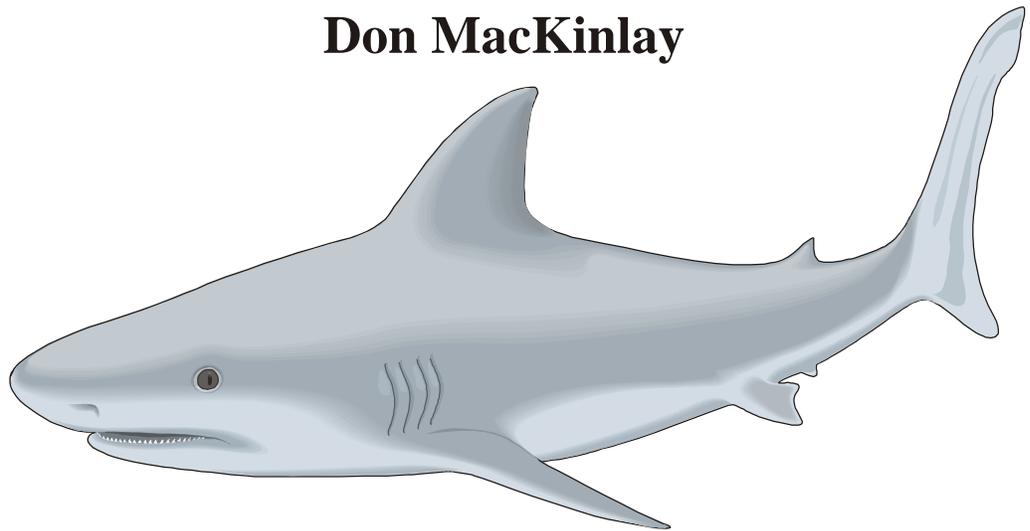


Stress in Fish

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

Stress in Fish

SYMPOSIUM PROCEEDINGS

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International Congress on the Biology of Fish

Towson University, Baltimore MD July 27-30, 1998.

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International Standard Book Number (ISBN)1-89433709-3

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PREFACE

In both the natural and aquaculture environments, fish are subjected to stimuli that can have profound negative effects on their health, reproduction, growth and survival. These stressors can induce a range of biological effects in fish, from rapid molecular and biochemical responses (e.g., heat shock proteins, hormonal changes) to long term organismic and population changes (e.g., immune and reproductive dysfunction). Fundamental research on stress

physiology has been indispensable in efforts to enhance fish health and well-being. Fisheries managers, for example, have been able to identify early signs of environmental deterioration by measuring changes in specific physiological endpoints in resident fish populations. Aquaculturists have developed improved, low-stress management practices by documenting the physiological responses of fish to alternative culture methods, and are creating improved strains of fish by selecting and breeding stress-resistant individuals.

The development of an integrated understanding of the complex biological phenomenon of stress in fish, and the overall advancement of the field, and will require a multi-disciplinary, multi-species approach. The present symposium, which brings together basic and applied researchers studying a diverse phylogenetic range of species, was organized as a step towards achieving this objective. The 17 papers comprising this symposium cover the entire range of biological organization from molecules to ecosystems, and include work on species from chondrosteans to advanced percids. Following the first paper which presents a theoretical overview of stress in fish, the papers were loosely organized according to the level of biological organization as follows: (1) molecular biology, biochemistry and cell biology, (2) endocrinology and physiology, and (3) population biology and ecology. Considerable overlap exists among these topics, however, reflecting the current move towards multidisciplinary research on stress in fish.

We wish to sincerely thank all of the investigators who contributed to this symposium, and hope that your participation will encourage you to pursue new collaborations and lines of research. We also hope that the research reported here will inspire other scientists to begin pursuing some of the many intriguing questions that remain to be answered about stress in fish.

Symposium Organizers:

Terence Barry	Bruce Barton	Don MacKinlay
Univ. of Wisconsin	Univ. of South Dakota	Fisheries Canada

CONGRESS ACKNOWLEDGEMENTS

This Symposium is part of the International Congress on the Biology of Fishes, 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

Stress: Pain at a safe distance? <i>Kelsch, S.W. & W.H. Neill</i>	1
Heat shock proteins and physiological stress in fish. <i>Iwama, G., M. Vijayan, C. F. Mazur & P.A. Ackerman</i>	7
The heat-shock protein response in Atlantic salmon (<i>Salmo salar</i>) branchial tissue. <i>Smith, T.R., G.C.Tremblay & T.M.Bradley</i>	9
Responses of pituitary hormones to stress in the gilthead sea bream <i>Sparus aurata</i> . <i>Tort, L., J. Rotllant, J. Perez, S.E. Wendelaar-Bonga</i> & <i>P. Balm</i>	13
Physiological stress responses in juvenile chondrosteian fishes - differences from teleosts. <i>Barton, B.A., H. Bollig, A.B. Rahn & B.L. Hauskins</i>	17
Acute stress response in triploid brook trout (<i>Salvelinus fontinalis</i>). <i>Benfey, T.J., M. Biron, K. MacLeod, L.E. McCabe,</i> <i>E.J. Stillwell & R.A. O'Keefe</i>	21
Sex steroid regulation of cortisol in rainbow trout. <i>Barry, T.P., M.R. Garcia-Abiado, J. Riebe, R. Bhat,</i> <i>B.Erskine, E. Vandeloise & J.A. Malison</i>	25
Effects of ram-air ventilation during transportation on water quality and physiology of walleye fingerlings. <i>Forsberg, J.A., B.A.Barton & R.C.Summerfelt</i>	31
The effect prolonged swimming, fasting, and predator presence on energy utilization and chronic stress in juvenile walleye (<i>Stizostedion vitreum</i>). <i>Czesny, S., J. Rinchar, M.A. Abiado, S. Kolkovski</i> & <i>K. Dabrowski</i>	37
The role of cortisol in regulation of glycogen metabolism in white muscle of Rainbow trout. <i>Milligan, C.L. & C. Johnson</i>	43

Effects of exogenous cortisol on ion regulation in developing larvae of tilapia (<i>Oreochromis mossambicus</i>). <i>Lin, G., J. Wang and P. Hwang</i>	49
Effects of cortisol on water balance in developing larvae of tilapia (<i>Oreochromis mossambicus</i>). <i>Lin, L., C.Weng & P.Hwang</i>	53
Changes in taurine plasma and tissue concentrations during periods of osmotic stress in the euryhaline tilapia, <i>Oreochromis mossambicus</i> . <i>Graham, C.R., N.H. Richman, S.K. Shimoda & E.G. Grau</i>	57
Blood chemistry and performance indices for juvenile chinook salmon and steelhead descaled experimentally and during passage through fish bypasses at dams on the Snake River, WA. <i>Congleton, J.L., W.J. LaVoie, C.B. Schreck, L.E. Davis, M.S. Fitzpatrick & D.G. Elliot</i>	71
Forest harvesting increases stream temperature: potential impacts on juvenile chinook? <i>Shrimpton, J.M., J.F. Bourgeois, J.T. Quigley & D.M. Blouw</i>	77
Physiological indicators of stress among fishes exposed to contaminated sediments from Lake Champlain. <i>Facey, D.E., C.Leclerc, D.Dunbar, D.Arruda & V.S. Blazer</i>	83
Interspecific hybridization and recovery from ecological stress. <i>Evans, R.P., L. Tao & D. Shiozawa</i>	89