# Testing Strontium for Estimating Weaning Ages: Implications for Marsupial Life History Reconstruction

Maya Bharatiya[1,2], Tanya M. Smith[1,2] and Christine M. Austin[3]

**Abstract**

Documenting the transition from infant nursing to an adult diet can shed light on the reproductive strategies of mammals, including the enigmatic *Diprotodon* and other megafauna that once roamed Queensland. Concentrations of the trace element strontium in primate teeth have been used as a proxy to estimate this transition. An influential model posits that strontium levels (relative to calcium) should be low during initial nursing due to limited strontium in milk, increase with the introduction of solid foods that contain higher amounts of strontium, peak at the cessation of suckling, and slowly decline as the gut begins discriminating against strontium in favour of calcium. This study tests this model by assessing trace elements in 13 human and non-human primate first molars (M1) with laser-ablation, inductively coupled plasma mass spectrometry. Only 54% of M1s had a peak in strontium immediately after the cessation of suckling, and none of these showed a subsequent decline in strontium. Alternative approaches are needed for inferring the weaning ages and life histories of ancient marsupials.

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[1] *Griffith Centre for Social and Cultural Research, Griffith University, Southport, QLD 4222, Australia* (*maya.bharatiya@griffithuni.edu.au*)
[2] *Australian Research Centre for Human Evolution, Griffith University, Nathan, QLD 4111, Australia* (*tanya.smith@griffith.edu.au*)
[3] *Department of Environmental Medicine and Public Health, Icahn School of Medicine at Mount Sinai, New York, NY 10029-5674, United States of America* (*christine.austin@mssm.edu*)

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