

Supplementary material

Potential invasions of phytoplankton in ship ballast water at South Korean ports

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Table S1. Phytoplankton taxa found in the ballast water from each ship studied

The total observation frequencies are shown in the bottom row

Taxon	Ship number																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Bacillariophyceae																							
<i>Actinoptychus senarius</i>	•	•																					
<i>Amphiprora alata</i>								•															
<i>Amphiprora paludosa</i>														•									
<i>Amphiprora</i> sp.						•																	
<i>Asterionella formosa</i>					•																		
<i>Asterionella glacialis</i>										•													
<i>Bacteriastrum comosum</i>								•															
<i>Bacteriastrum delicatulum</i>			•					•												•			
<i>Bacteriastrum furcatum</i>								•					•				•	•					•
<i>Bacteriastrum hyalinum</i>			•										•								•		
<i>Bellerochea horologicalis</i>																					•		•
<i>Chaetoceros affinis</i>								•		•	•	•	•		•			•		•	•		
<i>Chaetoceros compressus</i>										•	•	•					•						
<i>Chaetoceros constrictus</i>										•	•										•		
<i>Chaetoceros costatus</i>										•	•												
<i>Chaetoceros curvisetus</i>								•	•	•	•			•	•	•							
<i>Chaetoceros danicus</i>	•									•	•	•									•		
<i>Chaetoceros debilis</i>									•	•	•	•	•		•	•			•		•	•	•
<i>Chaetoceros decipiens</i>	•		•					•	•		•	•	•						•		•	•	•
<i>Chaetoceros denticulatus</i>			•																				
<i>Chaetoceros didymus</i>	•							•		•			•							•	•		
<i>Chaetoceros diversus</i>																•							
<i>Chaetoceros lacinius</i>						•																	
<i>Chaetoceros laevis</i>													•										
<i>Chaetoceros lorenzianus</i>			•								•		•		•		•		•				•
<i>Chaetoceros mitra</i>										•													
<i>Chaetoceros pendulus</i>										•													
<i>Chaetoceros pseudocurvisetus</i>			•										•									•	

Taxon	Ship number																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<i>Chaetoceros teres</i>										●													
<i>Chaetoceros vanheuroki</i>																●							
<i>Chaetoceros</i> sp.		●						●		●		●		●									●
<i>Corethron criophilum</i>	●																						
<i>Coscinodiscus centralis</i>		●								●							●	●	●	●		●	
<i>Coscinodiscus gigas</i>																	●						
<i>Coscinodiscus granii</i>																			●				
<i>Coscinodiscus lineatus</i>	●																						
<i>Coscinodiscus oculus-iridis</i>	●																●						
<i>Coscinodiscus radiatus</i>	●	●																			●		
<i>Coscinodiscus rothii</i>																						●	
<i>Coscinodiscus wailesii</i>	●		●																	●		●	●
<i>Coscinodiscus</i> sp.			●								●				●	●		●			●	●	●
<i>Cylindrotheca closterium</i>						●			●	●		●										●	
<i>Ditylum brightwellii</i>									●	●	●			●	●	●	●					●	
<i>Eucampia zodiacus</i>	●				●					●	●			●									
<i>Guinardia flaccida</i>								●		●			●	●									
<i>Guinardia striata</i>								●					●										
<i>Gyrosigma</i> spp.								●			●												
<i>Lauderia annulata</i>	●			●								●							●		●		
<i>Leptocylindrus danicus</i>				●							●			●	●								●
<i>Melosira moniliformis</i>																						●	
<i>Melosira varians</i>															●								
<i>Melosira</i> sp.														●								●	
<i>Meuniera membranacea</i>									●														
<i>Navicular</i> sp.								●															
<i>Nitzschia longissima</i>																		●					
<i>Nitzschia sigma</i>																		●					
<i>Nitzschia</i> spp.					●	●			●					●		●						●	
<i>Odontella mobiliensis</i>									●				●	●									●
<i>Odontella sinensis</i>										●				●									
<i>Paralia sulcata</i>	●						●							●			●	●					
<i>Planktoniella blanda</i>	●	●	●																				
<i>Pleurosigma angulatum</i>														●									

Taxon	Ship number																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<i>Pleurosigma</i> spp.	•					•			•		•		•		•			•		•		•	
<i>Proboscia alata</i>													•						•				•
<i>Pseudonitzschia delicatissima</i>							•																
<i>Pseudonitzschia pungens</i>		•	•				•			•				•						•			
<i>Pseudonitzschia seriata</i>														•									
<i>Pseudonitzschia</i> sp.													•					•					•
<i>Rhizosolenia alata</i> forma <i>gracillima</i>								•								•							
<i>Rhizosolenia calcar-avis</i>														•									
<i>Rhizosolenia hebetata</i> forma <i>semispina</i>									•							•						•	
<i>Rhizosolenia imbricata</i>													•	•					•		•	•	•
<i>Rhizosolenia pungens</i>											•										•		
<i>Rhizosolenia setigera</i>						•							•	•									
<i>Rhizosolenia</i> sp.																						•	
<i>Skeletonema costatum</i>					•	•	•		•		•		•	•	•	•			•	•	•	•	
Small centric diatoms	•					•	•		•					•				•			•		
Small penate diatoms						•	•								•								
<i>Stephanopyxis palmeriana</i>										•													
<i>Stephanopyxis turris</i>														•									
<i>Streptotheca tamesis</i>															•				•				
<i>Synedra affinis</i>															•								
<i>Synedra</i> sp.					•				•	•													
<i>Thalassionema frauenfeldii</i>									•	•			•	•		•	•				•		•
<i>Thalassionema nitzschioides</i>	•									•			•									•	
<i>Thalassiosira eccentrica</i>			•																				
<i>Thalassiosira hyalina</i>										•													
<i>Thalassiosira rotula</i>										•													
<i>Thalassiosira</i> spp.											•			•	•		•						
Dinophyceae																							
<i>Akashiwo sanguinea</i>																			•				
<i>Ceratium furca</i>			•			•					•		•										
<i>Ceratium fusus</i>			•										•										•
<i>Ceratium horridum</i>	•																						
<i>Ceratium kofoidii</i>	•																						
<i>Ceratium lineatum</i>													•										

Taxon	Ship number																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
<i>Ceratium macroceros</i>													●						●				
<i>Ceratium tripos</i>		●	●					●															●
<i>Ceratium</i> sp.						●																	
<i>Diplopsalis lenticula</i>													●										
<i>Gonyaulax diegensis</i>						●																	
<i>Prorocentrum gracile</i>													●										
<i>Prorocentrum minimum</i>	●																						
<i>Prorocentrum micans</i>						●																	
<i>Protoperidinium claudicans</i>																●							
<i>Protoperidinium conicum</i>													●										
<i>Protoperidinium divergens</i>			●																				
<i>Protoperidinium ovatum</i>													●										
<i>Protoperidinium pellidum</i>			●																	●			
<i>Protoperidinium pellucidum</i>			●																				
<i>Protoperidinium</i> sp.								●	●					●									●
<i>Scrippsiella trochoidea</i>									●														●
<i>Pyrophacus steinii</i>			●															●					
Nano dinoflagellate						●		●	●					●	●								●
Chrysophyceae																							
<i>Dictyocha fibula</i>	●																						
Raphidophyceae																							
<i>Chattonella</i> sp.																				●			
Freshwater species																							
<i>Anabaena spiroides</i>													●										
<i>Aulacoseira granulata</i>					●		●																
<i>Closterium</i> sp.													●										
Cyanobacteria																							
<i>Trichodesmium erythraeum</i>						●											●						
Unidentified species						●									●	●							●
Total	20	7	18	2	6	15	7	17	17	24	17	7	28	25	14	17	12	7	13	10	20	15	7