



Interfollicular fibrosis and organohalogenes in the thyroid of the harbour porpoises from the British and Belgian coasts

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INTRODUCTION

Previous studies have described high levels of polychlorobiphenyls (PCB), p,p'-dichlorodiphenyl-dichlorethen (DDT), p,p'-dichlorodiphenyl-trichlorethan (DDE) and polybrominated diphenylether (PBDE) in the blubber of the harbour porpoise (*Phocoena phocoena*) from the North Sea raising the question of a potential endocrine disruption in this species.



Fig. 1: Harbour porpoise (*Phocoena phocoena*)

MATERIELS AND METHODS

In the present study, the thyroids of 36 harbour porpoises from the British and the Belgian coast have been collected for histological and immunohistological investigations. The number and mean diameter of follicles and the relative distribution of follicular, connective and vascular tissues (%) were quantified in the thyroid of each individual. Then, the relationship between the thyroid morphometry data and previously described organic compounds (namely PCB, DDT, DDE and PBDE) was investigated using factor analysis and multiple regressions. The results of this work were compared to the previous study of harbour porpoises from the German (North and Baltic Seas), Norwegian and Icelandic coasts. Thyroid morphology was similar between the harbour porpoises from the British and Belgian coast.

RESULTS AND DISCUSSION

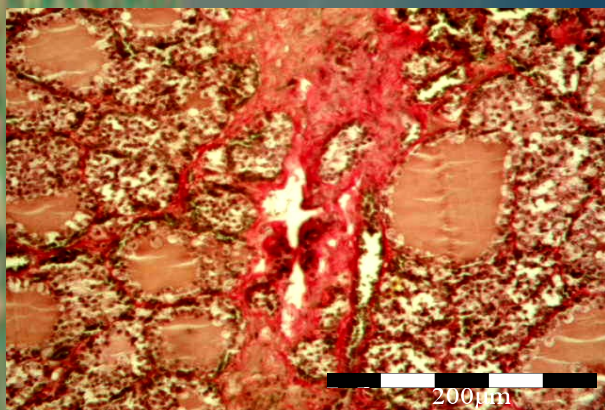


Fig. 2: *Elastica Van Gieson* stained section of the thyroid showing a severe interfollicular fibrosis

• The thyroids differed strongly between sampling sites (Fig. 3). Porpoises from the German (North and Baltic Seas) and Norwegian coasts displayed a high percentage of connective tissue revealing severe inter-follicular fibrosis (Fig. 2). The thyroids of Icelandic coasts displayed only a light inter-follicular fibrosis. The thyroids of the porpoises from the British and Belgian coasts occupied an intermediary place with a moderate fibrosis.

• A relation between mean diameter of follicles and the body size and mass suggesting a downward trend of activity of the thyroid with increasing body size and mass and thus, the age of the porpoises.

• A correlation-based principal component analysis (PCA) revealed one principal components explaining 69% of the total variance. The variables PCB, PBDE, DDT, and DDE compounds loaded highest on PC1. Our results pointed out a relationship between these pollutants (PC1) and interfollicular fibrosis in the thyroids of harbour porpoises from the German coast of the Baltic Sea (Fig. 4).

CONCLUSION

The present report supports the hypothesis of a contaminant-induced thyroid fibrosis in harbour porpoises raising the question of the long term-viability in highly polluted areas.

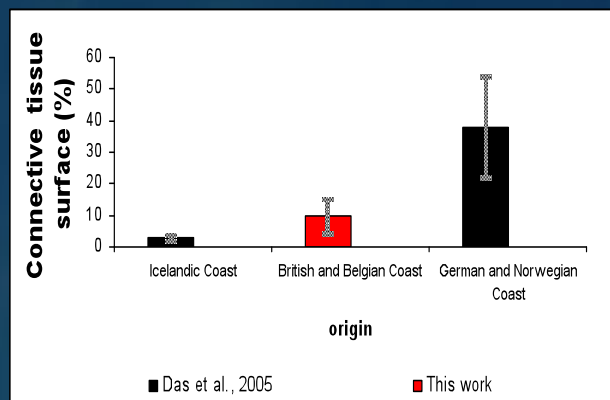


Fig. 3: Surface occupied by connective tissue in thyroids of harbour porpoises from different regions

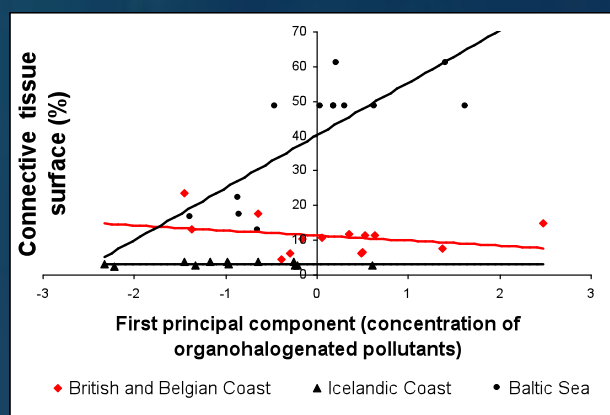


Fig. 4: Correlation between the concentration of organohalogenated pollutants and the surface occupied by connective tissue in thyroids of harbour porpoises from different regions

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Reference: Das et al., 2005; Archives of Environmental Contamination and Toxicology, In Press

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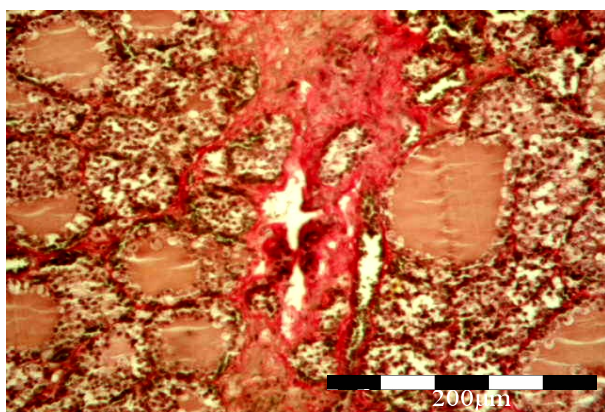


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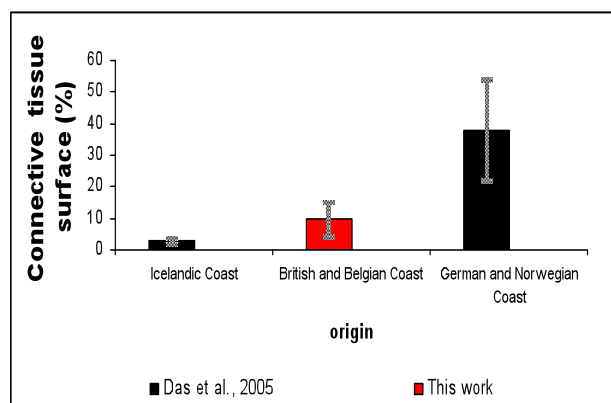


Fig. 3: Surface occupied by connective tissue in thyroids of harbour porpoises from different regions

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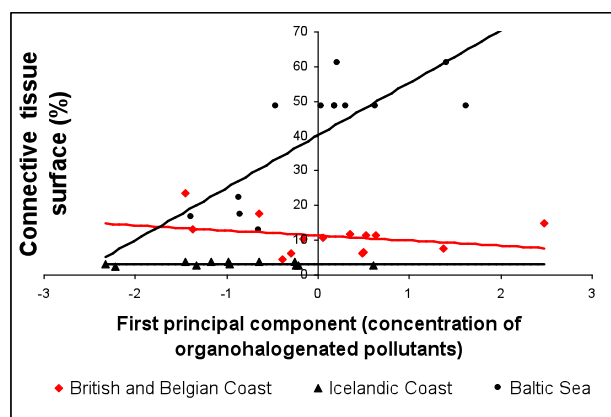


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