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# The Ag/Cd ratio as a new tool to distinguish sediment environments within and below oxygen minimum zones.

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Enrichment patterns of redox- and biosensitive trace elements (TEs) are key to reconstruct depositional conditions in organic-rich marine environments. Notably, Ag and Cd serve as valuable tracers for high primary productivity (diatom dominated) in upwelling regions. However, the authigenic sources and accumulation mechanisms of Ag and Cd - such as organic particle input and redox control - are not fully understood. To contribute to the discussion, we analyzed the distribution of Ag and Cd (along with Mo, Al and organic carbon) in short sediment cores from within and below the oxygen minimum zone (OMZ) of the continental margin off Namibia. We compared the obtained data with published sediment data from the Peruvian continental margin and introduce authigenic Ag/Cd ratios as a novel proxy for depositional conditions within and below OMZs.

Our results reveal distinct Ag enrichments in Namibian OMZ sediments, gradually decreasing with increasing water depth below the OMZ. By contrast, Cd is only enriched in Namibian OMZ sediments. This supports previous the finding that Cd is more sensitive to elevated bottom-water oxygen concentrations compared to Ag, in line with results from Peru margin sediments. Moreover, Ag and Cd enrichment appear to be linked to the deposition of diatomaceous organic matter. Hence, low authigenic Ag/Cd ratios are typical for OMZ sediments and high authigenic Ag/Cd ratios typical for sediments below an OMZ. These findings highlight the interplay of organic particle dynamics and redox conditions in shaping TE distributions, positioning the Ag/Cd ratio as a valuable tool for the recognition of (past) environments within and below OMZs.