

Diving activity of Rhinoceros auklets during molt and winter periods

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Seabirds adjust their behavioural time budget in response to changes in food conditions during the breeding period, but less is known about their responses to conditions during the non-breeding period. Rhinoceros auklets (*Cerorinca monocerata*) on Teuri Island, Japan, migrate to Okhotsk Sea and Japan Sea after breeding, and molt their primary feathers in autumn. Their diving activities have been studied extensively during the chick-rearing period, but not during the non-breeding period. Here we recorded the depth and immersion of three rhinoceros auklets during the non-breeding period using leg-mounted geolocators with depth sensors. Depth and immersion data (recorded every two minutes) were used to infer daily dive and flight times as well as maximum dive depths. The auklets showed little flight time (<1 hr/day) for about 7 weeks from the mid-August in Okhotsk Sea, suggesting that they molted primary feathers during this period. During this presumed molt period, daily dive times were shorter and maximum dive depth tended to be shallower, suggesting that the molt of primary feathers slightly compromised their diving ability. Dives occurred mostly between sunrise and sunset, and were deeper during winter, when auklets were in Japan Sea. They increased daily dive time in winter, presumably to gain energy store for migratory flights and for the next breeding season before returning to their colony. Our results suggest that Rhinoceros auklets adjust their diving activity and behavioral time budget in response to molt and energy demanding pre-breeding period in winter.