Food and feeding habits of marine fish *Sphyraena jello* (Cuvier, 1829) collected from Karaikal marine area, south east coast of India

[1]M. Bharathi*, and [2]Dr. A. Christy Ponni
Research Scholar, P.G and Research Department of Zoology, TBML College, Porayar - 609 307, Tamil Nadu, India.
Head of the Department P.G and Research Department of Zoology, TBML College, Porayar - 609 307, Tamil Nadu, India.

Corresponding author: Dr. A. Christy Ponni, *P.G and Research Department of Zoology, TBML College, Porayar - 609 307, Tamil Nadu, India.*

Abstract **:** Commercially important fish *Sphyraena jello* were collected from the Karaikal marine area south east coast of Pondicherry India, from January 2016 to December 2016. The samples were selected randomly and stored in boxes containing ice. This fish was resulted as carnivorous. The *Sphyraena jello* stomach showed variety of food particles which holds small fishes as a main food item. *Sphyraena jello* constitutes 88.6% of fish in their food habit.

Index Terms: Food, Feeding, Stomach Weight, Food items.

1. INTRODUCTION

Sphyraena jello belongs to family of Sphyraenidae which is also known as sea wolf signifying its savage and aggressive behavior while preying. Out of this fish family, 20 barracuda species inhabit in the world[1]. The fish is physically characterized by a wide and long anatomy with lateral strips and it is often found in the tropical and semi tropical water bodies. Having sharp teeth on its jaws, the fish attacks its prey in an ambush and by its jaws, so that the fish can easily wound and grind its prey[2]. Some studies attribute orgin of this fish to those fish species inhabiting in coral reefs as their safe shelter[3].

Changes in the populations of marine fishes have prompted researchers to examine and assess their stocks. In the past decade, the management of marine resources has usually been defined on the basis of a single-species model that has been used to develop multi-species models of exploited fish populations, which provide insight into the fluctuation of the marine resources[4]. Predator pressure is a pervasive influence on the evolution of populations and on the structure and function of nearly all marine communities and ecosystems[5].

Stomach content analysis, even in its most casual and anecdotal form, can yield incidental but immediately valuable information since predators are often better sampling devices than most commercial fishing gears[6]. Information on the food habits of marine fishes, such as the predator-prey relationships, is useful in order to assess the role of marine fishes in the ecosystem. There are only a only a few studies that describe stomach content analysis of marine fishes from the South China Sea and east coast of Malaysia.

Khalijah and Salleh[7], Chan and Liew [8] and Mohsin *et al.* [9] studied the stomach contents of communities of small demersal fish. These studies did not include the moderate to large fish species. Present study was conducted for *Sphyraena jello* was collected from Karaikal area waters on the south east coast of Pondicherry, India in order to determine their dietary compositions and food habits. Since there is little published information on the diets of fish from the South India Sea, the results of this study are also aimed at better understanding the biology of predator and prey species as well as being useful for stock- and ecosystem-level analyses.

II.MATERIALS AND METHODS

Fish samples *Sphyraena jello* were collected from Karaikal area, south east coast of Pondicherry, India, which is located at latitude 110º 05´ North South and longitude 79 º 5´ East West on Southern part of India. The samples were selected randomly and then stored in boxes containing ice to slow bacterial digestion process in the fish stomachs and make it easier to identify the prey. The fish samples were taken to laboratory for further analysis. The total length and fresh weight of the individual specimens were measured. Then the fish guts were removed and cut open. All food items in the stomachs were identified. The total number, wet weight and occurrence of each prey item in the stomach of the fishes were recorded. The dietary components for each species studied were expressed as a percentage of species composition. The food and feeding habits of the study fish *Sphyraena jello* were recorded from January 2016 to December 2016.

III. RESULTS AND DISCUSSION

In the present study, the fish samples were collected from Karikal area, south east coast of Pondicherry, India. The specie of marine fish *Sphyraena jello* selected for study is given in Table 1. This specie utilize a low number of different food items in *Sphyraena jello* are more selective in their diets and specialize on particular food items (Cuttle fish, oil sardine, lesser sardine, mackeral, anchovy, undigested fish mass, *Stolephorus* sp, completely digested fish paste, unidentified fish mass). The composition of the diet indicated that the fully adult fish was carnivores feeding on small marine animals, mainly teleosts. Cephalopods, crustaceans, echinoderm and mollusks also contributed to the diet (Table 1). It was possible to

count and weigh all food items in the stomach and most of the prey items were easily identified because of their size. The fishes' feeding habits fell in the spectrum between generalist and specialist.

Fish *Sphyraena jello* found in coastal areas of continental and island shelves. The gut content observed sizes ranged from 45-70 cm. It feeds mainly on small fishes, squids and shrimps. It caught mainly with handlines, bottom trawls, gill nets and encircling nets[10]. The fish is an active carnivore, fishes (90.6%) and cephalopods (9.4%) forming the main constituent of the diet (Cuttle fish, oil sardine, lesser sardine, mackeral, anchovy, undigested fish mass, *Stolephorus* sp, completely digested fish paste, unidentified fish mass). The present study on stomach contents elaborates feeding composition of commercially important fishes of this region. The *Arius thalassinus* is mainly feeds on benthic composition of animals. This results major constituent of feed is crustaceans. Although in some articles it has been indicated as scavenger due to the presence of big teleost vertebrae bone[11].

Sphyraena jello is a bigger fish that encountered in this study. The majority of food preference is fishes and cephalopods. The most frequently eaten prey items (fish, crustaceans, mollusks, worms and echinoderms) are the same than in all other studies on the diet of tropical carnivorous coastal fishes. The frequency of these items is probably not necessarily proportional to their abundance in the environment. Fish diet is highly linked to fish size as demonstrated by numerous studies which show that it acts on prey preference, prey diversity, feeding behavior or feeding rate. Nakamura *et al*. [12] indicates that there may be important changes of diet with size, many species switching from smaller, easier to access prey, to larger prey or to prey more difficult to catch or extract but of higher nutritive value. It is difficult to assess the consequence of such shifts in terms of energy flow as well as in terms of impact on the environment[13]. The analysis of the food of different species of trawl fishes has shown that most of them are predators on actively moving benthic invertebrates and teleost fishes[11].

However, it is important to recognize the actual complexity of the situation because species may feed at different levels in the food chain at different stages of their life cycle. For instance, Landry[14] found that fully adult codfish are predators on herring, but when they are small (<50 cm long) they feed on copepods and other planktonic crustaceans. Barracuda is a carnivorous species and attacks its prey through either camouflage or in an ambush and tears it into pieces by its sharp jaws[15].

IV. CONCLUSION

The present basic information of the food and feeding habits would form a useful tool for further studies. Therefore, both direct and indirect predation effects are important aspects that can give guidelines for the management of marine resources in this region.

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Table 1: Food and feeding habits of fish *Sphyraena jello* collected from Karikal south east coast of Pondicherry India (January 2016 to December 2016).

Month and Year	Stomach weight (gm)	Food items
Jan. 2016	59.5 ± 4.20	Oil sardine, lesser Sardines, mackeral, and cuttle fish
Feb. 2016	60.75 ± 5.96	Oil sardine, shrimps, mackeral, and cuttle fish
Mar. 2016	59.50 ± 4.20	Oil sardine, mackeral, cuttle fish and digested fish mass
Apr. 2016	74.75 ± 7.36	*Stolephorus* sp., lesser sardines, anchovy, digested fish paste
May 2016	40.50 ± 5.80	Cuttle fish, oil Sardine, lesser sardines, undigested fish mass
Jun. 2016	77.25 ± 8.53	Cuttle fish, oil sardine, lesser sardine, mackeral, undigested fish mass, *Stolephorus* sp, and completely digested fish paste
Jul. 2016	55.75 ± 7.41	Mackeral, cuttle fish, sciaenid and completely digested fish paste
Aug. 2016	78.5 ± 8.27	Mackeral, cuttle fish, lesser sardines, shrimp and unidentified fish mass
Sep. 2016	105.25 ± 4.64	Oil sardine, lesser sardine, mackeral, cuttle fish, shrimp and unidentified fish mass
Oct. 2016	125.75 ± 8.95	Oil sardine, lesser Sardine, cuttle fish, mackeral, undigested fish mass, *Stolephorus* sp, and completely digested fish paste
Nov. 2016	135.25 ± 7.13	Oil sardine, lesser sardine, anchovy, mackeral, cuttle fish, shrimp and unidentified fish mass
Dec. 2016	67.25 ± 5.74	Oil sardine, lesser sardine, mackeral, cuttle fish, shrimp and completely digested fish paste

Each value is the mean ± S.D. of four observations

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