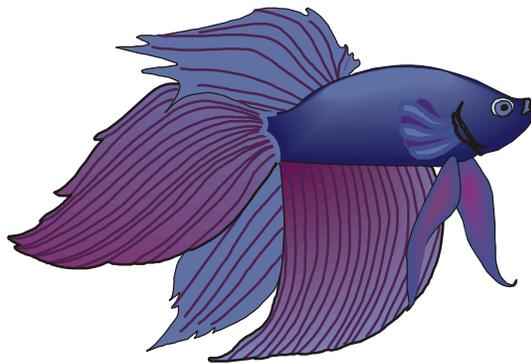


Nitrogen Production and Excretion in Fish

David J. Randall
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International Congress on the Biology of Fish
Towson University, Baltimore MD July 26-30, 1998

***Nitrogen Production and
Excretion in Fish***

SYMPOSIUM PROCEEDINGS

Dave Randall

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PREFACE

Teleosts are the major vertebrate group with between 20,000 and 30,000 species representing about 50 to 60% of all vertebrate species. Vertebrate movement onto land is a relatively recent event and much of the basic design of vertebrates was probably established in the aquatic environment. The broad generalization that aquatic vertebrates are ammonotelic, whereas terrestrial vertebrates are ureotelic, has obscured the fact that most mechanisms of nitrogen excretion are found in all vertebrate classes and that these mechanisms probably evolved in vertebrate aquatic ancestors. Teleosts and present day land vertebrates have diverged considerably from the ancestral aquatic vertebrate stock, but comparative studies of all vertebrates may elucidate basic patterns in nitrogen excretion in vertebrates.

Ammonia is continually produced by all vertebrates but cannot be accumulated in the body because it is toxic. Ammonia must, therefore, be excreted or converted to some other less toxic compound. Fish have evolved a wide variety of mechanisms to avoid ammonia toxicity, the symposium on NITROGEN PRODUCTION AND EXCRETION IN FISH describes and discusses many of these mechanisms. There is also some discussion of the sub-lethal toxic action of ammonia. In addition there is a review of ammonia transport in the mammalian nephron, with discussion of some recent developments in that field.

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Don MacKinlay
Congress Chair

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