Stable isotopic investigation of the feeding ecology of wild Bornean orangutans

ABSTRACT

Objectives We applied stable carbon and nitrogen isotope analyses to wild Bornean orangutans (*Pongo pygmaeus morio*) to investigate the feeding ecology of wild orangutans. Compared with African great ape species, orangutans are adapted to environments with chronic lower nutrition. But the usefulness of stable isotope analysis in the study of wild orangutan feeding ecology has not been fully explored. Methods The study site was a primary lowland dipterocarp forest in the Danum Valley, Sabah, Malaysia. A total of 164 plant and 94 fecal samples collected across 18 months were analyzed. Results Carbon and nitrogen stable isotope ratios of plant food samples do not systematically vary by plant parts (i.e., bark, fruits, and leaves). Elemental composition and stable isotope ratios of orangutan feces do not systematically vary by orangutans' sex and age classes, although fecal stable isotope ratios showed seasonal fluctuations. No isotopic contribution of breast milk was found in fecal samples collected from individuals at 2.7–6.5 years of age. Conclusions This study revealed key characteristics of the stable isotope ecology of wild orangutans living in a primary lowland forest. Although there was little isotopic variation among plant foods and orangutan individuals, seasonal fluctuations in baseline isotope ratios or orangutans' diet were found in Danum valley.