

On the English edition of Van Rheedé's *Hortus Malabaricus* by K. S. Manilal (2003)

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Van Rheedé, the Dutch Governor of Cochin, a soldier who had no training in botany, became fascinated by the flora of Malabar, compiled and published a unique 12-volume work Hortus Malabaricus between 1678 and 1693. K. S. Manilal has spent over 35 years rendering Hortus Malabaricus to English. Through this stupendous task, he has opened a vast treasure-house to scientists, medical practitioners, linguists and historians.

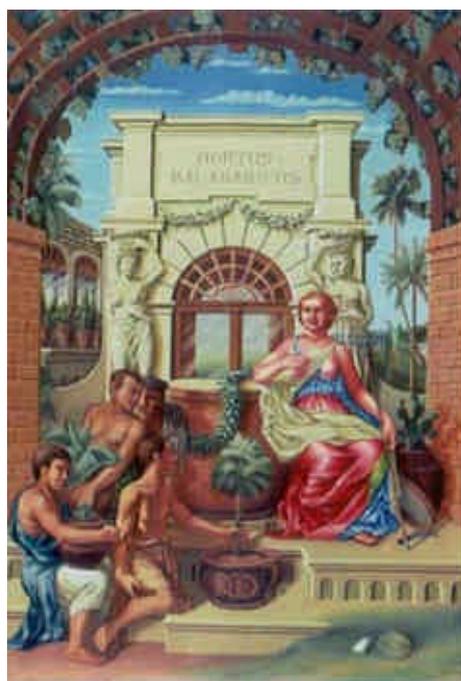
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At a time when botany is being pursued at a reductionist level, it is refreshing that an enlightened Indian taxonomist has presented to the scientific world, the English edition of a precious work published in Amsterdam more than three centuries ago. This work contains a wealth of information on the plants of Malabar (at present the state of Kerala) that has remained largely inaccessible to the vast majority of scholars because the entire text was written in Latin. Devoting over 35 years of intense labour to his task, K. S. Manilal has translated with high fidelity the entire text of *Hortus Malabaricus* (*Malabar Garden*) running into 12 volumes (1595 pages of double folio size) and containing illustrations and descriptions of 742 plants. The complete original title of the work is *Hortus Malabaricus, continens Regni Malabarici apud Indos celeberrimi omnis generis Plantas rariores*. Written in appreciation of Manilal's extraordinary achievement, the purpose of this article is to acquaint readers with the original work which deals with the traditional knowledge of the people of Malabar on useful plants, as well as their immense biological value today.

The original work in Latin

Considered to be the most comprehensive printed work on the natural wealth of Asia and of the tropics, *Hortus Malabaricus* was compiled and published between 1678 and 1693 by Hendrik Adriaan Van Rheedé tot Draakenstein (Van Rheedé hereafter), the then Dutch Governor of Cochin. Mentioned in these volumes are plants of the Malabar region (which stretches from Goa to Kanyakumari, about 900 km in length and varying from 74 to 200 km in

width). The work describes plants with multiple uses as well as with medicinal properties. It includes modes of preparation and application, based on pre-Ayurvedic knowledge of the ancient, renowned, hereditary physicians of Malabar. The ethno-medical information presented in *Hortus Malabaricus* was culled from palm leaf manuscripts by Itty Achuden, a famous physician of Malabar at that time. He dictated the material in Malayalam, which was then scrutinized by three Konkani gymnosophist priest-physicians (referred to in the text as 'brahmins') – Ranga Bhat, Vinayaka Pandit and Appu Bhat, followed by a process of thorough verification, discussion with other scholars and general agreement. The final draft was translated into Portuguese by the official interpreters of



Frontispiece of *Hortus Malabaricus*.

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Hendrik Adriaan Van Rhee de tot Draakenstein (1636–1691).

the Dutch East India Company. From Portuguese, the text was rendered into Dutch and thence to Latin. The introductions, forewords and dedications given separately in various volumes also contain valuable insights into the cultural, social, political, historical and linguistic conditions of 17th century Malabar.

The descriptions of plants comprising their habit, foliage, flowers, fruits, colour, smell, taste and practical value appear in *Hortus Malabaricus* under their Malayalam names. The plates bearing illustrations have been inscribed in Roman, Malayalam and Arabic scripts. Konkani names are given in Devanagari script. Nearly all the plants are illustrated (of the 791 plates, 712 are in double folio size and 79 in folio size). The expenses of publication were met by 'the widow of John Van Someren, the heir of John Van Dyck, Henry, and the widow of Theodore Boom' (title page, vol. 1).

Van Rhee de employed over 200 knowledgeable local collectors to bring to him whole plants or their twigs bearing flowers, fruits and seeds in different seasons. Many of these plants were introduced in the Company's gardens. Four soldiers from the Dutch Army were asked to execute the illustrations, to which descriptions were added in his presence. Then, a board of 15–16 expert physicians and botanists from various parts of Malabar was engaged to examine the materials prepared and present its opinion about the curative properties of the plants collected. Van Rhee de was most impressed by the authority as well as the civility and culture with which the discussions took place without 'acerbity, mental disturbance or neglect to

respect others' opinion' (preface to vol. 3, page xviii). Hundreds of bundles of all the plants collected and put in folded papers indicating their names, uses and description were shipped to Amsterdam, where they were thoroughly scrutinized by several experts.

Thus Van Rhee de's *Hortus Malabaricus* is the result of about 30 years of compiling and editing by a team of the best among 17th century European physicians, professors of medicine and botany, amateur botanists (such as Arnold Seyn, Theodore Janson of Almeloveen, Paul Herman, Johannem Munnicks, Joannes Commelinus, Abraham a Poot), Indian scholars and *vaidyas* (physicians) of Malabar and adjacent regions, and technicians, illustrators and engravers, together with the collaboration of company officials, clergymen (D. John Caesarius and Father Mathew of St. Joseph). This stupendous undertaking by the Dutch Governor of Cochin was greatly assisted by the King of Cochin and the ruling Zamorin of Calicut.

Van Rhee de – an incomparable soldier and a protagonist of Malabar flora

Van Rhee de was born in 1636 in an influential and noble family that owned castles and country houses, which gave them access to the Equestrian Order of Utrecht. Van Rhee de, who lost his parents in his boyhood, had no scientific training. He left the Netherlands when just 14 years old and entered the service of the Dutch East India Company at the age of 20. He was exposed to exotic flora at the Cape of Good Hope, Batavia and Ceylon (Sri Lanka). He took part in the conquest of Ceylon and Malabar while serving under Admiral Van Goens. For his exemplary performance in the battles and devotion to duty, Van Rhee de was rapidly promoted to councillor, 'regedore major', first captain and sergeant major of Ceylon and Commander of Malabar. He grew fond of the land and its people and secured for himself a favourable place in Malabar society and established an influential relationship with the Raja of Cochin, Vira Kerala Varma¹. When he was asked to resign from his post in 1678, he left Cochin and spent six years in the Netherlands. In view of his expert knowledge and talents, Van Rhee de was appointed Commissioner General of the Western Quarters to streamline the affairs of the Dutch East India Company in 1684. He returned to India and spent a few years in various parts, arriving in Cochin in 1691.

It is remarkable that, unlike other colonial army commanders, Van Rhee de took a keen interest in the amazingly rich flora of the region and was deeply impressed by it. In the preface to vol. 3, Van Rhee de goes into raptures while describing the forests of Malabar:

"...on the way I observed large, lofty and dense forests ...it was often very pleasant to behold on one tree, leaves, flowers and fruits of ten or twelve different kinds displayed. And yet they did not harm this tree in

any way so that the trunks of such trees were very close to each other and very thick, or at all events they lifted their heads in air to an elegant height of as much as eighty feet... and thus these forests resembled a house of a very elegant structure rather than virgin forests... Since I perceived all this repeatedly, this had led me believe that I judged not without reason that this part of India was truly and rightly the most fertile part of the whole world....'

Until his visit to Malabar, Van Rheedee had never seen giant woody climbers, nor immense trees of banyan that resembled imposing cathedrals with innumerable prop roots. He was also deeply impressed by the Malabaris who, irrespective of their profession, were knowledgeable about plants in their surroundings and derived all their medicines from them.

Van Rheedee also studied the social system of Malabar of that period. About the Konkani brahmins he states:

'Those who have the care of the ceremonies and of religion are also very numerous, and they live in the greatest tranquility and are favoured by very ample benefices and great esteem, to which are added the gifts of the pious people, so that those men can quite rightly be proclaimed the happiest men of the whole world... They do not contract marriages with persons of another nation or foreigners, and yet they permit any people of whatever religion to live freely among them. They never pass beyond the boundaries of their native country and yet they do not resent the travels of foreigners' (preface to vol. 3).

Van Rheedee was obsessed by the desire to get the rich plant diversity of Malabar documented as accurately as possible to meet the standards of the European experts. Torn between his multifarious official duties and the passion to offer something unknown to the West, the idea of compiling a book on the natural plant wealth of Malabar was conceived by Van Rheedee to prove his belief that Malabar was self-sufficient in all military and commercial requirements and, therefore, that Cochin was better suited to be the South East Asian headquarters of the Dutch overseas forces, than Colombo in Ceylon.

The compilation of *Hortus Malabaricus* did not proceed smoothly and Van Rheedee had to face countless problems – his own dismissal as Governor of Cochin; the premature death of expert botanists, Dutch physicians, trusted friends and the publishers; the need to change the plan of the book after the first two volumes were completed; the drying up of financial support for publishing; and above all, few takers for the book. Nevertheless, his energy, position, power, perseverance and resourcefulness compelled him to fulfil his goal. A detailed account of the colourful and chequered career of Van Rheedee has been published by Heniger¹. While quelling a rebellion in Malabar, Van

Rheedee fell ill. He passed away aboard the ship *Droghterland* off the coast of Bombay on 15 December 1691, while sailing from Cochin to Surat. The mausoleum built in his honour at Surat is a neglected and rarely frequented monument.

The English edition

The English edition contains a word-for-word translation of all the 12 volumes of *Hortus Malabaricus*. The original style of Latin has been followed and no attempt has been made to modify or modernize it so that researchers interested in analysis and interpretation can read the text in the way it was written. The medicinal properties of the plants concerned, as originally certified by the unchallenged authorities of traditional medicine in Kerala who supplied all such information, have been translated and interpreted by Manilal. Commentaries have been given on the etymology of the Malayalam names, revealing their traditional uses as well as their botanical peculiarities. In addition, the identity of all the plants and correct scientific botanical nomenclature acceptable under the International Code of Botanical Nomenclature (ICBN), have been provided by Manilal along with their important synonyms and basionyms. The exquisite illustrations have enabled Manilal to identify many of the plants up to the generic level. However, they lack sufficient technical details of floral characters that are required by taxonomists to determine the specific name. To overcome this handicap, Manilal and the research scholars in his group have visited and collected nearly all the plants described in *Hortus Malabaricus* from localities where they were originally gathered three centuries ago. The plants and their floral parts were then subjected to detailed observation and the correct identity of most was established. Their names were confirmed by consulting important herbaria in Europe and America.

Considering the fact that the tools to study plants under high magnification were not available, the artists have missed out bladders in *Utricularia reticulata* Sm. (nelipu, vol. 9, Figure 70 m), an aquatic insectivore. There is some doubt about the identification of chunda (chundai in Tamil). Whether it is *Solanum melongena* (vol. 2, Figure 37) or *S. erianthum* D. Don (syn. *S. verbascifolium* auct; non Linn.) needs to be verified. Also to determine the species of *Trapa*, fruit morphometry (size of fruit, number of spines, length of spines, etc.) is important. The illustration (vol. 11, Figure 37) shows no fruits. In the text, *Trapa natans* L. has been mentioned (p. 119) whereas the Index (vol. 11, p. 248; vol. 12, p. 352) lists it as *Trapa bispinosa* Roxb.

Based on the work carried out by Manilal and his associates, a concise reference book *An Interpretation of Van Rheedee's Hortus Malabaricus* was published from Berlin by the International Association of Plant Taxonomists, under their official publication series 'Regnum Vegetabile'². This is the only book by Indian authors published in this

series till date and is considered a classic, essential for any study on the taxonomy of South Asian and South East Asian plants.

By presenting these data for the first time in the English edition of *Hortus Malabaricus*, Manilal has thrown open the doors of a vast and fascinating treasure-house to scientists, medical practitioners and historians for further research. For easy reference, analyses, statistical comparisons and further studies, several indexes have been provided at the end of each volume. Apart from volume-wise, figure-wise indexes, full indexes of botanical names, family names, Malayalam, Portuguese, Dutch/Belgian and Konkani names have been included.

Information on the medicinal uses of plants described in this book is of immense importance and current relevance, in the context of the growing global demand for natural drugs as well as the Intellectual Property Rights regime and Biological Patent Laws. By translating and interpreting this valuable document in English, Manilal has contributed significantly towards the safeguarding of our natural plant wealth and indigenous knowledge from being exploited by foreign commercial interests.

The compilation and publication of *Hortus Malabaricus* is also intimately connected with the history of India and the politics of the 17th century Netherlands and the prevailing social conditions of Malabar. Manilal has been studying these aspects and has brought to light many interesting facts, some of which were included in his earlier book *The Botany and History of Hortus Malabaricus*, published from Rotterdam and Delhi³.

Hortus Malabaricus is the first book in which Malayalam appears in print. As the technology was in its infancy then, engraving the mirror images on each page was done on copper plates. The engravers at Amsterdam had no knowledge of Malayalam language or its script and this resulted in certain distortions. Malayalam has been printed in the book to reproduce two certificates and to depict the names of plants alongside their illustrations. Manilal states that this is not only the first but the only printed book in which both the *Kolezuthu* and the *Aryaezuthu* scripts of Malayalam language and numerals are used together, offering scope for further investigations by socio-linguists.

The plant wealth of Malabar in mid-17th century

A perusal of the 12 volumes indicates that among the flowering plants a large number are trees. A break-up of plant diversity shows 67 members of the Fabaceae (bean family), 20 grasses, including three bamboos, 18 ferns, several aquatic plants, 17 cucurbits, 16 orchids, 15 sedges, 10 palms, 10 plants of the ginger family, two gymnosperms (*Cycas circinalis* and *Gnetum edule*) and only one moss – *Bryum bicolor*. Besides important native plants as well as those naturalized in the region since antiquity such as areca nut, banana, *bel (bilva)*, black pepper, betel vine, *champak*,

coconut, *elengi (bakul or bullet wood)*, ginger, palmyra palm, red silk cotton, sappan wood (pieces of which are boiled even today to purify drinking water in Kerala), talipot palm and turmeric, a large number of plants introduced from the New World by the Portuguese have been described. The important introductions include: sweet potato (*Ipomoea batatas*), papaya (*Carica papaya*), cashew nut (*Anacardium occidentale*), guava (*Psidium guajava*), custard apple (*Annona squamosa*), bullock's heart (*A. reticulata*), pineapple (*Ananas comosus*), English pumpkin (*Cucurbita moschata*), chillies (*Capsicum annum* and *C. frutescens*). The inclusion of their names as plants of Malabar indicates that the climatic and soil conditions were suitable for their introduction and cultivation, and that the people had assimilated them into their cuisine and culture. However, a few other important Portuguese introductions from the New World are conspicuous by their absence: tapioca (which is presently a staple food crop in Kerala and in many parts of Africa), potato, groundnut, vanilla, cocoa and tobacco. A few surprising alien elements in *Hortus Malabaricus* are *Gomphrena globosa* (from tropical and warm America), *Aloe vera* (a succulent from tropical South Africa, Malagasy and Arabia, probably introduced by the Arabs), *Canna indica* (from tropical America), and *Ipomoea quamoclit* and *Mirabilis jalapa* (four-o'clock plant or marvel of Peru) from Mexico and tropical America respectively.

In general all the volumes are beautifully illustrated. A few are exceptional for their artistic presentation and accuracy and deserve to be highlighted: **Volume 1:** *Cocos nucifera* (all drawings), *Areca catechu*, *Corypha umbraculifera*, *Borassus flabellifer*, *Caryota urens*, *Bauhinia variegata*, *Morinda citrifolia*. **Volume 2:** all pictures of *Pandanus* spp., and *Cassia tora*. **Volume 3:** *C. umbraculifera* (Codda panna or mountainous palm of Malabar); *Cycas circinalis*, *Artocarpus heterophyllus*, *Annona squamosa*, *A. reticulata*, *Dillenia indica*, *Ceiba pentandra*. **Volume 4:** *Myristica malabarica*, *Lagerstroemia hirsuta*, *Calophyllum inophyllum*, *Guettarda speciosa*, *Salacia chinensis* and *Manilkara kauki*. **Volume 5:** *Ochlandra scriptoria*, *Clerodendrum inerme*, *Gomphia serrata*. **Volume 6:** *Hiptage benghalensis*, *Jasminum sambac*, *Tabernaemontana divaricata*, *Abutilon indicum*, *Hibiscus rosa-sinensis*, *H. mutabilis* (all pictures), *Bruguiera gymnorrhiza* (excellent), *Butea monosperma*, *Cassia glauca*, *Caesalpinia sappan*. **Volume 7:** *Tetrastigma leucostaphylum*, *Piper nigrum*, *Gloriosa superba*, *Dioscorea hispida*, *Ipomoea batatas*, *Basella alba*, *Gnetum edule*. **Volume 8:** *Lagenaria siceraria*, *Cucurbita moschata*, *Benincasa hispida*, *Cucumis sativus*, *Luffa acutangula*, *L. aegyptiaca*, *Momordica charantia*, *Bauhinia scandens*, *Entada rheedei*, *Canavalia rosea*, *Zanonia indica* (showing vivipary?). **Volume 9:** *Ceropegia candelabrum*, *Nerium oleander*, *Neptunia prostrata* (although the nodules at nodes are missing). **Volume 10:** *Gomphrena globosa*, *Solanum melongena*. **Volume 11:** *Aloe vera*, *Elettaria cardamomum*, *Costus*



Figure 9 in vol. 1 of *Hortus Malabaricus* depicting young and adult female plants of palmyra palm, *Borassus flabellifer*. Also shown are leaf, young inflorescence, flowers, whole fruits and cross-section of fruit.

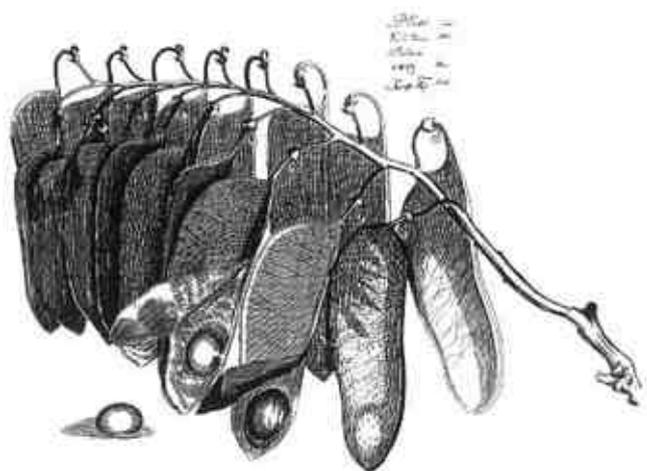
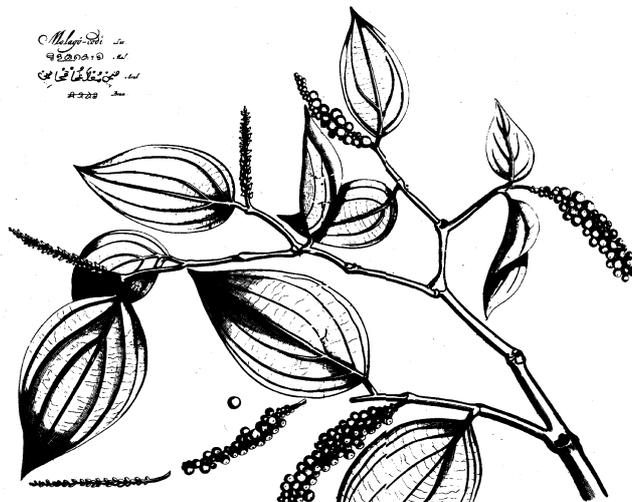


Figure 17 in vol. 6 of *Hortus Malabaricus* reproduced to show the high quality illustration of fruits of palash or dhak tree, *Butea Monosperma* (in which only one seed develops in a pod).



A twig of black pepper, *Piper nigrum*, reproduced from figure 12 in vol. 7 of *Hortus Malabaricus* showing young and old spikes bearing flowers and fruits.

speciosus, *Amorphophallus paeoniifolius*, *Colocasia esculenta*, *Lagenandra ovata*, *Nymphaea pubescens*, *Nelumbo nucifera*, *Pistia stratiotes*, *Ipomoea quamoclit*. **Volume 12:** *Rhynchosyilis retusa*, *Diplazium esculentum*, *Raphidophora pertusa*, *Lygodium flexuosum*, *Lycopodiella cernua*, *Saccharum spontaneum* and *Fimbristylis argentea*.

It is a tribute to the artists that several illustrations from *Hortus Malabaricus* have been repeatedly reproduced in learned journals and books during the past three centuries.

Impact of *Hortus Malabaricus* on Linnaeus' *Species Plantarum* (1753)

The use of languages being considered crucial in the evolutionary history of humans, naming and classifying objects became an important activity. Long-distance travel and trade along land routes followed by journeys by sea during the age of exploration added to the profusion of common names of plants in both oriental and occidental languages. For

example, cultivated plants such as rice and soybean have several hundred names in local dialects. Attempts made by early European botanists to classify and name plants in Latin resulted in phrase-names which are polynomials. Eventually it fell to the lot of the Swedish botanist Carl Linnaeus (1707–1778) to evolve an artificial (albeit practical) system of classification (based on the number of stamens and pistils in the flower) using an enormous amount of botanical data from several parts of the world in his monumental work *Species Plantarum*⁴. Linnaeus was also instrumental in strongly supporting the binomial system of nomenclature (already propounded by Bauhin in 1623). Since every specific name of this system consists of two parts – the generic name and the specific epithet, it is known as the binomial system. By suffixing abbreviations of the name of the person who first published the name (the term author is used for this purpose), Linnaeus solved the age-old problem of authenticity. The author's name is not a part of the botanical name, but is added for the purpose of precision. Thus the precise, referable, universal scientific name of the rice plant with its authenticity came to be accepted as *Oryza sativa* L. It differs from the related species of 'red rice' from West Africa, *O. glaberrima* Stendel. The International Code of Botanical Nomenclature presently in vogue, accepts the year of publication of Linnaeus' work *Species Plantarum* (1753) as the starting point for the nomenclature of all green plants (except mosses and a few special groups of algae).

Among the numerous books that Linnaeus studied thoroughly before producing *Species Plantarum*, only two merited his respect. He stated in his book *Genera Plantarum*⁵, 'I have not put my whole trust in any author excepting the work of *Hortus Elthamensis* by the very celebrated Dillenius and the work of *Hortus Malabaricus* by the illustrious Van Rheedee, having my firm conviction in their accurate data' (cited from Manilal *et al.*⁶). Linnaeus has included 258 Malayalam names of plants from *Hortus Malabaricus* in *Species Plantarum*. In his later works Linnaeus took 95 more Rheedean elements. Importantly, Linnaeus adopted many Malayalam plant names to coin binomials directly or after Latinizing them. Manilal states that, among plant names derived from Indian languages in *Species Plantarum*, the largest number are of Malayalam origin.

Among the many plants native to the Western Ghats or those in domestication in the middle of 17th century Malabar listed in *Species Plantarum* (1753; 2nd edn, 1762–63) only a few are given here: *Elettaria cardamomum* (L.) Maton (the lesser cardamom); *Areca catechu* L. (the betel nut); *Borassus flabellifer* L. (palmyra palm), *Ceropegia candelabrum* L. (a beautiful wild plant that is of potential ornamental value); *Cocos nucifera* L. (coconut), *Averrhoa bilimbi* L. (*bilimbi*); *Averrhoa carambola* L. (*carambola* or star fruit); *Ficus benghalensis* L. (*banyan*); *Ficus religiosa* L. (*pipal*); *Moringa oleifera* (horse-radish tree or drumsticks); *Indigofera tinctoria* L. (*indigo*); *Mangifera indica* L. (*mango*); A. Juss (named *Melia azadirachta* L.

in *Hortus Malabaricus*) (*neem*); *Michelia champaca* L. (*champak*); *Mimusops elengi* L. (*bakula* or bullet wood); *Nelumbo nucifera* Gaertn. (named *Nymphaea nelumbo* L. in *Hortus Malabaricus*) (*lotus*); *Phyllanthus emblica* L. (*emblic myrobalan*, *amla* or *aonla*); *Piper betle* L. (*betel leaf*); *Piper longum* L. (*Indian long pepper*); *Piper nigrum* L. (*black pepper*); *Tamarindus indica* L. (*tamarind*); *Nerium oleander* L. (*oleander*); *Crotalaria juncea* L. (*sunn hemp*); *Curcuma longa* L. (*turmeric*) and *Zingiber officinale* Rose. (named *Amomum zingiber* L.) (*ginger*).

A practice common among taxonomists is to honour noted botanists by naming newly discovered organisms after them. Linnaeus erected *Rheedia laterifolia* L. This name was subsequently proposed as *R. brasiliensis* (Mart.) Planch. Triana (Bakupari in Brazil) of the family Guttiferae (Clusiaceae) to honour Rheedee. This genus has now been merged with *Garcinia*. However, Rheedee's name has been commemorated as a specific epithet in 35 plants, a few important ones being *Strychnos rheedeei* C. B. Clarke; *Bulbophyllum rheedeei* (K. S. Manilal & C. Sathish Kumar), now elevated to a new genus *Rhytionanthos* by Garay *et al.*, an orchid; *Calamus rheedeei* Griff., a rattan; *Impatiens rheedeei* W. & A., a balsam; *Ochlandra rheedeei* Gamble (a bamboo from Kerala); *Phyllanthus rheedeei* W. a member of the Euphorbiaceae; and *Spathodea rheedeei* Wall., a member of the Bignoniaceae.

Itty Achuden

Manilal is of the opinion that the medicinal properties of plants listed in *Hortus Malabaricus* are based on pre-Ayurvedic traditional knowledge of the local people of Malabar. This raises several questions. Who were the people of Malabar? Were they aware of Ayurvedic knowledge before *Hortus Malabaricus* was compiled? When did Ayurveda actually reach Kerala? Not being familiar with the history of Kerala, I could get no clear-cut answers to these questions. However, a perusal of the various uses of plants listed in *Hortus Malabaricus* indicates that they are quite different from those listed in Ayurveda. For example, *Asparagus officinalis*, well known for its use as a galactagogue in Ayurveda, was employed for some other purposes by the traditional vaidyas of Malabar. There is a strong indication that the ethnobotanical and ethnomedical uses in Malabar were the outcome of empirical knowledge.

The most remarkable Indian figure associated with *Hortus Malabaricus* is Itty Achuden, Van Rheedee's key informant. What is known about him? What was the source of his knowledge? In response to my request, Manilal referred me to his book: *A Study on the Role of Itty Achuden in the Compilation of Hortus Malabaricus*⁸, published from Calicut in 1996 in Malayalam. As I cannot read Malayalam, Manilal gave me a brief account of Itty Achuden, whose distilled knowledge provided much of the textual information in *Hortus Malabaricus*.

Itty Achuden (his name appears as Itty Achudem in vol. 1) was born in the Collada family, famous for hereditary physicians in a place called Codakkarapalli of Carappuram, situated about 25 km south of Cochin. He belonged to the Ezhava caste, who were then treated as untouchables by the Malabar Hindu community. The head of the family who practised medicine was known as Collatt Vaidyan. When a Collatt Vaidyan died, his practice and title went to his (eldest) son. The Collatt Vaidyans maintained a family book consisting of several volumes of palm leaf manuscripts in Kolezhuthu Malayalam, in which were recorded names of medicinal plants, methods of preparation and application of drugs and the illnesses for which they were used. The family book not only served as a guide, but was in turn constantly enriched by recording the experiences of the individual physician of a new generation.

Nothing is known about the date/year of Itty Achuden's birth or about his descendants. All efforts by Manilal to trace Itty Achuden's life after the compilation of *Hortus Malabaricus* have failed. It is said that Itty Achuden put the family book in a cane (rattan) basket and passed it on to a Konkani brahmin neighbour for safe keeping, as he was leaving his home for a long time. There is a story in his village that he was taken to the Netherlands by the Dutch. This has to be verified, as the Dutch kept accurate records of all passengers arriving or leaving their ports by boat. It is also believed that the Konkani family returned the cane basket and its contents to the head of the Collatt family. There were no more physicians left in the family and the priceless treasure of the documentary record of medicinal knowledge got destroyed some time in 1963 or thereabouts. Curiously the basket still survives!

Manilal informs me that members of Itty Achuden's family had maintained a small thatched hut called *Vilakku Maadam* for several generations, to worship their ancestors by lighting an oil lamp every evening. As Itty Achuden was probably the last of the ancestral vaidyans, a lamp continues to be lit even today in his memory. A small portion



K. S. Manilal who has translated the text of the 12 volumes of *Hortus Malabaricus* from old Latin to English with annotations and modern botanical nomenclature, a work which took 35 years to complete.

of the Tropical Botanical Garden and Research Institute, Thiruvananthapuram, Kerala has been set aside to introduce plants listed in *Hortus Malabaricus* to honour Itty Achuden. The entrance to this enclosure has a gate typical of the Malabari tradition. In a rare gesture, Blume who had great respect for Van Rheede, immortalized Itty Achuden by naming a genus *Achudemia*, which has now been included under *Pilea* (Urticaceae). The courage shown by Van Rheede, the powerful ruling Dutch Governor, by inviting Itty Achuden to collaborate with him as an equal in the compilation of *Hortus Malabaricus*, respecting his knowledge and competence, and ignoring his social status, should be considered as an important milestone in the social history of Hindu medieval Malabar⁹.

Publication details of the English edition

Manilal must have been greatly relieved and genuinely elated that the University of Kerala agreed to publish all the 12 volumes of the English edition of *Hortus Malabaricus* (2003) and bear the entire cost. The quality of printing and production is superb. St. Joseph's Press, Thiruvananthapuram deserves praise for the excellent job accomplished. Proof-reading is a dying art and Manilal has been ably assisted by his former students in going over the printed text. There are still a few typographical errors which can be listed in an errata. The beautiful illustration on the cover page is the original frontispiece. Considering the precious contents, the price of Rs 20,000 for the entire set (US\$ 950 outside India) does not seem excessive for educational and research institutions. I understand that the University of Kerala has made a sizeable profit by the sale of the English edition.

The culmination of the 35-year project was the release of the work by the President of India, A. P. J. Abdul Kalam on 12 June 2003. He accepted a set from the Vice-Chancellor of the University of Kerala, coinciding with the 325th anniversary year of the publication of the original first volume of *Hortus Malabaricus* in 1678. Ironically, the University of Kerala authorities did not consider it necessary to invite the author to the book release in New Delhi!

Not one to feel satisfied with his accomplishment of bringing out the English edition, Manilal has taken up the task of organizing the production of a Malayalam edition of *Hortus Malabaricus* with the help of Malayalam scholars. The University of Kerala is also supporting this work.

Other contributions of Manilal to botany

Manilal is a distinguished plant taxonomist, respected for his erudition and utter dedication to the study of biodiversity and conservation. A quiet and soft-spoken person who carries his knowledge lightly, Manilal has the courage to express his views on the neglect of taxonomy in India un-

equivocally and clearly. Born in 1938 in Ernakulam, Manilal took the B Sc degree in his hometown and M Sc (1961) and Ph D (1964) degrees from Saugar University. He joined Calicut University as a Lecturer in Botany in 1964 and was promoted Reader in 1970 and then appointed Professor (1976–86) and Senior Professor (1986–99). Manilal has travelled widely and has authored over 200 research papers and 11 books. He is the author of *Flora of Calicut* with V. V. Sivarajan¹⁰.

An invaluable contribution of Manilal and his students is the unique and detailed survey of the rich flora of the Silent Valley. A significant people's movement spearheaded by the Kerala Shastra Sahitya Parishad involving environmentalists and conservationists in the late 1970s, was the agitation to stop the construction of a 75 MW hydroelectric project by constructing a dam across the Kunthipuzha (a tributary of the Periyar river) in Palakkad (Palghat) district of Kerala, which would have submerged over 830 ha of the dense tropical evergreen forest of the Silent Valley, that Salim Ali called '... a very fine example of one of the richest, most threatened and least studied habitats on earth'.

Between 1981 and 1984, Manilal and his three research scholars spent several hundred days and 400 nights inside the thick tropical jungle teeming with elephants, bears, poisonous snakes, monkeys, bats and blood-sucking leeches in the pouring rain! The project resulted in the collection and identification of 996 species of flowering plants belonging to 559 genera and 134 families (as against the assumed 240 species). These included rare and endangered endemics, wild relatives of black pepper, cardamom, ginger and turmeric, the Malabar daffodil orchid (*Ipsea malabarica* discovered by Jerdon in 1850 and never seen again), 12 neottiid orchids that occur only in a pollution-free environment and seven species new to science. Manilal and his associates have published over 40 research papers on their explorations of this region and a reference book *Flora of Silent Valley Tropical Rain Forests of India*¹¹. Importantly, the vast meticulously collected data on the plants of the Silent Valley, along with investigations on the fauna and ecology by other experts, lent strong support to the fact that these forests are indeed pristine and merit conservation at any cost. While Manilal's survey was in progress, scientists and journalists from Europe, Africa and South America came to India to study the working of this project. The declaration of Silent Valley as a National Park has been hailed as a triumph of the conservation movement in which common people, scientists, artists, poets, novelists, lawyers, and the media joined hands and fought relentlessly. This is also the first such movement in a Third World country that has served as a model. Those readers interested in a fuller account of this unique movement are referred to a beautifully produced and profusely illustrated book *Silent Valley – Whispers of Reason*¹².

Orchidology is another field in which Manilal and his student Sathish Kumar have done a substantial amount of

research, including taxonomy, anatomy, biology and floral evolution. As against the estimated 80 species native to South India (the Western Ghats), the count made by these authors is as high as 215, including the lady's slipper orchid *Paphiopedilum druryi*, once believed to have disappeared from its habitat¹³. Research on orchids can be found in two books by Manilal and Sathish Kumar^{14,15}.

Manilal has established a School of Plant Taxonomy at the University of Calicut. He has also spearheaded the founding of the Indian Association for Angiosperm Taxonomy in 1989, starting its excellent journal *Rheedeia* (named after his hero Van Rheede) in 1991. He deserves to be recognized by the leading scientific academies of the country. The Indian Botanical Society honoured Manilal with the V. Puri Medal (1990) and also elected him President of the Society for the year 1999. The Ministry of Environment and Forests awarded the prestigious E. K. Janaki Ammal Prize to Manilal in 2003 in recognition of his lifetime achievement in taxonomy.

Conclusion

Like Van Rheede, Manilal experienced endless obstacles in preparing the English edition of *Hortus Malabaricus*. The enormous practical outcome of this Herculean task has been the opening up of a database on the economic plant resources native to Kerala in the Western Ghats of India, the rich traditional knowledge system and application of medicinal plants for human diseases and disorders, cultivation and assimilation into our culture plants introduced from different parts of the world, including Latin America. It offers wide opportunities for further research in various fields such as botany, pharmacology, medicine, politics, geography, social history, linguistics and evolution of printing technology. Above all, Manilal has underscored the importance of taxonomy and its utility.

Paradoxically *Hortus Malabaricus*, originally meant to provide foreign powers a resource base in India, will be helpful through its English edition in safeguarding hundreds of Indian medicinal plants to prevent patenting against Indian interests and will act as a weapon against the negative impacts of globalization.

Manilal's work sends a clear message to those scientists who tend to avoid research that demands rigorous and intensive labour. There is a general impression that meaningful long-term studies spanning several decades cannot be successfully undertaken by individuals. Even scientific institutions are reluctant to do so. That Manilal has accomplished this gigantic task with practically no financial support from any government or private agency deserves deep appreciation.

The scientific community must recognize Manilal's scholarly and painstaking achievement at a time when citation indices and working in high-tech areas using modern tools appear to be the principal criteria for judging merit.

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