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# Assessing the dissolution effect on planktonic foraminiferal Mg/Ca ratios: Evidence from Caribbean core-tops

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In order to assess the dissolution effect on foraminiferal Mg/Ca ratios, we analyzed Mg/Ca of seven planktonic foraminiferal species and four of their varieties from Caribbean core-top samples covering a water depth range of from ∼900–4700 m water depth. Depending on the foraminiferal species or variety, Mg/Ca start to decline linearly below a critical calcite saturation value $\Delta[CO_3{}^{2-}]$ ($\Delta_{critical}$) of ∼18–28 $\mu$mol/kg by ∼0.04–0.11 mmol/mol per 1 $\mu$mol/kg $\Delta[CO_3{}^{2-}]$. Converting $\Delta_{critical}$ into water depth reveals that Mg/Ca decrease by ∼0.5–0.8 mmol/mol per kilometer below water depths of ∼2500–3000 m. Above these species- specific depth levels ($d_{critical}$), foraminiferal Mg/Ca remain stable although showing a higher intraspecific Mg/Ca variability than below. We developed routines to correct Mg/Ca from below $d_{critical}$ and $\Delta_{critical}$ for dissolution effects, which reduce the overall intraspecific variability by ∼24–64 %, and provide dissolution-corrected Mg/ Ca appropriate to calculate Holocene paleotemperatures. When taking into account only shallow core-top samples from <2000 m unaffected by dissolution, the systematic succession of foraminiferal species according to their Mg/Ca reflects expected calcification depths at different temperature regimes. The assignment of core-top Mg/Ca to modern temperatures, however, bears some uncertainty as foraminiferal calcification depths are not well constrained.