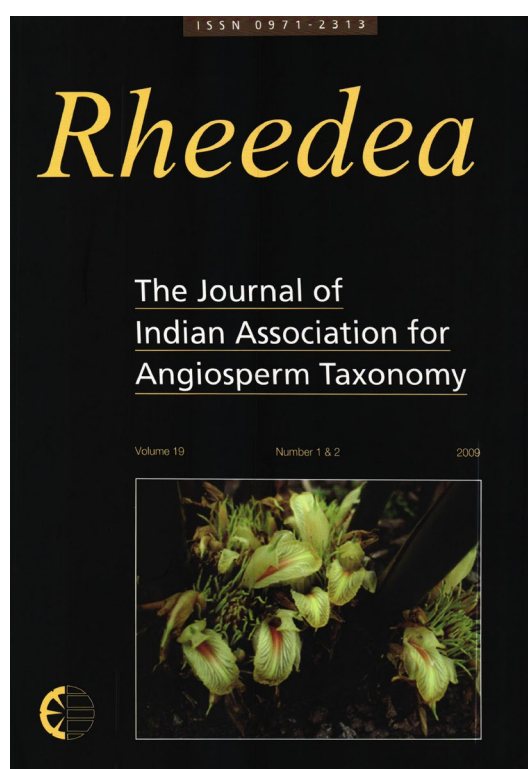




Linnaeus's Global Project – The Exploration of the World's Flora

Bertil Nordenstam



How to cite:

Nordenstam B. 2009. Linnaeus's Global Project – The Exploration of the World's Flora. *Rheedia* 19(1&2): 1-11.

<https://dx.doi.org/10.22244/rheedia.2009.19.01.01>

Received: 26.10.2008

Revised and accepted: 08.06.2009

Published in print: 30.12.2009

Published Online: 30.12.2009

Linnaeus's Global Project – The Exploration of the World's Flora

Bertil Nordenstam

Department of Phanerogamic Botany, Swedish Museum of Natural History, Stockholm, Sweden.
E-mail: Bertil.Nordenstam@nrm.se

Abstract

Linnaeus had the bold ambition to describe the world's total flora and fauna. To achieve these goals he utilized all available literature and natural science collections, including his own extensive herbarium and ever increasing botanical garden. He also developed an international network with more than 600 correspondents all over the civilized world. Furthermore, he encouraged and engaged his students as collectors and explorers, in Sweden as well as abroad. Those seventeen young men who ventured outside Europe are known as the Linnaean apostles. Among them are Tärnström, Adler, Torén and Osbeck, who all travelled to the Far East with the Swedish East India Company, and Thunberg, who went to South Africa and Japan with the Dutch East India Company. Kalm travelled in North America, Rolander and Löfling in South America, Falck in Russia, and Hasselquist and Forsskål in the Near East, Egypt and Arabia. Solander and Sparrman became famous as members of Captain Cook's circumnavigations. The information gathered from all the various sources were synthesized in the *Systema naturae*, *Species plantarum* and *Systema vegetabilium*, which were continuously amended and published in various editions during Linnaeus's lifetime and continued by others after his death in 1778.

Keywords: Carl Linnaeus, Apostles, Voyages, Exploration

Introduction

In 2007 the Tercentenary jubilee of the birth of Carl Linnaeus was celebrated, in his native country as well as in other places in the world. Rightly so, since the ambitions of the famous scientist were indeed worldwide; he aimed to describe the world's total flora and fauna. He did not travel extensively himself, only in a few European countries, but he sent his students to explore and collect in distant parts of the world. Those seventeen who travelled outside Europe he named his 'apostles' (Selander, 1960; Sörlin & Fagerstedt, 2004; Nordenstam, 2007a).

Linnaeus also developed an extensive network of correspondents, many of which provided him with natural history objects from different parts of the world. Numerous plants were grown in the Uppsala botanic garden, and Linnaeus could enrich the living collection by seed exchange with foreign institutions and persons. The Linnaean correspondence amounts to almost 6,000 letters to and from 600 correspondents worldwide (Nyström, 2007; Linnaeus. c18.net).

When the Swedish East India Company was founded in 1731 a new venue of contact with the Far East was created (Olán, 1920; Frängsmyr, 1976). The Company was destined for trade with China,



Carl Linnaeus. The 'bridegroom portrait' by J.H. Scheffel 1739 (From Tullberg, 1907).



Linnaeus with students and King Gustaf III visiting Hammarby (From Dahlström, 1860).

early 18th century was an under-populated and poverty-stricken country marked by long warfare and diseases such as plague. However, in a comparatively short time the country developed into a more wealthy state with an internationally acknowledged level of learning. This remarkable development was catalysed by the liaison between science and economy in an international context, and the most important factors and actors were the Swedish East India Company and the Royal Swedish Academy of Sciences, with Linnaeus as the key person. The first Swedish East India man sailed to Canton in 1732, and in few decades the East India Company became the most successful enterprise in Sweden (Kjellberg, 1974; Söderpalm, 2000). At the same time the Linnaean scientific method of classification spread over the learned world, and Linnaeus gained world fame.

and commerce and science soon established a fruitful partnership, enhanced by the foundation of the Royal Swedish Academy of Sciences in 1739. Linnaeus was one of the five founding fathers of the academy, which besides natural sciences favoured mercantile interests. Sweden in the

Linnaeus was of course interested in the exotic floras and faunas from a purely scientific standpoint. He wanted to describe and classify every species and also enrich his own collections as well as those of colleagues and friends, including the Swedish royalties.



Routes travelled by Linnaeus's apostles (From Wallström, 1983).

The students of Linnaeus were often trained in medicine as well as natural history and could be employed as ship's doctors. Others had studied theology and could serve as chaplains or priests onboard. During stays in ports they had the mission to collect ashore as much as possible of natural history objects. This ingenious scheme worked well in many instances. However, eight out of a total of 37 ships were lost at sea, and many crew members fell ill on board or died during the voyage.

The Linnaean apostles

The first apostle sent out for China was Christopher Tärnström (1711 – 1746). In 1746 Tärnström sailed from Gothenburg via Cadiz in Spain and the Cape of Good Hope towards the Indian Ocean and China. He had thorough instructions from Linnaeus what to bring back home, natural history specimens in general, of course, but also more specifically, a living tea plant, seeds of mulberry trees, and live goldfish for the Queen Lovisa Ulrica. Before the ship with Tärnström on board reached its destination he succumbed to a fever and died at Pulo Candor outside Cambodia (Söderpalm, 2005).

Another Linnaean apostle going eastwards to China was Carl Fredrik Adler (1720 – 1761), who travelled to Canton as a ship's surgeon on several voyages, first in 1748 – 1749, until he died at the coast of Java in 1761. He could not achieve much ashore, however, since the ship captains used to keep him on board, where his services were indispensable and almost constantly needed (Fries, 1903).

Soon followed two more apostles on the Chinese trade route, and they were vastly more successful as naturalists. Olof Torén (1718 – 1753) and Pehr Osbeck (1723 – 1805) both sailed from Gothenburg in 1750 as priests on two different Swedish ships (Stenström, 1935; Torén, 1953). Especially the latter had proved to be an excellent and talented student, and Linnaeus had great expectations on him. When Osbeck asked for instructions, Linnaeus answered that no instructions were needed for someone so skilled and knowledgeable. However, the much desired living tea plant was still high priority. Torén and Osbeck both arrived without problems to Canton and studied the natural history, especially the flora, in the surroundings. Both found many new plants, two of which were named by Linnaeus as the new genera *Torenia* and *Osbeckia*.

The genus *Torenia* belongs to the Foxglove or Snapdragon family (Scrophulariaceae). Today many tropical species from different continents are referred to this genus, but the original species described by Linnaeus was *Torenia asiatica*. It is



Torenia fournieri (from Nordenstam, 2007b).

an herb with beautiful blue flowers and is often cultivated. It was collected by Torén at Canton, and also found by Osbeck. There are original specimens preserved in the Linnaean herbaria in London as well as in Stockholm.

Torén's voyage is of special interest because the itinerary included India, which was normally not visited by other European East India companies than the British and the Dutch. The ship stayed at Surat in northwest India from 16 Sept. 1750 to 1 March 1751. The British had a factory in Surat since 1612, and the city was initially their most important centre of commerce in the region. However, Bombay became the capital of the British possessions in India in 1668 and also the commercial centre. During the stay at Surat Torén could spend altogether 23 days ashore collecting plants, animals and making notes to send to Linnaeus at home. On the continued voyage the ship also called briefly at Mangalore and Mahé on the west coast of India (Torén, 1953).

Already before Osbeck's departure from Sweden Linnaeus had promised to name a new genus *Osbeckia*. The suitable plant to receive the name was found by Osbeck outside Canton on 11 September 1751. He realized that it was new to Linnaean science, although it had a Chinese name and was

sold in the pharmacies as a medicine (Osbeck, 1757). It belongs to the large tropical *Medinilla* family (Melastomataceae).

Osbeck stayed in China for more than four months and made unprecedented rich collections and careful observations. His substantial diary was eventually published in 1757 (*"Dagbok öfver en Ostindisk Resa åren 1750, 1751, 1752"*). The travelogue became popular and widely read as the most authoritative contemporary account of China. Beside flora and fauna the inhabitants and their clothing and customs, husbandry and economics are described. The book was translated to German, French and English (*"A voyage to China and the East Indies"*, 2 vols., 1771), and quite recently into Chinese (2006).

Thanks to the East India Company, Linnaean disciples could explore countries like South Africa, India and China, and islands along the route such as Ceylon and Java. But in order to fulfil Linnaeus' global ambitions, other routes had to be taken as well, sometimes with the help of other nations than Sweden.

Linnaeus realized that much more exploration in the New World was needed. In North America plants of economic use could be found and perhaps successfully cultivated in Sweden, Linnaeus argued. The promising disciple Pehr Kalm (1716 – 1779) was sent to North America in 1747. He sailed via Norway and London and arrived to Philadelphia in September 1748. There he collected plants and seeds mainly in Pennsylvania and New Jersey, and in the summers of 1749 and 1750 he worked in Canada. Back in Sweden in 1751 he published his extensive diary in three volumes – four further volumes were planned but the manuscripts were lost in a fire (Kalm, 1753 – 1761; Skottsberg, 1951).

Kalm became a Professor of Economic Botany in Åbo, Finland, where he also founded a botanic garden. The genus *Kalmia* of the Heath family (Ericaceae) was named for him by Linnaeus. Kalm had found two beautiful species of this genus, which he realized was new. Another 60 new species collected by Kalm were included in Linnaeus' *"Species Plantarum"*, and his numerous seed collections were used to develop plants of economic use.

The ventures to South America were not entirely successful. Daniel Rolander went to Surinam in 1754 to work as a tutor and collector. He felt uncomfortable with the tropical heat and political unrest of the country and soon returned to Sweden with health problems. Most of his herbarium specimens ended up in Copenhagen, to the disappointment of Linnaeus.

Pehr Löfling (1729 – 1756) was Linnaeus' favourite student and no doubt one of the most talented. He helped Linnaeus with the tuition of the younger Linnaeus and the writing of some of Linnaeus' works, especially *"Philosophia botanica"*, which was published in 1751. In the same year Löfling left Sweden and took up a position as Royal Botanist and Professor in Spain, on Linnaeus' recommendations. He worked for two years on a flora of Spain, when he was commissioned to an expedition to South America. While the main mission was political, viz. to define the boundaries of the Spanish colonies, Löfling was in charge of the natural sciences of the expedition (Rydén, 1965).

In 1754 the expedition arrived to the northeast coast of present-day Venezuela. Löfling travelled in the regions along the Orinoco river, where he contracted malaria, and he died in 1756 at the age of 27. No collections are preserved from his South American travel, but his diary including many plant descriptions was published posthumously by Linnaeus as *"Iter hispanicum"* (1758). Many Löfling specimens from Spain are preserved in the Linnaean herbaria in London and Stock-



Sir Joseph Banks, portrayed in 1773 by Sir Joshua Reynolds. (Orig. in National Portrait Gallery, London).



Daniel Solander, oil painting by J. Zoffany (orig. in the Linnean Society of London).

holm. The plant named for him, *Loeflingia hispanica* L., is a small member of the Carnation family (Caryophyllaceae).

The third Linnaean apostle to visit South America was Daniel Solander (1733 – 1782). He was also one of Linnaeus' favourites, at least initially. He came to Uppsala in 1750, where Linnaeus took good care of him, almost like a family member, and apparently Solander was very fond of Linnaeus' eldest daughter. When Linnaeus was asked to send a knowledgeable and competent disciple to London, he chose Solander, who was keen to go to England. He arrived to London in 1760, where he worked at the British Museum and soon made important friends, like the wealthy and influential Sir Joseph Banks (Fries, 1940; Duyker, 1998).

Banks and Solander participated in the first circumnavigation of the world under Captain Cook – one of the most important and remarkable voyages of discovery ever made. Officially the aim of the expedition was to observe the 1769 transit of Venus (solar passage) from the newly discovered Tahiti, in order to determine the distance between the sun and the earth. Less officially, or rather more secretly, Captain Cook should search for *Terra*

australis, the presumed southern continent, and claim new land for the British Crown. Banks and Solander together with their own staff of eight artists, assistants and servants should make natural history observations and collections.

The ship "Endeavour" was specially rebuilt and furnished for the long journey, which lasted three years (1768 – 1771). They sailed along the east coast of South America with stops at Rio de Janeiro and Tierra del Fuego, where all plants collected were new to science. From there they sailed straight to Tahiti and stayed three months in that tropical paradise. Mission Tahiti fulfilled, the search for *Terra australis* started – a rough voyage with storms and shortage of provisions. Land was found and explored, it turned out to be two islands called New Zealand and separated by a sound, which was named Cook Strait. A good map was drawn and many plants and animals found. The encounters with the Maoris were not always friendly, and it was difficult to get provisions at times. One place was named Poverty Bay for such reasons.

Cook then sailed along the east coast of the land called New Holland. This was new territory, with rich harvests of new plants and animals. A landing



Sparrmannia africana, engraving after watercolour by P. J. Redouté (from Ventenat, *Le Jardin de Malmaison*, 1803 – 1804).

place was called Botany Bay, situated south of present-day Sydney, and the whole country was named New South Wales. The ship stranded on a coral reef in Queensland and had to be repaired. In the meantime Banks and Solander made excursions and found a strange animal called kangaroo.

The voyage continued in the strait between Australia and New Guinea and in Java the ship was repaired more properly. The crew was in poor condition, Banks and Solander were both sick, and the ship's doctor died in fever. When they arrived to England in June 1771 they brought home enormously rich collections, a most remarkable voyage of exploration had been completed successfully, although 38 men had been lost.

A Linnaean disciple of considerable fame was Anders Sparrman (1748 – 1829), who travelled on Captain Cook's second voyage round the world and explored the Cape Colony in South Africa just after Thunberg's pioneering work there. It is less well known that prior to these remarkable travels, Sparrman went on an East Indiaman to Canton. This was in 1765, when Sparrman was only 17 years old and in spite of his age hired as a ship's doctor on board the "*Stockholms Slott*". The captain was the renowned Carl Gustaf Ekeberg (1716 – 1784), a member of the Academy of Sciences and ardent purveyor of exotic natural objects to Linnaeus. The ship stayed in Canton from 26/8 1766 to 21/1 1767. Young Sparrman's scattered diary observations were published in a Linnaean dissertation "*Iter in Chinam*" in 1768 (Linnaeus, 1768).

When Captain Cook's second expedition was planned, Banks and Solander were considering to participate, but changed their minds when they inspected the small flagship "*Resolution*", which was "not fit for a Gentleman to embark in", in Banks' own words. The other ship, "*Adventure*" was even smaller. Instead the Germans Johann Reinhold and Georg Forster, father and son, were invited as naturalists on the voyage. When the expedition came to Cape Town in October 1772, Sparrman and Thunberg were both there, having arrived earlier that year. Sparrman was invited by the older Forster to participate in Cook's expedition and Captain Cook consented, somewhat reluctantly.

Sparrman was then 24 years old, but had a reputation as one of Linnaeus' promising students. Besides, he had made a voyage to China and was trained in medicine. From Cape Town Captain Cook sailed southwards in search for the southern continent and aiming at coming as close as possible to the South Pole. The "*Terra australis*" could not be found, but they ventured further south than any

other previous expedition. New Zealand, Tahiti and Easter Island were visited, and new land as well as plants and animals were discovered during the three years of voyage. On the way home to England they stopped at Cape Town again in 1776 and Sparrman disembarked there in order to continue his explorations in South Africa.

Sparrman was as much a zoologist as a botanist and besides plants he collected many birds, mammals and other animals. He dissected a hippopotamus to find out its relationships, and he brought a specimen of the quagga to Sweden, where it is still preserved in the Swedish Museum of Natural History in Stockholm. The species, a close relative of the zebra, became extinct in the 1870's. Sparrman published an interesting travelogue (Sparrman, 1783 – 1818), which was translated into English, German, and French. The genus *Sparrmannia* is named in his honour. *Sparrmannia africana* is a South African tree of the Linden family (Tiliaceae), which is popular in cultivation, especially as an indoor pot plant.

Some other Linnaean apostles are perhaps less well known today, such as Johan Peter Falck (1733 – 1774), who became a professor in Petersburg and made explorations in Russia, and Fredrik Hesselquist (1722 – 1752), who travelled to Egypt and



Peter Forsskål (1732–1763). Portrait by P. Dahlman (from Wallström, 1983; orig. in Salnecke castle, Uppland).

the Near East including the Holy Land. Both died on their travels. Hasselquist is remembered for his valuable plant collections and the travelogue "*Iter palaestinum*", which was published posthumously by Linnaeus and soon translated into several foreign languages (Hasselquist, 1757).

One of the most remarkable and gifted Linnaean students was Peter Forsskål (1732 – 1763). He studied in Uppsala and in Göttingen in Germany, where he got a doctor's degree in philosophy (Schück, 1923). Back in Sweden he became famed for a privately printed publication "*Tankar om borg-erliga friheten*" (meaning "*Thoughts on civil freedom*") (Forsskål, 1759). This was a defense for civil rights especially the freedom of the press. The publication was banned and confiscated. Soon afterwards Forsskål became involved in a Danish expedition to Egypt and "*Arabia felix*", i.e. Yemen. The undertaking was supported by the Danish King, but the expedition was very unfortunate. Five of its six members including Forsskål died, and the surviving member Carsten Niebuhr edited and published some of the results of the expedition including Forsskål's "*Flora aegyptiaco-arabica*" (1775).

Finally, the perhaps most famous of the Linnaean apostles, Carl Peter Thunberg (1743 – 1828). He became known as 'The Father of South African botany' and 'Japan's Linnaeus'. His fame comes from a nine years long and successful journey, which included almost three years in South Africa and 16 months in Japan (Svedelius, 1944; Nordenstam, 1993).

Thunberg enrolled at the University of Uppsala in 1761 and thus became one of Linnaeus' late students. After finishing a doctoral thesis in medicine in 1770 Thunberg went to Paris for further medical studies. On the way he met several

Dutch friends of Linnaeus and they suggested that the very talented Linnaean disciple should be sent to Japan for botanical exploration of the closed and isolated country. Linnaeus consented and after finishing his studies in Paris Thunberg was hired by the Dutch East India Company as a ship's doctor.

Japan was closed to European visitors with the exception that two Dutch ships a year could call at Nagasaki, where the commerce was strictly controlled. Thunberg had to act as a Dutchman, and on the way to Japan he stayed in the Dutch colony at the Cape, in order to learn the language fluently and to explore South Africa's flora and fauna. Thunberg made three long expeditions to the borders of the colony and made unprecedented rich collections of largely unknown and undescribed species.

In March 1775 Thunberg's voyage continued, and after a spell on Java he arrived to Japan in August that year. At first he was confined to the little island of Deshima in Nagasaki harbour, but managed to get permission to make excursions ashore around Nagasaki. In 1776 he took part in a four months journey across the Japanese islands to Edo, present-day Tokyo. He made extensive collections on the way, especially in the flourishing Hakone mountains near Mount Fuji.

The journey back to Sweden was slow, and Thunberg stayed some time again in Java and five months on Ceylon. In his later years (1825) he published two small flora lists of both islands, *Florula javanica* and *Florula ceilanica* (Thunberg, 1825a, b).

Thunberg set foot on Swedish ground in 1779, after almost nine years of travels. In Uppsala he soon succeeded the younger Linnaeus as Professor of Botany, and the rest of his long life he authored floras of the Cape and of Japan, hundreds of dissertations, a travelogue in three parts, and many zoological papers. He died in 1828 at the age of 85 as one of the last Linnaeans.

The genus *Thunbergia* was originally described with a single species from South Africa (Retzius, 1780), but today the genus has about 200 species in Africa and Asia. The "Black-eyed Susan", *Thunbergia alata*, is one of the well-known species in cultivation.

Earlier sources used by Linnaeus

Linnaeus had a detailed knowledge of earlier and contemporary botanical literature and possessed a considerable library. In his work on the world flora he used all available knowledge



Carl Peter Thunberg (1743 – 1828). Swedish stamp from 1973. Photo B. Nordenstam.

embedded in the writings of previous authors. Thus he could describe the flora of regions not visited by any of his own students. The Caribbean can be mentioned as an example. For this region Linnaeus obtained his information from four principal sources. One of these was the remarkable French monk and traveller Charles Plumier (1646 – 1704), who made three journeys to the Antilles between 1689 and 1697.

Although Plumier died at a comparatively early age of 58 years, he was incredibly industrious and wrote numerous volumes of descriptions and made more than 6,000 drawings, of which 4,000 are plants, the rest animals. Plumier published two botanical books in 1693 and 1703, with about 150 plates (Plumier, 1693, 1703). He named e.g. the genera *Fuchsia* and *Begonia*, well-known names later taken up by Linnaeus. Linnaeus became acquainted with Plumier's work during his stay in Holland, where Burman had Plumier's publications and copies of about 500 of his drawings. Burman later published some of them (262 plates) as "*Plantarum americanarum*" (1755 – 1760). Plates from this work were used as wallpaper in Linnaeus' summerhouse Hammarby outside Uppsala.

Another important source for Caribbean plants was the Austrian baron Nicolas Joseph Jacquin (1727 – 1817), who described many genera and species from the region, e.g. *Swietenia*, including *Swietenia mahagoni*, a valuable timber tree and the national plant of Dominican Republic. Linnaeus kept a lively correspondence with Jacquin (186 letters known during a period of 28 years; Linnaeus.c18.net) and named the genus *Jacquinia* in his honour.

A further source was Sir Hans Sloane (1660 – 1753). He had made important collections in Jamaica in 1687 – 1689, including some 800 new species. Linnaeus visited Sloane at Chelsea, London, in 1736, when the latter was 76 years old. Linnaeus was impressed with the quantity of Sloane's collections, but not with their arrangement – he remarked that "Sloane's great collection is in complete disorder" (Stearn, 1957). Sloane's herbarium consisted of 265 large volumes with altogether 120,000 specimens. This treasure was donated after his death in 1753 to the British Crown and laid the foundation of the British Museum (Natural History), now Natural History Museum in London.

A fourth source for Linnaeus's knowledge of the Caribbean flora was the Irishman Patrick Browne, a medical doctor with a talent for nature studies, who left Europe at the age of 17 and spent some years in the Caribbean. Browne became famous for his monumental work "*The Civil and Natural History of*

Jamaica" (1756, and two later editions). This important work contains descriptions of about 100 new genera, and the beautiful plates were drawn by the famous botanical artist Georg Dinosysius Ehret. Linnaeus managed to borrow a copy for a fortnight already in 1756 and read the voluminous work day and night with great interest, and sent a letter to Browne. Linnaeus readily accepted many of Browne's new genera, and included them in the 10th edition of *Systema naturae* (Linnaeus, 1759). He also managed to buy Browne's collection of Jamaican plants (about 1,000 specimens), which are now found in the Linnaean herbaria in London and Stockholm.

In similar ways Linnaeus gathered information for all parts of the world. For East Asia very limited information was available before the travels of his own apostles such as Torén, Osbeck and Thunberg. China and Japan were closed countries and remained closed during the 18th century except for certain ports open to selected European visitors. A few early sources are cited by Linnaeus such as Kaempfer's *Amoenitates exoticarum* for Japan. Some records were available from Macao, Canton or Cochin-China (e.g. by James Cuninghame,



Johannes Burman (1707 – 1779). Frontispiece to his *Theasaurus zeylanicus* (1737).



Burman's *Thesaurus zeylanicus* (1737).



Linnaeus's *Flora zeylanica* (1747).

cited by Plukenet and Petiver), or from travellers overland via camel caravan routes to North China (e.g., D. G. Messerschmidt). Linnaeus sometimes confused India and China and he used the epithets *indica* and *chinensis* (or *sinensis*) somewhat deliberately, sometimes not reflecting the true geographical origin.

However, for British India and the East Indies a wealth of information was available to Linnaeus already in the voluminous works of Rumphius and Rheede tot Draakestein. Georg Eberhard Rumpf (Rumphius, 1627–1702) had completed his incredible six-volume work *Herbarium Amboinense* in 1690 in spite of being blind since 20 years and having lost half of the illustrations in a fire. When the work was sent to Holland the manuscript was lost at sea, when the ship was sunk by the French. Again the work was started anew and finally arrived in the Netherlands in 1696, but it was not published until 1741, i.e. 39 years after the death.

Hendrik Adriaan van Rheede tot Draakestein (1637–1691) was a Dutch botanist and colonial administrator, Governor at Cochin on the Mala-

bar coast of India (Kerala). His *Hortus indicus malabaricus* in twelve folio volumes was published between 1678 and 1693 (1703).

The flora of Ceylon was explored already in the 1660's by Paul Hermann and in the early 18th century by Jan Hartog. Hermann's plants and publications were cited by Johannes Burman in his *Thesaurus zeylanicus* (1737).

Linnaeus was to some extent involved in this work, since he was staying with the Burmans in Holland at the time. Ten years later Linnaeus published his own *Flora zeylanica* (1747), principally based on another Hermann herbarium, which had been lost for 70 years, until it turned up in Denmark. It was in the private possession of a Danish apothecary August Günther, who contacted Linnaeus in 1744 and sent the herbarium to Uppsala. Linnaeus gratefully dedicated the publication to Günther. While the Hermann herbarium described by Linnaeus is now in the Banks collection in the Natural History Museum, London, the Hermann collection consulted by Burman is housed in Institut de France in Paris.

In *Species plantarum* (1753) Linnaeus described and named close to 5,000 species of plants, and in later publications he could add continuously to the number. When he had finally described more than 8,500 species, he perhaps thought that he had covered a major portion of the world's flora. However, today we know close to 300,000 species of vascular plants, and we know for certain that many more will be discovered and described.

Literature Cited

- Browne, P. 1756.** *The Civil and Natural History of Jamaica*. Printed for the author, and sold by T. Osborne and J. Shipton, London. (Ed. 3, sold by B. White and Son, London, 1789).
- Burman, J. 1737.** *Thesaurus Zeylanicus*. J. Waesbergios, S. Schouten, Amstelaedami.
- Dahlström, C. A. 1860.** *Teckningar ur Konung Gustaf III: s historia*. Typogr. fören., Stockholm.
- Duyker, E. 1998.** *Nature's Argonaut. Daniel Solander 1733 – 1782*. Miegunyah Press, Melbourne.
- Ekeberg, C. G. 1773.** *Capitaine Carl Gustav Ekebergs Ostindiska Resa, åren 1770 och 1771*. Henr. Foug, Stockholm.
- Forsskål, P. 1759.** *Tankar om borgerliga friheten*. Lars Salvius, Stockholm.
- Forsskål, P. 1775.** *Flora Aegyptiaco-Arabica*. Ed. C. Niebuhr. Mölleri, Haunia.
- Fries, Th. M. 1903.** *Linné. Lefnadsteckning*. Fahlcrantz, Stockholm.
- Fries, R. E. 1940.** *Daniel Solander. Minnesteckning*. Almqvist & Wiksell, Stockholm.
- Frängsmyr, T. 1976.** *Ostindiska kompaniet. Människorna, äventyret och den ekonomiska drömmen*. Wahlström & Widstrand, Stockholm; Bra Böcker, Höganäs.
- Hasselquist, F. 1757.** *Iter Palaestinum Eller Resa Til Heliga Landet, förrättad ifrån År 1749 Til 1752*. Lars Salvii, Stockholm.
- Kalm, P. 1753 – 1761.** *En Resa til Norra America*. Vols. 1 – 3. L. Salvii, Stockholm.
- Kjellberg, S. T. 1974.** *Svenska Ostindiska Compagnierne 1731 – 1813*. Allhems, Malmö.
- Linnaeus, C. 1747.** *Flora zeylanica*. L. Salvii, Holmiae.
- Linnaeus, C. 1751.** *Philosophia botanica*. G. Kiewewetter, Stockholmiae.
- Linnaeus, C. 1753.** *Species Plantarum*. Vols. 1 & 2. L. Salvii, Holmiae.
- Linnaeus, C. 1759.** *Systema Naturae*, ed. 10. Vol. 2. L. Salvii, Holmiae.
- Linnaeus, C. 1768.** *Dissertatio academica sistens iter in Chinam* (Resp. A. Sparrman). J. Edman, Upsaliae.
- Loefling, P. 1758.** *Iter hispanicum, eller Resa Til Spanska Länderna uti Europa och America, förrättad ifrån År 1751 til År 1756*. Ed. Carl Linnaeus. L. Salvii, Stockholm.
- Nordenstam, B. 1993.** *Carl Peter Thunberg. Linnéan, resenär, naturforskare*. Atlantis, Stockholm.
- Nordenstam, B. 2007a.** Apostlarnas äventyr. In: L. Åberg (Ed), *Från Linné till DNA*. Naturhistoriska riksmuseet, Stockholm. pp. 42 – 69.
- Nordenstam, B. 2007b.** *Linneanska blomster. Porträtt av växter och personer kring Linné*. Carlsons, Stockholm.
- Nyström, E. 2007.** Ett globalt nätverk – Linnés internationella korrespondens. In: L. Åberg (Ed), *Från Linné till DNA*. Naturhistoriska riksmuseet, Stockholm. pp. 70 – 83.
- Olán, E. 1920.** *Ostindiska kompaniets saga. Historien om Sveriges märkligaste handelsföretag*. Elanders, Göteborg.
- Osbeck, P. 1757.** *Dagbok öfver en Ostindisk Resa åren 1750, 1751, 1752*. L. L. Grefing, Stockholm. (English ed., *A voyage to China and the East Indies*, Benjamin White, London 1771; Chinese ed., Guangxi Normal Univ. Press 2006).
- Plumier, C. 1693.** *Description des plantes d'Amérique: avec leurs figures*. Impr. Royale, Paris.
- Plumier, C. 1703.** *Nova plantarum americanarum genera*. J. Boudot, Parisiis.
- Plumier, C. 1755 – 1760.** *Plantarum Americanarum*. In: Burman, J. (Ed), *Fasc. 1 – 10*. Amsterdam, Leiden.
- Retzius, A. J. 1780.** *Thunbergia capensis: Et nytt Växtslag från Africa*. *Physiogr. Sölsk. Handl.* 1(3): 163 – 165.
- Rheede tot Draakestein, H. A. van 1678 – 1703.** *Hortus Indicus Malabaricus*. Vols. 1 – 12. J. van Someren, J. van Dyck, Amstelaedami.
- Rumphius, G. E. 1741 – 1750.** *Herbarium Amboinense*. F. Changuin, J. Cataffe, H. Uytwerf, Amstelaedami: Apud Franciscum Chang-

- uion, Joannem Catuffe, Hermanum Uytwerf, Amsterdam.
- Rydén, S. 1965.** *Pehr Löfling. En Linnélärjunge i Spanien och Venezuela 1751 – 1756.* Almqvist & Wiksell, Stockholm.
- Schück, H. 1923.** *Från Linnés tid. Petter Forsskål.* Norstedt, Stockholm.
- Selander, S. 1960.** *Linnélärjungari främmande länder.* Albert Bonniers, Stockholm.
- Skottsberg, C. 1951.** *Pehr Kalm. Levnadsteckning.* Kungl. Vetenskapsakad., Stockholm.
- Söderpalm, K. (Ed) 2000.** *Ostindiska Compagniet. Affärer och föremål.* Göteborgs Stadsmuseum, Göteborg.
- Söderpalm, K. (Ed) 2005.** *Christopher Tärnströms journal. En resa mellan Europa och Sydostasien år 1746.* Mundus Linnaei Ser. No. 1. IK Foundation, London, Whitby.
- Sörlin, S. & O. Fagerstedt 2004.** *Linné och hans apostlar.* Natur och Kultur, Stockholm.
- Sparrman, A. 1783 – 1818.** *Resa Till Goda Hopps-Udden, Södra Pol-kretsen Och Omkring Jordklotet, Samt till Hottentott- och Caffer-Landen, Åren 1772 – 76.* Part 1, A. J. Nordström, Stockholm 1783. Part 2, 1: C. Delén, Stockholm 1802; Part 2:2: C. Deleen, Stockholm 1818.
- Stearn, W. T. 1957.** An Introduction to the Species Plantarum and cognate botanical works of Carl Linnaeus. In: *Carl Linnaeus, Species Plantarum, a facsimile of the first edition 1753.* The Ray Society, London.
- Stenström, F. 1935.** Pehr Osbeck och Lars Montin. Två halländska lärjungar. *Svenska Linnésällsk. Årsskrift 1935:* 59 – 94.
- Svedelius, N. 1944.** Carl Peter Thunberg 1743 – 1828. Ett tvåhundraårsminne. *Svenska Linnésällsk. Årsskrift 27:* 29 – 64.
- The Linnaean Correspondence.* Linnaeus.c18.net/Letters
- Thunberg, C. P. 1781.** *Dissertatio botanica de Protea.* J. Edman, Upsaliae.
- Thunberg, C. P. 1784.** *Flora japonica.* I. G. Mülleriano, Lipsiae.
- Thunberg, C. P. 1788 – 1793.** *Resa uti Europa, Africa, Asia, förrättad Åren 1770 – 1779.* Vols. 1 – 4. J. Edman, Upsala.
- Thunberg, C. P. 1825a.** *Florula javanica.* Parts 1 – 2. Palmblad, Upsaliae.
- Thunberg, C. P. 1825b.** *Florula ceilanica.* Palmblad, Upsaliae.
- Torén, C.-A. 1953.** Om Olof Torén, hans färder till Kina och Indien som skeppspredikant samt om växtsläktet *Torenia* L. *Svenska Linnésällsk. Årsskrift 36:* 17 – 56.
- Tullberg, T. 1907.** *Linnéporträtt.* Ljus, Stockholm.
- Wallström, T. 1983.** *Svenska upptäckare.* Bra Böcker, Höganäs.

Received: 26.10.2008

Revised and Accepted: 8.6.2009