

OBSERVATIONS ON THE BOTANY OF RAMANATHAPURAM DISTRICT, TAMIL NADU

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INTRODUCTION

Ramanathapuram District one of the three southern districts of Peninsular India, extends from the sea level to an altitude of 1700 m, and has a varied vegetation and flora (of which very little study has been done in the past). A thorough exploration needed for proper use of the plant wealth of the District is now under progress. The present paper gives a preliminary account on the vegetation of the district.

GEOGRAPHICAL FEATURES AND TOPOGRAPHY

Ramanathapuram District is situated between $9^{\circ} 4'$ and $10^{\circ} 24'$ N and $77^{\circ} 20'$ and $79^{\circ} 25'$ E covering an area of about 540 sq. km. It is bounded by Palk Strait of Bay of Bengal in the east, Gulf of Manaar in the south-east, Pamban river in the north-east, Periyar in the north-west, and the Deviar in the south-west. There are a number of small islands in the southern coast of which the Rameswaram Island covering an area of 85 sq. km is the largest. The next in prominence comes the Krusadi group of islands, in the Gulf of Manaar namely Pumirican (Pulle) Island, Wadu Island, Periyakanda Island, Krusadi Island and Shingle Island.

The district is drained by a number of small rivers among which Vaigai is the largest, feeding a number of tanks and discharges into the sea near Attangarai. The large number of tanks existing in the plains in this district has earned the name "*Lake District of Tamil Nadu*"

The main types of soil found in the area

are : (1) black cotton soil which is restricted to the cultivated areas in the plains and in the forest fringes, (2) red and red loamy soil is found along the foot of ghats, (3) black humus soil, and (4) sandy soil are seen along most of the river banks and along the sea coasts.

The climate is generally hot and dry in the plains and at lower altitude up to about 400 m. The humidity is low except up to about 20 km from the sea coast. The temperature and humidity are quite high throughout the year in Rameswaram and the Krusadi group of islands.

The upper slopes of the hills and places like Mudaliaruthu receive both the south west and north east monsoons from June to September and October to December respectively. Other areas receive much of their rain from north-east monsoon which is often late, irregular and scanty. The annual rainfall varies from 16.6 to 195 cm in different years. Ramanathapuram District is often prone to famine due to lack of timely rains.

PREVIOUS WORK

Before the reorganization of the Botanical Survey of India, only sporadic collections have been made from the area by C. A. Barber, S. N. Chandrasekharan, D. Daniel Sundararaj, J. Gopal Rao, M. O. P. Iyengar, K. C. Jacob, P. S. Jivanna Rao, G. H. Maduram, S. V. Parthasarathy, C. Rajasekhara Mudaliar, S. R. Raju, K. Ramanujam, Ramamoorthy, A. Rangachari, J. Sakharam Rao and others. Their specimens are deposited in the Madras Herbarium. After

the establishment of the Southern Circle of the Botanical Survey of India, four exploration trips were conducted to Srivilliputhur Reserve Forest by E. Vajravelu in 1965-1971. Three exploration trips were carried out in Sivaganga, Karaikudi and Tiruppathur ranges by K. Ramamurthy in 1964-65. Recently five exploration trips were conducted by the authors in Karaikudi, Sivaganga, Tiruppathur, Sayalgudi, Ayyanarkoil, Sethur Hills and Rameswaram Island during 1977 to 1980.

Iyengar (1927) and Chandrasekharan *et al.* (1946) surveyed the vegetation of the Krusadi group of islands and pointed out that the vegetation of the island is of special interest, as it differs much from that of the main land and the nearer Rameswaram island. Iyengar's collections are mostly located in the herbarium of the Presidency College, Madras, with a few in the Madras Herbarium. Collections of Chandrasekharan *et al.* are preserved in the Madras Herbarium. Rao *et al.* (1963 a, b) explored the Krusadi group of islands and the Rameswaram Island and their specimens are preserved at Central National Herbarium, Howrah (CAL). Wilson (1960) gave an account of the vegetation of Ramanathapuram Forest Division. The same author (1965) also dealt with soil erosion problems of Rameswaram Island in relation to forest types and soil conservation programmes. Rao *et al.* (1974, 1975) have made references to the coastal vegetation of Ramanathapuram. *Theriophorum sivaganganum* (Ramam. *et* Seb.) Bogner (1968) (= *Pauella sivagangana* Ramam. *et* Seb.) is a new species collected and described from the district by K. Ramamurthy (1966). *Jatropha villosa* Wight var. *ramnadensis* Ramam., is another new variety discovered by him (1967) from Karaikudi area.

VEGETATION

Vegetation of this area is much disturbed by climatic, physiographic, edaphic and biotic factors, and the whole area can be divided into three categories, namely (1) coastal and island

vegetation (2) vegetation of the plains and (3) the vegetation of the eastern slopes of the Western Ghats.

COASTAL AND ISLAND VEGETATION

The coral reefs at Mandapam form a special feature of the coastal region of Ramanathapuram. *Cymodocea rotundata* Ehernb. & Hempr. ex Asch., *C. Serrulata* (R. Br.) Asch. et Magnus, *Halophila* sp. and *Enhalus acroides* (L. f.) Royle are met with on these reefs.

Carnatic umbrella thorn forests (Champion & Seth, 1968) are seen extensively along the Ramanathapuram sea coasts, some isolated patches near Mandapam, Sayalgudi and Thondi coasts and also in Rameswaram Island. *Acacia planifrons* Wight & Arn. intermixed with *Borassus flabellifer* L. forms the dominant tree of the coastal region. Other trees like *Hibiscus tiliaceus* L. and *Thespesia populnea* (L.) Sol. ex Correa are also met with. Shrubs undershrubs and herbs like *Abutilon indicum* (L.) Sweet, *Indigofera tinctoria* L., *Ocimum gratissimum* L., *Salicornia brachiata* Roxb., *Suaeda nudiflora* Miq., *Tephrosia hirta* Ham. and *T. maxima* Pers. are frequently seen. The common climbers are *Cayratia carnosae* Gagnep., *Clitoria ternatea* L., *Hemidesmus indicus* (L.) R. Br., *Ipomoea pestigridis* L., *Momordica dioica* Roxb. ex Willd. and *Tylophora indica* (Burm. f.) Merr. Some of the common herbs are *Bacopa monnieri* (L.) Wettst., *Bergia ammannioides* Roxb., *Cleome gynandra* L., *Heliotropium curassavicum* L. and *Mollugo disticha* Ser., *Spinifex littoreus* Merr. is commonly found on the sandy areas close to the sea. Some of the sedges met with are *Cyperus arenarius* Retz., *C. laevigatus* L., and *C. rotundus* L., *Ipomoea pescaprae* Sweet is very common in sandy tracts.

The island of Rameswaram shows a most varied type of habitat including mobile sand dunes. The vegetation of the island consists of tropical thorny umbrella type forest degraded to low open scrub formation possibly

due to severe biotic and climatic causes. Rao *et al.* (1963) have given a detailed account of the vegetation of Rameswaram Island and Krusadi group of islands in the Gulf of Manaar. They have dealt with the vegetation account of Rameswaram Island under 8 distinct zones such as (1) marine vegetation (2) strand vegetation (3) inland vegetation (4) mangrove vegetation (5) saline vegetation (6) sand dune vegetation (7) dune slacks and (8) *Pandanus* swamps.

According to Rao *et al.* (1963) the vegetation of the Krusadi Island can be divided on habitat basis; viz. (1) foreshore sandy habitat (2) inland sandy habitat (3) salt marsh habitat (4) mangrove habitat and (5) maritime habitat.

VEGETATION OF THE PLAINS

There are two types of forests occurring in the plains, namely Southern thorn forests and Tropical dry evergreen forests—Carnatic evergreen forests. Southern thorn forests are found in and around Karaikudi, Tiruppathur and Sivaganga taluks. Herbs such as *Hybanthus enneaspermus* (L.) F. v. Muell., *Leucas stricta* Benth., *Mollugo pentaphylla* L., *Oldenlandia herbacea* (L.) Roxb. and *Polycarpaea corymbosa* (L.) Lamk. are met with. *Acacia chundra* (Rottl.) Willd., *A. horrida* (L.) Willd. and *A. planifrons* Wight & Arn. are the common trees of the forests. Amongst these, some unarmed trees like *Azadirachta indica* A. Juss. and *Strychnos potatorum* L. f. are also seen. The undergrowth consists of thorny shrubs like *Atalantia monophylla* (L.) Correa, *Carissa carandas* L. and *Dichrostachys cinerea* (L.) Wight & Arn. *Anisomeles malabarica* (L.) R. Br. ex Sims., *Clausena dentata* (Willd.) Roemer, *Erythroxylum monogynum* Roxb., *Jatropha villosa* Wight & Arn. var. *ramnadensis* Ramam., *Tarenna asiatica* (L.) Kuntze ex Schum. and *Triumfetta rhomboidea* Jacq., are some of the other shrubs and undershrubs growing abundantly in the plains. *Aponogeton natans* (L.) Engler & Krause, *Eichhornia crassipes*

(Mart.) Solms, *Nymphaea pubescens* Willd. and *Pistia stratiotes* L., are the fresh water aquatics found in the tanks and ponds of this area.

Tropical dry evergreen forests—Carnatic evergreen forests occur in Mummarasampatti, Sakkottai and Palayur. Trees like *Manilkara hexandra* (Roxb.) Dubard and *Sapindus emarginatus* Vahl are met with. The undergrowth consists mostly of the following shrubs: *Dodonaea viscosa* (L.) Jacq., *Memecylon umbellatum* Burm. f. and *Murraya paniculata* (L.) Jacq. Climbers like *Abrus precatorius* L., *Derris scandens* (Roxb.) Benth., *Pterolobium hexapetalum* (Roth) Sant. & Wagh, and *Ziziphus oenoplia* (L.) Mill., frequently occur.

The weed flora in the cultivated lands and fallow fields include *Acalypha indica* L., *Ammannia baccifera* L., *Dactyloctenium aegyptium* (L.) P. Beauv., *Echinochloa colonum* (L.) Link, *Lindernia hyssopoides* (L.) Haines., *L. oppositifolia* (Retz.) Mukerjee, *Ludwigia perennis* L., *Sida cordifolia* L., *Trianthema portulacastrum* L., *Tribulus terrestris* L. etc.

VEGETATION OF THE EASTERN SLOPES OF THE WESTERN GHATS

The main types of forests found in the ghats are (1) western tropical evergreen forests (2) tropical semi-evergreen forests (3) southern dry teak forests and (4) southern dry mixed deciduous forests. The western tropical evergreen forests occur in Srivilliputhur Range. Above an elevation of about 1000 metres, a number of small patches of *sholas* surrounded by grass lands chiefly comprising of *Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schultes, *Oplismenus compositus* (L.) P. Beauv. and *Themeda cymbaria* Hack. are seen. On grassy slopes, herbs like *Biophytum sensitivum* (L.) DC. var. *candolleianum* (Wight) Edgew. & Hook. f., *Coleus forskohlii* (Poir) Briq. and *Knoxia sumatrensis* (Retz.) DC. are common. Some of the undershrubs met with are *Leucas hirta* (Roth) Spreng. and *Vernonia albicans* DC.

In the *shola* forests, trees of *Buchanania lanzan* Spreng., *Gordonia obtusa* Wall. ex Wight, *Maesa indica* (Roxb.) DC., *Meliosma pinnata* (Roxb.) Walp. ssp. *arnottiana* (Walp.) Beus. and *Myristica dactyloides* Gaertn. are dominant. The common shrubs are *Clerodendrum serratum* (L.) Moon and *Gnidia glauca* (Fresen.) Gilg. Herbs like *Anaphalis subdecurrens* (DC.) Gamble, *Crotalaria prostrata* Rottl. ex Willd., *Heracleum sprengelianum* Wight & Arn., *Pouzolzia wightii* Benn. var. *nilghirensis* (Wight) Hook. f. and *Rhynchosia cana* DC. are common. *Habenaria crassifolia* A. Rich., *H. longicornu* Lindl., and *H. rariflora* A. Rich. are the terrestrial orchids of the area and epiphytic orchids like *Luisia tenuifolia* Bl. and *Vanda tessellata* (Roxb.) Hook. ex G. Don are also frequently seen. *Asplenium varians* Wall. ex Hook. et Grev., *Cyclosorus extensus* (Bl.) Ito, *C. parasiticus* (L.) Tardieu-Blent ex Tardieu-Blent et C. Chr., *Pyrrosia adnascens* (Sw.) Ching and *P. mollis* (Kuntze) Ching, are some of the common ferns in the forests. A rare collection of *Lilium neilgherrense* Wight has also been made from Mudaliaruthu.

The semi-evergreen forests occur in Sriviliputhur range from an altitude of 400 to 1000 metres. Some of the common trees found here are *Dimocarpus longan* Lour., *Mallotus philippensis* (Lamk.) Muell.-Arg. and *Pterospermum rubiginosum* Heyne. The undergrowth consists of *Clerodendrum viscosum* Vent., *Glycosmis mauritiana* (Lamk.) Tanaka and *Helicteres isora* L., some of the climbers are *Reissantia indica* (Willd.) Halle and *Ventilago madraspatana* Gaertn. Herbs such as *Anisomeles indica* (L.) Kuntze, *Coleus amboinicus* Lour. and *Zornia gibbosa* Span., are seen.

Southern dry teak forests occur in Ayyanarkoil and in some parts of Sethur forests where the altitude ranges up to 1455 metres. Trees like *Albizia lebbek* (L.) Willd., *A. odoratissima* (L. f.) Benth., *Chloroxylon swietenia* DC., *Dalbergia sissooides* Grah. ex Wight & Arn., *Sterculia foetida* L. and *Tectona grandis*

L. f. are common. Shrubs such as *Allophyllus serratus* (Roxb.) Kurz, *Flacourtia indica* (Burm. f.) Merr., *Phlebophyllum spicatum* (Roth) Bremek. var. *hypoleucum* (Nees) Bremek. and *Phyllanthus polyphyllus* Willd. are common. The climbers include *Aristolochia indica* L., *Cryptolepis grandiflora* Wight, *Dioscorea pentaphylla* L. and *Glycine wightii* (Wight & Arn.) Verdc. Herbs like *Aeschynomene indica* L., *Crotalaria verrucosa* L., *Leonotis nepetifolia* (L.) R. Br. and *Urena lobata* L. ssp. *sinuata* (L.) Borssum are commonly found in the forests.

Southern dry mixed deciduous forests occur in the outermost slopes of the ghats from the margin of cultivation where altitudes vary from 90 to 150 metres. Thorny species like *Acacia leucophlaea* (Roxb.) Willd. and *A. planifrons* Wight & Arn. are abundant. Other trees such as *Albizia amara* (Roxb.) Boivin, *Cochlospermum religiosum* (L.) Alston, *Gyrocarpus americanus* Jacq., *Pterocarpus marsupium* Roxb. and *Terminalia chebula* (Gaertn.) Retz. are also present. The common shrubs are *Cassia auriculata* L., *Pavetta indica* L. and *Xeromphis spinosa*, (Thunb.) Keay. Herbs like *Acalypha racemosa* Heyne ex Baill., *Andrographis alata* (Vahl) Nees, *Justicia glauca* Rottl. and *Scutellaria colebrookiana* Benth. are frequent.

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