

## Morphological Comparison of Organs in Several Species of Lampreys on the West Coast of Canada

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There are several species of lampreys on the West Coast of Canada but the phylogenetic and "pairing" relationships of these species are not clear. Identification has been made on the basis of specific features and morphometric determination of external characters. The morphology of internal organs, such as the liver, the alimentary canal, the kidneys (pronephros and opisthonephros), and gills can often provide insight into the feeding habits and osmoregulatory ability of most fish species, including lampreys. In an attempt at further identity of species of West Coast lampreys, the above organs, as well as the thyroid and pancreas, were prepared for light microscope observation in adults of the following species: *Lampetra ayresi* Günther, *Lampetra macrostoma* Beamish, *Lampetra* sp., *Lampetra richardsoni* Vladykov et Follett, and *Lampetra tridentata* Richardson. For the most part, recently-metamorphosed young adults (juveniles) were used for the study. Where possible, both freshwater and saltwater animals were examined in anadromous species and feeding was attempted in those species believed to be parasitic in the wild.

*L. richardsoni* is a nonparasitic species incapable of saltwater osmoregulation and this is reflected in poorly developed opisthonephric kidneys and limited number of folds along the entire length of the alimentary canal. An unusual transformation of the notochord was noted during the spawning migration. *L. ayresi*, *L. macrostoma*, and *L. tridentata* have features which indicate their parasitic feeding habits but they differ slightly in the structure of their opisthonephric kidneys and alimentary canal, the degree of regression of the larval pronephroi and opisthonephroi, and in the size and topography of their pancreatic tissue and thyroid gland. Differences in intestinal content also reflect varying methods of obtaining food. The results support their taxonomic designation as separate species but also indicate some basic similarities. *Lampetra* sp. is a freshwater species capable of feeding in the laboratory. Sexual maturation is concomitant with adult feeding and retention of some features of metamorphic transformation, and thus making this an unusual lamprey species. Further morphological information of internal organs of *Lampetra* sp. may provide useful information on the evolution and relationship of parasitic and nonparasitic species of lampreys.

Supported by the Natural Sciences and Engineering Research Council of Canada and Fisheries and Oceans of Canada grants.

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## PART II CHONDRICHTHYES

### Reproductive Strategies in Lamnoid Sharks

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The rarity of capture, large size or remote habitat of lamnoid sharks has necessarily limited detailed study of their reproductive biology. The most accessible, easily captured and maintained species, *Odontaspis taurus*, has received the most detailed study. Therefore, *O. taurus* has remained the comparative model for the periodic revelations in reproductive anatomy and embryonic development discovered in other lamnoid species. *Odontaspis taurus* is ovoviviparous, bearing only two embryophagous, oophagous embryos, one in each uterus. Intrauterine development in this species can be divided into seven major periods based on gestation time, embryonic anatomy, posture, activity and nutrition.

Similarity to reproduction in *O. taurus* can be seen in lamnids, alopiids and *Pseudocarcharias*