

Supplementary Material

Table S1. Results of the one-way PERMANOVA testing for differences in the concentration of biochemical compounds and composition (A), descriptors of nutritional quality (B) of organic matter in the sediment between sampling stations and seasons (df = degrees of freedom; MS = mean of squares; F = variance ratio; P = significance level; P(MC) = P Monte Carlo test; *** = P<0.001; ** = P< 0.01; * = P< 0.05). Sampling stations: Og=Oglio, Po=Po, Go=Gorino, Gi=Giralda, De=Delta and Ce=Cesenatico. Sampling seasons: W=winter, S=summer.

| | Source | Main test | | | | Pair wise | | | | | | | | | |
|------------------|------------------|-----------|------|-------|-----|-----------------------|-----------------------|------------------|-----|--------|---------|-------|------------|--|--|
| | | df | MS | F | P | Sampling station | | Sampling seasons | | | | | | | |
| | | | | | | Summer | Winter | Oglio | Po | Gorino | Giralda | Delta | Cesenatico | | |
| A) Chlorophyll-a | Station | 5 | 4.2 | 114.7 | *** | Gi>Go,Ce>D e>Po>Og | Gi>Go,De>O g,Po,Ce | W>S | ns | W>S | W>S | W>S | ns | | |
| | Season | 1 | 6.1 | 166.5 | *** | | | | | | | | | | |
| | Station x Season | 5 | 1.4 | 37.7 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Pheaopigment | Station | 5 | 6.0 | 157.3 | *** | Gi,Go>Ce>D e>Po>Og | Go>Gi>De>O g,Ce>Po | W>S | W>S | W>S | ns | W>S | S>W | | |
| | Season | 1 | 1.1 | 29.9 | *** | | | | | | | | | | |
| | Station x Season | 5 | 0.6 | 15.9 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Total pigment | Station | 5 | 5.9 | 162.2 | *** | Gi>Go,Ce>D e>Po>Og | Go>Gi>De>O g,Ce>Po | W>S | W>S | W>S | ns | W>S | S>W | | |
| | Season | 1 | 1.5 | 41.5 | *** | | | | | | | | | | |
| | Station x Season | 5 | 0.6 | 16.3 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Protein | Station | 5 | 4.1 | 182.1 | *** | Go>Ce>Gi> De>Po>Og | Gi>Po,De,Ce, Go>Og | W>S | W>S | S>W | W>S | W>S | S>W | | |
| | Season | 1 | 0.1 | 3.3 | ns | | | | | | | | | | |
| | Station x Season | 5 | 2.8 | 123.6 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Carbohydrate | Station | 5 | 2.6 | 98.1 | *** | Gi>Go>Ce> Po,De>Og | Po,Go>Gi>O g,De>Ce | W>S | W>S | W>S | W>S | W>S | S>W | | |
| | Season | 1 | 11.3 | 420.3 | *** | | | | | | | | | | |
| | Station x Season | 5 | 2.0 | 73.9 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Lipid | Station | 5 | 4.1 | 89.4 | *** | Go>Ce>Gi> Po,De>Og | Go>Gi,Po>O g,De>Ce | W>S | W>S | W>S | W>S | W>S | S>W | | |
| | Season | 1 | 7.9 | 172.9 | *** | | | | | | | | | | |
| | Station x Season | 5 | 1.1 | 24.8 | *** | | | | | | | | | | |
| | Residual | 24 | 0.0 | | | | | | | | | | | | |
| Biopolymeric C | Station | 5 | 4.2 | 156.4 | *** | Go>Ce>Gi> De>Po>Og | Gi>Go,Po>D e,Og>Ce | W>S | W>S | S>W | W>S | W>S | S>W | | |
| | Season | 1 | 2.1 | 78.0 | *** | | | | | | | | | | |
| | Station x Season | 5 | 2.2 | 82.9 | *** | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|----|------------------------------------|------------------|-----|--------|-------|-----|-------------------|-------------------|-----|-----|-----|-----|-----|-----|
| | Residual | 24 | 0.0 | | | | | | | | | | | |
| | Organic matter composition | Station | 5 | 21.0 | 123.8 | *** | Og≠Po≠Gi≠Go≠De≠Ce | Og≠Po≠Gi≠Go≠De≠Ce | S≠W | S≠W | S≠W | S≠W | S≠W | S≠W |
| | | Season | 1 | 26.5 | 156.1 | *** | | | | | | | | |
| | | Station x Season | 5 | 7.9 | 46.5 | *** | | | | | | | | |
| | | Residual | 24 | 0.2 | | | | | | | | | | |
| B) | Chlorophyll-a: biopolymeric C | Station | 5 | 28.4 | 147.8 | *** | Po>De>Gi>Ce,Go,Og | De,Gi>Go>Og,Ce>Po | ns | S>W | W>S | W>S | W>S | ns |
| | | Season | 1 | 4.6 | 23.8 | *** | | | | | | | | |
| | | Station x Season | 5 | 23.6 | 122.7 | *** | | | | | | | | |
| | | Residual | 24 | 0.2 | | | | | | | | | | |
| | Protein: biopolymeric C | Station | 5 | 816.2 | 188.2 | *** | Go,Ce>De>Og,Po,Gi | Ce>Gi>De>Og,Po,Go | S>W | S>W | S>W | S>W | S>W | W>S |
| | | Season | 1 | 2287.9 | 527.5 | *** | | | | | | | | |
| | | Station x Season | 5 | 446.5 | 103.0 | *** | | | | | | | | |
| | | Residual | 24 | 4.3 | | | | | | | | | | |
| | Protein: carbohydrate | Station | 5 | 0.3 | 182.9 | *** | Go,Ce>Gi>De>Og,Po | Ce>Gi>De>Og,Po>Go | S>W | S>W | S>W | S>W | S>W | W>S |
| | | Season | 1 | 1.0 | 515.6 | *** | | | | | | | | |
| | | Station x Season | 5 | 0.2 | 100.3 | *** | | | | | | | | |
| | | Residual | 24 | 0.0 | | | | | | | | | | |
| | Organic matter nutritional quality | Station | 5 | 845.0 | 186.5 | *** | Og≠Po≠Gi≠De≠Go,Ce | Og,Po≠Gi≠Go≠De≠Ce | S≠W | S≠W | S≠W | S≠W | S≠W | S≠W |
| | | Season | 1 | 2293.4 | 506.1 | *** | | | | | | | | |
| | | Station x Season | 5 | 470.3 | 103.8 | *** | | | | | | | | |
| | | Residual | 24 | 4.5 | | | | | | | | | | |
| C) | Aminopeptidase | Station | 5 | 2.6 | 5.6 | ** | Gi>Po,Ce,Og,Go>De | Gi,Go>De,Og>Ce>Po | ns | S>W | ns | ns | ns | S>W |
| | | Season | 1 | 0.1 | 0.2 | ns | | | | | | | | |
| | | Station x Season | 5 | 2.2 | 4.7 | ** | | | | | | | | |
| | | Residual | 24 | 0.5 | | | | | | | | | | |
| | β-glucosidase | Station | 5 | 2.6 | 19.5 | *** | Gi>Ce,Po>Go>De,Og | De,Po,Og>Gi>Go>Ce | W>S | W>S | ns | ns | W>S | S>W |
| | | Season | 1 | 5.4 | 39.7 | *** | | | | | | | | |
| | | Station x Season | 5 | 2.6 | 19.5 | *** | | | | | | | | |
| | | Residual | 24 | 0.1 | | | | | | | | | | |
| | Alkaline phosphatase | Station | 4 | 3.7 | 26.8 | *** | Gi>Ce,Po>Go>De,Og | Gi>Go>De,Ce,Og,Po | W>S | S>W | ns | S>W | W>S | S>W |
| | | Season | 1 | 0.2 | 1.3 | ns | | | | | | | | |
| | | Station x Season | 3 | 2.3 | 17.0 | *** | | | | | | | | |
| | | Residual | 18 | 0.1 | | | | | | | | | | |

Table S2. Results of multivariate PERMANOVA and pair wise test on prokaryotic (A) and meiofaunal (B) abundance, biomass, richness of meiofaunal taxa and taxonomic composition in the sediment among stations and sampling seasons (df = degrees of freedom; MF = mean of squares; F = variance ratio; P = significance level; *** = P<0.001; ** = P<0.01; * = P<0.05; ns = not significant). Sampling stations: Og=Oglio, Po=Po, Go=Gorino, Gi=Giralda, De=Delta and Ce=Cesenatico. Sampling seasons: W=winter, S=summer.

| | Source | Main test | | | | Pair wise | | | | | | | | |
|----------------------------------|------------------------------|------------------|---------|---------|--------|-------------------|-------------------|-------------------|-----|--------|---------|-------|------------|-----|
| | | df | MS | F | P | Sampling station | | Oglio | Po | Gorino | Giralda | Delta | Cesenatico | |
| | | | | | | Summer | Winter | | | | | | | |
| A) | Prokaryotic abundance | Sampling station | 5 | 6435.9 | 75.5 | *** | Go>Gi,Ce>De>Po>Og | Go>Gi,Ce>De,Po>Og | W>S | W>S | W>S | W>S | ns | S>W |
| | | Season | 1 | 795.6 | 9.3 | *** | | | | | | | | |
| | | Station x Season | 5 | 1029.4 | 12.1 | *** | | | | | | | | |
| | | Residual | 24 | 85.3 | | | | | | | | | | |
| | Prokaryotic biomass | Sampling station | 5 | 6410.3 | 75.5 | *** | Go>Gi,Ce>De>Po>Og | Go>Gi>Po,De,Ce>Og | W>S | W>S | W>S | W>S | ns | S>W |
| | | Season | 1 | 778.7 | 9.2 | *** | | | | | | | | |
| | | Station x Season | 5 | 999.3 | 11.8 | *** | | | | | | | | |
| | | Residual | 24 | 84.9 | | | | | | | | | | |
| | Prokaryotic OTUs composition | Sampling station | 4 | 4616.2 | 1313.0 | *** | Og#Po#Go#Gi#De#Ce | Og#Po#Go#Gi#De#Ce | S#W | S#W | S#W | S#W | S#W | S#W |
| | | Season | 1 | 5572.2 | 1584.9 | *** | | | | | | | | |
| | | Station x Season | 4 | 4085.7 | 1162.1 | *** | | | | | | | | |
| | | Residual | 10 | 3.5 | | | | | | | | | | |
| B) | Meiofaunal abundance | Sampling station | 5 | 13231.0 | 51.0 | *** | Gi>De>Go>Po,Ce>Og | Go,Gi>De>Ce>Po,Og | ns | S>W | W>S | ns | S>W | W>S |
| | | Season | 1 | 723.0 | 2.8 | ns | | | | | | | | |
| | | Station x Season | 5 | 2707.7 | 10.4 | *** | | | | | | | | |
| | | Residual | 24 | 259.3 | | | | | | | | | | |
| | Meiofaunal biomass | Sampling station | 5 | 12071.0 | 34.1 | *** | Gi>De>Go>Po,Ce>Og | Go,Gi>Ce>De>Po,Og | ns | ns | ns | ns | S>W | W>S |
| | | Season | 1 | 629.9 | 1.8 | ns | | | | | | | | |
| | | Station x Season | 5 | 3741.6 | 10.6 | *** | | | | | | | | |
| | | Residual | 24 | 353.8 | | | | | | | | | | |
| | Richness of meiofaunal taxa | Sampling station | 5 | 260.5 | 0.9 | ns | ns | ns | ns | ns | ns | ns | ns | ns |
| | | Season | 1 | 330.2 | 1.2 | ns | | | | | | | | |
| | | Station x Season | 5 | 411.6 | 1.5 | ns | | | | | | | | |
| | | Residual | 24 | 280.5 | | | | | | | | | | |
| Meiofaunal taxonomic composition | Sampling station | 5 | 13773.0 | 41.5 | *** | Og,Po#Go#Gi#De#Ce | De#Og,Po#Go,Gi#Ce | ns | S#W | S#W | ns | S#W | S#W | |
| | Season | 1 | 893.0 | 2.7 | ns | | | | | | | | | |
| | Station x Season | 5 | 2780.9 | 8.4 | *** | | | | | | | | | |
| | Residual | 24 | 332.2 | | | | | | | | | | | |