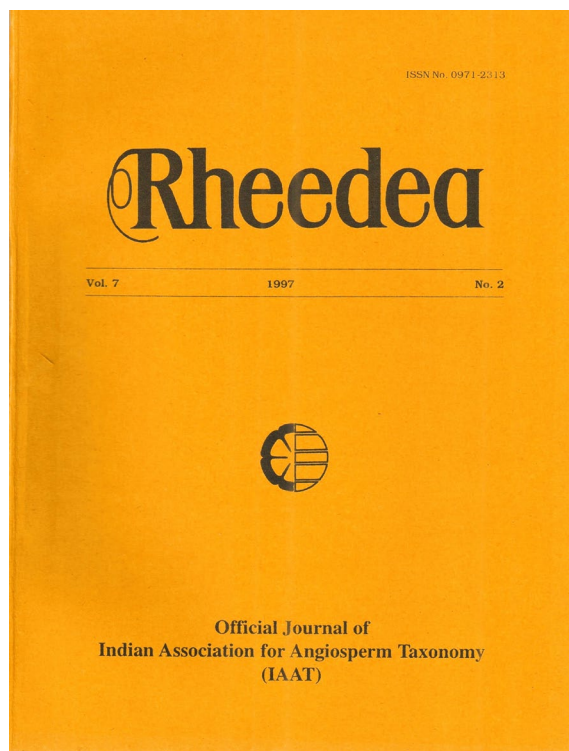




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On the Trail of Rheedeian Specimens

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Abstract

Van Rheedee is known to have sent to Europe many dried specimens of the plants described by him in *Hortus Malabaricus*. These Rheedeian specimens are of valuable historical importance and taxonomic significance but these herbarium specimens have never been traced despite repeated attempts by many botanists in various countries at various times. Recently a short report in Russian, by Karaveev published in 1976 in a Russian publication which had not attracted much attention earlier, came to the notice of the author, in which it was claimed that a part of the Rheedeian specimens is in the Moscow University Herbarium. After a critical study of these herbarium sheets in Moscow, it is reported here that they can not be related with Rheedeian herbarium specimens of *Hortus Malabaricus*.

INTRODUCTION

Van Rheedee's *Hortus Malabaricus*, about the plant wealth of Malabar, published during 1678-1693 is the first comprehensive treatise on the economically valuable natural plant wealth of this part of the world. It contains 791 illustrations and descriptions of 742 plants (found to belong to 691 modern taxa), covering 1534 printed pages of double folio size, in 12 volumes. *Hortus Malabaricus* which is closely connected with the history of modern botany was one of the main sources of Linnaeus for his knowledge of tropical flora of Asia.

It was Luigi Anguillara, who first introduced the technique of the conservation of plant specimens by drying and pasting on paper (cf., Heniger, 1986), at a time when the common method was to maintain them by cultivating in botanical gardens. After a modest beginning, the importance of the herbaria began to grow greatly since type specimens were needed for establishing new species under the system of binominal nomenclature.

Van Rheedee is known to have sent to Europe many dried plant specimens described by him but it was not known where they are lodged now. Many botanists since Rheedee tried to locate these herbarium sheets but could not succeed in their attempts. Linnaeus and several other subsequent taxonomists have, therefore, established many genera and species based on the illustrations and descriptions of these plants by Rheedee in his *Hortus Malabaricus*.

K.S. Manilal

Dioscorides, Theophrastus, Pliny and others established systematic methods of studying and classifying plants in Europe, which were being followed by botanists all over European countries. The discovery of the sea-routes to Asia and America resulted in a great influx of exotic plants from these regions to Europe, the vast majority of which had no similarity or affinity to the familiar European plants. Only a few medicinal and commercial plants among them could be connected with the writings of Dioscorides and others. The interpretation of the vast array of totally new forms of plants and their amalgamation into the existing systematic apparatus was a challenge that had to be faced by the European botanists at that time. Aids such as herbaria, hot houses, botanical gardens, new systems of plant classifications, etc., were born and developed at that time. Thus, already in the 16th century, herbarium sheets accompanying the original description and discovery had become valuable materials for clearing doubts on identity, nomenclature and classification. Renewed attempts were made by many taxonomists to trace the Rheedeian specimens which were among the first such specimens from Asia to arrive in Europe but, none of the attempts have been successful (Stafleu, 1967; Johnston, 1970; Manilal 1980; Heniger, 1986).

Source of Old Ceylonese and Indian Plants at Leiden, Amsterdam, Paris and Gottingen

At the time when Rheedee was making the first attempt in Cochin to compile his *Hortus*, Paul Herman who was assigned the work of preparing a Flora of Ceylon, passed through Cochin in or about 1674. Herman sent many Ceylonese herbaria to Arnold Syen, who was Professor of Botany at Leiden and Director of the Botanical Garden there and the first commentator of *Hortus Malabaricus*. Syen received many consignments in 1675, 1676 and 1677. Thus Syen had in his possession many Ceylonese (Asian) specimens for comparison and comments, when he received the manuscript of the 1st volume of *Hortus Malabaricus*. Though Syen did not consider himself as an expert on tropical botany, it may be noted that he did possess a good collection of herbaria of tropical plants. These collections of herbaria are now in Leiden (Heniger, 1986). After the death of Arnold Syen, Paul Herman was appointed his successor. He arrived in Leiden in 1680 from Ceylon.

Herman had also presented a collection of Ceylon herbaria to Jan Commelin, the second commentator of *Hortus Malabaricus*, who was one of the Commissioners of the Amsterdam Hortus Medicus, along with Huydecoper. Commelin had his private collection of herbaria too. These collections are identified with the herbarium volume now in the Institut de France in Paris (Lourteig, 1966).

During his stay in the Netherlands in 1735-1748, Linnaeus could become acquainted with the large collections of herbaria and living specimens of tropical plants there, originating from the Dutch colonies in the East. In the private *Hortus Cliffordianus*, belonging to the Amsterdam Banker George Clifford, Linnaeus identified about 95 plants with the plants in Rheedee's *Hortus Malabaricus*. When Linnaeus returned to Sweden, the Ceylon herbarium of Herman which was thought to be lost, was unexpectedly located at Uppsala University,

On the trail of Rheedean specimens

which he described in his *Flora Zeylanica*. He also succeeded in identifying about 210 of Herman's sheets with Van Rheeде's plants in *Hortus Malabaricus*.

Many others such as Herman, Boerhaave, Pieter Hotton, Adriaan van Royen, Johannes Burman and Georg Everhard Rumphius had also identified plants described by Rheeде, in other herbarium collections from the East. However, they did not confuse these herbaria with the *Hortus Malabaricus* herbaria of Van Rheeде.

Van Rheeде himself is known to have sent many herbaria of Ceylon plants to Leiden and Amsterdam. He was sending such collections in duplicate, one set to Jan Commelin in Amsterdam and the other to King William III. After the death of King William III in 1702, his share was sent to Leiden. These are preserved in Amsterdam and Leiden respectively (Heniger, 1986).

Having been obliged to leave Malabar in 1677, Rheeде was appointed again as Commissioner General of the Western Quarters in 1684, when he travelled by way of Cape of Good Hope, Ceylon, Bengal, Coromandel to Malabar. During this journey he sent plants from Ceylon, Bengal and Coromandel to Commelin and Huydecoper in Amsterdam. The specimens from Coromandel in the East coast of Peninsular (south) India, had their names written in Tamil, the native language of Madras (now Tamil Nadu). It may be remembered that Rheeде was in the East coast earlier also. He was in the besieged Tuticorin fortress during 1669, when the High Government at the Hague had the occasion to write to the (Dutch) Government of Ceylon to examine the possibility of exploiting the local medicinal plants. The Government of Coromandel had also received a similar letter at that time, which was perhaps kept in mind by Van Rheeде during his later visit to Coromandel, prompting him to make a collection of Coromandel plants and send them to Amsterdam.

Confusion of East Coast plants with Malabar plants

Paul Herman had sent several specimens of Eastern plants to Leonard Plukenet, who as a Royal Professor of Botany at the court of William III and Mary II and as intended of the Royal Gardens of Hampton Court was a prominent English botanist. He had access to many gardens and herbaria in England and the continent, having many Eastern specimens. Plukenet had access to a large collection of Indian plants collected by Samuel Brown, a surgeon of the English East India Company in Madras. Brown regularly sent seeds and other specimens collected from the neighbourhood of Madras and Coromandel to James Petiver who was the secretary of Hans Sloane, Secretary of the Royal Society of London. Plukenet assigned these as 'Malabar' herbarium, with 'Malabar' names. The names of these plants were actually Tamil names, the native language of Madras.

Information about a small collection of these 'Malabar' plants of Browne were published by Petiver in 1699, in *Philosophical Transactions, Vol.20*, with references to

K.S. Manilal

Hortus Malabaricus. In 1699 Brown's 'Malabar Herbarium' arrived in London. Royal society asked Petiver to describe it (Dandy, 1958). Before Petiver could carry out his studies, Plukenet had the opportunity to make a hasty study of Brown's collections and inserted them in his *Almagesti Botanici Mantissa* (1700) with many references to *Hortus Malabaricus*, citing the accompanying Tamil names as 'Malabarorum'. In his publications *Phytographica* (1691-1692), *Almagestum Botanicum* (1696), and *Amaltheum Botanicum* (1705) also Plukenet made numerous references to *Hortus Malabaricus*, discussing and identifying hundreds of plants from all volumes of *Hortus Malabaricus*, citing them as 'Malabar plants' and the Tamil names as 'Malabar names'. Many botanists in Europe did not know the significant differences between Malabar and Madras, and the native language of the two regions, Malayalam and Tamil respectively. Plukenet's papers created great confusion not only between the words Malabar and Madras and the words Malayalam and Tamil, but also between the true 'Malabar' collections of *Hortus Malabaricus* and the so called 'Malabar' plants from Madras and Coromandel, as seen from many subsequent publications since then.

Petiver published his study of Brown's Malabar herbarium in the *Philosophical Transactions* of 1702 and 1703. He criticized Plukenet's references to *Hortus Malabaricus* but identified 138 plants described in *Hortus Malabaricus* in Brown's herbarium. Johannes Burman (1737) compared Ceylon plants with *Hortus Malabaricus*. Georg Everhard Rumphius (1755) compared more than 150 plants in his *Herbarium Amboinense* with *Hortus Malabaricus*.

There is no holotype for many Linnaean taxon. Indicating a type is mentioning in an authentic publication a particular, specific specimen as the type, which is deposited in a specified place. The type-method was developed only during the first half of the 20th century (more than a century after Linnaeus). Linnaeus erected several new species and genera based on the illustrations published by Rheedee in *Hortus Malabaricus*. Many of these taxa and several others from *Hortus Malabaricus* have been typified by later authors citing specimens in the Linnaean Herbarium at the Linnaean Society and at other Herbaria. Other illustrations by Rheedee have also been made use of by various authors to typify the concerned species. All these activities undertaken for the formal typification of the eastern plants, as required in the type-method, made taxonomists still more eager to find out the whereabouts of Rheedean specimens known to have been sent to Europe which had vanished without any trace.

The Herbarium of the "Systematische-Geobotanisches Institut der Universitat Gottingen" was reported to possess 12 volumes of an old herbarium of plants from India, titled "Plantae Malabaricae". The name (Malabaricae) coupled with the number of volumes (12) suggested a strong connection with *Hortus Malabaricus* of Van Rheedee, which contains 12 volumes. This Gottingen herbarium has been mentioned on this account by De Candolle (1880) and Stafleu (1967). In 1970 Johnston examined the herbarium at Gottingen and

On the trail of Rheedeian specimens

concluded that they have no connection with *Hortus Malabaricus* as the 'Sanskrit' names do not agree with those in the book and there is no parallelism in the contents (Johnston, 1970).

While studying the botanical works of A. v. Haller, personal physician of King George II, Wagenitz (1978) investigated the history of the Gottingen collections further and found out that the "Plantae Malabaricae" are part of a large herbarium acquired by the University in 1764 from the heritage of August John v. Hugo, who was a friend of A. v. Haller. Wagenitz also found that the plant names given are not in Sanskrit but are in Tamil. The short commentaries in German are attributed to the hand of Ch. Th. Walther (1699-1741), who was a missionary stationed at Tranquebar. Comments by Lehman (1955) in his book *Es begann in Tranquebar*, and mention of a herbarium from Tranquebar made by A. v. Haller (1744) also point to the origin of these specimens from Tranquebar, a small town situated south of Madras on the east coast of Peninsular India (Coromandel coast). It is not clear who collected the specimens at Gottingen but Wagenitz (1978) concludes that they were collected in 1732/33 from the surroundings of Tranquebar by persons intimately connected with the missionary station there and, therefore, not connected with Rheede's *Hortus Malabaricus*. After this investigation by Wagenitz (1978) all concerned were compelled to be resigned to it that the Rheedeian specimens are lost beyond recovery but, any indication about the possible existence of them was still wishfully awaited.

Origin of Peninsular Indian specimens at Moscow

While working on the Fosberg files on the Foster collections made on the 2nd Cook Expedition to the South Seas in 1770s, Nicolson (1994) happened to come across several articles by Karavaev (Moscow) on the Foster specimens. Among these there was one (Karavaev, 1976) mentioning Rheedeian specimens in Moscow University Herbarium.

Karavaev mentions that these herbaria from the collections of Rheede were preserved in the University of Gottingen since 1760, from where it was brought to Moscow by H. Hofman in 1804 (DeCandolle, 1880). As it was well worth investigating this information further, the present author took the first opportunity in 1994 to examine and study these specimens at Moscow.

As mentioned by Karavaev (1976), this collection consists of 103 herbarium sheets of the usual size, on which the specimens appear to have been remounted on several occasions. These repeated changes of the mountings, the antiquity of the labels, perhaps the lack of adequate care with which the sheets were transported during the preceding centuries and the tortuous route of the journey to its present location, have resulted in a condition where the specimens, their appropriate original labels and sheets have all mixed up and do not match in many cases. Small pieces of dried leaves of the palm *Corypha umbracalifera* L. were used as labels originally, on which the names of the specimens are engraved using a sharp writing needle, as was the practice in the southern parts of India in the ancient times.

K.S. Manilal

The names are Tamil plant names and the script used is Tamil script. Apart from the palm leaf tags, in most cases labels on paper are also present, which obviously were prepared by later workers who studied the herbaria. Whatever might have been their past, at present these herbarium sheets are well preserved and carefully stored, with labels of identification in almost all cases according to the correct binomial nomenclature. All the plant species which are represented in this collection are not found to be described by Rheedee. Descriptions and illustrations of several of them are absent in *Hortus Malabaricus*, but are found in other literary sources such as Plukenet (1696, 1700).

Rheedean specimens and Moscow collections

Rheedean herbarium specimens of *Hortus Malabaricus* are of great importance not only as valuable historical museum pieces but also as specimens of taxonomical significance (Linnaeus, 1753). Karavaev (1976) has given a list of the "Paratypes" established by them from the herbarium specimens at Moscow, considered by them as belonging to Rheedee's *Hortus Malabaricus* collections. These types include -

1. *Tabernaemontana caronaria* Willd., Sp. Pl. 1: 1244 (1809). Nando Erwatum major et minor Hort. Mal. 2: 105, t. 54-55.
2. *Hedysarum diphyllum* L., Sp. Pl. 2: 747. Nelam-mari Rheedee, Hort. Mal. 9: 161, t.82.
3. *Scirpus articulata* L., Sp. Pl. 1: 47. Tsieli (Tselloi in Icon.) Rheedee, Hort. Mal. 12: 135, t. 71.
4. *Desmanthus natans* Willd., Sp. Pl. 4: 1044. Niti-todda-vaddi Rheedee, Hort. Mal. 9: 10, t. 20.
5. *Vitex negundo* L., Sp. Pl. 2: 938. Bemnosi Rheedee, Hort. Mal. 2: 15, t. 11.
6. *Nymphaea lotus* L. Sp. Pl. 1: 511. Ambel Rheedee, Hort. Mal. 11: 51, t. 26.
7. *Nymphaea nelumbo* L., Sp. Pl. 1: 511. Tamara Rheedee, Hort. Mal. 11: 59, t. 30.
8. *Nymphaea stellata* Willd., Sp. Pl. 2: 1153. Cytambel Rheedee, Hort. Mal. 11: 53, t.27.

However, the collection mentioned by Karavaev (1976) does not seem to have anything to do with the Rheedean herbarium specimens of *Hortus Malabaricus*. Specimens of some plants mentioned in *Hortus Malabaricus* are found to be present in this collection, which is perhaps the only relationship of this collection with *Hortus Malabaricus*.

On the trail of Rheedeian specimens

The original Rheedeian specimens of *Hortus Malabaricus* are collected from Malabar, mostly from and around Cochin. The language of this region is Malayalam and not Tamil which is the language of Madras. Though both these belong to the Dravidian family of languages, Malayalam and Tamil had separated from each other several centuries before and had attained their own uniqueness well before the 17th century, when the relevant plant collections were made and their labels written. The scripts of the two languages are also different. While at the time in question the Tamil script had somewhat stabilised in its morphology, the characters of Malayalam script were going through a period of transition. It so happens that during the time of compilation of *Hortus Malabaricus*, Malayalam language was written in both the older Vattezuthu script and in the newer Aryaezuthu script. The former type of script was used by merchants, physicians and others (considered as lower casts) while the latter type of script was used by scholars and priests (considered as upper casts). In *Hortus Malabaricus*, examples of both these types of scripts are in print. In fact, *Hortus Malabaricus* is the only book or document in which both Vattezuthu and Aryaezuthu scripts of Malayalam appear together (Manilal, 1996). Nevertheless, both these types of Malayalam scripts are entirely different from the Tamil script. On all the palm leaf labels, attached correctly or incorrectly on the herbarium sheets in the present Moscow collection, the script used is undoubtedly Tamil.

The ayurvedic system of medicine, utilizing the curative virtues of local plants, was a well advanced science in Malabar and in Madras. Many of the local plants and their parts, especially flowers and leaves were commonly used in houses as well as in temples, in religious rituals and specific social functions, almost on a daily basis. Being such an integral part of their daily life, people of both the above regions had their own names in their local languages for the local plants. Although one might occasionally find a plant with a common name in both Malayalam and Tamil, the local names of plants in general are different in the two languages. The names written on the palm leaf tags prepared originally and attached with these herbarium sheets, are Tamil plant names and not Malayalam names.

The Rheedeian herbarium specimens of *Hortus Malabaricus* were collected from and around Cochin of Malabar. *Hortus Malabaricus* is the result of a collaborative venture, only between Rheede and the local experts of Malabar. Specimens for *Hortus Malabaricus* were collected from no part of Madras nor any help from experts in Madras were taken in its compilation. Both Malabar and Madras are in the Peninsular India but, while the former is on its West coast, the latter is on its East coast. They are separated from each other by the Western Ghat mountains, which have the highest peaks south of Himalayas so that while Malabar receives both the South-West and North-East monsoon rains, Madras gets only the North-East monsoon. Malabar is characterised by a climate having high humidity and moderate temperature throughout the year whereas Madras has a dry weather with a much less annual rain fall.

K.S. Manilal

Mainly due to these reasons, the floristic components of Malabar (West coast) and Madras (East coast) are different. The herbarium collections mentioned by Karavaev contain many plants that are present in the drier regions of the Indian Peninsula near the East coast, while many of the common and characteristic plants of the Malabar West coast are not found to be included.

In general, the collection is not typically representative of Malabar but closely resembles that of Madras. Therefore, the possibility of these herbarium sheets being a part of the Rheedeian herbarium specimens of *Hortus Malabaricus* is very little. On the contrary, it is very likely that they belong to the ancient collections made from Coromandel and or Madras. Thus, the trail of Rheedeian specimens of *Hortus Malabaricus* sadly peters out once again.

Who made these collections and when were they made are questions, the answers to which are not ventured to be suggested here. Many people including Van Rhee made collections from Coromandel, Madras and such places other than Malabar in the Peninsular India during a wide period of time and sent them to many European botanists and gardens. No evidence could be isolated from these herbarium sheets in Moscow or from their labels to help one to arrive at any conclusion regarding these aspects.

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