athanasiadis, 1987 | Gerloff & Geissler, 1974 | Schnetter & Schnetter, 1981 |
| <i>Cladostephus spongiosum</i> (Hudson) C. Agardh = <i>Cladostephus hedwigoides</i> Bory de Saint-Vincent, <i>Cladostephus verticillatum</i> Auktorum | Athanasiadis, 1987 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Colpomenia peregrina</i> Sauvageau | Orfanidis, 1992 | Catra & Giardina, 2009 | Tsirika & Haritonidis, 2005 |
| <i>Colpomenia sinuosa</i> (Mertens in Roth) Derbès & Solier | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Culertia adpersa</i> (Mertens in Roth) De Notaris = <i>Aglaozonia melanoidea</i> Sauvageau (<i>nom. inval.</i>) | Athanasiadis, 1987 | | |
| <i>Culertia chilosa</i> (Falkenberg) P.C. Silva | Nikolaidis & Haritonidis, 1990 | Diannelidis <i>et al.</i> , 1977 | Schnetter & Schnetter, 1981 |
| <i>Culertia multifida</i> (Turner) Greville = <i>Aglaozonia parvula</i> (Greville) Zanardini, <i>Dicyota multifida</i> (J.E. Smith) Bory de Saint-Vincent | | Lazaridou, 1994 | |
| <i>Cystoseira amentacea</i> (C. Agardh) Bory de Saint-Vincent var. <i>amentacea</i> | | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| <i>Cystoseira amentacea</i> var. <i>stricta</i> Montagne = <i>Cystoseira spicata</i> Ercegović, <i>C. stricta</i> (Montagne) Sauvageau | Huvé, 1972 | | |
| <i>Cystoseira barbata</i> (Stackhouse) C. Agardh var. <i>barbata</i> | Tsekos <i>et al.</i> , 1982 | Diannelidis <i>et al.</i> , 1977 | Schnetter & Schnetter, 1981 |
| <i>Cystoseira barbatula</i> Kützing <i>emend.</i> Cormaci, G. Furnari & Giaccone = <i>Cystoseira graeca</i> Schiffner ex Gerloff & Nizamuddin | Athanasiadis, 1987 | Diannelidis <i>et al.</i> , 1977 | Schnetter & Schnetter, 1981 |
| <i>Cystoseira brachycarpa</i> J. Agardh <i>emend.</i> Giaccone var. <i>brachycarpa</i> = <i>Cystoseira brachycarpa</i> var. <i>balearica</i> (Sauvageau) Giaccone, <i>C. caespitosa</i> Sauvageau | Gerloff & Nizamuddin, 1975 | Gerloff & Nizamuddin, 1975 | Tsirika & Haritonidis, 2005 |
| | | Catra & Giardina, 2009 | (continued) |

(continued) Table 1.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|---|---|---|---|
| <i>Cystoseira compressa</i> (Esper) Gerloff & Nizamuddin f. <i>compressa</i> = <i>Cystoseira filicina</i> Bory de Saint-Vincent, <i>Cystoseira fimbriata</i> Bory de Saint-Vincent | Athnasiadis, 1987 | Diannelidis <i>et al.</i> , 1977 present study | Schnetter & Schnetter, 1981 |
| <i>Cystoseira compressa</i> f. <i>plana</i> (Ercegović) Cormaci, G. Furnari, Giaccone, Scammacca & Serio | | | |
| <i>Cystoseira corniculata</i> (Turner) Zanardini = <i>Cystoseira corniculata</i> subsp. <i>laxior</i> Ercegović, <i>C. ericoides</i> var. <i>densa</i> C. Agardh | Athnasiadis, 1987 Anagnostidis, 1968 Athnasiadis, 1987 Athnasiadis, 1987 | Diapoulis, 1983 Huvé, 1972 Lazaridou, 1994 Giaccone, 1968a | Giaccone, 1968b Diapoulis & Haritonidis, 1987a |
| <i>Cystoseira crinita</i> Duby f. <i>crinita</i> | Anagnostidis, 1968 | Huvé, 1972 | Diapoulis & Haritonidis, 1987a |
| <i>Cystoseira crinitophylla</i> Ercegović | Athnasiadis, 1987 | Lazaridou, 1994 | |
| <i>Cystoseira dubia</i> Valiante = <i>Cystoseira fucoides</i> Ercegović | Athnasiadis, 1987 | Giaccone, 1968a | Giaccone, 1968b |
| <i>Cystoseira elegans</i> Sauvageau | Haritonidis & Tsekos, 1975 | Catra & Giardina, 2009 | Tsirika & Haritonidis, 2005 |
| <i>Cystoseira foeniculacea</i> (Linnaeus) Greville f. <i>foeniculacea</i> = <i>Cystoseira abrotanifolia</i> (Linnaeus) C. Agardh, <i>C. discors</i> (Linnaeus) C. Agardh, <i>C. elata</i> Kützting, <i>C. ercegovicii</i> Giaccone | Athnasiadis, 1987 | Nizamuddin & Lehnberg, 1970 | Tsirika & Haritonidis, 2005 |
| <i>Cystoseira foeniculacea</i> f. <i>latiramosa</i> (Ercegović) Gómez Garreta, Barceló, Ribera & Rull Lluch = <i>Cystoseira discors</i> subsp. <i>latiramosa</i> Ercegović, <i>C. schiffneri</i> Hamel f. <i>latiramosa</i> (Ercegović) Giaccone | Chrysosvergis, 1995 | Sartoni & De Biasi, 1999 | |
| <i>Cystoseira foeniculacea</i> f. <i>tenuiramosa</i> (Ercegović) Gómez Garreta, Barceló, Ribera & Rull Lluch = <i>Cystoseira discors</i> f. <i>tenuiramosa</i> Ercegović, <i>C. ercegovicii</i> f. <i>tenuiramosa</i> (Ercegović) Giaccone, <i>C. schiffneri</i> f. <i>tenuiramosa</i> (Ercegović) Giaccone | present study | Giaccone, 1968a | present study |
| <i>Cystoseira humilis</i> Schousboe ex Kützting = <i>Cystoseira planiramea</i> Schiffner ex Gerloff & Nizamuddin* | Gerloff & Nizamuddin, 1975 | Catra & Giardina, 2009 | |
| <i>Cystoseira mediterranea</i> Sauvageau | Tsekos <i>et al.</i> , 1982 | Diannelidis <i>et al.</i> , 1977 | Diapoulis & Haritonidis, 1987a |
| <i>Cystoseira sauvageauana</i> Hamel | Diannelidis, 1953 | Diannelidis, 1950 | |
| <i>Cystoseira spinosa</i> Sauvageau var. <i>spinosa</i> = <i>Cystoseira adriatica</i> Sauvageau subsp. <i>adriatica</i> | Athnasiadis, 1987 | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |

(continued)

(continued) Table 1.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|--|-------------------------------|----------------------------------|-----------------------------|
| <i>Cystoseira spinosa</i> var. <i>compressa</i> (Ercegović) Cormaci, G. Furnari, Giaccone, Scammacca & Serio | Huvé, 1972 | Huvé, 1972 | |
| = <i>Cystoseira platyramosa</i> Ercegović | | | |
| <i>Cystoseira spinosa</i> var. <i>tenuor</i> (Ercegović) Cormaci, G. Furnari, Giaccone, Scammacca & Serio | Gerloff & Nizamuddin, 1975 | Gerloff & Nizamuddin, 1975 | |
| = <i>Cystoseira rechingeri</i> Schiffner ex Gerloff & Nizamuddin | | | |
| <i>Cystoseira susanensis</i> Nizamuddin | Tsiamis <i>et al.</i> , 2010a | | |
| <i>Cystoseira zosterooides</i> C. Agardh | Haritonidis & Tsekos, 1974 | Huvé, 1972 | Malea <i>et al.</i> , 1995 |
| = <i>Cystoseira opuntiooides</i> Bory de Saint-Vincent ex Montagne | | | |
| <i>Diclyopteris lucida</i> Ribera Siguan, Gómez Garreta, Pérez Ruzafa, Barceló Martí & Rull Luch | | Tsiamis <i>et al.</i> , 2010a | |
| <i>Diclyopteris polyptodioides</i> (De Candolle) J.V. Lamouroux | | | |
| = <i>Diclyopteris membranacea</i> (Stackhouse) Batters, | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Haliseris polyptodioides</i> (De Candolle) C. Agardh | | | |
| <i>Diclyota dichotoma</i> (Hudson) J.V. Lamouroux var. <i>dichotoma</i> | Athanasiadis, 1987 | Diapoulis, 1983 | Tsirika & Haritonidis, 2005 |
| <i>Diclyota dichotoma</i> var. <i>intricata</i> (C. Agardh) Greville, | | | |
| = <i>D. implexa</i> (Desfontaines) Lamouroux, | | | |
| <i>D. dichotoma</i> var. <i>implexa</i> (Desfontaines) S.F. Gray, | Athanasiadis, 1987 | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| <i>D. dichotoma</i> f. <i>implexa</i> (Desfontaines) Hauck | | | |
| <i>Diclyota fasciola</i> (Roth) J.V. Lamouroux var. <i>fasciola</i> | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| = <i>Dilophus fasciola</i> (Roth) M. Howe | | | |
| <i>Diclyota fasciola</i> var. <i>repens</i> (J. Agardh) Ardissonne | | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| = <i>Dilophus repens</i> (J. Agardh) J. Agardh | | | |
| <i>Diclyota linearis</i> (C. Agardh) Greville | Athanasiadis, 1987 | Diannelidis <i>et al.</i> , 1977 | Bitis 1988 |
| = <i>Diclyota linearis</i> f. <i>divaricata</i> Kützing (<i>nom. inval.</i>) | | | |
| <i>Diclyota mediterranea</i> (Schiffner) G. Furnari | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| = <i>Dilophus mediterraneus</i> Schiffner | | | |
| <i>Diclyota spiralis</i> Montagne | | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| = <i>Dilophus ligulatus</i> (Kützing) J. Feldmann, | Anagnostidis, 1968 | | |
| <i>Dilophus spiralis</i> (Montagne) Hamel | | | |
| <i>Discosporangium mesarhrocarpum</i> (Meneghini) Hauck | | Catra & Giardina, 2009 | Tsirika & Haritonidis, 2005 |
| <i>Ectocarpus fasciculatus</i> Harvey | | | Schnetter & Schnetter, 1981 |
| <i>Ectocarpus siliiculosus</i> (Dillwyn) Lyngbye var. <i>siliiculosus</i> | | | |
| = <i>Ectocarpus confervoides</i> Le Jolis var. <i>confervoides</i> , | | | |
| <i>E. confervoides</i> var. <i>siliiculosus</i> (Dillwyn) Farlow | Anagnostidis, 1968 | Diapoulis, 1983 | Tsirika & Haritonidis, 2005 |

(continued)

(continued) Table 1.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|---|--|----------------------------------|--------------------------------|
| <i>Ectocarpus siliculosus</i> var. <i>arectus</i> (Kützing) Gallardo = <i>Ectocarpus arectus</i> Kützing, <i>E. confervoides</i> f. <i>arectus</i> (Kützing) Kjellman | Athanasiadis, 1987 | Diannelidis <i>et al.</i> , 1977 | Schnetter & Schnetter, 1981 |
| <i>Ectocarpus siliculosus</i> var. <i>penicillatus</i> C. Agardh = <i>Ectocarpus penicillatus</i> (C. Agardh) Kjellman | Anagnostidis, 1968 (with reservations) Athanasiadis, 1987 | | Tsirika & Haritonidis, 2005 |
| <i>Elachista intermedia</i> P.L. Crouan & H.M. Crouan | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Elachista jabukae</i> Ereegovič var. <i>mediterranea</i> (G. Furnari) Cormaci & G. Furnari = <i>Elachista neglecta</i> Kuckuck (<i>nom. illeg.</i>) | Chrysovergis, 1995 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Feldmannia irregularis</i> (Kützing) Hamel | Chrysovergis, 1995 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Feldmannia paradoxa</i> (Montagne) Hamel var. <i>paradoxa</i> = <i>Ectocarpus paradoxus</i> Montagne, <i>Feldmannia globifera</i> (Kützing) Hamel | Chrysovergis, 1995 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Feldmannia paradoxa</i> var. <i>caespitula</i> (J. Agardh) Cormaci & G. Furnari = <i>Feldmannia caespitula</i> (J. Agardh) Knoepffler-Péguy | Chrysovergis, 1995 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Giraudia sphaecelarioides</i> Derbès & Solier | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Halopteris filicina</i> (Grateloup) Kützing | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Halopteris scoparia</i> (Linnaeus) Sauvageau = <i>Sypocaulon scoparium</i> (Linnaeus) Kützing | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Herponema graniferum</i> Kuckuck | Kuckuck, 1956 | | |
| <i>Hincksia mitchelliae</i> (Harvey) P.C. Silva = <i>Giffordia mitchelliae</i> (Harvey) Hamel | Haritonidis, 1978 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Hincksia sandriana</i> (Zanardini) P.C. Silva = <i>Giffordia sandriana</i> (Zanardini) Hamel | Chrysovergis, 1995 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Hydroclathrus clathratus</i> (Bory ex C. Agardh) M. Howe | Athanasiadis, 1987 | Diapoulis, 1983 | Bitis 1988 |
| <i>Kuckuckia spinosa</i> (Kützing) Kornmann | Kuckuck, 1958 | Diapoulis, 1983 | Diapoulis & Haritonidis, 1987a |
| <i>Kuetzingiella battersii</i> (Bornet ex Sauvageau) Kornmann | present study (with reservations, see Annex 1) | Catra & Giardina, 2009 | |
| <i>Lobophora variegata</i> (J.V. Lamouroux) Womersley ex E.C. Oliveira | | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Mesogloia lanosa</i> P.L. Crouan & H.M. Crouan | Athanasiadis, 1987 | | |
| <i>Mesogloia leveillei</i> (J. Agardh) Meneghini = <i>Liebmannia leveillei</i> J. Agardh | Athanasiadis, 1987 | Schiffner & Schussmig, 1943 | Schnetter & Schnetter, 1981 |
| <i>Myriactula rigida</i> (Sauvageau) Hamel | Athanasiadis, 1987 | | (continued) |

(continued) Table 1.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|---|--------------------------------|--|-----------------------------|
| <i>Myriactula rivulariae</i> (Suhr) J. Feldmann = <i>Elachista pulvinata</i> (Kützting) Harvey | Athanasiadis, 1987 | Giaccone, 1968a | Haritonidis & Tsekos, 1976 |
| <i>Myriactula stellulata</i> (Harvey) Levring | | Catra & Giardina, 2009 | |
| <i>Myrionema liechtensternii</i> Hauck | Athanasiadis, 1987 | Catra & Giardina, 2009 | |
| <i>Myrionema orbiculare</i> J. Agardh | Chrysosvegis, 1995 | Catra & Giardina, 2009 | |
| <i>Myrionema strangulans</i> Greville = <i>Myrionema vulgare</i> Thuret | Anagnostidis, 1968 | Catra & Giardina, 2009 | |
| <i>Myriotrichia adriatica</i> Hauck | Athanasiadis, 1987 | | |
| <i>Myriotrichia claviformis</i> Harvey = <i>Sireblonema sphaericum</i> (Derbès & Solier) Thuret | Athanasiadis, 1987 | | |
| <i>Myriotrichia protasperococcus</i> Berthold ex Kuckuck | Athanasiadis, 1987 | | |
| <i>Myriotrichia repens</i> Hauck | Athanasiadis, 1987 | | |
| <i>Nemacystus flexuosus</i> (C. Agardh) Kylin var. <i>giraudyi</i> (J. Agardh) De Jong = <i>Nemacystus ramulosus</i> Derbès & Solier | Athanasiadis, 1987 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Nereia filiformis</i> (J. Agardh) Zanardini | Athanasiadis, 1987 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Padina di-tristromatica</i> Ni-Ni-Win & Kawai | Ni-Ni-Win <i>et al.</i> , 2011 | | present study |
| <i>Padina pavonica</i> (Linnaeus) Thivy = <i>Padina mediterranea</i> Bory de Saint-Vincent, <i>Padina pavonia</i> (Linnaeus) J.V. Lamouroux | Athanasiadis, 1987 | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| <i>Petalonia fasciata</i> (O.F. Müller) Kuntze = <i>Ralfsia clavata</i> (Carmichael ex Harvey) P.L. Crouan & H.M. Crouan ** | Athanasiadis, 1987 | Politis, 1932 | |
| <i>Pseudolithoderma adriaticum</i> (Hauck) M. Verlaque = <i>Lithoderma adriaticum</i> Hauck | Athanasiadis, 1987 | Diapoulis, 1983 | |
| <i>Punctaria tenuissima</i> (C. Agardh) Greville = <i>Punctaria latifolia</i> Greville *** | Athanasiadis, 1987 | | Schnetter & Schnetter, 1981 |
| <i>Ralfsia verrucosa</i> (Areschoug) Areschoug | Athanasiadis, 1987 | Catra & Giardina, 2009 | Schnetter & Schnetter, 1981 |
| <i>Sargassum acinarium</i> (Linnaeus) Setchell = <i>Sargassum linifolium</i> C. Agardh | Athanasiadis, 1987 | Diannelidis <i>et al.</i> , 1977 | Schnetter & Schnetter, 1981 |
| <i>Sargassum hornschiehii</i> C. Agardh = <i>Sargassum amigdalifolium</i> Bory | Haritonidis, 1978 | Diannelidis <i>et al.</i> , 1977 | Haritonidis & Tsekos, 1976 |
| <i>Sargassum trichocarpum</i> J. Agardh = <i>Sargassum boryanum</i> Montagne | Athanasiadis, 1987 | Nizamuddin & Lehnberg, 1970 (with reservations) | (continued) |

(continued) Table 1.

| Taxa | North Aegean | South Aegean | Ionian Sea |
|--|------------------------------|--------------------------------|-------------------------------|
| <i>Sargassum vulgare</i> C. Agardh (<i>nom. illeg.</i>) = <i>Sargassum vulgare</i> var. <i>megaloophyllum</i> (Montagne) Grunow ex Bornet | Athanasiadis, 1987 | Catra & Giardina, 2009 | Schnetter & Schnetter, 1981 |
| <i>Scytosiphon lomentaria</i> (Lyngbye) Link = <i>Scytosiphon simplicissimus</i> (Clemente) Cremades, <i>Microspogium gelatinosum</i> Reinke | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Spatoglossum solieri</i> (Chauvin ex Montagne) Kützing | | Sartoni & De Biasi, 1999 | |
| <i>Spermatocchnus paradoxus</i> (Roth) Kützing | | Giaccone, 1968a | Giaccone, 1968b |
| <i>Sphacelaria cirrosa</i> (Roth) C. Agardh | Athanasiadis, 1987 | Diapoulis, 1983 | Tsirika & Haritonidis, 2005 |
| = <i>Sphacelaria cirrosa</i> var. <i>irregularis</i> (Kützing) Hauck, <i>Sphacelaria hystrix</i> Suhr ex Reinke | Chryssovergis, 1995 | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| <i>Sphacelaria fusca</i> (Hudson) S.F. Gray | Athanasiadis, 1987 | Lazaridou, 1994 | Tsirika & Haritonidis, 2005 |
| <i>Sphacelaria plumula</i> Zanardini | Chryssovergis, 1995 | Diapoulis & Haritonidis, 1987b | Schnetter and Schnetter, 1981 |
| <i>Sphacelaria rigidula</i> Kützing = <i>Sphacelaria furcigera</i> Kützing | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter and Schnetter, 1981 |
| <i>Sphacelaria tribuloides</i> Meneghini | Athanasiadis, 1987 | present study | present study |
| <i>Sporocchnus pedunculatus</i> (Hudson) C. Agardh | | | |
| <i>Stictyosiphon adriaticus</i> Kützing | Tsekos <i>et al.</i> , 1982 | | |
| <i>Stilophora tenella</i> (Esper) P.C. Silva = <i>Stilophora rhizodes</i> (Turner) J. Agardh (<i>nom. illeg.</i>), <i>S. rhizodes</i> var. <i>adriatica</i> J. Agardh*** | Athanasiadis, 1987 | Diapoulis, 1983 | Schnetter & Schnetter, 1981 |
| <i>Siriaria attenuata</i> (Greville) Greville | Haritonidis, 1978 | Giaccone, 1968a | Schnetter & Schnetter, 1981 |
| <i>Stypopodium schimperi</i> (Buchinger ex Kützing) M. Verlaque & Boudouresque | Katsanevakis & Tsiamis, 2009 | Sartoni & De Biasi, 1999 | Tsiamis <i>et al.</i> , 2010b |
| <i>Taonia atomaria</i> (Woodward) J. Agardh = <i>Padina phasiana</i> Bory de Saint-Vincent (<i>nom. illeg.</i>) | Athanasiadis, 1987 | Lazaridou, 1994 | Schnetter & Schnetter, 1981 |
| <i>Taonia pseudociliata</i> (J.V. Lamouroux) Nizamuddin & Godeh = <i>Taonia atomaria</i> f. <i>ciliata</i> (C. Agardh) Nizamuddin | present study | Nizamuddin, 1981 | |
| <i>Zanardinia typus</i> (Nardo) P.C. Silva = <i>Zanardinia collaris</i> Auktorum, <i>Z. prototypus</i> (Nardo) Zanardini (<i>nom. illeg.</i>) | Athanasiadis, 1987 | Sartoni & De Biasi, 1999 | Schnetter & Schnetter, 1981 |
| <i>Zonaria tournefortii</i> (J.V. Lamouroux) Montagne = <i>Zonaria flava</i> C. Agardh | | Lazaridou, 1994 | Giaccone, 1968b |

* Synonymy follows Taskin *et al.* (2012). Cormaci *et al.* (2012) consider *C. planiramea* as a taxon *inquirendum*.

** Sporophyte of *Petalonia fascia* (see Cormaci *et al.*, 2012).

*** Synonymy follows Cormaci *et al.* (2012).

over, Agardh (1882) recognized *C. flaccida* (= *C. umbellata sensu* Kützing) as a species of *Elachista* Duby. De Toni (1895) accepted Agardh's correction, but further transferred the species to the genus *Myriactis* Kützing (= *Myriactula* Kuntze). Regarding *C. umbellata*, Agardh (1882) proposed an emended description (including Kützing's concept of *C. flaccida*), and this opinion was also accepted by De Toni (1895). Kuckuck (1929) and Hamel (1935) reversed the situation again (favoring Kützing), maintaining the name *C. flaccida* for the alga with long assimilatory filaments and the name *C. umbellata* for the alga with short ones. Clarification must await re-examination of Agardh's original material from the Adriatic Sea. It could be added that further confusion was generated with the illustration of *Microcoryne ocellata* in Kuckuck (1929, fig. 53) - correctly identified by both Nienburg and Kylin. This illustration was cited by Hamel (1935) as representative of *C. flaccida*, but the material was apparently collected on the Swedish west coast (Kylin 1947, fig. 45) where neither Kylin nor later authors ever reported *C. flaccida* (or *C. umbellata*).

In Greece, *C. flaccida* was reported from Naxos Island by Schiffner & Schussnig (1943, as *Leathesia flaccida*). Athanasiadis (1987) excluded the species from the Aegean flora, due to its obscure status. Subsequently, *C. flaccida* was reported from Maliakos in the N. Aegean (Chryssovergis, 1995), while *C. umbellata* was reported both from Maliakos (Chryssovergis, 1995) and Karpavos (Catra & Giardina, 2009). Since, no taxonomic descriptions or illustrations were given in the latter studies; we maintain *C. flaccida* and *C. umbellata* as taxa pending documented records that should include a study of type material.

Cystoseira abies-marina (S.G. Gmelin) C. Agardh

The single record from the Ionian Islands (Greville 1827) is pending confirmation, like other sporadic records of this species in the Mediterranean Sea (Ribera *et al.*, 1992, note 34).

Cystoseira foeniculacea* f. *schiffneri (Hamel) Gómez Garreta, Barceló, Ribera & Rull Lluh
= *Cystoseira schiffneri* Hamel

This rather rare infraspecific taxon has been reported in Greece only by Chryssovergis (1995) from Maliakos Gulf (as *C. schiffneri* Hamel). Since neither a description nor illustrations were provided, the occurrence of this entity in Greece needs to be confirmed.

Cystoseira humilis* var. *myriophylloides (Sauvageau) J.H. Price & D.M. John
= *Cystoseira myriophylloides* Sauvageau

The records of *C. myriophylloides* from the Ionian and N. Aegean Seas (Tsekos & Haritonidis, 1977; Tsekos *et al.*, 1982) were considered as probable misidentifica-

tions, since this taxon occurs only in the Atlantic Ocean (Athanasiadis, 1987). Similarly, Ribera *et al.* (1992) pointed out that the presence of this entity in the Mediterranean Sea is uncertain. More recently, Taskin *et al.* (2012) recorded *C. humilis* var. *myriophylloides* from the Adriatic, Tunisia and Italy. In our opinion, the Greek records should be treated as debatable, pending documentation.

Cystoseira nodicaulis (Withering) M. Roberts
= *Cystoseira granulata* Auktorum

The single record from the Ionian Islands (Greville 1827, as *C. granulata* C. Ag.) is pending confirmation, as there are no other reports of this species from the eastern Mediterranean Sea (Ribera *et al.*, 1992; Gómez Garreta *et al.*, 2001b).

Cystoseira squarrosa De Notaris

This rare Mediterranean endemic has been reported from various localities in the Aegean and Ionian Seas (Gerloff & Geissler, 1974; Haritonidis & Tsekos, 1976; Tsekos *et al.*, 1982). Nevertheless, Alongi *et al.* (2002) reported that the only herbarium specimens from Greece (Attica), located at the Riksherbarium in Stockholm and labelled as *C. squarrosa*, belonged to *C. corniculata*. As the above records lack sufficient documentation, they are debatable pending new information. It could be added that *C. squarrosa* has been considered as a variety of *C. spinosa* in the past (Giaccone & Bruni, 1973).

Cystoseira tamariscifolia (Hudson) Papenfuss
= *C. ericoides* (Linnaeus) C. Agardh
= *C. selaginoides* Auktorum

This species was excluded from the Aegean flora (Athanasiadis, 1987), since its distribution was documented only in the eastern Atlantic Ocean and the western Mediterranean basin (Roberts, 1970). There are only some old records of the species from Crete (Raulin, 1869, as *C. ericoides* Turner; Diannelidis, 1950), the N. Aegean (Anagnostidis, 1968, as *C. ericoides*, with reservations) and Peloponnese (Bory, 1832, as *C. selaginoides* Bory) – the last record ‘...believed by Sauvageau... to refer either to *C. stricta*... or to *C. mediterranea*...’ (Roberts, 1970). Nevertheless, *Cystoseira tamariscifolia* has been recently reported from the Sea of Marmara (Taskin *et al.*, 2008). Therefore, in our opinion, the Greek records should be treated as debatable, pending new documented reports.

Leathesia mucosa J. Feldmann

The single record by Athanasiadis (1987) from Sifonia was provided with reservations. Pending confirmation, *L. mucosa* should be referred as debatable for the Greek flora.

Padina tenuis Bory de Saint-Vincent

Nizamuddin (1981) reported *P. tenuis* from several localities in the South Aegean Sea and other Mediterranean regions, providing a description and illustrations. Yet, on the basis of this information, Ni-Ni-Win *et al.* (2011) questioned the presence of this Indo-Pacific species in the Mediterranean suggesting that Nizamuddin's records might be misidentifications of *P. boergesenii* Al-lender & Kraft from the Central Atlantic. As we have not re-examined the Greek material of Nizamuddin, we consider his records as debatable, pending confirmation.

Pylaiella littoralis (Linnaeus) Kjellman

This species has been reported from Chalkidiki by Anagnostidis (1968, with reservations) and from Cephalonia Island by Schnetter & Schnetter (1981), but without a description or illustrations. Thus, the occurrence of *P. littoralis* in Greece needs to be confirmed.

Saccorhiza polyschides (Lightfoot) Batters

This large brown alga has been reported only once from Greece, collected by Chaubard & Bory (1838) in Chios Island. Whether it was dredged or found in the drift is unknown (Athanasiadis, 1987). Since *S. polyschides* has been found in Italy (Ribera *et al.*, 1992) its occurrence in Greece should not be ruled out.

Sargassum flavifolium Kützinger

This Atlantic species has been sporadically recorded in the Mediterranean, from Tunisia, Corsica, and Sicily (Gómez Garreta *et al.*, 2001b). It has also been reported from two sites in Chios Island (Tsekos *et al.*, 1982) but without a description or illustrations and hence its occurrence in the Aegean needs to be confirmed.

Sauvageaugloia griffithsiana (Greville *ex* W.J. Hooker) Hamel *ex* Kylin

This species was also reported once from the Island of Skiros (Tsekos *et al.*, 1982), but without a description or illustrations and hence its occurrence in the North Aegean needs to be confirmed.

Spongonema tomentosum (Hudson) Kützinger
= *Ectocarpus tomentosus* (Hudson) Lyngbye

The single record of this cold-temperate species from Pagasitikos in the North Aegean (Diannelidis 1935, as *Ectocarpus tomentosus*) lacks documentation and was excluded by Athanasiadis (1987), who noted the absence of other Mediterranean records. Since then *S. tomentosum* was reported from Italy and Turkey (Taskin *et al.*, 2008; Cormaci *et al.*, 2012) and hence, Diannelidis's record should be treated as debatable.

Taxa Excludenda

Chaetopteris plumosa (Lyngbye) Kützinger

The scarce Mediterranean records of this boreal species from Naples by Berthold, Dalmatia by Meneghini and the North Aegean (Haritonidis & Tsekos, 1974; Haritonidis, 1978) were treated either as misidentifications of *Sphacelaria plumula* (Funk, 1927, 1955; Prud'homme van Reine, 1982) or doubtful (Athanasiadis, 1987). Hence the species has been formally excluded from the Mediterranean flora (Ribera *et al.* 1992; Cormaci *et al.* 2012).

Chorda filum (Linnaeus) Stackhouse

Candargy (1899) reported this boreal species from the Island of Lesvos in the North Aegean. Hamel (1938) mentioned a specimen in herbarium Thuret, collected at Nice (France) during the 19th century, but did not include this material in the distribution of the species accepting the find as 'accidentelle'. More recently, *C. filum* was found by Ben Maiz *et al.* (1988) at Thau lagoon (France), where it was considered as an introduction through mollusc culture (Cormaci *et al.*, 2004). Since there are no later records of this species from the eastern Mediterranean, we agree with Athanasiadis (1987) that the single record from Lesvos should be considered as a misidentification and hence the species should be excluded from the Greek flora.

Cystoseira baccata (S.G. Gmelin) P.C. Silva

The only Mediterranean records of *C. baccata* originate from Greece, reported by Haritonidis & Tsekos (1976), Tsekos & Haritonidis (1977) and Tsekos *et al.* (1982) from localities both in the Ionian and the Aegean Seas. In our opinion, these records are misidentifications, since this species is restricted to the Atlantic Ocean (Ribera *et al.*, 1992; Gómez Garreta *et al.*, 2001b).

Dictyosiphon foeniculaceus (Hudson) Greville
= *Scytosiphon foeniculaceus* (Hudson) C. Agardh

The records from the Ionian Islands (Greville 1827, as *Scytosiphon foeniculaceus*) and the North Aegean Sea (Petkoff, 1943) should be excluded from the Greek flora since this species does not occur elsewhere in the Mediterranean Sea.

Ectocarpus reptans P.L. & H.M. Crouan

The single record of this taxon by Diannelidis (1953) was excluded by Athanasiadis (1987) based on the description provided, which let to suppose a misidentification. It could be noted that thalli resembling *E. reptans* are involved in the life history of species of *Asperococcus* Lamouroux.

Halidrys siliquosa (Linnaeus) Lyngbye

This North Atlantic brown alga does not occur in the Mediterranean Sea and the Aegean records by Haritonidis & Tsekos (1974) and Diannelidis *et al.* (1977) are probably misidentifications of large thalli of *Cystoseira compressa*.

Isthmoplea sphaerophora (Carmichael *ex* Harvey) Kjellman *ex* Gobi

This cold-temperate species does not occur in the Mediterranean Sea and the single record by Anagnostidis (1968) should be considered as doubtful probably based on a misidentification (Athanasiadis, 1987).

Protohalopteris radicans (Dillwyn) Draisma, Prud'homme & Kawai

The single record by Giaccone (1968a, as *Sphacelaria radicans* Harvey) is probably a misidentification, since this cold-temperate species does not occur in the Mediterranean Sea (Athanasiadis, 1987).

Sargassum ilicifolium (Turner) C. Agardh

The single record by Candargy (1899) from Lesbos Island is probably a misidentification as this Indo-Pacific species does not occur in the Mediterranean Sea (Athanasiadis, 1987).

Sargassum pallidum (Turner) C. Agardh

The single record from the Ionian Islands (Greville, 1827) should be considered as a misidentification, as this Pacific species is not known to occur in the Mediterranean Sea.

Sphacelorbis nanus (Nägeli *ex* Kützing) Draisma, Prud'homme & Kawai
= *Sphacelaria saxatilis* (Kuckuck) Sauvageau

The single record of this boreal species from the North Aegean by Anagnostidis (1968, as *S. saxatilis*) is doubtful and probably based on a misidentification (Athanasiadis, 1987), like previous Mediterranean records from the Adriatic Sea (Prud'homme *van* Reine, 1982). It could be added that sterile specimens of *S. nanus* are similar in morphology to *Sphacelaria rigidula* (Prud'homme *van* Reine, 1982) and the older Mediterranean records could instead refer to the latter species (Cormaci *et al.*, 2012), which occurs in Greece.

Taxa inquirenda

Cystoseira erica-marina Lamouroux *ex* Bory de Saint-Vincent (*nom. illeg.*)

Bory (1832) described this species from Cape Tenaron in Peloponnese and 'quelques points de l'Archipel',

creating simultaneously a later homonym of *Cystoseira erica-marina* (S.G. Gmelin) Naccari. Sauvageau associated Bory's material with *Cystoseira spinosa* (Athanasiadis, 1987) but a type element has not been selected. It should be added that '*Cystoseira erica-marina* (Wulf.) Zan.' also exists in the older Greek literature (e.g. Diannelidis, 1950) and this record has been referred to *C. corniculata* by Gerloff & Geissler (1974).

Cystoseira montagnei J. Agardh

The taxonomic status of this species remains unclarified (Cormaci *et al.*, 2012; Taskin *et al.*, 2012), and hence no type element has been selected. There are several records of *C. montagnei* from various localities in the Aegean and the Ionian Seas (Haritonidis & Tsekos, 1974; Diannelidis *et al.*, 1977; Haritonidis, 1978; Tsekos *et al.*, 1982), but in the absence of descriptions or illustrations the identity of the material is unknown.

Cystoseira montagnei* var. *moniliformis (Kützing) Hauck

Haritonidis & Tsekos (1974) reported from Thasos Island '*Cystoseira montagnei* var. *moniliformis* J. Agardh' presumably referring to *C. montagnei* var. *moniliformis* (Kützing) Hauck. The latter taxon is based on *Phyllacantha moniliformis* Kützing, which is described from Tenerife and according to the older literature is a synonym of *C. abies-marina* (S.G. Gmelin) C. Agardh (Agardh, 1848; De Toni, 1895). Because a type of *Phyllacantha moniliformis* has not been selected and the occurrence of *C. abies-marina* in the Mediterranean 'needs to be confirmed' (Ribera *et al.* 1992, note 34), we maintain the Greek record of *C. montagnei* var. *moniliformis* within the list of *taxa inquirenda*.

Dictyopteris tripolitana Nizamuddin

Nizamuddin (1981) described this species from collections from various locations in the Mediterranean Sea, including Attica, Crete and Egina Island in the South Aegean Sea. The taxonomic status of *D. tripolitana* was, however, questioned by subsequent authors (Athanasiadis, 1987; Ribera *et al.*, 1992; Cormaci *et al.*, 2012) based on the lack of sufficient documentation. Since no further evidence of this species has been provided until today, we consider it as a *taxon inquirendum* for the Mediterranean flora.

Phyllacantha affinis Kützing

Grunow (1861) reported this taxon from Kithira in the Ionian Sea, and Gerloff & Geissler (1974) treated the record as uncertain, pending correct identification. In the older literature (Agardh, 1848; De Toni, 1895), *P. affinis* is considered to be a synonym of *C. montagnei*, but a type element remains to be selected.

***Sargassum diversifolium* (Turner) C. Agardh**

This taxon was reported by Bory (1832) from the Island of Sapience and Cape Tenaron in southern Peloponnese. Later Grunow (1916) recognized Bory's material to belong to a distinct entity, which he described as *S. salicifolium* f. *diversifolium* Grunow - citing Turner's *Fucus diversifolius* (with questionmark) within the form range of *S. vulgare*. None of these taxa is typified, while the provenance of *F. diversifolius* Turner ('Shores of Egypt') has not been clarified.

***Sargassum obtusatum* Bory de Saint-Vincent**

Originally described from Modon and Navarino in the western Peloponnese (Bory, 1832), this taxon was most recently recognized as a variety of *Sargassum salicifolium* (J. Agardh) J. Agardh by Grunow (1916). Its taxonomic status is pending typification.

***Sargassum salicifolium* Auktorum**

This binomial was reported by Bory (1832, as *S. salicifolium* Bory), Diannelidis (1950, as *S. salicifolium* Lamouroux) and Anagnostidis (1968, with reservations). Bory included in the synonymy of his species *S. vulgare*, and later authors associated Bory's material from the Peloponnese with the latter taxon (e.g. Agardh, 1842). The identity of Diannelidis's and Anagnostidis's material from Crete and North Aegean, respectively, is unknown. It should be added that '*Sargassum salicifolium* (J. Agardh) J. Agardh' has been most recently reported from the Adriatic Sea by Špan (2005), who included in the synonymy *Sargassum coarctatum* Kützing - a species referred to *S. vulgare* by Gómez Garreta *et al.* (2001b). Apart from the nomenclatural problems - *Sargassum coarctatum* Kützing being the only legitimate name in the above species complex, none of these taxa is typified.

Professor Mazziari's list

Professor A. D. Mazziari collected extensively material from the Ionian Islands and also prepared a list of seaweeds from Corfu as a part of his manuscript "Flora Septinsularis". This work was never published but existed in the Corfu Public Library, which sadly was destroyed during World War II. Algal material from the Ionian Islands collected by Mazziari was identified and published by Grunow (1861), while fragments of Mazziari's manuscript were saved by Dr. Th. Stefanides and published as extracts (Stefanides, 1948). Later on, the remaining of Mazziari's seaweed list was kindly delivered to J. Sordina who published it (Sordina, 1951). In this latter work, there are several taxa that have never been reported elsewhere in Greece, such as *Sphacelaria racemosa* Greville, *Fucus ceranoides* Linnaeus, *Laminaria digitata* (Hudson) Lamouroux and *L. saccharina* (Linnaeus) Lamouroux. We believe that these records

are misidentifications, as also stated by Sordina (1951). None of these taxa is included in the collections studied by Grunow (1861), but it is interesting that Mazziari mentioned frequently finds of *Laminaria* specimens, cast ashore by the waves. Sordina himself visited some of the sites mentioned by Mazziari, but he never encountered any specimens of *Laminaria* or *Fucus*.

Discussion

In the first review of the Greek seaweeds (Diannelidis, 1950) only 31 taxa of Phaeophyceae had been listed. Later on, Gerloff & Geissler (1974) listed 63, while Athanasiadis (1987) listed 80 taxa for the Aegean Sea only. Lastly, in a survey of 265 Mediterranean brown algae, Ribera *et al.* (1992) included 93 taxa from Greece. The 107 confirmed taxa reported in this study reflect a further increase of our knowledge, and it should be attributed to the several new studies carried out during the last decades (e.g. Sartoni & De Biasi, 1999; Catra & Giardina, 2009; Tsiamis *et al.*, 2010a, b).

The distribution of these 107 brown seaweeds along the coasts is as follows: 94 taxa have been found in the N. Aegean, 90 taxa in the S. Aegean and only 70 taxa in the Ionian Sea (Fig. 1). This pattern may relate to the number (or extent of detail) of the studies conducted within each region (42 in the N. Aegean, 70 in the S. Aegean and 26 in the Ionian Sea), but may also reflect the particular environmental conditions of each region (e.g. the lower salinity and temperature values in the North Aegean).

Greek marine flora seems to host far less brown algae compared to the neighboring Italian coasts, where 214 taxa have been recorded (Furnari *et al.*, 2010). This difference definitely reflects the smaller number of phylogenetic studies that have been conducted in Greece, and generally in the Eastern Mediterranean Sea, with several coastal regions and islands still remaining poorly surveyed, particularly in the sublittoral and circalittoral zones.

Finally, many taxa are pending confirmation, whereas several others are treated as *taxa excludenda* or *inquirenda* (17, 11 and 8 taxa respectively). This is partly due to taxonomic difficulties but also to the scarcity of Greek specimens deposited in public herbaria.

To conclude, the continuous increase in the number of brown algae reported in Greece indicates that there are still major gaps in our knowledge of the marine flora of the Aegean and Ionian Seas, and that the number of species is expected to increase with additional surveys in unexplored areas and particularly in deeper habitats.

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References

- Agardh, J.G., 1842. *Algae maris Mediterranei et Adriatici, observationes in diagnosis specierum et dispositionem generum*. Apud Fortin, Masson et Cie, Parisiis, 164 pp.
- Agardh, J.G., 1848. *Species genera et ordines algarum, seu descriptiones succinctae specierum, generum et ordinum, quibus algarum regnum constituitur*. Volumen Primum. Algas fucoideas complectens. pp. [i-vi], [i]-viii, [1]-363. Lundae [Lund]: C.W.K. Gleerup.
- Agardh, J.G., 1882. Till Algernes Systematik. Nya bidrag (Andra afd.). IV. Chordarieae. V. Dictyoteae. *Lunds Universitets Årsskrift*, 17, 1-134.
- Alongi, G., Catra, M., Cormaci, M., Furnari, G., 2002. Observations on *Cystoseira squarrosa* De Notaris (Fucophyceae, Fucales), a rare and little known Mediterranean species, and its typification. *Botanica Marina*, 45 (6), 530-535.
- Anagnostidis, K., 1968. Untersuchungen über die Salz- und Süßwasser-Thiobiocönos (Sulphuretum) Griechenlands. *Wissenschaftliches Jahrbuch der physiko-mathematischen Fakultät der Universität Thessaloniki*, 10, 409-866.
- Ardissone, F., 1886. *Phycologia mediterranea. Parte II. Oosporee, zoosporee, schizosporee*. Tipografia, Maj et Malnati, Varese, 320 pp.
- Athanasiadis, A., 1987. *A survey of the seaweeds of the Aegean Sea with taxonomic studies on species of the tribe Antithamnieae (Rhodophyta)*. PhD Thesis. University of Göteborg, Sweden, 174 pp.
- Ben-Maiz, N., Boudouresque, C.F., Lauret, M., Riouall, R., 1988. Inventaire bibliographique des macrophytes (Algues, Phanérogames) dans l'étang de Thau (Herault, France). *Naturalia Monspeliensia, Série Botanique*, 52, 71-84.
- Bitis, I., 1988. *Investigations of the marine macroalgae (Chlorophyceae, Phaeophyceae, Rhodophyceae) of the Korinthiakos Gulf. Flora, taxonomy, phytogeography and ecology*. PhD Thesis. University of Athens, Greece, 195 pp.
- Bory de Saint-Vincent, J.B.G.M., 1832. Hydrophytes. p. 316-337. In: *Expédition scientifique de Morée. Section des sciences physiques. Tome III. 2e partie. Botanique*. F.-G. Levrault, Paris.
- Candargy, P.C., 1899. *La végétation marine de l'île de Lesbos (Mytilène)*. Thèses de la Faculté des sciences de Paris, Bigot Frères, Lille, France, 62 pp.
- Catra, M., Giardina, S., 2009. A survey of the marine macroalgae of Karpathos Island (the Aegean Sea, Greece). *Plant Biosystems*, 143 (3), 509-515.
- Chaubard, L.A., Bory de Saint-Vincent, J.B.J.M., 1838. *Nouvelle flore du Péloponnèse et des Cyclades*. F.G. Levrault, Paris, 87 pp.
- Chrysosvergis-Bacoyannis, F., Boudouresque, C.F., 1995. *L'impact de l'eutrophisation sur les algues benthiques (Chlorophyceae, Fucophyceae, Rhodophyceae) de l'infra-littoral supérieur du golfe de Maliakos (Mer Egée, Grèce)*. PhD Thesis. Université d'Aix-Marseille II, Marseille, France, 178 pp.
- Coppejans, E., 1974. A preliminary study of the marine algal communities on the Islands of Milos and Sikinos (Cyclades-Greece). *Bulletin de la Société Royale de Botanique de Belgique*, 107 (2), 387-406.
- Cormaci, M., Furnari, G., Catra, M., Alongi, G., Giaccone, G., 2012. Flora marina bentonica del Mediterraneo: Phaeophyceae. *Bollettino dell' Accademia Gioenia di Catania*, 45 (375), 1-508.
- Cormaci, M., Furnari, G., Giaccone, G., Serio, D., 2004. Alien macrophytes in the Mediterranean Sea: a review. *Recent Research Developments in Environmental Biology*, 1, 153-202.
- De Toni, G.B., 1895. *Sylloge algarum omnium hucusque cognitarum. Vol. 3., Fucoideae*. Sumptibus auctoris, Patavii, 638 pp.
- Diannelidis, T., 1935. Algues marines du Golfe Pagassai. *Actes de l'Académie d'Athènes*, 10, 249-254.
- Diannelidis, T., 1950. Greek marine flora and its utilisation. *Praktika of the Hellenic Hydrobiological Institute*, 3, 71-84.
- Diannelidis, T., 1953. Contribution à la connaissance des algues marines des Sporades du Nord (Cyanophyceae, Chlorophyceae, Phaeophyceae, Rhodophyceae). *Praktika of the Hellenic Hydrobiological Institute*, 6, 41-84.
- Diannelidis, T., Haritonidis, S., Tsekos, I., 1977. Contribution à l'étude des peuplements des algues benthiques de quelques régions de l'île de Rhodos, Grèce. *Botanica Marina*, 20 (4), 205-226.
- Diapoulis, A., 1983. *A qualitative and quantitative study of phytobenthos in Saronikos gulf (Greece)*. PhD Thesis. Aristotle University of Thessaloniki, Thessaloniki, 171 pp.
- Diapoulis, A., Haritonidis, S., 1987a. Marine algae of the west Greek coasts. *Acta Adriatica*, 28 (1-2), 85-101.
- Diapoulis, A., Haritonidis, S., 1987b. A qualitative and quantitative study of the marine algae in the Saronikos Gulf (Greece). *Marine Ecology*, 8 (2), 175-189.
- Funk, G., 1927. Die Algenvegetation des Golfs von Neapel, nach neueren ökologischen Untersuchungen. *Pubblicazioni della Stazione Zoologica di Napoli*, 7 (Suppl.), 1-507.
- Funk, G., 1955. Beiträge zur Kenntnis der Meeresalgen von Neapel: zugleich mikrographischer Atlas. *Pubblicazioni della Stazione Zoologica di Napoli*, 25 (Suppl.), 1-178.
- Furnari, G., Giaccone, G., Cormaci, M., Alongi, G., Catra, M. et al., 2010. Macrophytobenthos. *Biologia Marina Mediterranea*, 17 (1), 801-828.
- Gallardo, T., Gómez Garreta, A., Ribera, M.A., Cormaci, M., Furnari, G. et al., 1993. Check-list of Mediterranean Seaweeds, II. Chlorophyceae Wille s.l. *Botanica Marina*, 36, 399-421.
- Gerloff, J., Geissler, U., 1974. Eine revidierte Liste der Meeresalgen Griechenlands. *Nova Hedwigia*, 22, 721-793.
- Gerloff, J., Nizamuddin, M., 1975. Three new species of the genus *Cystoseira* C. AG. *Willdenowia*, 7 (3), 565-582.
- Giaccone, G., 1968a. Raccolte di fitobenthos nel Mediterraneo orientale. *Giornale Botanico Italiano*, 102 (3), 217-228.
- Giaccone, G., 1968b. Contributo allo studio fitosociologico dei popolamenti algali del Mediterraneo orientale. *Giornale Botanico Italiano*, 102 (6), 485-506.

- Giaccone, G., Bruni, A., 1973. Le Cistoseire e la vegetazione sommersa del Mediterraneo. *Atti del Reale Istituto Veneto di Scienze, Lettere ed Arti*, 131, 59-103.
- Gómez Garreta, A., Barcelo i Martí, M.C., Ribera Siguán, M.A., Rull Lluch, J., 2001b. *Cystoseira* C. Agardh. p. 99-166. In: *Flora Phycologica Iberica. Vol. 1. Fucales*. Gómez Garreta, A. (Ed.). Universidad de Murcia, Murcia.
- Gómez Garreta, A., Gallardo, T., Ribera, M.A., Cormaci, M., Furnari, G. *et al.*, 2001a. Check-list of Mediterranean Seaweed. III. Rhodophyceae Rabenh. 1. Ceramiales Oltn. *Botanica Marina*, 44 (5), 425-460.
- Greville, R.K., 1827. Some account of a collection of cryptogamic plants from the Ionian Islands. *Transactions of The Linnean Society of London*, 15 (2), 335-348.
- Grunow, A., 1861. Specimen florae cryptogamae septem insularum editum juxta plantas Mazziarianas herbarii Heuffleriani et speciatim quod filices herbarii Tommasiniani. IV. Algas. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, 11, 416-430.
- Grunow, A., 1916. Additamenta ad cognitionem Sargassorum. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, 66, 136-185.
- Guiry, M.D., Guiry, G.M., 2012. *AlgaeBase. World-wide electronic publication*. National University of Ireland, Galway. <http://www.algaebase.org>. (Assessed 21 October 2012).
- Hamel, G., 1931-1939. *Phéophycées de France*. Imprimerie Wolf, Paris, 432 pp.
- Haritonidis, S., 1978. A survey of the marine algae of Thermaikos Gulf, Thessaloniki, Greece. I. Distribution and seasonal periodicity. *Botanica Marina*, 21 (8), 527-535.
- Haritonidis, S., Tsekos, I., 1974. A survey of the marine algae of Thassos and Mytilene Islands, Greece. *Botanica Marina*, 17 (1), 30-39.
- Haritonidis, S., Tsekos, I., 1975. Marine algae of northern Greece. *Botanica Marina*, 18 (4), 203-221.
- Haritonidis, S., Tsekos, I., 1976. Marine algae of the west Greek coasts. *Botanica Marina*, 19 (5), 273-286.
- Huvé, H., 1972. Aperçu sur la distribution en mer Egée de quelques espèces du genre *Cystoseira* (Phaeophyceae, Fucales). *Bulletin de la Société phycologique de France*, 17, 22-37.
- Katsanevakis, S., Tsiamis, K., 2009. Records of alien marine species in the shallow coastal waters of Chios Island (2009). *Mediterranean Marine Science*, 10 (2), 99-107.
- Katsikopoulos, J., 1939. Algues marines d'Alexandroupolis. *Actes de l'Institut Botanique de l'Université d'Athènes*, 1, 201-204.
- Kuckuck, P., 1929. Fragmente einer Monographie der Phaeosporeen. *Helgoländer Wissenschaftliche Meeresuntersuchungen*, 17 (4), 1-93.
- Kuckuck, P., 1956. Ectocarpeen-Studien IV. *Herponema*, *Kützingeriella* nov. gen., *Farlowiella* nov. gen. *Helgoländer Wissenschaftliche Meeresuntersuchungen*, 5 (3), 292-325.
- Kuckuck, P., 1958. Ectocarpeen-Studien V. *Kuckuckia*, *Feldmannia*. *Helgoländer Wissenschaftliche Meeresuntersuchungen*, 6 (2), 171-192.
- Kützing, F.T., 1843. *Phycologia Generalis: oder, Anatomie, physiologie und systemkunde der tange*. F.A. Brockhaus, Leipzig, 458 pp.
- Kützing, F.T., 1858. *Tabulae Phycologicae oder Abbildungen der Tange. Vol. 8*. Gedruckt auf Kosten des Verfassers, Nordhausen, 48 pp.
- Kylin, H., 1947. *Die Phaeophyceen der Schwedischen westküste*. C.W.K. Gleerup, Lund, 99 pp.
- Lazaridou, E., 1994. *Systematics, bionomy and ecological study of the marine phytobenthos of the Milos Island (Cyclades)*. PhD Thesis. Aristotle University of Thessaloniki, Thessaloniki, 297 pp.
- Malea, P., Haritonidis, S., Kevrekidis, T., 1995. Metal content of some green and brown seaweeds from Antikyra Gulf (Greece). *Hydrobiologia*, 310 (1), 19-31.
- Nikolaidis, G., Haritonidis, S., 1990. Contribution to the study of marine flora and vegetation of N. Sporades Islands (Kira Panagia and Piperi), Aegean Sea, Greece. *GeoJournal*, 21 (3), 241-249.
- Ni-Ni-Win, Hanyuda, T., Draisma, S.G.A., Furnari, G., Meinesz, A., Kawai, H., 2011. *Padina ditristromatica* sp. nov. and *Padina pavonicoides* sp. nov. (Dictyotales, Phaeophyceae), two new species from the Mediterranean Sea based on morphological and molecular markers. *European Journal of Phycology*, 46 (4), 327-341.
- Nizamuddin, M., 1981. Contribution to the marine algae of Libya Dictyotales. *Bibliotheca Phycologica, Vol. 54*. J. Cramer, Vaduz, 122 pp.
- Nizamuddin, M., Lehnberg, W., 1970. Studies on the marine algae of Paros and Sikinos Islands, Greece. *Botanica Marina*, 13 (2), 116-130.
- Orfanidis, S., 1992. Light requirements for growth of six shade-acclimated Mediterranean macroalgae. *Marine Biology*, 112 (3), 511-515.
- Panayotidis, P., 1979. Étude phytosociologique de deux aspects saisonniers de la flore épiphyte des feuilles de *Posidonia oceanica* (Linnaeus) Delile, dans le Golfe de Thessaloniki, (Mer Égée, Grèce). *Thalassographica*, 3, 93-104.
- Panayotidis, P., Montesanto, V., Orfanidis, S., 2004. Use of low-budget monitoring of macroalgae to implement the European Water Framework Directive. *Journal of Applied Phycology*, 16 (1), 49-59.
- Petkoff, S., 1943. Algues marines de côtes bulgares de la mer Égée. *Spisanie na Bulgarskata Akademiya na Naukite*, 68, 269-280.
- Politis, J., 1925. Algues marines de la Péninsule d'Athos. *Annuaire scientifique de la Faculté de Philosophie de l'Université d'Athènes*, 1, 1-15.
- Politis, J., 1932. Sur la flore marine de l'île de la Crète. *Treatises of the Academy of Athens*, 2, 257-261.
- Politis, J., 1936. Sur la flore marine de l'Attique. *Treatises of the Academy of Athens*, 3, 1-44.
- Politis, J., 1953. Contribution à l'étude de la flore de la Chalcidique. *Treatises of the Academy of Athens*, 19, 1-97.
- Prud'homme Van Reine, W.F., 1982. A taxonomic revision of the European Sphacelariaceae: (Sphacelariales, Phaeophyceae). *Leiden Botanical Series, Vol. 6*. E.J. Brill, Leiden University Press, Leiden, 293 pp.
- Raulin, V., 1869. *Description physique de l'île de Crete. Vol. 2*. A. Bertrand, Libraire de la société de Géographique, Paris, 1078 pp.
- Reinbold, T., 1898. Meeresalgen von der Insel Rhodos. Gesammelt von Lehrer J. Nemetz. *Hedwigia*, 37, 87-90.
- Ribera, M.A., Gómez Garreta, A., Gallardo, T., Cormaci, M., Furnari, G. *et al.*, 1992. Check-list of Mediterranean Seaweeds. I. Fucophyceae (Warming 1884). *Botanica Marina*, 35 (2), 109-130.
- Roberts, M., 1970. Studies of the marine algae of the Brit-

- ish Isles 8. *Cystoseira tamariscifolia* (Hudson) Papenfuss. *British Phycological Journal*, 5 (2), 201-210.
- Sartoni, G., De Biasi, A.M., 1999. A survey of the marine algae of Milos Island, Greece. *Cryptogamie, Algologie*, 20 (3), 271-283.
- Schiffner, V., Schussnig, B., 1943. Algae. p. 1-15. In: *Flora Aegaea: flora der Inseln und Halbinseln des Ägäischen Meeres*. K.H. Rechinger (Ed.). *Denkschriften der Akademie der Wissenschaften in Wien. Mathematisch-Naturwissenschaftliche Klasse, Vol 105, No. 1.*
- Schmitz, F., 1879. Ueber grüne Algen aus dem Golf von Athen. *Bericht über die Senckenbergische Naturforschende Gesellschaft*, 1878, 17-23.
- Schnetter, R., Schnetter, M.L., 1981. Marine Benthosalgae von Kephalinia (Jonische Inseln). *Bibliotheca Phycologica*, 51, 111-152.
- Silva, P.C., 2012. *Index Nominum Algarum, University Herbarium, University of California, Berkeley*. <http://ucjeps.berkeley.edu/INA.html>. (Accessed 21 October 2012).
- Sordina, J., 1951. Marine plants of Greece and their use in Agriculture. *Praktika of the Hellenic Hydrobiological Institute*, 5, 73-124.
- Špan, A., 2005. The genus *Sargassum* in the Adriatic Sea: morphology, systematics and ecology. *Acta Adriatica*, 46 (Suppl. 1), 9-80.
- Stephanides T., 1948. A survey of the freshwater biology of Corfu and of certain other regions of Greece. *Praktika of the Hellenic Hydrobiological Institute*, 2, 187-201.
- Taşkın, E., 2008. The marine brown algae of the east Aegean Sea and Dardanelles. II. Ectocarpaceae, Chordariaceae and Scytosiphonaceae. *Cryptogamie, Algologie*, 29 (2), 173-186.
- Taşkın, E., Jahn, R., Öztürk, M., Furnari, G., Cormaci, M., 2012. *The Mediterranean Cystoseira (with photographs)*. Celal Bayar University Press, Manisa, Turkey, 75 pp.
- Taşkın, E., Pedersen, M.P., 2012. First report of the alien brown alga *Botrytella parva* (Takamatsu) H.-S. Kim (Chordariaceae, Phaeophyceae) from the eastern Mediterranean Sea. *Botanica Marina*, 55 (5), 467-471.
- Taşkın, E., Öztürk, M., Kurt, O., Öztürk, M., 2008. *The checklist of the marine algae of Turkey*. Ecem Kirtasiye, Manisa, Turkey, 87 pp.
- Tsekos, I., Haritonidis, S., 1977. A survey on the marine algae of Ionian Islands, Greece. *Botanica Marina*, 20 (1), 47-65.
- Tsekos, I., Haritonidis, S., Margaris, N.S., Tzavellas, K., 1982. Contribution to the study of populations of benthic macroalgae (Chlorophyceae, Phaeophyceae and Rhodophyceae) of the Greek Seas. *Thalassographica*, 5 (1), 61-153.
- Tsiamis, K., Montesanto, B., Panayotidis, P., Katsaros, C., Verlaque, M., 2010b. Updated records and range expansion of alien marine macrophytes in Greece (2009). *Mediterranean Marine Science*, 11 (1), 61-79.
- Tsiamis, K., Verlaque, M., Panayotidis, P., Montesanto, B., 2010a. New macroalgal records for the Aegean Sea (Greece, Eastern Mediterranean). *Botanica Marina*, 53 (4), 319-331.
- Tsirika, A., Haritonidis, S., 2005. A survey of the benthic flora in the National Marine Park of Zakynthos (Greece). *Botanica Marina*, 48 (1), 38-45.