

Supplementary Material

Table S1. Details of the primers used in this study for the high-throughput sequencing metabarcoding analyses.

Primer name	Primer sequence (5'-3')	Target gene region	Reference
Uni18SF	AGG GCA AKY CTG GTG CCA GC	V4 region of the eukaryote nuclear 18S ribosomal RNA (18S)	246
Uni18SR	GRC GGT ATC TRA TCG YCT T		
Hap454-F	GCGGTAATTCCAGCTCCAA	Haptophyta V4 region of the 18S ribosomal RNA (18S haptophytes)	247
Hap454-R	GATCAGTGAAAACATCCCTGG		
D1R-F	ACCCGCTGAATTTAAGCATA	Dinophyceae D1-D2 region of the 28S ribosomal RNA (28S)	248
305-R	TTTAAYTCTCTTTYCAAAGTCC		241
Lhapto8-F	CCATCTCATCCCTGCGTGTCTCCGAC	Haptophyta D1-D2 region of the 28S ribosomal RNA (28S haptophytes)	242
Lhapto20R_bis-R	TCAGACTCCTTGGTCCGTGTTTCT		

Table S2. Sea water samples from around the South Island of New Zealand, collected as part of the New Zealand Marine Phytoplankton Monitoring Programme and containing cells of potentially ichthyotoxic species were analysed using high-throughput sequencing metabarcoding using the four primer pairs listed in Supplementary table 1. The resulting taxonomic classifications of eukaryotic phytoplankton types that are associated with harmful effects are listed. No raphidophytes or dictyochophytes were detected.

Universal 18S ribosomal RNA - Diatoms	Universal 18S ribosomal RNA - Dinoflagellates	Specific 18S ribosomal RNA - Haptophytes	Specific 28S ribosomal RNA – Dinoflagellates	Specific 28S ribosomal RNA - Haptophytes
<i>Actinocyclus curvatulus</i>	<i>Akashiwo sanguinea</i>	<i>Algirosphaera robusta</i>	<i>Akashiwo sanguinea</i>	<i>Chrysochromulina spinifera</i>
<i>Cerataulina pelagica</i>	<i>Alexandrium affine</i>	<i>Braarudosphaera bigelowii</i>	<i>Alexandrium affine</i>	<i>Chrysochromulina camella</i>
<i>Chaetoceros</i> spp.	<i>Alexandrium</i> spp.	<i>Calcihaptophycidae</i> sp.	<i>Alexandrium pacificum</i>	<i>Chrysochromulina cymbium</i>
<i>Chaetoceros convolutus</i>	<i>Alexandrium margalefii</i>	<i>Chrysochromulina spinifera</i>	<i>Alexandrium margalefii</i>	<i>Chrysochromulina simplex</i>
<i>Chaetoceros danicus</i>	<i>Alexandrium minutum</i>	<i>Chrysochromulina acantha</i>	<i>Alexandrium minutum</i>	<i>Chrysochromulina</i> spp.
<i>Chaetoceros diadema</i>	<i>Alexandrium ostenfeldii</i>	<i>Chrysochromulina rotalis</i>	<i>Alexandrium ostenfeldii</i>	<i>Helladosphaera</i> sp.
<i>Chaetoceros elegans</i>	<i>Alexandrium pacificum</i>	<i>Chrysochromulina scutellum</i>	<i>Alexandrium</i> spp.	<i>Imantonia rotunda</i>
<i>Chaetoceros muellerii</i>	<i>Amoebophyra</i> spp.	<i>Chrysochromulina simplex</i>	<i>Amphidinium crissum</i>	<i>Phaeocystis</i> sp.
<i>Chaetoceros rostratus</i>	<i>Amphidoma languida</i>	<i>Chrysochromulina</i> spp.	<i>Amphidoma languida</i>	<i>Prymnesium</i> spp.
<i>Chaetoceros rotoporus</i>	<i>Amphisoleniaceae</i> sp.	<i>Coccolithus braarudii</i>	<i>Amylax triacantha</i>	
<i>Chaetoceros tenuissimus</i>	<i>Amylax buxus</i>	<i>Diacronema ennorea</i>	<i>Archaeperidinium constrictum</i>	
<i>Chrysophyceae</i> spp.	<i>Amylax triacantha</i>	<i>Dicrateria rotunda</i>	<i>Azadinium concinnum</i>	
<i>Chrysophyta</i> sp.	<i>Ansanella granifera</i>	<i>Dicrateria</i> sp.	<i>Azadinium cuneatum</i>	
<i>Coscinodiscus wailesii</i>	<i>Apocalathium aciculiferum</i>	<i>Exanthemachrysis</i> sp.	<i>Azadinium poporum</i>	
<i>Ectocarpus siliculosus</i>	<i>Archaeperidinium minutum</i>	<i>Gephyrocapsa muelleriae</i>	<i>Azadinium spinosum</i>	
<i>Guinardia delicatula</i>	<i>Asulcocephalium miricentonis</i>	<i>Gephyrocapsa oceanica</i>	<i>Azadinium trinitatum</i>	
<i>Leptocylindrus convexus</i>	<i>Azadinium dexteroporum</i>	<i>Haptolina</i> spp.	<i>Barrufeta bravensis</i>	
<i>Leptocylindrus</i> sp.	<i>Azadinium trinitatum</i>	<i>Haptophyta</i> spp.	<i>Biecheleria cincta</i>	
<i>Minutocellus polymorphus</i>	<i>Biecheleria cincta</i>	<i>Helicosphaera carteri</i>	<i>Biecheleriopsis adriatica</i>	

<i>Paraphysomonas butcheri</i>	<i>Biecheleriopsis adriatica</i>	<i>Helladosphaera</i> sp.	<i>Boreadinium breve</i>	
<i>Paraphysomonas foraminifera</i>	<i>Blastodinium mangini</i>	<i>Phaeocystis globosa</i>	<i>Cachonina hallii</i>	
<i>Paraphysomonas imperforata</i>	<i>Ceratoperidinium falcatum</i>	<i>Phaeocystis</i> spp.	<i>Calciodinellum albatrosianum</i>	
<i>Paraphysomonas</i> sp.	<i>Chytriodinium roseum</i>	<i>Prymnesiaceae</i> sp.	<i>Ceratium fusus</i>	
<i>Parmales</i> sp.	<i>Crypthecodinium</i> sp.	<i>Prymnesiophyceae</i> spp.	<i>Ceratium tripos</i>	
<i>Pelagomonas calceolata</i>	Dino-Group-I sp.	<i>Prymnesium</i> sp.	<i>Ceratoperidinium falcatum</i>	
<i>Phaeophyceae</i> sp.	Dino-Group-II sp.	<i>Scyphosphaera apsteinii</i>	<i>Ceratoperidinium</i> sp.	
<i>Pseudo-nitzschia pseudodelicatissima</i>	Dino-Group-III sp.	<i>Syracosphaerales</i> sp.	<i>Dinophysis</i> spp.	
<i>Thalassiosira tenera</i>	<i>Dinophysis</i> spp.		<i>Dissodinium pseudolunula</i>	
	<i>Diplopsalis caspica</i>		<i>Dissodinium</i> sp.	
	<i>Dissodinium pseudolunula</i>		<i>Ensiculifera</i> aff. <i>imariensis</i>	
	<i>Euduboscquella crenulata</i>		<i>Ensiculifera</i> cf. <i>loeblichii</i>	
	<i>Fragilidium</i> sp.		<i>Fragilidium duplocampanaeforme</i>	
	<i>Fragilidium subglobosum</i>		<i>Glenodinium inaequale</i>	
	<i>Gonyaulax fragilis</i>		<i>Gonyaulax baltica</i>	
	<i>Gonyaulax polygramma</i>		<i>Gonyaulax</i> cf. <i>spinifera</i>	
	<i>Gonyaulax</i> sp.		<i>Gonyaulax digitale</i>	
	<i>Gonyaulax spinifera</i>		<i>Gonyaulax elongata</i>	
	<i>Gotoius excentricus</i>		<i>Gymnodinium agaricoides</i>	
	<i>Gymnodinium aureolum</i>		<i>Gymnodinium aureolum</i>	
	<i>Gymnodinium dorsalisulcum</i>		<i>Gymnodinium</i> spp.	
	<i>Gymnodinium microreticulatum</i>		<i>Gymnodinium dorsalisulcum</i>	
	<i>Gymnodinium smaydae</i>		<i>Gymnodinium fuscum</i>	
	<i>Gymnodinium</i> sp.		<i>Gymnodinium litoralis</i>	

	<i>Gyrodinium dominans</i>		<i>Gymnodinium microreticulatum</i>	
	<i>Gyrodinium fusiforme</i>		<i>Gymnodinium</i> spp.	
	<i>Gyrodinium gutrula</i>		<i>Gyrodinium fusiforme</i>	
	<i>Gyrodinium helveticum</i>		<i>Gyrodinium moestrupii</i>	
	<i>Gyrodinium heterogrammum</i>		<i>Gyrodinium rubrum</i>	
	<i>Gyrodinium moestrupii</i>		<i>Gyrodinium spirale</i>	
	<i>Gyrodinium</i> sp.		<i>Heterocapsa orientalis</i>	
	<i>Gyrodinium spirale</i>		<i>Heterocapsa rotundata</i>	
	<i>Haplozoon praxillellae</i>		<i>Heterocapsa</i> spp.	
	<i>Heterocapsa nei/rotundata</i>		<i>Islandinium minutum</i>	
	<i>Heterocapsa pygmaea</i>		<i>Kapelodinium vestifici</i>	
	<i>Heterocapsa</i> sp.		<i>Karenia mikimotoi</i>	
	<i>Heterocapsa triquetra</i>		<i>Karenia umbella</i>	
	<i>Islandinium tricingulatum</i>		<i>Karlodinium</i> sp.	
	<i>Karenia mikimotoi</i>		<i>Karlodinium armiger</i>	
	<i>Karlodinium veneficum</i>		<i>Karlodinium ballatinum</i>	
	<i>Kofooidinium pavillardii</i>		<i>Karlodinium decipiens</i>	
	<i>Lepidodinium chlorophorum</i>		<i>Karlodinium gentienii</i>	
	<i>Luciella</i> sp.		<i>Karlodinium veneficum</i>	
	<i>Noctiluca scintillans</i>		<i>Katodinium glaucum</i>	
	<i>Paragymnodinium shiwhaense</i>		<i>Lebouraia pusilla</i>	
	<i>Paulsenella vonstoschii</i>		<i>Lepidodinium chlorophorum</i>	
	<i>Pelagodinium</i> sp.		<i>Lepidodinium viride</i>	
	<i>Pentapharsodinium</i> sp.		<i>Oblea rotunda</i>	
	<i>Pentapharsodinium tyrrhenicum</i>		<i>Oxyphysis oxytoxoides</i>	

	<i>Pfiesteria</i> sp.		<i>Peridiniopsis brodyi</i>	
	<i>Pheopolykrikos beauchampii</i>		<i>Peridinium aciculiferum</i>	
	<i>Polykrikos kofoidii</i>		<i>Polarella glacialis</i>	
	<i>Prorocentrum</i> spp.		<i>Polykrikos kofoidii</i>	
	<i>Prot erythroptosis</i> sp.		<i>Prorocentrum</i> spp.	
	<i>Protoceratium reticulatum</i>		<i>Prorocentrum triestinum</i>	
	<i>Protodinium simplex</i>		<i>Protodinium</i> sp.	
	<i>Proto peridinium americanum</i>		<i>Proto peridinium americanum</i>	
	<i>Proto peridinium bipes</i>		<i>Proto peridinium biconicum</i>	
	<i>Proto peridinium claudicans</i>		<i>Proto peridinium excentricum</i>	
	<i>Proto peridinium conicum</i>		<i>Proto peridinium lewisiae</i>	
	<i>Proto peridinium denticulatum</i>		<i>Proto peridinium parthenopes</i>	
	<i>Proto peridinium fusiforme</i>		<i>Proto peridinium punctulatum</i>	
	<i>Proto peridinium monovelum</i>		<i>Proto peridinium steidingerae</i>	
	<i>Proto peridinium pellucidum</i>		<i>Scrippsiella donghaiensis</i>	
	<i>Proto peridinium punctulatum</i>		<i>Scrippsiella lachrymosa</i>	
	<i>Proto peridinium</i> sp.		<i>Scrippsiella ramonii</i>	
	<i>Qia lebouriae</i>		<i>Scrippsiella trochoidea</i>	
	<i>Scrippsiella acuminata</i>		<i>Symbiodinium</i> sp. type A	
	<i>Scrippsiella precaria</i>		<i>Symbiodinium voratum</i>	
	<i>Spatulodinium pseudonoctiluca</i>		<i>Takayama acrotrocha</i>	
	<i>Stoeckeria algicida</i>		<i>Thoracosphaera</i> sp.	

	<i>Symbiodinium</i> sp. Clade A		<i>Torodinium robustum</i>	
	<i>Syndinium</i> sp.		<i>Tyrannodinium berlinense</i>	
	<i>Thecadinium kofoidii</i>		<i>Vulcanodinium rugosum</i>	
	<i>Torodinium robustum</i>		<i>Warnowia</i> sp.	
	<i>Tovellia aveirensis</i>		<i>Woloszynskia halophila</i>	
	<i>Tripos concilians</i>			
	<i>Tripos furca</i>			
	<i>Tripos fusus</i>			
	<i>Warnowia</i> sp.			
	<i>Woloszynskia halophila</i>			
	<i>Woloszynskia</i> sp.			

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