

## 餌の捕食から繁殖成功まで：アデリーペンギンの採餌行動と繁殖の関係を探る

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### **From individual prey capture to reproductive success: exploring the link between foraging behavior and reproduction in Adélie penguins**

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Understanding the mechanistic link among prey availability, foraging behaviour and reproductive output of predators is essential to monitoring and predicting their responses to environmental changes. Prey capture and foraging movement of predators would be important parameters to examine this link; however, few studies quantified the prey capture variability and examined its relationship with reproductive success in free-ranging marine predators. We examined the reproductive success, fine-scale movements, and prey capture rates of Adélie penguins at Hukuro Cove colony, in Lutzow-Holm Bay over three austral summers. Fine-scale movements of penguins were monitored with GPS-depth loggers, and prey capture rates were examined with head-only acceleration signals obtained from two accelerometers attached on the head and back of the birds. Reproductive success was low in 2010/11, intermediate in 2011/12, and relatively high in 2012/13 (0.2, 0.5 and 1.1 fledglings per nest, respectively). When combined with previous records over 5 summers, reproductive success was linearly and negatively related to annual average foraging trip durations ( $R^2 = 0.73$ ;  $n = 8$  years). Foraging trip duration increased with maximum distance reached from the colony during the trip in all three years, but trip duration was longer in 2010/11 than in 2012/13, after accounting for the effect of maximum distance. Prey capture rates at the dive-scale was low in 2010/11 and 2011/12 than in 2012/13. Average prey capture rates at the foraging trip scale did not differ between years, but the variation among individuals were highest in 2010/11. We suggest that variation, rather than average, of prey capture rates may have important consequence on reproductive success.