



Short Communication

Dietary composition of the sailfish *Istiophorus platypterus* (Shaw & Nodder, 1792) from Parangipettai, southeast coast of India

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Abstract

The diet composition of the sailfish *Istiophorus platypterus* (Shaw & Nodder, 1792) from Parangipettai, southeast coast of India (n=149; total length: 92-385 cm TL) was studied based on numerical composition (CN), percentage of gravimetric composition (CW), percentage and frequency of occurrence and index of relative importance (IRI) of prey. Occurrence in terms of frequency was anchovies (43.8%), rabbitfish (21.2%), squids (21.2%), ribbonfish (6.1%), tuna (3.1%), carangids (3.0%) and Indian mackerel (1.6%). The feeding intensities in relation to different size groups of sailfish were also analysed. The sailfish are carnivores, feeding mainly on teleosts and cephalopods.

Keywords: Sailfish, *Istiophorus platypterus*, diet composition

Introduction

The Indo-Pacific sailfish *Istiophorus platypterus* (Shaw & Nodder, 1792) (Family : Istiophoridae) is an apex predator and their distribution in Indian waters has been reported by Ramaiyan *et al.* (1987) and Somavanshi *et al.* (1998). The billfish (including sailfish) catch was 5347 tonnes in the year 2007 (CMFRI, 2008) in India. Sailfishes feed primarily on pelagic fishes and cephalopods (Evans and Wares, 1972) and are generalist predators (Rosas *et al.*, 2002). Visser and Bonoccorso (2003), while evaluating the food items of the killer whale (*Orcinus orca*), observed that they feed on sailfishes along with other fishes. The present paper is on the diet of the sailfish *I. platypterus* from Parangipettai coast (Tamil Nadu), southeast coast of India.

Materials and Methods

The diet composition of the sailfish, *I. platypterus* collected (n = 149) from fish landing centre at Parangipettai (Lat. 11° 29' N; Long. 79° 46' E) was analyzed (October, 2007- March, 2008). The total length (cm) and fresh weight (kg) of the individual specimens were recorded. To analyze the gut contents of the sailfish, three size groups were categorized based on total length with class intervals (100 cm each) such as

92-192 cm, 193-293 cm and 294-394 cm. The full stomach was immersed in 5 per cent formalin for analysis. All food items in the stomachs were identified to the genus level, wherever possible. The total number, wet weight and frequency of occurrence of each prey item in the stomach were recorded.

The results were expressed as percentage of numerical composition (CN), percentage of gravimetric composition (CW) and percentage of frequency of occurrence (F) of prey (Hyslop, 1980). The most important food item was determined by using the Index of Relative Importance (IRI) suggested by Pinkas *et al.* (1971) as follows: $IRI = (CN + CW) \times F$. The comparative feeding index (CFI) as described by Sahabur Hussain and Ramaiyan (1984) were also adapted in the present study.

Results and Discussion

The composition of the diet showed that the sailfish are carnivores feeding mainly on teleosts and cephalopods (Table 1). A total of nine prey genera consisting of eight fishes and one squid were identified. In terms of frequency of occurrence, anchovies (43.8%), rabbitfishes (21.2%), squids (21.2%), ribbonfish (6.1%), tuna (3.1%), carangids (3.0%), and Indian mackerel (1.6%) were dominant

in the diet. The prey components such as *Caranx* sp., *Stolephorus commersonii*, *Thryssa* sp., *Coilia dussumieri*, *Siganus* sp., *Trichiurus lepturus*, *Rastrelliger kanagurta*, *Thunnus* sp. and cephalopods are among the commercially important pelagic fishes along the east coast of India.

Table 1. Index of Relative Importance (IRI), numerical composition (CN), gravimetric composition (CW) and frequency of occurrence (F) of prey items in the diet of sailfish (*I. platypterus*) from Parangipettai waters

Prey	IRI (%)	CN (%)	CW (%)	F (%)
Family Engraulidae (anchovy)				
<i>Stolephorus commersonii</i>	29.98	15.98	5.16	20.54
<i>Thryssa mystax</i>	20.15	15.82	3.96	13.01
<i>Coilia dussumieri</i>	19.63	13.50	3.02	10.31
Family Siganidae (rabbitfish)				
<i>Siganus</i> sp.	23.08	8.36	51.64	21.21
Family Trichiuridae (ribbonfish)				
<i>Trichiurus lepturus</i>	1.79	21.45	11.60	6.06
Family Carangidae				
<i>Caranx</i> sp.	0.34	0.36	5.91	3.03
Family Scombridae				
<i>Rastrelliger kanagurta</i>	0.95	18.25	9.56	1.56
<i>Thunnus</i> sp.	0.73	2.91	3.72	3.06
Family Loliginidae (squid)				
<i>Loligo</i> sp.	3.34	3.27	5.42	21.21

Table 2. Percentage contribution (%) of prey items to the diet of different size groups of the sailfish, *I. platypterus*

Food items	Size groups (cm)		
	92-192 (%)	193-293 (%)	294-394 (%)
<i>Stolephorus commersonii</i>	22.71	11.52	11.38
<i>Thryssa mystax</i>	25.96	10.64	10.9
<i>Coilia dussumieri</i>	11.91	9.61	8.28
<i>Siganus</i> sp.	14.34	16.84	16.69
<i>Trichiurus lepturus</i>	0	4.14	3.51
<i>Caranx</i> sp.	2.93	4.68	5.88
<i>Rastrelliger kanagurta</i>	15.27	23.64	22.78
<i>Thunnus</i> sp.	0	8.37	7.24
<i>Loligo</i> sp.	6.88	10.56	13.34

In the size group of 92-192 cm, the anchovy *Thryssa mystax* was the dominant prey (25.96%) followed by *Stolephorus commersonii* (Table 2). In the other size groups 193-293 cm and 294-394 cm, the contribution of *R. kanagurta* was higher at 23.64% and 22.78%, respectively.

The percentage of feeding intensities in different size groups is presented in Table 3. It is apparent that 13 to 15% of fishes had empty stomach. The percentage of actively fed stomachs were more in the size group of 92-192 cm than in the size groups of 193-293 and 294-394 cm.

Table 3. Percentage of feeding intensities in relation to different size groups of *I. platypterus*

Size groups	92-192 cm	193-293 cm	294-394 cm
Empty (%)	14.92	12.97	13.08
Trace (%)	15.86	8.38	6.88
¼ full (%)	5.97	16.49	14.63
Poorly fed (%)	21.83	24.87	21.51
½ full (%)	8.4	18.65	22.39
Moderately fed (%)	8.4	18.65	22.39
¾ full (%)	12.31	21.89	21.29
Full (%)	21.83	12.7	13.08
Gorged (%)	20.71	8.92	8.65
Actively fed (%)	54.85	43.51	43.02
Total	100	100	100

Major forage items of the Indo-Pacific sailfish are fish and squid and the adults are fairly opportunistic feeders and take almost any food they come across (Nakamura, 1985). During several longline cruises of Japanese research vessels in the eastern North Pacific Ocean, the adult *I. platypterus* have been shown to feed mainly on cephalopods and fish (Bramidae, Stromateidae, Carangidae, Gempylidae, Belonidae, Balistidae) (Nakamura, 1985). Alayola *et al.* (2002) reported a total of 64 prey categories of the sailfish (*I. platypterus*) including fish and an insignificant proportion of cephalopods from the southern Gulf of California, Mexico. Bachok *et al.* (2004) noticed anchovy, round scad, squid, rabbitfish, bigeye scad, and dussumier's halfbeak as prey items of the sailfish from the east coast of Peninsular Malaysia. In general, the types of prey consumed by sailfish are almost the same

worldwide and the most common families are Scombridae and Carangidae that inhabit open waters.

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