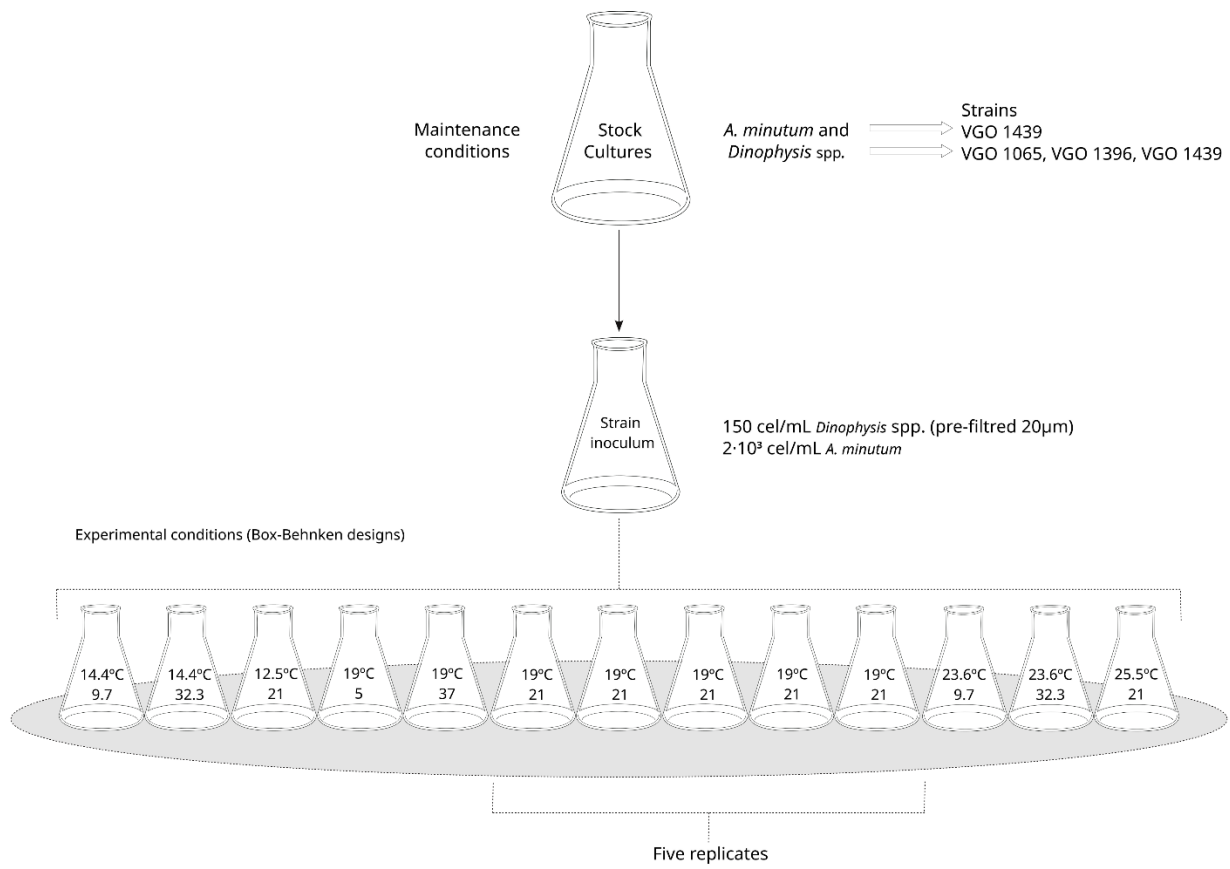
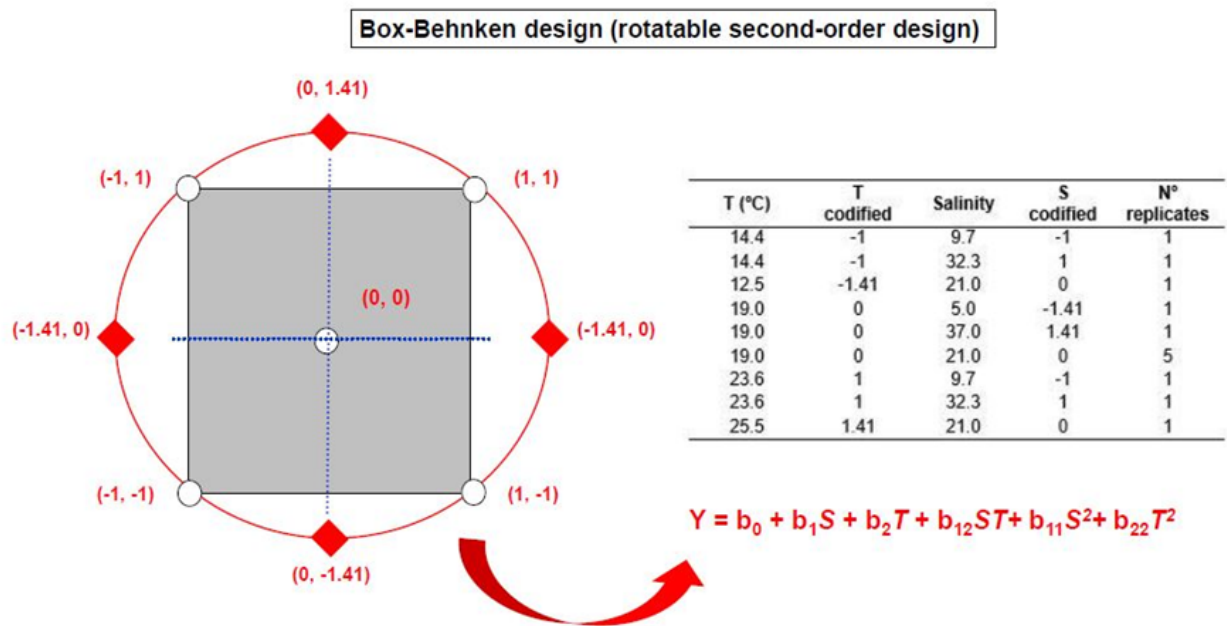


**Figure S1.** Violin plot of a 24 years (1994–2020) time series of temperature (°C) and salinity from CTD casts (top 10 m) in Ría de Vigo. Red dots represent outliers. Source: IEO monitoring project RADIALES, Spanish Institute of Oceanography (<https://www.seriestemporales-ieo.net/>).



**Figure S2.** Experimental design scheme



**Figure S3.** Graphical representation of the rotatable second-order design employed to study the effect of temperature and salinity on dinoflagellates growth. The position of factorial (the four white circles at the vertices of the grey square), axial (red squares) and centre points are shown in codified values. Summary table with the 13 experimental treatments and the type of polynomial equation obtained.

**Table S1.** Experimental domain and codification of independent variables in the factorial rotatable design.

Coded values	Natural values	
	T (°C)	S
-1.41	12.5	5.0
-1	14.4	9.7
0	19.0	21.0
+1	23.6	32.3
+1.41	25.5	37.0

Codification:  $V_c = (V_n - V_0) / \Delta V_n$

Decodification:  $V_n = V_0 + (\Delta V_n \times V_c)$

$V_n$  = natural value of the variable to codify

$V_c$  = codified value of the variable

$V_0$  = natural value in the centre of the domain

$\Delta V_n$  = increment of  $V_n$  for unit of  $V_c$

**Table S2.** Fisher F test ( $\alpha=0.05$ ). mean square ratios used to validate the model consistency.

$F_{den}^{num}$  are the theoretical values to  $\alpha=0.05$  with the corresponding degrees of freedom for numerator (num) and denominator (den).

**the model is acceptable when**

$F1 = \text{Model} / \text{Total error}$	$F1 \leq F_{den}^{num}$
$F2 = (\text{Model} + \text{Lack of fitting}) / \text{Model}$	$F2 \leq F_{den}^{num}$
$F3 = \text{Total error} / \text{Experimental error}$	$F3 \leq F_{den}^{num}$
$F4 = \text{Lack of fitting} / \text{Experimental error}$	$F4 \leq F_{den}^{num}$

**Table S3.** Changes in cell density (cells ml<sup>-1</sup>) of *Dinophysis* (*D. acuta*, *D. caudata* and *D. acuminata*) under different temperature and salinity combinations. Initial concentration (Init. Conc.).

<i>D. acuta</i>										
	T(°C)	14.4	14.4	23.6	23.6	19	19	12.5	25.5	19
	S	9.7	32.3	9.7	32.3	5	37	21	21	21
Init. Conc.		131	141	161	126	185	187	188	180	157
Max.		131	377	161	309	185	428	305	180	300
Mean		33	254	12	198	14	288	229	13	234
Median		0	235	0	213	0	267	207	0	249
SD Mean		4	26	1	25	1	20	24	1	41
<i>D. caudata</i>										
	T(°C)	14.4	14.4	23.6	23.6	19	19	12.5	25.5	19
	S	9.7	32.3	9.7	32.3	5	37	21	21	21
Init. Conc.		187	231	196	175	132	125	172	137	160
Max.		187	378	196	675	143	478	172	137	180
Mean		79	260	71	358	107	297	81	29	158
Median		37	252	21	308	102	303	60	9	159
SD Mean		10	25	11	47	6	32	13	8	23
<i>D. acuminata</i>										
	T(°C)	14.4	14.4	23.6	23.6	19	19	12.5	25.5	19
	S	9.7	32.3	9.7	32.3	5	37	21	21	21
Init. Conc.		124	172	92	181	119	132	106	152	143
Max.		124	336	92	237	119	387	195	152	244
Mean		8	230	5	154	7	262	174	25	208
Median		0	240	0	182	0	285	176	0	211
SD Mean		0	18	0	12	0	20	6	2	38