31 August 2016

Hector’s dolphin research update

Toxoplasma in the marine environment

Hector’s dolphin necropsy study
Results of the ongoing necropsy research were last presented at the MRAG meeting on 2 November 2015. At this point, fatal toxoplasmosis had been diagnosed in 8/95 (8.3%) of dolphins examined since 2001, and latent infections (i.e. presence of the organism but no active disease) in 25/88 (28.4%). Since the last reported fatal case in September 2015, only one Hector’s dolphin has been submitted for necropsy. This animal was moderately decomposed, meaning that full analysis was not possible, but there were no obvious indications of toxoplasmosis.

Opportunistic study – other dolphin species
Molecular (PCR) and immunohistochemical testing has been conducted on tissues from 34 common dolphins, 7 dusky dolphins and 2 striped dolphins, all recovered from the Hauraki Gulf area. None were positive on either immunohistochemistry or PCR analysis. However, since the preservation methods used for these tissues can cause destruction of DNA, it is impossible to be sure that these are true negatives. Further investigation for toxoplasmosis in non-Hector’s dolphin species would be useful but would require changes to be made in sample processing protocols.

Toxoplasma in the marine environment – risk factor analysis
This study is one component of a 3-4 year PhD project currently underway (student - Alicia Coupe). We are using greenshell mussels collected bi-monthly from two key coastal sites (Port Waikato and Raglan) as bio-indicators of environmental contamination by infectious toxoplasma oocysts. Alicia has been working on the development of a sensitive, specific and economical molecular assay for detection of oocysts in haemolymph (mussel blood). To date we have collected over 2,000 haemolymph over a 2 year period. In the next phase of her study Alicia will run her assay on these samples to determine prevalence at each sampling point. These data will then be modelled against potential risk factors (for example rainfall, geographical features, proximity to urban or feral cat populations) to look for associations.
Final results are not expected to be available until towards the end of her PhD candidature (scheduled thesis completion date is February 2019).

**Other pathogens – *Brucella sp.***

Brucellosis is a well-known disease in terrestrial species, causing a variety of syndromes including reproductive disease (e.g. stillbirth, infertility, uterine and testicular infections). In the past few decades several new *Brucella* species have been described in marine mammals. We have tested 24 Hector’s and 3 Maui dolphins that were submitted for necropsy between November 2006 and October 2010. Two of these dolphins (7%) had active brucellosis: one was a stillborn Maui and one was a pregnant female Hectors. Five others (all Hector’s) had asymptomatic infections (i.e. their tissues were positive for the presence of *Brucella* DNA but they did not have active disease.)

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