



Poster code : ANA-PATH-11

Bite injuries of grey seals on harbour porpoises: the DNA proof

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Bite-like skin lacerations on harbour porpoises (*Phocoena phocoena*) have been suspected to be caused by the predation by grey seals (*Halichoerus grypus*). The bite injuries observed had two aspects: large flaps of skin and blubber missing with frayed edges, and pinhole lesions. Both lesions had been unequivocally inflicted antemortem, as judged from their hemorrhagic nature. Nevertheless, the grey seal predation was not definitively demonstrated. Stranded dead porpoises with bite-like skin injuries were selected and sampled for genetic investigations. Samples of both bite-like injury lesions have been swabbed and frozen (-20°C). In addition, head of a recently dead grey seal was used to mimic bite-like skin injuries on a porpoise carcass. Subsequently, the artificial skin injuries were swabbed too, along with the gum of the seal used for inflicting them. (positive controls). Total DNA was extracted from the swabs and was used to retrieve a fragment of mitochondrial DNA by PCR. Primers were designed to amplify a specific stretch of mitochondrial DNA known to differ between grey seals (249 bp) and porpoises (224 bp). The amplicon targeted was successfully amplified from all samples and then sequenced. The grey seal-specific mitochondrial DNA was retrieved from all swabs i.e. from the gums and mimicked skin injuries (positive controls) and from the suspected lesions. We conclude (1) that it is possible to detect grey seal DNA from dead porpoises even after several days in seawater and (2) that bite-like skin lesions found on dead porpoises in our context result definitively from grey seals attacks. The cause of such attacks remains unclear, likely linked with predation, although aggressive behaviour cannot be excluded.