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## Report of Epizootic Cirripede, *Conchoderma Virgatum* (Spengler, 1790) on *Pennella instructa* (Wilson, 1917) parasitic on Indo-Pacific Sailfish *Istiophorus platypterus* caught from Andaman Sea

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**Abstract**

This paper reports on the occurrence of *Conchoderma virgatum* on *Pennella instructa* parasitised on *Istiophorus platypterus* from the Andaman Sea. This is a new locality record which confirms the range extension of the species to south-east Bay of Bengal. All four parasite specimens were collected, two specimens each from either side of the dorsal fish base of a male Indo-Pacific sailfish, *Istiophorus platypterus*. The fish was caught by the multifilament tuna longliner vessel *MFV Blue Marlin* during February' 2016 voyage in the area Lat.12° 18' N and Long. 093° 25' E at a depth of 1748m. Among four *P. instructa* specimens, one was hosting the striped goose barnacle *Conchoderma virgatum*. In this paper the parasite specimens are described and their occurrence in Andaman and Nicobar waters of the Andaman Sea is documented for the first time.

**Keywords:** Andaman Sea, range extension, sailfish, striped goose barnacle, tuna longliner

**1. Introduction**

The EEZ of Andaman and Nicobar Islands is about 0.6 million sq.km which is 30% of total EEZ of India [1]. The marine ecosystem of these islands is mainly equipped with the mangroves, coral reefs and invisible banks. The island is very rich in terms of living organism and fishery resources. It is bestowed with a coastal length of 1,912 km which is 1/4<sup>th</sup> of the total coast line of India. The demarcation of these island is 6°45' -13°45'N and 92°15'-94°00' E in the south-east of the Bay of Bengal (Andaman Sea). The Indo-Pacific sailfish, *Istiophorus platypterus* (Shaw and Nodder, 1792) are widely distributed in tropical and temperate surface waters of the world's oceans [2] and form important components of commercial as well as recreational fisheries. In the Indian EEZ, this species are taken primarily as incidental bycatch in drift gillnets and hooks and line fisheries [2]. *Pennella instructa* Wilson (Syn. *Pennella zeylanica* Kirtisinghe, 1932) is a copepod parasite infecting many marine fishes, especially billfishes, including swordfish, sailfish and marlins [5]. From Indian waters, Devaraj and Bennet [4] have described *P. instructa* infested on *Istiophorus platypterus* collected from the South-east and South-west coasts of India; Varghese *et al.* [5] have reported *Pennella instructa* parasitic on *Istiophorus platypterus* from north-west coast of India. The epizootic cirripede, *Conchoderma virgatum* (Spengler, 1790) commonly called as striped goose barnacle is a pelagic cirripede found in all tropical waters of the world, attached to nearly all larger forms of marine life, including parasitic copepods, sea snakes, turtles, sunfish, billfishes, sperm whales and humpback whales. From Indian waters, Daniel and Premkumar [6] have reported the occurrence of *Conchoderma virgatum* on *Pennella* sp., parasitic on *Cypsilurus speculiger*; Natarajan and Nair [7] on *Lernaenicus hemiramphi* Kirtisinghe; Fernando and Ramamoorthy [8] on a scyphozoan medusa and Lazarus and Sreenivasan [9] have reported its occurrence on *Pennella didontis* Oken; Varghese *et al.* [5] have reported on *Pennella instructa* parasitic on *Istiophorus platypterus* from north-west coast of India.

The present study reports *Conchoderma virgatum* (Spengler, 1790) on *Pennella instructa* Wilson parasitic on *Istiophorus platypterus* (Shaw and Nodder, 1792) from the Andaman Sea for the first time confirming the range extension of the species to south-east Bay of Bengal.

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## 2. Materials and Methods

The parasite specimens (4 Nos.) were collected (two specimens each from either side of the dorsal fin base) from a male Indo-Pacific sailfish, *Istiophorus platypterus* (Shaw and Nodder, 1792). The sailfish was caught as bycatch by the multifilament tuna longliner vessel *MFV Blue Marlin* during February 2016 voyage in the area Lat. 12° 18' N and Long. 093° 25' E at a depth of 1748m. The sea surface temperature (SST) in the sampling area was 28.5 °C. The cephalosome and neck were deeply embedded in the muscle of the host.

Hence, a chunk of the muscle was removed and the parasite was separated, washed with fresh water, photographed and stored in 40% Ethyl alcohol. At shore laboratory the copepod parasite *P. instructa* Wilson was identified based on the characters described by Devaraj and Bennet [4] and *C. virgatum* by Daniel and Premkumar [6]. The specimens were deposited in the museum of the Zonal base of Fishery Survey of India, Port Blair.

### 2.1 Species descriptions

Phylum	Arthropoda	
Sub-Phylum	Crustacea	
Sub-Class	Copepoda	Thecostraca
Order	Siphonostomatoida	Lepadiformes
Family	Pennellidae	Lepadidae Darwin, 1852
Genus	<i>Pennella</i> Oken, 1815	<i>Conchoderma</i> von Olfers, 1814
	<i>Pennella instructa</i> Wilson C.B., 1917	<i>Conchoderma virgatum</i> Spengler, 1789

### 3. Results

All the four parasite specimens (two from each side of the dorsal fin base) were collected from a male sailfish *Istiophorus platypterus* caught as bycatch by the multifilament tuna longliner vessel *MFV Blue Marlin*. All *P. instructa* were females and found deeply embedded into the muscle (subcutaneous musculature) close to large blood

vessel. The host i.e. *Istiophorus platypterus* was of Lower Jaw Fork Length (LJFL) 213cm and weighed 45 Kg. Among four, one large parasite was found attached with the pelagic cirripede, *Conchoderma virgatum* (Spengler, 1790) (Fig. A&B). Skin and muscular necrosis was observed around the area of attachment of the parasite (Fig.1.A).



**Fig A:** *P. instructa* attached to the host, **B:** *P. instructa* attached with Striped Goose Barnacle, *Conchoderma virgatum*.

#### 3.1 *Pennella instructa* Wilson, 1917

(Copepoda: Pennellidae)

Female-They are large in size. The cephalosome is bulbous to cylindrical and has 3 short (less than the width of the cephalosome) unbranched projections or horns which protrude and extend perpendicular to its neck. These horns are antennae modified to antlers [9]. The flat or truncated portion of the cephalosome is completely covered with papillae. The cephalosome and neck are yellow and the trunk is dark brown. Neck is longer than genital part of the trunk. Abdomen about half the length of the genital part, its ventral and ventro-lateral areas covered with processes which branch extensively forming a thick matting of processes. Yellow coloured egg strings are straight and very long than the body length (Fig. A & B). In the present study the total length of *P. instructa* varied from 10.3 to 16.6 cm.

The extreme host reaction to the infestation is evident from the formation of thick fibrous cyst around the parasite and in the present study one fibrous cyst was found of about 1.2 cm in diameter (Fig. A).

#### 3.2 *Conchoderma virgatum* Spengler, 1790

(Cirripedia-Lepadomorpha)

In the present study, a striped goose barnacle, *Conchoderma virgatum* (Spengler, 1790) was found attached on the trunk of a large *P. instructa* (Fig. A & B). The total length of the specimen was 2.8cm. The base stem (peduncle) and body (capitulum) are blended together without forming a distinct separation. The capitulum is white with brown striations. Six pairs of biramous cirriform legs were present in the trunk, which were dark brown. Caudal appendages were absent. Attachment to the parasite is made by means of a very adhesive cement-like substance. Natarajan and Nair [6] have reported the absence of egg strings and puncturing of the substratum in addition to inflammation due to *Conchoderma virgatum* infestation on *Lernaeenicus hemiramphi*. But, in the present study no visible effects of infestation were observed on *P. instructa* except slight inflammation on the place of attachment and they were also bearing the egg strings.

#### 4. Discussion

The present study reports parasitisation of *Pennella instructa* on sailfish and the occurrence of *Conchoderma virgatum* on *Pennella instructa* from the Andaman Sea for the first time. Devaraj and Bennet <sup>[4]</sup> have described the characters of this parasite infested on sailfish collected along the south-east and south-west coasts of India. Varghese *et al.* <sup>[5]</sup> have reported *Pennella instructa* on sailfish and the occurrence of *Conchoderma virgatum* on *Pennella instructa* parasitised on sailfish from north-west coast of India, were in all the *P. instructa* collected had *Conchoderma virgatum* attached to it. In the present study, out of four *P. instructa* collected from a single male sailfish only one had *Conchoderma virgatum* attached to it. Hogans *et al.* <sup>[11]</sup> have found that this copepod weakened the host by damaging the heart.

Recently, many parasites, including *Pennella instructa* have been used as biological tags to distinguish the population of fishes and also to discriminate billfishes with different histories of movement. Fish may become infested by parasites in specific geographic regions during their life history and therefore “marking” them with an identifiable natural tag indicating the habitat previously occupied which may allow it to be distinguished from other fishes from different origin <sup>[12]</sup>. Thus, investigations of the parasite assemblage on fishes may provide information about their life cycle, movements and stock identity <sup>[13]</sup>. The use of copepod parasite like *P. instructa* as a natural tag is advantageous over conventional artificial tags as *P. instructa* develops the anchor fully when it has reached its final destination at a food source in the host <sup>[14]</sup>. In contrast, the artificial tag is preformed and increase the relative area of tissue damage during penetration, weakening the attachment strength. Speare <sup>[15]</sup> has used several parasites including *P. instructa* to distinguish stocks of sailfish in Queensland (Australia) waters. Similar studies can be carried out in the Indian waters to identify the sailfish stocks occurring in the Indian EEZ, as the sailfish constitutes a major component of the longline fishery. The impact of infestation by *P. instructa* on the sailfish needs further investigation to estimate the extent of damage, incapacitation and mortality caused to the sailfish due to parasitism and the relation between *P. instructa* and *Conchoderma virgatum* also needs to be understood fully.

Thus, the present study confirms the range extension of the copepod parasite, *Pennella instructa* and also the Striped Goose Barnacle, *Conchoderma virgatum* on *P. instructa* to the south-east Bay of Bengal i.e. the Andaman Sea.

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