Effects of sampling methods on the chemical composition of sediment pore water

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In recent marine expeditions, pore water samples are commonly collected by compression using hydraulic squeezer, separation using centrifuge, and extraction using Rhizon sampler. However, it has been pointed out that the chemical composition of pore water may not be consistent among these methods. In this study, the effects of these three sampling methods on the chemical composition of pore water were examined by comparative experiments. As a result, differences were found in the concentrations of various ions among the three sampling methods. Although there was no significant difference in the centrifugal force (rotation speed), the squeezer showed slight increases in the concentrations of various ions. Furthermore, when the amount of sediment was small, the ion concentrations significantly increased with the increase in pressure. On the other hand, the Rhizon sampler was characterized by a smaller force applied to the sediment than the other sampling methods, the concentrations of various ions were relatively constant. The sampling pressure on sediments is likely an important factor controlling the chemical composition of pore water, the sampling method should be examined carefully in accordance with the analytical objectives.

Keywords: hydraulic squeezer, centrifuge, Rhizon sampler

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