

The diet of Australasian gannets in New Zealand coastal waters: the use of DNA based analysis to characterise marine food webs



Photo credit

https://commons.wikimedia.org/wiki/File:Australasian_Gannet_in_flight,_from_below.jpg

An important part of understanding how ecosystems function, depends on identifying interactions between predators and their prey. Studies of the diet of top predators in food webs provide an important tool in this regard. Australasian gannets are one such seabird.

Substantial numbers breed on islands and mainland sites around the coast of northern New Zealand. During this period, adults make regular foraging trips from land based colonies to coastal waters to collect food for chicks. Birds returning with full crops to feed chicks can be easily induced to regurgitate and the food items collected by the action of catching and holding the bird over an appropriate container. The diet of gannets can then be described by identifying the relatively undigested items directly or in the case of more digested items using more digestive resistant body parts such as fish ear bones and squid beaks. A range of new approaches relying on the extraction and analyses of remnant DNA from prey eaten by predators have been and are being developed. This remnant DNA maybe recovered from digested stomach contents or the faeces of the predator. This study will compare the results of diet analyses based on the traditional method of analysing the contents of regurgitations and these new molecular approaches. Importantly the study will also investigate whether we can detect and identify remnant DNA from marine organisms eaten by the fish and squid prey of gannets. This will allow the description of the food web, on which gannets depend, at multiple levels in a way not possible using traditional analyses. Subject to this validation we will then use these molecular based techniques to explore whether there maybe differences between birds of different status (for example between male and females) reflecting more subtle partitioning of food resources.

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