

**SOUTHWEST FISHERIES SCIENCE CENTER
FOURTH QUARTER REPORT-FY 2003
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Title of Accomplishment or Milestone: Shipboard Molecular Identification of Billfish Eggs

Current Status: The manuscript Shipboard Identification of Billfish (families Xiphiidae and Istiophoridae) Eggs and Larvae Using a Species-Specific Multiplex PCR and First Description of Eggs of the Shortbill Spearfish, *Tetrapturus angustirostris*. is in internal review for submittal to Marine Biology

Background Information: Research on billfishes (families Istiophoridae and Xiphiidae) has been conducted primarily on adults, which are easily obtainable from commercial and recreational fisheries. Conventional tagging studies of adult billfish and tunas indicate they are highly migratory and capable of trans-oceanic movements. However, there is evidence for philopatry (return to common spawning areas) in tunas. For management purposes these spawning areas may be critically important to protect from over-harvesting. To better understand the reproductive behavior of bill fishes, temporal and spatial patterns of the distribution of eggs and larvae warrant further investigation. Unlike tunas billfish eggs cannot be identified by visual means. Hence a genetic approach was needed.

Purpose of Activity: The goals were: 1. to develop a molecular method for the identification of billfish eggs and larvae, 2. to use the method onboard ship to ID billfish eggs and larvae to study a billfish spawning area off the Kona Coast of Hawaii.

Description of Accomplishment and Significant Results: We report the first use of a shipboard PCR based assay to differentiate species of Istiophorid larvae and identify eggs of both Istiophorid and Xiphiid billfishes while on board ship near Kona, Hawaii. A species-specific multiplex PCR assay was designed to amplify a single, unique size fragment of the mitochondrial cytochrome b gene for all 6 species of Indo-Pacific billfish.

Significance of Accomplishment: This near real-time identification method for morphologically indistinguishable billfish eggs and larvae provides investigators the opportunity to employ adaptive sampling methods to increase sampling efficiency. This will help in determining the spatial resolution and nursery habitat of patchily distributed early life stages. The area off the Kona Coast does appear to be a billfish spawning hot spot. Further cruises are planned now that the method has been developed.

Problems: None

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