Floristic Diversity of Diu Island

P. P. Sharma and R. L. S. Sikarwar*
Shri Muktanand College, Gangapur, Aurangabad (MH)
*Arogyadham, Deendayal Research Institute, Chitrakoot,
Dist. Satna-485 780, M.P.
Email: dr_ppsharma@yahoo.co.uk, rlssikarwar@rediffmail.com

Introduction

The Union Territory of Daman and Diu, one of the former Portuguese colonies is situated on the edge of southern borders of Gujarat State. It came into separate existence on 30th May 1987, after de linking from Goa which attained statehood on the same date.

The word 'Diu' is derived from the Sanskit word "Dweep", means "Island". Diu is a beautiful and quiet secluded, tiny island, situated between the 20°41'–20044'N and 70°52'–71 °0' E. Spread over an area of about 40 sq. km, of which 363 ha is covered by food crops and about 430 ha is utilized for cash crops like coconut, vegetables, etc. This island is bounded by 'Chasi' river on the north and on the remaining three sides, it is hugged by Arabian Sea. On the north Chasi river separates Ghoghla from the mainland of Junagadh district of Gujarat State. Ghoghla together with another tiny Simbor island (situated few kilometers away, east of Diu along the coast) forms a part of Diu district.

Small hillocks, rising like mounds of gold surround the island, and they attain a maximum height of not more than 30 meters. While in Diu very thin cover of light brown sandy loam soil is present. Soils are neutral to slightly alkaline. According to Rao and Agarwal (1964), the climate of Diu is typical of humid subtropical with concentration of precipitation in warm season, the high humidity in conjunction with the high temperature results in sultry, oppressive conditions in contrast to dry summer heat. Average annual rainfall is about 540 mm and temperature varies from 20°C to 36°C. Relative humidity in both the areas is high during rainy season and low during summer, the percentage varying from 55 to 87 throughout the year.

Diu Island is devoid of natural forest as such. Different kinds of habitats found in these areas are sand stone pits, soil filled rocky creeks, salt pans, sandy belt along sea shore, swampy backwater areas and road sides. Based on the habitat preference of different plant communities, vegetation can be classified as :

1. Rock strand vegetation,
2. Sandy sea shore vegetation and
3. Inland sandy plain vegetation.

Plants growing in rocky habitat along sea shore are stunted or of creeping life form, may be due to constant high velocity wind and effect of sun rays.

In Diu considerable rocky area is exposed to Arabian Sea, even sandy beaches are intercepted in some areas by rocky shoreline. The exposed rocks with holes and crannies are often filled up with sandy soil. Plants forming large populations in such habitat are *Statice stocksii, Lepidagathis trinervis* and *Serricostoma pauciflorum*, etc. *Atriplex stocksii, Euphorbia indica, Glinus oppositijolius, Goniogyna hirta, Indonesiella echioides, Lindenbergia indica, Polycarpaea spicata, Portulaca quadrifida, Tephrosia uniflora* ssp. *petrosa* are the common prostrate or stunted species found in this habitat.

Root parasite *Striga gesnerioides* var. *minor* is rather frequent in Diu on *Indoneesiella echioides* and *Lepidagathis trinervis.*

In Diu slightly interior of the sea shore, where soil is more sandy than rocky, species like *Aerva lanata, Bombax micranthus, Celosia argentea, Clerodendrum multiflorum, Crotalaria retusa, Leucas aspera* and *Trianthema decandra*, etc. are common.

The sandy or strand vegetation is found all along the narrow sandy beaches. While in narrow stripes of muddy flats mangrove vegetation is found in Diu. Common components growing in such a habitat are *Acacia nilotica* ssp. *indica, Aloe barbadensis, Ipomoea pes-caprae, Jatropha gossypifolia, Lantana sp., Sericostoma pauciflorum* and *Solanum suratfense, etc. Ipomoea pes-caprae forms extensive patches all over the foreshore,* along with *Halopyrum mucronatum* and other common sand binders like *Aeluropus lagopoides, Cyperus arenarius* and *Launaea sarmentosa.*

The grass *Halopyrum mucronatum* forms gregarious patches along sea shore, mixed with *Goniogyna hirta* and

Convolvulus microphyllus, occupying a borderline between pure strand flora and the inland flora.

Muddy flats towards northern end of Diu, at the bank of Chasi River harbour mangrove species *Avicennia marrina* var. *acutissima*. Other species found in association are *Acanthus ilicifolius, Aegiceras corniculatus, Sonneratia apetala, Salicornia* sp. and a few members of Cyperaceae and Poaceae like *Apluda mutica, Arthraxon lancifolius, Digitaria ciliaris, Eragrostis ciliaris and Fimbristylis polytrichoides*, etc.

The gravelly soil in Diu, deposited by thin mantle of sand, harbour plants like *Acacia nilotica. Cassia italica. Enicostema verticillata. Euphorbia hirta, Heliotropium zeylanicum. Jatropha gossypifolia, Leucas aspera, Lotus garcini and Pedalium murex, etc.* The plants like *Calotropis procera, Capparis decidua* and *Euphorbia neriifolia* are also common.

The branched palm *Hyphaene dichotoma* and other palms and trees like *Borassus flabellifer, Phoenix sylvestris. Pilhecellobium dulce, Pongamia pinnata, Tamarindus indica* and *Thespesia populnea*, etc. are common. The palm species *Hyphaene dichotoma* and *Phoenix sylvestris* are abundant in Diu. The Union territory is ideal for coconut cultivation, most of the cultivated area of Diu is densly covered by *Cocos nucifera* plantations.

Common hedge plants in the island are *Cadaba fruticosa, Capparis sepiaria. Cordia dichotoma. C. gharaf, Lantana* sp. and *Pongamia pinnata*. Common climbers found are *Cayratia trifolia, Cliloria ternatea, Cocculus hirsutus, Ipomoea sepiaria* and *Mukia maderaspatana*. Near the salt pans, halophytes, like *Suaedea* sps. and *Arthrocnemum* sp. are found together with grasses and sedges like *Aeluropus lagopoides, Fimbristylis poolytrichoides, Cymbopogon parkeri. Chloris montana* and *Urochondra setlilosa*. etc.

Previously the plant accounts of Diu were not worked out thoroughly ever though some workers like Cooke (1901-1908), Talbot (1909-1911, Saxton & Sedgwick (1918), and several others made notable contributions to the floristic studies of Western India. Inspite of such a good work on the plants of Western India data on the plants of Diu based on authentic herbarium material were lacking, except for few from Daman by Bhide (Rao, 1985).

Rao and Agarwal (1964), while working on the ecology of Saurashtra coast and neighbouring islands has studied the ecology of Diu Island. Flora of Goa. Diu, Daman, Dadra and Nagar Haveli have been worked out by Rao (1985), with extensive exploration of these areas. Singh and Sharma (1999) worked out floristic diversity of Dadra Nagar Haveli, Daman and Diu.

Rao (1985) while working for the flora of Goa, Diu, Daman, Dadra and Nagar Haveli has recorded 404 angiosperm species belonging to 267 genera and 76 families from Daman and Diu alone.

The largest ten families in Diu are Poaceae (34 genera and 56 species), **Fabaceae** (21 genera and 37 species), **Asteraceae** (16 genera and 19 species), **Acanthaceae** (8 genera and 14 species), **Malvaceae** (with 8 genera and 13 species), **Scrophulariaceae** (7 genera and 11 species), **Euphorbiaceae** (6 genera and 16 species), **Rubiaceae** (6 genera and 11 species), **Cyperaceae** (6 genera and 10 species), **Convolvulaceae** (6 genera and 9 species).

The relative dominance of family Poaceae in this area in respect of number of genera and species is same for the whole country. Family Fabaceae takes second position in this area, and so also in the flora of India.

Phytogeographical Affinities: Vegetation of Diu is allied to the general flora of the coastal regions of Gujarat, Maharashtra and Goa states. Most of the plants occurring in Diu are found to be common along the coastal areas of Gujarat and Maharashtra states. However, some plants which are common in Daman and Diu are reported as restricted to the arid tracts of Gujarat State and Sind province of Pakistan (Sabnis and Rao, 1983). A few examples of such plant species are: *Atriplex stocksii, Commiphora wightii, Sericostoma pauciflorum, Statice stocksii*, etc. Generally palms are seen in Diu with extensive growth of *Hyphaene* and *Borassus* are somewhat comparable with the palms of Sudan and North Arabia (Rao, 1985). But phytogeographically the flora of these areas shows affinities with tropical and sub-tropical Africa and Indo-Malaysia. The examples of such affinities are the common elements of tropical and sub-tropical Africa like: *Abutilon indicum, Desmodium gangeticum, Emilia sonchifolia, and Sesbania bispinosa*, etc. Some plants,

The following Tables I and II show the ten largest families in Diu.

Table I: Comparison of number of genera with that of India

Sr. No.	Family	No. of Genera in Diu	No. of Genera in India
1.	Poaceae	34	264
2.	Fabaceae	21	167
3.	Asteraceae	16	166
4.	Acanthaceae	8	92
5.	Malvaceae	8	22
6.	Euphorbiaceae	8	84
7.	Scrophulariaceae	7	62
8.	Rubiaceae	6	113
9.	Cyperaceae	6	38
10.	Convolvulaceae	6	28

Table II : Comparison of number of species with that of India

Sr. No.	Family	No. of Species in Diu	No. of Species in India
1.	Poaceae	56	1291
2.	Fabaceae	37	1141
3.	Cyperaceae	28	545
4.	Asteraceae	19	803
5.	Euphorbiaceae	16	523
6.	Acanthaceae	14	500
7.	Malvaceae	13	93
8.	Scrophulariaceae	11	368
9.	Convolvulaceae	9	184
10.	Rubiaceae	8	616

like *Bombax ceiba* and *Cleome viscosa* found in Indomalesia are common in Daman and Diu.

Endemism: The endemic plant *Hyphaene dichotoma*, restricted to westem India, seen in several hundreds along the sandy bed of the airfield area of Diu and also in the adjoining regions outside Diu boundary, is really remarkable and has no parallel anywhere in India, either along coastal or desert areas (Rao,1985).

Some of the endemic plant species of India are also distributed in this area: (Ahmedullah and Nayar, 1986).

Sr. No.	Name of the species	Family
1.	*Atriplex stocksii*	Chenopodiaceae
2.	*Crotalaria filipes*	Fabaceae
3.	*Eriocaulon dianae* var. *dianae*	Eriocaulaceae
4.	*Hibiscus talbotii*	Malvaceae
5.	*Hyphaene dichotoma*	Arecaceae
6.	*Lxora brachiata*	Rubiaceae
7.	*Neanotis rheedii*	Rubiaceae
8.	*Sericostoma pauciflorum*	Boraginaceae

Useful plants: A variety of plants are being used in the territory for different purposes, such as fruits, vegetables, cereals, pulses, fibres, condiments, spices, timber, liquor making, etc. They are categorized as follows.

Cereals and Millets: *Oryza sativa and Zea mays, etc. are the main cereals and millets cultivated.*

Pulses: *Cajanus cajan, Cicer arientinum* and *Lablab purpureus* are the main pulses.

Condiments and Spices: *Allium sativum, Capsicum annum , Coriandrum sativum.*

Fibres: The fibre crops grown in the territory are *Crotalaria juncea* and *Hibiscus cannabinus* etc.

Fruits: Plants cultivated for fruits are *Annona squamosa, Carica papaya. Musa paradisiaca* and *Psidium guajava*; epicarp of ripe fruit of *Hyphaene dichotoma* is also edible.

Vegetables: Main vegetables grown are *Abelmoschus esculentus, Allium cepa, Brassica oleracea, Cucumis sativus, Ipomoea batatas, Luffa acutangula, Lycopersicon lycopersicum, Raphanus sativus* and *Solanum tuberosum*, etc.

Beverages: The fresh sap from *Borassus flabellifer*

Ipomoea pes-capre

Phoenix sylvestris

Hyphaene dichotoma

and *Phoenix sylvestris* is used as beverage.

Coconut: *Cocos nucifera* is one of the most important cash crops of the area.

Minor forest products: Some plants play important role in the economy of the local people. Mature hard endosperm of *Hyphaene dichotoma* is utilised in making attractive small scent and snuff containers, thus serving as a good source for cottage industry.

Bauhinia racemosa and *Diospyros melanoxylon* leaves are used for Bedi wrapping.

Medicinal Plants: Some plants medicinally used in Diu are *Asparagus racemosus, Boerhavia diffusa, Capparis zeylanica, Gloriosa superba. Holarrhena pubescens, Justicia adhatoda, Solanum surattense, Vitex negundo and Woodfordia fruticosa*, etc.

References

Ahmedullah, M and M. P. Nayar 1986. *Endemic Plants of the Indian Region*. Botanical Survey of India, Calcutta.

Cooke, T. (1901-1908.) *The Flora of the Presidency of Bombay,* Vol. I-III. (Reprinted edition, Botanical Survey of India, Calcutta, 1958.

Rao, R.S. (1985). *The Flora of Goa, Diu, Daman, Dadra and Nagar Haveli.* Vol. I & II, Botanical Survey ofIndia.

Rao, T.A. & Agarwal, K.R. (1964). Ecological studies of Saurashtra Coast and Neighbouring Islands. I. Diu Island. *Bull. Bot. Surv. India* 6(2-4): 173-183.

Sabnis, S.D. & Rao, K.S.S. (1983). Observations on some Rare or Endanngered Endemics of South-eastern Kutch. In: S.K. Jain and Rao, R.R. (eds.) *An assessment of threatened plants of India*. Botanical Survey of India, Calcutta. pp. 71-77.

Saxton W. T. & Sedgwick. L. J. (1918). Plants of North Gujarat. *Rec. Bot. Surv. India*. 6:207-323.

Singh, N.P. & Sharma, P. P. (1999). Floristic diversity of Daman and Diu (U.T.), in Mudgal, V. & P.K.Hajra (eds). *Floristic diversity and its conservation strategies in India,* BSI, Calcutta 2**;** pp. 735-746.

Talbot, W. A. (1909-1911). *Forest Flora of the Bombay Presidency and Sindh*. Vol. I-II. Poona.