The effect of hydrostatic pressure on grazing in three calanoid copepods

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The vertical distribution of copepods and the factors determining it have been studied extensively. Different individuals belonging to the same species and life stage are commonly dispersed across a depth range sometimes reaching tens of meters. Usually this depth range is referred to as a feature of the population. However, a recent study has shown that copepods of the same species, life stage and sex are vertically segregated based on their lipid content, suggesting the possibility of individual depth selection within the depth range of a species. Furthermore, some copepods appear to maintain their individual vertical position in the water column with high precision against downwelling and upwelling currents. The adaptive benefits of this behavior are unknown. We hypothesized that changes in hydrostatic pressure alter the buoyancy of copepods and, in turn, affect their grazing rate. We tested this hypothesis in laboratory grazing experiments with three calanoid species, *Calanus helgolandicus*, *Pleuromamma indica* and *Rhincalanus nasutus*, grazing on cultured phytoplankton. The study was based on a comparison of gut pigment content between individuals that fed in chambers with low (1 bar) and increased (4 bars) pressure. A significant effect of pressure was found for *C. helgolandicus* (lower gut content at increased pressure) but not for *P. indica* and *R. nasutus*. If the effect observed in *C. helgolandicus* is common, it would add a new dimension to our understanding of copepod ecology in the oceanic realm, where plankton is often exposed to vertical currents and internal waves.