

## **Spatial distribution of live benthic foraminifera in the Rh ne prodelta: Faunal response to a continental-marine organic matter gradient**

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Benthic foraminifera were collected in the Rhône prodelta (Gulf of Lions, Mediterranean Sea), an enriched zone with high organic matter content. In June 2005, sediment cores were sampled at depths ranging from 20 to 100 m. Four distinct foraminiferal assemblages were determined in the study area, reflecting the geographical distribution of the impact of river supply. The living foraminiferal faunas present a typical picture, with strongly impoverished faunas composed exclusively of stress-tolerant taxa (*Fursenkoina fusiformis*, *Bulimina aculeata*, *Leptohyalis scottii*, and *Adelosina longirostra*) in the immediate vicinity of the river mouth. This assemblage is well adapted to a high input of continental organic matter and a minimum oxygen penetration depth into the sediment. To the southwest, under the main corridor followed by the river plume, high organic input with a dominantly terrestrial signature (more refractory) may be stressful for many taxa which need organic matter of a more labile quality. In this area, *Nonion scaphum*, *Nonionella turgida* and *Rectuvigerina phlegeri* are present in low densities. On the edge of this area, these taxa show much higher densities. A greater proportion of marine organic carbon could explain their increasing abundances in this area. Towards the east and towards the deepest stations, in the outer part of the enriched zone, biodiversity increases. Faunas at these stations have intermediate densities and contain a number of taxa (*Cassidulina carinata*, *Epistominella vitrea*, *Valvulineria bradyana*, *Nonionella iridea/bradyi*) at the deepest stations; *Bolivina dilatata/spatulata* and *Textularia porrecta* at the eastern stations) that seem to benefit from more marine organic matter. The comparison of geochemical measurements and foraminiferal data strongly suggests that the spatial distribution of foraminifera in the Rhône prodelta is mainly governed by the quality and the quantity of organic matter reaching the sediment-water interface. Since bottom waters are well oxygenated (215-260  $\mu\text{mol/L}$ ), and oxygen penetration into the sediment is less than 1 cm at all stations, benthic ecosystem oxygenation appears to have only a minor impact on regional differences in faunal distribution.

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