

A CHECKLIST OF SUBTIDAL SEAWEEDS FROM CAMPECHE BANKS, MEXICO

Lista de algas marinas submareales de los Bancos de Campeche, México

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ABSTRACT

Subtidal marine benthic macroalgae offshore the Yucatan in Campeche Banks, Mexico, were collected by box-dredging at 20 to 56 meter depth during June 2005, aboard the Pelikan R/V. Collected seaweeds of Campeche Banks include 178 species encompassing 22 Heterokontophyta, 93 Rhodophyta, 60 Chlorophyta and three Cyanophyta. *Mesophyllum incertum*, *Apoglossum ruscifolium*, *Cryptonemia seminervis*, *Agardhinula browneae*, *Nemacystus howei*, *Padina profunda*, *Nereia tropica*, *Pseudotetraspora marina*, *Anadyomene linkiana*, *A. pavonina*, *Pseudocodium floridanum* and *Caulerpa brachypus* are new records for Atlantic coast of Mexico. Most of the species located in this study were previously recorded from the subtidal waters of the Mexican Caribbean.

Key words: new records, richness, Seaweed

RESUMEN

Se recolectaron muestras de algas marinas submareales en los Bancos de Campeche, México, por dragado entre 20-56 metros de profundidad, en junio 2005, a bordo del Pelican R/V. Se determinaron 178 especies que incluyen 22 Heterokontophyta, 93 Rhodophyta, 60 Chlorophyta y tres Cyanophyta. *Mesophyllum incertum*, *Apoglossum ruscifolium*, *Cryptonemia seminervis*, *Agardhinula browneae*, *Nemacystus howei*, *Padina profunda*, *Nereia tropica*, *Pseudotetraspora marina*, *Anadyomene linkiana*, *A. pavonina*, *Pseudocodium floridanum* y *Caulerpa brachypus* son nuevos registros para la costa Atlántica de México. La mayoría de las especies ubicadas en este estudio se registraron previamente en aguas del Caribe mexicano.

Palabras clave: Algas marinas, nuevos registros, riqueza

INTRODUCTION

The Gulf of México is characterized by a relatively shallow but well developed continental shelf with an extensive system of generally deep, hard, banks of varying origin and composition (Fredericq *et al.* 2009). The Mexican component of the Gulf may be divided as follows: 1) an alluvial sector from Tamaulipas to

Veracruz with several estuarine systems; 2) the submerged limestone plateau off the coast of Yucatan, known as the Campeche Banks, of biogenic origin composed mainly of coral and calcareous algal remains; and 3) the Caribbean sector where the narrow and karstic continental shelf is dominated by coral reefs. Campeche banks are located in sector 2. The direction of dispersal of marine algae by currents in the area tends to be from the Caribbean Sea to Campeche Banks and row westward and northward (Robledo *et al.* 2003). Although several references to the seaweeds of Campeche Banks exist (Huerta-Múzquiz 1958, 1961; Huerta-Múzquiz & Garza-Barrientos 1966; Huerta-Múzquiz *et al.* 1987; Ortega 1995; Gurgel *et al.* 2003; Robledo *et al.* 2003; Callejas-Jiménez *et al.* 2005; Gavio *et al.* 2005; Mendoza-González & Mateo-Cid 2007; Fredericq *et al.* 2009; Gallegos *et al.* 2009; Senties & Dreckmann 2011; Mateo-Cid *et al.* 2012) only two of these reports are based on subtidal collections. In light of the paucity of information available on the subtidal marine algae of the Campeche Banks, this study provides an updated list of the marine benthic algae collected from 20 to 56 meter depth.

MATERIAL AND METHODS

Study site and collections

Sampling was carried out in the Campeche Banks during June 2005 aboard the R/V Pelican using a box dredge (Joyce & Williams 1969). A total of 132 samples were collected at 20°35' N, 92°04' W and 22°40' N, 90°30' W (Fig. 1), between 20 and 56 m depths (with water temperatures of 18–22°C). Algae were preserved in formalin/sea water at a 1:19 ratio. Semi-permanent slides were prepared using corn syrup/water 1:1 with a trace of phenol added to prevent fungal growth. Voucher slides and specimens are housed at the herbarium of the Escuela Nacional de Ciencias Biológicas (ENCB) at the Instituto Politécnico Nacional in Mexico, D.F. Mexico; additional vouchers were housed at the herbarium of the University of Lafayette, Louisiana (LAF). Classification follows Taylor (1960), Schneider & Searles 1991, Ortega *et al.* (2001), Cho *et al.* (2008), Dawes & Mathieson (2008), Wynne (2011) and Guiry & Guiry (2013).

RESULTS

The taxa identified from collections are listed in Table 1 with depth, collection dates, new records for Mexico and other Mexican Caribbean localities where previously recorded. Three taxa of Cyanophyta, 93 Rhodophyta, 22 Heterokontophyta and 60 Chlorophyta were identified for a total of 178 taxa.

Four red algae, *Mesophyllum incertum*, *Apoglossum ruscifolium*, *Cryptonemia seminervis*, *Agardhinula browneae*; three brown algae, *Nemacystus howei*, *Padina profunda*, *Nereia tropica*; and five green algae, *Pseudotetraspora marina*, *Anadyomene linkiana*, *A. pavonina*, *Pseudocodium floridanum* and *Caulerpa brachypus*, are new records for the Atlantic coast of Mexico. Of the 178



Fig. 1. Localities sampled of the 2005 collecting cruise offshore the Campeche Banks, Mexico. Black dots show collecting sites.

species recorded in this study, 125 were reported in earlier publications (Mendoza-González *et al.* 2000; Robledo *et al.* 2003; Mateo-Cid *et al.* 2006, 2012; Mendoza-González *et al.* 2007; Fredericq *et al.* 2009; Gallegos *et al.* 2009). New records and previously reported species are indicated in Table 1.

Table 1. List of species from Campeche Banks, México.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
CYANOPHYTA					
Oscillatoriaceae					
<i>Blennothrix lyngbyacea</i> (Kütz.) K. Agn. & J. Komárek	X	X			4
<i>Lyngbya semiplena</i> J. Agardh	X				NRC
Scytonemataceae					
<i>Scytonematopsis crustacea</i> (Thuret ex. Bornet & Flahault) Koválik & Komárek	X				4
RHODOPHYTA					
Bonnemaisoniaceae					
<i>Asparagopsis taxiformis</i> (Delile) Trevis.	X				3,4
Callithamniaceae					
<i>Crouania attenuata</i> (C. Agardh) J. Agardh	X				3,4
<i>Seirospora occidentalis</i> Børgesen	X				3
Ceramiaceae					

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>Antithamnionella elegans</i> (Berthold) J.H. Price & D. John	X				6
<i>Callithamniella tingitana</i> (Schousb.) Feld.-Maz.	X			X	3
<i>Ceramium luetzelburgii</i> O.C. Schmidt	X	X			3,4
<i>C. nitens</i> (C. Agardh) J. Agardh	X				6
<i>Gayliella flaccida</i> (Harv.) T.O. Cho & L. McIvor	X				3,4
<i>G. transversalis</i> (Collins & Herv.) T.O. Cho & Fredericq	X				NRC
Champiaceae					
<i>Champia parvula</i> (C. Agardh) Harv.	X		X	X	3,4,6
Colaonemataceae					
<i>Colaonema hypneae</i> (Børgesen) A.A. Santos & C.W.N. Moura	X				NRC
Corallinaceae					
<i>Amphiroa rigida</i> J.V. Lamour.	X				3
<i>A. tribulus</i> (Ellis & Sol.) J.V. Lamour.	X				3,4
<i>Hydrolithon farinosum</i> (J.V. Lamour.) Penrose & Y.M. X Chamb.				X	3,4,6
<i>Jania cubensis</i> Mont. ex. Kütz.	X	X		X	3
<i>Neogoniolithon accretum</i> (Foslie & M. Howe) Setch. & Mason		X	X		3
<i>N. brassica-florida</i> (Harv.) Setch. & Mason			X		3,4
<i>Spongites yendoi</i> (Foslie) Y.M. Chamb.			X	X	6
<i>Titanoderma pustulatum</i> (J.V. Lamour.) Nägeli				X	3
Cystocloniaceae					
<i>Hypnea spinella</i> (C. Agardh) Kütz.	X				NRC 3,6
Dasyaceae					
<i>Dasya baillouviana</i> (S.G. Gmel.) Mont.			X		3,4
<i>D. corymbifera</i> J. Agardh		X	X		4
<i>Dictyurus occidentalis</i> J. Agardh		X			4
<i>Heterosiphonia crispella</i> (C. Agardh) M.J. Wynne	X	X	X		3,4
Delesseriaceae					
<i>Apoglossum ruscifolium</i> (Turner) J. Agardh				X	NRM
<i>Hypoglossum hypoglossoides</i> (Stackh.) Collins & Herv.				X	3,4
<i>H. subsimplex</i> M.J. Wynne	X	X		X	NRC
<i>H. tenuifolium</i> (Harv.) J. Agardh			X		3,4
<i>Nitophyllum adhaerens</i> M.J. Wynne	X				3
Erythrotrichiaceae					
<i>Erythrotrichia carnea</i> (Dillwyn) J. Agardh	X				3,4

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
Fauchaceae					
<i>Gloiocladia atlantica</i> (Searles) R.E. Norris				X	3
<i>G. blomquistii</i> (Searles) R.E. Norris				X	NRC
<i>G. rubrispora</i> (Searles) R.E. Norris				X	NRC
Galaxauraceae					
<i>Dichotomaria marginata</i> (Ellis & Sol.) J.V. Lamour.	X				3,4
<i>D. obtusata</i> (Ellis & Sol.) J.V. Lamour.	X	X	X	X	NRC
<i>Galaxaura rugosa</i> (Ellis & Sol.) J.V. Lamour.	X				3,4
Gelidiellaceae					
<i>Gelidiella acerosa</i> (Forssk.) J. Feldmann & Hamel	X				2,3
Gracilariaceae					
<i>Gracilaria blodgettii</i> Harv.		X			3,4
<i>G. cylindrica</i> Børgesen		X	X	X	NRC
<i>G. mamillaris</i> (Mont.) M. Howe			X		4
Halymeniaceae					
<i>Corynomorpha clavata</i> (Harv.) J. Agardh	X				NRC
<i>Cryptonemia crenulata</i> (J. Agardh) J. Agardh	X	X	X		3,4
<i>C. seminervis</i> (C. Agardh) J. Agardh		X			NRM
<i>Halymenia chinophysa</i> Collins & M. Howe	X	X		X	NRC
<i>H. floresii</i> (Clemente) C. Agardh		X	X		4
Hapalidiaceae					
<i>Lithothamnion occidentale</i> (Foslie) Foslie			X	X	4
<i>Mesophyllum incertum</i> (Foslie) Lemoine		X	X	X	NRM
<i>M. ornatum</i> (Foslie & Howe) Athanas.	X		X		NRC
Incertae sedis					
<i>Agardhinula browneae</i> (J. Agardh) De Toni				X	NRM
Kallymeniaceae					
<i>Kallymenia limminghei</i> Mont.	X	X	X	X	NRC
<i>K. westii</i> Ganesan		X			3
Liagoraceae					
<i>Liagora ceranoides</i> J.V. Lamour.	X				3,4
Lomentariaceae					
<i>Ceratodictyon variable</i> (J. Agardh) R.E. Norris	X				2,6
<i>Lomentaria divaricata</i> (Durant) M.J. Wynne			X	X	NRC
Nemastomataceae					
<i>Predaea feldmannii</i> Børgesen			X	X	3
Peyssonneliaceae					
<i>Peyssonnelia armorica</i> (P. Crouan & H. Crouan) Weber-van Bosse	X	X	X	X	4

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>P. boergesenii</i> Weber-van Bosse		X			NRC
<i>P. conchicola</i> Piccone & Grunov		X	X		3
<i>P. inamoena</i> Pil.			X	X	3,4
<i>P. rubra</i> (Grev.) J. Agardh				X	6
Pterocladiaaceae					
<i>Pterocladia capillacea</i> (S.G. Gmel.) Santel. & Hommers.		X	X		NRC
<i>P. sanctarum</i> (Feldmann & Hamel) Santel.	X				NRC
Rhodomelaceae					
<i>Bryothamnion seaforthii</i> (Turner) Kütz.		X			6
<i>B. triquetum</i> (S. Gmel.) M. Howe	X				6
<i>Chondria polyrhiza</i> Collins & Herv.	X				4
<i>Herposiphonia secunda</i> f. <i>tenella</i> (C. Agardh) M.J. Wynne	X				3,4,6
<i>Laurencia caraibica</i> P.C. Silva					4
<i>L. intricata</i> J.V. Lamour.	X		X		3,6
<i>L. obtusa</i> (Huds.) J.V. Lamour.				X	3,4
<i>Lophocladia trichoclados</i> (C. Agardh) F. Schmitz	X		X	X	3
<i>Neosiphonia flaccidissima</i> (Hollenb.) M.S. Kim & I.K. Lee	X				3
<i>Osmundea lata</i> (M. Howe & W.R. Taylor) Y. Yoneshigue-Valentin, M.T. Fujii, & C.F. Gurgel		X	X	X	NRC
<i>Polysiphonia atlantica</i> Kapraun & J.N. Norris	X		X		3,4
<i>Wrightiella tumanowiczii</i> (Gatty) F. Schmitz				X	NRC
Rhodymeniaceae					
<i>Botryocladia occidentalis</i> (Børgesen) Kylin	X	X	X	X	2
<i>B. pyriformis</i> (Børgesen) Kylin	X	X	X	X	3
<i>B. spinulifera</i> W.R. Taylor & I.A. Abbott	X		X	X	3,4
<i>Chrysomenia enteromorpha</i> Harv.	X	X	X	X	3,4
<i>C. halymenioides</i> Harv.		X	X	X	3
<i>C. ventricosa</i> (J.V. Lamour.) J. Agardh	X	X		X	NRC
<i>Rhodymenia pseudopalmata</i> (J.V. Lamour.) P.C. Silva	X	X		X	NRC
Scinaiaaceae					
<i>Scinaia complanata</i> (Collins) Cotton				X	2,3,4
Schyzimeniaceae					
<i>Platoma gelatinosum</i> (M. Howe) C.W. Schneid., M.C. McDevit, G.W. Saunders & C.E. Lane			X	X	5
<i>Titanophora incrustans</i> (J. Agardh) Børgesen		X	X	X	5
<i>T. weberae</i> Børgesen			X		5
Sebdeniaceae					

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>Sebdenia flabellata</i> (J. Agardh) Parkinson	X				4
Solieriaceae					
<i>Sarcodiotheca divaricata</i> W.R. Taylor				X	NRC
<i>Solieria filiformis</i> (Kütz.) P.W. Gabrielson	X	X			4
Wrangeliaceae					
<i>Anotrichium tenue</i> (C. Agardh) Nägeli	X				3,4,6
<i>Griffithsia heteromorpha</i> Kütz.	X				NRC
<i>Ptilothamnion speluncarum</i> (Collins & Herv.) D.L. Ballant. & M.J. Wynne	X				NRC
<i>Tiffaniella gorgonea</i> (Mont.) Doty & Meñez	X				4
<i>Wrangelia penicillata</i> (C. Agardh) C. Agardh		X			3,4,6
HETEROKONTOPHYTA					
Acinetosporaceae					
<i>Herponema tortugense</i> (W.R. Taylor) W.R. Taylor					4
Chordariaceae					
<i>Nemacystus howei</i> (W.R. Taylor) Kylin	X	X			NRM
Dictyotaceae					
<i>Canistrocarpus cervicornis</i> (Kütz.) J.C. De Paula & O. De Clerck	X			X	1,4
<i>Dictyopteris delicatula</i> J.V. Lamour.					1,4
<i>D. jamaicensis</i> W.R. Taylor		X			1,2
<i>D. justii</i> J.V. Lamour.	X	X	X		1,2,4
<i>D. polypodioides</i> (De Candolle) J.V. Lamour.			X	X	1
<i>Dictyota dichotoma</i> (Huds.) J.V. Lamour.	X				1,2
<i>D. menstrualis</i> (Hoyt) R. Schnetter, I. Hörning & Weber-Peukert					1,4
<i>D. pulchella</i> I. Hörning & R. Schnetter	X	X	X	X	1,2,4
<i>Lobophora variegata</i> (J.V. Lamour.) Womersley	X	X	X	X	1,2,4
<i>Padina profunda</i> Earle				X	NRM
<i>Spatoglossum schroederi</i> (C. Agardh) Kütz.	X	X	X	X	NRC
<i>Stypopodium zonale</i> (J.V. Lamour.) Papenfuss	X		X		1,4
<i>Zonaria tournefortii</i> (J.V. Lamour.) Mont.	X				
Sargassaceae					
<i>Sargassum filipendula</i> C. Agardh	X	X		X	NRC
<i>S. hystrix</i> J. Agardh	X		X		NRC
<i>S. vulgare</i> C. Agardh	X				1
Scytosiphonaceae					
<i>Colpomenia sinuosa</i> (Mert.) Derbès & Solier	X	X			1,2,4
Sphacelariaceae					

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>Sphacelaria rigidula</i> Kütz.	X				2,4
Sporochneaceae					
<i>Nereia tropica</i> (W.R. Taylor) W.R. Taylor		X		X	NRM
<i>Sporochnus pedunculatus</i> (Huds.) C. Agardh		X	X	X	NRC
CHLOROPHYTA					
Anadyomenaceae					
<i>Anadyomene linkiana</i> D.S. Littler & Littler			X	X	NRM
<i>A. pavonina</i> (J. Agardh) Wille				X	NRM
<i>A. saldanhae</i> A.B. Joly & E.C. Oliveira		X	X	X	1,4
<i>A. stellata</i> (Wulfen) C. Agardh			X		1,4,6
<i>Microdictyon boergesenii</i> Setch.		X	X	X	NRC
Boodleaceae					
<i>Boodlea composita</i> (Harv.) F. Brand		X	X		1
<i>Phyllodictyona nastomosans</i> (Harv.) Kraft & M.J. Wynne				X	NRC
<i>P. pulcherrimum</i> J.E. Gray			X	X	1
Bryopsidaceae					
<i>Trichosolen duchassaingii</i> (J. Agardh) W.R. Taylor			X		1,6
Caulerpaceae					
<i>Caulerpa ashmeadii</i> Harv.		X	X		6
<i>C. brachypus</i> Harv.		X			NRM
<i>C. cupressoides</i> (Vahl) C. Agardh	X				1,4
<i>C. lanuginosa</i> J. Agardh		X	X		1
<i>C. mexicana</i> Sonder		X			1,6
<i>C. microphysa</i> (Weber-van Bosse) Feldmann	X	X	X	X	1,4
<i>C. peltata</i> J.V. Lamour.	X	X	X	X	1,6
<i>C. prolifera</i> (Forssk.) J.V. Lamour.		X			4,6
<i>C. racemosa</i> (Forssk.) J. Agardh		X			1,6
<i>C. serrulata</i> (Forssk.) J. Agardh			X		1
<i>C. sertularioides</i> (Gmel.) M. Howe		X		X	1,4,5,6
<i>C. verticillata</i> J. Agardh	X				1,4
Cladophoraceae					
<i>Chaetomorpha linum</i> (O.F. Müll.) Kütz.					6
<i>Cladophora albida</i> (Nees) Kütz.		X	X	X	1,4
<i>C. catenata</i> (L.) Kütz.	X	X	X	X	1
<i>C. prolifera</i> (Roth) Kütz.			X	X	4
<i>Rhizoclonium riparium</i> (Roth) Harv.	X		X		4,6
Codiaceae					
<i>Codium carolinianum</i> Searles			X	X	NRC

Table 1. Continuation.

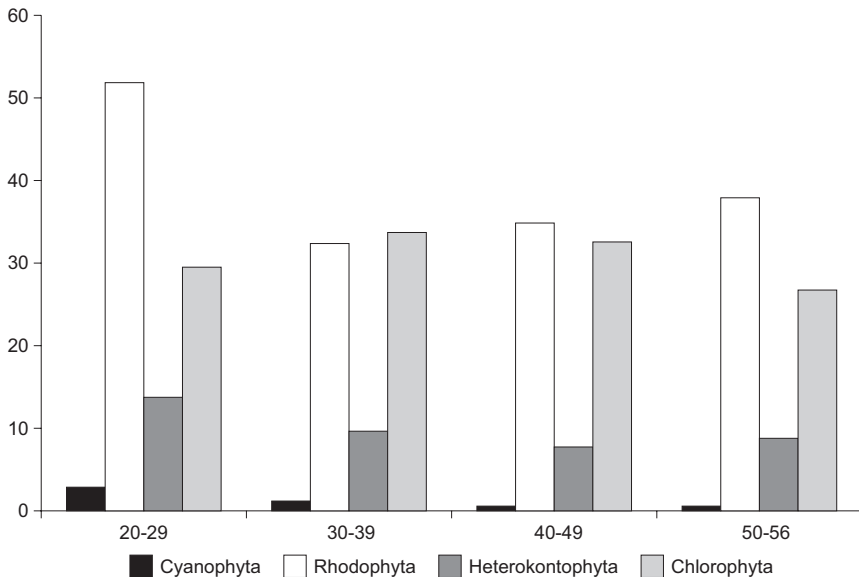
Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>C. intertextum</i> Collins & Herv.	X	X	X	X	NRC
<i>C. isthmocladum</i> Vickers	X	X	X	X	1,6
Dichotomosiphonaceae					
<i>Avrainvillea levis</i> M. Howe	X	X	X	X	NRC
<i>A. longicaulis</i> (Kütz.) G. Murray & Boodle			X		1
<i>A. nigricans</i> Decne.	X				1,4
Halimedaceae					
<i>Halimeda discoidea</i> Decne.	X	X	X	X	1,2,4
<i>H. gracilis</i> Harv.	X	X	X	X	1,4
<i>H. incrassata</i> (Ellis) J.V. Lamour.	X	X	X		1,4
<i>H. scabra</i> M. Howe	X	X			6
<i>H. simulans</i> M. Howe	X			X	1
<i>H. tuna</i> (Ellis & Sol.) J.V. Lamour.	X	X	X	X	1,4
Palmellopsidaceae					
<i>Pseudotetraspora marina</i> Wille	X				NRM
Phaeophilaceae					
<i>Phaeophila dendroides</i> (P. Crouan & H. Crouan)	X			X	4
Batters					
Polyphysaceae					
<i>Acetabularia schenkii</i> K. Möbius	X				NRC
Siphonocladaceae					
<i>Cladophoropsis membranacea</i> (Bang ex. C. Agardh)	X				6
Børgesen					
<i>Dictyosphaeria cavernosa</i> (Forssk.) Børgesen	X	X	X		1
Udoteaceae					
<i>Penicillus capitatus</i> var. <i>laxus</i> Børgesen			X		NRC
<i>Pseudocodium floridanum</i> Dawes & A.C. Mathieson		X	X	X	NRM
<i>Rhipidosiphon floridensis</i> D.S. Littler & Littler	X	X	X		4
<i>Rhipocephalus phoenix</i> var. <i>longifolius</i> A. Gepp & E. Gepp			X		1
<i>Udotea caribaea</i> D.S. Littler & Littler	X	X	X	X	NRC
<i>U. conglutinata</i> (Sol. & Ellis) J.V. Lamour.		X			2,6
<i>U. cyathiformis</i> Decaisne	X	X	X		1
<i>U. dixonii</i> D.S. Littler & Littler	X	X	X	X	1
<i>U. looensis</i> D.S. Littler & Littler	X	X			1
<i>U. luna</i> D.S. Littler & Littler					NRC
<i>U. occidentalis</i> A. Gepp & E. Gepp	X	X		X	1,4
<i>U. spinulosa</i> M. Howe		X	X		1,2
<i>U. spinulosa</i> f. <i>palmettoidea</i> A. Gepp & E. Gepp			X		NRC

Table 1. Continuation.

Taxa	Depth (m)				OBS
	20-29	30-39	40-49	50-56	
<i>U. unistratea</i> D.S. Littler & Littler		X	X		1
<i>U. wilsonii</i> A. Gepp, E. Gepp & M. Howe		X			1,4
Valoniaceae					
<i>Valonia macrophysa</i> Kütz.	X	X	X	X	1
<i>V. ventricosa</i> J. Agardh	X			X	NRC

OBS = Species previously reported in the Mexican Caribbean and the Campeche Banks; 1 = Mendoza-González *et al.* 2000; 2 = Robledo *et al.* 2003; 3 = Mateo-Cid *et al.* 2006; 4 = Mendoza-González *et al.* 2007; 5 = Fredericq *et al.* 2009; 6 = Mateo-Cid *et al.* 2012; NRM = New record for Mexico; NRC = New record of subtidal seaweeds from Mexican Caribbean and Campeche Banks.

The following families were the best represented in number of species in the study area: Corallinaceae (8), Rhodomelaceae (12), Dictyotaceae (13), Caulerpacaeae (12) and Udoteaceae (15). The highest number of species was located among the 20-29 meters deep with 99; this number decreases at depths from 30 to 39 meters where were found only 77, between 40 and 49 m depth were 76; finally at depths from 50 to 56 m were found 74 species (Fig. 2).

**Fig. 2.** Number of species of each group and depth.

DISCUSSION

The benthic marine flora of the Campeche Banks confirms the tropical nature of the subtidal benthic algae of this region and provides new information on its composition. One of the most striking features of the seaweeds of Campeche Banks is the predominance of tropical species. Approximately 85% of the Rhodophyta, Heterokontophyta and Chlorophyta found in the Campeche Banks, also have been recorded from the Caribbean and Bermuda (Taylor 1960; Littler & Littler 2000). Some samples of tropical taxa that shares with the Caribbean region are *Dichotomaria marginata*, *D. obtusata*, *Chrysymenia ventricosa*, *Titanophora incrustans* and *Anadyomene pavonina*.

Rhodophyta dominate in terms of species richness at depths from 20 to 56 m, with the greatest diversity found at 20 to 30 m and 50 to 56 m depth. Cyanophyta were under represented with only three species. Chlorophyta were well-represented at 20 to 56 m depth. Only 22 species of Heterokontophyta were collected, with the lowest diversity occurring at 56 m depth. Distinct differences between in diversity species found at different depths, this may be due to the amount of light that can reach over 30 meters; the substrate should also be considered, because of there is much less available for the growth of benthic algae, as well as temperature and nutrients. Since it was found the highest species richness at depths of 29-30 m, it is clear that the sampled localities with these depths are in the vicinity of the reefs Triángulos, Banco Pera, Banco Nuevo and Cayo Arcas. As observed in this paper, the number of species decreased slightly with depth, especially the groups of the Cyanophyta and Heterokontophyta, these results agree with those found in other studies carried out in the Mexican Caribbean (Mateo-Cid *et al.* 2006; Mendoza-González *et al.* 2000, 2007). It is important to note that in this study are located 37 new records of subtidal algae for Campeche Banks, and these species have not been recorded in subtidal waters of the Mexican Caribbean, among there are *Hypoglossum subsimplex*, *Ptilothamnion speluncarum*, *Cryptonemia seminervis*, *Agardhinula browneae*, *Nemacystus howei*, *Anadyomene linkeana*, *A. pavonina* and *Pseudocodium floridianum*. The species mentioned previously have been recorded in other Caribbean regions, which maybe indicative of the dispersal of marine algae by currents in the area tends to be from the Caribbean Sea to Campeche Banks and row westward and northward (Robledo *et al.* 2003). Also, the majority of species comprising the Campeche Banks offshore flora is tropical and has centers of distribution in the Caribbean Sea. Together these results show that there is a high species richness of seaweeds inhabiting the subtidal waters of the western region the Campeche Banks, therefore it is desirable conduct studies that allow knowing the seasonal variation and the seaweeds richness of this region. It is also notable that the distance from reefs to the banks decides the diversity of these organisms.

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