

Growth response of cobia *Rachycentron canadum* (Pisces: Rachycentridae) under the hypersaline conditions of the Emirate of Abu Dhabi

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Cobia (*Rachycentron canadum*) are a migratory pelagic species and are present in the Arabian Gulf, Red Sea, South Africa to the southern Japan, all tropical and subtropical oceans and seasonally in temperate waters^{1,2,3,4}. Cobia are reported to withstand a wide range of water temperatures and salinities¹. In the United Arab Emirates (UAE) cobia, known locally as sikel, is a common fish in the local markets and usually attains high prices. UAE is listed as one of the top five producers of wild caught cobia in the world⁵. Due to their high growth rates and adaptability to different culture facilities and conditions, cobia aquaculture operations are expanding throughout the world^{4,6,7,8,9}. The global aquaculture production of cobia has increased from 3 tons in 1995 to 25,373 tons in 2006¹⁰.

Salinity tolerance of cobia is another interesting characteristic. In nature the fish is found at salinities ranging from 8 to 44 ppt. Under culture conditions, the juvenile fish were reported to adapt well when taken from waters of 22 to 44 ppt salinity to water as low as 5 ppt with good FCRs and growth rates^{5,10}.

Encouraged by the worldwide successful practices of cobia, it was decided to consider adopting this species for aquaculture at the Aquaculture Center, Abu Al Abyad Island (ACAAB), Emirate of Abu Dhabi, UAE. Accordingly, in June 2005 juvenile cobia, averaging 2.28 g body weight and 8.92 cm body length, were introduced from Taiwan and grown at ACAAB.

Abu Al Abyad Island, where the Center is located, is the major island of Abu Dhabi Emirate and it is known for its harsh environmental conditions where water temperature and salinity during summer time reach as high as 36°C and 58 ppt, respectively¹¹. The results of rearing this species under the hypersaline conditions of Abu Al Abyad Island (50-55 ppt) are presented in this article.



A one-year cobia.

Acclimation of the fish

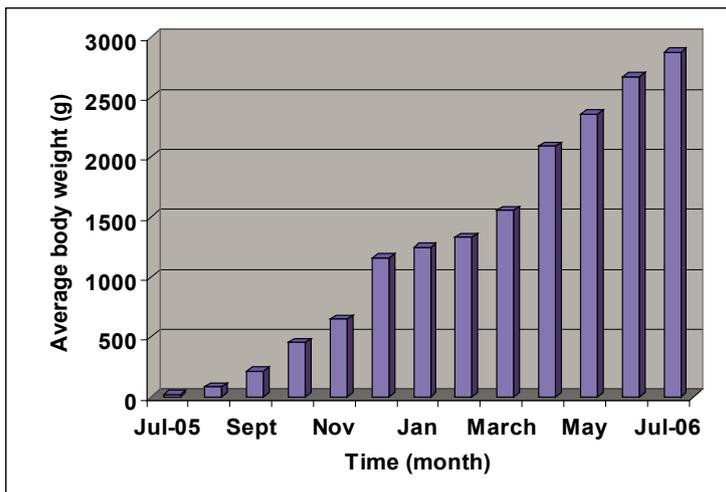
Upon arrival at the ACAAB, the fish were placed in a 30-t rectangular concrete indoor tank with water salinity of 24 ppt similar to that of the origin. Fish feeding started 24 hours post-arrival and were fed to satiation with 2 mm marine fish feed (45% protein and 10% lipid), three times/day. After two weeks of rearing the fish under 24 ppt, the water salinity was gradually increased by 2 ppt/day until the fish were completely acclimatized to the natural seawater salinity of Abu Al Abyad Island (55 ppt) over a period of 15 days. During this acclimation period, the fish mortality mounted to 7%.

Grow-out

Following the acclimation period, 87 % of fish were tagged and released into the sea with the purpose of replenishing the wild habitat around the Island. The remaining cobia fingerlings averaging 19.68 ± 0.89 g body weight and 16.43 ± 1.12 cm body length were transferred for grow-out to four 5 x 5 x 2.5 m³ (55 m³ water volume) floating net cages placed near the shore of an artificially dredged channel. All cages were shaded from direct sun light with green shading materials. The fish were stocked at a rate of 4 fish / m³. Floating pellet feed (54% crude protein, 10% crude fat) were used during the grow-out period at a feeding rate 0.5 – 1% BW. Fish were fed twice a day, 6 days a week. At monthly intervals 25 fish from each cage net were individually weighed and measured and the daily feed allowance was adjusted accordingly.

Within a growth period of 12 months the average body weight attained was 2.87 kg, ranging in size from 1.78 to 3.86 kg. The feed conversion ratio attained was about 2.0. No diseases issues were observed during the grow-out period and the average survival rate was 80%.

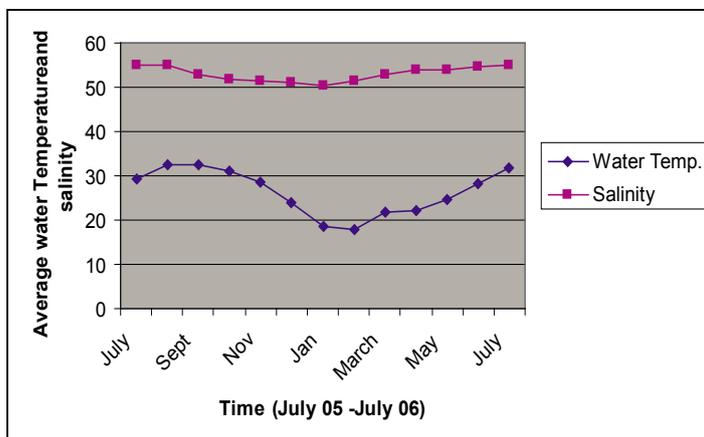




Growth performance of cobia *Rachycentron canadum* under hypersaline conditions.

During the grow-out trials the salinity ranged between 53 and 57 ppt (54.99 ± 1.1 ppt) while the water temperature ranged from 17°C to 34°C.

The growth rates obtained may be low when compared to 6 kg/year obtained in other parts of the world (e.g. Taiwan). However, they compare well with the results reported by Benetti *et al.*⁸. The authors indicated that cobia grown in tanks in Miami, USA at densities of 2 -3 kg/m³, reached about 2 kg in 12 months and this low growth performance was attributed to the high stocking densities applied. During the present trial, a very low stocking density (4 fish/m³) was applied but still the growth rates achieved remained much below the expected high rates. The reason behind this slow growth rates in the present study could be attributed mainly to the high salinity levels prevailing in the area all year round.



Water temperature and salinity recorded during the grow-out period.

Conclusion

The growth results obtained at ACAAB are not consistent with the impressive growth rates reported elsewhere and that was due to the depressive effect of the high salinity levels prevailing in the area. Nevertheless, when comparing the growth performance of cobia with that of other marine fish species cultured in the Center¹², it is obvious that cobia is very much the most promising candidate for a viable aquaculture in the area. To evade the depressive effects of high salinity and temperature and make cobia aquaculture more promising in the area, it could be recommended that future trials should consider the indoor rearing of cobia during summer time, in particular during July and August, before transferring them to cages or even pond systems.

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