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Studies on the nematode parasites of Atlantic salmon and related species from other hosts*

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*Detailed results of this investigation have been submitted for publication in the Journal of the Fisheries Research Board of Canada (1970).

Summary

1) *Anisakis* sp. larvae were examined from Atlantic salmon, cod and herring; *Contracaecum* sp. larva I and adult *C. aduncum* were examined from salmon; *Contracaecum* sp. larva II and *Porrocaecum* sp. larvae were examined from cod, and *P. decipiens* and *C. osculatum* were examined from grey seals.

2) Larvae and adults of the nematode genera *Anisakis*, *Contracaecum* and *Porrocaecum* could be easily distinguished by employing starch gel electrophoresis and subsequent staining for esterases, peroxidases and Amido Black proteins.

3) Sex and ontogeny correlated variations could not be found in any of the protein systems examined.

4) Previously unidentifiable *Porrocaecum* and *Contracaecum* larvae from the musculature of Atlantic cod could be positively identified as *P. decipiens* and *C. osculatum* by comparing zymograms with those of the adult forms from grey seals.

5) Esterase and Amido Black electropherograms in adult *Contracaecum aduncum* were distinctly different from those of *C. osculatum*. These proteins are evidently species specific.

6) *Contracaecum* larvae could be identified as *C. aduncum*, adults of which were found in the same host.

7) Two polymorphisms in *Anisakis* enzymes (esterases and acid phosphatases) are evidently controlled by six and four alleles, respectively.

8) Identity of zymograms of *Anisakis* larvae from Atlantic salmon, cod and herring indicates that only one species is represented in these hosts throughout the north Atlantic. However, gene frequency differences among *Anisakis* in salmon and herring indicate that either (1) each host species harbours different breeding populations of *Anisakis*, or (2) there are different selection pressures at the fish host level.

9) Comparisons of zymograms suggest that *Anisakis* and *Porrocaecum* are more closely related to one another than either of them to *Contracaecum*. These results agree with a hypothesis founded on morphological grounds.

10) Inhibition studies of the esterases indicated the dominance of choline esterases with only one band in *Anisakis* and *Contracaecum* belonging to another sub-class, the arylesterases.

11) The high peroxidase activity in haemoglobin indicated the presence of unconverted cod haemoglobin in the guts of most *Porrocaecum* (from cod fillets). Despite freezing the three possible haemoglobin patterns found in cod seemed completely unaltered when sampled from *Porrocaecum* guts. This indicates the possibility of an indirect approach to population studies on cod.