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## Checklist of Mediterranean Free-living Dinoflagellates

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An annotated checklist of the free-living dinoflagellates (Dinophyceae) of the Mediterranean Sea, based on literature records, is given. The distribution of 673 species in 9 Mediterranean sub-basins is reported. The number of taxa among the sub-basins was as follows: Ligurian (496 species), Balear-Provençal (360), Adriatic (322), Tyrrhenian (284), Ionian (283), Levantine (268), Aegean (182), Alborán (179) and Algerian Seas (151).

### Introduction

The oligotrophic conditions in the Mediterranean Sea could favour the richness of dinoflagellates, typical organisms of oligotrophic waters. Intensive studies have been made by Jörgensen (1920, 1923), Schiller (1931–37) (Adriatic Sea), Pavillard (1905–1937) (Gulf of Lions and Monaco), Halim (1960) (Villefranche and Alexandria), Rampi (1939–1969) (Ligurian Sea) and Margalef (1945–1995) (Spanish coasts). However a catalogue of the dinoflagellate species recorded is not available. The aims of this study are to provide a checklist of the species from each sub-basin and to evaluate the species richness of dinoflagellates in the Mediterranean Sea based on a compilation of published data.

### Material and Methods

This study is based on literature records of free-living dinoflagellates (Table I), grouped in the main sub-basins of the Mediterranean Sea (Fig. 1). References used for the elaboration of this checklist, but not cited in the text, checklist or notes are listed in the Appendix. Species with their nomenclatural authorities are arranged alphabetically in each order according to the classification proposed by Chrétiennot-Dinet *et al.* (1993) with the following modifications: the genera *Parahistioneis* and *Phalacrocoma* have been added to the Dinophysaceae; *Balechina* Loeblich *et* Loeblich III, *Plectodinium* Biecheler and the recently erected genera *Akashiwo* G. Hansen *et* Moestrup, *Karenia* G. Hansen *et* Moestrup and *Karlodinium* J. Larsen have been added to the Gymnodiniaceae; *Proterythropsis* Kofoid *et* Swezy in Kofoid has been added to the Warnowiaceae; *Pavillardinium* De-Toni has been added to the Oxytoxaceae; *Exuviella* Cienkowski has been added to the Prorocentraceae; *Mysticella* Carbonell-Moore has been added to the Podolampadaceae; *Calcigonellum* Deflandre, *Cal-*

*cionellum* Deflandre, *Pentapharsodinium* Indelicato *et* Loeblich III and *Preperidinium* Mangin have been added to the Peridiniaceae.

Synonyms have been tracked down and relocated in order to avoid duplicate entries. Synonyms, which have not been quoted in the world literature during the last decades, are not reported. Because of space limitation, not all the references reporting each species for each area have been included. Only when a taxon is reported in less than 3 of the 9 Mediterranean sub-basins considered, is the source of the record reported. Exceptionally, also in 3 of the Mediterranean sub-basins when the number of citations was low (< 5). In some cases, these scarcely reported taxa can be considered as misidentifications or unreliable records, recently described species or rare species. The results of this study depend on the valid identification by the authors of each reference. In most of the cases, there are not photographs or figures of the taxa and the verification of the records is difficult. Records of unarmoured cells should be considered cautiously due to the difficulties of their identification. Most of these doubtful records are in the studies by Skolka *et al.* (1986) for the Libyan waters and/or Innamorati *et al.* (1986, 1989 a,b) for the Ligurian Sea. Many species of the rare genera *Histioneis* and *Heterodinium*, mainly reported by Rampi (1939–1969) and Halim (1960), were not further recorded after their first description. For recently described taxa, the geographical distribution is still unknown beyond the type locality (e.g., some calcareous dinoflagellates). Parasitic (except *Dissodinium pseudohunula* Swift *ex* Elbrächter *et* Drebes) and symbiotic species (i.e., *Symbiodinium* Freudenthal) have been excluded. Freshwater species have been excluded [e.g., *Peridiniella catenata* (Levander) Balech, *P. danica* (Paulsen) Okolodkov *et* Dodge, etc]. Sometimes these species are reported from offshore waters especially in sub-basins such as the Adriatic or Aegean Seas. Taxa only reported from the identification of cysts have been excluded except

Table I. References considered for each Mediterranean sub-basin (references from the Appendix are excluded).

Alb	Arg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev
13	52	4	3	12	21	3	59	1-2
33	56	8-9	6	14-18	149	10	73-74	40
56	87-88	24	19	49	151	20	82-83	46
100	127	34	23	51		22	126	65-66
119		47	27-30	57-58		50		81
		60	32	61-64		71-72		83
		68-69	38-39	75-77		141		85-86
		96-99	54-55	84		150		106-107
		101-105	58	89-93		163-167		126
		115-116	70	116		173-176		
		118	95	125				
		120-122	108-113	129-140				
		168-169	117	160-161				
		171-172	128					
			143-144					
			146-148					
			151					
			162					
			177-178					

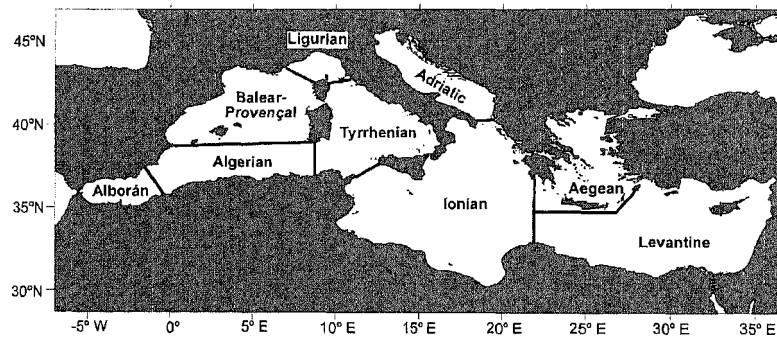


Fig. 1. Map of the Mediterranean sub-basins.

when live cells have germinated from cysts (Ciminiello *et al.* 2000, D'Onofrio *et al.* 1999, Meier *et al.* 2002).

## Results

Mediterranean free-living planktonic dinoflagellates were represented by 673 species with 604 and 480 species reported in the western and eastern basins respectively (Table II). The Ligurian (74%), Balear-Provençal (53%), Adriatic (48%), Tyrrhenian = Ionian (42%) and Levantine (40%) Seas showed the highest number of species whereas the Aegean (27%), Alborán (26%) and Algerian (22%) Seas showed the lowest number of species.

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I acknowledge the financial support by the Spanish Ministry of Science and Technology and by the European Commission (ICB2-CT-2001-80002). I thank for the helpful comments and suggestions by four reviewers and the Editor. This checklist has been made possible with the collaboration of many colleagues supplying less accessible literature.

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Table II. List of taxa and their distribution.

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<b>Actinisciales</b> Sournia 1984										
Actiniscaceae Kützing 1844										
<b>Achradina</b> Lohmann 1903										
<i>Achradina pulchra</i> Lohmann			+		+					76, 116
<b>Actiniscus</b> Ehrenberg 1843										
<i>Actiniscus pentasterias</i> (Ehrenberg) Ehrenberg	+		+	+	+					
<b>Brachydiniales</b> Loeblich III <i>ex</i> Sournia 1984										
Brachydiniaceae Sournia 1972										
<b>Asterodinium</b> Sournia 1972										
<i>Asterodinium gracile</i> Sournia <sup>1</sup>				+	+				+	1, 57
<i>Asterodinium libanum</i> Abboud-Abi Saab <sup>1</sup>					+				+	2, 57, 58
<b>Brachydinium</b> F.J.R. Taylor <sup>2</sup>										
<i>Brachydinium capitatum</i> F.J.R. Taylor			+		+		+		+	
<i>Brachydinium taylorii</i> Sournia			+							102
<b>Desmomonadales</b> Pascher 1914										
Desmocapsaceae Pascher 1914										
<b>Desmocapsa</b> Pascher 1914										
<i>Desmocapsa gelatinosa</i> Pascher <sup>3</sup>					+		+			75, 76, 77, 145
Haplodiniaceae Lindemann 1928										
<b>Haplodinium</b> Klebs 1912										
<i>Haplodinium antjoliense</i> Klebs <sup>4</sup>					+					75
Dinococcales Pascher 1914										
Gloeodiniaceae Pascher <i>ex</i> Schiller 1937										
<b>Gloeodinium</b> Klebs 1912										
<i>Gloeodinium marinum</i> Bouquaheux <sup>5</sup>			+		+					12, 103, 160
Thoracosphaeraceae Schiller 1930										
<b>Thoracosphaera</b> Kamptner 1927										
<i>Thoracosphaera heimii</i> (Lohmann) Kamptner <sup>6</sup>		+	+	+		+		+	+	
<b>Dinophysales</b> Lindemann 1928										
Citharistaceae Kofoid <i>et</i> Skogsberg 1928										
<b>Citharistes</b> Stein 1883										
<i>Citharistes apsteini</i> Schütt									+	81
<i>Citharistes regius</i> Stein				+	+	+				
Dinophysaceae Stein 1883										
<b>Amphisolenia</b> Stein 1883										
<i>Amphisolenia bidentata</i> Schröder	+	+	+	+	+	+	+	+	+	
<i>Amphisolenia bispinosa</i> Kofoid				+						29
<i>Amphisolenia brevicauda</i> Kofoid					+					91, 139
<i>Amphisolenia clavipes</i> Kofoid									+	1, 86
<i>Amphisolenia complanata</i> Kofoid <i>et</i> Skogsberg					+					91
<i>Amphisolenia extensa</i> Kofoid	+			+	+					33, 80, 90
<i>Amphisolenia globifera</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Amphisolenia inflata</i> Murray <i>et</i> Whitting		+	+	+	+					91, 105
<i>Amphisolenia lemmermanni</i> Kofoid									+	40, 46
<i>Amphisolenia palaeotheroides</i> Kofoid					+					91
<i>Amphisolenia palmata</i> Stein	+	+	+	+			+		+	
<i>Amphisolenia quadrispina</i> Kofoid									+	1, 86
<i>Amphisolenia rectangulata</i> Kofoid			+	+						148, 168
<i>Amphisolenia sigma</i> Halim <sup>7</sup>									+	66
<i>Amphisolenia spinulosa</i> Kofoid		+	+	+	+	+	+	+	+	
<i>Amphisolenia truncata</i> Kofoid <i>et</i> Michener		+	+		+				+	
<b>Dinophysis</b> Ehrenberg 1839 (= <i>Phalacroma</i> Stein 1883 <i>partim.</i> )										
<i>Dinophysis acuminata</i> Claparède <i>et</i> Lachmann <sup>8</sup>	+	+	+	+	+	+	+	+	+	
<i>Dinophysis acuta</i> Ehrenberg <sup>9</sup>	+	+	+	+	+	+	+	+	+	
<i>Dinophysis alata</i> Jörgensen <sup>10</sup>			+	+	+	+	+			
<i>Dinophysis amandula</i> (Balech) Sournia <sup>11</sup>		+	+	+	+	+				
<i>Dinophysis apicata</i> (Kofoid <i>et</i> Skogsberg) Abé <i>vel</i> Balech					+					125
<i>Dinophysis apiculata</i> Meunier <sup>12</sup>					+					91
<i>Dinophysis biceps</i> Schiller					+		+			138, 145

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Dinophysis caudata</i> Saville-Kent	+	+	+	+	+	+	+	+	+	
<i>Dinophysis circumscuta</i> (Karsten) Balech			+	+	+	+	+		+	
<i>Dinophysis dentata</i> Schiller					+		+			77, 145, 175
<i>Dinophysis diegensis</i> Kofoid <sup>13</sup>			+		+		+			76, 168, 175
<i>Dinophysis exigua</i> Kofoid et Skogsberg									+	81
<i>Dinophysis fortii</i> Pavillard <sup>14</sup>	+		+	+	+	+	+	+	+	
<i>Dinophysis hastata</i> Stein <sup>15</sup>	+		+	+	+	+	+	+	+	
<i>Dinophysis irregularis</i> (Lebour) Balech							+			175
<i>Dinophysis minuta</i> (Cleve) Balech							+			150
<i>Dinophysis mitra</i> (Schütt) Abé <i>vel</i> Balech <sup>16</sup>	+		+	+	+	+	+	+	+	
<i>Dinophysis monacantha</i> Kofoid et Skogsberg				+						95
<i>Dinophysis ovum</i> Schütt <sup>17</sup>	+	+	+	+	+	+	+	+		
<i>Dinophysis parva</i> Schiller <sup>18</sup>			+	+	+	+	+			
<i>Dinophysis punctata</i> Jörgensen			+	+	+	+		+		
<i>Dinophysis pusilla</i> Jörgensen			+	+						76, 115
<i>Dinophysis recurva</i> Kofoid et Skogsberg <sup>19</sup>	+		+		+	+	+	+	+	
<i>Dinophysis rete</i> Sournia <sup>20</sup>						+				173, 175
<i>Dinophysis rotundatum</i> Claparède et Lachmann	+	+	+	+	+	+	+	+	+	
<i>Dinophysis sacculus</i> Stein <sup>21</sup>	+	+	+	+	+	+	+	+	+	
<i>Dinophysis schilleri</i> Sournia <sup>22</sup>			+	+	+	+	+	+	+	
<i>Dinophysis schroederi</i> Pavillard	+		+	+	+	+	+			
<i>Dinophysis schuettii</i> Murray et Whitting <sup>23</sup>	+		+	+	+	+	+	+	+	
<i>Dinophysis similis</i> Kofoid et Skogsberg <sup>24</sup>			+							81, 122, 168
<i>Dinophysis sphaerica</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Dinophysis spinosa</i> Rampi		+	+	+	+				+	
<i>Dinophysis tripos</i> Gourret	+	+	+	+	+	+	+	+	+	
<i>Dinophysis uracantha</i> Stein	+		+	+	+	+	+	+	+	
<i>Histioneis</i> Stein 1883 (= <i>Parahistioneis</i> Kofoid et Skogsberg 1928 <i>partim</i> .)										
<i>Histioneis alata</i> Rampi				+						136
<i>Histioneis bernhardii</i> Rampi				+						140
<i>Histioneis cerasus</i> Böhm							+			10
<i>Histioneis depressa</i> Schiller			+		+	+				
<i>Histioneis detonii</i> Rampi <sup>25</sup>				+						136
<i>Histioneis elegans</i> Halim				+						64
<i>Histioneis expansa</i> Rampi				+						136
<i>Histioneis faouzii</i> Halim				+						64, 140
<i>Histioneis fragilis</i> Böhm in Schiller					+					149
<i>Histioneis gubernans</i> Schütt				+			+			130, 140, 176
<i>Histioneis hippoperoides</i> Kofoid et Michener								+		81
<i>Histioneis hyalina</i> Kofoid et Michener					+			+		81, 149
<i>Histioneis imbricata</i> Halim				+						64
<i>Histioneis inclinata</i> Kofoid et Michener			+		+					47, 136, 149
<i>Histioneis isselii</i> Forti				+			+			51, 141
<i>Histioneis joergensenii</i> Schiller			+	+	+	+	+			
<i>Histioneis kofoidii</i> Forti et Issel				+			+			50, 95, 141
<i>Histioneis ligustica</i> Rampi				+						133, 136
<i>Histioneis longicollis</i> Kofoid			+	+		+		+		
<i>Histioneis marchesonii</i> Rampi			+						+	34, 133
<i>Histioneis oxypteris</i> Schiller			+	+			+			140, 145
<i>Histioneis pavillardii</i> Rampi				+						129
<i>Histioneis rampii</i> Halim				+						64
<i>Histioneis remora</i> Stein			+					+		81, 122
<i>Histioneis robusta</i> Rampi				+						140
<i>Histioneis speciosa</i> Rampi				+						140
<i>Histioneis subcarinata</i> Rampi			+							99, 136
<i>Histioneis sublongicollis</i> Halim				+						64
<i>Histioneis variabilis</i> Schiller				+	+		+			
<i>Histioneis villafranca</i> Halim				+						64
<i>Histioneis vouckii</i> Schiller				+	+	+				
<i>Ornithocercus</i> Stein 1883										

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Ornithocercus francescae</i> (Murray et Whitting) Balech <sup>26</sup>					+		+		+	
<i>Ornithocercus geniculatus</i> Dangeard			+		+					+
<i>Ornithocercus heteroporos</i> Kofoid	+		+	+	+	+	+			+
<i>Ornithocercus magnificus</i> Stein	+	+	+	+	+	+	+	+	+	+
<i>Ornithocercus quadratus</i> Schütt <sup>27</sup>			+	+	+	+	+	+	+	+
<i>Ornithocercus splendidus</i> Schütt <sup>28</sup>			+		+	+	+	+	+	+
<i>Ornithocercus steinii</i> Schütt <i>emend.</i> Kofoid et Skogsberg <sup>29</sup>					+		+		+	+
<i>Ornithocercus thumii</i> (Schmidt) Kofoid et Skogsberg	+		+							33, 115
<i>Parahistioneis</i> Kofoid et Skogsberg 1928 (= <i>Histioneis</i> Stein 1883 <i>partim</i> .)										
<i>Parahistioneis acutiformis</i> Rampi					+					136
<i>Parahistioneis karstenii</i> (Kofoid et Michener) Kofoid et Skogsberg <sup>30</sup>					+					129
<i>Parahistioneis mediterranea</i> Schiller					+	+	+			
<i>Parahistioneis paraformis</i> Kofoid et Skogsberg					+				+	81, 136
<i>Parahistioneis sphaeroidea</i> Rampi					+			+		73, 136
<i>Parahistioneis varians</i> Böhm in Schiller							+			10
<i>Phalacroma</i> Stein 1883 (= <i>Dinophysis</i> Ehrenberg 1839 <i>partim</i> .)										
<i>Phalacroma acutum</i> (Schütt) Pavillard <sup>31</sup>	+		+		+	+	+			
<i>Phalacroma argus</i> Stein	+	+	+	+	+	+	+		+	
<i>Phalacroma bipartitum</i> Kofoid et Skogsberg			+							99
<i>Phalacroma cuneus</i> Schütt		+	+	+	+	+	+		+	
<i>Phalacroma doryphorum</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Phalacroma expulsulum</i> (Kofoid et Michener) Kofoid et Skogsberg <sup>32</sup>			+		+					64, 69, 99
<i>Phalacroma favus</i> Kofoid et Michener			+	+	+	+	+	+	+	
<i>Phalacroma nasutum</i> Stein <sup>33</sup>	+	+	+	+	+	+	+			
<i>Phalacroma operculatum</i> Stein	+		+		+		+			
<i>Phalacroma ovatum</i> (Claparède et Lachmann) Jörgensen	+	+	+	+	+	+	+		+	
<i>Phalacroma parvulum</i> (Schütt) Jörgensen	+	+	+	+	+	+	+	+	+	
<i>Phalacroma porodictyum</i> Stein			+	+	+		+		+	
<i>Phalacroma praetextum</i> Kofoid et Michener			+	+						95
<i>Phalacroma pulchellum</i> Lebour	+	+	+	+	+	+	+	+	+	
<i>Phalacroma striatum</i> Kofoid					+	+	+			80, 125, 173, 175
<i>Tripsolemia</i> Kofoid 1906										
<i>Tripsolemia bicornis</i> Kofoid			+	+	+	+	+	+		
<i>Tripsolemia longicornis</i> Kofoid					+					76
<i>Tripsolemia truncata</i> Kofoid	+		+				+	+	+	
Oxyphysaceae Sournia 1984										
<i>Oxyphysis</i> Kofoid 1926										
<i>Oxyphysis oxytoxoides</i> Kofoid			+	+				+	+	
Gymnodinales Lemmermann 1910										
Gymnodiniaceae Lankester 1885										
<i>Akashiwo</i> G. Hansen et Moestrup 2000										
<i>Akashiwo sanguinea</i> (Hirasaka) G. Hansen et Moestrup <sup>34</sup>		+	+	+	+	+	+	+	+	
<i>Amphidinium</i> Claparède et Lachmann 1885										
<i>Amphidinium acutissimum</i> Schiller	+		+		+	+	+			
<i>Amphidinium acutum</i> Lohmann					+	+			+	
<i>Amphidinium carterae</i> Hulburt			+						+	1, 168
<i>Amphidinium conus</i> Schiller					+		+			77, 145
<i>Amphidinium crassum</i> Lohmann <sup>35</sup>		+	+		+	+	+	+		
<i>Amphidinium cucurbitella</i> Kofoid et Swezy					+	+	+	+		149
<i>Amphidinium curvatum</i> Schiller					+	+	+			
<i>Amphidinium extensum</i> Wulff					+	+				75, 76, 149
<i>Amphidinium flagellans</i> Schiller					+	+	+			

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Amphidinium glaucum</i> Conrad					+					76
<i>Amphidinium globosum</i> Schröder			+		+	+	+		+	
<i>Amphidinium hyalinum</i> Entz					+	+				77, 149
<i>Amphidinium inflatum</i> Kofoid		+								127
<i>Amphidinium kesslitzii</i> Schiller					+		+		+	
<i>Amphidinium lacustriforme</i> Schiller <sup>36</sup>			+			+	+			
<i>Amphidinium lanceolatum</i> Schröder					+	+	+			
<i>Amphidinium latum</i> Lebour			+			+	+			
<i>Amphidinium lissae</i> Schiller					+		+			76, 77, 175
<i>Amphidinium oceanicum</i> Lohmann					+	+				75, 149
<i>Amphidinium operculatum</i> Claparède et Lachmann <sup>37</sup>		+		+			+			145, 177
<i>Amphidinium ovoideum</i> (Lemmermann) Lemmermann					+					76
<i>Amphidinium pellucidum</i> Herdman					+					76
<i>Amphidinium roseolum</i> (Schmarda) Schiller						+				149
<i>Amphidinium schroederi</i> Schiller <sup>38</sup>		+			+	+	+			
<i>Amphidinium sphenoides</i> Wulff <sup>39</sup>					+	+				76, 149
<i>Amphidinium stigmatum</i> Schiller					+	+	+			
<i>Amphidinium turbo</i> Kofoid et Swezy					+				+	77, 81
<i>Amphidinium vasculum</i> Kofoid et Swezy						+				149
<i>Amphidinium vigrense</i> Woloszynska					+					76
<i>Balechina</i> Loeblich et Loeblich III 1966										
<i>Balechina coerulea</i> (Dogiel) F.J.R. Taylor					+	+				76, 149
<i>Balechina marianae</i> F.J.R. Taylor <sup>40</sup>					+					160
<i>Cochlodinium</i> Schütt 1896										
<i>Cochlodinium achromaticum</i> Lebour			+		+					76, 102
<i>Cochlodinium adriaticum</i> Schiller					+		+			77, 145
<i>Cochlodinium brandtii</i> Wulff		+			+	+	+			
<i>Cochlodinium citron</i> Kofoid et Swezy						+				149
<i>Cochlodinium constrictum</i> (Schütt) Lemmermann				+				+		81, 147
<i>Cochlodinium faurei</i> Kofoid et Swezy								+		81
<i>Cochlodinium geminatum</i> (Schütt) Schütt					+					147
<i>Cochlodinium helix</i> (Pouchet) Lemmermann <sup>41</sup>			+			+	+			
<i>Cochlodinium polykrikoides</i> Margalef <sup>42</sup>				+						143
<i>Cochlodinium pulchellum</i> Lebour			+		+		+			
<i>Cochlodinium pupa</i> Lebour			+							101, 102
<i>Cochlodinium strangulatum</i> (Schütt) Schütt				+	+	+				
<i>Cochlodinium turbineum</i> Kofoid et Swezy						+				149
<i>Cochlodinium schuettii</i> Kofoid et Swezy							+			141, 145
<i>Gymnodinium</i> Stein 1878 emend. G. Hansen et Moestrup										
<i>Gymnodinium achromaticum</i> Lebour			+							34, 99
<i>Gymnodinium agile</i> Kofoid et Swezy					+	+				76, 149
<i>Gymnodinium aguiliforme</i> Schiller			+		+	+	+			
<i>Gymnodinium album</i> Lindemann <sup>43</sup>					+					76
<i>Gymnodinium amphora</i> Kofoid et Swezy					+					76
<i>Gymnodinium arcticum</i> Wulff		+			+	+		+		
<i>Gymnodinium attenuatum</i> Kofoid et Swezy					+	+				76, 149
<i>Gymnodinium auratum</i> Kofoid et Swezy					+	+				76, 149
<i>Gymnodinium aureolum</i> (Hulburt) G. Hansen <sup>44</sup>			+	+		+	+	+		
<i>Gymnodinium aureum</i> Kofoid et Swezy			+			+				101, 149
<i>Gymnodinium baccatum</i> Balech			+							34
<i>Gymnodinium biconicum</i> Schiller					+	+	+			
<i>Gymnodinium canus</i> Kofoid et Swezy						+			+	86, 149
<i>Gymnodinium caput</i> Schiller					+	+	+			76, 145, 149
<i>Gymnodinium carinatum</i> Schilling		+								127
<i>Gymnodinium catenatum</i> Graham <sup>45,46</sup>	+	+								13, 56
<i>Gymnodinium cinctum</i> Kofoid et Swezy					+					76
<i>Gymnodinium conicum</i> Kofoid et Swezy <sup>47</sup>						+	+	+		22, 149
<i>Gymnodinium corii</i> Schiller				+	+	+	+			
<i>Gymnodinium costatum</i> Kofoid et Swezy			+							99

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Gymnodinium cucumis</i> Schütt			+	+	+		+			
<i>Gymnodinium diploconus</i> Schütt					+	+	+			
<i>Gymnodinium dissimile</i> Kofoid et Swezy					+	+				76, 149
<i>Gymnodinium elongatum</i> Hope				+		+				144, 149
<i>Gymnodinium flavum</i> Kofoid et Swezy					+				+	76, 81
<i>Gymnodinium fulvum</i> Kofoid et Swezy						+				149
<i>Gymnodinium fuscum</i> (Ehrenberg) Stein		+			+	+				
<i>Gymnodinium galeaeforme</i> Matzenauer									+	81
<i>Gymnodinium gelbum</i> Kofoid									+	81
<i>Gymnodinium gibberum</i> Schiller					+	+	+	+		
<i>Gymnodinium gleba</i> Schütt					+	+				76, 147
<i>Gymnodinium gracile</i> Bergh						+				149
<i>Gymnodinium grammaticum</i> (Pouchet) Kofoid et Swezy <sup>48</sup>					+	+		+	+	
<i>Gymnodinium heterostriatum</i> Kofoid et Swezy <sup>49</sup>					+	+	+	+	+	
<i>Gymnodinium impudicum</i> (Fraga et Bravo) G. Hansen et Moestrup <sup>46</sup>	+		+	+	+	+	+	+	+	
<i>Gymnodinium incertum</i> Herdman						+				76
<i>Gymnodinium incisum</i> Kofoid et Swezy						+				76
<i>Gymnodinium lachmannii</i> Saville-Kent						+				75
<i>Gymnodinium lineatum</i> Kofoid et Swezy							+			149
<i>Gymnodinium lira</i> Kofoid et Swezy						+				76
<i>Gymnodinium lohmannii</i> Paulsen							+	+	+	40, 149
<i>Gymnodinium maguelonnense</i> Biecheler <sup>50</sup>			+			+				9, 149
<i>Gymnodinium marinum</i> Saville-Kent						+	+		+	
<i>Gymnodinium minor</i> Lebour						+	+	+		21, 22, 76
<i>Gymnodinium mitratum</i> Schiller						+	+			76
<i>Gymnodinium multilineatum</i> Kofoid et Swezy						+				76
<i>Gymnodinium multistriatum</i> Kofoid et Swezy			+						+	81, 168
<i>Gymnodinium najadeum</i> Schiller			+	+	+	+	+			
<i>Gymnodinium nanum</i> Schiller			+		+					75, 76, 77, 102
<i>Gymnodinium neapolitanum</i> Schiller			+	+	+	+	+			
<i>Gymnodinium opressum</i> Conrad			+		+					75, 76, 102
<i>Gymnodinium ostenfeldii</i> Schiller					+	+		+		75, 76, 145
<i>Gymnodinium ovulum</i> Kofoid et Swezy					+					75, 76
<i>Gymnodinium paulsenii</i> Schiller					+	+	+	+		
<i>Gymnodinium pulchellum</i> J. Larsen <sup>51</sup>			+	+						23, 171
<i>Gymnodinium pulchrum</i> Schiller						+		+		
<i>Gymnodinium punctatum</i> Pouchet						+	+			75, 76
<i>Gymnodinium pygmaeum</i> Lebour						+	+			76
<i>Gymnodinium ravenescens</i> Kofoid et Swezy						+	+			76
<i>Gymnodinium rotundatum</i> Klebs			+		+	+	+			
<i>Gymnodinium rubrocinctum</i> Lebour					+	+				76
<i>Gymnodinium scopulosum</i> Kofoid et Swezy					+	+				76
<i>Gymnodinium semidivisum</i> Schiller					+	+				75, 76, 77, 145
<i>Gymnodinium simplex</i> (Lohmann) Kofoid et Swezy <sup>43</sup>			+		+	+	+	+	+	
<i>Gymnodinium situla</i> Kofoid et Swezy						+				149
<i>Gymnodinium sphaericum</i> Calkins						+				149
<i>Gymnodinium sphaeroideum</i> Kofoid					+	+				75, 149
<i>Gymnodinium sulcatum</i> Kofoid et Swezy					+					76
<i>Gymnodinium translucens</i> Kofoid et Swezy					+					75
<i>Gymnodinium tridentatum</i> Schiller						+		+		149
<i>Gymnodinium variabile</i> Herdman			+		+	+				75, 76, 77, 102, 149
<i>Gymnodinium vestificii</i> Schütt <sup>52</sup>						+	+			76, 147
<i>Gymnodinium voukii</i> Schiller						+	+	+		
<i>Gymnodinium wulffii</i> Schiller						+	+			77, 149
<i>Gyrodinium</i> Kofoid et Swezy 1921 emend. G. Hansen et Moestrup (= <i>Gymnodinium</i> Stein 1878 partim.)										
<i>Gyrodinium acutum</i> (Schütt) Kofoid et Swezy			+	+		+				







Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Oxytoxum parvum</i> Schiller <sup>126</sup>			+		+	+	+	+		
<i>Oxytoxum punctulatum</i> Rampi <sup>127</sup>				+	+					55, 138
<i>Oxytoxum radiosum</i> Rampi					+					131, 138
<i>Oxytoxum rampii</i> Sournia <sup>128</sup>				+	+					29, 140
<i>Oxytoxum scolopax</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Oxytoxum sphaeroideum</i> Stein		+	+		+	+	+	+	+	
<i>Oxytoxum spinosum</i> Rampi				+	+					64, 131
<i>Oxytoxum subulatum</i> Kofoid			+	+	+					29, 91, 105
<i>Oxytoxum turbo</i> Kofoid				+	+				+	
<i>Oxytoxum variabile</i> Schiller <sup>129</sup>	+		+	+	+	+	+	+	+	
<i>Oxytoxum viride</i> Schiller			+	+	+	+	+	+	+	
<i>Pavillardinium</i> De-Toni 1936 (= <i>Amphidoma</i> Stein 1883 <i>partim.</i> , <i>Murrayella</i> Kofoid 1907)										
<i>Pavillardinium ovale</i> (Pavillard) De-Toni <sup>130</sup>				+						29, 123
<i>Schuettilia</i> Balech 1988 (= <i>Gonyaulax</i> Diesing 1866 <i>partim.</i> , <i>Oxytoxum</i> Stein 1883 <i>partim.</i> )										
<i>Schuettilia mitra</i> (Schütt) Balech <sup>131</sup>	+	+	+	+	+	+	+			
Peridiniaceae Ehrenberg 1828										
<i>Calcigonellum</i> Deflandre 1948										
<i>Calcigonellum infula</i> Deflandre <i>emend.</i> Montresor <sup>132</sup>				+						39
<i>Calciodinellum</i> Deflandre 1947										
<i>Calciodinellum levantinum</i> Meier, Janofske et Willems <sup>133</sup>									+	106
<i>Calciodinellum operosum</i> Deflandre <sup>132</sup>				+						39
<i>Diplopelta</i> Stein ex Jörgensen 1912 (= <i>Dissodium</i> Abé 1941 <i>partim.</i> )										
<i>Diplopelta bomba</i> Stein ex Jörgensen <sup>134</sup>	+		+	+	+				+	
<i>Diplopelta symmetrica</i> Pavillard <sup>135</sup>			+	+	+					
<i>Diplopsalis</i> Bergh 1881 (= <i>Dissodium</i> Abé 1941 <i>partim.</i> )										
<i>Diplopsalis lenticula</i> Bergh <sup>136</sup>	+	+	+	+	+	+	+	+	+	
<i>Diplopsalopsis</i> Meunier <i>emend.</i> Balech 1988										
<i>Diplopsalopsis orbicularis</i> (Paulsen) Meunier <sup>137</sup>							+			150
<i>Diplopsalopsis latipeltata</i> Balech et Borgese				+						28, 144
<i>Kryptoperidinium</i> Lindemann 1924										
(= <i>Glenodinium</i> Ehrenberg 1837 <i>partim.</i> )										
<i>Kryptoperidinium foliaceum</i> (Stein) Lindemann <sup>138</sup>			+			+		+		
<i>Oblea</i> Balech ex Loeblich et Loeblich III 1966										
<i>Oblea rotunda</i> (Balech) Balech ex Sournia <sup>139</sup>				+		+				32, 149
<i>Pentapharsodinium</i> Indelicato et Loeblich III 1986										
(= <i>Peridinium</i> Ehrenberg 1831 <i>partim.</i> )										
<i>Pentapharsodinium tyrrhenicum</i> (Balech) Montresor, Zingone et Marino <sup>140</sup>				+						6, 111
<i>Peridinium</i> Ehrenberg 1831 <sup>141</sup>										
<i>Peridinium quinquecorne</i> Abé <sup>142</sup>				+			+		+	
<i>Preperidinium</i> Mangin 1913 (= <i>Diplopetopsis</i> Pavillard 1913, <i>Zygabikodinium</i> Loeblich et Loeblich III 1970)										
<i>Preperidinium meunieri</i> (Pavillard) Elbrächter <sup>143</sup>				+	+	+			+	
<i>Protoperidinium</i> Bergh <i>emend.</i> Balech 1974 <sup>141</sup>										
(= <i>Peridinium</i> Ehrenberg 1831 <i>partim.</i> , <i>Minuscula</i> Lebour 1925)										
<i>Protoperidinium abei</i> (Paulsen) Balech <sup>144</sup>	+		+	+	+			+	+	
<i>Protoperidinium anthonyi</i> (Fauré-Fremiet) Balech					+					76
<i>Protoperidinium bipes</i> (Paulsen) Balech <sup>145</sup>	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium bispinum</i> (Schiller) Balech <sup>146</sup>		+		+	+			+	+	
<i>Protoperidinium brevipes</i> (Paulsen) Balech								+	+	
<i>Protoperidinium brochii</i> (Kofoid et Swezy) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium bulla</i> (Meunier) Balech					+					76
<i>Protoperidinium cerasus</i> (Paulsen) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium claudicans</i> (Paulsen) Balech	+	+	+	+	+			+	+	

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Protoperidinium conicoides</i> (Paulsen) Balech									+	40
<i>Protoperidinium conicum</i> (Gran) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium crassipes</i> (Kofoid) Balech <sup>147</sup>		+	+	+	+	+	+	+	+	
<i>Protoperidinium curvipes</i> (Ostenfeld) Balech <sup>148</sup>	+	+			+				+	
<i>Protoperidinium deficiens</i> (Meunier) Balech									+	86
<i>Protoperidinium depressum</i> (Bailey) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium diabolus</i> (Cleve) Balech <sup>149</sup>	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium divergens</i> (Ehrenberg) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium elegans</i> (Cleve) Balech				+	+					
<i>Protoperidinium excentricum</i> (Paulsen) Balech				+	+			+		
<i>Protoperidinium exigupes</i> (Mangin ex Halim) Dodge									+	40
<i>Protoperidinium fimbriatum</i> (Meunier) Balech					+					76
<i>Protoperidinium finitimum</i> Balech <sup>150</sup>			+	+	+				+	
<i>Protoperidinium globulus</i> (Stein) Balech <sup>151</sup>	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium grande</i> (Kofoid) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium granii</i> (Ostenfeld) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium heteracanthum</i> (Dangeard) Balech			+	+						77, 99
<i>Protoperidinium hirobis</i> (Abé) Balech				+					+	1, 144
<i>Protoperidinium inclinatum</i> (Balech) Balech				+						99
<i>Protoperidinium inflatum</i> (Okamura) Balech	+	+	+	+	+				+	
<i>Protoperidinium laispinum</i> (Mangin) Balech	+	+	+	+					+	
<i>Protoperidinium leonis</i> (Pavillard) Balech	+	+	+	+	+		+	+	+	
<i>Protoperidinium ligusticum</i> (Rampi) Balech					+					138
<i>Protoperidinium maranense</i> Tolomio									+	163, 165
<i>Protoperidinium mariebourae</i> (Paulsen) Balech	+	+	+	+	+	+	+			
<i>Protoperidinium mediterraneum</i> (Kofoid) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium minutum</i> (Kofoid) Loeblich III	+	+		+	+				+	
<i>Protoperidinium mite</i> (Pavillard) Balech	+		+	+	+				+	
<i>Protoperidinium nipponicum</i> (Abé) Balech <sup>152</sup>								+	+	40, 150
<i>Protoperidinium nudum</i> (Meunier) Balech <sup>153</sup>			+	+	+				+	98, 99
<i>Protoperidinium oblongum</i> (Aurivillius) Parke et Dodge	+	+	+	+	+				+	
<i>Protoperidinium obtusum</i> (Karsten) Parke et Dodge									+	150
<i>Protoperidinium oceanicum</i> (Vanhöffen) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium oviforme</i> (Dangeard) Balech	+	+	+	+	+				+	
<i>Protoperidinium ovum</i> (Schiller) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium pallidum</i> (Ostenfeld) Balech	+	+	+	+	+			+	+	
<i>Protoperidinium parthenopes</i> Zingone et Montresor					+					178
<i>Protoperidinium pedunculatum</i> (Schütt) Balech	+	+	+	+	+				+	
<i>Protoperidinium pellucidum</i> (Schütt) Balech	+	+	+	+	+			+	+	
<i>Protoperidinium pentagonum</i> (Gran) Balech	+	+	+	+		+	+	+	+	
<i>Protoperidinium punctulatum</i> (Paulsen) Balech	+	+	+	+	+			+	+	
<i>Protoperidinium pyriforme</i> (Paulsen) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium quarnerense</i> (Schröder) Balech	+	+	+	+	+			+	+	
<i>Protoperidinium schilleri</i> (Paulsen) Balech	+	+	+	+						
<i>Protoperidinium simulium</i> (Paulsen) Balech	+	+	+	+					+	
<i>Protoperidinium sinaicum</i> (Matzenauer) Balech					+	+				76, 77, 149
<i>Protoperidinium solidicorne</i> (Mangin) Balech <sup>154</sup>			+	+	+		+		+	
<i>Protoperidinium sphaericum</i> (Murray et Whitting) Balech			+	+	+	+	+	+	+	
<i>Protoperidinium sphaeroides</i> (Dangeard) Balech <sup>155</sup>	+	+		+						149
<i>Protoperidinium sphaeroideum</i> (Mangin) Balech <sup>155</sup>										
<i>Protoperidinium steinii</i> (Jörgensen) Balech	+	+	+	+	+	+	+	+	+	
<i>Protoperidinium subinerme</i> (Paulsen) Loeblich III	+	+	+	+	+			+	+	
<i>Protoperidinium thorianum</i> (Paulsen) Balech	+				+	+			+	
<i>Protoperidinium tregouboffii</i> (Halim) Balech <sup>156</sup>					+					63, 64
<i>Protoperidinium tristylum</i> (Stein) Balech					+			+	+	76, 168, 175
<i>Protoperidinium tubum</i> (Schiller) Balech	+		+	+	+			+		
<i>Protoperidinium tumidum</i> (Okamura) Balech					+			+		
<i>Protoperidinium variegatum</i> (Peters) Balech		+								127
<i>Protoperidinium wiesneri</i> (Schiller) Balech <sup>157</sup>			+		+			+		



Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Scrippsiella</i> Balech ex Loeblich III 1965 <sup>158</sup>										
<i>Scrippsiella lachrymosa</i> Lewis				+						39, 112
<i>Scrippsiella precaria</i> Montresor et Zingone				+						109
<i>Scrippsiella ramonii</i> Montresor				+						39, 108
<i>Scrippsiella rotunda</i> Lewis				+						39, 117
<i>Scrippsiella spinifera</i> Honsell et Cabrini							+			72
<i>Scrippsiella trochoidea</i> (Stein) Balech ex Loeblich III <sup>159</sup>	+	+	+	+	+	+	+	+	+	
Podolampadaceae Lindemann 1928										
<i>Blepharocysta</i> Ehrenberg 1873										
<i>Blepharocysta hermosillai</i> Carbonell-Moore				+						19
<i>Blepharocysta paulsenii</i> Schiller			+		+	+			+	
<i>Blepharocysta splendor-maris</i> (Ehrenberg) Stein	+	+	+		+				+	
<i>Mysticella</i> Carbonell-Moore 1994										
<i>Mysticella striata</i> (Schütt) Carbonell-Moore <sup>160</sup>					+					132
<i>Podolampas</i> Stein 1883										
<i>Podolampas bipes</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Podolampas curvatus</i> Schiller					+					76, 145
<i>Podolampas elegans</i> Schütt	+	+	+	+	+	+	+	+	+	
<i>Podolampas palmipes</i> Stein	+	+	+	+	+	+	+	+	+	
<i>Podolampas spinifera</i> Okamura <sup>161</sup>	+	+	+	+	+	+	+	+	+	
Pyrophacaceae Lindemann 1928										
<i>Pyrophacus</i> Stein 1883										
<i>Pyrophacus horologium</i> Stein emend. Wall et Dale	+	+	+	+	+	+	+	+	+	
<i>Pyrophacus steinii</i> (Schiller) Wall et Dale				+	+		+	+	+	
<i>Pyrophacus vancampoae</i> (Rossignol) Wall et Dale <sup>162</sup>			+							96, 160
<i>Peridinales incertae sedis</i>										
<i>Ceratoperidinium</i> Margalef ex Loeblich III 1980										
<i>Ceratoperidinium mediterraneum</i> Abboud-Abi Saab <sup>163</sup>									+	2
<i>Ceratoperidinium yeye</i> Margalef ex Loeblich III <sup>163</sup>			+						+	1, 99, 169
<i>Fragilidium</i> Balech ex Loeblich III 1965 (= <i>Helgolanicum</i> von Stosch 1869, <i>Goniodoma</i> Stein 1883 partim.)										
<i>Fragilidium fissile</i> Balech				+						6
<i>Heterocapsa</i> Stein 1883 (= <i>Cachonina</i> Loeblich III 1968)										
<i>Heterocapsa lanceolata</i> Iwataki et Fukuyo <sup>164</sup>								+		126
<i>Heterocapsa niei</i> (Loeblich III) Morrill et Loeblich III <sup>165</sup>				+		+	+			
<i>Heterocapsa rotundata</i> (Lohmann) G. Hansen <sup>166</sup>		+			+			+	+	
<i>Heterocapsa triquetra</i> (Ehrenberg) Stein		+	+			+	+	+		
<i>Micracanthodinium</i> Deflandre 1937 (= <i>Cladopyxis</i> Stein 1883 partim.)										
<i>Micracanthodinium bacilliferum</i> (Schiller) Deflandre <sup>167</sup>					+		+			20, 140
<i>Micracanthodinium claytonii</i> (Holmes) Dodge <sup>168</sup>					+		+			22, 140
<i>Micracanthodinium setiferum</i> (Lohmann) Deflandre <sup>169</sup>		+	+	+	+	+				
<i>Spiraulax</i> Kofoid 1911 (= <i>Gonyaulax</i> Diesing 1866 partim.)										
<i>Spiraulax jolliffei</i> (Murray et Whitting) Kofoid	+		+	+	+		+	+	+	
<i>Prorocentrales</i> Lemmermann 1910										
Prorocentrales Stein 1883										
<i>Exuviella</i> Cienkowski 1881 <sup>170</sup>										
<i>Exuviella aperta</i> Schiller <sup>171</sup>		+			+					77, 145, 168
<i>Mesoporos</i> Lillick 1937 (= <i>Porella</i> Schiller 1928)										
<i>Mesoporos globulus</i> (Schiller) Lillick		+	+	+	+	+	+			
<i>Mesoporos perforatus</i> (Gran) Lillick	+	+	+	+	+	+	+	+	+	
<i>Prorocentrum</i> Ehrenberg 1834 <sup>170</sup> (= <i>Exuviella</i> Cienkowski 1881)										
<i>Prorocentrum aporum</i> (Schiller) Dodge	+		+	+	+	+	+	+		
<i>Prorocentrum arcuatum</i> Isseel <sup>172</sup>			+	+			+	+		

Table II. (continued)

Dinophyceae West et Fritsch 1927	Alb	Alg	Bal	Tyr	Lig	Ion	Adr	Aeg	Lev	Reference no.
<i>Prorocentrum balticum</i> (Lohmann) Loeblich III	+		+		+	+	+	+	+	
<i>Prorocentrum belizeanum</i> Faust				+		+				151
<i>Prorocentrum cassubicum</i> (Woloszynska) Dodge					+			+		75, 76, 83
<i>Prorocentrum compressum</i> (Bailey) Abé ex Dodge <sup>173</sup>	+	+	+	+	+	+	+	+	+	
<i>Prorocentrum concavum</i> Fukuyo					+					151
<i>Prorocentrum cordatum</i> (Ostenfeld) Dodge <sup>174, 175</sup>	+		+		+	+	+	+	+	
<i>Prorocentrum dactylus</i> (Stein) Dodge		+	+		+	+	+			
<i>Prorocentrum dentatum</i> Stein <sup>176</sup>	+		+	+	+	+	+	+	+	
<i>Prorocentrum emarginatum</i> Fukuyo				+						172
<i>Prorocentrum gracile</i> Schütt <sup>177</sup>		+	+	+	+	+	+	+	+	
<i>Prorocentrum lima</i> (Ehrenberg) Dodge		+	+	+	+	+	+	+	+	
<i>Prorocentrum maximum</i> (Gourret) Schiller <sup>178</sup>		+	+	+	+	+	+	+	+	
<i>Prorocentrum micans</i> Ehrenberg <sup>179</sup>	+	+	+	+	+	+	+	+	+	
<i>Prorocentrum minimum</i> (Pavillard) Schiller <sup>175</sup>		+	+	+	+	+	+	+	+	
<i>Prorocentrum nanum</i> Schiller <sup>180</sup>			+		+		+			
<i>Prorocentrum nux</i> Puigserver et Zingone				+						128
<i>Prorocentrum ovum</i> (Schiller) Dogde			+	+	+		+	+		
<i>Prorocentrum rostratum</i> Stein	+		+	+	+		+	+	+	
<i>Prorocentrum rotundatum</i> Schiller <sup>181</sup>		+	+	+	+	+	+	+	+	
<i>Prorocentrum scutellum</i> Schröder <sup>182</sup>	+	+	+	+	+	+	+	+	+	
<i>Prorocentrum triestinum</i> Schiller		+	+	+	+	+	+	+	+	
<i>Prorocentrum vaginulum</i> (Stein) Dodge <sup>183</sup>		+	+		+	+	+	+	+	
<i>Prorocentrum venetum</i> Tolomio et Cavolo <sup>184</sup>							+			164
<i>Protaspidales</i> Loeblich III 1970										
Entomosigmataceae Chatton 1952										
<i>Entomosigma</i> Schiller 1925										
<i>Entomosigma peridinioides</i> Schiller <sup>185</sup>				+	+		+			75, 76, 145
<i>Pyrocystales</i> Apstein 1909										
Pyrocystaceae (Schütt) Lemmermann 1899										
<i>Dissodinium</i> Klebs in Pascher emend. Elbrächter et Drebes 1978 <sup>186</sup>										
<i>Dissodinium pseudolunula</i> Swift ex Elbrächter et Drebes <sup>187</sup>			+	+	+	+	+	+	+	
<i>Pyrocystis</i> Murray ex Haeckel 1890 <sup>186</sup> (= <i>Gymnodinium</i> Stein 1883 partim., <i>Dissodinium</i> Klebs in Pascher emend. Elbrächter et Drebes 1978 partim.)										76, 125
<i>Pyrocystis acuta</i> Kofoid		+	+	+	+	+	+	+	+	
<i>Pyrocystis elegans</i> Pavillard	+		+	+	+	+	+	+	+	
<i>Pyrocystis fusiformis</i> (Wyville-Thomson ex Haeckel) Blackman <sup>188</sup>	+		+	+	+	+	+	+	+	
<i>Pyrocystis gerbaultii</i> Pavillard <sup>189</sup>			+	+	+					
<i>Pyrocystis hamulus</i> Cleve			+		+	+	+		+	
<i>Pyrocystis margalefi</i> Léger <sup>190</sup>			+		+					91, 104
<i>Pyrocystis minima</i> (Matzenauer) Schiller <sup>191</sup>				+	+	+	+			
<i>Pyrocystis noctiluca</i> Murray ex Schütt <sup>192</sup>		+	+	+	+	+	+	+	+	
<i>Pyrocystis obtusa</i> Pavillard		+	+	+	+	+	+	+	+	
<i>Pyrocystis robusta</i> Kofoid		+	+	+	+	+	+	+	+	
Dinoflagellates of uncertain identification										
<i>Adinimonas</i> Schiller 1928										
<i>Adinimonas oviforme</i> Schiller <sup>193</sup>		+				+	+		+	
<i>Archaeosphaerodiniopsis</i> Rampi 1943										
<i>Archaeosphaerodiniopsis verrucosa</i> Rampi <sup>194</sup>						+				135
<i>Pachydinium</i> Pavillard 1915										
<i>Pachydinium mediterraneum</i> Pavillard <sup>195</sup>			+		+	+				

## Notes

- <sup>1</sup> Reported in the Western Mediterranean Sea by Gómez and Claustre (2003). These records assigned to *Asterodinium gracile* Sournia presented morphological differences with respect to the type species. *Asterodinium libanum* Abboud-Abi Saab requires a more detailed description.
- <sup>2</sup> The type species *Brachydidinium capitatum* F.J.R. Taylor (Taylor 1963) was replaced by *Brachydidinium capitatum* F.J.R. Taylor due to an etymological error (Taylor 1967). Sournia (1973 p. 5) reported that the correction is invalid.
- <sup>3</sup> Rare dinoflagellate epiphytic on Rhodophyceae (see Sournia 1986, p. 36).
- <sup>4</sup> Rare and insufficiently described taxon (Sournia 1986, p. 36).
- <sup>5</sup> According to Taylor (1976 p. 190), the cysts were reported by Margalef *et al.* (1954). *Gloeodinium* Klebs and *Hemidinium* Stein have been considered as the immobile and mobile stage respectively of the life cycle of the same taxa (see Sournia 1986 p. 67). The continental species, *Hemidinium nasutum* Stein and others, are reported in the Mediterranean waters (e.g., Schiller 1935–1937, p. 89–92, Viličić *et al.* 2002).
- <sup>6</sup> *Syracosphaera heimii* Lohmann. This taxon was previously considered to be a coccolithophorid and has been scarcely reported in dinoflagellate checklists (see Tangen *et al.* 1982).
- <sup>7</sup> This taxon resembles *Amphisolenia spinulosa* Kofoid and *Amphisolenia mozambica* Sournia.
- <sup>8</sup> This taxon presents synonyms as *Dinophysis borealis* Paulsen, *D. lachmanni* Paulsen, *D. boehmii* Paulsen or *D. skagii* Paulsen.
- <sup>9</sup> *Dinophysis dens* Pavillard.
- <sup>10</sup> The orthographical similarity of *Dinophysis alata* Jörgensen, *Dinophysis alata* Böhm and *Dinophysis alata* (Wood) Balech is confusing. Viličić *et al.* (2002) reported *Dinophysis alata* (Wood) Balech.
- <sup>11</sup> *Dinophysis amygdala* Balech, *Phalacroma ovum* Schütt, non *Dinophysis ovum* Schütt.
- <sup>12</sup> This taxon resembles *Phalacroma ovatum* (Claparède et Lachmann) Jörgensen.
- <sup>13</sup> *Dinophysis caudata* var. *diagensis* Kofoid.
- <sup>14</sup> *Dinophysis intermedia* Pavillard, *Dinophysis laevis* Pouchet.
- <sup>15</sup> *Phalacroma odiosum* Pavillard.
- <sup>16</sup> *Phalacroma mitra* Schütt, *Phalacroma rapa* Stein, *Phalacroma dolichopterygium* Murray et Whitting.
- <sup>17</sup> Non *Phalacroma ovum* Schütt.
- <sup>18</sup> *Dinophysis infundibula* Schiller.
- <sup>19</sup> *Dinophysis lenticula* Pavillard.
- <sup>20</sup> *Dinophysis reticulata* (Kofoid) Balech.
- <sup>21</sup> *Dinophysis acuminata* f. *reniformis* Pavillard, *D. pavillardii* Schröder, *D. reniformis* (Pavillard) Kofoid et Skogsberg, *D. ventrecta* Schiller.
- <sup>22</sup> *Dinophysis sphaeroidea* (Schiller) Balech.
- <sup>23</sup> *Dinophysis uracantha* Schütt, non *Dinophysis uracantha* Stein.
- <sup>24</sup> *Dinophysis sphaerica* Pavillard
- <sup>25</sup> A possible variety of *Histioneis depressa* Schiller (Taylor 1976, p. 44).
- <sup>26</sup> *Ornithocercus carolinae* Kofoid, *Histioneis francescae* Murray et Whitting.
- <sup>27</sup> *Ornithocercus assimilis* Jörgensen, *O. galea* (Pouchet) Abé.
- <sup>28</sup> *Histioneis splendida* Murray et Whitting.
- <sup>29</sup> *Ornithocercus serratus* Kofoid, *O. orbiculatus* Kofoid et Michener.
- <sup>30</sup> *Histioneis karstenii* Kofoid et Michener.
- <sup>31</sup> *Dinophysis acutoidea* Balech, *Phalacroma acutum* Pavillard.
- <sup>32</sup> *Phalacroma stenopterygium* Jörgensen.
- <sup>33</sup> *Pseudophalacroma nasutum* (Stein) Jörgensen, *Dinophysis nasuta* (Stein) Parke et Dixon.
- <sup>34</sup> *Gymnodinium sanguineum* Hirasaka, *G. splendens* Lebour.
- <sup>35</sup> *Amphidinium phaeocysticola* Lebour has been considered as a synonym of *A. crassum* Lohmann. However this synonymy is debatable (Elbrächter 1979).
- <sup>36</sup> *Amphidinium lacustre* Stein, *A. schroederi* Schiller and *A. lacustriformis* Schiller are often considered as synonyms. Typically fresh and brackish water species.
- <sup>37</sup> *Amphidinium klebsii* Kofoid et Swezy.
- <sup>38</sup> Considered as a synonym of *Amphidinium lacustriforme* Schiller by Dodge (1982 p. 72).
- <sup>39</sup> *Gymnodinium filum* Lebour.
- <sup>40</sup> Taylor (1976 p. 114) reported this taxon from the Ligurian Sea.
- <sup>41</sup> Non *Cochlodinium helix* Kofoid et Swezy (= *Cochlodinium helicoides* Lebour).
- <sup>42</sup> Confusion possible between *Cochlodinium polykrikoides* Margalef (= *C. heterolobatum* Silva) and *Gymnodinium impudicum* (Fraga et Bravo) G. Hansen et Moestrup (see Cho *et al.* 2001).
- <sup>43</sup> *Gymnodinium albulum* Lindemann and *G. simplex* (Lohmann) Kofoid et Swezy may be synonyms.
- <sup>44</sup> The North European taxon, *Gyrodinium aureolum* Hulburt *sensu* Braarud et Heimdal, is a synonym of *Karenia mikimotoi* (Miyake et Kominami ex Oda) G. Hansen et Moestrup (= *Gymnodinium nagasakiense* Takayama et Adachi) (Hansen *et al.* 2000). See also Note 51.
- <sup>45</sup> According to Bolch and Reynolds (2002) other taxa that also produce microreticulate cysts such as *Gymnodinium nolleri* Ellegaard et Moestrup and *G. microreticulatum* Bolch et Hallegraeff are present in the Tyrrhenian and Adriatic Seas based on the cysts reported by Montresor *et al.* (1998) and Rubino *et al.* (2000).
- <sup>46</sup> The records of *Gymnodinium catenatum* Graham by Carrada *et al.* (1991), Giacobbe *et al.* (1995) and Labib (1997) are considered as *G. impudicum* (Fraga et Bravo) G. Hansen et Moestrup.
- <sup>47</sup> *Gymnodinium conicum* Kofoid et Swezy (= *G. viridis* Lebour) is considered as a synonym of *Gyrodinium viridescens* Kofoid et Swezy. Non *Gyrodinium conicum* Schiller.
- <sup>48</sup> *Gymnodinium punctatum* var. *grammaticum* Pouchet.
- <sup>49</sup> *Gymnodinium rhomboides* Schütt, *G. hyalinum* Lebour (= *G. lucidum* Ballantine in Parke et Dixon). *Gyrodinium striatissimum* (Hulburt) G. Hansen et Moestrup has been considered as a synonym until the redescription of *G. heterostriatum* Kofoid et Swezy by Elbrächter (1994).
- <sup>50</sup> This brackish waters taxon appears associated with *Karenia mikimotoi* (Miyake et Kominami ex Oda) G. Hansen et Moestrup (see also Notes 44 and 51).
- <sup>51</sup> According to Faust and Gullede (2002) this taxon was recorded in the Tyrrhenian Sea by Carrada *et al.* (1991). Confusion possible with species of the complex *Karenia mikimotoi* (Miyake et Kominami ex Oda) G. Hansen et Moestrup. *Gymnodinium pulchellum* is distinguished from *K. mikimotoi* by the sigmoid apical groove. See also Note 44.
- <sup>52</sup> This taxon resembles *Katodinium glaucum* (Lebour) Loeblich III.
- <sup>53</sup> *Gyrodinium opinum* (Schütt) Lebour.
- <sup>54</sup> *Gyrodinium dominans* Hulburt.
- <sup>55</sup> "lacryma" (= tear-drop) should be the correct epithet of this taxon.
- <sup>56</sup> *Gymnodinium spirale* var. *pepo* Schütt.
- <sup>57</sup> *Gymnodinium spirale* var. *pinguis* Schütt.
- <sup>58</sup> *Gymnodinium breve* Davis, *Ptychodiscus brevis* (Davis) Steidinger.
- <sup>59</sup> Reported as *Gymnodinium galatheanum* Braarud (= *Gyrodinium galatheanum* (Braarud) Taylor *sensu* Taylor). More recently this taxon, unless *Gymnodinium galatheanum* Braarud *sensu* Kite et Dodge, is considered as a synonym of *Karodinium micrum* (Leadbeater et Dodge) J. Larsen (Daugbjerg *et al.* 2000).
- <sup>60</sup> *Massartia glauca* (Lebour) Schiller, *Gyrodinium glaucum* (Lebour) Kofoid et Swezy, *Gymnodinium minutum* Lebour, *Massartia minuta* (Lebour) Conrad et Kufferath, *Massartia tubulata* Rampi.
- <sup>61</sup> *Massartia tubulata* Rampi.
- <sup>62</sup> Related to the genus *Gyrodinium* Kofoid et Swezy according to Sournia (1986, p. 57).
- <sup>63</sup> *Gymnodinium teredo* Pouchet.
- <sup>64</sup> *Ptychodiscus inflatus* Pavillard, *P. carinatus* Kofoid.
- <sup>65</sup> *Erythroopsis agilis* Hertwig. Probably several species are reported as *E. agile* (Hertwig) P.C. Silva according to Elbrächter (1979).
- <sup>66</sup> Elbrächter (1979) considered this taxon as a synonym of *E. agile* (Hertwig) P.C. Silva.
- <sup>67</sup> To the best of my knowledge, never reported after the initial description by Greuet (1968b).
- <sup>68</sup> *Pouchetia armata* Dogiel, *Pouchetia maculata* Kofoid et Swezy.
- <sup>69</sup> *Kofoidinium lebourae* (Pavillard) Taylor (= *Gymnodinium lebourae* Pavillard).
- <sup>70</sup> Originally described from the Ligurian Sea as *Leptodinium caudatum* Cachon et Cachon.
- <sup>71</sup> *Pratjetella medusoides* (Hertwig) Loeblich et Loeblich III. Doubtful taxon (Sournia 1986, p. 53).
- <sup>72</sup> *Abedinium dasyptus* (Cachon et Cachon) Loeblich et Loeblich III.
- <sup>73</sup> Reported from the Ligurian Sea as *Leptospathium navicula* Cachon et Cachon-Enjumet (1964) after the description by Margalef (1963). Balkis (2000) reported this taxon from the Marmara Sea.
- <sup>74</sup> Resembles *Pronoctiluca acuta* (Lohmann) Schiller.
- <sup>75</sup> *Oxytoxum margalefii* Rampi, *Oxytoxum tonollii* Rampi.
- <sup>76</sup> *Murrayella spinosa* Kofoid, *Pavillardinium spinosum* (Kofoid) Taylor ex Sournia, *Amphidoma spinosa* (Kofoid) Kofoid et Michener, *Gonyaulax rouchii* Rampi.
- <sup>77</sup> This taxon resembles *Ceratium incisum* (Karsten) Jörgensen.
- <sup>78</sup> *Ceratium buceros* f. *claviger* (Kofoid) Schiller, *Ceratium horridum* f. *claviger* (Kofoid) Sournia.
- <sup>79</sup> Also reported as *Ceratium trichoceros* var. *contrarium* (Gourret) Schiller.
- <sup>80</sup> *Ceratium horridum* var. *lenticulatum* Jörgensen, *C. buceros* f. *denticulatum* (Jörgensen) Schiller.
- <sup>81</sup> Reported as *Ceratium pulchellum* f. *eupulchellum* by Ghazzawi (1939) in the Canal of Suez. This taxon re-
- sembles *C. tripos* var. *pulchellum* (Schröder) López, see Sournia (1967).
- <sup>82</sup> *Ceratium arcuatum* (Gourret) Pavillard, *C. tripos* var. *arcuatum* Gourret, non *C. arcuatum* Cleve.
- <sup>83</sup> *Ceratium fusus* var. *extensum* Gourret.
- <sup>84</sup> *C. tripos* var. *horridum* Cleve, but *C. tenue* (Ostenfeld et Schmidt) Jörgensen, *C. intermedium* (Jörgensen) Jörgensen and *C. buceros* (Zacharias) Schiller have not been considered as synonyms.
- <sup>85</sup> This taxon resembles *Ceratium limulus* (Gourret ex Pouchet) Gourret.
- <sup>86</sup> *C. tenuissimum* Kofoid.
- <sup>87</sup> *Ceratium carriense* var. *volans* (Cleve) Sournia.
- <sup>88</sup> *Acanthodinium caryophyllum* Kofoid.
- <sup>89</sup> *Micracanthodinium quadrispinum* (Pavillard) Margalef.
- <sup>90</sup> Confusion possible with *Cladopyxis brachiolata* Stein.
- <sup>91</sup> *Heterodinium detonii* Rampi.
- <sup>92</sup> *Crypthecodinium setense* Biecheler.
- <sup>93</sup> *Goniodoma polyedricum* (Pouchet) Jörgensen, *Heteraulacus polyedricum* (Pouchet) Drugg et Loeblich, *Triadinium polyedricum* (Pouchet) Dodge, *Goniodoma polyedra* Rampi.
- <sup>94</sup> *Heteraulacus sphaericum* (Murray et Whitting) Loeblich III, *Triadinium sphaericum* (Murray et Whittman) Dodge.
- <sup>95</sup> Reported as *Pyrodinium schilleri* (Matzenauer) Schiller [= *Pyrodinium bahamense* Plate var. *compressum* (Böhm) Steidinger, Tøster et Taylor].
- <sup>96</sup> *Alexandrium lusitanicum* Balech.
- <sup>97</sup> Reported as *Goniodoma ostenfeldii* Paulsen by Lecal (1954).
- <sup>98</sup> Reported as *Gonyaulax subulata* Kofoid et Michener. This taxon resembles *Amylax triacantha* (Jörgensen) Sournia (Dodge 1982, p. 217).
- <sup>99</sup> Reported as *Gonyaulax? triacantha* Jörgensen by Lecal (1954).
- <sup>100</sup> *Gonyaulax spinifera* *sensu* Schütt.
- <sup>101</sup> *Gonyaulax digitale* Kofoid, *Protoperidinium digitale* Pouchet.
- <sup>102</sup> Resembles *Gonyaulax birostris* Stein.
- <sup>103</sup> Reported by Narusevich and Tokarev (1989) in an undetermined location of the Mediterranean Sea.
- <sup>104</sup> The comments by Schiller (1935–1937, p. 290) on the similarity between *Gonyaulax kofoidii* and *G. pacifica* Kofoid could induce confusion between both taxa (Pavillard 1937, p. 16; Taylor 1976, p. 104).
- <sup>105</sup> *Gonyaulax minima* Matzenauer.
- <sup>106</sup> Resembles *Gonyaulax ovata* Matzenauer (Schiller 1935–1937, p. 289; Taylor 1976, p. 105).
- <sup>107</sup> *Pavillardinium brianii* (Rampi) Sournia (= *Murrayella brianii* Rampi).
- <sup>108</sup> *Gonyaulax levanderi* (Lemmermann) Paulsen, *Ceratocorys spinifera* Schröder.
- <sup>109</sup> *Gonyaulax diacantha* (Meunier) Schiller, *Gonyaulax longispina* Lebour, *Amylax diacantha* Meunier.
- <sup>110</sup> *Gonyaulax milneri* (Murray et Whitting) Kofoid, *Goniodoma milneri* Murray et Whitting.
- <sup>111</sup> *Gonyaulax polyedra* Stein.
- <sup>112</sup> *Gonyaulax grindleyi* Reinecke, non *G. reticulatum* Kofoid et Michener.
- <sup>113</sup> *Heterodinium laticinctum* Kofoid.
- <sup>114</sup> *Heterodinium pulchrum* Böhm, *Heterodinium richardii* Pavillard.
- <sup>115</sup> *Heterodinium mediocre* f. *sinistrum* (Kofoid) Kofoid et Adamson.

- 116 *Ostreopsis monotis* (Meunier) Lindemann.  
 117 *Ceratium biconicum* Murray et Whitting, *Murrayella biconica* (Murray et Whitting) Pavillard and *Pavillardinium biconicum* Rampi are considered synonyms.  
 118 *Pavillardinium intermedium* (Pavillard) de Toni (= *Murrayella intermedia* Pavillard), non *Centrodinium intermedium* Pavillard.  
 119 *Pavillardinium splendidum* (Rampi) Rampi (= *Murrayella splendida* Rampi).  
 120 Resembles *Corythodinium reticulatum* (Stein) Loeblich et Loeblich III.  
 121 *Prorocentrum curvatum* Kofoid.  
 122 Non *Corythodinium globosum* (Kofoid) Taylor.  
 123 *Oxytoxum sceptrum* (Stein) Schröder.  
 124 *Oxytoxum challengeroides* Kofoid.  
 125 *Oxytoxum mediterraneum* Schiller.  
 126 *Oxytoxum tenuistriatum* Rampi.  
 127 This taxon resembles *Oxytoxum ovale* Schiller  
 128 *Oxytoxum ligusticum* Rampi.  
 129 *Oxytoxum gracile* Schiller.  
 130 *Murrayella ovalis* Pavillard. See also comments on the genus by Sournia (1986, p. 73).  
 131 *Gonyaulax mitra* (Schütt) Kofoid, *Oxytoxum gigas* Kofoid.  
 132 Based on the germination of recent cysts (D'Onofrio et al. 1999).  
 133 Meier et al. (2002) reported 14 species of calcareous dinoflagellates from recent cysts (4 new species), only this taxon that germinated from one cyst from the Levantine Basin is included.  
 134 *Diplopsalis asymmetrica* (Mangin) Lindeman, *Diplopsalis bomba* (Stein) Dodge et Toriumi, *Dissodinium asymmetricum* (Mangin) Loeblich III.  
 135 Considered as a synonym of *Diplopelta bomba* Stein ex Jörgensen by Dodge (1982 p. 157).  
 136 *Dissodinium lenticulum* (Bergh) Loeblich III, *Glenodinium lenticula* (Bergh) Schiller.  
 137 *Diplopsalis orbicularis* (Paulsen) Steidinger et Williams. Usually a brackish water species.  
 138 *Glenodinium rotundum* (Lebour) Schiller.  
 139 Originally described from the Tyrrhenian Sea as *Peridinium tyrrhenicum* Balech (Balech 1990).  
 140 Nearly all of the marine species of *Peridinium* Ehrenberg have been transferred to *Protoperidinium* Bergh.  
 141 *Protoperidinium quinquecorne* (Abé) Balech.  
 142 This taxon presents synonyms such as *Diplopsalis minor* (Paulsen) Lindemann, *Zygabikodinium lenticulatum* (Manguin) Loeblich et Loeblich III, *Diplopeltopsis minor* (Paulsen) Pavillard, *Diplopsalis lenticula* f. *minor* Paulsen (see Dodge and Toriumi 1993, Elbrächter 1993).  
 143 Non *Protoperidinium biconicum* (Dangeard) Balech.  
 144 *Minuscula bipes* (Paulsen) Lebour.  
 145 *Protoperidinium bimucronatum* (Schiller) Balech. The synonymy between *Peridinium sourniai* F.J.R. Taylor and *Protoperidinium bispinum* (Schiller) Balech is debatable.  
 146 According to Schiller (1935, p. 223) *Peridinium curtipes* Jörgensen is a synonym of *Peridinium crassipes* Kofoid, consequently a confusion could be expected. *Protoperidinium crassipes* (Kofoid) Balech and *Protoperidinium curtipes* (Jörgensen) Balech are different species: 1) *Protoperidinium crassipes* (Kofoid) Balech (= *Peridinium crassipes* Kofoid), 2) *Protoperidinium curtipes* (Jörgensen) Balech (= *Peridinium crassipes* Paulsen 1907, non Paulsen 1930). See also Balech (1988, p. 110).  
 147 *Peridinium decipiens* var. *curvipes* Ostensfeld, *Protoperidinium subcurvipes* (Lebour) Balech.  
 148 *Protoperidinium longipes* (Karsten) Balech.  
 149 According to Balech (1976) this taxon is related to the freshwater species *Protoperidinium achromaticum* (Levander) Balech.  
 150 *Protoperidinium ovatum* Pouchet [= *P. globulus* var. *ovatum* (Pouchet) Schiller, *Peridinium ovatum* (Pouchet) Schütt] have been considered as synonyms.  
 151 This taxon can be confused with *Protoperidinium ovum* (Schiller) Balech.  
 152 Also reported from the Tyrrhenian Sea based on cysts by Montresor et al. (1998).  
 153 *Protoperidinium spiniferum* (Schiller) Balech.  
 154 The orthographic similarity between *P. sphaeroides* (Dangeard) Balech and *P. sphaeroideum* (Mangin) Balech is confusing (Sournia 1978, p. 29).  
 155 This taxon resembles *Protoperidinium brachypus* (Schiller) Balech.  
 156 *Protoperidinium angustum* (Dangeard) Balech.  
 157 Most of the recently described species of *Scrippsiella* Balech ex Loeblich are reported from the germination of cysts (Montresor et al. 1994, D'Onofrio et al. 1999).  
 158 *Scrippsiella faeroense* Dickensheets et Cox, non *Scrippsiella faeroense* (Paulsen) Balech et Soares.  
 159 Reported by Rampi (1941) as *Blepharocysta striata* Schütt (see Carbonell-Moore 1994).  
 160 *Podolampas spinifer* Pavillard.  
 161 *Tuberculodinium vancampoeae* (Rossignol) Wall (= *Pterospemopsis vancampoeae* Rossignol). Taylor (1976 p. 183) reported the presence of this taxon in the Mediterranean Sea based on Margalef (1948).  
 162 One specimen that resembles *C. yeye* Margalef from the Alborán Sea, one specimen of *C. yeye* and other undetermined species of this genus were observed from the Balearic coasts (unpublished obs.). *Ceratoperidinium mediterraneum* Abboud-Abi Saab requires a more detailed description.  
 163 Iwataki et al. (2002) reported this taxon based on the material from the Aegean Sea by Pennik and Clarke (1977).  
 164 *Cachonina niei* Loeblich III.  
 165 *Katodinium rotundatum* (Lohmann) Loeblich III, *Marsartia rotundata* (Lohmann) Schiller, *Amphidinium rotundatum* Lohmann, *Katodinium minutum* (Lebour) Sournia.  
 166 *Cladopyxis bacillifera* Schiller.  
 167 *Cladopyxis claytonii* Holmes.  
 168 *Cladopyxis setifera* Lohmann, *Micracanthodinium bacilliferum* (Schiller) Deflandre.  
 169 The genus *Exuviella* was included in *Prorocentrum* by Dodge (1975). McLachlan et al. (1997) proposed the separation of both genera.  
 170 Schiller (1931–1933, p. 26) reported this taxon as *Exuviella (?) aperta* Schiller (described from the Adriatic Sea in 1928). Inadequate description according to Dodge (1975).  
 171 *P. micans* var. *gibbosum* Schiller, *P. gibbosum* (Schiller) Schiller, *P. blatta* Athanassopoulos. Resembles *Prorocentrum micans* Ehrenberg.  
 172 According to Dodge (1975): *Prorocentrum bidens* Schiller, *P. lebourae* Schiller, *Exuviella oblonga* Schiller [= *Prorocentrum oblongum* (Schiller) Taylor], *E. lenticulata* Matzenauer, *E. elongata* Rampi.  
 173 *Prorocentrum pyriformis* (Schiller) Hascl.  
 174 *Prorocentrum minimum* (Pavillard) Schiller and *Prorocentrum cordatum* (Ostensfeld) Dodge may be synonyms (Velikova and Larsen 1999).  
 175 *Prorocentrum obtusidens* Schiller, also *P. monacense* Kufferath described in the Ligurian Sea (Kufferath 1957).  
 176 *P. hentschellii* Schiller, *P. sigmoides* Böhm, *P. macrurus* Athanassopoulos. Resembles *P. micans* Ehrenberg.  
 177 According to Dodge (1975): *Prorocentrum mexicanum* Osorio-Tafall, *P. obtusum* Ostensfeld, *P. brochi* Schiller, *P. ovale* Schiller, *P. ovalis* Rampi, *P. rampii* Sournia.  
 178 *Prorocentrum schilleri* Böhm in Schiller.  
 179 *Prorocentrum nanum* Schiller and *P. pusillum* (Schiller) Loeblich were considered as synonyms until Puigserver and Zingone (2002).  
 180 *Prorocentrum cornutum* Schiller.  
 181 *Prorocentrum sphaeroideum* Schiller, *P. robustum* Osorio Tafall.  
 182 *Prorocentrum adriaticum* Schiller.  
 183 This taxon resembles *Prorocentrum mexicanum* Osorio-Tafall that is here considered a synonym of *Prorocentrum maximum* (Gourret) Schiller.  
 184 Regarded as a doubtful dinoflagellate by Sournia (1986, p. 37).  
 185 *Dissodinium* is a genus of parasitic dinoflagellates with a complicate life cycle including planktonic life cycle stages similar to those of the genus *Pyrocystis*. In contrast, *Pyrocystis* is a permanently free-living phototrophic dinoflagellate with a predominant coccoid stage and a flagellated dinospore stage (e.g., Elbrächter et al. 1987).  
 186 *Pyrocystis lunula* (Schütt) Schütt, *Dissodinium lunula* (Schütt) Pascher.  
 187 *Dissodinium fusiformis* (Thompson ex Murray) Matzenauer.  
 188 *Dissodinium gerbaultii* (Pavillard) F.J.R. Taylor  
 189 Léger (1973) reported the presence of this taxon in the Spanish Mediterranean coast by Margalef et al. (1957). Drebes (1981) reported that *Pyrocystis margalefii* Léger is probably identical with the resting stages of *Dissodinium pseudolunula* Swift ex Elbrächter et Drebes.  
 190 *Dissodinium minimum* Matzenauer.  
 191 *Pyrocystis pseudonoclituca* Wyville-Thomson ex Murray, *Dissodinium pseudolunula* Swift ex Elbrächter et Drebes.  
 192 Regarded as a doubtful dinoflagellate by Sournia (1986, p. 97). Commonly reported as *Adinomonas* Schiller.  
 193 Regarded as a doubtful dinoflagellate by Sournia (1986, p. 97).  
 194 Doubtful taxon (Sournia 1986, p. 98). Also reported from the Sicilian coasts or North-Italian lakes by Andreis et al. (1982).

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## Taxonomic Notes on Marine Algae from Malaysia. X. Four Species of *Dasya* (Rhodophyceae), with the Descriptions of *Dasya longifila* sp. nov. and *D. malaccensis* sp. nov.

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Four species of the red algal genus *Dasya* (Dasyaceae, Ceramiales), including two new species, are reported from Malaysia. *Dasya iyengarii* Børgesen and *D. pilosa* (Weber-van Bosse) Millar are reported from Malaysia for the first time, and their morphological features are described along with taxonomic comments. *Dasya longifila* Masuda et Uwai, sp. nov. is chiefly distinguished by its long, monosiphonous, pseudolateral filaments (often longer than the axis) in which intercalary cell divisions take place, and a small number of tetrasporangial stichidia and spermatangial branches per fertile pseudolateral from several related species that possess small-statured, sparsely corticated axes. *Dasya malaccensis* Masuda et Uwai, sp. nov. is characterised by its diminutive thallus (up to 10 mm high) with thickly corticated axes, relatively short pseudolaterals, and narrow tetrasporangial stichidia and spermatangial branches. This species has no close relatives among small-sized species of *Dasya*.

### Introduction

The red algal genus *Dasya* belonging to the Dasyaceae (Ceramiales) is characterised by: 1) its radially branched and sympodially developed axes issuing numerous, pigmented, monosiphonous pseudolaterals (usually from every segment) that are subdichotomously branched several times and usually persistent; 2) tetrasporangial stichidia formed from a branch of monosiphonous filaments including pseudolaterals and bearing whorls of up to 7 tetrasporangia and 2–4 postsporangial cover cells; 3) spermatangial branches also produced from a branch of monosiphonous filaments including pseudolaterals; and 4) the absence of pericarp initials at fertilisation (Parsons 1975, Maggs and Hommersand 1993, Parsons and Womersley 1998). *Dasya* currently includes more than 80 species that are widely distributed in tropical to temperate seas of the world (Parsons and Womersley 1998). However, no species of the genus had been reported from Malaysian waters (Phang and Wee 1991), which are a very important region in assessing the relationship between the marine algal flora of the Pacific and that of the Indian Ocean. In the present paper we report four species of *Dasya* including two new species on the basis of our recent collections from Malaysia.

### Material and Methods

Specimens examined were collected at various localities in Malaysia by us. The specimens were fixed in 10% Formalin in seawater, and later some were

dried as voucher herbarium specimens or mounted in 30% Karo<sup>®</sup> on microscope slides and deposited in the Herbarium of the Graduate School of Science, Hokkaido University (SAP), or in the Seaweed Herbarium, Institute of Biological Sciences, University of Malaya (KLU). Sections were made by hand using a razor blade and stained with 0.5% (w/v) cotton blue in a lactic acid/phenol/glycerol/water (1:1:1:1 [v/v]) solution and mounted in 50% glycerol/seawater or 30% Karo<sup>®</sup> on microscope slides.

### Observations and Discussion

*Dasya iyengarii* Børgesen 1937: 345, f. 16, 17 (Figs 1–9)

**Distribution:** Tropical regions in the Pacific Ocean (Price and Scott 1992, present paper) and the Indian Ocean (Silva et al. 1996, present paper).

**Specimens examined:** Kedah: Tanjung Datai Besar (6°25'51"N, 99°40'25"E; 19.xii.1997; tetrasporangial SAP 093314, 093315), Pulau Langkawi. Sarawak: Pulau Talang-Talang Besar (1°55'02"N, 109°46'28"E; 26.v.1998; tetrasporangial SAP 093317-093320), Sematan. Sabah: Pantai Layang Layangan (5°20'13"N, 115°11'43"E; 1.vi.1998; tetrasporangial SAP 093321), Pulau Labuan; Pulau Gaya (6°01'21"N, 116°03'01"E; 4.vi.1998; tetrasporangial SAP 093322), Kota Kinabalu; Black Rock (6°06'55"N, 118°00'04"E; 16.v.1998; spermatangial SAP 093316), Sandakan. Terengganu: Tanjung Batu Lepir (5°53'08"N,