TEMPORAL AND SPATIAL DISTRIBUTION OF FISH LARVAE IN RELATION TO OCEANOGRAPHIC CONDITIONS IN THE BRAZIL NORTHEAST EXCLUSIVE ECONOMIC ZONE

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INTRODUCTION

Ichthyoplankton studies play a key role in the understanding of the ecology and evolution of fish fauna and their constituent populations (Moser, 1993). Demand for knowledge on the distribution and abundance of ichthyoplankton has increased in fishery research to complement independent stock assessments and help predicting fisheries yields.

Interactions between physical and biological processes has been shown at the level of phytoplankton (Odebrecht & Djurfeldt, 1996), zooplankton (Resgalla & Montú, 1993), Ichthyoplankton (Muelbert & Sinque, 1996; Sinque et al., 1996), and fishery resource level (Andrade, 1996).

Distribution patterns of fish larvae in any region of the ocean are related to the reproductive activity of the adult population and hydrographic features that affect the dispersal of the larvae. That kind of study contributes to understand the interrelationships among fish species during their early life stages, as well as adult spawning patterns. (Nonaka et al., 2000).

This study aims to examine the temporal and spatial changes in the fish larvae composition and abundance with to physical and biological processes of the Brazil Northeast Exclusive Economic Zone. Particular emphasis was placed on the temporal variation of abundant fish taxa.

MATERIALS AND METHODS

A total of 562 samples were collected during four expeditions realized between 1995 and 2000. The expeditions were made on August - October of 1995 (Period 1), January - April of 1997 (Period 2), April - July of 1998 (Period 3) and September - December of 2000 (Period 4).

Ichthyoplankton samples were collected using Bongo nets with 50 cm - diameter mouth, 500 meshes,. Sampling was done through oblique hauls with duration of 10 minute .Depth varied according to each station reaching 200m. In the laboratory, all larvae were removed from each sample and stored in 70% alcohol. The larvae were identified according to the morphological characters of each group. Standard densities of individual taxa were expressed as the number per 100 m3 of filtered water for each collection.

Temperature and salinity were recorded by CTD. The determination of the secondary biomass (dry weight) was carried through according to methodology described at Omori and Ikeda (1984).

RESULTS AND DISCUSSION

From the 19,425 larvae collected during Period 1 (2,969 larvae), Period 2 (5,941 larvae), Period 3 (4,697 larvae) and Period 4 (5,818 larvae), 80 taxa (60 families, 19 orders and 1 superfamily) were identified. During the four periods, 80% of the total larvae taken represented eight families in decreasing order of abundance: Scombridae (0.6 %), Carangidae (1.6 %), Paralepididae (2.7 %), Bothidae (3.3 %), Gonostomatidae (5.6 %), Scaridae (7.5 %), Gobiidae (21 %), Myctophidae (37.7 %).

In relation to habitat of adult fish, three dominant groups were recognized in the Brazil Northeast Exclusive Economic Zone: epipelagic fish, mesopelagic fish and coral-reef-associated fish. Abundance levels of mesopelagic fish larvae tow families (Myctophidae and Gonostomatidae) were highest during periods 2 and 4. To the Paralepididae, levels of abundance were highest in period 3, decreased in period 2 and period 4, and were at a minimum during the period 1. Abundance of the Gobiidae (coral-reef-associated fish) was at a peak in period 2, followed by period 4 and period 1. For the Scaridae family, a peak in larval abundance

was observed during the period 3. Abundance levels of epipelagic fish larvae families (Caragidae and Scombridae) were very low during the investigated periods.

Myctophidae larvae were collected at open ocean stations with higher density over the North Chain Brazilian and F. Noronha Archipelago, but also were collected at coastal stations with higher densities between Natal and Salvador on the period 2 and period 4. Larvae of Gonostomatidae were found predominantly at open ocean stations, some at the continental margin. Gobiidae larvae were concentrated over the North Chain Brazilian and F. Noronha Archipelago and just a small number of them were collected at open ocean stations. The distribution patterns of the Scaridae larvae were similar during all Periods, with higher densities at open ocean stations. Carangidae larvae were collected more frequently near the coast. Paralepididae larvae were collected at open ocean stations during all Periods, with higher densities in the adjacent area to Saint Peter and Saint Paul Archipelago during Period 3. The highest densities of grouper larvae (Bothidae) were found at ocean area between F. Noronha Archipelago and Saint Peter and Saint Paul Archipelago during the Period 3, but the North Chain Brazilian stations also showed relatively high densities during Period 2. Most of the Scombridae larvae were collected at coastal stations between Maceió and Aracajú (Period 2)and at open ocean stations (Period 3).

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