

## **Ostrich Eggshells as Paleoenvironmental Indicators in the Pliocene Laetoli Succession, N. Tanzania**

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In addition to their utility as a biostratigraphic tool, fossil eggshell fragments of ostriches have great potential for contributing to paleoenvironmental interpretations. Isotopic analyses of the organic and inorganic components of fossil eggshells provide an archive of diet and prevailing climatic conditions during the past. Eggshell fragments represent a ubiquitous component of the Laetoli fossil assemblages and >800 specimens have been systematically sampled from the sequence since 1998. Morphology of the eggshells and their taxonomic affinities indicates that two different species of *Struthio* are represented – *Struthio* sp. nov. in the Lower Laetolil Beds (~4.3-3.8 Ma) and Upper Laetolil Beds (~3.8-3.5 Ma) below Tuff 3 which is replaced higher in the U. Laetolil Beds by the modern species of ostrich, *S. camelus*. Preliminary isotopic analyses of 78 eggshell fragments from the Laetoli succession indicate a distinct dietary shift within the Upper Laetolil Beds correlating to this taxonomic change. Isotopic signatures of the older eggshell material indicate diets dominated by browse with a greater component of C<sub>3</sub> biomass in the diet than modern ostriches in the region. The earliest appearance of *S. camelus* in the sequence is marked by a 5-6% positive shift indicating a C<sub>4</sub> grazing component greater than modern ostriches at Laetoli and more comparable to extant ostriches in the Turkana Basin. Oxygen isotopic values also become more enriched, possibly reflecting the dietary shift. Samples of *S. camelus* from the overlying Upper Ndolanya Beds (~2.7-2.6 Ma) yielded isotopic signals consistent with the older *Struthio* sp. nov. material, indicating a reversion to earlier C<sub>3</sub> dominated diets. Relative to isotopic analyses of associated fossil mammalian herbivore taxa that retain overall uniform diets through the sequence, the eggshell data provide evidence of discrete dietary shifts in struthionids, which is linked to taxonomic and ecological change.

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