Supplementary Table S1: Lipid classes identified in macroalgae, microalgae and halophyte, extraction, and identification methods. *Freshwater species.

Algae	Species name	Phylum	Sample origin	Lipid extraction	Compound identification	Lipid classes identified	Lipidomics precision level	Study objective	Reference
Macroalgae	*Bifurcaria bifurcata*	Ochrophyta	Wild	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	MGDG, DGDG, SQDG, PC, PE, PG, PI, DGTS, DGTA	Lipid molecular species	Characterization and bioprospection (antioxidant activity)	Santos et al. 2020[2]
	Lobophora sp.	Ochrophyta	Wild	Bligh & Dyer, 1959[1]	TLC; GC-FID and HPLC-HRMS - LC/MS-IT-TOF	PI; PC; PG; PA; MGDG; DGDG; SQDG; DGTA; DGTS	Lipid molecular species	Bioprospection (anti-iflammatory activity)	Pham et al. 2020[3]
	Saccharina latissima	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	DGDG, DGMG, MGDG, MGMG, SQDG, SQMG, LPA, PA, LPC, PC, LPE, PE, LPG, PG, LPI, PI, MGTS, DGTS	Lipid molecular species	Ecology (geographical origin)	Monteiro et al[4]
	Sargassum muticum	Ochrophyta	Wild	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	MGDG, MGMG, DGDG, SQDG, LPC, PC, LPE, PE, LPG, PG, PI, DGTS, DGTA	Lipid molecular species	Characterization and bioprospection (antioxidant activity)	Santos et al. 2020[2]
	Undaria pinnatifida (Wakame)	Ochrophyta	Not applicable (bought, as dried chunks, from local grocery stores)	Bligh & Dyer, 1959[1]	HILIC-ESI-FTMS and RPLC-ESI-MS	SQDG; SQMG; DGDG; DGMG; PG; LPG; PI; PA; PE; PC; LPC	Lipid molecular species	Characterization	Coniglio et al. 2021[5]
	Gracilariopsis lemaneiformis	Rhodophyta	Aquaculture	Methanol, methyl tert-butyl ether, isopropanol/acetonitrile	LC-MS/MS	MGDG, ceramides, SQDG, PC, DGDG (most	Lipid molecular species	Ecology (global warming)	Zhang et al. 2020 [6]

					abundant)			
Gracilaria sp.	Rhodophyta	Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	MGDG, DGDG, SQMG, SQDG, LPC, PC, LPE, PE, PA, PI-Cer, MGTS, DGTS	Lipid molecular species	Characterization and bioprospection (antiproliferative and anti-inflammatory activity)	da Costa et al. 2017[7]
Grateloupia turuturu	Rhodophyta	Wild	Modified Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	DGTS, MGTS, MGDG, MGMG, DGDG, DGMG, SQDG, SQMG, PC, LPC, PE, LPE, PG, LPG, PA, PI-Cer	Lipid molecular species	Bioprospection (antioxidant and anti-inflammatory activity)	da Costa et al. 2021[8]
Palmaria palmata	Rhodophyta	Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	SQMG, SQDG, MGMG, MGDG, DGMG, DGDG, LPC, PC, LPE, PE, LPG, PG, PI, PA, PI-Cer	Lipid molecular species	Characterization and bioprospection (antioxidant activity)	Lopes et al. 2019[9]
Porphyra dioica	Rhodophyta	Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	MGDG, DGDG, SQMG, SQDG, PA, PG, LPG, PC, LPC, PE, PI, PI-Cer, DGTS	Lipid molecular species	Characterization	da Costa et al. 2018[10]
Codium tomentosum	Chlorophyta	Wild and Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	MGMG, MGDG, DGMG, DGDG, SQMG, SQDG, LPG, PG, LPC, PC, LPE, PE, LPI, PI, MGTS, DGTS	Lipid molecular species	Characterization and bioprospection (antioxidant activity)	Rey et al. 2020[11]
Ulva rigida	Chlorophyta	Aquaculture	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	SQMG, SQDG, MGMG, MGDG, DGMG, DGDG, MGTS, DGTS, LPG, PG, LPI, PI, LPC, PC, LPE, PE	Lipid molecular species	Characterization	Lopes et al. 2019[12]

Microalgae	*Ceratoneis closterium*	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	Ceratoneis sp.	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	**Conticribra weissflogii*	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_8 UPLC-(ESI)-Q-TOF-MS^n	DGCC; PC; MGDG; DGDG; SQDG; PG; TG	Lipid species	Growth conditions	Li et al. 2016[14]
		Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides; Monosaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	Microchloropsis gaditana	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]; *n*-Heptane; bead milling	GC-FID; C_{18} UPLC-ESI-MS and MS/MS	LPC; PC; DGTS; MGTS; DGDG; DGMG; MGDG; PG; PI; SQDG; SQMG; FFA	Lipid molecular species	Characterization and different extraction procedures	Cauchie et al. 2021[15]
	Amphora sp.	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
		Ochrophyta	Aquaculture	$CHCl_3/CH_3OH$ (1:1, *v/v)*	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	DGTS; DGTA	Lipid molecular species	Characterization	Li et al. 2017[16]
	Chaetoceros gracilis	Ochrophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGCC	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
	Cyclotella cryptica	Ochrophyta	Aquaculture	MTBE	UPLC-ESI-MS^n	PC; PE; PI; PG; SQDG; DGDG; MGDG; TG	Lipid molecular species	Characterization	Cutignano et al. 2016[19]
	Cylindrotheca closterium	Ochrophyta	Aquaculture	Modified gravitational method	GC-FID; HPLC-ESI-TOF-MS and HPLC-ESI-ion-trap-MS^n	DGDG; MGDG; SQDG; TG	Lipid molecular species	Growth conditions	Wang et al. 2019[20]
	Nannocloropsis oceanica	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_8 UPLC-(ESI)-Q-TOF-MS	MGDG; DGDG; SQDG; PG; DGTS; TG	Lipid molecular species	Characterization	Li et al. 2015[21]
	Nannocloropsis oceanica IMET1	Ochrophyta	Aquaculture	Folch et al. 1957[17]	C_{18} HPLC-ESI-QqQ-MS	DGTS; PC; PE; PI; PG; MGDG;	Lipid molecular	Growth conditions	Han et al. 2017[22]

					DGDG; SQDG	species		
	Ochrophyta	Aquaculture	MTBE	HILIC-ESI-MS^n; GC-FID	MGDG; DGDG; SQDG; DGTS; MGTS; PG; PI; PE; PC; LPC	Lipid molecular species	Characterization	Meng et al. 2017[23]
Nannocloropsis oceanica	Ochrophyta	Aquaculture	Folch et al. 1957[17], CH_2Cl_2/CH_3OH CH_2Cl_2/ethanol, ethanol, ethanol assisted by ultrasonic bath, ethanol assisted by ultrasonic probe	HILIC-HR-ESI-MS and MS/MS	SQDG; SQMG; DGTS; MGTS; PG; PI; PE; PC; LPC; PI-Cer	Lipid molecular species	Characterization and different extraction procedures	Melo et al. 2021[24]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	LTQ; FT-ICR-MS	DGTS; MGTS; DGDG; MGMG; MGDG; SQDG; PG; DG; TG	Lipid species	Growth conditions	Willetteet al. 2018[25]
Nannochloropsis salina	Ochrophyta	Aquaculture	MTBE	UPLC-ESI-MS^n	MGDG; DGDG; SQDG; PG; PI; PE; PC; TG	Lipid molecular species	Characterization	Cutignano et al. 2016[19]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	GC-MS; LTQ FT-ICR MS	MGTS; DGTS; MGDG; DGDG; SQDG; PG; DG; TG; FFA	Lipid species	Growth conditions	Gill et al. 2018[26]
Nannocloropsis sp.	Ochrophyta	Aquaculture	Folch et al. 1957[17]	Off-line SPE-Si; Off-line TLC; LC-ESI-QqQ-MS^n; GC-MS	DGDG; MGDG; SQDG; PG; LPG; LPC; LPE; PC; PE; PI	Lipid species	Characterization	Yao et al. 2015[27]
Nannochloropsis sp. PJ12	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	GC-MS; C_{18} LC-MS and LC-MS/MS	DGDG; DGTS; LPC; LPE; LPG; MGDG; PA; PC; PE; PG; PI; SQDG; TG; DG; FFA;	Lipid molecular species	Growth conditions	Liang et al. 2019[28]
Nannochloropsis gaditana	Ochrophyta	Aquaculture	Folch et al. 1957	TLC; GC-FID; ESI-LTQ-XL-MS; HPLC-ESI-QqQ-MS^n	SQDG; MGDG; DGDG; PG; PI; PE; PC; DGTS; DG; TG	Lipid molecular species	Characterization and Growth conditions	Jouhet et al. 2017[29]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-	DGTS	Lipid	Characterization	Cañavate

				TOF-MS		molecular species		et al. 2016[18]
Nannochloropsis oculata	Ochrophyta	Aquaculture	$CH_3OH/CHCl_3$ (1:1, *v/v*); H_2O/ CH_3OH/ $CHCl_3$ (3:2:1, *v/v/v*)	(−) ESI FT-ICR MS; NanoLC-FT-ICR-MS; Online Nano LC-MS and MS/MS	DGDG; DGMG; DGTS; PI-Cer; LPC; LPE; MGDG; MGMG; PC; PE; PG; PI; SQDG; FFA	Lipid species	Characterization	Liu et al. 2016[30]
Phaeodactylum tricornutum	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	TLC; GC-FID; ESI-LTQ-MS^n	MGDG; DGDG; SQDG; SQMG; PG; PC; DGTA; PE; PI; DG; TG	Lipid molecular species	Characterization and Growth conditions	Abida et al. 2015[31]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	TLC; GC-FID; ESI-LTQ-XL-MS; HPLC-ESI-QqQ-MS^n	DGDG; MGDG;DGTA; PE; PC; PG; PI; SQDG; DG; TG	Lipid molecular species	Characterization and Growth conditions	Jouhet et al. 2017[29]
	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides; Disaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGTA	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	GC-FID; HPLC-ESI-QqQ-MS and MS/MS	SQDG; MGDG; DGDG; PG; PI; PE; PC; DGTA; DG; TG	Lipid classes	Growth conditions	Jaussaud et al. 2020[32]
Skeletonema sp.	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Trisaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Skeletonema tropicum	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Trisaccharide ceramides	Lipid molecular species	Characterization	Li, et al. 2017[13]
Skeletonema costatum Skeletonema SKSPXS0711	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Disaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Skeletonema costatum Skeletonema SCXMBO2	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides; Disaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]

**Stephanodiscus* sp.	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Thalassiosira pseudonana	Ochrophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	Ochrophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGCC	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
Thalassiosira weissflogii	Ochrophyta	Aquaculture	MTBE	UPLC-ESI-MS^n	MGDG; DGDG; SQDG; PG; PI; PE; PC; TG	Lipid molecular species	Characterization	Cutignano et al. 2016[19]
**Chlamydomonas reinhardtii*	Chlorophyta	Aquaculture	CH_3OH:$CHCl_3$:H_2O (5:2:2, *v/v/v*)	Nano ESI-MS^n LTQ	DGTS; MGTS; MGDG; DGDG; SQDG; PG; PI; TG	Lipid molecular species	Growth conditions	Yang et al. 2015[33]
	Chlorophyta	Aquaculture	Folch et al. 1957[17]	Off-line SPE-Si; Off-line TLC; LC-ESI-QqQ-MS^n; GC-MS	DGDG; MGDG; SQDG; PG; LPG; LPE; PC; PE; PI	Lipid species	Characterization	Yao et al. 2015[27]
	Chlorophyta	Aquaculture	Folch et al. 1957[17]	C8 RP-UPLC-ESI-LTQ-Orbitrap-MS	MGDG; DGDG; SQDG; PE; PG; PI; DGTS	Lipid molecular species	Characterization and growth conditions	Yang et al. 2018[34]
	Chlorophyta	Wild	Not applicable	MALDI-MS and MALDI-MS/MS	DGTS, MGDG, DGDG, TG	Lipid species	Ecology (herbicide exposure)	Shanta et al. 2021[35]
**Chlorella sp.*	Chlorophyta	Aquaculture	Folch et al. 1957[17]	LC-ESI-LTQ-MS/MS; GC-MS	MGDG; DGDG; SQDG; PG; PE; PC; DGTS	Lipid molecular species	Growth conditions	White et al. 2019[36]
**Chlorella vulgaris*	Chlorophyta	Aquaculture	Folch et al. 1957[17]	HILIC-HR-ESI-MS and MS/MS; GC-MS	PC; LPC; PE; LPE; PG; PI; DGDG; DGMG; MGDG; MGMG; SQDG; Cer; PI-Cer	Lipid molecular species	Growth conditions and Bioprospection	Couto et al. 2021[37]
**Chlorella vulgaria*	Chlorophyta	Aquaculture	Folch et al. 1957[17]	Off-line SPE-Si; Off-line TLC; LC-ESI-QqQ-MS^n; GC-MS	DGDG; MGDG; SQDG; PG; LPG; LPC; LPE; PC; PE; PI	Lipid species	Characterization	Yao et al. 2015[27]

**Chlorococcum amblystomatis*	Chlorophyta	Aquaculture	Folch et al. 1957[17]	HILIC-HR-ESI-MS and MS/MS; GC-MS	PC; LPC; PE; LPE; PG; PI; PI-Cer; DGDG; DGMG; MGDG; MGMG; SQDG; SQMG; DGTS; MGTS	Lipid molecular species	Characterization and Bioprospection	Conde et al. 2021[38]
**Ettlia oleoabundans*	Chlorophyta	Aquaculture	CH_3OH assisted by bead milling followed by 2-ethoxyethanol, hexane:toluene:acetone: CH_3OH (2:2:1:1, *v/v/v/v*)	LC-ESI-QToF-MS and LC-MS/MS	MGMG; MGDG; DGDG; SQDG; PA; PG; PI; PC; PE; MG; DG; TG; FFA	Lipid species	Growth conditions	Matich et al. 2018[39]
**Haematococcus pluvialis*	Chlorophyta	Aquaculture	CH_3OH/ $CHCl_3$ (1:1, *v/v*); H_2O/ CH_3OH/ $CHCl_3$ (3:2:1, *v/v/v*)	(−) ESI FT-ICR MS; NanoLC-FT-ICR-MS; Online Nano LC-MS and MS/MS	DGDG; DGMG; DGTS; PI-Cer; LPC; MGDG; PC; PE; PG; PI; SQDG; FFA	Lipid species	Characterization	Liu et al. 2016[30]
Picochlorum atomus	Chlorophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGTS	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
Scenedesmus sp.	Chlorophyta	Aquaculture	Folch et al. 1957[17]	Off-line SPE-Si; Off-line TLC; LC-ESI-QqQ-MS^n; GC-MS	DGDG; MGDG; SQDG; PG; LPG; LPC; LPE; PC; PE; PI	Lipid species	Characterization	Yao et al. 2015[27]
	Chlorophyta	Aquaculture	Modified gravitational method	GC-FID; HPLC-ESI-TOF-MS and HPLC-ESI-ion-trap-MS^n	DGDG; MGDG; DGTS; PG; PE; MGTS; TG	Lipid molecular species	Growth conditions	Wang et al. 2019[20]
Tetraselmis suecica	Chlorophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGTA	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
Emiliania huxleyi RCC1250 (strain AC453)	Haptophyta	Aquaculture	Folch et al. 1957[17]	HILIC-HR-ESI-MS and MS/MS; GC-MS	SQDG; SQMG; DGDG; MGDG; DGMG; MGMG; DGTS; MGTS; DGCC; PC; PE; MMPE; PDPT; PI; PG; LPC; LPE;	Lipid molecular species	Characterization	Aveiro et al. 2020[40]

					sGSL; hGSL; Ceramides			
Emiliania huxleyi (strain CCMP 3268)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Emiliania huxleyi (strain CCMP 370)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PE; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Emiliania huxleyi (strain CCMP 374)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Emiliania huxleyi (strain CCMP 379)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Emiliania huxleyi (strain CCMP 3266)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PG; BLL; DGCC;	Lipid species	Growth conditions	Lowenstein et al. 2021[41]

				quadrupole - Orbitrap mass spectrometer	MGCC; DGTS; DGTA; PDPT			
Haptolina ericina (strain CCMP 282)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PE; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Isochrysis galbana (strain CCMP 715)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PG; BLL; DGCC; MGCC; DGTS; DGTA; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Isochrysis galbana	Haptophyta	Aquaculture	CH_3CH_3/CH_3OH (1:1, *v/v)*	TLC; ^1H NMR; SPE-C_{18}; C_{18} RP-UPLC-ESI-MS^n; GC-MS	MGDG; DGDG; GalCer	Lipid molecular species	Characterization and Bioprospection	de los Reyes et al. 2016[42]
	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Monosaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Isochrysis galbana Parke	Haptophyta	Aquaculture	$CHCl_3/CH_3OH$ (1:1, *v/v*)	C_8 RP-UPLC-ESI-Q-TOF-MS	DGCC; MGDG; MGCC; MGDG; MGMG; SQDG; SQMG; TG	Lipid molecular species	Growth conditions	Huang et al. 2017[43]
Isochrysis zhanjiangensis	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Monosaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Pavlova gyrans (strain CCMP 608)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid	DGDG; GlcADG; MGDG; MGMG; SQDG; PG; BLL; DGCC; MGCC;	Lipid species	Growth conditions	Lowenstein et al. 2021[41]

				quadrupole - Orbitrap mass spectrometer	DGTS; DGTA			
Phaeocystis antarctica (strain CCMP 3314)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PG; BLL; DGCC; MGCC; DGTS; DGTA	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Phaeocystis globosa (strain CCMP 628)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PE; PG; BLL; DGCC; MGCC; DGTS; DGTA	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Pleurochrysis carterae (strain CCMP 645)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PG; BLL; DGCC; MGCC; DGTS; DGTA	Lipid species	Growth conditions	Lowenstein et al. 2021[41]
Pleurochrysis carterae	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Monosaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
*Prymnesium parvum (*strain CCMP 1926)	Haptophyta	Aquaculture	Bligh & Dyer, 1959[1]	Normal and RP-HPLC–Q Exactive hybrid quadrupole - Orbitrap mass spectrometer	DGDG; GlcADG; MGDG; MGMG; SQDG; PC; PE; PG; BLL; DGCC; MGCC; PDPT	Lipid species	Growth conditions	Lowenstein et al. 2021[41]

Alexandrium minutum	Myzozoa	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
	Myzozoa	Aquaculture	MTBE	UPLC-ESI-MS^n	MGDG; DGDG; SQDG; PG; PI; PE; PC; TG	Lipid molecular species	Characterization	Cutignano et al. 2016[19]
Alexandrium tamutum	Myzozoa	Aquaculture	MTBE	UPLC-ESI-MS^n	MGDG; DGDG; SQDG; PG; PE; PC; TG	Lipid molecular species	Characterization	Cutignano et al. 2016[19]
Gyrodinium dorsum	Myzozoa	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGCC	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
Karlodinium veneficum	Myzozoa	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Prorocentrum donghaiense	Myzozoa	Aquaculture	Bligh & Dyer, 1959[1]	C_{18} RP-UPLC-ESI-Q-TOF-MS^E	Ceramides; Monosaccharide ceramides	Lipid molecular species	Characterization	Li et al. 2017[13]
Chroomonas placoidea	Cryptophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGTA	Lipid molecular species	Characterization	Cañavate et al. 2016[18]
Rhodomonas baltica	Cryptophyta	Aquaculture	Folch et al. 1957[17]	HPLC-ESI-TOF-MS	DGTA	Lipid molecular species	Characterization	Cañavate et al. 2016[18]

	Spirulina platensis	Cyanobacteria	NA	$CH_3OH/CHCl_3$ (1:1, *v/v*); H_2O/ CH_3OH/ $CHCl_3$ (3:2:1, *v/v/v*)	RP-UPLC-HRMS (HESI-Q Exactive hybrid quadrupole-Orbitrap mass spectrometer C_{18}	LPG; PG; PI; SQMG; SQDG; MGMG; MGDG; DGMG; DGDG	Lipid molecular species	Other	La Barbera, et al. 2018[44]
	Schizochytrium limacinum	Bigyra	Aquaculture	Folch et al. 1957[17]	Off-line SPE-Si; Off-line TLC; LC-ESI-QqQ-MS^n; GC-MS	DGDG; MGDG; SQDG; PG; LPG; LPC; LPE; PC; PE; PI	Lipid species	Characterization	Yao et al. 2015[27]
Halophytes	*Cakile maritima* (seeds)	Tracheophyta	Wild	$CHCl_3/CH_3OH$ /formic acid (1:1:0.1), 1 M KCl, 0.2 M H_3PO_4	QTOF-MS-MS	PL (PC, PE, PG, PA, PI, PS,	Lipid species	Characterization	Zitouni et al. 2016[45]
	Eryngium maritimum (seeds)	Tracheophyta	Wild	$CHCl_3/CH_3OH$ /formic acid (1:1:0.1), 1 M KCl, 0.2 M H_3PO_4	QTOF-MS-MS	PL (PC, PE, PG, PA, PI, PS,	Lipid species	Characterization	Zitouni et al. 2016[45]
	Halimione portulacoides	Tracheophyta	Aquaculture (first collected from wild)	Bligh & Dyer, 1959[1]	HILIC–LC–Q–Exactive-MS and MS/MS	PC, PE, PG, PI, PA, MGDG, DGDG, SGDG, HexCer	Lipid molecular species	Characterization	Maciel et al. 2020[46]
	Halimione portulacoides (leaves)	Tracheophyta	Wild	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	PC, PE, PG, PI, PA, SQDG, MGDG, DGDG, HexCer	Lipid molecular species	Characterization (Nutritional purposes)	Maciel et al. 2018[47]
	Halimione portulacoides	Tracheophyta	Aquaculture (first collected from wild)	Bligh & Dyer, 1959[1]	HILIC–LC–Q–Exactive-MS and MS/MS	LPC, PC, LPE, PE, PA, PG, PI, DGDG, MGDG,SQDG	Lipid molecular species	Ecology (manipulation of culture conditions)	Custódio et al. 2020[48]
	Salicornia ramosissima	Tracheophyta	Aquaculture (first collected from wild)	Bligh & Dyer, 1959[1]	HILIC–LC–Q–Exactive-MS and MS/MS	PC, PE, PG, PI, PA, MGDG, DGDG, SGDG, HexCer	Lipid molecular species	Characterization	Maciel et al. 2020[46]
	Salicornia ramosissima (fresh branch	Tracheophyta	Wild	Bligh & Dyer, 1959[1]	LC(HILIC)-MS and MS/MS	PC, PE, PG, PI, PA, SQDG, MGDG, DGDG,	Lipid molecular species	Characterization (Nutritional purposes)	Maciel et al. 2018[47]

tips)	HexCer

Abbreviations: BLL - Betaine-like lipids; CH_2Cl_2 –Dichloromethane; $CHCl_3$ – Chloroform; CH_3OH – Methanol; DG – Diacylglycerol; DGCC – Diacylglyceryl carboxyhydroxymethylcholine; DGDG – Digalactosyl diacylglycerol; DGMG – Digalactosyl monoacylglycerol; DGTA – Diacylglycerylhydroxymethyl-N,N,N-trimethyl-β-alanine; DGTS – Diacylglyceryl-N,N,N-trimethyl homoserine; FFA – Free fatty acids; GalCer - Galactosylceramide; GlcADG – Glucuronosyldiacylglycerol; H_2O – Water; H_3PO_4 – Phosphoric acid; HexCer – Hexosylceramide; hGSL – Host glycosphingolipid; KCl – Potassium chloride; LPA – Lyso-phosphatidic acid; LPC – Lyso-phosphatidylcholine; LPE – Lyso-phosphatidylethanolamine; LPG – Lyso-phosphatidylglycerol; LPI – Lyso-phosphatidylinositol; MG – Monoacylglycerol; MGCC – Monoacylglycerylcarboxyhydroxymethylcholine; MGDG – Monogalactosyl diacylglycerol; MGMG – Monogalactosyl monoacylglycerol; MGTS – Monoacylglyceroltrimethylhomoserine; MMPE – Monomethylphosphatidylethanolamine; MTBE – Methyl tert-butyl ether; PA – Phosphatidic acid; PC – Phosphatidylcholine; PDPT – Phosphatidyldimethylpropanethiol; PE – Phosphatidylethanolamine; PG – Phosphatidylglycerol; PI – Phosphatidylinositol; PI-Cer – Inositolphosphoceramides; PS – Phosphatidylserine; sGSL – Sialic acid glycosphingolipids; SQDG – Sulfolipid sulfoquinovosyl diacylglycerol; SQMG – Sulfoquinovosyl monoacylglycerol; TG – Triacylglycerol.

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