Detailed foraging behavior of Adélie penguins from Adélie Land, East Antarctica, revealed by video and accelerometry loggers

Kentaro Ito[1], Jean-Baptiste Thiebot[2], Thierry Raclot[3], Timothée Poupart[3], Yan Ropert-Coudert[4] and Akinori Takahashi[1,2]

[1]*Department of Polar Science, The Graduate University for Advanced Studies, Tokyo, Japan*

[2]*National Institute of Polar Research, Tokyo, Japan*

[3]*Institut Pluridisciplinaire Hubert Curien – Université de Strasbourg - CNRS Strasbourg France*

[4]*Centre d'études Biologiques de Chizé, Université de La Rochelle, CNRS Villiers-en-Bois, France*

Significant changes in environmental conditions within the Eastern Antarctic marine ecosystem are currently being observed. In addition to a shift in temperature, precipitation and wind regimes ashore, considerable modifications occur in sea-ice extent and seasonality. To investigate how these changes may affect top predators such as penguins through bottom-up processes, the detailed foraging behavior of free-ranging Adélie penguins were examined with bird-borne video loggers in addition to acceleration-depth-temperature loggers. The field study was conducted during the chick-brooding stage of the penguins breeding at Pointe Géologie archipelago, Adélie Land, from December 2014 to January 2015. We obtained 59 hours of video footage containing diving scene from 21 birds, of which 16 birds also had concomitant time-depth-acceleration records, and another 4 birds were tracked with GPS loggers. We obtained time-depth-acceleration records covering a full foraging trip from 11 birds, including 5534 dives (>1 m) in total. The general dive patterns were similar to what observed in this region previously: mean dive depth and duration were 29.1±30.7 m (median = 9.05 m, maximum = 110 m) and 72.2±52.2 s (median = 68.0 s, maximum = 197 s). During the feeding events underwater, the video footage revealed not only the number and timing of prey capture, but also what kind of prey the birds did capture during their dives. The prey species seen on the video are compared with the prey field known from previous diet studies carried out in this region. Moreover, as we observed other conspecific individuals on the footages, we discuss cooperative or agonistic behavior during foraging and traveling phases.