

Sexual Reproduction and Genetic Polymorphism within the Cosmopolitan Marine Diatom *Pseudo-nitzschia pungens*

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Table S1. The genetic distances calculated with ITS sequences among three clades of *Pseudo-nitzschia pungens*. The dark grey area indicates clade I, light grey clade II, and the clear area indicates clade III strains, respectively. The strains used for mating experiments in this study are shown with solid boxes, and the genetic distances between these strains are shown in the dotted boxes. The genetic information of *P. pungens*

[illegible]

strains used in this table is obtained from the previous study³⁸.

Table S2. Morphometric data (average $\pm$ SD) of each parent and offspring strain of *Pseudo-nitzschia pungens*

Strain (n)	Genotype	Generation	Fibulae (in 10 μ m)	Striae (in 10 μ m)	Poroids (in 1 μ m)	Remark
HY40E5 (20)	Clade I	parent	12.63 $\pm$ 1.00	11.92 $\pm$ 0.73	3.03 $\pm$ 0.17	<i>P. pungens</i> var. <i>pungens</i>
Pnsb109 (20)	Clade III	parent	13.80 $\pm$ 0.93	13.36 $\pm$ 0.64	3.38 $\pm$ 0.24	
HYOFB6 (15)	n. d	offspring	12.96 $\pm$ 1.23	12.36 $\pm$ 1.35	2.84 $\pm$ 0.22	

n; measured individual cell number,

n.d; genotypes were not determined due to mixed sequences.

There is no significant morphological difference among three strains in ANOVA test ($p = 0.05$)

Table S3. Variable sequences of each sub-clade of clade III in ITS2 region.

Clade	Sub-clade	Variable sequences at each locus of ITS2														
		6 th	21 rd	35 th	53 th	82 th	117 th	122 th	135 th	184 th	189 st	194 th	211 rd	212 th	224 th	227 th
III	IIIaa	C	T	A	T	T	T	G	T	C	T	A	G	C	C	G
	IIIab	C	T	A	T	T	T	G	T	C	C	A	A	C	C	G
	IIIb	T	T	A	T	T	T	A	T	G	C	A	G	C	C	G
I	n	C	C	C	C	C	C	G	C	G	C	G	G	A	G	T

Table is organized on the data of the previous study³⁸.

The ITS2 sequences varied in shading locus within clade III.

n; clade I has no sub-clade.

Table S4. *Pseudo-nitzschia* clones used in this study including species, strain, clade, origin, data of isolation and Genbank accession number.

Species	Strain	Clade	Origin	Isolated date
<i>P. pungens</i> var. <i>pungens</i>	HY38B2	I	Korea, Jeju Island, Port Jeju	2012 / 10
var. <i>pungens</i>	HY40E5	I	Korea, Geojae Island, Jangmok	2014 / 10
var. <i>pungens</i>	HY40C3	I	Canada, Nanaimo Island, Inner Harbour	2013 / 10
var. <i>pungens</i>	HY48D2	I	Canada, Nanaimo island, Inner Harbor	2013 / 10
var. <i>pungens</i>	Pnpng1	I	New Zealand, Nelson, near Cawthron Institute	2014 / 09
var. <i>cingulata</i>	HY47B2	II	USA, Washington State, Puget Sound	2014 / 06
var. <i>cingulata</i>	HY47B3	II	USA, Washington State, Puget Sound	2014 / 06
var. <i>cingulata</i>	HY47B5	II	USA, Washington State, Puget Sound	2014 / 06
var. <i>pungens</i>	Pnsb109	III	Malaysia, Kuching, Santubong	2014 / 02
var. <i>pungens</i>	HY29B9	III	Korea, Namhae Island, Namhae	2013 / 08
var. <i>pungens</i>	HY48C9	III	Korea, Masan Bay	2014 / 08
var. <i>pungens</i>	HYOFA5	n. d	Offspring of HY40E5 and Pnsb109	2015 / 06
var. <i>pungens</i>	HYOFB6	n. d	Offspring of HY40E5 and Pnsb109	2015 / 06
var. <i>pungens</i>	HYOFB7	n. d	Offspring of HY40E5 and Pnsb109	2015 / 06
var. <i>pungens</i>	HYOFE3	n. d	Offspring of HY40E5 and Pnsb109	2015 / 06

n.d; genotypes were not determined due to mixed sequences.

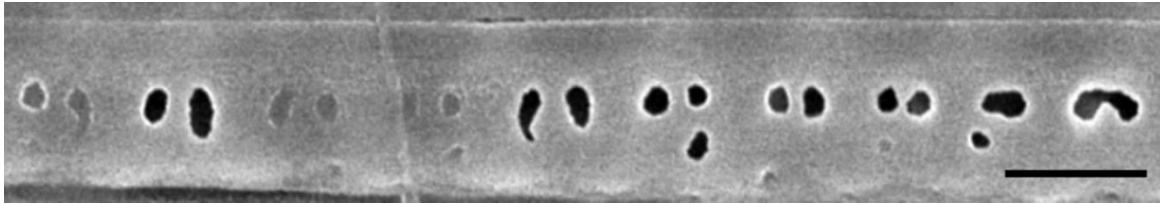


Fig. S1. Transmission electron microscope image of the valvocopulae of *Pseudo-nitzschia pungens* var. *cingulata* (HY47B5 strain) showing square structures consisting of 2 - 4 poroids. Scale bar: 1 μ m.