DIET OF SOUTHERN GIANT PETREL CHICKS IN ANTARCTICA: A DESCRIPTION OF NATURAL PREYS

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Abstract: *This study aims to describe the food resource of Southern Giant Petrel during the chick-rearing period in Antarctica. The study was conducted in Stinker Point, Elephant Island in the Austral Summer of 2012/2013. Samples were collected randomly from chicks by flushing methods. In the laboratory all the items were identified and the frequency of occurrence was calculated. We identified twelve different items in the diet of SGP chicks. The most frequent item was the remains of seabird species, followed by crustaceous and cephalopods. This study presents new ecological data on the species, since studies on Antarctic populations are scarce.*

Keywords: *Macronectes giganteus*, Elephant Island, Crustaceous, Stomach Content

Introduction

Seabirds spend most of the time at sea, except during the breeding period, when they migrate to their reproductive sites in land (Harrison, 1983). The Southern Giant Petrel (SGP) is a pelagic Procellariiform (Quintana *et al.*, 2005) and presents a circumpolar distribution in the Southern Hemisphere and Antarctic and sub-Antarctic regions (Harrison, 1983; Patterson *et al.*, 2008).

As most seabirds, SGP is a top predator and a marine environmental indicator. This species, like other seabirds, tend to respond quickly to environmental changes. Therefore it is important to study their diet and to evaluate the ecological process they are part of. Data of adults and chicks diet are reported for South American populations (Copello *et al.*, 2008; Copello *et al.*, 2011), however, information about Antarctic populations is scarce. Therefore, this study aims to describe the food resource of SGP during the chick-rearing period in Antarctica.

Materials and Methods

The study was conducted in Stinker Point, (61°13'20.5"S, 55°21'35"W), Elephant Island, between February and March 2013. A total of 30 samples were collected randomly from

chicks, however, only 26 samples were analyzed. All chicks were banded to avoid their recapture (Figure 1).

The samples were collected according to the flushing method (Copello *et al.*, 2008). In laboratory, samples were drained and the solid components were removed and identified. The frequency of occurrence was calculated based on the formula $FO = (Na \times 100) / Nta$; (FO = Frequency of occurrence; Na = the number of samples in which a particular item appeared; Nta = total number of samples).

Results

The SGP chicks diet analyzed showed several different types of preys. We identified twelve different items (Table 1) (Figure 2); the most frequent prey in the chick diet was the remains of other seabirds species ($FO = 92.3\%$) and the second was the two species of crustaceous ($FO = 53.84\%$). Cephalopods beaks (two lower and one upper beak) were identified as two species and correspond to a $FO = 7.69\%$.

Discussion

It was observed that in the Antarctic region, the main preys of SGP are other seabird species, mainly penguins, followed by invertebrates, such as crustaceous and

Figure 1. Southern Giant Petrel chick in Stinker Point, Elephant Island during the austral summer of 2012/2013. Photo: Elisa de Souza Petersen.

Table 1. Frequency occurrence of preys resource in chicks diet of SGP in Stinker Point between February and March 2013. (FO = Frequency of occurrence; Na = the number of samples in which a particular item appeared).

Groups	Na	FO (%)
Birds		92,30
NI*	23	88,46
Throat	1	3,84
Heart	4	15,38
Liver	1	3,84
Intestine	1	3,84
<i>Pygoscelis papua</i> Tongue	5	19,23
<i>Pygoscelis antarcticus</i> Tongue	11	42,30
Feathers	13	50,00
Crustaceous		53,84
<i>Bovallia gigantea</i>	11	42,30
<i>Pleoticus muelleri</i>	3	11,53
Cephalopod		7,69
<i>Chiroteuthis veranyi</i>	1	3,84
<i>Batoteuthis skolops</i>	1	3,84

* NI: Identification was not possible due to the advanced stage of digestion of the items.

cephalopods. The same pattern was observed in the sub-Antarctic region, where SGP is considered a scavenger feeding on seabirds and pinniped carcasses (Copello *et al.*, 2008). There are also registers of predation on eggs and on hatching chicks from other species (Warham, 1962; Le Bohec *et al.*, 2003). In Elephant Island, Chinstrap and Gentoo penguin colony areas are next to SGP breeding areas (Petry, 1994), facilitating the predation of these species. Penguin chicks are also the main prey of Skuas, another top predator seabird in Antarctic. These penguin chicks are a relevant source of energy to the chicks of predators (Young, 1994), as SGP, since we found a higher frequency of this item in the samples.

Besides penguins, the diet of Antarctic SGP chicks is also based on crustaceous and cephalopods, in a smaller proportion, as well as observed in South America (Quintana *et al.*, 2005; Copello *et al.*, 2008). The two crustaceous species identified, are known to be distributed in the South Atlantic Ocean. The two species of cephalopods are knowingly distributed in the Sub-Antarctic region. This information bears out the fact that SGP adults travel long

Figure 2. Items identified in the Southern Giant Petrel chicks' diet. (a) Represent a *Pygoscelis antarcticus* tongue, (b) Represent a *Pygoscelis papua* tongue, (c) *Pleoticus muelleri* and (d) *Bovallia gigantea*. Photos: Ana Lucia Bezerra.

distances during the breeding period in the search of food for their chicks. The same was observed by Petry & Krüger (2011), in a tracking study of individuals in Antarctica with geolocators. The invertebrate species were also identified in the diet of SGP breeding in South America and in other seabirds and marine mammals top predator's diet (Xavier & Cherel, 2009).

Conclusion

In this study it was possible to verify that SGPs diet in Antarctica is similar to the diet of other SGP populations breeding in different areas. It was also verified that SGP Antarctic individuals forage long distances seeking for food for their chicks. The data is relevant to studies on the

ecology of this region, since data on this species is scarce in Antarctica.

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