

Occurrence of Ascidians: an initiative from the Gujarat coast, India

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Abstract:

Ascidians belong to the subphylum Tunicata which represents a variety of organisms along the Indian coastal waters. These organisms are known to be a fouling community due to their rapid growth ability. Major finding of the recent research work is to provide an outline of tunicates with their diversity and distribution data along the rocky shores of Gujarat which may provide positive approach in a direction of tunicate research as these group became invasive on most of the substrates. This study reveals 13 species of ascidians along the rocky intertidal stretch with their distribution record.

Key Words: Diversity, Tunicate, Invasive, Intertidal stretch

Introduction:

Ascidians are known as tunicates or sea squirts which belong to the phylum Chordata hence it is also known as the distant cousin of humans, without a backbone. They are having tough outer protective layer 'tunic' which is made up of tunicin which gave the name tunicates to these organisms. As India is known to be a richly biodiverse country and listed among 10 mega biodiversity countries, this research will add more species to the list from the Gujarat coastal stretch. approximately 3000 described species found in all marine habitats (Cameron et al., 2000, Kott, 2005). Notable work was carried out during the last decade by different authorities in India such as Meenakshi (2003), Jaffar Ali et al. (2009), Jaffar Ali & Tamilselvi (2016), Murugan (2018), Tenjing (2018), Kaleemullah (2018) who gave an idea about taxonomic and biological diversity and their distribution. Tunicates are a fouling community that enormously grows on any substratum and may lead to competition for space with the native species. Ascidians require more and more focus due to their ability to be invasive and displace organisms, e.g., bivalves, sponges, hydroids and other ascidians (Bullard et al. 2007; Lengyel et al. 2009).

Materials and Methodology:

Field surveys were conducted along the four rocky shores of Gujarat such as Okha (22°28'N 69°05'E), Dwarka (22°13'N 68°58'E), Shivrajpur (22°33'N 68°58'E) and Veraval (21°35'N 69°36'E) during January to June 2022. Very less samples were collected during the survey and identification was mainly based on high-resolution photographs. Identification was

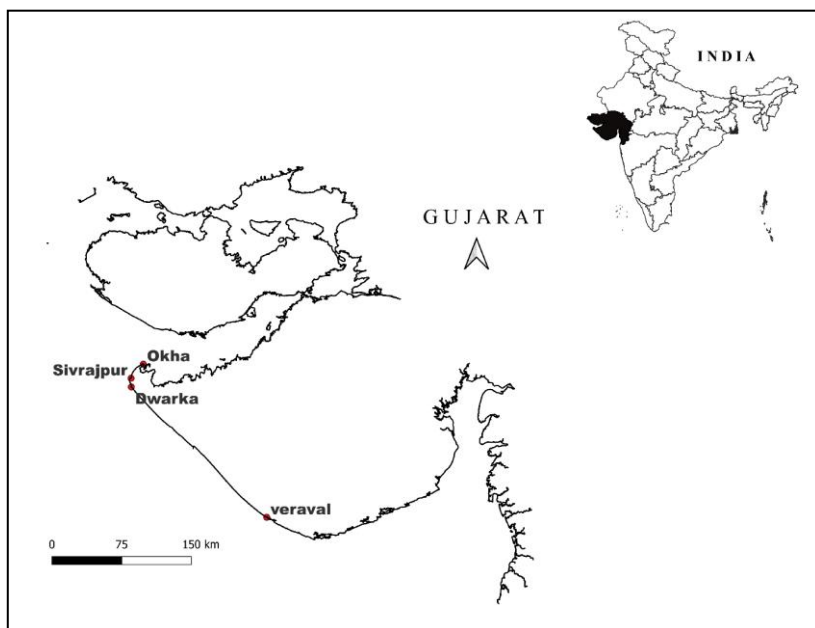


Figure 1: Map showing the sampling sites of Gujarat coastline

carried out by tunicates morphology with the help of identification features given by Meenakshi (2003). Other literature such as prominent research papers, books, and online portals Database, World register of marine species, Marine species identification portal) were also considered for the identification. Location mapping was done

by QGIS 3.10.5. (Figure 1)

Result and Discussion:

Present study on Ascidian diversity from Gujarat coast resulted in 13 species of ascidians belonging to seven different families (Figure 2). The checklist is given below in Table 1. The scientific nomenclature of the species is as per the World Register of Marine Species (WoRMS). Among seven families, Didemnidae sp. were observed dominantly and covers most of the population than the other tunicates although more species were observed from the Styelidae family. Occasional sitting of Salpidae individuals were also noted.

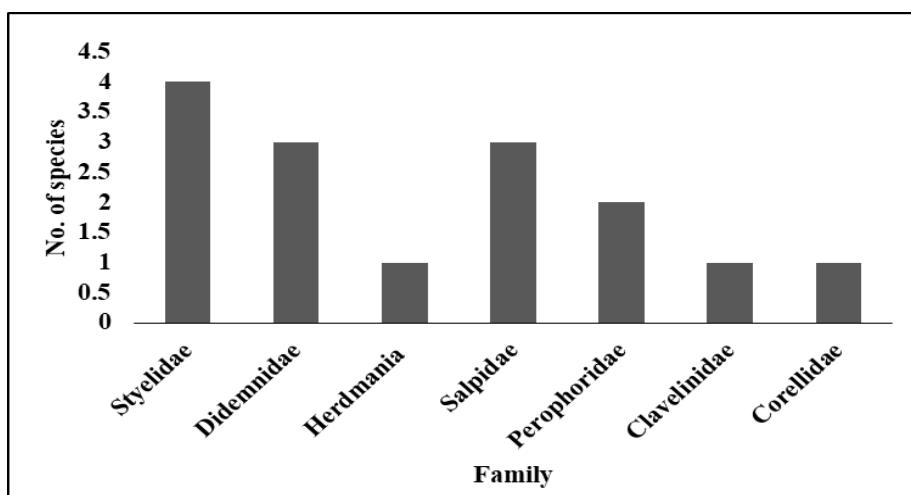


Figure 2: Number of species observed against ascidian families during the study period

Table 1. Diversity and distribution of different Ascidians along selected rocky shore of Gujarat

No.	Species diversity	Distribution			
		Okha	Dwarka	Shivrajpur	Veraval
1.	<i>Botrylloides violaceus</i>	+	+	+	+
2.	<i>Botryllus schlosseri</i>	+	+	+	-
3.	<i>Didemnum psammathodes</i>	+	+	+	+
4.	<i>Rhodosoma turcicum</i>	+	-	-	-
5.	<i>Lissoclinum</i> sp.1*	+	+	-	-
6.	<i>Lissoclinum</i> sp.2*	+	+	+	-
7.	<i>Perophora japonica</i>	+	-	+	-
8.	<i>Symplegma oceania</i>	+	-	+	-
9.	<i>Symplegma brakenhielmi</i>	+	-	-	-
10.	<i>Clavelina</i> sp.*	+	-	+	-
11.	<i>Ecteinascidia thurstoni</i>	-	-	+	-
12.	<i>Herdmania momus</i>	+	+	+	+
13.	<i>Salpa</i> sp.1*	-	-	-	+

(Note: '+' presence, '-' absence, '*' sp. or species identification yet to be done).

Discussion:

Ascidians have been an interesting population for the scientific community in last two decades (Pourquie, 2001). Colonial tunicates were dominant during the field observations. *Didemnum psammathodes* mainly observed underneath the rock and from crevices in between large rock approximately 40-60 cm in size. Similar pattern was discussed by Jaffar et al. (2016). During field surveys, Okha was observed as a hot spot for Ascidians as all the species were found dominant along the Okha coastline. Social tunicates such as *Ecteinascidia* and *Clavelina* species were also reported from Shivrajpur during survey. It inhabits underneath the rocks in small clumps. *Herdmania momus* was the only species of solitary tunicate which was very common from Okha as compared to other sampling sites. Veraval was the coast from where very fewer colonial tunicates were observed. However, a rare

Salpidae sp. was found occasionally from the intertidal belt as the species of salps were found to be pelagic. This distribution pattern is mostly influenced by substrate characteristics which also indicate the composition of tunicates (Tamilselvi and Abdul Jaffar Ali, 2013).

The present research provides a database of 13 species of ascidians with their distribution along the rocky coast of Gujarat, India. As most of the species of ascidians are sedentary, substrates play a significant role in the settlement of these organisms (Patterson Edward and Ayyakkannu, 1992). Many species were observed from artificial substrates instead of Natural substrates or habitats possibly due to anthropogenic activities or man-mediated transportation (Tyrrell and Byers, 2007). In this light, a method of stopping vessel fouling is to keep clean boat hulls regularly and detach tunicates from there. Tidal exposure was mandatory to observe maximum tunicates. It may be noted that more field visits to collect data on various environmental parameters are required to understand their effect on tunicates and their invasiveness on the coastline. This in future might help to avoid habitat loss for native species. This study is important as tunicates play an important role in evolution, ecology and economy.

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