

Supplementary figures and tables to response to referee comments on
'Egusphere-2026-3460'

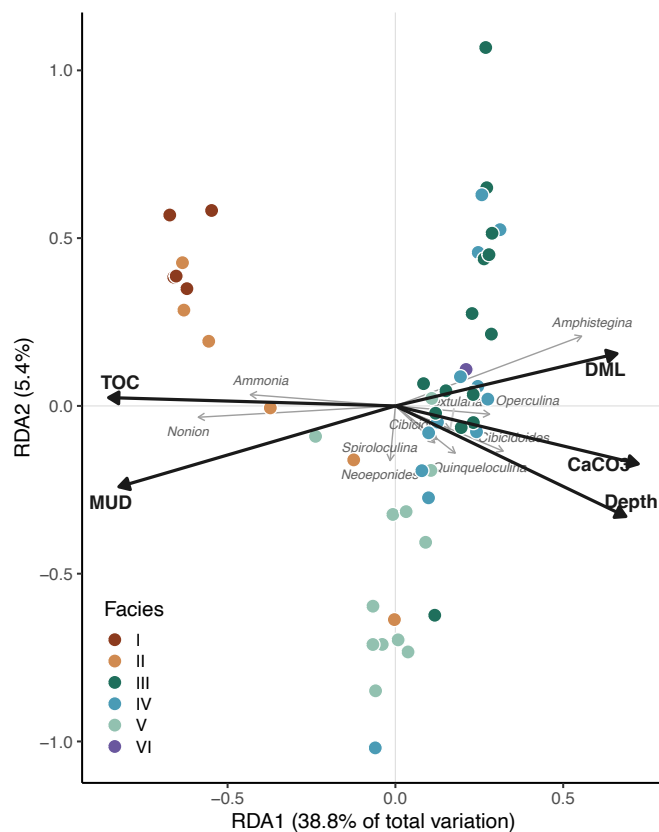


Figure S1. Redundancy analysis (RDA) triplot of benthic foraminiferal genus composition constrained by environmental variables, replacing the principal component analysis of Fig. 9. Genus abundances are Hellinger-transformed; constraints (water depth, distance from mainland, mud content, CaCO_3 , TOC) are standardised. Samples are colour-coded by sedimentary facies. Black arrows show environmental constraints; grey arrows and italic labels show the ten best-fitted genera.

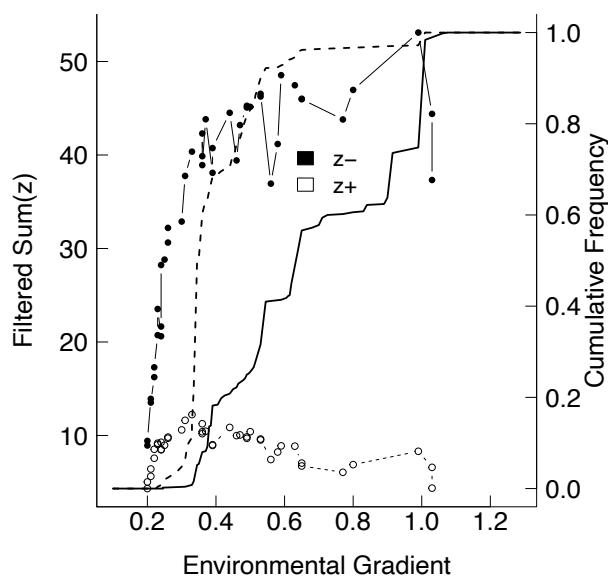


Figure S2. Threshold Indicator Taxa Analysis (TITAN) of benthic foraminiferal genus composition along the total organic carbon gradient. (A) Filtered sum(z) scores for taxa declining (z-) and increasing (z+) with increasing TOC, with bootstrap cumulative frequency distributions of community change points. (B) Change points for individual taxa with bootstrap 5th–95th percentile limits; symbol size scales with indicator score. Only taxa occurring in at least three samples are included.

Table S1. Marginal permutation tests, 4999 permutations. Gravel and sand excluded (closed array with mud); distance to Makassar Strait excluded (redundant with distance from mainland); FoRAM Index and functional-group proportions excluded (derived from the response data).

MODEL	RDA (GEN. COMPOSITION ~ DEPTH + DML + MUD + CaCO ₃ + TOC)		
Response transformation	Hellinger (relative abundances, 42 genera)		
Constraint transformation	standardised		
DCA axis-1 gradient length	2.68 SD		
Constrained variation	50.8%		adj. R ² = 0.45
RDA1 / RDA2	38.8% / 5.4%		
Global test	F = 9.28		p = 0.0002
CONSTRAINT	Marginal F		
Water depth	3.91	p	VIF
Distance from mainland	3.51	0.005	2.6
Mud content	3.65	0.011	2.9
CaCO ₃	1.61	0.009	5.9
TOC	2.20	0.141	3.0

Table S2. Independent validation of the facies classification. Bray–Curtis dissimilarities of relative genus abundances; 4999 permutations. Foraminiferal data were excluded from the cluster analysis defining the facies.

TEST	STATISTIC	P
PERMANOVA, nearshore (I–II) vs mid/outer (III–VI)	pseudo-F = 28.77, R ² = 0.37	0.0002
PERMDISP, same grouping	F = 0.09	0.771
PERMANOVA, all six facies	pseudo-F = 10.67, R ² = 0.54	0.0002
Indicator species analysis	16 of 42 genera significant	—

Table S3. Segmented regression with one breakpoint. PCoA1 is the first principal coordinate of Bray–Curtis dissimilarities of relative genus abundances. Davies test assesses evidence for a change in slope; bold indicates $p < 0.05$.

RESPONSE	PREDICTOR	BREAKPOINT (SE)	R ² LINEAR	R ² SEGMENTED	DAVIES P
FoRAM Index	TOC (%)	0.56 (0.10)	0.631	0.712	0.009
FoRAM Index	Mud (wt%)	12.6 (4.0)	0.707	0.744	0.130
FoRAM Index	Distance from mainland (km)	25.8 (5.7)	0.384	0.452	0.140
FoRAM Index	Water depth (m)	41.3 (6.3)	0.265	0.335	0.154
PCoA1	TOC (%)	1.24 (0.43)	0.759	0.763	0.813
PCoA1	Mud (wt%)	72.2 (27.7)	0.672	0.797	<0.001
PCoA1	Distance from mainland (km)	21.1 (4.2)	0.443	0.546	0.015
PCoA1	Water depth (m)	38.5 (3.6)	0.543	0.655	0.004

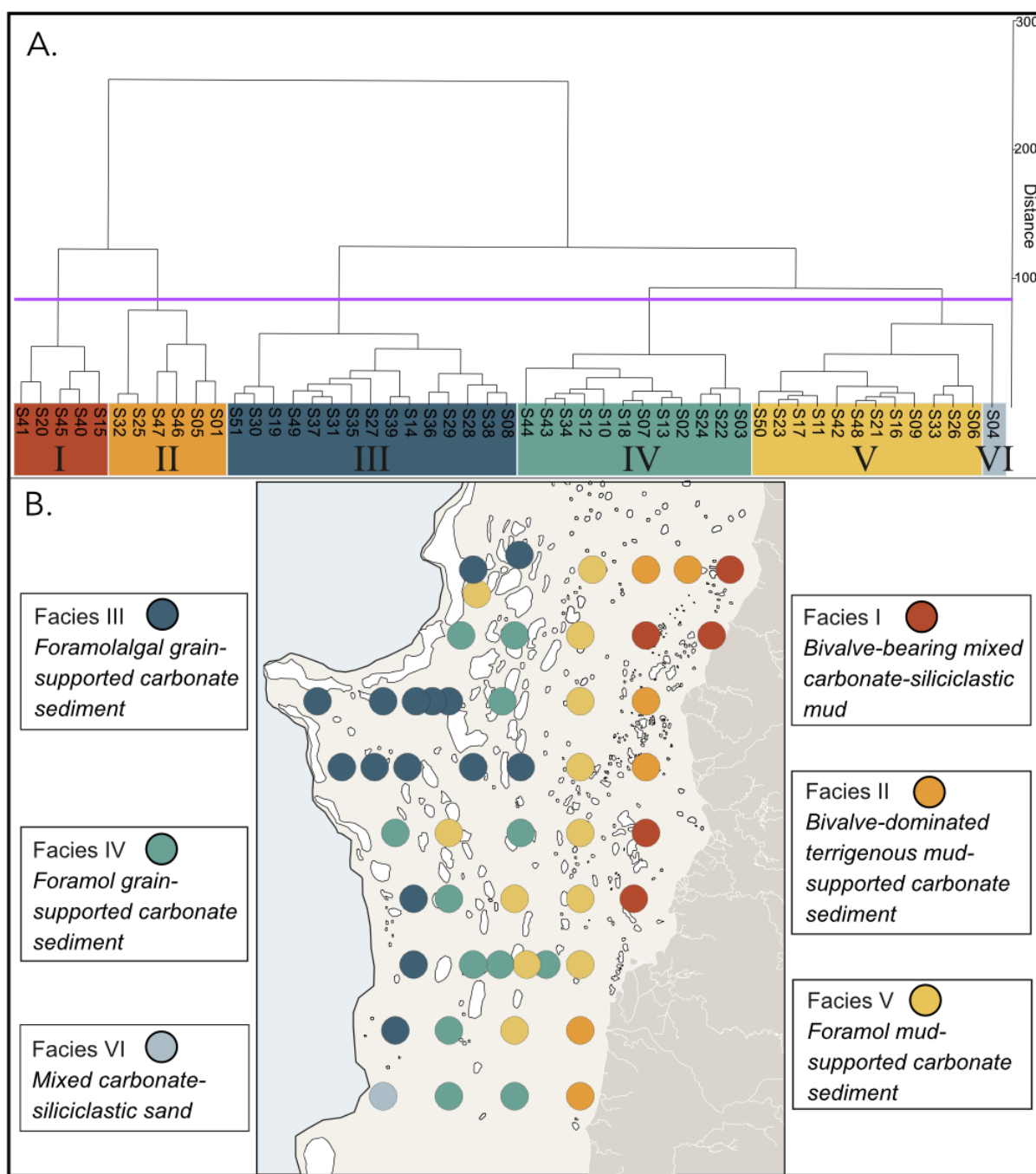


Figure S3. Figure 8, indicating a purple line at the linkage distance at which the dendrogram was cut, yielding five groups. Facies VI (sample S04) was retained as a separate unit on sedimentological grounds rather than by the linkage criterion, on the basis of its elevated siliciclastic content (33.5 wt%) and interpretation as a relict deposit. Cluster analysis was performed exclusively on grain-size, carbonate and skeletal-component data; foraminiferal assemblage data were excluded.