



Checklist of Intertidal Organisms of Dana Pani Beach, Mumbai Suburban, Maharashtra, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Dana Pani Beach is located in Malad West, Mumbai Suburban, Maharashtra at 19°10'10.88"N Latitude and 72°47'18.20"E Longitude. There is very scanty research data available on this beach location. The study was conducted from March 2022 to June 2023. The beach is a tourist place and fishery activities are also carried out which had a heavy impact on the site due to constant anthropogenic interruption. This is a tentative checklist of intertidal flora and fauna to investigate the diversity vis-à-vis environmental and/or anthropogenic devastation caused to the habitat. The species identification was carried out by referencing through respective field guides. The specimens were carried out using DSLR and smartphone camera. and different online repositories based on

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marine faunal and flora. The Intertidal species with the ability to withstand such vagaries (littering the place with broken glasses of alcohol bottles, immersion of idols, and littering plastic bags) were found in abundance. Two marine algal populations in abundance were observed to be *Ulva* and *Gracillaria*. The mangrove community was dominated by *Avicennia marina* and *Sonneratia apetala*. Anthozoans and Polychaetes showed the lowest diversity when compared with other groups of organisms. The bird population was most abundant within the habitat. In order of abundance, the animal population was represented by 20% Aves = 17% Malacostraca = 17% Gastropods > 9% Teleostei > 5% Bivalvia > 4% Hydrozoa > 2% Anthozoans = 2% Hexanauplia = 2% Polychaetes > 1% Cephalopoda > 1% Hexapoda. From the study, it can be concluded that the rocky shore is quite diverse in terms of gastropods, crabs, and green algae in comparison to the sandy shore and mudflat. In totality, 82 faunal and floral species were observed at the site. This checklist is the promising baseline for future studies on this site for the biodiversity of specific animal groups or intertidal ecology.

Keywords: Anthropogenic activities; dana pani beach; flora; fauna; intertidal region.

1. INTRODUCTION

Dani Pani Beach is situated in Malad West of Mumbai Suburban, Maharashtra. Geographically, it is situated at 19°10'10.88"N Latitude 72°47'18.20"E Longitude. The beach is located in the Madh Island area. This location is a busy place where people frequently visit for picnics, walking, cricket play and fishing. The location is adjacent to Aksa Beach. The beach is divided into three types of shores viz. rocky shore, sandy shore and a small area of mudflat.

Unlike any beach found in Mumbai Suburban, this beach is quite different in terms of the formation of rocky shores gradation. The beach is also utilized for bait fishing near the shoreline and also for boat fishing. Dana Pani is also part of film shooting locations. The study on this location is very scanty. The rocky shore boulders were dominated by Hooded oysters and Grapsidae crabs during the pre-monsoon season. This shows high biodiversity and but under high anthropogenic pressure due to the regular litter of food items, plastic items, broken bottles of alcohol. The bags of grains are thrown by the public where stray dogs feed on and birds like House crows and Black kite are also seen scavenging on grains. Like Bandra Bandstand's rocky shore, this beach was covered with patches of mangroves. Intertidal ecology not only connects to oceans but also the terrestrial world making us understand the ecological balance between the two systems. Studies on biodiversity were carried out along the Mumbai sites viz. Girgaon, Haji Ali, and Gorai Creek by Balasaheb et al. [1]. The sampling was carried out from July 2009 to January 2011. In this study, fifty-nine species were recorded belonging to the groups viz. molluscs, arthropods, coelenterates, and

echinoderms. Marine Drive showed the highest number of gastropods and clams. Along Gorai Creek, an abundance of *Telescopium telescopium*, *Potamidus cingulatis*, mudskipper, and fiddler crabs [1-3]. A comparative intertidal faunal biodiversity was carried out on the intertidal region of TIFR (Tata Institute of Fundamental Research), Bandstand (Bandra), and NCPA (National Centre for Performing Arts) from December 2006 to November 2007. In this study, fifty intertidal species were recorded from all three sites which comprise of 41 Gastropods, 5 Pelecypoda, 1 Crustacea, 1 Anthozoa, 1 Cephalopoda and 1 Ophiuroidea [4]. A study on intertidal diversity in South Mumbai (Girgaon Chowpatty and Haji Ali) were carried out during low tide from November 2019 to February 2020 [5]. In Girgaon Chowpatty sandy substratum, Gastropods were dominant (47.1%) followed by Crustacea (29.4%)> Cnidaria (5.9%)> Polychaeta (5.9%) > Bivalvia (5.9%) and Pisces (5.9%). Whereas in Haji Ali rocky substratum, Gastropods were the dominant faunal group (50%) followed by Crustaceans (13%)> Pisces (13%)> Calcara (6%) and Hydrozoa (6%). The lowest diversity was recorded from groups viz. Anthozoa, Tuberculosis, Bivalvia, and Polychaeta [5].

The present study focuses on the preliminary checklist of the site. Since there are no references regarding this site. This data would be a baseline for future biodiversity assessments of this particular site.

2. MATERIALS AND METHODS

Dani Pani Beach is situated in Malad West of Mumbai Suburban, Maharashtra. Geographically, it is situated at 19°10'10.88"N Latitude 72°47'18.20"E Longitude (Figs. 1 & 2).



Fig. 1. Satellite photo of dana pani beach
(Source: Google Earth Pro)



Fig. 2. Study location landscape photo

Seasonal investigation on the site during the low tide period from March 2022 to June 2023. Photographic documentation was done using a phone camera and a DSLR camera (Nikon D5300). Photos of flora and fauna and inanimate objects were documented with landscape photos of beaches to have insight into beach conditions.

Microscopic specimens were identified under a Light Binocular Microscope (LaboMed) was utilized. The microscopic species such as diatoms were observed in 40X magnification.

Identification of photos documented were cross-verified from websites such as

- WORMS (<https://www.marinespecies.org/index.php>)
- Fishbase (<https://www.fishbase.in/search.php>),
- Sealifebase (<https://www.sealifebase.se/search.php>),
- GBIF (<https://www.gbif.org/>) and previous ten years of research study on Mumbai shores.

The floral and faunal species were identified and cross-verified from reference papers and pictorial field guides. A book titled "Sea Shells of India An Illustrated Guide to Common Gastropods" by Deepak Apte was referred to identify gastropod

species. The identification of the bivalves was based on reference books such as “Annotated Checklist of Indian Marine Molluscs (Cephalopoda, Bivalvia and Scaphopoda): Part-1.” by Ramakrishna and A. Dey, and “Biology and ecology of edible marine bivalve molluscs” authored by Ramasamy Santhanam [6-9].

3. RESULTS AND DISCUSSION

Dani Pani Beach is situated at 19°10'10.88"N Latitude 72°47'18.20"E Longitude. The site is quite different from beaches like Juhu Koliwada and Haji Ali Dargah that is situated in Santacruz and Mahalaxmi. In Dani Pani, the rocky shore is hilly with small intertidal pools filled with small fishes, anemones, brachyuran crabs Nerite snails and Cerith snails. Whereas in Juhu Koliwada and Haji Ali Dargah, rocky shores are flat with a high number of small rock boulders whereas in Dani Pani the rock boulders are comparatively larger in size. The rocky shores of Dani Pani were dominated by 2 mangrove species viz. *Avicennia marina* and *Rhizophora mucronata*. Outside the rocky shore, the location is widespread with mangrove-associated species *Thespesia populnea* and *Ipomoea pes-caprae*. The occurrence of sponges is scarce as compared to other Mumbai beaches such as Juhu Koliwada, Haji Ali Dargah and Bandstand Promenade. The abundance of Avifauna (that includes aquatic and residential birds) within and around the beaches is very high due to the high amount of terrestrial and Mangrove trees found within the vicinity of the beaches. The rocky

boulders were widely spread by *Saccostrea cucullata* (Hooded oyster). During low tide and high levels of sunlight, *Graspus* and *Metopograpsus* were mostly observed due to their herbivorous diet [10]. Intertidal pools were usually filled with fishes which are juveniles of species such as *Lutjanus argentimaculatus* and *Ellochelon vaigiensis*. From Diogenidae (Left-handed hermit crabs) family species such as *Clibanarius infraspinus* were commonly found in rocky shores and also in mudflats. *Clibanarius infraspinus* was found to be sheltered in various species of gastropod shells such as *Gyrineum natator*, *Indothais blanfordi*, *Nassarius sp.*, *Nerita oryzae*, *Nerita chamaeleon*, *Nerita albicilla*, *Planaxis sulcatus*, *Telescopium telescopium*, *Trochus maculatus*, *Clypeomorus bifasciata*, *Euchelus asper*. Sandy shores were mostly populated with Dotillidae species such as *Dotilla myctiroides* and *Scopimera sp.* A small mudflat portion is surrounded by Rocky boulders encrusted with hooded oysters. Within the mudflat, there was present a puddle of water which was dominated by *Boleophthalmus dussumieri* (Dussumier’s mudskipper) and brachyuran crabs such as *Gelasimus hesperiae* and *Macrophthalmus sulcatus*. In order of abundance, the animal population was represented by 20% Aves = 17% Malacostraca = 17% Gastropods > 9% Teleostei > 5% Bivalvia > 4% Hydrozoa > 2% Anthozoa = 2% Hexanauplia = 2% Polychaetes > 1% Cephalopoda > 1% Hexapoda. In total, 82 species of flora and fauna were observed during the research study (Table 1; Fig. 3 & Fig. 5).

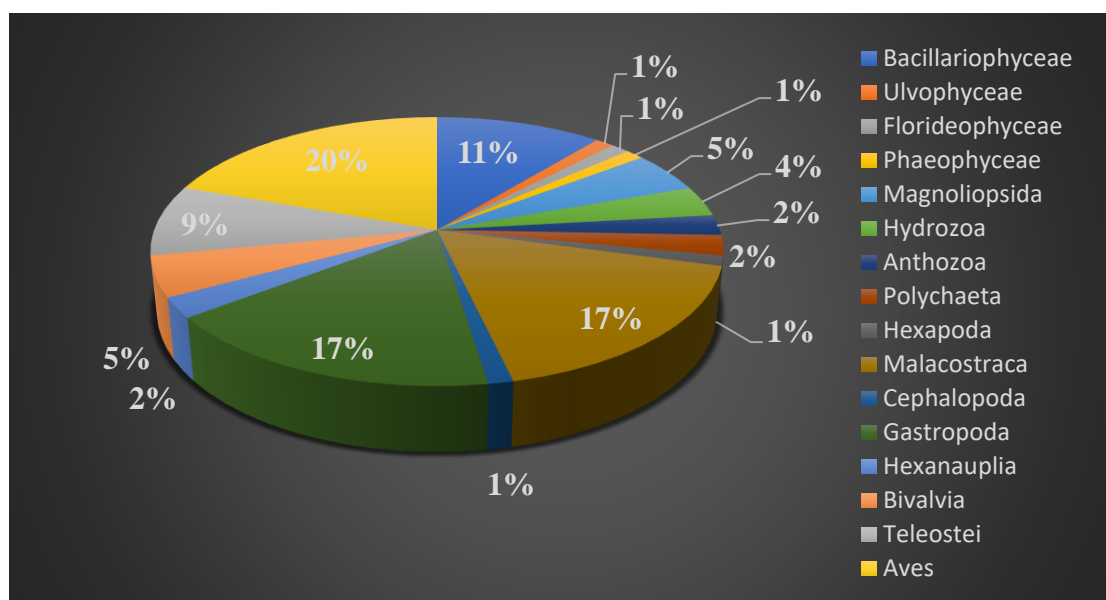


Fig. 3. Number of species from each class found in Dana Pani Beach

Table 1. Checklist of Intertidal flora and fauna

| Sr No. | Family | Scientific Name | Common Name | Observation |
|--------|-------------------|--|--|---|
| 1 | Achnanthaceae | Achnanthes sp. | N/A | Rocky shore (tidal pool) |
| 2 | Biddulphiaceae | <i>Biddulphia</i> sp. | N/A | Rocky shore (tidal pool) |
| 3 | Catenulaceae | <i>Amphora</i> sp. | N/A | Rocky shore (tidal pool) |
| 4 | Entomoneidaceae | <i>Entomoneis</i> sp. | N/A | Rocky shore (tidal pool) |
| 5 | Fragilariaceae | <i>Synedra</i> sp. | N/A | Rocky shore (Found associated to the green algae) |
| 6 | Licmophoraceae | <i>Licmophora</i> | N/A | Rocky shore (tidal pool) |
| 7 | Pinnulariaceae | <i>Pinnularia</i> sp. | N/A | Rocky shore (tidal pool) |
| 8 | Pleurosigmataceae | <i>Gyrosigma</i> | N/A | Rocky shore (tidal pool) |
| 9 | Striatellaceae | <i>Grammatophora</i> sp. | N/A | (Found associated to algal surface) |
| 10 | Dictyotaceae | <i>Padina</i> sp. | Mermaid's fan seaweed | Rocky shore (inside tidal pool) |
| 11 | Gracilariaceae | <i>Gracilaria</i> sp. | Red algae | Rocky shore (inside the tidal pool) |
| 12 | Ulvaceae | <i>Ulva</i> sp. | Sea lettuce | Rocky shore (on the rock) |
| 13 | Acanthaceae | <i>Avicennia marina</i> var. <i>acutissima</i> Staph & Mold. | Grey mangrove | Mudflat & Rocky |
| 14 | Convolvulaceae | <i>Ipomoea pes-caprae</i> (L.) R.Br. | Railroad vine, Goat's foot vine | Sandy shore |
| 15 | Lythraceae | <i>Sonneratia apetala</i> Banks | Mangrove apple | Mudflat and rocky |
| 16 | Malvaceae | <i>Thespesia populnea</i> (L.) Solans ex Correa | Indian tulip tree, Aden apple or Portia tree | Sandy shore |
| 17 | Porpitidae | <i>Porpita porpita</i> (Linnaeus, 1758) | Blue button | Sandy shore |
| 18 | Sertulariidae | <i>Dynamena crisioides</i> (Lamouroux, 1824) | Golden Fern Hydroid | Rocky shore (on the rock and inside the tidal pool) |
| 19 | Sertulariidae | <i>Idiellana pristis</i> (Lamouroux, 1816) | Saw-toothed Fern Hydroid | Rocky shore (on substratum) |
| 20 | Actiniidae | <i>Anthopleura anjunae</i> (Den Hartog & Vennam, 1993) | Anjuna anemone | Rocky shore (inside tidal pool) |
| 21 | Actiniidae | <i>Anthopleura dixoniana</i> (Haddon & Shackleton, 1893) | Banded Bead Anemone | Rocky shore (inside tidal pool) |
| 22 | Nereididae | <i>Nereis</i> sp. | Clam worm | Rocky shore |
| 23 | Onuphidae | <i>Diopatra</i> sp. | Decorator worm | Sandy shore |
| 24 | Gerridae | <i>Halobates</i> sp. | Sea skater | Rocky shore (inside tidal pool) |

| Sr No. | Family | Scientific Name | Common Name | Observation |
|--------|------------------|--|------------------------------|---|
| 25 | Alpheidae | <i>Alpheus sp.</i> | Snapping shrimp | Rocky shore (inside tidal pool) |
| 26 | Balanidae | <i>Amphibalanus amphitrite</i> (Darwin, 1854) | Striped Barnacle | Rocky shore |
| 27 | Chthamalidae | <i>Chthamalus sp.</i> | Chthamalid Barnacles | Rocky shore |
| 28 | Diogenidae | <i>Clibanarius infraspinus</i> (Hilgendorf, 1869) | Orange-striped Hermit Crab | Rocky shore (inside tidal pool) or Mudflat |
| 29 | Dotillidae | <i>Dotilla myctiroides</i> (H. Milne Edwards, 1852) | Asian Solider Crab | Sandy shore |
| 30 | Dotillidae | <i>Scopimera sp.</i> | Sand bubbler crab | Sandy shore |
| 31 | Grapsidae | <i>Grapsus albolineatus</i> (Latreille in Milbert, 1812) | Mottled Lightfoot Crab | Rocky shore (inside tidal pool and within crevices) |
| 32 | Grapsidae | <i>Metopograpsus sp.</i> | N/A | Rocky shore |
| 33 | Leucosiidae | <i>Ryphila cancellus</i> (Herbst, 1783) | Purse crab | Sandy shore |
| 34 | Macrophthalmidae | <i>Macrophthalmus sulcatus</i> (H. Milne Edwards, 1852) | N/A | Mudflat |
| 35 | Matutidae | <i>Matuta victor</i> (Fabricius, 1781) | Common moon crab | Sandy shore |
| 36 | Ocypodidae | <i>Austruca annulipes</i> (H. Milne Edwards, 1837) | Ring-legged Fiddler Crab | Mudflat |
| 37 | Ocypodidae | <i>Gelasimus hesperiae</i> (Crane, 1975) | Western Calling Fiddler Crab | Mudflat |
| 38 | Palaemonoidea | <i>Palaemon pacificus</i> | Indian bait prawn | Rocky shore (inside tidal pool) |
| 39 | Portunidae | <i>Charybdis sp.</i> | Swimming crab | Rocky shore (inside tidal pool) |
| 40 | Xanthidae | <i>Leptodius exaratus</i> (Milne-Edwards, 1834) | N/A | Rocky shore |
| 41 | Loliginidae | <i>Uroteuthis (Photololigo) duvaucelii</i> (d'Orbigny [in Férussac & d'Orbigny], 1835) | Indian squid | Sandy shore |
| 42 | Cerithiidae | <i>Clypeomorus bifasciata</i> (G. B. Sowerby II, 1855) | Double-banded Creeper | Rocky shore |
| 43 | Chilodontaidae | <i>Euchelus asper</i> (Gmelin, 1791) | Toothed top shells | Rocky shore (inside the tidal pool) |
| 44 | Cymatiidae | <i>Gyrineum natator</i> (Röding, 1798) | Common Triton Snail | Rocky shore (inside tidal pool) |
| 45 | Melongenidae | <i>Volegalea cochlidium</i> (Linnaeus, 1758) | Spiral melongena | Rocky shore (inside tidal pool) |
| 46 | Muricidae | <i>Indothais blanfordi</i> (Melville, 1893) | Blandford's Whelk | Rocky shore (inside tidal pool) |
| 47 | Nassariidae | <i>Nassarius sp.</i> | Nassa Mud Snails | Rocky shore (inside tidal pool) |
| 48 | Neritidae | <i>Nerita albicilla</i> (Linnaeus, 1758) | Blotched Nerite | Rocky shore (inside tidal pool) |
| 49 | Neritidae | <i>Nerita chamaeleon</i> | Chamaeleon | Rocky shore (inside |

| Sr No. | Family | Scientific Name (Linnaeus, 1758) | Common Name | Observation |
|--------|--------------|--|---------------------------------|---|
| 50 | Neritidae | <i>Nerita oryzarum</i> (Récluz, 1841) | N/A | Rocky shore (inside tidal pool) or Mudflat |
| 51 | Olividae | <i>Agaronia gibbosa</i> (Born, 1778) | Gibbous Olive | Rocky and Sandy shore |
| 52 | Planaxidae | <i>Planaxis sulcatus</i> (Born, 1778) | Tropical Periwinkle | Rocky shore (inside tidal pool) |
| 53 | Potamididae | <i>Pirenella cingulata</i> (Gmelin, 1791) | Girdled horn shell | Rocky shore or Mudflat |
| 54 | Potamididae | <i>Telescopium telescopium</i> (Linnaeus, 1758) | Mud Creeper | Rocky shore or Mudflat |
| 55 | Trochidae | <i>Trochus maculatus</i> (Linnaeus, 1758) | Red-spotted topshell | Rocky shore |
| 56 | Donacidae | <i>Donax scortum</i> (Linnaeus, 1758) | N/A | Rocky shore and sandy shore |
| 57 | Ostreidae | <i>Saccostrea cucullata</i> (Born, 1778) | Hooded Oyster | Rocky shore firmly attached to rock boulders) |
| 58 | Veneridae | <i>Dosinia sp.</i> | Saltwater clams | Sandy shore |
| 59 | Veneridae | <i>Gafrarium divaricatum</i> (Gmelin, 1791) | Forked Venus clams | Rocky shore |
| 60 | Blenniidae | <i>Istiblennius sp.</i> | Rockskippers | Rocky shore (within the tidal pool) |
| 61 | Gobiidae | <i>Bathygobius sp.</i> | Frill-goby | Rocky shore (within the tidal pool) |
| 62 | Gobiidae | <i>Boleophthalmus dussumieri</i> (Valenciennes, 1837) | Dussumier's Mudskipper | Mudflat |
| 63 | Lutjanidae | <i>Lutjanus argentimaculatus</i> (Forsskål, 1775) | Mangrove red snapper | Rocky shore (within the tidal pool) |
| 64 | Mugilidae | <i>Ellochelon vaigiensis</i> (Quoy & Gaimard, 1825) | Squairetail mullet | Rocky shore (within the tidal pool) |
| 65 | Mugilidae | <i>Mugilogobius sp.</i> | N/A | Rocky shore (within the tidal pool) |
| 66 | Ophichthidae | <i>Pisodonophis sp.</i> | N/A | Rocky shore (within the tidal pool) |
| 67 | Accipitridae | <i>Milvus migrans</i> (Boddaert, 1783) | Black kite | Sandy shore |
| 68 | Alcedinidae | <i>Alcedo atthis</i> (Linnaeus, 1758) | Common Kingfisher | Rocky shore |
| 69 | Ardeidae | <i>Ardea cinerea</i> (Linnaeus, 1758) | Grey Heron | Rocky shore and Mudflat |
| 70 | Ardeidae | <i>Casmerodius albus</i> (Linnaeus, 1758) | Great White Egret | Rocky shore and Mudflat |
| 71 | Ardeidae | <i>Egretta garzetta</i> (Linnaeus, 1766) | Little egret | Rocky shore and Mudflat |
| 72 | Ardeidae | <i>Egretta gularis</i> (Bosc, 1792) | Western Reef-egret (Bosc, 1792) | Rocky shore and Mudflat |
| 73 | Ardeidae | <i>Egretta intermedia</i> (Wagler, 1829) | Intermediate Egret | Rocky shore and Mudflat |

| Sr No. | Family | Scientific Name | Common Name | Observation |
|--------|--------------|--|-----------------------|-----------------------------|
| 74 | Charadriidae | <i>Charadrius mongolus</i> (Pallas, 1776) | Lesser Sand plover | Rocky shore and Sandy shore |
| 75 | Corvidae | <i>Corvus splendens</i> (Vieillot, 1817) | House Crow | Rocky shore and Sandy shore |
| 76 | Corvidae | <i>Corvus macrorhynchos</i> Wagler, 1827 | Large-billed Crow | Rocky shore and Sandy shore |
| 77 | Columbidae | <i>Columba livia</i> Gmelin, JF, 1789 | Rock Pigeon | Rocky shore |
| 78 | Hirundinidae | <i>Hirundo smithii</i> (Leach, 1818) | Wire-tailed Swallow | Rocky shore |
| 79 | Muscicapidae | <i>Copsychus saularis</i> (Linnaeus, 1758) | Oriental Magpie-Robin | Rocky shore |
| 80 | Passeridae | <i>Passer domesticus</i> (Linnaeus, 1758) | House Sparrow | Rocky shore |
| 81 | Pycnonotidae | <i>Pycnonotus cafer</i> (Linnaeus, 1766) | Red-vented Bulbul | Rocky shore |
| 82 | Pycnonotidae | <i>Pycnonotus jocosus</i> (Linnaeus, 1758) | Red-whiskered Bulbul | Rocky shore |

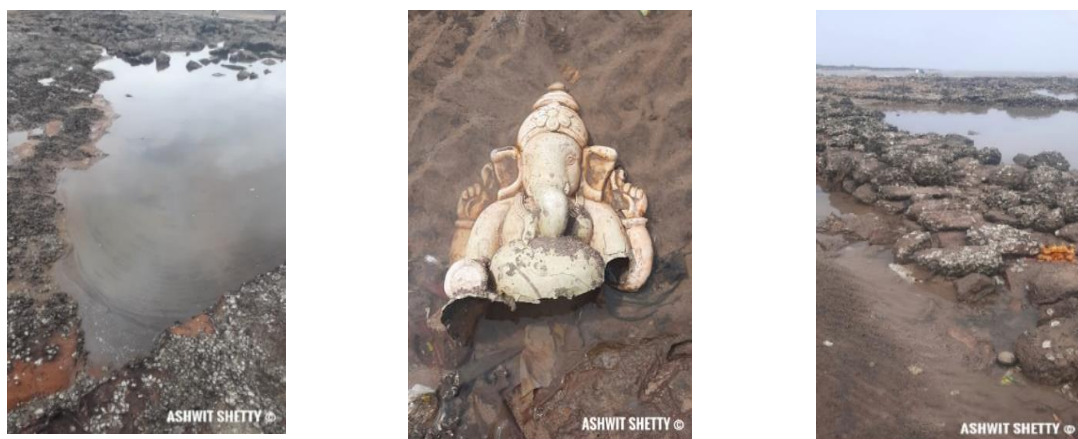


Fig. 4. Intertidal site polluted with idols

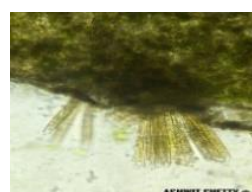


Achnanthes sp.

Biddhulphia sp.

Amphora sp.

Entomoneis



Synedra sp.



Licmophora sp.



Pinnularia sp.



Gyrosigma sp.



Grammatophora



Padina sp.



Gracilaria sp.



Ulva sp.



Avicennia marina



Ipomoea pes-caprae



Sonneratia apetala



Porpita porpita



Dynamena crisioides



Idiellana pristis



Anthopleura anjunae



Anthopleura dixoniana



Nereis sp.



Dioptra sp.



Halobates sp.



Alpheus sp.



Amphibalanus amphitrite



Chthamalus sp.



Clibanarius infraspinus
(sheltered inside *Euchelus asper*)



Dotilla myctiroides



Scopimera sp.



Graspus albolineatus



Metograspus sp.



Ryphila cancellus



Macrophthalmus sulcatus



Matuta victor



Austruca annulipes



Gelasimus hesperiae



Palaemon pacificus



Charybdis sp.



Leptodius exaratus



Uroteuthis (Photololigo) duvaucelii



Clypeomorus bifasciata



Euchelus asper



Gyryneum natator



Indothais blanfordi



Nassarius sp.



Nerita albicilla



Nerita chamaeleon



Nerita oryzae



Agaronia gibbosa



Planaxis sulcatus



Pirenella cingulata



Telescopium telescopium



Trochus maculatus



Donax scortum



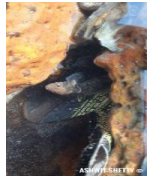
Saccostrea cucullata



Dosinia sp.



Gafarium divaricatum



Istiblennius sp.



Bathygobius sp.



Boleophthalmus dussumieri



Lutjanus argentimaculatus



Ellochelon vaigiensis



Mugilogobius sp.



Pisodonophis sp.



Milvus migrans



Egretta garzetta



Corvus splendens
and *Corvus macrorhynchos*



Passer domesticus



Columba livia

Fig. 5. Images documented of flora and fauna from the study site - Dana Pani Beach

In terms of species composition of Crustacean, the Grapsidae is abundant as compared to other crustacean families. In a study conducted by Pawar from June 2013 to May 2015, Grapsidae showed 2nd highest species distribution which was about 16.13% after Portunidae which was about 29.03% in three substations creeks of Uran viz. Sheva creek, Peerwadi coast and Dharamtar creek [11]. In this study, the maximum species diversity of brachyuran crabs was recorded during pre-monsoon and monsoon

seasons [11]. In a study conducted by Balasaheb et al. from July 2009 to January 2011 on intertidal biodiversity in Girgaon, Marine Drive, Haji Ali and Gorai Creek. In that study, *Leptodius exaratus* is a common Xanthidae crustacean in Gorai Creek. Portunidae crabs such as *Charybdis japonica* are common in Marine Drive, Haji Ali Dargah and Gorai Creek. Grapsidae species were plentiful in human-made structures of stone and cracks in wooden elements of a bridge. The fiddler or dhobi crabs of three

species viz. *Uca annulipes* (accepted scientific nomenclature: *Austruca annulipes*), *U. vocans* (accepted scientific nomenclature: *Gelasimus vocans*), and *U. dussumieri* (accepted scientific nomenclature: *Tubuca dussumieri*) were found abundantly in marshy places in mangrove swamps of Gorai creek [1]. From Family Balanidae, *Balanus amphitrite* (accepted scientific nomenclature: *Amphibalanus amphitrite*) is common in Marine Drive and *Balanus variegatus* (accepted scientific nomenclature: *Amphibalanus variegatus*) is common in Girgaon Chowpatty and Haji Ali Dargah. From Family Alpheidae, 2 species viz. *Alpheus euprosyne* and *A. heterochaelis* are common in Marine Drive and Haji Ali Dargah. Portunidae crabs such as *Charybdis japonica* are common in Marine Drive, Haji Ali Dargah and Gorai Creek [1]. A study conducted by Mangale and Kulkarni on Fiddler Crabs biodiversity in the Mumbai region showed that *Uca annulipes* (accepted scientific nomenclature: *Austruca annulipes*) were abundant in all study sites viz. Madh Marve Jetty, Malad shore, Sewri shore, Vashi and Nerul shore and Panvel and Karanja Creek [12].

The site showed a lot of species abundance from Neritidae as compared to other Gastropod families. In a study conducted by Salvankar and Jadhav from November 2018 to October 2019 on mollusc (Gastropod and Bivalve) diversity from Vasai-Virar Beaches. Beaches included Suruchi Beach, Bhuigaon Beach, Kalamb Beach, Rajodi Beach and Arnala Beach. In this study, four Neritidae species viz. *Nerita albicilla*, *N. balteata*, *N. costata* and *N. oryzarum* are found in all beaches of Vasai-Virar [13].

The avifauna constitute 20% of species on the beaches which consist of aquatic and residential birds in the study site. Because around the vicinity of the beaches are the terrestrial trees and mangrove trees in and around Dana Pani. The most abundant family observed were the Ardeidae on this beach during the study period. A similar survey on Avifauna was conducted by Chauhan et al., from March 2004 to July 2005 in Gorai Creek. It showed that individuals from families such as Ardeidae, Cuculidae, Muscipidae, Passeridae, Sturnidae and Corvidae were dominant throughout the study period. This might be due to the availability of food, shelter and less exposure to humans [14].

In terms of microorganisms, various diatoms were observed from genus *Achnanthes*,

Biddulphia, *Entomoneis*, *Synedra*, *Pinnularia*, *Grammatophora*, and *Licmophora*. Out of this genus, *Pinnularia* was most commonly observed. The most prevalent phytoplankton species in aquatic settings are diatoms. Diatoms are less studied than other types of algae, particularly in India, due to a variety of factors including a lack of literature, a time-consuming separation technique, and eye-straining straining study/observation since they are visualized under oil immersion [15]. In a study conducted on the seasonal abundance of microalgae along Mumbai's rocky shores of Aksa and Bandra, from September 2010-April 2011. The study showed a higher species richness of microalgae in tidal pools in both Bandra and Aksa during the post-monsoon period but Aksa beach showed a more homogenous microalgal population and it might be due to more nutrients in water bodies. Also, during pre-monsoon analysis, both sites showed that species were evenly distributed. In both places the diatoms viz. *Nitzschia spp.*, *Navicula spp.* and *Thalassiosira* were most commonly in both places [16].

The beach is quite a busy site due to picnics; cricket play and fishing. However, due to this high level of Anthropogenic activities biodiversity lives in under the pressure of contamination of the ecosystem. The tidal pool showed murkiness due to litter of plastic bottles, plastic bags and idols made up of Plaster of Paris (PoP). This litter object takes many years to degrade in the environment causing detrimental effects on the ecosystem. The littering caused by anthropogenic effects may not only limit itself to the beach but also beyond the shores in the ocean waters affecting the marine life living within that ecosystem. Because of the plastic objects, the issues such as microplastic will take rise leading to detrimental effects on fauna and flora life in the ocean ecosystem. Dani Pani Beach is also a fishing site for boat fishing and individual bait fishing for fish consumption. If such an anthropogenic pressure that is affecting marine life is not mediated, it can lead to detrimental effects on fish that are consumed. Since the area is a fishing site. There was no siting of by-catch rep near shore. The nearby places from the study sites such as Marve Beach and Gorai Creek showed the presence of sea snakes due to by-catch [17].

4. CONCLUSION

The study shows that the beach shows an abundance of Avifauna, Brachyuran and

Gastropods. The place is under high anthropogenic pressure due to the litter of the packets, bottles and idols (Fig. 4). Due to these intertidal pools water becomes murky. This preliminary survey would be the baseline for future research on this site.

5. RECOMMENDATIONS

- Monthly or Quarterly clean-up would be recommended to be organized by a non-profit organization.
- Annual report on physiochemical parameters of the beach and to take effective measures on the environmental related to sedimentary and aquatic issues of the beach.
- To create awareness about the beach ecology aspects.
- A marine walk to be organized for schools and colleges to educate about the habitat and its benefits to the fishery communities.

FUTURE SCOPE

- Since there were 82 species of total fauna and flora recorded from Dana Pani Beach. With a holistic approach, a seasonal study can be performed to evaluate biodiversity data of the flora and fauna of the beach.
- The seasonal study of biodiversity will give an outlook on season-wise variation in a population of different flora and fauna within the study site.

CONFERENCE DISCLAIMER

Some part of this manuscript was previously presented and published in the conference: An International Conference on Coastal and Marine Conservation CMC-2024 dated from 1st and 2nd March, 2024 in Mumbai, India. Web Link of the proceeding: <https://mithibai.ac.in/wp-content/uploads/2024/02/CMC2024-CONFERENCE-brochure..pdf>

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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