





# Wallich and his contribution to the Indian natural history

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## Abstract

Various activities of Nathaniel Wallich, especially those that connect with Indian natural history are briefly reviewed. Wallich rose to a naturalist of international standard from a prisoner of war in discovering the riches of the then British India and reporting to the learned world. He established a close network of leading experts in the field of natural history and exchanged plant materials for the benefit of both the donor and receiving countries. During his superintendence of the then Royal Botanic Garden, Calcutta, which prevailed nearly three decades, Wallich introduced useful plants from across the world and elevated the status of the Garden as one of the finest in the world, published over 8,000 new species, about 142 genera of plants and established a world class herbarium. An initiative funded by the World Collections Programme has tried to give due recognition to Wallich towards his contribution to natural history by hosting a website ([www.kew.org/wallich](http://www.kew.org/wallich)). This is a joint collaborative project between Kew Gardens, The Natural History Museum, London and The British Library with additional inputs from the Acharya Jagdish Chandra Bose Indian Botanic Garden, Howrah and The National Archives of India, New Delhi.

**Keywords:** Collections, Herbarium, Online Resource, Wallich Catalogue

## Introduction

Nathaniel Wallich (1785–1854) spent 34 years in India mainly working as Superintendent of the Calcutta Botanic Garden and was employed by the Honourable East India Company (EIC). The EIC was founded in 1600 by England and dissolved in 1874. The company traded textiles and spices with India and helped to forge the British Empire in India. The Garden was established in 1787 by Lieutenant Colonel Robert Kyd, who was the first Superintendent of the Garden followed by William Roxburgh. Roxburgh was succeeded by Francis Hamilton (often referred to as Francis Buchanan-Hamilton), who was in-charge for a very short period of four months. Francis was succeeded by Nathaniel Wallich, who was made Superintendent of the Gardens in 1817 and occupied this post till 1846.

The Garden is situated on the west bank of the river Hooghly (Ganga). The main goal of the garden was to introduce, cultivate and distribute plants, which were commercially valuable and economically important. Robert Kyd proposed cultivating cinnamon, dacca cotton, indigo, tobacco, coffee, sandalwood, pepper and tea. The layout of the Garden is similar to Kew Gardens as both the gardens are contemporaries; both are

located next to the river and use similar irrigation systems. Kew Garden was built in 1759 and the Calcutta Botanic Garden was established in 1787. Over the years, the Garden changed its name and a brief history of the garden reveals that during the EIC's rule in India, it used to be called 'The Hon'ble Company's Botanic Garden. In 1860s, it was known as the Royal Botanic Garden and on 25th June 2009, the Garden was named in honour of the Bengal Polymath – 'Acharya Jagdish Chandra Bose Indian Botanic Garden (AJCBIBG)'. Presently, it is governed by the Botanical Survey of India (BSI), which comes under the Ministry of Environment, Forest and Climate Change, Government of India.

Wallich has an interesting biography. He studied medical degree along with botany and went to India in 1807. Initially, he worked as a physician to the Danish settlement in Serampore (Shrirampur), near Calcutta (Kolkata). The British invaded and seized the area and Wallich was imprisoned, however, due to his merit and on William Roxburgh's request, he was released on parole in 1809 and was recruited in the Company's service as an assistant botanist to William Roxburgh.

Other botanists who had medical degrees and studied botany as part of their degree and were recruited in the Company include William

Roxburgh, Francis Buchanan-Hamilton, Robert Wight, Benjamin Heyne, James Shuter, and William Griffith. They all had their training either at Edinburgh, Glasgow or Aberdeen in Scotland (Desmond, 1982; Noltie, 1999). Wallich was also the founder, curator and the first director of the Indian Museum (1814–19). His contribution to botany during those times is unmatched to any of his contemporaries. His small contribution on the *List of Indian Woods* (*Trans. Soc. London Encour. Arts* 48(2): 439–481. 1831–32) inspired many later botanists. He wrote important books such as *Tentamen Florae Nepalensis Illustratae* (Vol. I–II, 1824–26) and *Plantae Asiaticae Rariores* (Vol. I–III, 1830–32) and is famous for ‘A numerical list of dried specimens of plants in the East India Company’s Museum, collected under the superintendence of Dr Wallich of the Company’s Botanic Garden at Calcutta’ commonly known as the ‘Wallich Catalogue’. This list was written by Wallich himself in 1828, which was lithographically reproduced to replace the necessity of writing the numerous copies of labels, which would have been required whilst distributing the duplicates of the Company’s collection.

The specimens in the catalogue were either collected by Wallich himself or other collectors during the same period including collections by W. Roxburgh, W. Gomez, W. Griffith and R. Wight. The collector of each specimen is clearly cited in the catalogue itself. Some of Wallich’s plant collectors include: Robert Blinkworth, Kamroop, Francis de Silva, M.R. Singh, Bharat Singh, George Porter, Henry Bruce and Akkul Mahmud (Wallich, 1828).

A total of sixty-four universities, museums, societies and individuals received the duplicates (Desmond, 1982). The set retained by the Indian Museum was offered to the Linnaean Society of London in 1832. In 1905, Sir William Turner Thiselton-Dyer, the Director of the Royal Botanic Gardens at Kew tried to get the herbarium (Wallich Herbarium) transferred to Kew; however, he did not succeed and in 1913, due to shortage of space, The Linnaean Society transferred the Wallich Herbarium as well as the South and Southeast Asian collections to Kew. He also contributed new plant descriptions to Roxburgh’s *Flora Indica*. Robert Wight, then, a leading botanist in Madras Presidency, has rightly quoted Wallich as:

“I consider Botany, and especially Indian Botany, as owing him a large debt of gratitude for what he did, on that occasion, towards

making the measures of Flora known to the scientific world” (Desmond, 1992).

Lithographic Government Press was formed in India in 1823 (Desmond, 1999: 117), and Wallich was the first author in India to use lithographic press for floral illustration. Wallich also designed innovative methods of preserving seeds in brown sugar prior to shipping, which helped the plants to survive longer.

He went on numerous expeditions around the Himalayas, Nepal, Burma (Myanmar), Malaysia, Penang, Singapore, South Africa and Mauritius. Apart from the herbarium specimens, Wallich collected fruits and flowers and preserved them in 172 spirit bottles (Desmond, 1982). Wallich was instrumental in the discovery of tea plants growing in the Assam region and made fruitful contributions to the development of the botanical garden at Kolkata. Between 1817 and 1818, Wallich sent numerous plants and seeds as gifts to his friends and botanical institutes across the world including France, the Netherlands, USA, South Africa, New South Wales, Mauritius, St. Helena and Denmark (Desmond, 1992: 83). Some of the plants (**Fig. 1a,b**) for example: *Picea smithiana* (Wall.) Boiss. (Morinda spruce) was named by Wallich in memory of Sir James Edward Smith, founder of the Linnean Society. Wallich also commissioned Gorachand (artist) to reproduce this illustration in colour (*Plantae Asiaticae Rariores* Vol. III 1832: 246, plates 8 & 9 in Desmond’s *The European Discovery of the Indian Flora*, 1992). This plant is native to the Western Himalayas and was introduced by George Govan, Superintendent of Saharanpur Botanic Garden, who sent seeds back to his father in Cupar, Fife (Noltie, 1999). Wallich sent plants and seeds of red and white species of rhododendrons from Sylhet and Nepal to Joseph Banks in Britain.

Wallich brought the drawing of *Bergenia ciliata* (Haw.) Sternb. to England in 1828. This plant is native to Central Asia, from Afghanistan to China to the Himalayas, is introduced and cultivated in the United Kingdom. *Rosa microphylla* Roxb. ex Lindl., a species native to the Himalayas and grows at elevation ranging from 1280 to 3292 m, was introduced and cultivated in England from as early as the 19th century (Desmond, 1992, plates 14 & 16). *Impatiens glandulifera* Royle, commonly known as the ‘Himalayan Balsam’ is another plant, which has now become an invasive weed in the United Kingdom (<https://secure.fera.defra.gov.uk/nonnativespecies/factsheet/factsheet.cfm?speciesId=1810>). In one of his applications for home leave, Wallich claimed:

“My harvest far exceeds that reaped by any travelling naturalist or any party of naturalists during a corresponding period of time” (Desmond, 1992: 88).

He encouraged his fellow physicians and friends to make use of all the facilities in the garden, which included the library as well. He urged pupils from local schools to visit the garden and explained about the flora in the garden. The botanic garden at Calcutta was known as ‘Wallich’s pet’ (Desmond, 1992). Apart from Nathaniel Wallich, both William Roxburgh and Robert Kyd are renowned for their contributions to Indian botany and hold an important place in Indian natural history. Although the study of the Indian natural history was guided by the patronage and commercial interests of the EIC, the personnel had a strong interest and liking to natural history (Desmond, 1982).

Wallich contributed many important scientific papers and he was feted for the same. In 1818, he was made a Knight of Dannebrog by Denmark. He was a member of the Royal Danish Society of Sciences and the Royal Medical Association of Copenhagen. In England, he was Vice-President of the Linnean Society (became Vice-President in 1849), the Royal Asiatic Society and the Royal Society (Vice-President from 1852 to 1853). On retiring, Wallich came back to England in April 1846. Wallich passed away at his home in London on 28th April 1854 and laid to rest at Kensal Green Cemetery. Much of the inscriptions on the grave are illegible (Fig. 1d). An obelisk in Wallich’s memory has been erected by the East India Company at the AJCBIBG. Wallich had a son, George Charles Wallich (1815–99) and a daughter, Hannah Sarah.

## Materials and Methods

Herbarium collections and illustrations from Kew Gardens and The Natural History Museum (NHM) as well as Wallich’s correspondence at British Library have been digitised, scanned and have been entered onto a database. These can be viewed online via [www.kew.org/wallich](http://www.kew.org/wallich). The herbarium specimens at Kew and NHM were matched with the illustrations/drawings and were selected for scanning/digitizing by botanists at Kew Gardens and NHM. The plant names were checked for updated nomenclature ([www.ipni.org](http://www.ipni.org), [www.tropicos.org](http://www.tropicos.org) and [www.theplantlist.org](http://www.theplantlist.org)).

The annotations of the drawings have been derived from *Plantae Asiaticae Rariores*. All the data which are displayed on the website are given

in **Table 1**. This data can be viewed online at [www.kew.org/wallich](http://www.kew.org/wallich) (Fig. 2). This site contains Wallich’s biography, specimens collected by Wallich, drawings/illustrations drawn by the artists who were commissioned by Wallich and Wallich’s correspondence to various people during his life time. At the moment, data from the Natural History Museum, Kew Gardens and the British Library have been added to the website (**Table 1**). The collections can be filtered and items relevant to a particular interest can be explored. For example, the collections can be explored by filtering only the specimens or drawings or correspondence or Wallich’s biography or all items at a time. The correspondence data can also be downloaded as a PDF file.

## Herbarium

At Kew, Wallich’s herbarium specimens are stored in the general herbarium taxonomically and the original EIC’s Herbarium is arranged as per Wallich’s list. The herbarium is still retained in its original mahogany cabinets at the eastern end of the herbarium ‘B’ wing, on the ground floor. The collection numbers 9149 ‘species’ and a total of 20,500 gatherings from several localities. An incomplete set of about 12,000 Wallich’s collections is also deposited in the Central National Herbarium (CAL), Howrah, India. Many other herbaria across the world hold duplicates, e.g., Oxford (OXF); Cambridge (CGG); Berlin (B); Geneva (G); the Royal Botanic Garden, Edinburgh (E); the University College, Dublin (DBC); Paris (P); Munich (M); Saint Petersburg (LECB); Melbourne (MEL), Leiden (L); Turin (TO); Florence (FL); Liverpool (LIV); Philadelphia (PH); Karl-Franzens-Universität Graz (GZU); Prague (PRM); Copenhagen (C); Lund (LD); the University of Michigan (UMF); Brussels (BR); Antwerp (AWH) and Rome (HFLA) (de Candolle & Radcliffe-Smith, 1981).

At NHM, the collections are arranged taxonomically. Problems faced while scanning included bigger herbarium sheets that would not fit in a normal herbarium scanner. These were scanned in half and the images were stitched together in adobe photoshop software. Initially, only a few collections have been digitised and scanned, there are a lot of specimens and drawings which have not yet been added to the website. In December 2010, as part of the World Collections Funded Wallich Project, a team of six people from Kew Gardens and the NHM visited the AJCBIBG to assess Wallich’s correspondence. The state of the



Fig. 1. a. *Picea smithiana* (Wall.) Boiss. (Pinaceae); b. *Bergenia ciliata* (Haw.) Sternb. (Saxifragaceae); c. Herbarium specimen of *Clematis acuminata* DC. (Wallich Numer. List No. 4670, ©The Trustees of the Natural History Museum, London); d. Nathaniel Wallich's grave (courtesy: Marie Murphey, Kensal Green Cemetery).



Fig. 2. Wallich collection at Kew (Source: [www.kew.org/wallich](http://www.kew.org/wallich))

archival correspondence is a cause for international concern and it is anticipated that these will be restored/conserved in the near future. At the moment basic stabilisation and preservation has been done (Prakash & Singh, 2016).

## Results

Most of the collections of Wallich are housed at NHM and Kew Gardens, whilst the drawings of the Wallich collections are comparatively more in Kew Gardens than in NHM (Table 1).

Wallich was very active during his stay in India and discovered thousands of novelties and published through his books and papers. A rough estimate from the IPNI records show as many as 141 new genera (*Actinostachys* Wall., *Adamia* Wall., *Adenosacme* Wall., *Aikinia* Wall., *Allantodia* Wall., *Amherstia* Wall., *Amphirhepis* Wall., *Ancistrocladus* Wall., *Ancylocladus* Wall., *Andersonia* Buch.-Ham. ex Wall., *Androtropis* R. Br. ex Wall., *Anisadenia* Wall. ex Meisn., *Anisochilus* Wall., *Anogeissus* (DC.) Wall. ex Guillem. & Perr., *Anthogonium* Wall. ex Lindl., *Argostemma* Wall., *Arthrobotrys* Wall., *Astrogyne* Wall. ex M.A. Lawson, *Bamia* R. Br. ex Wall., *Banglium* Buch.-Ham. ex Wall., *Barclaya*

Table 1. Collections from Kew Gardens, NHM and British Library (Source: [www.kew.org/wallich](http://www.kew.org/wallich))

Type of Collections	Kew Gardens	NHM	British Library
Specimens	234	341	0
Drawings	205	104	0
Correspondence	0	0	111

Wall., *Beaumontia* Wall., *Belostemma* Wall. ex Wight, *Berliera* Buch.-Ham. ex Wall., *Blepharistemma* Wall. ex Benth., *Boottia* Wall., *Broughtonia* Wall. ex Lindl., *Calosacme* Wall., *Cardiopteris* Wall., *Cardiopteris* Wall. ex Benn. & R. Br., *Catalium* Buch.-Ham. ex Wall., *Centrostachys* Wall., *Cercocoma* Wall., *Chrysobaphus* Wall., *Codonopsis* Wall., *Colquhounia* Wall., *Conghas* Wall., *Corysanthera* Wall. ex Endl., *Crawfurdia* Wall., *Cryptochilus* Wall., *Cyananthus* Wall. ex Benth., *Cyrtolobium* R. Br. ex Wall., *Cyrtotropis* Wall., *Dactylicapnos* Wall., *Dalhousiea* Wall. ex Benth., *Desmocarpus* Wall., *Didymocarpus* Wall., *Dischema* Wall. ex Voigt, *Eriocoryne* Wall. ex DC., *Erismanthus* Wall. ex Müll.Arg., *Finlaysonia* Wall., *Gardneria* Wall., *Gastrochilus* Wall., *Geniosporum* Wall. ex Benth., *Glossocarya* Wall. ex Griff.,

*Gomphandra* Wall. ex Lindl., *Gomphostemma* Wall. ex Benth., *Gomphostylis* Wall. ex Lindl., *Govania* Wall., *Gymnobothrys* Wall. ex Baill., *Gyrandra* Wall., *Haematospermum* Wall., *Hapalasia* Wall. ex Wight & Arn., *Hemiphragma* Wall., *Henslowia* Wall., *Herpetospermum* Wall., *Hitchenia* Wall., *Holboellia* Wall., *Homolostyles* Wall. ex Wight, *Hyalostemma* Wall., *Hydrostemma* Wall., *Hymenocardia* Wall. ex Lindl., *Hymenodictyon* Wall., *Hymenopogon* Wall., *Hymenopyramis* Wall. ex Griff., *Hypericinea* Wall., *Isopteris* Wall., *Jackia* Wall., *Jenkinsia* Wall. ex Voigt, *Kayea* Wall., *Kurrimia* Wall. ex Meisn., *Leiospermum* Wall., *Lepidostachys* Wall. ex Lindl., *Leptanthes* Wight ex Wall., *Leptodermis* Wall., *Leycesteria* Wall., *Melanorrhoea* Wall., *Mesodactylis* Wall., *Microtropis* Wall. ex Meisn., *Monochilus* Wall. ex Lindl., *Monolophus* Wall., *Mormoraphis* Jack ex Wall., *Myrioblastus* Wall. ex Griff., *Myrioneuron* R. Br. ex Wall., *Natsiatum* Buch.-Ham. ex Wall., *Neuropeltis* Wall., *Notholirion* Wall. ex Voigt & Boiss., *Oleoxydon* Wall., *Ornithochilus* (Wall. ex Lindl.) Benth. & Hook.f., *Orthostemma* Wall. ex Voigt, *Oxyramphis* Wall. ex Meisn., *Pentaphragma* Wall. ex A. DC., *Pentasachme* Wall. ex Wight, *Pericoptis* Wall., *Periplexis* Wall., *Phlebochiton* Wall., *Phytocrene* Wall., *Plagiotaxis* Wall., *Platystemma* Wall., *Pleotheca* Wall., *Polyscalis* Wall., *Prionopectis* Wall., *Puraria* Wall., *Putranjiva* Wall., *Pyrrhocoma* Wall., *Raphistemma* Wall., *Roylea* Wall., *Saccostoma* Wall. ex Voigt, *Sarcocordylis* Wall., *Sarcopyramis* Wall., *Schizonotus* Lindl. ex Wall., *Schultzia* Wall., *Scitaminea* Wall., *Spenocarpus* Wall., *Sphaerocarya* Wall., *Sphaeropteris* Wall., *Sphaerosacme* Wall. ex Roxb., *Staurogyne* Wall., *Syndesmis* Wall., *Tetrapeltis* Wall. ex Lindl., *Thomsonia* Wall., *Tordylioides* Wall. ex DC., *Tricyrtis* Wall., *Tripteranthus* Wall. ex Miers, *Turraya* Wall., *Urophyllum* Wall., *Vicarya* Wall. ex Voigt, *Vossia* Wall. & Griff., *Wightia* Wall. and *Xeropappus* Wall.) and over 8,000 species are in Wallich's name as the author. His specimens, too many, were studied by later students and commemorated Wallich several times (there are 219 binomials with epithet *wallichiana*, 22 binomials with epithet *wallichianus*, 66 binomials with the epithet *wallichianum* and 420 binomials with epithet *wallichii*). As a true follower of Linnean principles, Wallich described his new genera and species in the same pattern as that of Linnaeus and never looked beyond these concepts. A host of names he used in the *Wallich Catalogue* were not published. Some were published by his friends and colleagues and there are many that remained as names without descriptions (*nomen nudum*). Had he accepted the family concept inaugurated and introduced by A.L. de Jussieu in

1789, he would have named many new families. But he remained a true and faithful Linnean like his predecessors, William Roxburgh and Francis Buchanan-Hamilton.

## Discussion

Digital resources are increasingly becoming an important tool for reference study and with various technological advances, it is important that we move ahead with changing times and make data accessible as per the users need. Digitisation helps in not only making the data virtually accessible to a global audience but also helps in reduced handling of the specimens and conservation. The Wallich's correspondence at CAL has been digitised (Dr. P. Singh, Director, BSI and Dr. P. Lakshminarasimhan, Scientist E, Head, BSI, WRC, Pune and former Head of CAL, BSI, Howrah, pers. comm. in July 2015).

The online resource ([www.kew.org/Wallich](http://www.kew.org/Wallich)) serves an important reference tool to researchers, botanists, scholars, historians and amateurs those who are interested in Natural History around the world and it also shows how an online digital resource can unite the collections together. At the moment, the collections that include Wallich's correspondence, plant drawings and the herbarium specimens from Kew Gardens, the British Library and the Natural History Museum are available on the website.

This effort has shown how an online resource can help in bringing collections together and fill in the gaps in the collections thereby uniting not only the collections together but also fostering good relations and collaborative works across geographical boundaries. Institutes around the world with Wallich's holdings are encouraged to add data to the website. This will help in not only filling the gaps in the collections but will also help to unite the collections globally under a common platform.

On another note, Royal Botanic Garden, Edinburgh (E) continues to work on Wallich, particularly the Wallich Catalogue and they too have an interactive version online now (<http://wallich.rbge.info>). The Kew Wallich (K-W) specimens are also scanned and links to the online versions are included in the Wallich Catalogue Online. Wallich specimens can also be viewed online on the Natural History Museum's data portal (<http://data.nhm.ac.uk>). You are encouraged to use these resources and hope that you find these online resources useful.

Come on India, you too are encouraged to add (or provide a link) to this useful resource ([www.kew.org/wallich](http://www.kew.org/wallich)) and to the links of E and NHM and make Wallich's holdings at AJCBIBC known to the world!

Wallich's project also provides an opportunity to Institutes, Museums and Gardens with similar collections to come together and work collectively across boundaries without any barriers as over and again we have seen that science cannot progress in isolation.

## Conclusion

Danish-born physician and naturalist, Nathaniel Wallich worked in India at Serampore, a Danish settlement near Calcutta and later for the East India Company. He holds an important place in the Indian Natural History and is considered as a prominent figure in the history and development of Indian Botany. He was appointed as Superintendent of the erstwhile Calcutta Botanic Garden (Acharya Jagdish Chandra Bose Indian Botanic Garden) in 1817 and held this position till 1846. He was involved in the early development of the garden, described many new plant species, as many as 8,000 species and 142 genera ([www.ipni.org](http://www.ipni.org)) and developed a large herbarium collection, the duplicates of which were distributed to various institutes across Europe. He also commissioned artists to draw the illustrations based on plant specimens. Wallich was also the founder and the first Curator of the Indian Museum.

Nathaniel Wallich is renowned for a catalogue of more than 20,000 dried plant specimens, which is known as the "Wallich Catalogue". The specimens in the Catalogue were collected by Wallich himself and by other collectors around the same period by his contemporaries namely Roxburgh, Gomez, Griffith and Wight. The personal collections of Wallich are housed at the Kew Herbarium separately as "Wallich Herbarium (K-W)" or "The East India Company Herbarium". In addition to the specimens in the Wallich Herbarium, he distributed duplicates of his specimens to Kew which are kept along with other general collections. He also sent duplicates to the Natural History Museum, London and to other institutes around the world. Wallich published two important books, *Tentamen Florae Nepalensis Illustratae* (Vols. I-II, 1824-26) and *Plantae Asiaticae Rariores* (Vols. I-III, 1829-32), and went on numerous expeditions around the Himalayas, Nepal, Burma, Malaysia, Penang, Singapore, South Africa and Mauritius. Wallich contributed a span of almost 30 years of his service to Botany.

I would like to conclude this article by a quote of Wallich, which he wrote to William Hooker on 1 January 1828:

"I shall not sink into oblivion: My plants will survive when I shall not even be a name" (Director's Correspondence 43, folio 149, Kew Gardens).

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