

THE ENERGETIC COSTS OF BEING A FLANGED PRIME MALE ORANGUTAN: INSIGHTS INTO THE EVOLUTION OF MALE BI-MATURISM

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It is well documented that in many species of fish, birds, reptiles and amphibians alternative male reproductive morphs exist. Although different reproductive strategies have been described for many male mammals, the existence of two truly distinct male reproductive morphs may be a unique mammalian feature of orangutans. One morph, "flanged" males, are twice the size of females and have well developed secondary sexual characteristics, whereas the other "unflanged" morph retains a smaller, sub-adult or female-like body size and lacks secondary sexual features. Both male morphs are sexually mature and have sired offspring in the wild and captivity. Here we use nine years of data on energetic variables to compare flanged and unflanged wild male orangutans (*Pongo pygmaeus wurmbii*) from Gunung Palung National Park, Indonesian Borneo. New data are presented on energy intake, energy expenditure, ranging patterns, and mating behavior in these two morphs. The physiological effects of these energetic and social behaviors is assessed through measurement of testosterone, C-peptide, and ketones from non-invasively collected urine samples. Data demonstrate the significantly higher cost of being a prime flanged male orangutan as well as the existence of a third class of adult male - the past prime flanged male. These data are used to propose a new explanation for how the energetic demands of being a prime flanged male orangutan, coupled with the distinctive features of the Southeast Asian rain forest and long female reproductive periods, selected for the flanged and unflanged morphological forms, with their differing reproductive strategies.

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