

REVIEW OF EARLIER WORK

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REVIEW OF EARLIER WORK

Systematic floristic exploration in India started with the arrival of westerners on the scene. Even before the publication of Linnaeus's *Species Plantarum* (1753), several important books on Indian plants were published, mainly from medicinal point of view, which attracted the attention of western scholars on the plant wealth of India. Thus in his "Oscoloquios . . ." published from Goa (1565), Garcia de Orta, the personal physician of the then Portuguese Governor, described several medicinal plants from this part of the world; but this is more of a medical man's notes than that of a botanist. The first published work on the botany of Indian plants had to wait more than another century, when the then Dutch Governor of Cochin, Henrich van Rheedee (1678-1703) published his monumental 12 volume work, *Hortus Indicus Malabaricus* containing description and beautiful illustrations of plants of Kerala. This work is not only a land mark in the plant resource studies in Asia (Manilal, 1980) but is intimately implicated in the history of botany in general, as it was consulted and accepted by Linnaeus as a source book on Indian plants. He adopted 265 Indian plant names into botanical nomenclature and many of them are lectotypified by Rheedian figures (Moore & Dransfield, 1979; Majumdar & Bakshi, 1979; Vaczy, 1980).

Major contributions towards the floristic studies in India were made by the Britishers. Among those who contributed to the botany of Peninsular India, Robert Wight's (1830-1853) name is the most important. His contributions include 28 publications, and among them the *Illustrations of Indian Botany* (1840) and *Icones Plantarum Indiae Orientalis* (1838-1853) are the most important. Together with Arnott, he published the *Prodromus Florae Indiae Peninsularis* (1834). This was followed by the works of Richard Boddome - *Flora Sylvatica of South India* (1869-1874) and *Icones Plantarum Indiae Orientalis* (1868-1874).

Joseph Dalton Hooker, for the first time in India brought out the complete floristic data of Indian plants in the form of a flora, the *Flora of British India* in 7 volumes (1872-

1897). This distinguished work inspired many botanists. After the publication of the *Flora of British India*, comprehensive regional floras were published. As the Britishers divided India into presidencies and provinces, the regional floras were known after the names of presidencies and provinces; and the *Flora of the Presidency of Bombay* by Cooke (1901-1908) and the *Flora of the Presidency of Madras* by Gamble and Fischer (1915-1936) were published. The other notable contributions on the South Indian flora are the *Forest Trees of Travancore* (Bourdillon, 1908), *Flowering Trees of Travancore* (Rama Rao, 1914), *Vernacular List of Trees, Shrubs and woody climbers of the Madras Presidency* (Lushington, 1915), *Flora of Anamalais* (Fischer, 1921) and *Flora of South Indian Hill Stations* (Fyson, 1932).

The *Flora of Presidency of Madras* still remains the basic identification manual of plant taxonomic studies in Peninsular India. After this, exploration in South India was mainly undertaken by the Southern Circle of the Botanical Survey of India, Coimbatore. This has resulted in the discovery of several new and interesting taxa. Karthikeyan *et al.* (1983), Nair (1986a, 1986b) and Manilal and Raveendrakumar (1998) have compiled lists of such new additions since the publication of the *Flora of the Presidency of Madras*.

As far as the floristics of Kerala state is concerned, Botanical Survey of India, the Taxonomy division of the Botany Department of University of Calicut, and Kerala Forest Research Institute have made substantial interesting and useful contributions. Floristic studies of several districts of the state have been completed, in most cases as part of Ph.D research programmes. In Kerala, the flora of most of the districts have been studied, and that of the rest are being completed. *The Flora of Calicut* (Manilal & Sivarajan, 1982), *Flora of Cannanore* (Ramachandran & Nair, 1988), *Flora of Silent Valley* (Manilal, 1988), *Flora of Palghat* (Vajravelu, 1990), *Flora of Kerala: Grasses* (Sreekumar & Nair, 1991), *Flora of Thiruvananthapuram* (Mohanan & Henry, 1994), *Flora of Nilambur* (Sivarajan & Mathew, 1996) and *Flowering Plants of Thrissur Forest* (Sasidharan & Sivarajan, 1996) the hitherto floras of various areas of the state. The other district floras that have been completed are that of Quilon district (Mohanan, 1984), Malappuram district (Babu, 1990), Kottayam district (Antony, 1989) and Pathanamthitta district

(Anilkumar, 1993). The aquatic and wetland flora of Northern Kerala has been studied by Joseph (1991) and the sedge flora of Kerala by Rejani (1991). Several other areas and districts are active 'surveillance' and this might ultimately lead to a '*Flora of Kerala*' which is the fond hope of all taxonomists, teachers and students of this region.

The area of the present study was not subjected to systematic exploration in the past. Among the present day plant collectors of the district, mention must be made of P.V. Sreekumar (1991) who studied the flora of Kerala grasses, resulting in the discovery of some new and interesting taxa (Sreekumar Nair & Nair, 1981). The other plant collectors of this regions were the scientists like M.S. Swaminathan, Prasad and Bhargavan of the Botanical Survey of India (Southern circle), Coimbatore. Another notable plant collector of this region is Prof. N. Ravi (1996) of the Tropical Botanic Garden and Research Institute, Palode.

METHODOLOGY

The area of present study - **Alappuzha district** - could be reached here by bus, train or even boats. Most of the areas of this district could be reached by train or bus, but the Kuttanadu region, most areas of which are surrounded by water, could be reached only by boats. Several field trips of duration ranging from 1 to 5 days were made at regular intervals to various parts of the district for a period of about 6 years from 1993 and made intensive and extensive collection of plants. A total of about 3100 plants have been collected. Collection trips were repeated till full data on each species have been gathered. Usually 5 specimens of each species were collected from all the available localities in view to have a knowledge on range of variation, the local distribution and commonness/rarity of the taxa.

For collection and preservation, the procedures given by Jain and Rao (1977) and van Balgooy (1987) were generally followed. Usually specimens were collected in generative state - in flowering/fruitlet or both. But where generative stages could not be observed during the period of study, vegetative specimens were also collected. Tree-

climbers were employed for collecting specimens from tall trees, large lianas and epiphytes. Specimens from smaller trees were collected by using hooked-poles. In case of dioecious species both male and female specimens were collected separately. Parasites were collected along with their hosts, wherever possible. Special techniques given by Fosberg and Sachet (1965) were employed for collecting plants of families such as Araceae, Arecaceae, Bambusaceae and Pandanaceae. Living specimens of orchids and other interesting taxa were collected and grown at the garden of the S.N.M. College, Maliankara and further observations and studies were made.

Field notes such as date of collection, locality, altitude, habit, habitat, nature of bark and root, exudate if any, colour of juvenile leaves, flowers, fruits, etc., species frequency and dominance, associations, etc. were made during the exploration trips. For preservation at field, wet method (Fosberg & Sachet, 1965) using 70% methylated alcohol was employed. It was experienced that this method was very effective and also time and space saving. For drying and poisoning the standard method was followed. Identification and description were made from fresh, dried specimens as well as specimens pickled in 70% alcohol. Drawings were most often made from fresh or herbarium specimens and also from pickled specimens. Often compound light microscope was used for observation of microscopic characters like indumentum, placentation details, etc. Almost all specimens cited were self collected, except for a few relevant specimens deposited at the Southern circle of the Botanical Survey of India at Coimbatore (MH) and at the Calicut University Herbarium (CALI). The herbarium specimens prepared during the present study were deposited in the Herbarium of the Calicut University (CALI), and S.N.M. College.

Materials collected were provisionally identified using the *Flora of the Presidency of Madras* (Gamble & Fischer, 1915-1936), *Flora of Hassan District* (Saldanha & Nicolson, 1976), *Flora of Tamil Nadu, Carnatic* (Matthew, 1983), and the *Revised Handbook to the Flora of Ceylon* (Dassanayake & Fosberg, 1980-1991; Dassanayake, Fosberg & Clayton, 1994 and 1995). Available monographs, revisions and other relevant literature were also referred. Confirmation of the identification of some of the difficult

taxa were made by matching with authenticated specimens available at the Madras Herbarium (MH). Critical problematic specimens were got identified by experts of respective families, notably from Kew, Rijksherbarium, Southern and Central circles of the Botanical Survey of India, TBGRI and KFRI.

PLAN OF PRESENTATION OF DATA

The format proposed by Radford *et al.* (1974) was followed for general presentation of the flora. The families were classified according to Bentham and Hooker's system of classification (1862-1883). But, with regard to delimitation of taxa, some deviations were made so as to bring it consonance with the current understanding of the concerned taxa.

Artificial keys were provided for families, genera, species and varieties. Keys are strictly dichotomous and intended, and are relevant only to the taxa included. As far as possible, both vegetative and generative characters readily observable were utilized for the keys. Full citation of the family and generic names have been given referring to *Index Nominum Genericorum* (Farr *et al.*, 1979) and *International Code of Botanical Nomenclature* (Tokyo Code - 1993) (Greuter *et al.*, 1994). Genera with more than one species were provided with a short generic description covering only the characters of the included species. In genera with single species, the generic description was omitted and a detailed description of the species was given. Alphabetical order is followed in the treatment of genera within families, and species within genera. Each species was provided with detailed nomenclatural citations including reference from *Flora of British India* (Hooker, 1872-1897), *Flora of the Presidency of Madras* (Gamble & Fischer, 1915-1936), *Flora of Hassan District* (Saldanha & Nicolson, 1976), *Flora of Calicut* (Manilal & Sivarajan, 1982), *Flora of Tamil Nadu Carnatic* (Matthew, 1983), *Flora of Silent Valley* (Manilal, 1988), *Flora of Cannanore* (Ramachandran & Nair, 1988), *Flora of Palghat District* (Vajravelu, 1990), *Flora of Thiruvananthapuram* (Mohanam & Henry, 1994), *Flora of Nilambur* (Sivarajan & Mathew, 1996) and *Flowering Plants of Thrissur Forest* (Sasidharan & Sivarajan, 1996). Besides these floras, relevant monographs, revisions, etc. were also referred to. *Icones* of Wight (1839-1853) and Beddome (1968-

1874) were cited wherever applicable. *Revised Handbook to the Flora of Ceylon* (Dassanayake & Fosberg, 1980-1991; Dassanayake, Fosberg & Clayton, 1994 and 1995) was also cited to assess the Sri Lankan affinity of the flora. Synonyms relevant to Peninsular Indian Flora were given in italics. Local names, if available, were given in italic bold at the end of nomenclatural citation. For the abbreviations of periodicals, *Botanico Periodicum Huntianum* (B-P-H) (Lawrence *et al.*, 1968) was followed.

The nomenclatural citations were followed by precise species description in the following sequence: habit; leaves; inflorescence; flowers; calyx; corolla; stamens; pistils; fruit and seed. The characters like glabrous and entire have not been specified unless they were key characters. Species description was followed by data on phenology; the worldwide distribution, information on frequency, habitat, rarity/endemism if applicable, and specimen citation. Notes on medicinal or other economic importance, taxonomic or nomenclatural problems if any, have been provided at the end in separate paragraph. Illustrations and photographs of very few selected plants were also provided.

The following abbreviations and symbols were used in the thesis.

c.	-	more or less (\pm) / about
cm	-	centimeter
Fl. & Fr.	-	Flowering and Fruiting
ha	-	hectare
m	-	meter
mm	-	millimeter
CALI	-	Calicut University Herbarium
MH	-	Madras Herbarium (Botanical Survey of India, Coimbatore, Tamil Nadu)

- CNS - C.N. Sunil
- O - absent
- SNMCH - Sree Narayana Mangalam College Herbarium
(Maliankara, N. Paravoor, Ernakulam Dist., Kerala)
- BSI - Botanical Survey of India
- TBGRI - Tropical Botanic Garden and Research Institute (Palode,
Thiruvananthapuram, Kerala)
- KFRI - Kerala Forest Research Institute (Peechi, Thrissur, Kerala)

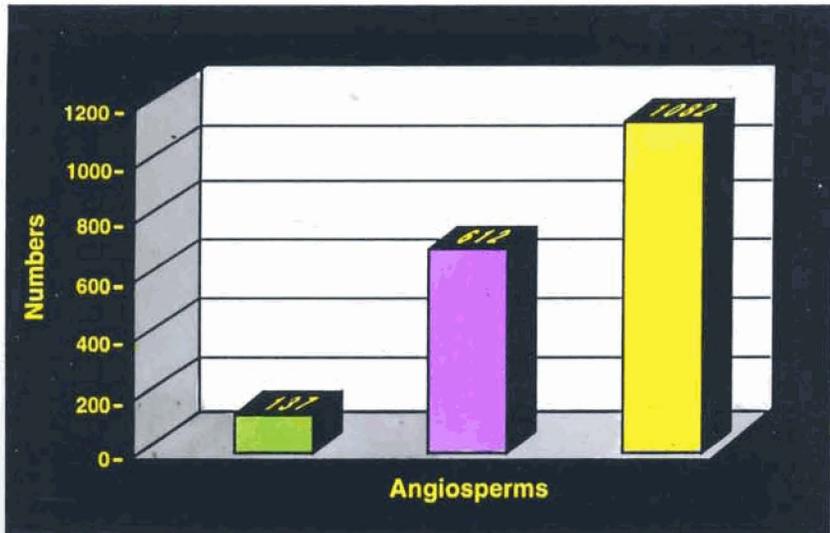


Fig.2 Number of families, genera and species of Angiosperms of Alappuzha District.

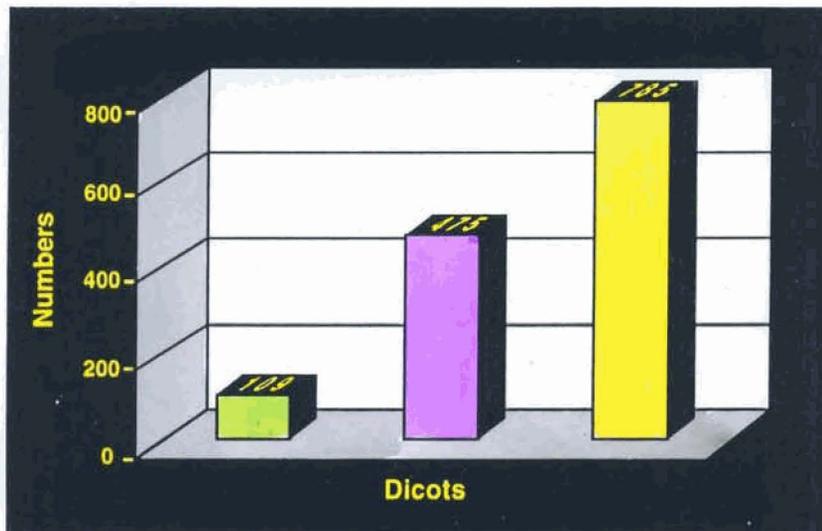


Fig. 3 Number of families, genera and species of Dicotyledons

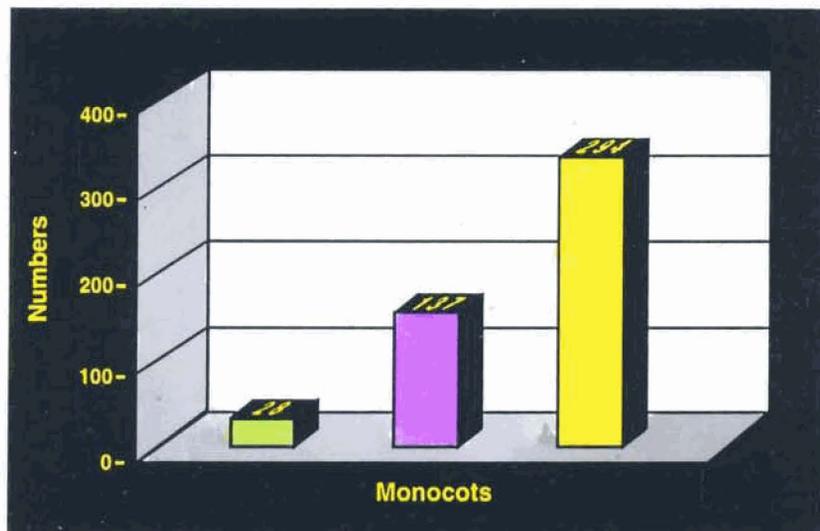


Fig. 4 Number of families, genera and species of Monocotyledons

