

Flora of Beyt Shankhodhar in the Gulf of Kuchchh

UNTAWALE A G AND AMBIYE VIJAYA

National Institute of Oceanography, Goa, India.

Different types of flora of Beyt Shankhodhar in the Gulf of Kuchchh have been studied with reference to the abiotic and biotic factors.

Major floral groups were both of terrestrial and marine habitats. Most of the terrestrial plants are of xerophytic nature and scanty due to the extreme climatological conditions. About 33 species of angiosperms have been recorded from this island. Qualitative distribution of the intertidal marine algae of this island indicated 120 spp. belonging to chlorophyta (18 genera - 33 species), Phaeophyta (20 genera - 34 species) and Rhodophyta (43 genera - 54 species). Most common were represented by the genera *Ulva*, *Codium*, *Caulerpa*, *Dictyota*, *Padina*, *Stoechospermum*, *Hypnea* and *Acanthophora*.

Mangrove flora was conspicuously absent perhaps because of the strong current and 'tidal bore'.

INTRODUCTION

Beyt Shankhodhar in the Gulf of Kuchchh is also called as "Beyt Dwarka". As the shape of this island resembles conch shell, which are extensively found along this shore, it is named as "Beyt Shankhodhar". Mythologically it was the summer resort of Lord Shri Krishna. It is 2 km off Port Okha (Gujarat) (Fig. 1).

Archaeologically it is proved that the entire part of the Gulf of Kuchchh was almost dry land, 9000 years ago and Dwarka Island must have been connected to the mainland of Okha. This is because of the tidal dominance in the entire Gulf of Kutch. (Rao, 1987: 22-30). As a result of this present Beyt Shankhodhar got separated from the mainland of Okha. A series of drastic ecological changes must have taken place in this process which ultimately resulted in the formation of several islands where now arid climate, scanty rainfall and xerophytic flora prevail.

Several taxonomists have studied the flora of west coast of India (Cooke, 1901-1909, Talbot, 1909-1911), but they neglected the islands. Blatter (1908-1909: 756-77) also studied the flora of Gulf of Kuchchh. Rao *et al* (1964: 31-42; 1966: 16-24) studied ecology of Saurashtra and neighbouring islands for strand flora. Misra (1960: 187-203) studied ecology, distribution and seasonal succession of marine algae of India, where he has discussed the Gulf of Kuchchh region. Chauhan *et al* (1968-1978: 648) surveyed the Saurashtra coast and Gulf of Kuchchh for seaweed resources. Bhandari and Trivedi (1974: 97-99) have evaluated the algal resources along Hanumandandi and Vumani reef of Beyt Shankhodhar.

These islands are very interesting from the view point of phytogeography and thus show similarity of floristic and faunistic elements, as well as geological structures with adjacent mainland. Present paper deals with the flora of Beyt Shankhodhar and factors affecting the vegetation.

Geomorphology : Beyt Shankhodhar is a narrow strip of sand and rocks and is 13 km long. The east end of Beyt Shankhodhar is composed of sand hills covered by bushes and is called "Hanuman Point". The south eastern point is called as "Padmatirth Point" (Fig. 2). Between the sandy southeast of Beyt Shankhodhar and

mainland of Okhamandal the passage is very shallow having bank in the mid-channel which is nearly dry during low tides (Gujarat Gazetteer 1970: 634).

Geology : The substratum is composed of miliolite and called as "Porbandar stone" (Ahmed, 1972: 222). It is covered with silt, sand and clay.

Climate : The climate of this area is arid to semi-arid. Climatological data from meteorological observations at Dwarka show total annual rainfall ranging from 100-220 mm. Maximum temperature varies from 35 ° - 38°C. Minimum temperature ranges from 15 ° - 20° C. The extreme temperatures show $\pm 5^\circ$ C fluctuations. Average wind velocity is 17.1 knots/hr. Relative humidity is maximum during monsoon, and varies from 70-80%. Tidal amplitude (also called as Tidal-bore) varies from 6-7 meters. Tide increase in the velocity near Beyt from 2-3 knots to 3-4 knots/hr at Dwarka.

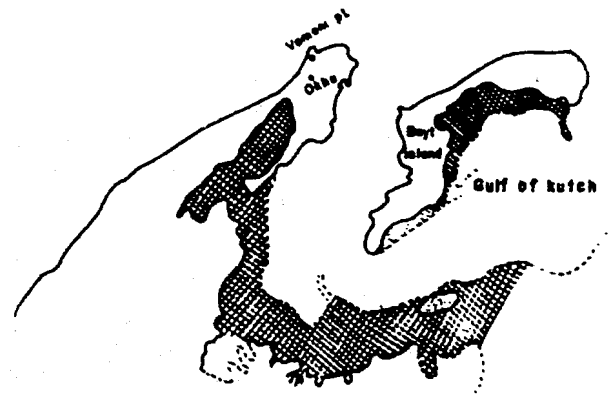


Fig. 1 Beyt Shankhodhar in the Gulf of Kutch

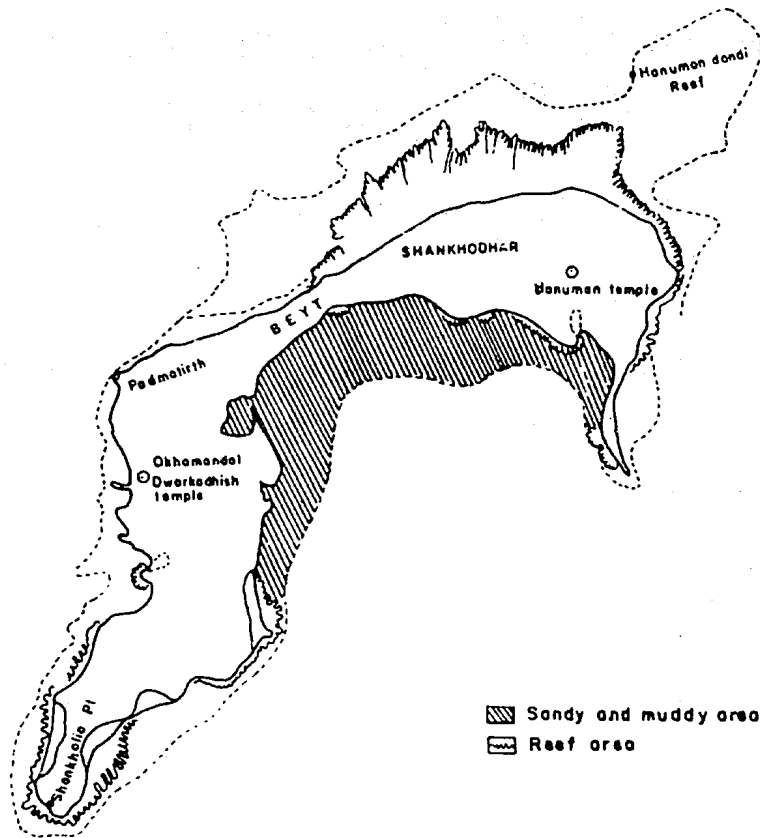


Fig. 2 Beyt Shankhodhar

Vegetation : The entire flora of Beyt Shankhodhar can be classified into two major groups:

1. Terrestrial flora
2. Intertidal flora

1. *Terrestrial flora* : It is composed of herbs, trees and shrubs inhabiting the central region of this island. Altogether 33 plants belonging to 21 families have been collected from this area. This can be subdivided into (a) *land plants* (b) *sand dunes*.

a. *Land plants* : It is mainly composed of dry, deciduous, thorny shrubby plants. Trees are rarely seen. Unsatisfactory growth of trees is due to indiscriminate grazing and cutting. *Caryota urens*, *Acacia catechu*, *Zizyphus* spp. are very commonly seen in this island. Herbal flora includes *Boerahaavia diffusa*, *Achyranthus aspera*, *Launea pinnatifida*, *Saunhus* sp., *Cyperus aranarius*, *Coldenia procumbens*, *Trichodesma indicum*, *Cressa critica*, *Capparis aphylla*, *Thevetia nerifolia*, *Calotropis gigantea*, *Hemidesmus indicus*, *Suaeda maritima* are common shrubs.

b. *Sand dunes* : These sand dunes show the presence of formation of psammophytic vegetation, mostly of herbaceous spp. These plants have ability to bind sand, rapid regeneration, and reproduction. They can also tolerate high temperatures and low water requirements. *Ipomea pes-caprae*, *Launea pinnatifida*, *Spinifex squarrossus* and several other grasses and sedges are the common sand dune plants on this island. Along with these dunes *Cyperus aranarius*, *Portulaca* sp., *Periploca aphylla*, *Prosopis*

spicigera are found in association.

2. *Intertidal flora* : The marine flora is represented by several species of a) *marine algae* and b) *seagrasses*. It shows complete absence of mangroves.

a. *Seagrasses* : Very few plants of *Halophila ovalis*, *Cymmodocea rotundata* are observed mostly in the region where the substratum is covered with the silt.

b. *Marine algae* : The growth of marine algae is dependent on various factor like tides, wave action, nature of substratum, salinity and nutrients. Marine algal flora of Beyt Shankhodhar is remarkably rich and supported by gently sloping littoral region, with extensive flat areas, rock pools and puddles. Similarly, the dead coralline substratum also provides very good substratum.

The marine algal zonation according to the tidal positions at Beyt Shankhodhar are discussed below :

i) *Supra littoral zone* : This belt is recognised as blackish green belt on sandy soil substratum. *Lyngbya majescula*, *Phormidium* sp. and *Calothrix* sp. are important members of this belt.

The shallow pools of this belt show association of *Laurencia*, *Chondria*, *Ectocarpus*, etc.

ii) *Upper midlittoral zone* : This green belt is composed of algae like *Ulva beytensis*, *Ulva fasciata*, *Enteromorpha* sp., *Cladophora* sp. and *Struvea* sp.

iii) *Lower midlittoral zone* : This zone is characterised by the abundance of brown algae in this belt and includes algae like *Colpomenia sinuosa*, *Iyengaria stellata*, *Hydroclathrus clathrutus*,

Boodlea sinensis, *Sargassum* spp and *Cystoseira* sp. In the shallow water puddles algal population is represented by the species of *Caulerpa*, *Cladophoropsis*, *Laurencia*, *Gracilaria*, *Halimeda* and *Udotea*.

iv) *Infralittoral zone* : Species of *Champia* *Gracilaria*, *Padina*, *Gastroclonium* are the characteristic of this zone.

The shallow puddles in this zone show abundant and varied growth of *Halymenia porphyroides*, *Scinaia indica*, *Scinaia hatei*, *Grateloupia indica*, *Sebdenia polydactyla*.

In the rock pools of this belt, thick growth of coralline algal species like *Amphiroa*, *Jania*, *Cheilosporum* is observed. *Gracilaria* and *Laurencia* are found in association.

Seasonal variation has accounted for the algal population of each belt.

Approximately 120 marine algae belonging to chlorophyta, (18 gen. 33 sp), Phaeophyta (20 gen. 33 sp), Rhodophyta (43 gen. 54 sp.) have so far been reported from this island.

CONCLUSIONS

1. Flora of Beyt island shows predominance of marine algae. Species diversity and abundance of marine algal flora is supported by various environmental factors. In comparison with the land plants there is minimum environmental and biotic pressure on marine algae.

2. Terrestrial vegetation is adversely affected because of scanty rainfall and arid climate. Therefore, only xerophytic plants grow under these conditions because of their ability to withstand wide range of temperatures and edaphic conditions.

3. Due to the paucity of food, fodder and fuel there is over exploitation of land plants by the local people.

4. Although the muddy shore facing the mainland is suitable for mangrove growth, the fast water current and tidal bore of 6-7 m prevent their establishment and growth.

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