




## Uncommon Mass Beaching of *Porpita porpita* (Linnaeus, 1758) in the Gulf of Mannar, Tamil Nadu, India

Mohamed Tharik<sup>1</sup> , Sai Saraswathi<sup>2</sup> , Kumaraguru Arumugam<sup>1\*</sup> 

<sup>1</sup>Biodiversity Conservation Foundation, India

<sup>2</sup>Nature Club, VIT, Vellore, Tamil Nadu, India

### Abstract

*Porpita porpita* (Linnaeus, 1758) was found stranded on the beaches from Vadakadu to Olaikuda Coastline, Rameswaram Island, Gulf of Mannar, after the Nivar Cyclone hit from December 7 to 14, 2020. The current mass beach stranding of *P. porpita* can be explained by offshore swarming and subsequent drift away to the beach due to shoreward water currents and wind speed.

### Keywords:

Blue Button Jellyfish, Nivar Cyclone Effect, Rameswaram, Gulf of Mannar, Mass Beaching

### Article history:

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### Introduction

*Porpita porpita* (Linnaeus, 1758) commonly known as “Blue Button” jellyfish, is within the class of Hydrozoa belongs to the family Porpitiidae. (Sahu et al., 2020; Ravichandran et al., 2014; ITIS, 2021; Ozlem, 2017). They are free-floating marine organisms consisting of a colony of hydroids, that live mostly in the pelagic zone and are propelled by sea currents and wind (Ravichandran et al., 2014; Gurlek et al., 2020). *P. porpita* possesses tentacles that are vivid blue colour and a shiny brown gas-filled flat disc (Ozlem, 2017). To defend, reproduce, and capture their prey such as copepods, zooplankton, microscopic fish eggs and larvae, they contain many little tentacles armed with stinging nematocytes. (Pandya et al., 2013; Ravichandran et al., 2014; Lillo et al., 2019). *P. porpita* is preyed upon by nudibranchs such as *Glaucus atlanticus* and *Glaucilla marginata* which belong to the family Glaucidae. Furthermore, the shelled snails *Janthina spp.* construct bubble rafts to stay at the water’s surface and hunt upon *P. porpita*. (Beiri, 1966; Thomson and Bennett 1970). It's also one of the diets preferred by neonatal loggerhead turtles. (Sahu et al., 2020) This cosmopolitan species has been documented from various tropical and subtropical regions of the Indian Ocean, Pacific Ocean and Atlantic Oceans (Lillo et al., 2019).

\* Corresponding Author: Kumaraguru ARUMUGAM, E-mail: bcfconserves@gmail.com

Few experts noticed *P. porpita* swarming on the shores of various Indian coastal locations. During the monsoon season, a considerable number of *P. porpita* washed up on the Veraval beach on India's west coast (CMFRI, 2010). The jelly *P. porpita* (Linnaeus, 1758) was discovered stranded on beaches from Astaranga to Puri in Odisha State in May 2016. (Sahu et al., 2020). In Tamil Nadu, mass beachings of *P. porpita* were observed on the Chennai coast during the Gaja Cyclone in November 2018. (The Hindu, 2019). However, no previous swarming records have been found on Rameswaram Island, and scientific evidence on *P. porpita* drifting in the Gulf of Mannar and the Palk Strait coastline of Tamil Nadu is lacking. As a basis, the purpose of this research is to document a rare mass beaching of *P. porpita* in the Gulf of Mannar (GoM) and to correlate the incidence with wind speed and water currents towards the shoreline. An assessment of this incident was carried out based on the routine field investigation to establish the scientific basis, taking into consideration of various environmental aspects.

### Materials and Method

Rameswaram is a small island located 570 kilometers south of Chennai in the GoM. The Pamban Bridge connects Rameswaram Island to mainland India. The Island is surrounded by rich coral reefs, seaweeds diversity and many marine organisms. In the present study, the mass beaching of *P. porpita* was reported after the Nivar Cyclone hit from December 7 to 14, 2020 in the stretch of 6 km coastline from Vadakadu (Lat:  $9^{\circ}17'55.51''\text{N}$ , Long:  $79^{\circ}19'38.48''\text{E}$ ) to Olaikuda (Lat:  $9^{\circ}19'28.78''\text{N}$ , Long:  $79^{\circ}18'10.74''\text{E}$ ) had been studied in Rameswaram Island, GoM (Figure 1).



Figure 1. Map showing location of *P. porpita* mass beach stranding (Red Line) in Vadakadu-Olaikuda Coastal region, Rameswaram Island, Tamil Nadu.

Field Survey was undertaken immediately after the Nivar Cyclone. The GPS was recorded using a UTM Geo map. The species were photographed during the field study (Figure 2). The morphological characteristics of the species led to its identification as *P. porpita*. Natural Earth Data Source (<https://earth.nullschool.net/>) was used to collect physical parameters such as wind speed and water currents.

## Results and Discussion

The species was identified as *P. porpita* owing to its unique combination of morphological traits such as size, shape, colour, and organism structure. *P. porpita* has a huge hydroid colony with a disc-shaped mantle 2.5 cm in diameter and polyps on the bottom. As indicated by, the mantle and dactylozooids are blue, whereas the centre of the float area is silvery (Calder, 1988; Schuchert, 2010).

According to Zavodnik (1987), physical parameters such as wind speed and ocean currents influence jellyfish distribution. These conditions are thought to cause them to concentrate or swarm along the coast. During the Nivar cyclone, severe winds of 120-130 kmph lashed across Tamil Nadu State, reaching 60 kmph in Rameswaram Island, GoM. (The Hindu, 2020). As per the Natural Earth Data Source, the maximum wind speed 62 kmph and maximum water currents 1.19m/s recorded in the study region in the first week of December 2020, and it shows that the water current and wind flow towards the shore during the event. (Figure 3). The average wind speed and water currents in December in Rameswaram coastline is 29 kmph and 0.8 m/s respectively. The current mass beach stranding of *P. porpita* can be explained as offshore swarming, subsequent drift away and discrete patches along the coastline due to unusual shoreward water currents and wind speed. It can be concluded that due to the Nivar cyclonic effect the *P. porpita* swarming towards the seashore. More research on the movement pattern of these organisms and their association with environmental parameters is the need for the effective prediction of these events.



Figure 2. Beach stranding of *P. porpita* in Vadakadu-Olaikuda Coastline, Rameswaram

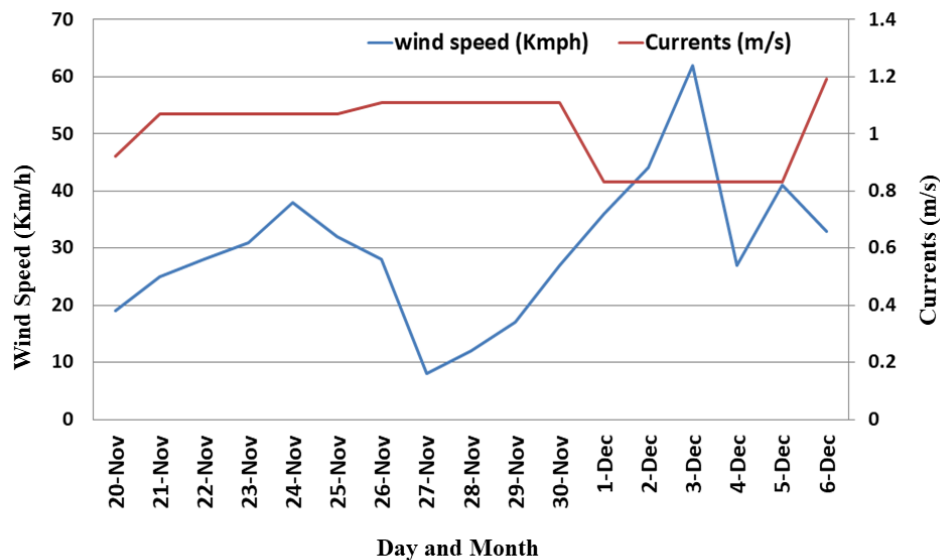


Figure 3. Wind speed and water currents of Rameswaram coastline from November 20 -December 7, 2020. (Source: <https://earth.nullschool.net/>)

### Author Contributions

All author contributions are equal for the preparation research in the manuscript.

### Conflict of Interest

The authors declare that they have no conflict of interest

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