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^{13}C & ^{15}N isotope fractionations in *Stuthio camelus* eggshells: a tool for ecological and environnemental reconstructions

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Stable carbon and nitrogen isotopes analyses of bird's remains provide valuable information on the diets and the environments in which they live and trophic relationships within past and present ecosystems. This approach is useful where some isotopically distinct dietary sources are available to consumers. Therefore, analysis of tissues can track the relative contributions of each source to the diet. Stables isotopes analysis complement more conventional dietary approaches that include the evaluation of assimilated and not just ingested dietary contribution and an estimation of the time-integrated food. The period over which tissue isotopic concentrations will reflect the isotopic signature of a specific diet is function on the isotopic turnover rate in that tissue (Hubson & Clark, 1992a; 1992b). Isotopes ratios in shell protein and calcium carbonate of ostrich eggshells provide record of condition at the time of shell development in the breeding season. In this study we investigated isotopic fractionation between diet and organic/inorganic components of *Struthio camelus* eggshells raised in captivity on a large sample of eggs and we provide new estimations of isotopes fractionation between the eggshell organic matrix-diet, eggshell mineral matrix-diet and eggshell organic matrix-mineral matrix. The large data sets obtained during this experiment allow us to redefine some isotopic fractionation values for birds raised in captivity.

When the birds consumed exclusively pur-C3 diet, the difference between the δ^{13}C diet and the δ^{13}Corga of the shells is about +2-3‰Ḋuring this period, the difference between the δ^{13}C diet and the δ^{13}C mineral fraction is about 16-17‰Ṫhe isotopic enrichment between the organic and the mineral fraction is about 14.8 +/- 0.8‰Ḟor the δ^{15}N, the fractionation is about 2-3‰

During the experimental phase (with introduction of maize in the food, $\sim$40% in proportion) the isotope carbon values shift to more positive values. The change, in both organic and mineral fraction, is recorded in 4 days but the amplitude is different between the two fractions. In the organic phase the enrichment is about +3‰ whereas in the mineral phase the enrichment is about +6‰Ṫhe shift in the mineral phase is similar to those observed for the food. The isotopic enrichment between the organic and the mineral fraction is about 17.1 +/- 0.7‰ . For the δ^{15}N, the enrichment is less pronounced, of about 1,3‰

References:

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