THE DIET OF FUR SEALS (*ARCTOCEPHALUS TROPICALIS* AND *A. GAZELLA*) AT MARION ISLAND

by

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Dedication

This is dedicated to my parents, Ratshilumela Phanuel and Nyamutshagole for their love, support, encouragement and advices.

Abstract

The diet of the Subantarctic fur seal (*Arctocephalus tropicalis*) and Antarctic fur seal (*A. gazella*) were investigated at Marion Island from 1996-2000. Scats were examined and the extent of possible dietary overlap determined. No significant differences existed between their diets. Twenty-one species of fish were identified from sagittal otoliths in the scats with *A. gazella* having a slightly more diverse diet than *A. tropicalis* (20 versus 18 taxa), the two predators sharing 17 out of 21 taxa. The shared prey species contributed more than 99 % of the numerical abundance (NA) of fish prey. Otoliths of the mesopelagic Myctophidae (lantern fish) were by far the most numerous (98.1 % NA) hard prey components identified in the scats of the fur seals, with up to eight different prey species making up an individual scat. Fish from other families were rarely taken by *A. tropicalis* and *A. gazella*.

The *A. gazella* diet is comprised mainly of fish, crustaceans and cephalopods while fish and cephalopods were the only two taxa identified in the diet of *A. tropicalis*. Three myctophid species namely *Electrona carlsbergi, Gymnoscopelus fraseri* and *G. piabilis* accounted for 60 % NA of prey items in the diets. Minor differences in their diets were that *Champsocephalus gunnari* was utilised by *A. tropicalis* only while *Lepidonotothen larseni, Paranotothernia gracillis* and *P. magellanica* were eaten by *A. gazella*.

There were distinct seasonal variations in the utilization of some prey species. The utilization of *E. carlsbergi, E. subaspera, G. bolini* and *G. fraseri* by both *A. tropicalis* and *A. gazella* were higher in winter than in the early and late summer. During the winter season, *A. tropicalis* predominantly fed on *E. subaspera* (7.45 %), *G. fraseri* (22.17 %) and *G. piabilis* (26.56 %) whereas there was a 50 % decrease in the consumption of *G. piabilis* (23.39 %) by *A. gazella*,

with a concomitant increase in other major prey species. *Krefftichthys anderssoni* seemed were utilized more in summer by *A. tropicalis* and *A. gazella* (NA of 26.38 % and 14.88 % respectively).

The two fur seals fed on fish of more or less the same size over a wide size range. The length and the mass of fish consumed were similar, the fur seals feeding on both small species (*K. anderssoni* and *P. bolini*) as well as larger prey species (*G. nicholsi, G. piabilis* and *P. choriodon). Arctocephalus gazella* in particular preyed on large species such as *D. eleginoides*. All prey species appearing in the diet of *A. tropicalis* and *A. gazella* except *E. antarctica, G. fraseri, G. nicholsi, K. anderssoni,* and *P. choriodon* yielded non significant differences in size. *Arctocephalus gazella* ate significantly larger *E. antarctica* and *P. choriodon* while *A. tropicalis* took larger sized *G. fraseri, G. nicholsi* and *K. anderssoni*.

The total biomass of fish consumed by *A. tropicalis* and *A. gazella* were 1.9×10^5t and 1.1×10^4t respectively. Much less squid was consumed with *A. gazella* consuming a far larger amount (459.78 t) than *A. tropicalis* (367.79 t).

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