

Growth and Development of Domestic Juvenile Nassau Groupers

JOHN W. TUCKER, JR. and PETER C. WOODWARD
Harbor Branch Oceanographic Institution
5600 Old Dixie Highway
Fort Pierce, FL 34946

ABSTRACT

Nassau groupers (*Epinephelus striatus*) were reared from eggs. The planktonic larvae began transforming into juveniles and orienting to solid surfaces 42 days after hatching (dah); some had finished by 46 dah and all by 70 dah. At 98 dah, total lengths were in the range 49-95 mm and weights 1.7-12.8 g (mean 6.0 g). At 243 dah, total lengths were in the range 81-203 mm and weights 7.0-143.1 g (mean 52.3 g). Survival during 98-243 dah was 97% (109/112).

KEYWORDS: *Epinephelus striatus*, fish culture, Nassau grouper, Serranidae.

INTRODUCTION

Tucker *et al.* (in press) first induced ovulation in Nassau groupers at Grand Cayman during the 1987 spawning season. Since then we have worked to refine spawning methods and to determine suitable conditions and diets for rearing Nassau groupers to market size and beyond. This progress report describes rearing of larvae and juveniles.

METHODS

Eggs were obtained at Grand Cayman from wild females that had been induced to ovulate with two injections of human chorionic gonadotropin (Tucker *et al.*, in press). Eggs were incubated and fish reared at HBOI in 3,500-L circular, black fiberglass tanks containing filtered salt water from the Indian River. For eggs and larvae, temperature and salinity ranges were 23-28°C and 28-35‰; for juveniles, 26-32°C and 18-37‰. Larvae were fed rotifers (*Brachionus plicatilis*), *Artemia* sp. from nauplii up to 5 days after hatching (dah), minced penaeid shrimp, an experimental grouper starter feed, and an experimental grouper production feed. Rotifers and one to five-day-old *Artemia* were fed *Nannochloropsis oculata* and Tahitian *Isochrysis* sp. Two hours before giving them to the fish, rotifers and one to five-day-old *Artemia* were enriched with a microencapsulated diet and a yeast/algae based rotifer food. Starter pellets were offered to the fish once a day during 42-60 dah; they were given to the fish twice a day during 61-66 dah and once a day during 67-97 dah. At 98 dah, the fish were measured and weighed. They were then sorted by size into four tanks, fed the production diet once a day for 145 d, and measured and weighed again.

RESULTS AND DISCUSSION

The larval period was long (Table 1), but might have been shortened by providing more cover in the tanks or different foods. Larvae were planktonic until 42 dah, when they began orienting to the tank walls and bottoms. They grew faster than those of several other species (Leis, 1987). Transformation of all fish to the juvenile stage occurred during 46-70 dah, with individuals making the change in less than a week. Weaning was accomplished during 56-61 dah (Table 2). Growth and feed conversion were good (Table 3). At 98 dah, total lengths were in the range 49-95 mm and weights 1.7-12.8 g (mean 6.0 g). During the 145-day growth trial, lengths increased to 81-203 mm and weights to 7.0-143.1 g (mean 52.3 g); three of the smallest fish died soon after the trial began, leaving 109 of 112 surviving.

Table 1. Development of Nassau grouper.

EVENT	AGE (dah)	TOTAL LENGTH (mm)
Hatched	0	1.8
First fed	2.5	2.5
Exhausted yolk and oil	5	3
First ate Artemia nauplii	11	5
Transformed	46-70	35-50
First ate dry feed	56-59	40-60

Table 2. Feeding schedule for Nassau groupers.

AGE (dah)	TOTAL LENGTH (mm)	FOOD
3-22	2.6-6	Enriched rotifers (50-200 um)
11-60	5-60	Artemia nauplii (just hatched)
21-60	6-60	Enriched Artemia (2-5 dah)
23-49	7-35	Enriched rotifers (118-200 um)
56-61,63,66,69		Minced penaeid shrimp
56-97	40-80	1.6 mm pellets
	80-140	2.4 mm pellets
	140-250	4.0 mm pellets
	250-	9.5 mm pellets

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Table 3. Results from a 145-day growth trial with Nassau groupers (each number is a mean for two tanks).

INITIAL WEIGHT (g)	FINAL WEIGHT (g)	DAILY^a RATION (%)	DAILY GROWTH (%)	FEED^b CONVERSION RATIO
4.2	32.6	1.49	1.42	1.06
8.6	76.4	1.37	1.51	0.91

^a Percent of wet fish weight
^b Dry feed weight eaten/wet fish weight gained

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