

Angiosperm diversity in the island of Rameshwaram coastal region, mannar biosphere reserve, South India

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ABSTRACT

The biodiversity of plant resources has been studied during the end of summer season in Rameshwaram coastal island. The total number of plants has been identified with the help of Flora of the Presidency of Madras. Rameswaram receive higher rainfall during the rainy season due to the formation of cyclone. Meanwhile the soil type is almost sandy soil. Our team went to Rameswaram is a famous pilgrimage centre for Hindus and we spent the time and to evaluate and list the plant species is available at the time of survey in the month of August 2011. Nearly forty six total species survive after the summer season. Such type of plant species survive in the sandy soil and hottest climate. We should recommend to the peoples establish the number of tree species in Rameswaram coastal region, which is most beneficial for pilgrims.

INTRODUCTION

Rameshwaram, located in the state of Tamil Nadu, is an island separated from the mainland by the channel of Pamban. It is almost 40 km away from the Peninsula of Jaffna in Sri Lanka. After Kashi, it is the second holiest place in the country. Rameshwaram is actually located on top of the Indian Peninsula. There are many mythological stories wound around this ancient city of temples. Rajendran *et al.* [1998] stated that conservation of few rare species is the challenging problem of botanical research. Ved *et al.* [1998] reported that systematic mapping of the occurrence of rare and endangered plants also provides the distributional pattern and its availability of the species, historic as well as current, the causes for their reduction in number and rarely can be diagnosed.

Karuppusamy *et al.* [2002] suggested that one third of Indian floral diversity of higher plants about, thousand five hundred species were estimated in Dindugal district region. Environmental education and awareness is relatively a new discipline to explicit the environmental disturbances, effects on biodiversity and also to develop a basic understanding of the total environment and the interrelationship of man and environment. This is also teaching in which way life on earth depends on quality of these surroundings and how to care and conserve our nature and natural resources. The desirable change in attitudes and behavior, it fosters a conservation awareness, rural and ethics in students through participating in environmental protection and improvement [Rajendran and Sharma, 1998]. The present investigation gives an account on plant resources available in Rameshwaram Island in Gulf of Mannar Biosphere reserve and recorded ethno botanical uses of plants were also analysed.

MATERIALS AND METHODS

Place

Rameshwaram present in the region of gulf of Mannar biosphere region, Tamil Nadu state. The geographical co-ordinates of Rameshwaram are 9.28° North Latitude 79° East Longitude. The city of Rameshwaram stretches across an area of 61.8 square km and has a moderate tropical kind of weather. The average temperature recorded during the summers is 33°C. The climate is cool and pleasant during the winters. The Rameshwaram municipality is the governing body of the city. The small town of Rameshwaram, located in Ramantapuram district of Tamil Nadu is one of the four Dhams. The place is a fusion of divine charm and natural solitude, where one wakes up with amazing awakening. The name Rameshwaram echoes with a lot of purity as it is named after Lord Rama, the hero of the epic Ramayana. The place has a strong bond with mythological Ramayana. Often called as the Benaras of South, the sacred island of Rameshwaram located in the Gulf of Munnar at the very tip of Indian peninsula is a blissful destination. Loaded with several mythological stories, the holy town has amazing power to inspire the visitors to sit for a while and venture deep into the depths of this sacred place.

Rightly said, whoever visits Rameshwaram attains Mokshya. Rameshwaram is truly divine, and the inexplicable aura of the place liberates one from the stress and strain of daily life.

Location

Rameshwaram is a town in Ramanathapuram district in the Indian state of Tamil Nadu. It is located on Pamban Island separated from mainland India by the Pamban channel and is about 50 kilometres from Mannar Island, Sri Lanka. Pamban Island, also known as Rameshwaram Island, is connected to mainland India by the Pamban Bridge. Rameshwaram is the terminus of the railway line from Chennai and Madurai. Together with Kashi, it is considered to be one of the holiest places in India to Hindus, and part of the Char Dham pilgrimages. Hence, it is a bustling pilgrim centre.

Climate

Rameshwaram has a tropical climate. With March, the summer season begins. It drags till June with mercury reaching up to 35 degree Celsius. Monsoons arrive in July and stretches till September marked by humidity and average rainfalls. Winters begin in November and continue till February. The temperature reaches up to 17 degree Celsius.

Ethnobotany

In this view, we are following the method of Javin and Rao [1983] and Jain [1987]. Number of interviews conducted among different peoples in Rameshwaram region. Rameshwaram is a holistic place for Hindu. We conducted the interview in the month of August, 2011.

Culture characteristics

Rameshwaram is known for its rich cultural heritage. The lifestyle of the local inhabitants of the city revolves around the observance of religious rituals. We are going to observe the cultural characters of Rameshwaram people especially their life style. Maximum people belonging to Fisherman communities.

RESULTS AND DISCUSSION

Observation of plant resources

A number of field visits were made to Rameshwaram region in the month of August, 2011. August is the end of summer season and starting of rainy season. Maximum most of the places driest in nature. We observed what are all the plant species available in this month in Rameshwaram island and listed in table. The identification of plants were made with of Gamble [1921], Gamble and Fischer [1957] and Matthew [1983]. In Dhanuskodi region we observed the xerophytic plant species *Spinifex sporosis* belongs to the family Poaceae.



Fig.1. *Spinifex* sp. (Poaceae)-A xerophytes plant.

Nearly 45 angiosperm plant species were recorded and identified during the survey. Such type of plant species was tabulated in table 1. The results show that the habitat of plants belongs to herbs, shrubs and tree species. But, we have observed only minimum tree species. Threatened plant species are more likely to be driven toward extinction by future habitat loss than non-threatened species because the former are generally restricted in range and consist of fewer individuals. We can therefore determine whether future land-use and climatic changes exacerbate extinction risk predictions by testing whether these will have the greatest negative influences in areas already characterized by the highest number of currently threatened species. In the Dhanuskodi region, the soil types are mostly sandy in nature. That's why here mostly the dominant species is *Prosopis julifera* (Fig.3) and *Casuarina equisetifolia* (Fig.2).



Fig.2. Diversity of *Casuarina equisetifolia*

In particular, the impacts of land-use and climatic changes on plant biodiversity will have extensive ramifications on other taxa and human society given that plants are fundamental structural and nutrient-sequestering components of most ecosystems. Not only do plants produce resources that support non-plant biodiversity [Huston, 1994; Primack and Corlett, 2005], they also provide food and materials essential for human existence [Kier *et al.*, 2005], and are involved in many ecological processes necessary for the persistence of life [Hamilton and Hamilton, 2006]. Nature-based tourism and recreation, including in protected areas, is increasing worldwide and in Australia [Newsome *et al.*, 2002a; Worboys *et al.*, 2005]. Also, use of protected areas is often zoned, with some areas highly developed and extensively modified through provision of infrastructure such as sealed roads, carparks, toilets, visitor centres, picnic areas, camping areas and accommodation. These areas often attract large numbers of people. In contrast, other zones within the same protected areas may be classified remote (which can be designated as 'wilderness') where there is

limited access, no or few facilities, and only small numbers of visitors, with restriction on the types of activities permitted [Worboys *et al.*, 2005].

While urban growth accelerates in many regions, stimulating urban sprawl and leading to the formation of “megacities” [Kraas, 2008], divergent trends have been observed in regions of economic decline.



Fig.3.Vast diversity of *Prosopis julifera*.

The identification of spatial patterns of species occurrence and richness is an essential component of design of reserve networks [Pressey *et al.*, 1993; Williams *et al.*, 1999; Cabeza *et al.*, 2004], Describing these patterns using comprehensive sampling of all taxa would be expensive and time consuming [Raven and Wilson, 1992].



Fig.4.Ethnobotanical uses of leaf stem of *Borassus* sp.

Ethnobotanical studies are often significant in revealing locally important plant species. Information was learned from healers using semi-structured interviews with a questionnaire. The basic method followed was a guided field interview [Martin, 1995, Maundu, 1995]. The plant part predominantly used was the leaves. Other parts used included either bark or their underground parts. Eighty seven percent of the plant species encountered in the study are indigenous and reports of all underground plants parts were from indigenous species. This is important when looking at the sustainable use of indigenous flora. Rural communities are at high risk of developing respiratory infections and are of great concern to epidemiologists [Nester *et al.*, 2001]. India is endowed with rich and diverse forest resources [Zahoor and Santosh,2012]

Identification of appropriate partners for further development and implementation of the Foundation’s public awareness strategy, including preparation of a long-term work plan and budget. Development of public awareness activities based on as wide a range of methods and techniques as possible, including a broadly-based school program

and other activities focusing on children. Till today the plant and plant parts are practiced among tribal people for their day to day ailments [Anil and Bhausaheb, 2011]. In developing countries, the losses of crops due to pest, plant disease and competition from weeds is great [Kwasi Opoku *et al.*, 2011].

Table.1. Various angiosperm plant species recorded at Rameshwaram coastal island

S.No.	Name of the Plants	Family
1.	<i>Prosopis juliflora</i> (SW)DC.	Mimosaceae
2.	<i>Moringa oleifera</i> Lam.	Moringaceae
3.	<i>Pongamia pinnata</i> (L.)Pierre	Fabaceae
4.	<i>Hibiscus rosa-sinensis</i> L.	Fabaceae
5.	<i>Cocous nucifera</i> L.	Arecaceae
6.	<i>Musa paradisiaca</i> L.	Musaceae
7.	<i>Delonix regia</i> (Hook)Ruf.	Caesalpiniaceae
8.	<i>Millingtonia hortensis</i> L.f.	Bignoniaceae
9.	<i>Azadiracta indica</i> Adr.Juss.	Meliaceae
10.	<i>Thespesia populnea</i> (L.)Sol.excon	Fabaceae
11.	<i>Tephrosia purpurea</i> (L.)Pers.	Fabaceae
12.	<i>Ipomoea pes-caprae</i> (L.)R.Br.	Convolvulaceae
13.	<i>Carica papaya</i> L.	Caricaceae
14.	<i>Acorus calamus</i> L.	Cyperaceae
15.	<i>Cyanodan dactylon</i> (L.)Pers.	Poaceae
16.	<i>Nerium oleander</i> L.	Apocyanaceae
17.	<i>Calotrophis gigantea</i> (L.)R.Br.	Asclepiadaceae
18.	<i>Tamarindus indicus</i> L.	Mimosaceae
19.	<i>Alstonia scholaris</i> L.Br.	Apocyanaceae
20.	<i>Lawsonia inermis</i> L.	Lythraceae
21.	<i>Cassia auriculata</i> Linn.	Caesalpiniaceae
22.	<i>Cissus quadrangularis</i> L.	Vitaceae
23.	<i>Tectona grandis</i> L.f.	Verbanaceae
24.	<i>Terminalia catapa</i> L.	Terminaliaceae
25.	<i>Zizium cumini</i> (L.)Skeels.	Myrtaceae
26.	<i>Ficus religiosa</i> L.	Moraceae
27.	<i>Ficus benghalensis</i> L.	Moraceae
28.	<i>Guvaya mirtales</i>	Myrtaceae
29.	<i>Cassurina equisetifolia</i> Forester&Forester f.	Casurinaceae
30.	<i>Ervatamia divaricata</i> (L.)Burkill.	Apocyanaceae
31.	<i>Embilica officinalis</i> Gaerther	Euphorbiaceae
32.	<i>Spinifex sporosis</i>	Poaceae
33.	<i>Clitoria ternatea</i>	Fabaceae
34.	<i>Coccinia indicum</i> Wight&Aru	Cucurbitaceae
35.	<i>Sesbania grandiflora</i> (L.)Poiret	Fabaceae
36.	<i>Mirabilis jalapa</i> L.	Nyctaginaceae
37.	<i>Ixora coccinea</i> L.	Rubiaceae
38.	<i>Acacia leucophloea</i> (Roxb.)Willd.	Mimosaceae
39.	<i>Albizia lebbbeck</i> (L.)Benth.	Mimosaceae
40.	<i>Pedaliium murex</i> L.	Pedaliaceae
41.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae
42.	<i>Cassia siamea</i> Lam.	Caesalpiniaceae
43.	<i>Psidium gujava</i> L.	Myrtaceae
44.	<i>Acacia nioltica</i> (L.)Del.ssp.	Myrtaceae
45.	<i>Catharanthes roseus</i> (L.)Don.	Apocyanaceae
46.	<i>Borassus flabellifer</i>	Arecaceae

A wide variety of methods and techniques are available for developing public awareness, and can be put to use in promoting forest biodiversity conservation. These include modern mass media (newspapers, magazines, radio, television, film); traditional media (songs and plays); printed materials (posters, leaflets and illustrated booklets); billboards and wall-writing; messages printed on bags, transport, signs and other things used or encountered in daily life; use of popular personalities as advocates; school programs; outdoor education programs; and interpretive facilities in protected areas.

Outdoor education programs can be used to provide direct, hands-on contact with nature, either as part of organized school programs or as an extracurricular or outside of school activity. Potential venues include forested areas (e.g.,

Bhawal National Park, which is relatively easily accessible from Dhaka), but also urban parks and wetlands. Effective development of public awareness will require a dual national and local focus. Many important issues are cross-cutting and national in scope, and can be effectively covered through development of national-level awareness campaigns. Other issues, as well as benefits from local forest conservation efforts will vary from location to location within the country, and these differences will need to be addressed in the development and delivery of public awareness programs. Such programs will be most effective if they address issues of immediate relevance to a majority of stakeholders, utilizing suitable methodologies.

CONCLUSION

We concluded that the total number of species available at Rameswaram coastal region after the summer season. Such types of plants have been reported after an established survey. Mostly the team observed the herb and shrub species. Only we find out lesser number of trees. The team has been recommended to the peoples of Rameswaram and Non Governmental Organizations of coastal region establish the more number of tree species and get benefit.

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