Locomotion speed of the benthic foraminifer Ammonia tepida exposed to different nitrogen and carbon sources

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Résumé en anglais	Ammonia tepida is a dominant benthic foraminifer colonizing intertidal mudflat sediments. Horizontal locomotion speeds were monitored using time-lapse image analysis over 6 and 24 h. Experimental conditions were based on foraminifera exposed to dry sediment re-suspended in artificial sea water (ASW) without any nutrient addition (condition DS), to combusted sediment re-suspended in in ASW also without any nutrient addition (condition CS), or to combusted sediment re-suspended in ASW enriched with either: nitrate, urea, glucose, soil extract (SE), extracellular polymeric substances (EPS), benthic diatoms (Entomoneis paludosa) or natural microphytobenthic assemblages (MPB). Significant differences were already measured after 6 h between A. tepida mean locomotion speeds at the different experimental conditions. However, differences were clearer after 24 h where the slowest A. tepida mean locomotion speed was measured in specimens placed in CS (1.00 ± 0.30 mm h− 1) and the highest mean locomotion speed in DS (2.99 ± 0.22 mm h− 1). Three different groups were defined according to their locomotion speed, (1) foraminifera exposed to DS had a locomotion speed significantly higher than all other conditions, (2) foraminifera placed in conditions enriched in SE, Glucose, Urea and EPS had intermediary locomotion speeds (1.8–2.5 mm h− 1), and (3) conditions with foraminifera showing the lowest locomotion speeds (1–1.6 mm h− 1) were CS, nitrate, MPB and E. paludosa. Thus, foraminifera exposed to organic matter (DS, SE, Glucose and Urea) showed faster locomotion speeds than foraminifera exposed to inorganic matter (CS, nitrate) or live preys (E. paludosa, MPB). Dissolved organic matter enrichment enhanced foraminifera locomotion speed, which might be a behavioural response to satisfy their carbon and/or nitrogen requirements, and the lowest locomotion speed observed when feeding on live preys might be a consequence of longer time required for live prey phagocytosis.
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