A REVIEW STRATEGY ON TROPICAL COAST MARINE FISHES FOR ITS REPRODUCTION

K. R. Chidambaram
Professor-HOD
AMET University

T. Mohan
Professor, Marine Engineering
AMET University

ABSTRACT

The tropical marine fishes are sediments on the mangrove, sea grass and corals communities for their life cycle. Such fishes exhibits correct spawning behaviors at the desired time but the predation are reduced by the transported locations of pelagic eggs and larvae offshore. Due to this irregular behavior there creates a problem in post-larvae habitat where they cannot back to its originated place. Though spawning is concentrated once in a year, but they are reduced due to weak current or winds which fail to transport the larvae to the origin. In order to avoid such problem spawning is carried out near shore gyres to favor the return of the larvae. Therefore offshore larval dispersion seems to fail by not adapting this condition. Moreover, lunar periodicity is commonly seen in these species which has been recognized to enhance the offshore flushing of eggs and larvae. This paper reviews about the reproductive strategy of marine fishes in the tropical region where they are roughly depends on the physical behavioral of oceanic conditions.

Key words: corals, spawning and lunar periodicity.


http://www.iaeme.com/issue.asp?JType=IJARM&VType=6&IType=3

1. INTRODUCTION

Tropical region marine environment slightly vary from higher latitudes, where seasonal variations are minimal in day length by wind and current patterns through temperature differences. Therefore tropical marine environment has low nutrition level comparatively than upwelling regions which results in low oceanic plankton
density with high abundant predators. However, tropical environment has two major marine (faunas) habitats like coral and mangrove communities unlike the latitudinal regions. Herewith, this article was reviewed on the reproductive strategy of tropical marine fishes influenced by the environmental characteristics. Mainly focusing on the sedimentation of tropical marine fishes on the fauna communities found in the particular region. Basically tropical fishes are profound to sediment on sandy or muddy shelves, but they are not considered for wide study. So, the fauna associated fishes are taken into consideration to know their spawning strategies.

2. LOCATION OF SPAWNING

2.1. Shifting Spawners:
Several study supported the migration of spawners that 19 out of 20 migrates to deep sea environment. But some have suggested that the offshore spawning can also be seen in one or more species. According to Palau, during inter-spawning the migration is taken place either in pairs ((Siganus punctatus) nor individual (e.g. Serranids). These migrations are favored by the locations where they get aggregated on the reef channels and the outer reef slope or crest to distribute their eggs in planktons of lagoon reef. Although, fish eggs were seems to be less inside lagoon reefs. Therefore, offshore spawning is also reflects for the distribution of parent populations but it is not usual for them. According to many studies most of the migrated larvae makes out chances of recruitment to their own point of origination due to shallow deep predators and unusual favorable oceanic condition to reef by local currents. This is seems to be reasonable which might return significant in number where they came but sometimes by the offshore larval period by exhausted food supply. Though the spawning near shore facilitates the larva back to the oceanic shallow water with apparent concentration of zooplanktons for its food. So the spawned adults in shore can be made attentive towards their own habitat by increasing the food level for the retention of eggs and shallow larvae in productive waters. But many species have not taken this advantage over the strategy which has necessary sacrifice if shallow-water predation pressure on larval survival for its food supply.

2.2. Non-Shifting Pelagic Egg Spawners:
Generally marine fishes belongs to small tropical region do not migrate to deep waters for spawning. The smaller marine species always remain close to the shelter of their original habitats due to the attention of large ones for its prey. One of the common behavior of spawning in small fishes near the reef, carrying pelagic eggs by force dashing in upward direction to release their gametes in a second for its arrival. It can be seen in some members out of four different families. This behavior was sort to appear in small species like pomacanthids and chaetodontids, serranid, scarid and labrid because of the adaptation in common environment where these reef acts as a safety shelter to protect them against the mouth waiting to trap their eggs. The upward spawning rush of reef fish helps distribute their gametes to reach out of the deep/benthic predator’s threat to release the eggs to float on the just below the water surface where they can move towards the spawning surface in large number species with pelagic eggs.

2.3. Demersal Eggs of the Non-Shifted Spawners:
The act of living in the deepest part of the water bodies are referred to as demersal. Such demersal eggs are found in reef fish families like Siganidae, Balistidae,
Gobiidae, Blenniidae, Clinidae, Apogonidae, Tetraodontidae and Pomacentridae. This situation was created by these reef fishes to guard their eggs against predators. Generally, the larva of these fishes are found in outer reef beyond the water surface but not far to offshore like coastal species with pelagic eggs. Still it is in secret to know the trip making for hatching in deep water. Demersal eggs are hatched at advanced stage development comparative to pelagic eggs. Some larvae like Siganus lineatus aggregates shortly at the surface after hatching but it is not noted in all species laying demersal eggs. It is also necessary to find the hatching of demersal eggs predominantly on, or just prior to, the turn of the high tide, which can be seen in the case of clownfish.

2.4. INTENSIFIED LIVING CONDITION:
Marine species in the shallow tropical regions either viviparous or ovoviviparous, where their reproductive habitat is far from tropical fresh water fishes. Though, the tropical marine fishes have advantage over freshwater fishes by laying their eggs in low areas to escape their off-springs from predators whereas fresh water fishes have restricted area for their low offspring development. Therefore some disadvantages are seen for the live bearing marine species like increased stress, low fecundity, and increased vulnerability on adults carrying their young. But also have advantage by minimizing the predation on young by exporting them to offshore.

2.5. FURTHER REPRODUCTIVE STRATEGY:
As described above it is useful to categorize the reproduction of tropical marine fishes in four types to know less about their reproductive habitats. Still some species did not fit those patterns, where a number of species move for shelters in shore waters, holes of reef communities and close to the walls for spawning while the pelagic larvae are restricted to shallow waters to guard them. The pelagic larvae of some species seem to be found in less abundant in plankton of seagrass beds or mangrove roots, than their large adult groups. But some small pelagic species spawn near the shore and retains largely back to the shallow water. At present, there is no explanation for how the larval species cope up with the shallow water condition whereas the coastal larval species were selected for offshore existence.

3. SPAWNING PERIODICITY
3.1. Spawning Peaks on Seasonal Basis:
The reproductive activities of coastal marine fishes often extended by considering the seasons of the year, where unusually large numbers of species and individuals within them reproduce. Such periods are referred to as collective spawning peaks which can be seen in spring and fall by various groups. But it cannot be seen all around the world due to certain reasons like
   i. temperature variations.
   ii. Plankton productivity.
   iii. Rainfall.
This was greatly supported for the reproductive strategies of these fishes to maximize the recruitment of offshore larvae to their nearby inshore habitats. This relationship was prevailed by the modifying the observation on hydrographic features and velocity of current and winds at local topographic areas. Finally, it was appeared to collect the
frequent spawning peaks at spring and fall shifts by comparing the relative strength of current and wind of the year at high and low recruitment.

3.2. Lunar Periodicity:
Lunar spawning cycles are seen in marine food fishes; out of 51 fishes all around the world six tropical fishes have lunar spawning reproductive strategy.

The phenomenon of discovering the importance of tropical marine fishes by several reasons. Such are
1. Previously published information is lagged many decades.
2. Studies on reproductive periodicity was based on infrequent sampling, seasonal trends
3. The presence of smaller spawning species are unless demonstrated.

The majority of fishes having lunar spawning rhythms are distributed taxonomically based on the new or full moon. Additionally, they are caught by the native fisherman by knowing their spawning grounds and lunar rhythms. Therefore, spawning stupor is also a characterized for tropical freshwater species which enhances to continue spawning inshore against predator threats coincide with seasonal tides especially in spring.

4. SPAWNING FREQUENCY:
It was clearly noted that smaller populations of many species spawns periodically for much longer portions of the year. Therefore spawning seasons of marine fishes are longer than lower latitudes due to the survival conditions of temperature and food supply. The reason for making longer periods in tropical marine fishes, they stay at a vacant hole for long periods for the reproductive activity where they can colonize and increase the recruitment of larvae by occupied water movement. But sometimes it may be death or departure. Many adult species spend their lives under the shelter of mangrove roots or seagrass where some species like carangids seek for moving shelter like under jellyfish or boundary layer of larger fish. The cost of spawning should be low at higher latitudes with short single annual period. Therefore, the growth rates of reef fishes are relatively high compared with marine temperate species with short life span. In order to reproduce more temperate species with long life in shorter period of the suitable year for production. But the relationship between spawning frequency and life span cannot suit for tropical where they have longer life span with more frequency. However, populations subject over predation and competition characteristic in tropical communities produce few number of high quality young than juvenile competitive species to survive. Thus the outcome must depend on both relative numbers and quality of the species, but it cannot maximize by this characters it requires more investment in energy tough energy is limited. Finally, many tropical marine fishes are opted to reproduce quantity of offspring than quality.

5. CONCLUSION
Hence, this paper was completely reviewed about the reproductive strategy of tropical marine fishes by explaining their various spawning categorizes based on the seasonal variation and time of frequency for spawning. Lunar periodicity is one of character in tropical marine fish spawning which can increase their reproductive status is also detailed. Finally, it was concluded that still more investigations are need
to turn advantage over disadvantage of spawning by this reproductive strategical issue.

**REFERENCE:**


