Supplementary information

Table S1 Group 1 post hoc pairwise comparisons. GDA, Redłowo station; MECH, Mechelinki – Rewa; PC, principal component; SMB, Southern Middle Bank.

	p	
Index	**PC1**	**PC2**
MECH-GDA	0.373	0.530
SMB-GDA	<0.0001	0.006
SMB-MECH	<0.0001	0.405

Table S2 Group 2 post hoc pairwise comparisons. DAS, Darß-Zingst-Bodden Chain; MECH, Mechelinki – Rewa; ODE, Odense Fjord; PC, principal component; UJW, Ujście Wisły, mouth of the Vistula.

	p	
Index	**PC1**	**PC2**
MECH-DAS	0.454	<0.0001
ODE-DAS	0.869	0.051
UJW-DAS	0.439	0.023
ODE- MECH	0.866	0.075
UJW- MECH	0.044	0.939
UJW-ODE	0.150	0.694

Table S3 Group 3 post hoc pairwise comparisons. ABE, Aberthaw; GDA, Redłowo station; GLO, Bassin du Gloria; HSH, Holkham Salts Hole; MECH, Mechelinki – Rewa; OR0, Shingle Street lagoon 0; PC, principal component; SLA, Slaughden; SMB, Southern Middle Bank.

	p	
Index	**PC1**	**PC2**
GDA-ABE	<0.0001	<0.0001
GLO-ABE	<0.0001	<0.0001
HSH-ABE	<0.0001	0.873
MECH-ABE	<0.0001	<0.0001
OR0-ABE	<0.0001	<0.0001
SLA-ABE	0.827	0.069
SMB-ABE	1.000	0.132
GLO-GDA	<0.0001	<0.001
HSH-GDA	<0.0001	<0.0001
MECH-GDA	1.000	0.792
OR0-GDA	<0.0001	0.114
SLA-GDA	<0.0001	<0.0001
SMB-GDA	<0.0001	<0.0001
HSH-GLO	0.071	<0.0001
MECH-GLO	<0.0001	0.007301
OR0-GLO	0.701	0.220
SLA-GLO	<0.0001	<0.001
SMB-GLO	<0.0001	<0.001
MECH-HSH	<0.0001	<0.0001
OR0-HSH	0.799	<0.0001

SLA-HSH	<0.0001	0.863
SMB-HSH	<0.0001	0.946
OR0-MECH	<0.0001	0.860
SLA-MECH	<0.0001	<0.0001
SMB-MECH	<0.0001	<0.0001
SLA-OR0	<0.0001	<0.0001
SMB-OR0	<0.0001	<0.0001
SMB-SLA	0.976	1.000

Table S4 Generalised additive model summary statistics of nonlinear relationships between environmental factors and shape PCs 1 and 2. [a]Index was applied as a random intercept to account for the variability across sites. PC, principal component.

Parameter	**edf**	**F**	**p-value**
f(Salinity) × shapePC1	1.968	49.842	**<0.0001**
f (Salinity) × shapePC2	1	0.72	0.397
f(Rainfall) × shapePC1	1.978	21.954	**<0.0001**
f(Rainfall) × shapePC2	1	5.747	**0.017**
f(Length) × shapePC1	1.935	14.807	**<0.0001**
f(Length) × shapePC2	1.69	15.902	**<0.0001**
f(Depth) × shapePC1	1.982	34.284	**<0.0001**
f(Depth) × shapePC2	1	21.044	**<0.0001**
s(Index)[a]	2.182	3.207	**0.004**

Table S5 Mean organic content of *C. glaucum* collected from eight coastal lagoons compared with specimens from MECH. EMS, Emsworth Mill Pond, Hampshire, UK; GLO, Bassin du Gloria, France; GOU, La Goulette, Tunisia; LAR, Etang de L'Arnel, France; MECH, Mechelinki – Rewa, Gulf of Gdańsk, Poland; ND, no data; NOR, North Cotes lagoon, Lincolnshire, UK; OR0a, Shingle Street lagoon 0a, Suffolk, UK; SLA, Slaughden, Suffolk, UK; TAW, Tawnagh, County Galway, Ireland; wt%, weight percentage.

Lagoon	**Organic content (wt% ± SD)**
EMS	2.29 ± 0.23
GLO	2.56 ± 0.70
GOU	2.27 ± 0.21
LAR	2.18 ± 0.12
NOR	2.04 ± 0.14
OR0a	1.78 ± 0.20
SLA	1.67 (ND)
TAW	2.09 ± 0.21
Average	**2.16 ± 0.38**

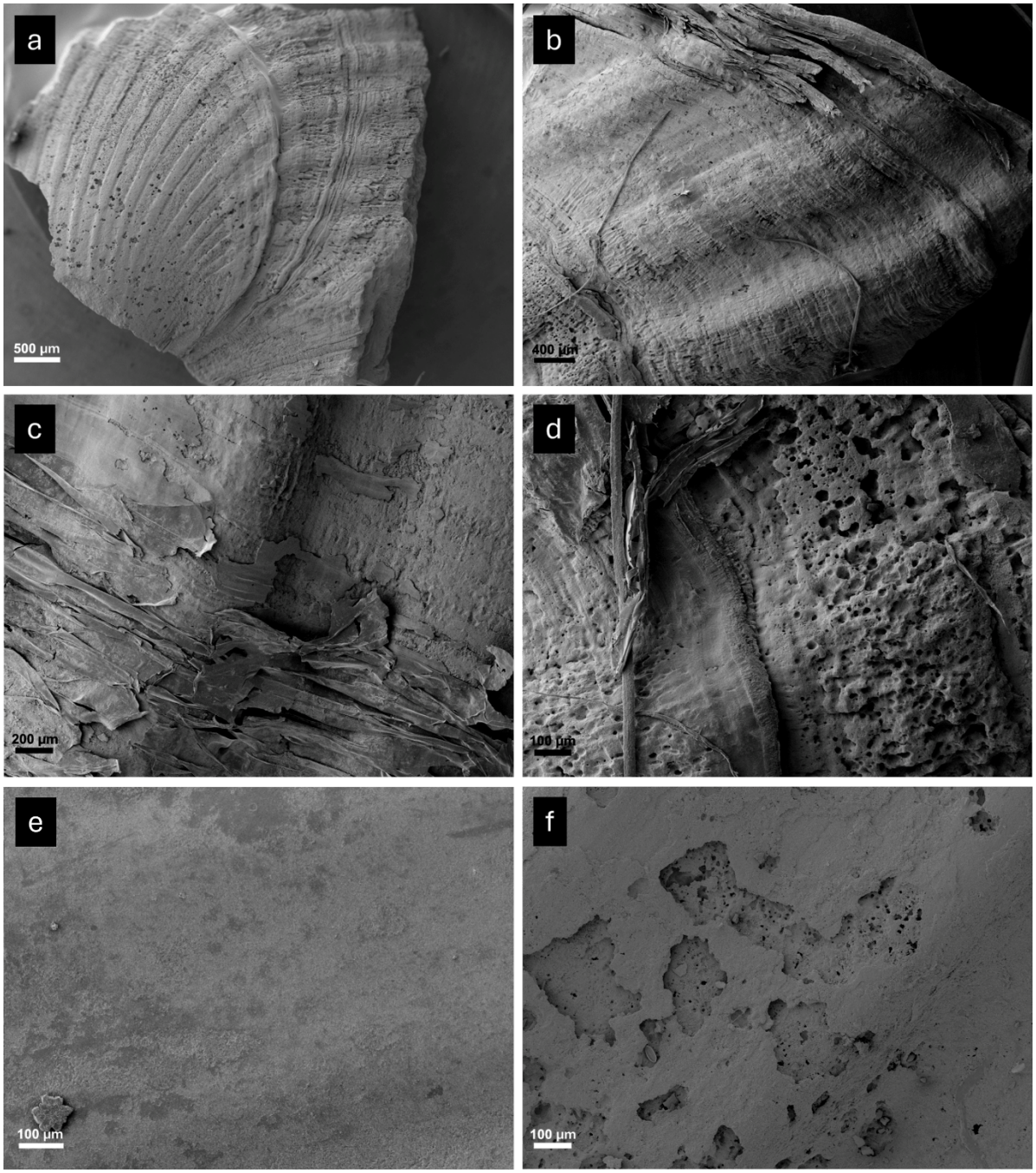

Fig. S1 (a–d) External postmortem examination of surface dissolution on a specimen from MECH. Condition of internal surfaces (e) *in vivo* and (f) postmortem. MECH, Mechelinki – Rewa.