

EVALUATION OF THE CAPACITY FOR COMPENSATORY GROWTH IN
JUVENILE BLACK SEA BASS (*Centropristis striata*) AND SOUTHERN FLOUNDER
(*Paralichthys lethostigma*)

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A Thesis Submitted to the
University of North Carolina at Wilmington in Partial Fulfillment
Of the Requirements for the Degree of
Master of Science

Center for Marine Science

University of North Carolina at Wilmington

2003

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ABSTRACT

Compensatory growth (CG) refers to the ability of individuals to accelerate growth rate following periods of nutritional deprivation. This study examined the use of cyclical feeding regimes to elicit CG in two marine fishes with different life histories: black sea bass (*Centropristis striata*) and southern flounder (*Paralichthys lethostigma*). During Phase I, 60 juveniles of each species were divided equally into 3 cyclical feeding treatments and one control group (unlimited ration). There also was a group control for each species to test for any differences between the group held and the individually held controls. Treatment groups were starved for either 2, 5 or 8 days, refed until consumption rates returned to control levels, and then starved again. During Phase I, treatments were examined for their ability to elicit CG after at least 3 feed/no feed cycles. During Phase II, deprived treatments were returned to unlimited ration and monitored for additional compensation relative to controls. The duration of the experiments was 73 days for black sea bass and 61 days for southern flounder. Analyses indicate that capacity for CG is minimal in both species. Following Phase I, controls were larger than deprived treatments for both species, suggesting that cyclical feeding regimes did not elicit a strong compensatory response. Although cyclical feeding produced a hyperphagic response in both species, the duration of hyperphagia was short (~1-2 days) and insufficient to support CG. Furthermore, treatment groups did not increase growth efficiencies relative to controls during Phase I. During Phase II, D5 and D8 treatments displayed partial compensation as evidenced by increased weight-specific feeding rate (WSFR), growth rate (G) and gross growth efficiency (K_1); however, control fish maintained a distinct size advantage. Proximate composition analysis (non-polar lipids,

protein, AFDW) reveal different patterns of energy allocation in these species, with the black sea bass showing higher lipid content and lower water content compared to the southern flounder. Results are discussed in light of competing hypotheses regarding the fitness consequences of compensatory growth. Limited hyperphagic responses and lack of full compensation may be due to constraints on digestion rate, or decreased fitness associated with maximal growth rates.

ACKNOWLEDGEMENTS

I would like to acknowledge the United States Environmental Protection Agency for supporting this study through the Science to Achieve Results graduate research fellowship program. I would also like to thank the University of North Carolina at Wilmington Department of Biological Sciences for supporting me with a teaching assistantship during my first semester, and the Graduate School for awarding me a New Scholars Award upon my admission into the Master of Science in Marine Science program.

Through the course of my tenure, Dr. Thomas E. Lankford, Jr. has been an invaluable source of help and support for this study, and has also served as a mentor as well as my major advisor. I've learned a lot from him and owe him many thanks! Thank you to my other committee members: Dr. Pam Seaton, Dr. Wade Watanabe and Dr. Eric Schultz, who have all been wonderful to work with. Dr. Joan Willey has also been a great source of support during my time as a graduate student and I thank her for all her help. The administrative staffs at the Center for Marine Science and in the Office of Sponsored Programs have helped me numerous times, and also deserve a well-earned thank you. Rob Deans, Ron Moore, and Roger Keeter also need to be thanked for their diligence and dependability for keeping the wet lab running while my experiments were in progress. Last, but certainly not least, thanks to all my friends in Wilmington for their support!

DEDICATION

This thesis is for my family, whose unconditional love and encouragement have made it possible for me to come this far in life.

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