

A detailed botanical illustration in a sepia or aged paper tone. The image features a large, dense cluster of long, thin, pointed leaves on the left side. To the right and extending towards the bottom, there are several stems with smaller, similar leaves and numerous small, round, spiky seed heads or flower clusters. The overall style is that of a classic scientific or historical botanical drawing.

SUCH TREASURE  
& RICH  
MERCHANTIZE

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Images from the *Hortus Malabaricus* volumes at Blatter Herbarium Library of St. Xavier's College, Mumbai have been photographed by Vinesh Gandhi, Mumbai

The botanical information in this exhibit is of academic and historical interest and should not be considered to be of therapeutic value

Exhibit curated by: Annamma Spudich  
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# SUCH TREASURE & RICH MERCHANTIZE

INDIAN BOTANICAL KNOWLEDGE  
IN 16<sup>TH</sup> AND 17<sup>TH</sup> CENTURY EUROPEAN BOOKS

Annamma Spudich

National Centre for Biological Sciences | Tata Institute of Fundamental Research | 2008



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**THE SPICE TRADE** was the principal context of contact between Asia and Europe in the early modern era. Until the middle of the 18<sup>th</sup> Century, botanicals from India were important ingredients of European life as culinary additives, medicines, and luxury items like perfumes, aromatics and unguents for religious rituals. Vast quantities of natural products, “Rich Merchandize,” went through and from India to Europe along the spice route. The search for shorter and direct sea routes to India was the driving force for the voyages of discovery that profoundly changed both the world’s maps, and its history.

In 1498 Vasco da Gama arrived in Calicut to procure pepper and other natural products for Portugal. Large numbers of European traders followed da Gama and settled in coastal areas of India to join the Asian spice trade. Along with commodities, Europeans in India sought out and compiled indigenous knowledge of medicinal and agrarian plants for their use in India and elsewhere. Botanicals were essential to existence in the colonies, both as foods and as medicines to combat unfamiliar tropical diseases for which Europeans had no remedies. Profitable trade required accurate knowledge of botanical commodities. Procuring such information was part of the European strategy, and traders and travelers were encouraged and later commissioned to do so. India was uniquely able to provide such knowledge. Study and veneration of plants are part of the culture of India. The wealth of botanical knowledge from thriving indigenous medical traditions and centuries-old agricultural practices made its way into several European books published in the 16<sup>th</sup> and 17<sup>th</sup> centuries.

Information about the many hitherto unknown Indian plants collected from India was also important for the emerging field of botany and was key to the development of the botanical classification systems in the 18<sup>th</sup> century. The exhibit “Such Treasure and Rich Merchandize: Indian Botanical Knowledge in 16<sup>th</sup> and 17<sup>th</sup> Century European Books” presents botanical illustrations, prints, and maps from seven European books published in those early times and provides fascinating glimpses into this little known chapter of the history of East-West interaction.

WHAT THE BOOKS DO NOT TELL US ABOUT, however, is the contribution of indigenous scholars to the effort. Their participation was vital for acquiring and understanding highly sophisticated and codified botanical knowledge from age-old Indian knowledge systems. The specifics and accuracy of the information suggest intimate collaboration with and cooperation from unidentified Indian sources. While for the most part the Indian collaborators are not identified, they are generally acknowledged as learned and dedicated scholars.

The earliest book referred to in this exhibit is Garcia da Orta's "*Colloquies on the Simples, Drugs and Materia Medica of India...*" published in Portuguese in Goa in 1568. Garcia da Orta was a naturalist-physician trained at the University of Salamanca and attended the viceroys of Goa. In "*Colloquies...*" da Orta acknowledged that an important system of botanical knowledge "taught of yore by the Muses of Ganges and Ind," but unknown to Galen and the Greeks, existed in India. His book was compiled from knowledge gathered from the Hakims and Vaidyas of Goa during the thirty years he worked there. Based on his newfound knowledge, da Orta reported, for the first time, Indian treatments for tropical diseases unfamiliar to European physicians and corrected myths about Indian plant medicines available in Europe at the time.

"*Colloquies...*" was rapidly incorporated into European books on botany and medicine and remained an important source of Asian botany in Europe for a hundred years. The Spanish physician Christobal Acosta introduced da Orta's work to Europe in his "*Tracto de las Drogas y Medicinas de las Indias Orientalis*" (Burgos, 1578). The book provided valuable information as reference points for study of plants of the Americas.

Charles E'Cluse, professor of Botany and the first director of the prestigious Leiden Botanical Garden, published "*Exoticorum librum decem...*" in Antwerp (1605) with condensed versions of da Orta's and Acosta's works. Though E'Cluse had never been in India, he was an avid scholar and collector of botanical specimens, and was instrumental in disseminating, through his commentaries of da Orta's work, knowledge on Indian botanicals in Europe. Illustrations of Indian plants from Acosta's and E'Cluse's books are featured in the exhibit.

*Itinerario* by Jan Huyghen van Linschoten published in Holland (1596) predated the founding of the British and Dutch East India Companies and was seen as “one of the keys that opened the entrance to India” (Thiele, 1883). The *Itinerario*, compiled from information Linschoten gathered during his nine years in Goa, describes forty five plants –“Drugges, Spyces, Hearbs and Plants”– of medicinal and commercial value. While van Linschoten refers to da Orta many times, he clearly had first hand experience with Indian physicians, as he has high praise for them: “Many of the heathen are very well acquainted with medicine. They help not only the Indians but also the Christians, the archbishop, And viceroy with more dedication than the Europeans.” *Itinerario* and the English translation *John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies* were valuable sources on all things Indian for the newly chartered Dutch and English East India Companies.

*The Greate Herball or Generall Historie of Plantes* by John Gerard, apothecary and master of the Company of Barber Surgeons, was published in Elizabethan England at the end of the 16<sup>th</sup> Century (London, 1597). Gerard has three chapters in the “Herball” on plants from the “Indies.” With its witty text and remarkably accurate illustrations, the book was popular in medical-botanical and literary circles. Gerard had never been to India and assembled the chapters on plants of the “Indies” from the vast amount of Indian botanical knowledge available in Europe at the time. Throughout the book Gerard gives accounts of how he learned “From Forreine Places All the Varietie of Herbes,” and how he collected cuttings and seeds of exotics, providing fascinating glimpses of the circuitous routes botanicals traveled from Asia to Europe at the end of the 16<sup>th</sup> century.

The compendious botanical work *Hortus Indicus Malabaricus*, published in Amsterdam from 1678 to 1693 and entirely devoted to the useful and medicinal plants of Malabar, is highlighted in this exhibit. This twelve volume treatise compiled under the direction of Henrik Adriaan van Rheede, the Dutch governor of Malabar, is unique in the annals of colonial botany in illustrating the extent of collaboration between European and Indian scholars. In this work, Indian scholars are specifically identified and honored for their contributions. In volume 1, the Malabar traditional physician Itty Achudem and three Brahmin physicians of the Ayurveda tradition are acknowledged as the sources, by testimonials in their own hand. They provided

information on the medical and other properties of the flora of Malabar and procured specimens for the illustrations. The illustrations are identified by Malayalam names written in Malayalam, Arabic, Roman, and Nagari scripts, and are notable for the quality of the engravings and for botanical detail.

Cataloging plants with a viable classification system was an important milestone in the development of botany as a science independent of medicine. *Hortus Malabaricus* was an important resource on Asian plants for Carl Linnaeus, and others working on botanical classification systems, and it introduced several Malayalam plant names into botanical nomenclature. For their monumental contributions to botany Van Rheede and Itty Achudem were honored by the genus names “Rheedia” and “Achudemia.” Quotes from contemporary commentaries on the *Hortus Malabaricus* highlight its contribution to botanical knowledge in the 17<sup>th</sup> century and beyond.

Other quotes, maps and illustrations from the period give glimpses of Asian and European worlds in the 16-18<sup>th</sup> centuries. Cartography was an essential tool of trade, and maps from books on “voyages of discovery” illustrate how important India was in world commerce. The four maps included in the exhibit, dating from the 16<sup>th</sup> to the 18<sup>th</sup> centuries, show details and city plans of the coastal areas of peninsular India involved in European commerce. In sharp contrast to the painstakingly accurate botanical illustrations and maps, images of the people of India are products of European imaginings of the fantastic and exotic India, and are perhaps a premonition of the colonial history of the 19<sup>th</sup> century.

**MATERIAL SOURCES:** Because of the fragile nature of rare books and maps, all the displays in the exhibit at the NCBS are accurate reproductions of original materials. Some part of the material in the current exhibit was part of a previous exhibit at the Cantor Center for Visual Arts at Stanford University in 2003 entitled “*From Forreine Places All the Varietie of Herbes.*” All the images and text from rare book libraries and collections in India, Europe and America, are reproduced here with permission of the owners.

**Annamma Spudich, Scholar in Residence, National Center for Biological Sciences, Bangalore.**

## ACKNOWLEDGEMENTS

A great many books, events and people have inspired the work that led to this exhibit. My childhood spent among pepper vines and the aromas of drying cardamom and ginger left a powerful and lasting imprint on my senses. Several years ago coming across the 1597 edition of *The Greate Herball* by John Gerard in the Cambridge University library, with woodcuts of spices and the beautiful image of the ficus tree, is the most direct influence that led me here. That book and others published in the 16th and 17th centuries in Europe record information on spices and medicinal plants that were part of my childhood world, and I was driven to explore this further to understand the how and why of it. Then I had the good fortune to cross paths with a renowned scholar and Ashtavaidian, Olassa Chirataman Narayan Moos, who for me personified the scholar physician behind the knowledge recorded in the books in this exhibit. That meeting solidified for me the need to study the subject of this exhibit. So after many years in a biochemistry research lab, I decided to pursue this interest. I was fortunate to have support and interest from several people who were intrigued by it as I was.

First and foremost I am grateful to Prof. K. VijayRaghavan, Director of NCBS, for his vision and his enthusiastic support for the project. This exhibition brings together history, science and art, a bit off-beat for a scientific institution at the forefront of modern experimental science. However the picture of pre-colonial East-West encounters that this exhibit presents, where Indian knowledge and skills were sought after, collected and acknowledged, is not unfamiliar to many at NCBS.

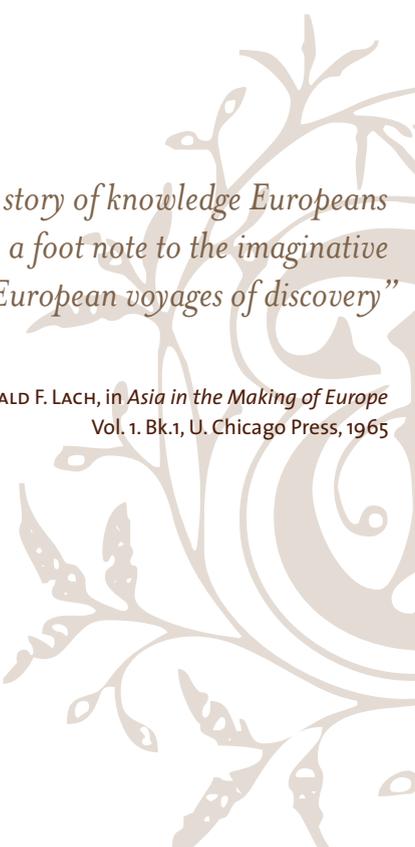
I am also very grateful to the faculty and staff at NCBS, who helped at many levels to make this exhibit possible. This project benefited from their enthusiastic support and critical input.

Ms. Sarita Sundar and her colleagues at Trapeze were critical to the success of this project. Working with them was a pleasure and also an exercise for my brain. Besides teaching me the intricacies of graphic design, they challenged my assumptions and brought order to make this a visually and intellectually exciting project. The catalog and the exhibit are the result of a very equal collaboration between us.

I am very grateful to Dr. Geoff Hyde for critically reading the text and for bringing his scientific and editorial skills to help to refine the content. My thanks also to Ms. Patience Young of the Cantor Center for Visual Arts at Stanford University and Dr. Joan Theobald Wren for collaborating with me on a previous exhibit, which launched me into doing exhibitions.

And finally, to JAS, thanks.





*“The remarkable story of knowledge Europeans encountered is often a foot note to the imaginative daring of the European voyages of discovery”*

DONALD F. LACH, in *Asia in the Making of Europe*  
Vol. 1. Bk.1, U. Chicago Press, 1965

**THIS** quote from volume 1 of Prof. Donald Lach’s monumental work *Asia in the Making of Europe* highlights the theme of this exhibition. Exchange of knowledge was part and parcel of the centuries old trade between India and the west. Communication between Europe and India accelerated after Vasco da Gama arrived in Calicut in 1498, and in the 16<sup>th</sup> century several European travelers, adventurers and traders wrote books on the wonders and commodities of “exotic Indies.” These books on travel, adventure and exotica contain records of the remarkable botanical knowledge available in India in the 16<sup>th</sup> and 17<sup>th</sup> centuries.

“Those herbs, the first-born of the gods,  
three ages of the world ago,  
those will I worship in my thought,  
the hundred and seven virtues of those  
(with new) tawny (sprouts)...”

**Stanza from the Rg Veda**

(Dated to 1500-900 BC)

Translated by Heinrich Zimmer,

In *Hindu Medicine*, Johns Hopkins University Press, Baltimore, 1948



Throughout Indian history plants are valued for their healing and life giving properties. Several incantations, like this stanza from the Rg Veda, extol the virtues of medicinal plants. Such knowledge was passed on by oral recitation and later in written texts to form an unbroken tradition of knowledge into modern times.



**Medical Palm Leaf Manuscript**

Kerala, India

Late 19th – early 20th century

Palm leaf with charcoal and ink

Leaf size, 1.5x7 in

Private Collection

Palm leaf manuscript pages are made from leaves of *Borassus flabellifer* or *Corypha umbraculifera*, inscribed with an iron stylus and enhanced with ink made from lamp black or charcoal mixed with oil. This magical-medical manuscript with text and diagrams describes medicinal plant formulations and ritual cures for diseases of women and children. Many palm leaf manuscripts in vernacular languages and Sanskrit are scattered throughout India in libraries and private collections. They are important sources of the early botanical-medical knowledge of India.



*Above:* **The Bower Manuscript, 350-375 AD**  
Book II, Leaf 9, Obverse  
Birch Bark with Ink calligraphy, Leaf size 3.5x12.5 in  
Sanskrit, Gupta Script  
Bodleian Library, Oxford University

*Below:* **The Bower Manuscript, 350-375 AD**  
Book II, Leaf 9, Reverse  
Birch Bark with Ink calligraphy, Leaf size 3.5x12.5 in  
Sanskrit, Gupta Script  
Bodleian Library, Oxford University

The earliest botanical knowledge of India is found in medical treatises. The foundations of an organized system of medicine in India may have been laid during the Maurya period; the edicts of Ashoka record establishing medicinal botanical gardens and hospitals for both man and beast. Buddhist texts extol the expertise of the royal physicians Jivaka and Ajatasatru. Indian Buddhist monks were learned in the arts of healing and an arogya vihara is part of an excavation of a 4<sup>th</sup> century Buddhist monastery at Pataliputra.

The Bower Manuscript shown above is a botanico-medical manuscript dated to the 4<sup>th</sup> century AD. The manuscript of 51 Birch bark leaves, written on obverse and reverse, was discovered in Central Asia in 1890 and was identified to be the pocket book of Yasomitra, an Indian Buddhist monk physician. It contains parts of six books, four on medicinal plant formulations and their uses, and two on divinations. The complex prescriptions suggest considerable knowledge of the properties of plant medicines.

A.F. R. Hoernle of the Asiatic Society of Calcutta transcribed the manuscript from Gupta Sanskrit script and translated the text into English. The translation, with Hoernle's scholarly discourses on the manuscript, was published by the Archaeological Survey of India at the end of the 19<sup>th</sup> century. All the original Birch Bark leaves are now in the Bodleian Library, Oxford.

# QUEST FOR THE INDIES

VOYAGES IN SEARCH OF  
"SUCH TREASURE AND RICH MERCHANDIZE",  
IN 16TH AND 17TH CENTURY BOOKS



*“But since Europe has tasted of this luxury,  
since the custom of a hundred years has made their spices  
necessary to the constitutions of all degrees of people,  
since their silks are pleasing every where to the better sort, and  
since their calicoes are a useful wear at home,  
and in our own plantations, and for the Spaniards in America,  
It can never be advisable for England to quit this trade,  
and leave it to any other nation.”*

CHARLES D’AVENANT, 1697,  
to the Most Honourable John Lord Marquis of Normanby  
Yale University Archives

**THE** voyages in search of a direct sea route from Europe to the source of spices was the driving force behind explorations that profoundly changed the map of the world. The spice trade was an important interface between the East and the West. From the first century B.C. Roman ships would ride the monsoon winds to India’s west coast, laden with gold, and return with pepper and other Indian natural products that Europeans coveted as essential to life.

At the end of the 17<sup>th</sup> century, Indian spices and textiles were necessary ingredients of European life at home and in the colonies in the Americas. The need for these necessities and luxuries brought competing European powers to enter the Asian trade. The major European powers of the 17th century, the Dutch and the British, incorporated companies with exclusive rights to trade in Asia. The British East India Company, incorporated by Royal charter from Elizabeth I at the end of 1600, was the forerunner of British rule in India. The dominant role the British were to occupy in Asia is suggested in the quote above from D’Avenant.



**Vasco da Gama introduced to the Zamorin  
(or King) of Calicut in India**

From John Hamilton Moore, *The Complete Collection of Voyages and Travels*

London, Alexander Moog, c. 1780

Copper engraving, Original Size 6.75x11.5 in  
Private Collection

**This print from the 18th century is a fanciful rendering of the encounter in 1498 between the Zamorin of Calicut and Vasco da Gama. The Zamorin (Samudra Raja) had control of trade from the Malabar ports and had amicable relationships with Arab and other communities involved in the Malabar spice trade. The initial encounter between the Zamorin and da Gama was cordial and the Portuguese were dazzled by the splendor of the Zamorin’s court and his reception of the newcomers. An 18th century report, based on earlier records, describe it thus: “The Zamorin received the newcomers kindly, and admitted them to an audience, at which he appeared clothed in white calico flowered with gold and adorned with precious gems. His couch was placed in a hall furnished with rich carpets and tapestry and a golden fountain poured out its waters before it. The Portuguese, unacquainted with Indian customs, had provided no nuzzar for the prince ...”**

*India, an historical sketch*, George Trevor, London,  
Religious Tract Society, 1799.



**THIS** map, estimated to be from late 16<sup>th</sup> century, and the accompanying text, provide an interesting picture of the contemporary European view of Asia: *“it was there the Almighty Creator was pleased, not only to Plant the Paradise for the first Man Adam...”* and the land had the added advantage that *“the Earth produces not only all the common Necessaries of Life in great Plenty, but gives us over, and above, all those Delicacies, which serve for Delight and Luxury...”*

The passage above resonates well with the following statement from the introduction to the very popular 16<sup>th</sup> century Dutch book *John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies* and highlights the European view of Asia as the source of treasures found nowhere else.

*“Third part of all the land that is inhabited..., all very fruitful and yielding such treasure and rich Merchandize, as none other place of the whole world can afford.”* \* These treasures and rich merchandize included rare spices, dyes, silks, fine cottons, rare woods, exotic animals, gems and “pearl of the Orient”.

\*“To the Reader” in *John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies*. Printed at London by John Wolfe, 1598.

*Facing page: Hand Colored Map of Asia.*  
Late 16<sup>th</sup> Century,  
Hand-colored engraving, 7.25x8 in  
Artist and Source unknown  
Private Collection

*“Until industrialization the balance of trade was in favor of Asia, meaning Europe bought more from Asia than they sold to them and as a result large quantities of precious metals were used for the payment”*

PETER SPUFFORD

*Power and Profit: The Merchant in Medieval Europe*  
Thames and Hudson, London, 2003





**Indian elephant Hanno**

Pen and ink drawing 1514-1516

Attributed to the Italian master Raphael

(or the artist Giuliano Romano)

Kupferstichkabinett, Staatliche Museen zu Berlin /bpk

Photo: Jörg P. Anders

## IN THE 16<sup>TH</sup> AND 17<sup>TH</sup> CENTURIES

exotic flora and fauna were collected by European nobility as witness to their colonization of far reaching territories and were important accessories of power and prestige. Among the many exotic items taken to Europe from India in the early 1500s by the Portuguese was an elephant from Cochin named Hanno. The elephant, highly trained to perform and of a rare light color, was originally taken to Portugal with other exotic species of flora and fauna to grace the collection of King Manuel of Portugal. In 1514, with great pomp and ceremony Manuel presented Hanno to Pope Leo X along with other exotic gifts. Manuel's gifts were calculated to draw attention to Portugal's "conquest" of the fabled lands of the Indies, to seek papal support for Portuguese expansion in the Eastern hemisphere and to discourage competition in the same arena from other European nations. Leo X was dazzled by the exotic gifts and Hanno became a particular favorite of the Pope. Shortly after, Portugal was granted exclusive exploration rights to all of the Eastern hemisphere by papal authority.

Hanno became a sensation in Europe and Hanno's image was immortalized in sculptures and sketches by celebrated artists of the 16th century like Raphael. The image here served as a model for other works of art in the 16th century. "Hanno" is believed to be a corruption of the vernacular Malayalam word "Aana" meaning elephant.\*

\**The Pope's Elephant*, by Silvio A. Bedini,  
J. S. Saunders & Company, Nashville, USA, 1998.



**IMAGES** of Indian port cities active in European trade were popular in travel books and books on geography during the 16<sup>th</sup> and 17<sup>th</sup> centuries. Masulipatam and Surate were especially active in the textile trade with the Middle East and with South East Asia and Goa was the headquarters of the Portuguese colony in Asia. Coastal areas of these cities housed European forts and factories and European ships and buildings topped by crosses indicate European presence. The Indian location is suggested in these images by elephants and by non-European, dark skinned people of uncertain identity.

**Engravings from 18<sup>th</sup> century of Indian port cities**

**Masulipatam, Goa and Surate**

*Aussicht von Surate, Goa and Masulipatam*

F. de Bakker, engraver

Original Copper engravings, 1751

Size 7.25x 13.5 in

Private Collection



## ON MAPS & CARTOGRAPHY

**MAP** making is the oldest of the pictorial arts and in their simplest form maps have guided human migrations from the earliest times. Maps brought together the sciences, navigation, and exploration and provided the means for ships to sail from Europe to Asia. The lure of the riches of the “Indies” was an impetus to the advancement of cartography and maps were closely guarded by their owners. In the 16<sup>th</sup> century the Portuguese and Spanish led the Europeans in creating navigational maps. Portuguese travelers and cartographers Francisco Rodriguez and Tome Pires traveled to India and beyond in the early 16<sup>th</sup> century to further their nation’s effort in Asia. Dutch cartographers Mercator and Ortelius added their brilliant cartographic work to that of the Portuguese with new ways of picturing the world and expanded access to the riches of Asia in the 16<sup>th</sup> century.



The lure of the riches of the “Indies” was an impetus to the advancement of the field of cartography

**World Map (Planisphaerum Terrestre), 1704**  
Published by Adam Friedrich Zürner  
Hand-colored map, Original Size 25x22 in  
Special Collections, Stanford University Libraries

The early 18<sup>th</sup> century worldview is literally revealed on this double hemisphere map. Multiple views of the hemispheres are an added feature. This map identifies Indian port cities that were important for European trade—Goa, Calicut, and Surat. Dotted lines on the map indicate voyages of Vasco da Gama (first Portuguese explorer to arrive in India, 1498), Ferdinand Magellan (first circumnavigated the earth in 1519), and Sir Francis Drake (who followed Magellan in 1577).





**World Map, Typus Orbis Terrarum, 1598**

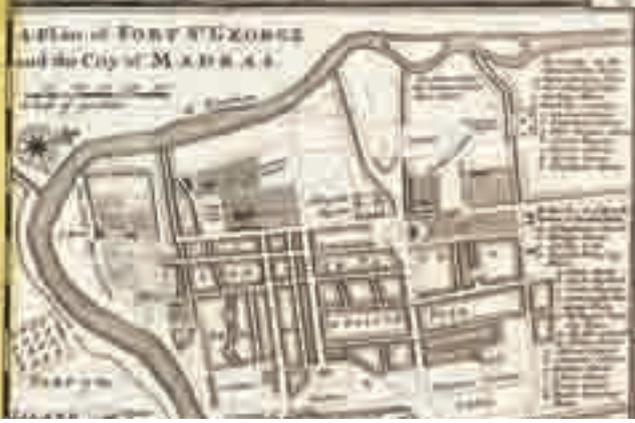
*John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies.*

Printed at London by John Wolfe, 1598

J. Bapt. Vrient, Antwerp, Cartographer

Copper engraving, original size 13.75x19.5 in  
Huntington Rare Book Library

Maps of voyages were closely guarded by the owners and highly coveted by those who did not have them. This map, included in John Huyghen van Linschoten's book, written on his return to Holland after several years in the employ of the Portuguese in Goa, provided the Dutch with crucial information on travel to Goa, the administrative and trading center of the first European colonies in Asia. Port cities important for trade, Calicut, Goa, Diu, Guzarate, and Cambium are noted on the map.



THE EASTERN PART OF THE GREAT MONGOLIAN EMPIRE

The Equatorial Line

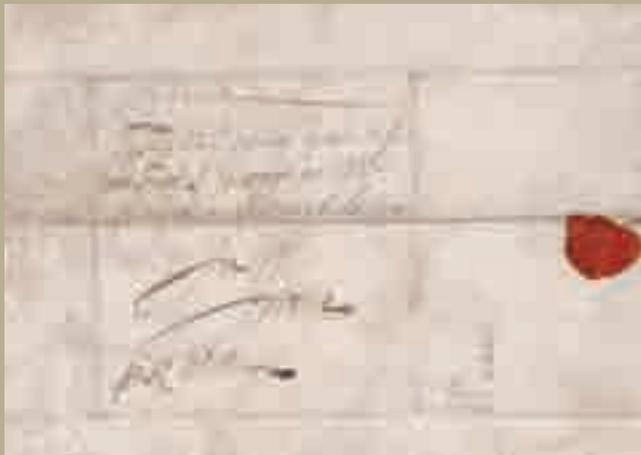


## ELIHU YALE & THE INDIA CONNECTION

Large fortunes were made in India by individual European traders. Prominent among them was Elihu Yale, major founding donor to Yale University. Yale spent twenty years in Fort St. George, Madras with the British East India Company, first as an indentured clerk and later (1687-92) as the governor of Fort St. George. While in India, Yale traded in diamonds, textiles, pepper, lac and other valuable commodities.

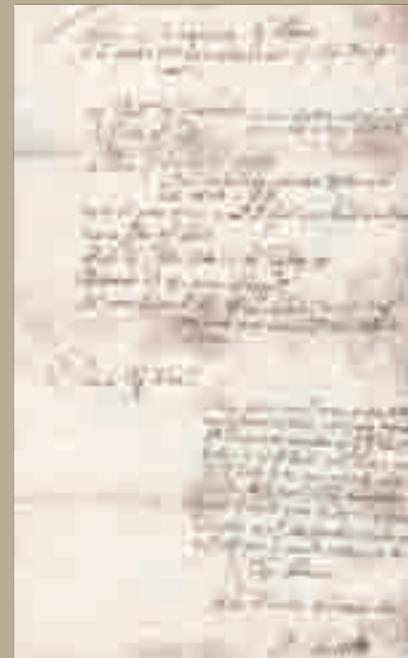
This is a partial list (recovered from a ship wreck) of the commodities Yale sent from India in one shipment, on the English merchant ship *Orange*. They were high value commodities of European trade, "Such Treasures and Rich Merchandize." They include,

DIAMONDS  
BAG OF PEARLS  
GOLD  
MUSK  
RICH EMBROIDERED SILK  
LAC  
BALES OF COTTON  
CHESTS OF TAFTY  
12 TONS OF PEPPER



*Above:* A cover addressed To "Hon. Elihu Yale, Esq,  
At Fort St. George, In India"  
Yale Archives  
Beinecke Rare Book Library  
Yale University

*Right:* A list of items salvaged from the wreckage  
of the English ship, *Orange*  
Yale Archives  
Beinecke Rare Book Library  
Yale University



Previous page: **Map of the East Indies, 1715**

Herman Moll, cartographer

Hand colored map, original size 24x40 in

Special Collections, Stanford University Libraries

Dedicated to the directors of the British East India Company, this map is inset with city plans of important European trading ports in Asia. Three

Indian coastal cities, Surat, Goa and Madras are among them. The fine print covering the interior

of the map identifies European settlements and areas rich in commodities of European trade, such as pepper, diamonds, pearls and cotton cloth.



**Above: Fort St. George and The City of Madras**

Detail Inset from the Map of the East Indies, 1715

Madras city is divided into “Black town,” and “White town” to indicate Indian and European living areas. English, Jewish, Portuguese and Armenian burial places noted on the map point to the different nationalities living and trading in Madras in 1715.



**Presq'isle de L'Inde, 1683**

Nicolas Sanson d'Abbeville,

French Cartographer

Colored map, Size 7.5x9.5 in

Ryhiner map collection, Stadt-und

Universitätsbibliothek, Bern

French royal geographer and historian Nicolas Sanson d'Abbeville

was a major influence in cartography. This map of South India by

Sanson is notable for its detail. Mountain ranges, rivers, major

kingdoms and numerous coastal and interior cities are noted on

this map. An inset of Malabar extending from Cananor to Cape

Comorin provides further details of the Malabar coast. Maps like

this and the 1715 map of the East Indies by Herman Moll were

guides for traders seeking commodities in India.



**Map of the City of Goa,**  
Dutch, Mattheus Merian,  
Frankfurt, 1670  
Copper engraving  
Original size 8x 14 in  
Private collection

Bird's-eye view of the headquarters of the Portuguese colony in Goa by the noted Swiss engraver, Mattheus Merian. The cartouche on the right lists 29 establishments in the city, all with Portuguese names. Many small boats and ocean going vessels in the foreground suggest the commercial activity of the city. By placing two elephants in the foreground the European artist has attempted to reference the Indian location of the engraving.

# THE BOOKS

THE RECORDS OF "SUCH TREASURE AND RICH  
MERCHANTIZE" IN 16TH AND 17TH CENTURY BOOKS

INDIAN BOTANICAL KNOWLEDGE  
IN 16<sup>TH</sup> AND 17<sup>TH</sup> C. EUROPEAN BOOKS



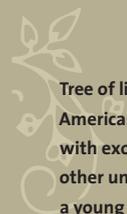
**BOOKS** were important mediators of the transfer of knowledge from India to Europe in the 16<sup>th</sup> and 17<sup>th</sup> centuries. Those that survive provide a unique window into the complex nature of early East-West interaction, which was based on commercial interest in the natural products of India as commodities of trade. Daily life in Europe and in the colonies depended on Indian plant products as medicines and essentials of daily life.

Systematization of botanical information from India was not, by and large, intellectually motivated. Rather, it was driven by the economic, political and everyday realities of the European enterprise. Large profits could be had by precise identification and effective cultivation of valuable plants such as rare spices, dyes and medicinal plants. The knowledge encapsulated in these books was garnered from existing scholarly traditions: the centuries-old medical traditions and agrarian practices of India. Illustrations and text from the seven books included here give glimpses of the vast amount of knowledge of Indian plants available in Europe during the 16th and 17th centuries and highlight the importance of Indian botanical knowledge to science and history of the period.

## ABOUT BOTANICAL PRINTS

Pictorial representations were vital for assimilation and dispersal of the botanical knowledge brought to Europe from around the world in the 16<sup>th</sup> and 17<sup>th</sup> centuries. In that period, when botany and medicine were not distinct sciences and apothecaries and herbalists, not botanists, identified and prescribed plant medicines, illustrations were essential tools of medicine. The earliest botanical illustrations of the period are crude woodcuts, often botanically inaccurate, but by the end of the 16<sup>th</sup> century high quality woodcuts were being created from drawings of live specimens by talented artists. Later, copperplate engravings would become the standard for botanical illustrations. With fine lines and added shading, copperplate engravings rendered highly refined illustrations.

In the days when live plant specimens could not withstand the rigors of long voyages, skilled field illustrators were important for the study of exotic botany. Indigenous artists often worked with Europeans to produce drawings of the flora, as in the case of the *Hortus Malabaricus*. The drawings were later converted to copperplate engravings for mechanical reproduction. The best botanical illustrations are products of skillful collaborations between artists, engravers and plant scientists and have inspired poets, writers, tapestry weavers, embroiderers, and textile designers for generations.



Tree of life designs were popular in Europe and the Americas in the 18<sup>th</sup> century and reflect the fascination with exotic Asian flora. This embroidery with lotuses and other unusual flowers and two exotic animals was done by a young Philadelphia girl. It is one of several such pieces in the collection at the Winterthur Museum.



**Tree of Life Embroidery, 1748, Philadelphia**  
Winterthur Museum, Delaware, USA  
Bequest of Henry Francis du Pont

Orta's account is the first of Indian materia medica by a European based on first hand observation and study. *'Colloquies...'*, 1563



Elizabeth I becomes Queen of England - 1558

Akbar ascends the Mughal throne - 1555

Battle of Talikota, ends Vijaynagar reign in South India - 1565



The book of Charles E'Cluse disseminated Orta's and Acosta's works in Europe. *'Exoticorum...'*, 1605

1500

Columbus's first voyage - 1492



*'Tractado de las...'*, 1578  
Acosta came to India with the hope that he could "see the diversity of plants God has created for human health" and learn about them.

A royal charter establishes the British East India Company - 1600

*'De Historia...'*, 1542  
Fuchs's book records 100 non-European plants used for medicines in Europe.



# THE RECORDS



**'The Greate Herball', 1597**  
Gerard, in his book has images of how plants, seeds and plant products came to Europe from Asia and the Americas.



**'Hortus Indicus Malabaricus', 1678**  
A twelve volume treatise, initiated by van Rheede, the Hortus is the most extensive study of medico- botanical resources of Asia published in Europe prior to the 18th century.

1700



**'His Discourses...', 1598**  
Linschoten's book was published in 1598 and was "one of the keys that opened the entrance to India" for both British as well as Dutch East India Companies.

**THE** knowledge of Indian botanicals encapsulated in the seven books featured here was garnered from India's centuries-old scholarly medical traditions and agrarian practices. As such they are important repositories of traditional knowledge and deserve further study.

These books are also windows into the nature of pre-colonial East-West interactions. Overtures by Europeans seeking commodities, and knowledge about them, were welcomed by Indian scholars and rulers, resulting in the ready sharing of information. Scattered across these books are the European authors' reports on the scholarship, skill and dedication to knowledge amongst Indian scholars and physicians.

GOA, 1563

## GARCIA DA ORTA

*Colloquies on the Simples, Drugs and Materia Medica of India and some of the fruits found there, and wherein matters are dealt with concerning practical medicine and other goodly things to know.*

**Orta's account is the first of Indian materia medica by a European based on first hand observation and study.**



GARCIA DA ORTA'S book '*Colloquies on the Simples, Drugs and Materia Medica of India....*' published in Goa in 1563 was the first account of Indian materia medica by a European based on first hand observation and study. Orta was a naturalist-physician trained at the University of Salamanca who worked in Goa from 1534-1564. His book is in the form of dialogs between Orta and an imaginary character, Ruano, a newly arrived Portuguese physician. Their discussions focus on 57 medicines, edibles and novelties from the west coast of India, all vital commodities of European trade.

During his 30 years in Goa, Orta had ample opportunity to study the application of Indian materia medica to diseases he was familiar with and to others specific to the tropics. Orta did not know Sanskrit and could not consult classical Indian medical texts but learned indigenous medical practices from the Goan native physicians, the Hakims and Vaidyas and the folk healers. The '*Colloquies*' contain the first descriptions by a European of many tropical diseases and their indigenous therapies, including those for cholera.



Orta acknowledged the dominant position of Indian physicians in the context of European life in Goa and relied on their expertise with the regional materia medica: Scattered throughout the book are comments that highlight Orta's respect for the native physicians. *"This medicine is very good, and I have often succeeded with it, yet I feel bound to confess that it is not so valuable nor so certain as the herb\* which the Malabaris give...."*\*\* Though rooted in the European medical system, he acknowledged that *"that there were certain medicines the Greeks did not know."*\*\*\* He also acknowledged that if he was not in India, away from the dominance of the Galenic medical tradition, he would not have been at liberty to admit as much.

Orta's book was quickly translated into many European languages. A condensed version in Latin by Charles E'Cluse was published in 1567, later Latin editions appeared between 1574 and 1611. Several Italian translations were done between 1579 and 1611 and the French translation in 1602. *'Colloquies...'* remained an important resource on Indian botany and medicine and was cited repeatedly by European botanists and travel writers of the 16th and 17th centuries.

#### Pages from the english translation

*"Colloquies on the Simples, Drugs and materia medica of India ...."*  
 Garcia da Orta, Goa, 1563,  
 English Translation by Clement Markham  
 (Ed. and Translator) Hakluyt Society, London, 1913.

\* da Orta may be referring to *Holarrhena antidysenterica* called Conessi bark in 19<sup>th</sup> century British Materia medica or Tellicherry bark in India

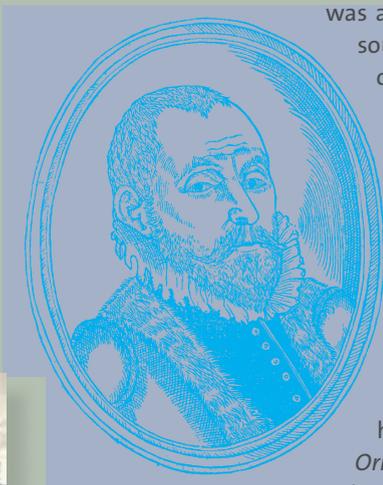
\*\* Garcia da Orta, *'Colloquies...'* Goa 1563, English Translation, Clement Markham, 1913).

BURGOS, 1578

## CHRISTOBAL ACOSTA

*Tractado de las Drogas y Medicinas de las Indias Orientalis*

Acosta came to India with the hope that he could “see the diversity of plants God has created for human health” and learn about them.



**Title page and Portrait of the Author**

**Christophorus Acosta Africanus**

*Tractado de las Drogas y Medicinas de las Indias Orientalis, con etc*

Christophorus Acosta, 1578

Woodcut

Original size, 4.75x7.25 in each

University of California, San Francisco Libraries

CHRISTOPHORUS ACOSTA AFRICANUS, (Christobal Acosta) was a Spanish physician and naturalist who traveled widely in south and western India during the third quarter of the 16<sup>th</sup> century. Acosta arrived in Goa in 1568, the year Garcia da Orta died. Acosta was the personal physician to the viceroy of Goa, and in 1569 served as a physician at the royal hospital in Cochin. Acosta came to India with the hope of finding “in several regions and provinces learned and curious men from whom I could daily learn something new; and to see the diversity of plants God has created for human health” (*‘Tractado ...’*). While in India Acosta studied and collected botanical specimens and made accurate drawing of plants of interest. Acosta’s drawings were later rendered into fine woodcut illustrations in his book *Tractado de las Drogas y Medicinas de las Indias Orientalis* (*‘Treatise of the Drugs and Medicines of the East Indies’*) published in Burgos, Spain, in 1578, after he returned from three years in India.

Acosta’s work drew on Orta’s earlier work, but added seventeen species not described by Orta. Several plants were pictured for the first time in Europe in this book, including the sensitive plant, “Dela Yerua Mimosa Capitulo.” Acosta’s work contained detailed descriptive text on the medicinal uses of Indian plants, and valuable practical information for European druggists and physicians who relied on many medicinal herbs from India in their daily work. Acosta also compared Indian plants with related European species and with plants introduced to Europe from the Americas during that time (Acosta’s bother, Jose Acosta, was a respected naturalist who published an important book on the natural history of the Americas). An Italian translation of *‘Tractado..’* was published in Venice in 1685 titled *Historia delle Droghe delle Indie Orientali* and an abridged Latin version was included in Charles E’Cluse’s important botanical work *‘Exoticorum libri decem...’* (Antwerp, 1605).



**Carcapuli, *Garcinia cambogia (indica)***

*Tractado de las Drogas y Medicinas de las Indias Orientalis,*

Woodcut

Burgos, 1578

Original size 5.6x3.5 in

University of California,

San Francisco Libraries

This woodcut of *Garcinia cambogia* in '*Tractado de las Drogas...*' was the earliest illustration of this tree in Europe. Fruit of *Garcinia* is commonly called Kokum, Kodampuli, or fish tamarind in parts of South India. The name "Carcapuli" in this 16<sup>th</sup> century book may be derived from the vernacular words for black color (carap) and the sour taste (puli) of the fruit. Dried fruit is used for flavoring food and leaves and fruit are used in medicinal preparations. Past folk medical practices suggest use in diseases specific to women.



**Jaca, *Artocarpus heterophyllus***

*Tractado de las Drogas y Medicinas de las Indias Orientalis,*

Woodcut

Burgos, 1578

Original size 5.6x3.5 in

University of California,

San Francisco Libraries

This image may refer to Jacka-maram, *Artocarpus heterophyllus* or anjelicakka, *Artocarpus hirsutus*, both common in South India. The name Jaca is derived from the vernacular name. *A. heterophyllus* with large fruits erupting from the trunk of the tree, fascinated Europeans for the unusual location of its fruit and was pictured in several European books of the period. Unripe and ripe fruits and seeds of *Artocarpus heterophyllus* are used as food, wood is used for construction and bark and leaves yield a yellow dye.



**Pimenta negra, Black Pepper, *Piper nigrum***

*Tractado de las Drogas, Medicinas de las Indias Orientalis*

Woodcut

Burgos, 1578

Original size 5.6x3.5 in

University of California,

San Francisco Libraries

This rather stylized image of the black pepper vine, *Piper nigrum* is an early illustration of the plant in Europe. In the text Acosta reports that pepper was known to Pliny, Galen, Dioscorides, and the Arab physician Avicenna, an indication of the antiquity of the spice trade.

ANTWERP, 1605

## CAROLI CLUSII

The book of Charles E'Cluse disseminated Orta's and Acosta's work in Europe.

*Exoticorum Libri Decem: Quibus Animalium, Plantarum, Aromatum, Aliorumque Peregrinorum Fructuum Historiae Describuntur: Item Petri Bellonis Observationibus*"

**THE** works of Orta and Acosta, and the Indian botanical heritage they drew upon, achieved an even higher level of European visibility in 1605 when they were included in the important pre-Linnean work of CHARLES E'CLUSE, professor of botany at the University of Leiden: the *'Exoticorum libri decem: quibus animalium, plantarum, aromatum, aliorumque peregrinorum fructuum historiae describuntur: Item Petri Bellonis Observationibus'* (Antwerp, 1605).

E'Cluse (also: Clusius, Caroli Clusii) was one of the most influential figures in European botany and founded the Leiden Botanical Garden (Leiden Hortus Medicus), which with its extensive collections of exotic plants, held a pre-eminent position in European scientific circles. Clusius came across Orta's *'Colloquies'* in Lisbon in the year after it was published in Goa and immediately set about translating its botanical content into Latin. He included it in his *Aromatum et Simplicium Aliquot Medicamentorum Apud Indios Nascentium Historia* published in Antwerp in 1567. In Clusius's *'Exoticorum...'*, he included 144 pages on Orta's work, and an additional section from Acosta's work mentioned earlier. Latin editions and Italian and French translations of the *'Exoticorum...'* appeared in rapid succession and the Indian botanical knowledge collected by Garcia da Orta and Acosta became even more widely available to scholars and naturalists. The *'Exoticorum...'* would remain the main reference work on Indian botany for the next hundred years. Illustrations of familiar Indian plants from the *'Exoticorum...'* are reproduced here.



**Frontispiece**  
*'Exoticorum libri decem...'*  
Caroli Clusii,  
Antwerp, 1605  
Copperplate engraving, Size 7x10 in  
Stanford University Special Collections

**The frontispiece from Clusius's book, containing condensed versions of Garcia da Orta's and Christobal Acosta's books with commentaries by Clusius, alludes to the exotic plants and animals described in the book. Mythical figures from Greek mythology- Atlas carrying the globe on his shoulders and the war-like goddess Athena with an owl and coiled serpents-add an ominous air to the image and reflect the European world of conquest and exploration of the seventeenth century.**



**Coccus, *Cocos nucifera* L.**  
'*Exoticorum Libri...*'

Carolus Clusius  
Plantin Publisher, Antwerp, 1605  
Original woodcut, Size 3.5x5 in  
Stanford University Special Collections

This image of the very familiar coconut tree, with fruit and seed, is from the 1605 edition of Carolus Clusius published in Antwerp. Clusius helped to make a vast amount of information about Indian plants available to European botanists in the 16<sup>th</sup> and 17<sup>th</sup> centuries. The terms Clusius used to describe the coconut, "Tenga" and "Copra," are vernacular names still in use in Malabar.



Products of the coconut tree were important commodities of trade. Besides culinary and multiple domestic uses, coconut oil was used as a hair tonic to retard hair loss after fevers; the juice inside the unripe fruit was used for fever and urinary disorders.



***Piper nigrum* L. and *Piper longum* L.**  
'*Exoticorum Libri...*'

Carolus Clusius  
Plantin Publisher, Antwerp, 1605  
Original woodcut, Size 3.5x5 in  
Stanford University Special Collections

*Piper nigrum* (black pepper) and *Piper longum* (long pepper) were valuable as spices and medicines in Europe and in India and, until the Dutch started cultivating pepper in Java, the most important commodities of the Indian spice trade. Tome Pires in 1512 reported to the Portuguese King Manuel that "*There must be twenty thousand bahars of pepper in Malabar*" (*Suma Orientales*). White pepper (de-husked black pepper) was widely believed to be derived from the seed of a separate and rare plant, an error purposely maintained by the traders to increase its value.

Peppers contain a host of chemicals including (for black pepper) piperine, piperidine, chavicine, and essential oils. *Piper longum* and *Piper nigrum* were used for flavorings and medicines in India since early times. *Piper nigrum* and *Piper longum* are still used in traditional and modern medicine, for topical analgesics, and in expectorants. The 4<sup>th</sup> century Bower manuscript (see page 13) lists several formulations using both, alone and in combination with other herbs.

"Take the following ingredients, goat's milk, ginger, Vacha (*Acorus Calamus*), Sigru, (*Moringa pterygosperma*), chebulic myrobalan, long pepper, black pepper, Patha (*Stepaniaher nandifolia*), rock salt and clarified butter. Of the eight drugs, from ginger to rock salt, take one pala each and boil these in one preastha of clarified butter, together with four times as much of the milk. By the use of this preparation a man attains memory and intelligence."

*Bower Manuscript*, Ninth Leaf, Obverse, 258-260, Edited With English Translation and Notes by A.F.R. Hoernle, Archaeological Survey of India, Volume XXII, Calcutta, 1893.



BASEL, 1542

## LEONHART FUCHS

*De Historia Stirpium*

The one hundred non-European species described in *De Historia Stirpium* were medicines from Asia and the Americas cultivated in Europe in the middle of the 16th century.



Right: **Frontispiece**

Above: **Portrait of Leonhart Fuchs**  
*De Historia Stirpium*

Leonhart Fuchs, Basel, 1542

Woodcut, Size 6x9 in.

Special Collections, Stanford University Libraries



**THE** herbal *De Historia Stirpium* by Leonhart Fuchs, Professor of Medicine and Botany at the University of Tübingen from 1535 to 1566, is a landmark in the history of botany. Fuchs undertook the work to provide training physicians with accurate information on medicinal plants that were available in Germany at the time. The volume describes 515 plants, along with woodcut illustrations that are remarkable for their quality and accuracy (“positively delineated according to the features and likeness of the living plants”). The 100 non-native species in *De Historia Stirpium* provide an interesting record of plants from Asia and the Americas that were cultivated in Europe in the middle of the 16th century.



**Chalecutischer Pfeffer and Langer Indianischer Pfeffer**  
**(*Capsicum annum*, *Capsicum frutescens*)**  
*De Historia Stirpium*  
 Leonhart Fuchs, Basel, 1542  
 Original Woodcut, Size 14x9.5 in  
 Special Collections, Stanford University Libraries

Among the 100 non-native plants that Fuchs describes in the *De Historia Stirpium* are four species of chili peppers from the Americas. Fuchs refers to them as “*Indian pepper/Calecuticum – pepper...it has almost all the uses and effects of common pepper.*” Chili pepper extracts were used in medicinal preparations as stimulants and analgesics then, as they are today.

Fuchs erroneously refers to capsicums as Indian pepper, equating them to black pepper from India (which is not represented in *De Historia Stirpium*) because of their pungent taste. The common pepper referred to by Fuchs is black pepper (*Piper nigrum*) indigenous to the Malabar region of South India, and the black gold of the early spice trade. Chili peppers originated in the Americas, but within fifty years of Columbus’s voyage of 1493, chili peppers had arrived in India and soon became essential ingredients of Indian cuisine. India is now one of the largest exporters of chilies.

LONDON, 1598

## JOHN LINSCHOTEN

*“John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies.”*

**‘His Discourses...’ was essential cargo for British and Dutch East India Company ships embarking for India and was considered “one of the keys that opened the entrance to India”**



### Frontispiece

*John Huyghen van Linschoten:  
His discourses of voyages into ye East and West Indies.*

Printed at London by John Wolfe, 1598

Original woodcut, Size 24x16 cm

Huntington Library Rare Books Collection

The frontispiece and the botanical images reproduced here are from the English translation of the “Itinerary” of John Huyghen van Linschoten, titled *John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies*, and published in London in 1598. The Raja of Cochin and a ship of the Malabar warriors along with the king of Tangil, exotic dragons, ships and a crest are crowded into this image. The Malabar warriors and their raja were formidable opponents of the Portuguese, and Linschoten has much to say about them in the book.

JOHN HUYGHEN VAN LINSCHOTEN’S “Itinerario”, published in Holland in 1596, is the first Dutch book to present information on the botanicals of India. Linschoten’s book was quickly translated into English as “John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies” (1598) with enthusiastic support from Richard Hackluyt, a proponent of English colonial expansion into Asia. Linschoten had been a merchant-traveler in the service of the Portuguese in Goa. He returned to Holland after 5 years in Goa and was urged to publish accounts of his voyages and maps of his travels along with “eye witness images” of life in Goa, the major European settlement in Asia in the 16<sup>th</sup> century.

The botanical information in the book is part and parcel of the travel narrative provided for travelers, physicians, and collectors interested in the exotic commodities of India. Linschoten lists 45 Indian plants “*Spices, drugges, plants and stuffes for Physitions and Apothecaries, that is the common sort and such as are ordinarily used in India, and of their growing in what manner and place they grow.*” Though Linschoten does not cite any Indian sources for his information (he refers to Garcia da Orta, repeatedly) he must have had the benefits of the services of indigenous physicians, about whom he says, “*Many of the heathen are very well acquainted with medicine. They help not only the Indians but also the Christians, the archbishop. And viceroy with more dedication than the Europeans.*” The Dutch physician Paludanus added further annotations to the medicinal uses of the plants described by Linschoten, based on information already available to him in Europe. Linschoten’s book was essential cargo for British and Dutch East India Company ships embarking for India during the next century and was considered “one of the keys that opened the entrance to India.”\*

\* (Thiele, P. A., Prefatory Notes, Book II, in *John Huyghen van Linschoten: His discourses of voyages into ye East and West Indies*. Printed at London by John Wolfe, 1598, Printed for the Hakluyt Society, London, 1883).



**Bambus or the Reede of India;**  
**Arbore de Reys or “The root tree”;** Duriaones  
*John Huyghen van Linschoten:*  
*His discourses of voyages into ye East and West Indies.*  
 Printed at London by John Wolfe, 1598  
 Original Woodcut, Size 25.0x31.7 cm  
 Huntington Library Rare Books Collection

This image from Volume II of Linschoten’s book shows Indian plants that fascinated Europeans in the 16th century. At the center is the *Arbore de Reys* (Banyan tree) also referred to here as the “root tree.” Linschoten refers to Clusius who “nameth it by the authority of Plinie (first century Roman historian Pliny) the Indian Fig Tree” and “this tree is very wonderful to beholde” with “branches that extend so far on all sides that two hundred men can stand beneath them.”

Bambus, Bamboo of the Coromandel Coast, has many uses including the making of palanquins, and of boats that discourage attack by crocodiles. Curative properties were also attributed to the bamboo: it “helps against choleric afflictions and dysentery” and “it is much sought by Arabs and Persians.” On the right of the picture is durian. Linschoten cautions against excessive consumption of this fruit, native to Malacca, and he suggests betel leaf as an antidote to the “hurt by the Duriaones.”

LONDON, 1597

## JOHN GERARD

*The Greate Herball or Generall Historie of Plantes*

*'The Great Herball'* describes the medicinal properties of more than two hundred plants of the 'Indies' available in England at the end of the 16<sup>th</sup> Century.



**Portrait of John Gerard**

*The Greate Herball*, John Gerard

Published by Iohn Norton, London, 1597

Woodcut, Size 8x12 in

Special Collections, Stanford University Libraries

JOHN GERARD, is shown here holding the potato in flower, a plant indigenous to the Americas. Gerard, master of the Company of Barber-Surgeons and an apothecary in London during the reign of Elizabeth I, published *The Greate Herball or Generall Historie of Plantes* in London in 1597. Gerard described medicinal uses and cultivation properties for 1200 plants in his book, including a "varietie of herbs from forreine places." From the "Indies" 280 plants are included, illustrated with remarkable accuracy. Like many of his European contemporaries who studied, collected, and cultivated exotic botanicals, Gerard never left Europe but gathered his knowledge from traders, travelers and other adventurers returning from abroad.

For several of the exotic species Gerard reported his sources and details of how the plants, seeds and plant products came to Europe. For *Nasturtium indicum* he recounts, "*the seeds of this rare and faire plant came first from the Indies to Spaine and those hot regions, and from there to France and Flanders, from there I receiued seede...from Iohn Robin of Paris.*" About the Aloe or Houseleeke, "*This plant grows very plentiful in India-from whence juice is put into skins is brought into Europe.*" He thus left for posterity glimpses of the circuitous routes plants traveled from Asia to Europe in the 16<sup>th</sup> century. Gerard's work was not only an important reference work for naturalists and physicians but also a source of inspiration for generations of poets and writers. Three examples of Indian plants from Gerard's book are illustrated here.



**Areca, The Drunken Date Tree**  
*Areca catechu* L.

*The Grete Herball*

Published by Iohn Norton, London, 1597

Original Woodcut, Size 5.5x 5.5 in

Special Collections, Stanford University Libraries

Gerard states, "It groweth in the East Indies in divers places, as in Malavar, where vulgarly it is called Pac and of the nobles and gentlemen Areca." Pac and areca are still used as vernacular names in Malabar. Chewing of areca nut and betel leaf with lime was an important part of social rituals in India then as it is today and the mixture is attributed with analgesic, antibacterial and breath purifying properties. "When Indians are vexed with some intolerable ache or pain, or must of necessitie, endure some torment, they do take this fruit, whereby the rigor of the pain which they should otherwise feel is very much mitigated,.....doth strengthen the gums, fasten the teeth." Gerard, 1597.

Modern chemical analysis shows that the areca nuts contain large quantities of tannin and the alkaloid arecoline. Arecoline has anti-helminthic activity and is used in veterinary medicine as a purgative to expel worms.



**Tamalapatra-Indian leafe,**  
*Cinnamomum* (Lauraceae)

*The Grete Herball*

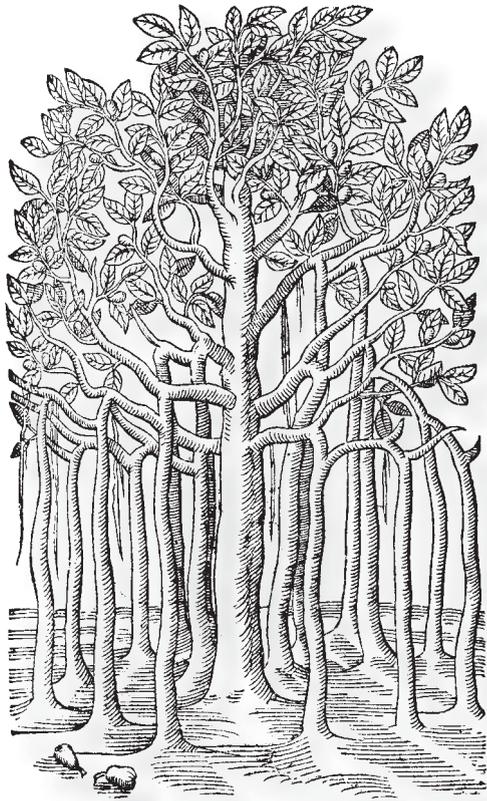
Published by Iohn Norton, London, 1597

Original Woodcut, Size 3x5 in

Special Collections, Stanford University Libraries

Since medieval times tamalapatra leaves, from a plant related to cinnamon, were prized for their medicinal properties and as a source of fragrant oils, like many members of the plant family Lauraceae. Gerard noted that "it provoketh urine mightily, warmeth and comforteth the stomacke... It is laid among cloathes, as well to keepe them from moths and other vermine as also to give them a sweet smell." A bath made from the leaves boiled in water was used to alleviate joint pain. Bark of the root boiled with cardamom and 'moschat nut' (nutmeg?) were used for colic of the stomach. A herb leaf with the name tamalapatra is found in several books of the 16th and 17th centuries. In the Arabic materia medica it was called sadhaji Hindi, and in the European pharmacopeias, Folium indicum. Even today water boiled with leaves of related species is used for rheumatic pain, and leaves of a related plant called vayana are used to flavor food in South India.





#### The Arched Indian Fig Tree

*Ficus bengalensis* L.

*The Greate Herball*

Original Woodcut, Size 3x5 in

Published by Iohn Norton, London, 1597

Special Collections, Stanford University Libraries

The ficus tree with its aerial root system fascinated Europeans for centuries. Gerard cites several European writers who described the ficus tree through out the centuries, "This tree is called, of those that have trauelled, *Ficus Indica*, the Indian Fig; and *Arbor Goa*, of the place it growth in greatest plenty: we may call it in English, the arched Fig tree. Such as desire to see more of this Fig tree, may have recourse to *Clusius his exotics*, lib.1 cap.1 where he shewes it was mentioned by diuers ancient Writers, as *Curtius*. Lib.9. *Plin*. Lib.12, ca.5, *Strabo*. Lib.5 and *Theophr*. *Hist.Plant*. lib.4. cap.5 by name *Ifficus Indica*." Gerard, 1597

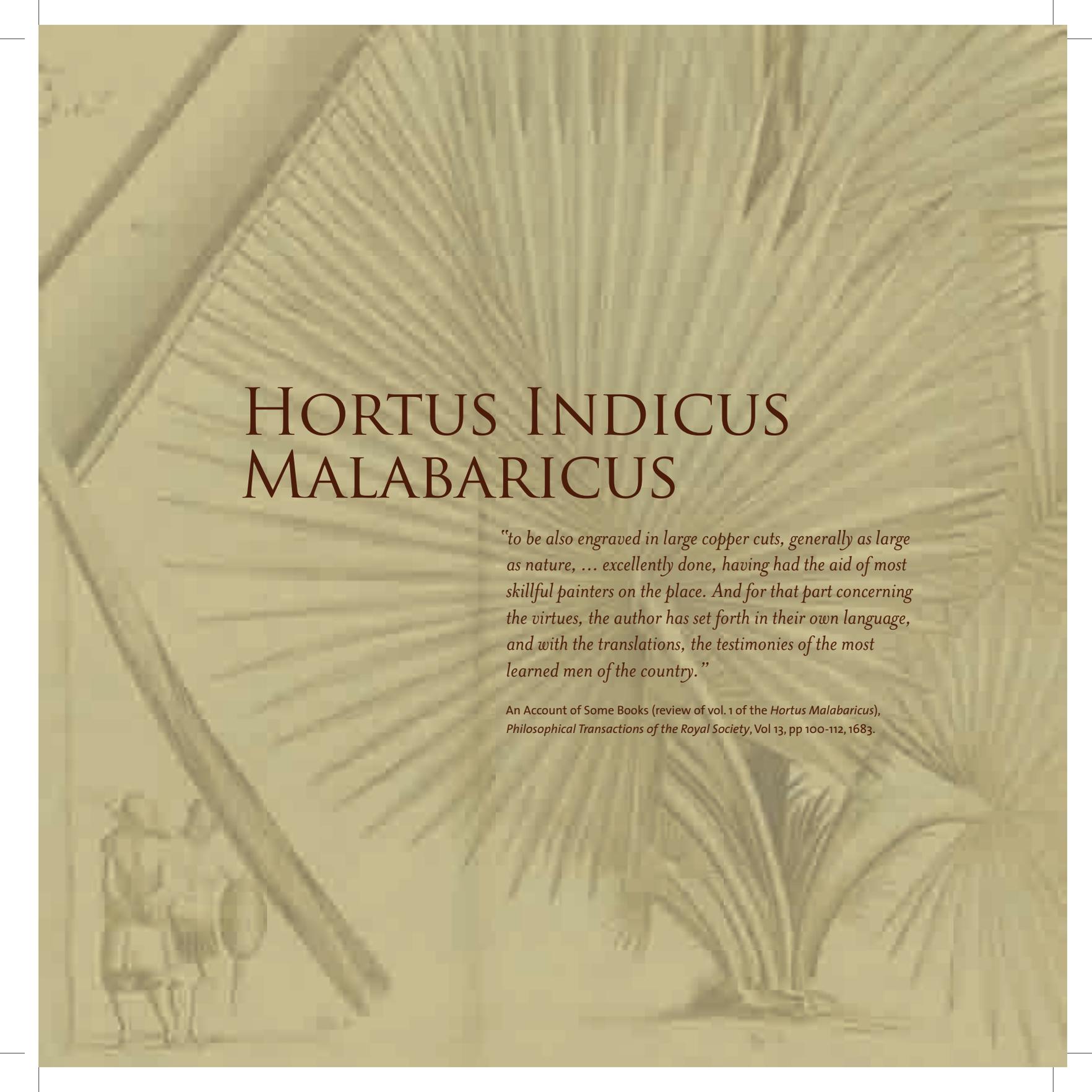
This remarkably accurate illustration of the ficus tree in *The Great Herball* highlights the meticulous care with which botanical information was recorded by Europeans while in India. While Gerard suggests that many of the foreign plants illustrated in his book were grown in his garden in London, it is not likely for the Indian Fig Tree illustrated here.



DESCRIPTIONS OF EXOTIC PLANTS of India, like the ficus tree described by Gerard, inspired literature and popular culture of Europe during the period. Milton's description of the fig tree of the Garden of Eden, in his epic poem "Paradise Lost," very closely resembles the Ficus tree pictured by Gerard.

*"Into the thickest Wood, there soon they chose  
The Figtree, not that kind for Fruit renown'd,  
But such as at this day to Indians known  
In Malabar or Decan spreads her Armes  
Braunching so broad and long, that in the ground  
The bended Twigs take root, and Daughters grow  
About the Mother Tree, a Pillard shade  
High overarch't, and echoing Walks between;  
There oft the Indian Herdsman shunning heate  
Shelters in coole, and tends his pasturing Herds  
At Loopholes cut through thickest shade: Those Leaves  
They gatherd, broad as Amazonian Targe,  
And with what skill they had, together sowd,  
To gird thir waste, vain Covering if to hide  
Thir guilt and dreaded shame"*

John Milton, *Paradise Lost*, Ninth Book, verses 1100-1114, 1674.

The background of the page features a detailed engraving of a palm tree with its fronds radiating outwards. In the lower-left corner, two figures are depicted: one standing and one seated, possibly engaged in a conversation or a transaction. The entire scene is rendered in a fine-line, engraved style typical of 17th-century scientific illustrations.

# HORTUS INDICUS MALABARICUS

*“to be also engraved in large copper cuts, generally as large as nature, ... excellently done, having had the aid of most skillful painters on the place. And for that part concerning the virtues, the author has set forth in their own language, and with the translations, the testimonies of the most learned men of the country.”*

*An Account of Some Books (review of vol. 1 of the Hortus Malabaricus), Philosophical Transactions of the Royal Society, Vol 13, pp 100-112, 1683.*

AMSTERDAM, 1678-1693

## VAN RHEEDE

"*Hortus Indicus Malabaricus*"  
Volumes 1-12

Twelve volumes, published in Amsterdam between 1678 and 1693, record 742 plants (792 copperplate engravings) from Malabar, mostly from the region's healing traditions.



This engraving of Henricus Adrianus van Rheeade (1636-1691) from the *Hortus Malabaricus* is attributed to Peter Stevens van Gunst. It is dated to 1684 when van Rheeade was 48 years old. The various shields included in this engraving indicate the honors and privileges of his noble family.

*Hortus Malabaricus*

Amsterdam, 1684

Original Copper engraving

Size 15x10 in

Blatter Herbarium Library, St. Xavier's College, Mumbai

THE most extensive study of the medico-botanical resources of Asia published in Europe prior to the 18th century is the celebrated pre-Linnean work, *Hortus Indicus Malabaricus* compiled by the Dutch governor of Malabar, HENDRIK ADRIAAN VAN RHEEDE TOT DRAKENSTEIN (van Rheeade). Van Rheeade was born in the Netherlands, in 1636, to an aristocratic family with a military and colonial background. His long career with the Dutch East India Company began when he left home at 14. Van Rheeade came into prominence when he ousted the Portuguese from Cochin and crowned Vira Kerala Varma as Raja of Cochin. Varma later became a collaborator in the *Hortus Malabaricus* project. By 1670, van Rheeade was appointed Commander of Malabar for his great administrative and diplomatic skills.

Unique amongst his peers, van Rheeade genuinely respected the Malabaris, their knowledge and culture. In compiling the *Hortus Malabaricus*, he was driven by the enormous potential the region's rich resources had for the Dutch.

Van Rheeade returned to the Netherlands in 1676 and the first volume of the *Hortus Malabaricus* was published two years later. At the request of the directors of the company, he returned to India again six years later to combat corruption in the Indian colonial administration but died while sailing to Surat – where his mausoleum still stands.

TWELVE VOLUMES, published in Latin in Amsterdam between 1678 and 1693, record 742 plants from Malabar with 792 copperplate engravings, mostly of plants used in regional medicines. Drawing on the thriving Ayurvedic and pre-Ayurvedic healing traditions of Malabar, this monumental project was driven by van Rhee­de’s enduring respect for the botanical wealth of Malabar, the need for new medicines by the Dutch colonists, and the internal conflicts within the Dutch in Asia. Compilation of the *Hortus Malabaricus* brought together dozens of European and Indian scholars, translators and artists. According to van Rhee­de, “a board committee had been brought together from various parts of Malabar” (Heniger, 1980) with the help of regional rajas, to contribute their knowledge on the botanicals of Malabar and “three or four painters at once accurately depicted living plants readily brought by collectors” (Heniger, 1980). The text includes location of collection, habitat, descriptions of the plant and medicinal or other uses.

Van Rhee­de also states that the use of these plants “whose curative virtues were proclaimed by indigenous physicians as having been famous for extreme antiquity was rapidly approaching its end.” (Heniger, 1980). The medical texts referred to in the testimonials of the scholar-physicians above are long lost. For many valuable medicinal uses of plants of South India the *Hortus Indicus Malabaricus* may now be the only extant record.

J. Heniger, in *Botany and History of Hortus Malabaricus*, ed. K. S. Manilal, Balkema, Rotterdam. 1980



Frontispiece, *Hortus Indicus Malabaricus*

Vol. 1 (of 12)

Amsterdam, 1678

Original Copper engraving

Size 15x10 in

Blatter Herbarium Library, St. Xavier’s College, Mumbai

A woman representing Botany is seated on a high pedestal beneath an arch surrounded by children, presumably Indian, who offer her potted plants. Coconuts in the foreground and palm trees in the background suggest the exotic flora contained in the book. As was common during the period, the indigenous Indian flora are represented accurately but the people are not.

## INDIAN SCHOLARS OF THE HORTUS MALABARICUS

In the preface to volume 3, van Rheede eloquently expressed his respect for the scholars and physicians of Malabar, “*Some of them have no other occupation than temple service and are exempt from all worldly cares, being constantly occupied with genteel wisdom, stargazing and natural sciences*” (Heniger, 1980). In volume 1 the Malabar traditional physician Itty Achudem and three Brahmin physicians of the Ayurveda tradition (Ranga Botto, Vinaique Pandito, and Apu Botto) are acknowledged for their important contributions to the *Hortus Malabaricus*, by including their hand written testimonials in vernacular languages and also in Latin translation.

This signed statement of the Malabar physician Itty Achudem in Malayalam Kolezuthu script is prominently placed in volume I of the *Hortus Malabaricus*. By this gesture van Rheede acknowledged Achudem’s important contributions to the *Hortus Malabaricus*. Achudem was from a long lineage of physicians and a member of the “Chego” (ezhava) community. In the testimonial in his own hand Achudem identified himself and certified that he provided information and procured specimens for the *Hortus Malabaricus* based on years of experience and practice. He refers to information written “in our book” believed to be a palm-leaf manuscript handed down within his family. The book that Achudem mentions has yet to be found.

By identifying Achudem and the three Brahmin physicians, van Rheede sets himself apart from other compilers of indigenous knowledge. The standard for the period was for contributing indigenous scholars to remain unidentified, leaving only those who gathered their knowledge to be recorded for posterity.



Page of the testimonial of Itty Achudem  
Malayalam, Kolezuthu script  
*Hortus Malabaricus* vol.1, ix,  
Amsterdam, 1678  
Original Copper engraving, Size 7.5x5 in  
Blatter Herbarium Library, St. Xavier's College, Mumbai

*“Indeed they disputed and strongly defended their own opinions, but with incredible modesty, such as you might even miss in the most distinguished philosophers of the world, without any acerbity, mental disturbance or neglect to respect each other’s opinions”*

HENDRIK ADRIAAN VAN RHEEDE

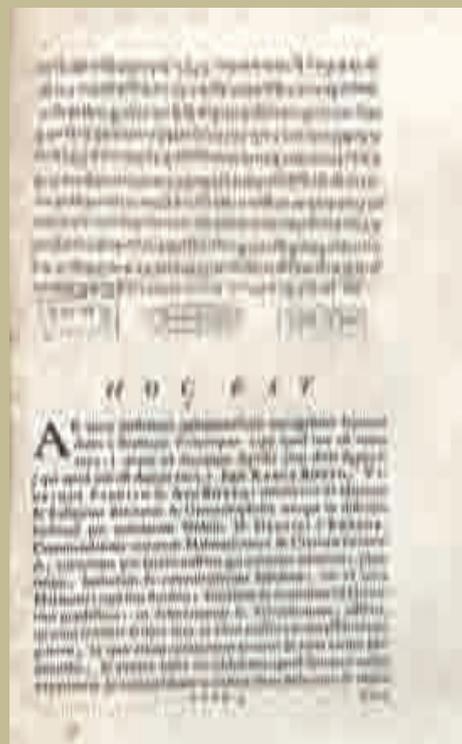
*Hortus Indicus Malabaricus*, vol. 3, 1681

(Translation by J. Heniger in *Botany and History of Hortus Malabaricus*, K.S. Manilal, Balkema, Rotterdam 1980.)

Details of Itty Achudem’s identity indicate the value placed on knowledge in South Indian society at the end of the 17th century. He was not a Nambuthiri, traditionally the scholar physicians of Malabar, but a member of the lower caste “Chego” community. Nevertheless his selection by van Rheeде as the pivotal contributor to the *Hortus Malabaricus* appears to have been readily accepted by the high-caste Brahmin physicians mentioned above. More than one hundred years earlier, in 1512, the Portuguese apothecary and factor Tome Pires, writing to King Manuel of Portugal about India, likewise took note of the honor given to knowledge irrespective of caste in South India.

*“They always make a deep reverence to the masters who teach them, so much so that if the best of the Nayars were to meet a Mukkuvan\* who happened to have taught him something, he would make him a reverence and then go and wash himself”*

\*Mukkuvan is a Malayalam word meaning fisherman. (*The Suma Orientalis of Tome Pires, An Account of the East, 1512-1515*. Translated from the Portuguese, MS in the Bibliotheque de la Chambre des Deputes, Paris, edited by Armando Cortesao, The Hakluyt Society, London, 1944.)



Page of the testimonial of Ranga Botto,

Vinaique Pandito, and Apu Botto

Konkani in Nagari script

*Hortus Malabaricus* vol.1, xi,

Amsterdam, 1678

original Copper engraving

Size 6.75x5.5 in

Blatter Herbarium Library, St. Xavier’s College, Mumbai

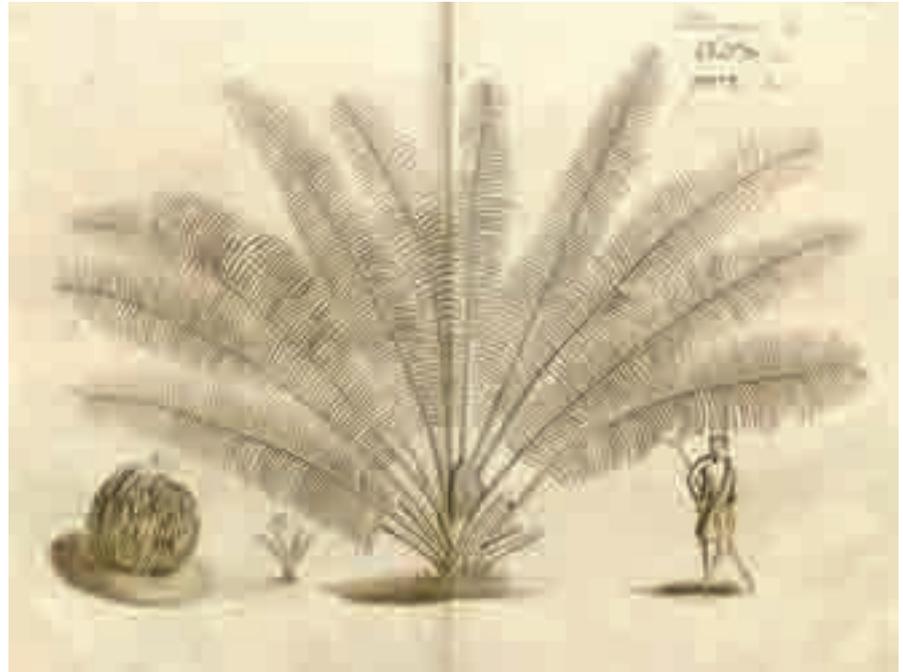


## ILLUSTRATIONS IN THE HORTUS MALABARICUS



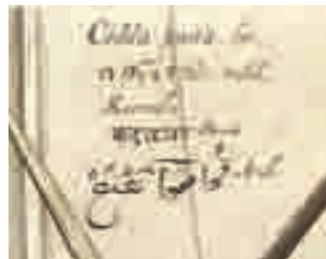
**An Unidentified Man, Detail,**  
fig. 4, Vol. 11, *Hortus Malabaricus*,  
Amsterdam, 1692  
Original Copperplate engraving, Size 5.5x7.5 in  
Private Collection

The image of a man standing along side of *elettari* (*Amomum cardamomum* L.) indicates the size of the plant. It is a rare image, likely drawn of a real person, showing the dress and appearance of a south Indian male from the 17th century.



**THE** *Hortus Malabaricus* contains some of the finest botanical illustrations known. The engravings are of very high quality, the original drawings were made from live specimens and plants are described fully, with roots, flowers, fruits and seeds included in the illustrations. For many specimens some part of the plant is drawn to size or juxtaposed with other images to provide a sense of scale. Plant names in use in the locality of collection are written in the regional language of Malabar,

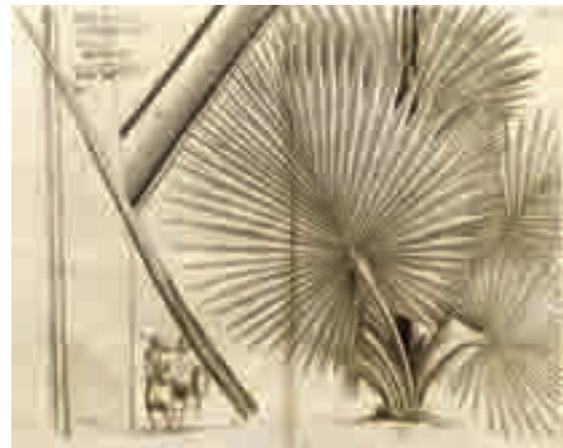
Malayalam, and also in Sanskrit, Latin, and Arabic scripts. European artists residing in the Dutch colony in Cochin, together with unknown Malabar artists, made the original drawings, later turned into copperplate engravings in the Netherlands. The drawings for engravings of the *Hortus Malabaricus*, now in the collection of the British



Library, have signatures of two Dutch artists, Bastian Stoopendael and Antony Jakob Goedkint.



The *Hortus Malabaricus* drawing above (now in the British Library) and the corresponding copper engraving from Volume 3 on the left, are mirror images – the images are reversed in the process of making copperplate engravings from the drawings. The human figure in the copper engraving made in Amsterdam is somewhat more European compared to the original drawing made in India.



There are insets in several illustrations showing activities that may relate to the making of the *Hortus*. The image on top shows seven men carrying a large palm frond, indicating its large size, and the image at the bottom shows a European man (van Rheeде??) in conversation with a warrior (Indian?). Both images are insets to figures in Volume 3.

## IMAGES FROM THE HORTUS MALABARICUS

showing plants commonly used in India as culinary ingredients or in folk medicines.

Botanical names of the identified plants are from Nicolson, Suresh and Manilal (1988).

### **Hummatu, *Datura stramonium***

Vol. 2, Fig. 28, 1679

*Hortus Malabaricus*

Original, Hand colored copperplate engraving

Size 18x13.5 in

Private Collection

Seeds and leaf of the plant have sedative and narcotic properties. Van Rheede states that in Malabar the leaf extract was used for treating sacred disease (*morbo sacro*), making reference to the hallucinogenic properties of the plant. Ointment from sap of the leaves is used to reduce swelling. The alkaloids scopolamine, hyoscyamine and atropine are isolated from *Datura stramonium*.





Seeds of the Areca palm, with leaves of the Piper betel vine, are used as a masticator by approximately one billion people all over Asia. Breath purifying and digestive properties of Areca nuts were reported in European books of the 16<sup>TH</sup> and 17<sup>TH</sup> centuries. Areca nuts contain large quantities of Tannin and the alkaloid arecoline that cause vaso-dilation and stimulate the digestive tract. Areca nuts are used in veterinary medicine as a purgative to expel worms. Arecaline is a natural muscarinic alkaloid agonist.

**Areca, Caunga, *Areca catechu* L.**

Vol. 1, Fig. 5

*Hortus Malabaricus*, 1678

Original, copperplate engraving

Blatter Herbarium, Mumbai



Male and female Papaya plants are pictured in this engraving. The plant is an exotic native to Mexico and Central America, and was introduced to India by the Portuguese. *Hortus Malabaricus* does not give medicinal uses for any part of the plant; it reports that, "it is not in use among our physicians." Parts of the plant are used as a vermifuge and for contraceptive purposes in contemporary Indian folk medicine. Latex of Papaya plant is the source of the protease papain.

**Papajamaram, *Carica papaya* L.**

Vol.1, Fig. 15

*Hortus Malabaricus*, 1678

Original, copperplate engraving

Blatter Herbarium, Mumbai



Tamarind is widely used in South India as a condiment in curry preparations. *Hortus Malabaricus* lists many medicinal uses for the fruit and bark of the tree, alone and in combination with other plant products. Infusion of the fruit rich in calcium, phosphorous and niacin is used in febrile diseases. Powdered Tamarind seeds are used as sizing by the Indian textile industry.

**Balam-Pulli or Maderam Pulli, *Tamarindus Indica* L.**

Vol.1, Fig. 23

*Hortus Malabaricus*, 1678

Original, copperplate engraving

Blatter Herbarium, Mumbai



This common tree is valued for the medicinal properties of its fruit and also for the purifying properties of its wood. Seeds and fermented juice are used for asthma, anemia and jaundice. *Phyllanthus emblica* has been an ingredient of medicinal formulations in India for centuries and it was an important item of commerce during the 16<sup>th</sup> and 17<sup>th</sup> centuries. The Bower Manuscript on early Indian medicine (dated to the 4<sup>th</sup> century A.D) calls it one of "three divine fruits." Fruit rich in vitamin C is used to treat scurvy.

**Nellikka, *Phyllanthus emblica* L.**

Vol. 1, Fig. 38

*Hortus Malabaricus*, 1678

Original, copperplate engraving

Blatter Herbarium, Mumbai



Panja, *Ceiba pentandra*,  
Vol 3, Fig. 51  
*Hortus Malabaricus*, 1682  
Original, copperplate engraving  
Blatter Herbarium, Mumbai

The silk cotton tree yields cotton used for pillows and bedding. In folk medicine the seeds, leaves, bark and resin are used to treat dysentery, fever, asthma, diabetes and kidney disease.



This is the sappan wood tree used for dyeing since the Middle Ages. Wood of the tree is red and when boiled with water and mixed with aluminum mordants yields a red dye (brazilin) for textiles and other materials. The exact color produced depends on the pH of the solution. The wood is also used for fine wood carvings and much sought after. In parts of the world the tree has been over harvested.

**Tsja-pangam, *Caesalpinia sappan* L.**  
 Vol.6, Fig. 2  
*Hortus Malabaricus*, 1686  
 Original, copperplate engraving  
 Blatter Herbarium, Mumbai



Prof. Manilal mentions in the English translation of the *Hortus Malabaricus* that at present Ana-mullu can only be found in a few protected sacred groves of Malabar. The large thorns were used for piercing the ear lobe. Leaves and wood of the plant have medicinal uses.

**Ana-mullu, *Dalbergia horrida* (Dennst.) Mabb.**  
 Vol. 8, Fig. 40  
*Hortus Malabaricus*, 1688  
 Original, copperplate engraving  
 Blatter Herbarium, Mumbai

**Modira-canjiram, *Strychnos colubrina* L.**  
Vol. 8, Fig. 24  
*Hortus Malabaricus*, 1688  
Original, copperplate engraving  
Blatter Herbarium, Mumbai

Leaves of this tree are used to soothe arthritic pain. This plant is related to caniram (*Strychnos nux-vomica*, L.) source of the powerful alkaloids strychnine and brucine.



## A CORNERSTONE IN THE STUDY OF BOTANICAL CLASSIFICATION

### HORTUS MALABARICUS IN BOTANICAL LITERATURE:

Jan Commelin, *Catalogus Plantarum Horti Medici  
Amstelodamensis*, 1689 (64)

John Ray, *Methodus Plantarum Nova*, 1682 (300)  
John Ray, *Historia Plantarum*, 1686 (615)

Paul Hermann, *Musaeum Zeylanicum*, 1717 (200)

James Petiver, *Philosophical Transactions of the Royal Society*,  
1679, Vol 20 (138)

Georg Everhard Rumphius, *Herbarium Amboinensis*, 1628-1702 (150)

Carolus Linnaeus, *Flora Zeylanica*, 1774, (210)  
Carolus Linnaeus, *Species Plantarum*, 1753 (250)  
Carolus Linnaeus, *Species Plantarum*, 1762-1763 (320)

(The list above adapted from Henninger, J.  
*Hendrik Adriaan Van Rheedee Tot Drakenstein (1636-1691) And Hortus  
Malabaricus: A contribution to the History of Dutch Colonial Botany*,  
Balkema, Rotterdam, 1986).



**THIS** list, by no means complete, identifies some of the important botanical publications of the 17<sup>th</sup> and 18<sup>th</sup> centuries that cited the *Hortus Malabaricus* as their resource. The numbers in parenthesis indicate the number of citations to the *Hortus Malabaricus*. During this period, botany was an active area of scientific study in Europe and scholars were attempting to classify plants collected from different regions of the world, especially the tropics. Herbarium collections and botanical gardens in Europe used the detailed illustrations and descriptions in the *Hortus Malabaricus* as an important resource (see contemporary review below). Carolus Linnaeus in his pivotal publication on plant taxonomy, *Species Plantarum* (1753), included over 250 references to the *Hortus Malabaricus* and 320 references in the later edition (1762-1763).

*“This excellent work, giving an account of most rare and curious trees and shrubs of the fruitful and flourishing country of Malabar in the East Indies, by their descriptions, virtues, and what ever else has been observed remarkable...”*

An Account of Some Books (review of vol. 1 of the *Hortus Malabaricus*),  
*Philosophical Transactions of the Royal Society*, Vol. 13, pp 100-112, 1683.

## HORTUS MALABARICUS AS A SCIENTIFIC RESOURCE

Since the twelve volumes were compiled, *Hortus Malabaricus* has been a pivotal resource for botanists studying tropical plants. Physicians living and working in India and Southeast Asia in the 17<sup>th</sup> and 18<sup>th</sup> centuries referred to these volumes for mastering the bewildering array of tropical medicinal plants that they encountered in their daily work. In a communication published in the Philosophical Transactions of the Royal Society in 1698 (vol. 20, p. 313), James Petiver, apothecary and fellow of the Royal Society, refers 59 times to the *Hortus Malabaricus* to identify a list of medicinal plants sent to him by surgeon Samuel Brown, working at Fort St. George, Madras.

All of the major publications on Indian Botany (see the article in this catalog by D.H. Nicolson for an extensive list) and seminal publications on tropical botany since 1678 (for example, Georg Rumphius's *Herbarium Amboinense*, 1741-1750, Joannis Burmanni Ed., Amsterdam, 1747-50), relied on the detailed images and descriptions from the *Hortus Malabaricus* as a standard reference work. The *Hortus Malabaricus* continues to be important for Indian botany in the modern era. The Ayurvedic scholar N.S. Moos used these twelve volumes as his key reference work for two 20<sup>th</sup> century books on Kerala Ayurvedic medical plants – *Single Drug Remedies*, 1976 and *Ayurvedic Flora Medica*, 1978 (Vaidyasarthi Press, Kottayam).



One of several images in Georg Rumphius's important book on the flora of South East Asia, *Herbarium Amboinense* (published posthumously, 1741-1750) that cited *Hortus Malabaricus* as an important reference work. The handwritten ink label at the lower margin refers to Pandi avanacu, *Hortus Malabaricus*, vol 2, Plate 32, 1679

In 1988 Dan Nicolson of the Smithsonian Institution and C.R. Suresh and K.S. Manilal of Calicut University published their scholarly treatise, "*An Interpretation of van Rheede's Hortus Malabaricus*," on re-collecting and identifying all but one of the plants described in the *Hortus Malabaricus* "in or near their original localities" (Nicolson, et al, 1988). They have identified the plants in modern scientific nomenclature and thus updated the resources in these volumes making them even more accessible and valuable for modern science.

One of the important mandates of contemporary science is discovery of new and improved drugs. *Hortus Malabaricus* contains botanical-medical information on more than seven hundred plants of the Malabar region, which has a strong history of traditional medicine. Ethno-botanical leads are important sources of modern drugs even today (Paul Alan Cox in "Ethnobotany and the Search for New Drugs". G. Prance and J. Marsh (eds), Ciba Foundation Symposium 185, Academic Press, London, 1994.), and as such these volumes and the books in this exhibit that record earlier botanical medical knowledge of India deserve scrutiny as a source for new therapeutic agents.

## HORTUS MALABARICUS AS A LINGUISTIC AND CULTURAL SCHOLARLY RESOURCE



**THE** *Hortus Malabaricus* is not only a valuable scientific resource, but its twelve volumes are immensely valuable to scholars from diverse fields as a window into the social, political and linguistic history of southern India in the 17<sup>th</sup> century. The first volume of *Hortus Malabaricus* provides very rare records of the two different scripts of Malayalam language side by side in the certificates of the translator Emmanuel Carneiro and the Malabar traditional physician Itty Achudem.

These two individuals, from very distinct social classes, one from the Portuguese-Indian community of Cochin and the other from the traditional family of Chego physicians, used two entirely different scripts. Carneiro's Malayalam Aryaezuthu script is very like modern Malayalam and accessible today, while Itty Achudem's handwriting is an older Malayalam Kolezuthu script known only to a few scholars now. Achudem's writing may be closer to the original source of the Malayalam language. These scripts side by side should be of interest to linguists studying the evolution of south Indian languages.

The importance given to Itty Achudem in the *Hortus Malabaricus* in spite of his lower caste origins tells us a great deal about the complex social structure of south Indian society 300 years ago. While Achudem was a member of the Chego community of Malabar, his reputation as a scholar physician was more important not only to van Rheede, who invited Achudem to be a major contributor to the volume and singled him out for honor, but also to the Malabar raja or local source who brought Achudem to van Rheede's attention as the scholar to consult. Achudem's selection highlights the honor placed on knowledge in south Indian society and resonates well with the quote from Tome Pires from 100 years earlier (cited earlier in this catalog, on page 49).

Professor Manilal and other scholars of the *Hortus Malabaricus* have written about the importance of van Rheede's preface to volume 3 as a window into South India in the early days of European-Indian interaction (K.S. Manilal in *Botany & History of the Hortus Malabaricus*, Ed. K.S. Manilal, Balkema, Rotterdam, 1980). Scattered throughout the *Hortus Malabaricus* (and the other books in this exhibit) are details also of aspects of life and culture in South India. Of particular interest are the images of South Indian persons included among some of the botanical illustrations (see page 50-51). They show South Indian persons of different occupations (soldiers, labourers, noblemen?) but they are not identified. However these are 17<sup>th</sup> century representations of dress and occupations of South Indians, most likely drawn in Cochin since they are also in the original drawings for the *Hortus Malabaricus* in the British Library, referred to earlier.

## THE ENGLISH TRANSLATION OF THE HORTUS MALABARICUS



AN important development in the study of the *Hortus Malabaricus* was its translation from Latin into English – a 35-year project that was the brainchild of eminent taxonomist, Prof. K. S. Manilal, Emeritus, Calicut University. These 12 volumes – [van Rheedé's *Hortus Malabaricus* (Malabar Garden), English Edition, with annotations and modern botanical nomenclature], were published in 2003 by the University of Kerala, Thiruvananthapuram.

Prof. Manilal's updated translation has removed the ambiguities in the Latin edition. This English edition, along with a previous book *An interpretation of van Rheedé's Hortus Malabaricus* (Regnum Vegetabile, v.119) by D.H. Nicolson, C.R. Suresh and K.S. Manilal, Koeltz Press, Königstein, makes the 300 year old medical traditions of Malabar available for modern scientific study.

Prof. K. S. Manilal, Prof. Emeritus Calicut University, is one of the foremost scholars of the *Hortus Malabaricus*. In addition to the English translation he has recently completed a Malayalam translation of the *Hortus Malabaricus*, also to be published by Kerala University. He is the recipient of many honors for his work in plant taxonomy and the prestigious Janaki Ammal prize given by the Ministry of Environment and Forests. Manilal is the author of many scholarly publications including the definitive reference work *Flora of Silent Valley Tropical Rain Forests of India*.

# CONTRIBUTORS TO INDIAN BOTANY

## AFTER THE HORTUS MALABARICUS

Dan H. Nicolson, Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington, DC 20013-7012m USA.

**I**N the period between the publication of the *Hortus Malabaricus* and Independence in 1947, Indian botany was of enormous interest to the colonial Europeans, especially the British. The botanists who travelled to India published voluminously on the local flora. They included some of the greatest naturalists of their times, for example J. D Hooker. The list below briefly details the backgrounds of these botanists and their major Indian works. Although I will not attempt to cover contributors to post-Independence Indian botany (when it really came into its own) I do provide details about three 20<sup>th</sup> century Indian botanists whom I knew personally. They were all, like Father Matthew, van Rheede's earliest botanical advisor on the *Hortus Malabaricus*, Catholic priests.

(Botanists are described in chronological order, based on their date of birth.)

### 1751-1800

WILLIAM ROXBURGH  
(1751-1815) British

Roxburgh was one of the most outstanding of all botanists to work in India. Born in Scotland, he became Superintendent at Calcutta in late 1783. Many of his works were finished by colleagues, e.g. *Plants of the Coast of Coromandel* in 3 vols. (1795-1820), *Hortus Bengalensis* (1814), *Flora Indica* (1820-1824, in 2 vols with additions by Wallich (see below) and 1832-1844, in 4 vols without Wallich's additions, edited by William Carey (1761-1834)). There is an important commentary on Roxburgh's *Hortus Bengalensis* by C. B. Robinson (Philipp. J. Sci. Sect. C Botany 7: 411-419. 1912). There is an important work on Roxburgh's *Flora Indica* drawings (Calcutta) by Sanjappa, Thothathri & Das (Bull. Bot. Surv. India 33: 1-232. 1994 ('1991')).

NATHANIEL WALLICH  
(1786-1854) Danish

Another giant of Indian Botany was the Dane, Nathaniel Wallich, born Nathan Wulff. His "*Numerical List of Dried Specimens...*" (1828-1832) accounted for 6,224 (some count 7,693, because of his use of letters under many specimen numbers). The first set of these specimens are now at Kew, having come there in 1913 (see Kew Bull. 1913: 255-263. 24 Sep 1913). This is a work needing a commentary because of its extensive use of now cryptic abbreviations of collectors' names and localities [e.g. RHBC = Roxb. Hort. Bot. Calcuttensis]. The purpose of the work was to provide labels for the specimens, so the cryptic information is also on the specimens. Some of Wallich's *nomina nuda* in his *Numerical List* were validated in George Don's *General History* (1831-1838), noted by Sprague (Kew Bull. 1925: 312-314). Wallich's *Plantae Asiaticae Rariores* (1829-1832) included 300 plates.

- ROBERT WIGHT (1796-1872) British The Scot Robert Wight published several works, the biggest being his *Icones Plantarum Indiae Orientalis* (1838-1853, in 6 volumes with 2101 plates). Other works include his *Illustrations of Indian Botany* (1838-1850), and *Spicilegium Neilgherrense* (1846-1851) both with many plates.
- JOACHIM OTTO VOIGT (1798-1843) Danish Voigt, a Dane, succeeded Carey at the Serampore Botanical Garden in Calcutta (1834-1841). His *Hortus Suburbanus Calcuttensis* (1845), with 5,515 species, was seen through the press by William Griffith.
- JOHN FORBES ROYLE (1798-1858) British, born Kanpur John Forbes Royle is best known for his 2 vol. "*Illustrations of the Botany ... of the Himalaya Mountains...*" (1833-1840). There is an important work on the first set of the Royle Herbarium (which is in Liverpool) by S. Harrison in *Taxon* 27: 21-33. 1978. The second set went to the Linnaean Society (now at the British Museum) and the third went to Berlin (mostly destroyed).
- GEORGE WALKER ARNOTT (1799-1868) British Arnott had been a student with Robert Wight. Arnott (sometimes called Walker-Arnott) had studied under William Hooker at Edinburgh and traveled with Bentham in Spain. Arnott, imbued with the new Natural System, collaborated with Wight who worked on the *Prodromus Florae Peninsulae Indiae Orientalis* (1834) while living with William Hooker at Kew. Thus the Wight and Arnott publications are the first to adopt the new Natural System (abandoning the Linnaean System).

### 1801-1850

- HUGH FALCONER (1808-1865) British Hugh Falconer, Scottish physician, palaeontologist, zoologist and botanist, went to India in 1830 and by 1832 was Superintendent of Saharanpur Botanic Garden (succeeding Royle) from 1832-1841. After a trip to England (1842) he returned to Calcutta as a professor of botany and Superintendent of the Calcutta Botanic Garden (1848-1855) until he retired to England. At heart he was a geologist. When he returned to England (1855) he had 76 packages of plants and 5 tons of fossil bones!
- WILLIAM GRIFFITH (1810-1845) British William Griffith was a physician, botanist and man of genius. He went to Madras in 1832 as a surgeon, was in Assam with Wallich 1835-1836, in Bhutan 1837-1839, Afghanistan 1839-1841, Superintendent of Calcutta Botanic Garden 1842-1843 and went to Malacca where he died in 1845. He was a major contributor to Wallich's *Numerical List of Dried Specimens*. He also edited Voigt's *Hortus Suburbanus Calcuttensis* (1845). At least 12 of his papers came out after his death, the last in 1859. Perhaps he is best known for his *Icones Plantarum Asiaticarum* (vol. 1-4 with 620 lithographs, 1847-1854).

THOMAS THOMSON  
(1817-1878) British

Thomas Thomson was a physician and botanist, pupil of William Hooker in Glasgow and fellow-student of his son, Joseph Dalton Hooker. He was a surgeon in the Bengal Army (1839), traveled in the western Himalayas and Tibet (1847-1851 (with J. D. Hooker 1849), publishing a major work on his travels in 1852. He worked with J. D. Hooker on the *Flora Indica* but only one volume was published (1855). The work was replaced by *The Flora of British India* (1872-1897) with Thomas Thomson contributing Ranunculaceae-Papaveraceae and Resedaceae-Pittosporaceae.

JOSEPH DALTON HOOKER  
(1817-1911) British

Joseph Dalton Hooker, one of the most prodigious botanists of any period, succeeded his father (William Jackson Hooker (1785-1865)) as the Director of Royal Botanic Gardens, Kew (1865-1885). He went to India in 1848. He and Thomas Thomson are thought to have collected 150,000 plant specimens in India. As mentioned above, their *Flora Indica* (1855), was replaced by J.D. Hooker's *The Flora of British India* (1872-1897) in 7 volumes (5,568 pages of text with ca. 14,000 species). If this weren't enough he also published (1) *The Rhododendrons of Sikkim-Himalaya* (1849-1851), (2) *Himalayan Journals* which went through 3 editions (1854, 1855, 1891), and (3) *Illustrations of Himalayan Plants* (drawings made for the late John Ferguson Cathcart (1802-1851) by Walter Hood Fitch (1817-1892)).

NICOL ALEXANDER DALZELL  
(1817-1878) British

A Scotsman, Dalzell arrived in Bombay in 1841. With the support of Alexander Gibson (1800-1867) he published a "*Catalogue of the indigenous ... plants of the Bombay Presidency*" (1858), based on John Graham's (1805-1839) posthumous *Catalogue of the Plants Growing in Bombay* (1839), which had been finished by Joseph Nimmo (born in India? -1854). Dalzell's collaboration with Gibson resulted in Dalzell and Gibson's *The Bombay Flora* (1861) with 332 pages and a supplement of 112 pages.

WILLIAM MUNRO  
(1818-1880) British

William Munro came to India in 1834 as a Lieutenant and was seriously wounded. He would go on to become a Major in 1852, Colonel in 1854, Major-General in 1868 and finally General in 1878. He became a major agrostologist, identifying Australian grasses for George Bentham (1800-1884), Hong Kong grasses for B.C. Seemann (1825-1871), Indian grasses for J. D. Hooker (1817-1911), grasses of Mexico and Texas for John Torrey (1796-1873), etc. His 157 page monograph of the Bambusaceae (1868) was very influential.

HUGH FRANCIS CLARKE CLEGHORN  
(1820-1895) British, born Madras

Cleghorn did an M.D. at Edinburgh and returned to India in 1842. He became a professor of botany at Madras in 1852, became the first Conservator of Forests in 1856, finally Inspector-General 1867, until retiring to Scotland in 1869. In 1861 he published a large work on the *Forests and Gardens of South India*.

- DIETRICH BRANDIS (1824-1907) German  
Dietrich Brandis was born in Bonn, came to India and until 1862 was Superintendent of Forests in Burma (then a province). By 1864 he was Inspector-General of Forests, retiring in 1883. He completed (1874) *The Forest Flora of North-West and Central India* that had been started by John Lindsay Stewart (ca. 1832-1873). He worked at Kew and Bonn on his *Indian Trees* (1906).
- RICHARD HENRY BEDDOME (1830-1911) British  
Beddome came to India in 1848 and in 1856 joined the Forest Service. By 1863 he had published *Ferns of Southern India* (two editions in 1863-1864 and 1872-1873 and a Supplement in 1876) with hundreds of illustrations. He then did *The Ferns of British India* (1865-1876) with 390 illustrations. His *Flora Sylvatica for Southern India* (1869-1873) had 330 plates. His *Handbook to the Ferns of British India, Ceylon and the Malay Peninsula* (1883) had 300 plates.
- DANIEL OLIVER (1830-1916) British  
Daniel Oliver, Keeper at Kew, most famous for his work on the *Flora of Tropical Africa*, had an impact on Indian Botany with his 1869 *First Book of Indian Botany* (2<sup>nd</sup> ed. in 1881 and reprinted in 1889).
- CHARLES BARON CLARKE (1832-1908) British  
Clarke taught mathematics until his arrival at Calcutta 1865, when he became an avid plant collector, Superintendent of Calcutta Botanic Garden (1869-1871) and Inspector of Schools 1875 onwards. He took his collections to Kew and was allowed to work on Hooker's *Flora of India* until 1883, retired 1887 and worked at Kew until 1906, working on the last part of vol. 2, 200 pages of vol. 3 and 520 pages of vol. 4.
- WILHELM SULPIZ KURZ (1834-1878) German  
Wilhelm Kurz, a botanist (pupil of Martius) in the Dutch East Indian army, became the curator of the herbarium in the Calcutta Botanical Garden in 1878. He published on the *Vegetation of the Andaman Islands* (1870) as well as on the Burmese flora (1874-1877), and on the *Forest Flora of British Burma* (1877, over 1000 pages).
- THEODORE COOKE (1836-1910) British  
Theodore Cooke, an Irishman, went to India 1860 to build railways and was the principal at the Poona Civil Engineering College (1865-1893). When George King formed the Botanical Survey, Cooke (1891) organized a Bombay Section. He is best known for his *Flora of the Bombay Presidency* ([1901]-1908) in 2 vols. with more than 1600 pages.
- GEORGE ALEXANDER GAMMIE (1839-1935) British  
Gammie was sent to India (Mungpu, Sikkim) in 1865 to oversee cinchona plantations and quinine extraction. He began publishing reports of botanical tours in 1894. He retired in 1897 but continued to publish.

GEORGE KING  
(1840-1909) British

Another Scottish botanist, George King came to India in 1866 as a medical doctor and five years later was appointed Superintendent of the Calcutta Botanic Garden (1871-1898), which was then in a bad state. He founded and was the first editor of *Annals of the Royal Botanic Garden, Calcutta*, publishing his treatment of *Ficus* in the first volumes (1887-1888). He also became the Director of the Botanical Survey of India (1891-1898) and founded the *Records of the Botanical Survey of India*.

JOHN FIRMINGER DUTHIE  
(1845-1922) British

John Firminger Duthie, an Englishman, came to India where he was Superintendent of the Saharanpur Botanic Garden (1876-1903). He is best known for his *Flora of the Upper Gangetic Plain* (1903-1929).

WILLIAM ALEXANDER TALBOT  
(1847-1917) British

Talbot, from Ireland, went to India in 1875 working in the Bombay Presidency, becoming Conservator of Forests there. He is best known for his *Systematic of the Trees, Shrubs and Woody Climbers of the Bombay Presidency* (1<sup>st</sup> ed. in 1894, 2<sup>nd</sup> ed. in 1902) and his *Forest Flora of the Bombay Presidency and Sind* (vol. 1, 1909 and vol. 2, 1911) with more than 1000 pages.

JAMES SYKES GAMBLE  
(1847-1925) British

Gamble, an English forester and botanist, entered the Indian Forestry Department in 1871, was posted to Burma 1872 and later to other places, including Madras Presidency in 1882, transferred to Dehra Dun in 1890 where he was Director at the Imperial Forestry School until retirement in 1895. He compiled the *List of Trees, Shrubs and Large Climbers in the Darjeeling District* (1878). He collaborated with George King on *Materials for a Flora of the Malayan Peninsula*. He wrote *A Manual of Indian Timbers* (1<sup>st</sup> ed., 1881, 2<sup>nd</sup> ed., 1902). He also wrote *The Bambuseae of British India* (1894-1896) but is best known for his *Flora of the Madras Presidency* ( [1915]-1936, which was finished by Cecil Ernest Claude Fisher (1874-1950).)

KANOBA RANCHODDAS KIRTIKAR  
(1850-1917) Indian

Kanoba Ranchoddas Kirtikar, was surgeon-major in the British-Indian Army, full professor of *materia medica* at Bombay, and a founder of the Bombay Natural History Society. His *Indian Medicinal Plants* (1918), with Basu Baman Das, has more than 1400 pages and over 1000 plates.

### 1851-1900

GEORGE WATT  
(1851-1930) British

George Watt, an economic botanist from Scotland, came to Calcutta University in 1873 but was sent to Hoogli and was able to do some field work. He was added to the staff of the Calcutta Exhibition (1883-1884) and began compiling his massive and vastly important *Dictionary of the Economic Products* (1885-1893, the Index appeared in 1896), in 6 vols. The last vol. with 4 parts totaled more than 2000 pages.

DAVID PRAIN  
(1857-1944) British

David Prain, Scottish, curator of the Calcutta Herbarium in 1887, succeeded George King as Director between 1898-1905 and then became Director at Kew 1905-1922. He was

perhaps best known (aside from his monographs) for his *Bengal Plants* (1903, 2 vols with more than 1300 pages).

UPENDRANATH N. KANJILAL  
(1859-1928) Indian

Kanjilal was an Indian botanist, a Conservator of Forests in Assam and a lecturer at Dehra Dun. His *Forest Flora of the School Circle*, i.e. Dehra Dun (1901) went through 3 editions during his life. His five volume posthumous *Flora of Assam* (with various co-authors) came out 1934-1940.

CHARLES ALFRED BARBER  
(1860-1933) British

Barber was a pioneer specialist in agricultural botany. After being in the West Indies (1891-1895) he came to India in 1898 as Director of the Botanical Survey of Southern India. From 1908 he was at the Agricultural College at Coimbatore in charge of botany, entomology and mycology and became the first sugarcane expert 1912-1918. He retired to Cambridge in 1919 where he lectured on tropical agriculture. He published a number of papers in various journals but his magnum opus was his *Studies in Indian sugarcanes* (1915-1919) with 425 pages and 90 plates, published in the Mem. Dept. Agr. India, Bot. 7-10.

HENRY HASELFOOT HAINES  
(1867-1945) British

Haines, born in London, came to India in 1888. He became Divisional Forest Officer for Chota Nagpur, then Imperial Forest Botanist at Dehra Dun (1905), and Conservator of Forests (1909-1919). He is best known for *A Forest Flora of Chota Nagpur* (more than 600 pages) and *The Botany of Bihar and Orissa* (1921-1925).

CECIL ERNST CLAUDE FISCHER  
(1874-1950) British, born Bombay

After studies near London, Fischer was posted at Madras (1895-1926), and then became the Assistant for India at Kew (1926-1940), completing Gamble's *Flora of Madras*.

### 1901-1930

HERMENEGILD SANTAPAU  
(1903-1970) Indian

Father Hermenegild Santapau, Principal at St. Xavier's College in Bombay, was appointed temporary Director of the Botanical Survey of India in 1954. The Directorship had terminated just before the Second World War with the retirement of Charles Cumming Calder (1884-1962). He published many works, including *The Flora of Khandala* (1953) with more than 400 pages.

CECIL JOHN SALDANHA  
(1926-2002) Indian

Father Cecil John Saldanha was Principal at St. Joseph's College in Bangalore. He became aware of the American Public Law-480 program that involved excess holding of rupees credited to the US Government by India. At the time (1966-1967), Dan H. Nicolson was a Senior Fulbright Fellow in Nepal. We met and, to make the story short, the money was made available, and the *Flora of the Hassan District* was published in 1976 with more than 900 pages. It was the first publication in India not using the Bentham-Hooker system, being based on Cronquist's new scheme. This was the first and last time this source of money was used for botany. The need for this type of study was however recognized by the University Grants Commission, resulting in an explosion of UGC-funded floristic work

KOYAPILLIL MATHAI MATTHEW  
(1930-2004) Indian

in India, including Saldanha's incomplete *Flora of Karnataka* (vol. 1, 1984 in 535 pp. and vol. 2, 1996 in 304 pp.).

Like his famed eponymous predecessor, the latter-day Father Matthew was based in Kerala where he was Director of the Rapinat Herbarium at St. Joseph's College in Tiruchirapalli. He, like Father Saldanha, tried to get a PL-480 grant in collaboration with an American. Although this didn't eventuate he got one of the first UGC (University Grants Commission) grants. This enabled him to start work on his magisterial *Flora of the Tamilnadu Carnatic*. This began with an introductory volume (1) in 1981, *Materials for a Flora of the Tamilnadu Carnatic*. That was followed by vol. 2, *Illustrations on the Flora of the Tamilnadu Carnatic* in 1982. In 1983 came vol. 3, Part One of the *Flora* (with an 84 page Introduction and 1284 pp.) and Part Two (with a 50 page Introduction and pp. 1285 through 2154). That was followed by vol. 4, *Further Illustrations on the Flora of the Tamilnadu Carnatic* in 1988 with an Introduction of 36 pp. plus more than 900 pp. and a total of 834 plates.

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**Dan H. Nicolson of the Smithsonian Institution and Natural History Museum in Washington D.C. is a plant taxonomist with interests in tropical floristic work, and botanical literature and nomenclature. Nicolson has a long history of interest in Indian Botany and has worked in India with Cecil Saldanha on the important *Flora of the Hassan District* (published in 1975) and with C.R. Suresh and K.S. Manilal on a definitive work on the *Hortus Malabaricus* (1988). He is the editor of many scholarly journals and the author of more than 200 publications. He is the recipient of several awards including the 2004 Science Achievement Award from the National Museum of Natural History and the 2005 Stafleu Medal for his work on the botany of the 2<sup>nd</sup> Cook expedition. He has been honored for his contributions to Indian botany with four Indian plants being named after him.**





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