

***Biology and
Management of
Burbot***

SYMPOSIUM PROCEEDINGS

Vaughn L. Paragamian

Don D. MacKinlay

*International Congress on the Biology of Fish
Towson University, Baltimore MD July 27-30, 1998.*

Copyright © 1998
Physiology Section,
American Fisheries Society
All rights reserved

International Standard Book Number (ISBN) 1-894337-00-X

Notice

This publication is made up of a combination of extended abstracts and full papers, submitted by the authors without peer review. The papers in this volume should not be cited as primary literature. The Physiology Section of the American Fisheries Society offers this compilation of papers in the interests of information exchange only, and makes no claim as to the validity of the conclusions or recommendations presented in the papers.

For extra copies of this Symposium, or the other 20 Symposia in the Congress series, contact:

Don MacKinlay, SEP DFO, 555 West Hastings St.,
Vancouver BC V6B 5G3 Canada
Phone: 604-666-3520 Fax 604-666-6894
E-mail: mackinlayd@pac.dfo-mpo.gc.ca

Website: www.fishbiologycongress.org

PREFACE

The burbot is an ancient and mysterious species of north temperate fish with a unique life history that has made it particularly vulnerable to man's infringements on its habitats. The burbot is a species with many vernacular names; freshwater cod, ellpout, lawyer, ling, cusk, lush, mud blower, and some names better left unprinted. It is an efficient piscivore by night that has made it the top predator of many of its environs. The species is highly esteemed in some waters, not for its gamy fight at the end of a line, but for its lobster like taste at the end of a fork. Yet in many angling circles it is greatly disdained and considered a "trash fish". It is also one of the most poorly understood fish, and its place in fish management schemes is usually ignored. In this Symposium we have assembled the world's experts to discuss the biology and management of this species, not only to improve our knowledge and understanding but to promote better management of this freshwater cod. The topics of the Symposium include; Distribution and Stock Identification, Physiology, Biology and Behavior, and Management and Conservation.

Vaughn L. Paragamian
Idaho Dept. Fish & Game

Don D. MacKinlay
Salmonid Enhancement Program
Fisheries and Oceans Canada

CONGRESS ACKNOWLEDGEMENTS

This Symposium is part of the International Congress on the Biology of Fish, whose main sponsors were Fisheries and Oceans Canada (DFO), and Towson University. The main organizers of the Congress, on behalf of the Physiology and Fish Culture Sections of the American Fisheries Society, were Don MacKinlay of DFO (overall chair, program and proceedings), Karin Howard (registration and accommodations) and Jay Nelson of Towson University (local arrangements). I would like to extend a sincere 'thank you' to the many contributors who took the time to prepare a written submission for these proceedings. Your efforts are very much appreciated.

Don MacKinlay
Congress Chair

TABLE OF CONTENTS

Genetic characteristics of burbot in the Kootenai River drainage of Montana, Idaho and British Columbia. <i>Powell, M.S., V.L. Paragamian & J.C. Faler</i>	1
Occurrence of burbot (<i>Lota lota</i>) larvae in relation to pH. <i>Urho, L., J. Lappalainen, J. Kjellman & R. Hudd</i>	5
Gastric evacuation rate of burbot fed single-fish meals at different temperatures. <i>Paakkonen, J.-P.J. & T.J. Marjomaki</i>	11
Characteristics of a tributary-spawning population of burbot from Columbia Lake, British Columbia. <i>Arndt, S.K.A. & J. Hutchinson</i>	15
Burbot larval evidence for more than one North American species? <i>Snyder, D.E.</i>	21
Larval bottlenecks in oligotrophic fish. <i>Carl, L.M.</i>	35
Oxygen consumption of burbot (<i>Lota lota</i>) fed different rations of vendace (<i>Coregonus albula</i>). <i>Paakkonen, J.-P.J. & T. Lyytidainen</i>	47
Bad matching between hatching and acidification; a pitfall for the coastal burbot <i>Lota lota</i> L., of the River Kyrönjoki. <i>Hudd, R. & J. Kjellman</i>	51
Ecology of burbot in western Lake Superior. <i>Schram, S.T., T.N. Halpern & T.B. Johnson</i>	55
Feeding of burbot (<i>Lota lota</i> (L.)) at different temperatures. <i>Paakkonen, J.-P.J. & T.J. Marjomaki</i>	69
Sonic tracking of burbot in Lake Opeongo, Ontario. <i>Carl, L.M.</i>	73
The status of recreational fisheries for burbot in the United States. <i>Quinn, S.</i>	77

Burbot management: population condition and size structure assessment tools and their application. <i>Fisher, S.J.</i>	91
Thermal acclimation capacity of the burbot (<i>Lota lota</i> , L.) from Montenegro. <i>Nikcevic, M., A. Hegedish, B. Mickovic & R.K. Andjus</i>	97
Collapse of burbot fisheries in Kootenay Lake, British Columbia and the Kootenai River, Idaho. <i>Paragamian, V.L., J. Hammond & H. Andrusak</i>	103
The effects of variable flows and temperature on burbot spawning migrations in the Kootenai River, Idaho, USA, and Kootenay Lake, British Columbia, Canada, post Libby Dam. <i>Paragamian, V.L.</i>	121
Effects of compensatory growth on a burbot population. <i>Kjellman, J. & R.Hudd</i>	141
Can burbot help lake trout battle sea lamprey. <i>Swink, W.</i>	147