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Impact of heavy metals (Cu, Fe, Pb, Zn) on carbon and nitrogen uptake of the diatom-bearing benthic foraminifera *Heterostegina depressa d'Orbigny* 1826

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Foraminifera are protists thriving in marine and estuarine environments. They occupy all sorts of habitats, from nearly fresh water to the abyssal ocean. In this study we investigated the uptake of inorganic carbon (C) and nitrogen (N) with respect to the presence of heavy metals (*Cu*, *Fe*, *Pb*, *Zn*) on the photosymbiont-bearing benthic coral reef foraminifera *H. depressa d'Orbigny 1826*. This species does not ingest food, it feeds exclusively on the products of its symbionts. Recent studies demonstrated the vulnerability of this species in the context of shifting environmental parameters (e.g. pCO_2, temperature). Here, we analyzed the impact of heavy metal contamination on the metabolism of these diatom-hosting foraminifera. Incubation experiments were accomplished with artificial seawater enriched with heavy metals at 50 µg/L and 500 µg/L. Additionally, the stable isotopes ^{13}C (sodium bicarbonate) and ^{15}N (ammonium chloride) were added into the water to trace their assimilation. Seven individuals of *H. depressa* were used per replicate, placed in crystallization dishes and incubated for several time points (1d, 3d, 5d, 7d). Furthermore, Microscopy-PAM measurements were performed. The fluorometer consisting of a modified epi-fluorescence microscope equipped with a modulated LED light source and a photomultiplier for detection of modulated chlorophyll fluorescence was applied to monitor the heavy metal effects on the photosymbiont activity. We saw that copper exhibited the greatest toxicity, while iron increased symbiotic activity. Lead caused biased results, forming dark, brown spots in the cultures. While low concentrations of zinc promoted the growth and metabolism of the foraminifera, high concentrations were toxic.