Investigating the role of calcification in Coccolithophores

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Despite the ecological significance of coccolithophores, the role of calcification remains uncertain, and the cellular mechanisms behind the process remain poorly understood. One of the reasons for this is that studies to date have predominantly focused on *Emiliania huxleyi*, the most globally abundant coccolithophore species. It is well documented that *E. huxleyi* can readily exist in a non-calcified state in laboratory cultures without any significant impact on cell fitness. However, emerging evidence suggests that there are important physiological differences among species and that the mechanisms of calcification in *E. huxleyi* are not typical of all coccolithophores. *Coccolithus braarudii*, a significant contributor to global calcite production, has been highlighted by recent literature as a contrasting species to *E. huxleyi* in terms of its calcification mechanisms. We applied a multifaceted approach to compare the impact of disrupting calcification in *E. huxleyi* and *C. braarudii* in culture experiments. Our findings indicate that there are clear differences between these organisms, which adds to the emerging variation in calcification mechanisms found in the coccolithophores, and these differences have important implications for our understanding of the evolution, ecology, and future response of coccolithophores to changing ocean conditions.