Hortus Malabaricus

Deni Bown reports on the dawn of a new tropical botanic garden

A **BOTANIC GARDEN IS** all things to all people – a research institution but also an educational centre, public park, mecca for plant lovers, visitor attraction, and place of historic interest. Most evolve into these roles over many years so how can a new botanic garden achieve this mix of science, outreach, venue and history in just over a decade? I recently visited Hortus Malabaricus (Garden of Malabar) in Kerala, South India, and was surprised how quickly an 11ha estate has been re-purposed to do all the above.

Hortus Malabaricus is the brainchild of Sam Santhosh, founder of the SciGenom Research Foundation, which administers the garden. Its mission is to protect and conserve plants native to the Western Ghats, a chain of mountains bordering the Malabar Coast for 990 miles from Maharashtra, through Goa and Karnataka, to southernmost Kerala. It is a global biodiversity hotspot, with about 5,500 indigenous plant species, some 2,253 of which are endemic to India, including 1,270 found only in the Western Ghats.

Design and construction began in 2015 but, thanks to sound planning, along with the tropical climate, most areas look like they have been there much longer. Managing the botanic garden as a destination has also been done well. There are hotel-standard cottages for garden stays, along with activities and events. But what impressed me most was how it has achieved historic status by focusing on the 742 species documented in the 12-volume, 6,000-page *Hortus Malabaricus*, after which it is named.



PHOTOGRAPHY: DENI BOWN

A monumental work

Hortus Malabaricus by Hendrik van Rheede (1636–1691) was published in the Netherlands from 1678 onwards when he was Governor of Dutch Malabar. Like most colonial administrators in parts of the world that were little-known to Europeans, van Rheede was impressed by the many plants used for food, medicine and other practical purposes, and he realised their importance for healthcare and livelihoods. He also recognized that reliable information was vital for administration, development and trade. To this end he employed people to collect and document the key species – notably Itty Achudan (b. 1640), an authoritative pre-Ayurvedic (traditional Indian medical) practitioner. The result was a groundbreaking treatise on 'economic botany' which was used by Linnaeus when devising binomial nomenclature and has inspired botanists to this day.

Plants described in *Hortus Malabaricus* are illustrated with copper-plate engravings which are a joy to look through. However, what was written alongside them is not so easy to appreciate. In fact, it took over 300 years before there was an English translation. This gargantuan task was undertaken by Professor KS Manilal at the University of Calicut, for which he had to learn Latin. It was published in 2003 and a translation into Malayalam, the principal language of Kerala, followed in 2008. Given how long it took for the book to become fully accessible to today's readers, the botanical garden followed remarkably quickly!

Most of the species recorded by van Rheede are now grown in the garden, along with *Entada rheedei*, the best-known example of one named after him. This gargantuan climber, which already covers four large trees, produces dangling pods over 1m long containing large flat brown seeds. »





(Left) Entrance to Hortus Malabaricus. (Above) The huge legume pod of *Entada rheedei*.



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The opening page of *Hortus Malabaricus* (right) showing its author Hendrik van Rheede.

Cochlospermum vitifolium 'Plenum' (below) is the double-flowered form of the rosa amarilla tree that produces a yellow-orange dye used for textiles.





DR ANOOP P BALAN



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Clockwise from far left: *Ensete superbum* is endemic to the Western Ghats; *Aerides crispa* is used to treat earache; *Crinum malabaricum* is a source of galanthamine; *Tirumala* butterflies extract alkaloids from *Crotalaria retusa*.



ALGANANDA

Known as sea beans, they float down rivers and across oceans, occuring in forests of tropical Africa, Australia and Asia – including the Western Ghats.

A garden of parts

The garden has 14 sectors. Several left a deep impression on me, especially the Sacred Grove. Through symbolic structures and plantings, this describes how plants have underpinned human culture in this part of the world since the Indus Valley Civilisation (c. 3300–1300 BCE) and how veneration of plants, such as the bodhi tree or pipal (*Ficus religiosa*), has ensured their protection and conservation.

An open-air temple in the Sacred Grove, modelled on a 9th- to 12th-century shrine, encircles a Krishna cup fig (*Ficus krishnae*). This fig has pouched leaves which, according to Hindu mythology, were filled with butter by Krishna. Close by is a timber building for gatherings which is also tree-centric. It is built around two large rosewoods (*Dalbergia sissoo*) and an Indian laurel (*Terminalia elliptica*), with a roof of coconut leaves.

Another sector demonstrates the importance of pepper (*Piper nigrum*), a climber found in tropical forests of the Western Ghats. Long before Vasco da Gama landed on the Malabar Coast in 1498, it was the centre of the spice trade, especially for pepper – 'black gold' – which was in demand throughout Asia, the Middle East and Europe for food preservation before refrigeration, and as a condiment before the introduction of chilli from America. Large-scale production continues today, combining well with tree crops, such as betel (*Areca catechu*), but here some 25 cultivars are displayed on various trees, including the endemic Malabar nutmeg (*Myristica malabarica*).

In another sector there are glasshouses. One is for orchids – to date 14 of the 15 species in *Hortus Malabaricus* have been collected, including *Aerides crispa*, a Western Ghats endemic traditionally used to treat earache. Another displays ferns and fern relatives, and a third is for *Zingiberaceae*, the ginger family, including cardamom (*Elettaria cardamomum*) which, like pepper, is native and still a major crop.

The sector Kadalivanam (banana forest) displays over 40 commercially important selections and hybrids of *Musa acuminata* and *M. balbisiana*, together with oddities such as rock banana (*Ensete superbum*), an endemic from rocky terrain in the Western Ghats. After dormancy in the dry season, it shoots up to 3.5m, producing a drooping rosette of reddish bracts and small stubby fruits.

An archway leads to the vegetable sector which supplies the restaurant. Cucumber was first domesticated in India, and wild cucumbers, *Cucumis sativus* var. *hardwickii*, which have rounded fruits, can still be found in the Western Ghats. They are important for breeding resistance to mosaic virus and other diseases.

Diverse in landscape and purpose

The garden is roughly crescent-shaped. Visitors enter along Van Rheede Avenue to the reception area via a small roundabout which encircles a mango tree and bust of van Rheede with its daily offering of flowers such as *Cochlospermum vitifolium* 'Plenum'. At the widest part of the garden, paths lead uphill to the sector for aquatic plants. There are over 200 species, almost half of which are described in *Hortus Malabaricus*. Many are displayed in individual aquatic planters, arranged on three terraced levels. Treasures here include *Crinum malabaricum*, a traditional Ayurvedic remedy now recognized as a rich source of galanthamine to treat dementia. It is critically endangered, being confined to a few seasonal rivers over laterite plateaus in northern Kerala. Another rare endemic, *Nymphoides krishnakesara*, with heart-shaped floating leaves and small white flowers, occurs in nearby pools.

Also uphill is the butterfly garden. Its crowning glory is a three-storey viewing deck and rearing cages. Terrace plantings are of host plants for butterflies and their larvae. These include rattleweed (*Crotalaria retusa*), visited by blue tigers (*Tirumala* species) for collecting pyrrolizidine alkaloids from which they make pheromones. The leaves are dotted with proboscis puncture marks.

As the butterfly sector shows, botanic gardens are not just about plants and people. While their primary purpose is to connect us to our heritage and encourage, as Andrew Marvell put it in 1668 'a green thought in a green shade', they also have a wild side. Along the lower terraces of Hortus Malabaricus, the driveway leads to Rheedianum, a nature reserve adjoining the Wadakkanchery Forest Reserve. Realising how important wildlife is to the garden, Hortus Malabaricus has a staff naturalist who records wildlife such as squirrels, palm civets, monkeys, pangolins, birds and butterflies – and provides guided tours, opening our eyes to the big picture. ○

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Acknowledgements I am grateful to Hortus Malabaricus founder, Sam Santhosh, botanists Dr Anoop P Balan and Dr Anand Gopinath and the garden's naturalist, Alagananda, for checking text and contributing images.