

Short communication

Stomach contents of cetaceans incidentally caught along Mangalore and Chennai coasts of India

Anoop A. Krishnan, K.S. Yousuf, P.L. Kumaran, N. Harish, B. Anoop, V.V. Afsal, M. Rajagopalan, E. Vivekanandan, P.K. Krishnakumar*, P. Jayasankar

Central Marine Fisheries Research Institute, Post Box No. 1603, Ernakulam North P.O., Cochin 682 018, Kerala, India

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Abstract

The stomachs of 32 individuals of seven cetacean species incidentally caught in gill net and purse seine fisheries along Mangalore and Chennai coasts (India) between 2004 and 2006 were examined. The whole stomach (fore-gut, mid-gut and hind-gut) was examined in all cases. Prey remains (666 prey items comprising six species of teleosts, one crustacean and one squid species) were found in the stomachs of eight individuals (the remaining 24 stomachs were found to be empty). All cetaceans were found to feed mostly on teleosts with wide range of trophic levels. Based on an index that included frequency of occurrence, percentage by number and by weight, the oil sardine *Sardinella longiceps* was the main prey in the sample. Cetaceans appear to favour both pelagic as well as demersal prey, possibly indicating surface and benthic feeding habits.

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1. Introduction

Dietary studies are important to address the position of particular species within food webs (e.g., trophic status), define their ecological role and investigate the connection between organisms through predator–prey relationships. Being top predators, most cetaceans play an important role in the marine, coastal and riparian ecosystems. Analysis of stomach contents of dolphins can provide information on their diet as well as on their diving, foraging behaviour and ecology (Clarke and Kristensen, 1980).

A number of studies are available on the food habits of cetaceans in the world oceans, but there are only few studies on the feeding habits of cetaceans in the Indian seas. Karbhari et al. (1985), Natarajan and Rajaguru (1985) and Mohammed et al. (2006) have reported the food habits of the spinner dolphin

(*Stenella longirostris*) from samples collected near Mumbai (northwest coast), Parangipettai (southeast coast) and Karnataka (southwest coast), respectively. Krishnapillai and Kasinathan (1987) have reported the food remains of the bottlenose dolphin (*Tursiops aduncus*) near Mandapam (southeast coast). In the present paper, stomach contents of cetaceans incidentally caught by fishing gear along Mangalore and Chennai coasts are reported.

2. Material and methods

2.1. Collection and analysis of samples

Samples of incidentally caught cetaceans that were landed by gill nets and purse seines at Mangalore, Malpe and Gangoli (southwest coast) and Chennai (13°03'N and 80°16'E, southeast coast) during the years 2004–2006 were collected (Fig. 1). As the maximum distance between the three southwest coast centres was only 150 km, the results of these centres were

* Corresponding author. Central Marine Fisheries Research Institute, MRC of CMFRI, P.B. No. 244, Bolar, Mangalore, Karnataka 575001, India.

E-mail address: kriskupk@gmail.com (P.K. Krishnakumar).

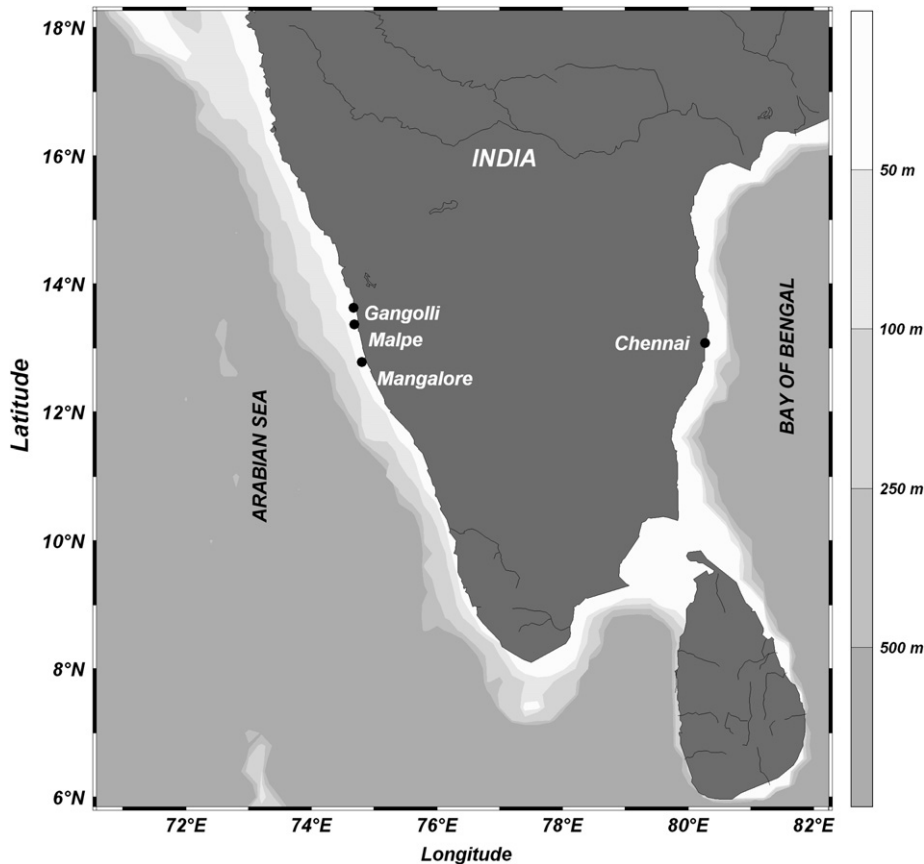


Fig. 1. Map of India showing the locations (indicated by ●) where the cetaceans were incidentally caught.

pooled and the collection centre is termed as Mangalore (12°51'N and 74°49'E) in this paper. Stomach contents of 32 animals (belonging to seven species) were examined: 11 finless porpoise (*Neophocaena phocaenoides*), 13 spinner dolphin (*Stenella longirostris*), two bottlenose dolphin (*Tursiops aduncus*), two Indo-pacific humpbacked dolphins (*Sousa chinensis*), two Risso's dolphin (*Grampus griseus*), one pan-tropical spotted dolphin (*Stenella attenuata*) and one long beaked common dolphin (*Delphinus capensis*). The fishing operations in which the dolphins were caught were restricted to one day's duration and all these incidentally caught cetaceans were landed in the morning within 24 h of capture. The fishermen said that the cetaceans had been caught during the night. All the specimens were landed in fresh condition and their total length and sex were recorded. The location of sample collection and other details are given in Table 1.

2.2. Examination of stomach contents

After removal, the entire stomachs were stored in 70% ethanol until analysis. At the time of analysis, the stomach contents of each dolphin were washed and sieved through 200- μ mesh. It was then processed following the procedures described by Pierce and Boyle (1991). The wet weight of contents was recorded in gram. Fish ear-bones (otoliths) were the main

structures used for prey identification, based on Harkonen (1986) and Smale et al. (1995). Cephalopod mandibles (beaks) were identified following Roper et al. (1984) and Vecchione et al. (1998). All the cetaceans examined in the present study are commonly found in these areas and frequently occur in the incidental catches (CMFRI, 2007).

2.3. Calculation of prey importance

The following three parameters were used to investigate the occurrence and relative importance of the prey found in the stomachs: percentage by number (%N), percentage frequency of occurrence (%FO), percentage by weight (%W) and Index of Relative Importance (IRI). Index of Relative Importance (IRI) of each prey (*i*) is a combination of the first three parameters and was estimated following Pinkas et al. (1971) as:

$$IRI_i = (\%N_i + W_i)\%FO_i$$

2.4. Statistical analysis

Taxa diversity (*H*) in the diet was estimated using the Shannon–Weiner index (Krebs, 1999) available in PRIMER (version 5 for Windows). Analysis of variance (ANOVA) was performed using SPSS (version 13.0 for Windows).

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