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History, evolution, and current status of botanical illustrations in Sri Lanka

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Abstract: Botanical illustration is a technique that is being used to describe plants by drawings, connecting science and art. The documented history of botanical illustrations in Sri Lanka dates back to the 17th century, when Paul Hermann (1646–1695) collected and illustrated the local flora, after which several British and local illustrators engaged in drawing flowering plants with a greater emphasis on plant identification. Artists used various techniques such as colour paintings, line diagrams, graphite drawings, etc. to illustrate the morphological traits of species, accurately. The 18th and 19th centuries became the golden era of botanical illustrations of Sri Lanka, with the launching of outstanding illustrations produced by Haramanis, William and George de Alwis. Henry Trimen's (1893) *Plates in illustration of a handbook to the flora of Ceylon* was a result of these 18th century drawings. The extent of illustrative works declined thereafter, though a few line illustrations were published in the *Revised handbook to the flora of Ceylon* and in *Medicinal plants (indigenous and exotic) of Ceylon*. However, the botanical illustrations that were produced pale in comparison with the rich plant diversity of the country. There are a few drawings of fungi, ferns and mosses from Sri Lanka. While most of the angiosperm species diversity in Sri Lanka seems to have been illustrated at one time or other, lower plants are not well represented proportionately, as the diversity of these is very high in Sri Lanka, and the completion of this remaining floristic diversity of Sri Lanka would be a huge task.

Keywords: Ceylon, Drawings, Era, Flora.

Introduction

Botanical illustration is a technique that is used to demonstrate morphological characteristics of a plant in detail, which is useful for the identification of plants and for record keeping purposes. A botanical illustrator is an artist who translates plant morphology into beautiful art. The illustrator draws accurate illustrations of plants and their traits for scientific purposes. The expectation from an illustration is its scientific accuracy rather than its artistic value. However, the combination of science and art makes wonderful botanical illustrations. Botanical artists fail if their work lacks scientific accuracy (Hickman *et al*., 2017).

Botanical illustrations can be classified into different levels and types. Simple drawings of plant parts may include illustrations of only the leaves, twigs, flowers or the fruits. Complex portrayals may contain details of the habit, twigs, leaves and their arrangement, and flowers and their parts. The ability to incorporate magnified diagrams of specific features and the ability to selectively emphasize specific characteristics is unique to illustrations because these may be important for the identification of species. The incorporation of scale bars is a necessity because it allows to calculate the actual size of the plant and its parts. Live plant specimens, herbarium sheets, or images of the plants have all been used as models by artists when creating illustrations of plants. As sketching methods, graphite or pen and ink lines, shaded diagrams, or colour paintings can be used to highlight significant identifying characteristics of a plant species. While some artists only employ one drawing style, others integrate different approaches into a single drawing.

Botanical illustrations in Sri Lankan history date back to the 17th century, when the Dutch ruled over several regions of the country. Dutch governors greatly appreciated the Sri Lankan flora since it contained plants of high medicinal

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properties, and because of its high diversity as well. The Dutch botanist Paul Hermann (1670–1677) is the creator of the first record of an illustration of the local flora (Van Andel & Barth, 2018). After the Dutch were replaced by the British, a strong and stable foundation was laid to document the flora through the establishment of the Royal Botanical Gardens Peradeniya in Sri Lanka around 1750 (Macmillan, 1906). Alexander Moon, Dr. George Henry Kendrick Thwaites and Henry Trimen were the main drivers among the garden's superintendents and directors who contributed to the study and documentation of the local flora. During the 17th century and first half of the 18th century, mostly foreign illustrators and botanists illustrated the flora including line drawings and paintings. Thereafter, Haramanis de Alwis Seneviratne and his family were the leading figures that transferred botanical drawing skills to local talents. De Alwis' family members mainly produced descriptive paintings of flowering plants. During the 19th century many local artists drew botanical illustrations and with their drawings, as a result, many books were published. Currently, there are several botanical artists employed at several institutes in Sri Lanka involved with illustrative work. These illustrators and their work are, perhaps unjustly, not as fully appreciated as those of the 17th and 18th centuries, because such works is nowadays competing with photography (Hickman *et al*., 2017). Both techniques, illustration and photography, have advantages and disadvantages. Scientific drawings can be used to show specific distinct anatomical and morphological features of plants and only the people who have the knowledge can prepare such illustrations. On the other hand, Photographic images, particularly digital ones, are easily produced and are highly reproducible. The lack of trained illustrators, however, is a constraint which limits the preparation of illustrations.

The present review attempts to present an overview of the historical aspects and uses of botanical drawings of the Sri Lankan flora including flowering plants, mosses, and selected fungi, and evaluates the current scenario of botanical artwork in the country. This review also highlights publications based on botanical illustrations, botanical illustrators, and botanists who have used these illustrations.

History of Sri Lankan botanical illustrations

The Dutch era

The first historical record of Sri Lankan botanical illustrative work dates back to the 17th century. At that time, two botanical gardens, Kalutara and Jaffna, were administered by Dutchmen (Pethiyagoda & Sudasinghe, 2017). Several of the Dutch officials were interested in the Sri Lankan flora, and at that time Paul Hermann (1646–1695), a German-born Dutch botanist became the first European botanist that made a collection of plants from Sri Lanka (Fernando & Ormerod, 2008). He resided in Sri Lanka between 1670 and 1677 and assembled an extensive collection of dried plant specimens and drawings. Hermann's notes and the illustrative works of Sri Lanka were passed on to William Sherard (1659–1728), who edited them to produce a catalogue published as *Musaeum Zeylanicum* in 1717 (Hermann, 1717; Fernando & Ormerod 2008). In addition, Hermann's specimens and collection of drawings were deposited in the Paul Hermann Ceylon Herbarium in Leiden, The Netherlands (van Andel *et al*., 2018a). Hermann's possible Rumphius specimens and botanical drawings have been published in a recent research article by van Andel *et al*. (2018b). Thus, Hermann became the first recorded plant illustrator and a qualified botanist in the history of the Sri Lankan flora (Cramer, 2001), so much so that he is recognized as the father of Sri Lankan botany (Peiris, 1952). Linnaeus also used Hermann's specimens and drawings for his publication *Flora Zeylanica sistens plantas indicas Zeylonae insulae* in 1747.

The Leiden University Library in The Netherlands holds other examples of botanical drawings of the Sri Lankan flora. It possesses a two-piece codex entitled *Icones plantarum Malabaricarum*, *adscriptis nominibus et viribus* (*'Illustrations of plants from the Malabar, assigned names and strength'*), Volumes 1 and 2.

These contain 262 water colour drawings of medicinal plants from Sri Lanka (*e.g.*, Fig. 1), with handwritten descriptions of local names, habitats, medicinal properties and therapeutic applications. This work, dated 1720, is anonymously published (Anonymous, 1720; van Andel *et al.*, 2018a), and accessible as digital collections of the Leiden University Library.

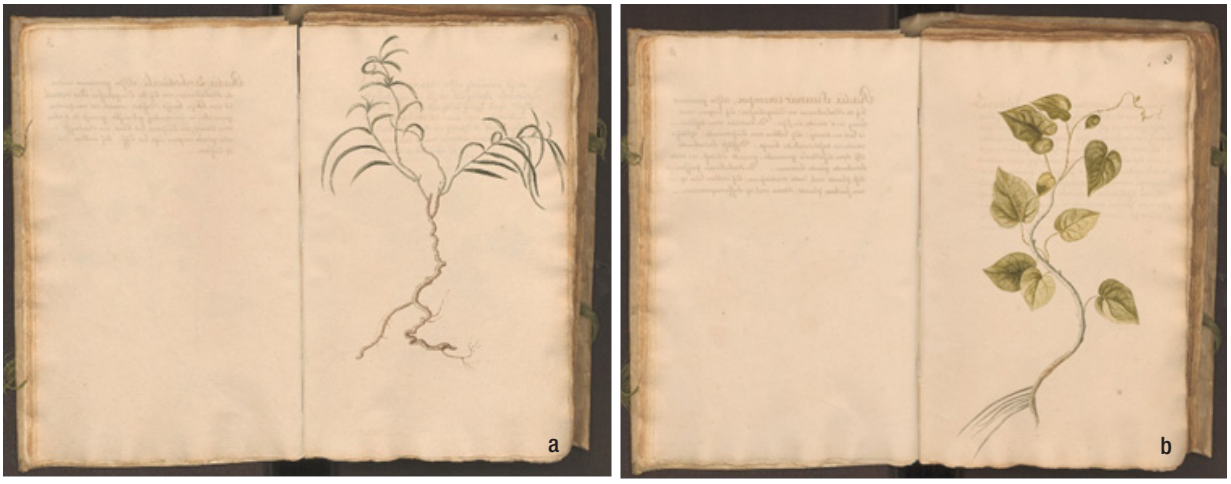

Fig. 1. Drawings of: **a.** *Hemidesmus indicus* (L.) R.Br. ex Schult.; **b.** *Tinospora cf. sinensis* (Lour.) Merr. in *Icones plantarum Malabaricarum* (Part I). Source: public domain https://digitalcollections.universiteitleiden.nl/iconesplantarummalabaricum) © Nicolien Karskens, Leiden University Libraries, Shelfmark: BPL126D, Special Collections Services 15th February 2022.

The British Era

The British established the first botanical garden of Sri Lanka in Kalutara in the middle of the 18th century which led to a heightened focus on botanical drawings in Sri Lanka. The Royal Botanic Gardens at Peradeniya was finally established in 1821 under the superintendence of Alexander Moon, who extensively collected and studied the local flora (Pethiyagoda & Sudasinghe, 2017). The British colonel George Walker and his wife Anna Maria Walker documented several plant species and made illustrations of some of these, during the period of 1830–1838 (https://stories.rbge.org.uk/archives/6095). They mainly produced watercolour illustrations of orchids collected from Adam's Peak (Fernando & Ormerod, 2008). Their collection of illustrations is currently deposited at the Kew Herbarium. During the Walkers' stay in Sri Lanka, several superintendents and directors were at the Royal Botanic Gardens, Peradeniya, but most of them had not been deeply involved in Sri Lankan floristic studies until George Gardner (1812–1849) was appointed as superintendent in 1844 (Pethiyagoda & Sudasinghe, 2017). After Gardner's period, Thwaites was appointed superintendent in 1849 and went on to work at the Royal Botanical Gardens continuously for 31 years, until he retired in 1881 (Macmillan, 1906). Thwaites (1864) published the first systematic catalogue of the flora of Ceylon in *Enumeratio plantarum Zeylaniae* by describing the plant species, although this book does not contain any botanical drawings. Thwaites (1855) published uncoloured illustrations of *Trichadenia zeylanica* Thwaites and *Flagellaria plicata* Hook.f. (Fig. 2). In the lower left corner of each drawing is the acronym G.H.K.T. anal. The name H. de Alwis with the abbreviation *del* (*delineavit*, indicating that he drew the illustration), together with G.H.K.T. Therefore, the botanical artists of those drawings could be Thwaites and H. de Alwis.

De Alwis and his family as pioneers in plant and fungi illustration in Sri Lanka

The first native botanical illustrator recorded in the Sri Lankan floristic history is Haramanis de Alwis (1792–1894). His family provided an enormous service to the Sri Lankan flora so that Pethiyagoda (1999) introduced the de Alwis family of Sri Lanka as the pioneers in Sri Lankan biological illustration. Haramanis de Alwis was employed as a botanical artist at the Kalutara Botanical Garden (1818–1822) and later in the

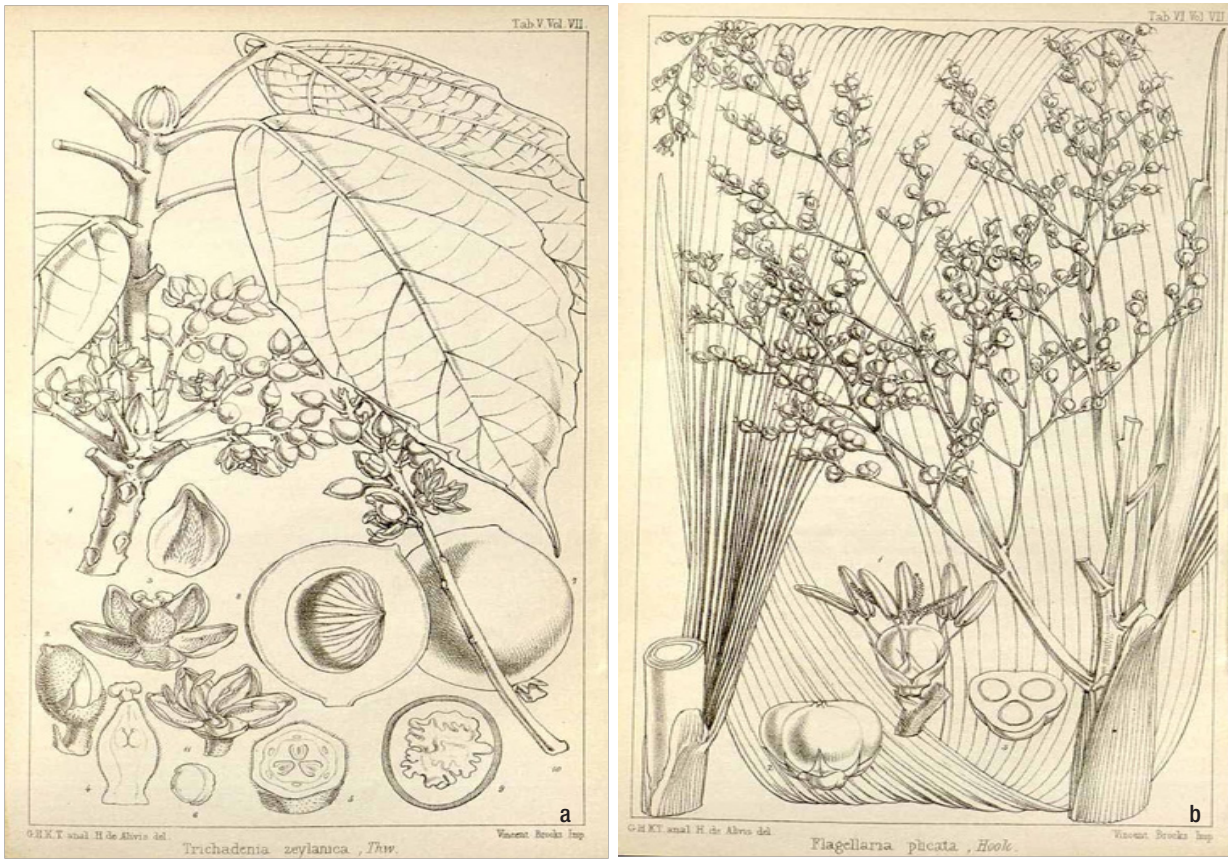

Fig. 2. Presumed combined illustrative works of Dr. George Henry Kendrick Thwaites and Haramanis de Alwis illustrating: **a.** *Trichadenia zeylanica* Thwaites (source: https://www.biodiversitylibrary.org/page/767627); **b.** *Flagellaria plicata* Hook.f. (source: https://www.biodiversitylibrary.org/page/767628). Images from the biodiversity Heritage Library. Contributed by Missouri Botanical Garden, Peter H. Raven Library. Sources: public domain.

Royal Botanical Gardens, Peradeniya (1822–1861). During this period, he completed colour paintings of more than 2,000 Sri Lankan plants. His paintings mainly focused on plants of the lowland wet zone, such as the endemic *Stemonoporus wightii* Thwaites. He mostly produced watercolour paintings, although he also may have collaborated with Thwaites on some line diagrams (Fig. 2). His drawings are always recognised for their precision, neatness, and utilisation of natural colour patterns (*e.g.,* Fig. 3a). This demonstrates his thorough understanding of plant morphology.

William de Alwis (1843–1916), one of the sons of H. de Alwis, was involved as a natural illustrator, who has mainly drawn colour paintings. He has completed more than 1,000 Sri Lankan fungal taxa (see below section "Pteridophytes, lower plants, and fungi"), for the Royal Botanical Gardens, Peradeniya, under the direction of Trimen (1843–1896), then director of the botanic gardens William de Alwis was adept in drawing butterflies (Pethiyagoda, 1999), but he has drawn many flowering plants as well (*e.g.,* Fig. 3b). George de Alwis, another son of H. de Alwis, was also a natural illustrator and has drawn many plants (*e.g.,* Fig. 3c). Trimen (1893) published *Plates in illustration of a hand-book to the flora of Ceylon* which was supplemented by many of the illustrations produced by H. de Alwis and his two sons, with some being combined drawings of these three artists. The botanical illustrations of the three de Alwis illustrators were accurate, clear and descriptive and superior to the illustrations of predecessors.

The collections of the original illustrations of the de Alwis family members, and sometimes copies of their illustrations are now located in several institutions in Sri Lanka, including the National Herbarium, Peradeniya; the National Museum

Fig. 3. Examples of printed botanical illustrations prepared by the de Alwis family: **a.** *Dipterocarpus zeylanicus* Thwaites ((https://upload.wikimedia.org/wikipedia/commons/3/37/A hand book to the flora of Ceylon %28Plate X%29 %286430634733%29.jpg) by Haramanis de Alwis; **b.** *Wormia triquetra* Rottb. (https://commons.wikimedia.org/wiki/File:A hand-book to the flora of Ceylon (Plate III) (6430631879).jpg) by William de Alwis; **c.** *Derris oblonga* Benth. (https://www.facebook.com/The-National-Trust-Sri-Lanka-271456696225973/photos/pcb.935652456473057/935651936473109/) by George de Alwis. Sources: Trimen (1893), downloaded from public domains).

of Sri Lanka, Colombo; the Department of Agriculture, Gannoruwa; Queen's Cottage (president's bungalow), Nuwara Eliya, and abroad in the Natural History Museum, London, the Royal Botanic Gardens, Kew, the Singapore Botanic Gardens, and the Calcutta Botanic Gardens, India (Pethiyagoda, 1999). The literature evidenced that W. de Alwis and G. de Alwis in specific contributed botanical illustrators to the Calcutta Botanical Gardens and Singapore Botanical Gardens (Pethiyagoda, 1999). Although Sri Lankans have not given the de Alwis family enough credit for their immense contributions to Sri Lankan flora, British scientists and botanists have honoured them highly: H. de Alwis has an endemic Sri Lankan species of leafless orchid named after him by John Lindley, *Taeniophyllum alwisii* Lindl.. The period in which the three de Alwis illustrators worked can be regarded as the golden era of botanical illustration in Sri Lanka.

A.G. de Alwis (son of W. de Alwis), of whom there is no evidence in the literature to trace his full name, has contributed drawings of several grass species to the national botanical illustration collection. Senaratna (1956) published the book *The grasses of Sri Lanka* based on A.G. de Alwis's drawings. Alfred de Alwis (another son of W. de Alwis) contributed some botanical drawings of spermatophytes for the book *The Kandy flora* by Alston in 1938 that contains 404 botanical drawings (Alston, 1938). These illustrations were rather small but floral and distinctive features are clearly illustrated in enlarged drawings. Alfred and A.G. de Alwis served as draughtsmen for the Department of Agriculture, Sri Lanka. Two presumed brothers, Charles de Alwis and James de Alwis, worked as draughtsmen to the Singapore Botanical Garden during the period of 1890–1908. They worked under the Director of Singapore Botanical Garden, Dr. Henry Nicholas Ridley (1855–1956) (Pethiyagoda, 1999; Anonymous, 2017). They engaged in the Flora of the Malay Peninsula Project and produced more than 260 illustrations in total (Yok, 2021). Charles de Alwis alone prepared 180 botanical drawings (Mabberley & Kiew, 2005). The relationship of C. de Alwis and J. de Alwis within the de Alwis family is unknown (Pethiyagoda, 1999).

The post 19th century era

The documented details of botanical artists and botanical illustrations are scarce during the 20th century. This could be due to the arrival of the analog camera at the beginning and later digital camera to capture the morphology of plants even at great magnifications, or due to the lack of interest in illustrations. As an example, *A handbook of tropical gardening and planting with special reference to Ceylon* by Macmillan (1914) included black and white photographs, while on the cover of the book is a colourful botanical illustrations.

While line diagrams predominated in the post 19th and 20th centuries. Bond (1953) published a book titled *Wild flowers of the Ceylon hills* that featured colour images of numerous widespread wild flowers found in Sri Lanka's hill areas. In addition, the work by Dorothy Fernando (1907–1981) is also appreciated, who was a well-known nature artist and during the late 1940th travelled, collected and painted wild flowers using water colours. Her collection of drawings is published in the book *Wild flowers of Ceylon* (Fernando, 1954). It contains 173 plant paintings, including three ground orchids and flowers of a few small trees.

The launching of the volume series of *A revised handbook to the flora of Ceylon* was one of the biggest flora projects in Sri Lanka during the periods of 1968–1979 and 1990–2000. The flora project has brought many systematic improvements to Trimen's *Flora of Ceylon* (Cramer, 2005). This revised flora contains descriptions of all the indigenous flowering plant species, and includes some notes on their history, uses and distribution. The 14 volumes contain 360 botanical illustrations and some of the illustrators are given in Table 1. However, some of the illustrations are made by anonymous artists.

Don Martin Arthur Jayaweera was appointed superintendent of the Royal Botanic Gardens, Peradeniya, in 1945. He published a book, *Medicinal plants (indigenous and exotic) used in Ceylon*, during 1980–1982 in five parts (Jayaweera, 1980, 1981a, b, 1982a, b). The series gave an equal emphasis to botanical drawing

Table 1. List of botanical illustrations published in the series *A revised handbook to the flora of Ceylon* (Dassanayake & Fosberg Volume 1–9, 11; Dassanayake & Clayton 10, 12–14) by volume and plant families.

Volume	Plant Family	Number of illustrations	Acronym/ Illustrator
1 (1980)	No illustrations included.		
2 (1981)	Apostasiaceae	1	No acronym/ Anonymous artist.
	Bignoniaceae	1	MAG/ Malani Goonathilleka No acronym/ Anonymous artist.
	Lemnaceae	1	
	Orchidaceae+	169	BJP/ B.J. Premasuriya, and several anonymous artists.
3 (1981)	Ebenaceae	6	No acronym/ Anonymous artist/s.
	Gesneriaceae	8	MAG/ Malani Goonathilleka
	Martyniaceae	1	MAG/ Malani Goonathilleka
	Moraceae	32	No acronym/ Anonymous artist/s.
	Pandanaceae	8	Inoue *s.n.* and Read 2325/ Anonymous artist/s.
	Pedaliaceae	1	MAG/ Malani Goonathilleka artists.
4 (1983)	Zingiberaceae	5	RMS/ Anonymous artist.
5 (1985)	Balsaminaceae	7	CG-W/ C. Gray-Wilson
	Cyperaceae	35	No acronym/ Clare Benson
	Rutaceae	9 (leaves only)	No acronym/ Anonymous artist/s.
6 (1987)	Aponogetonaceae	5	R 70/ Anonymous artist.
	Araceae	1	No acronym/ A.R. Tangerini
	Melastomataceae	3	No acronym/ Anonymous artist.
	Rubiaceae	2	No acronym/ Anonymous artist.
	Solanaceae	12	F/N/ Anonymous artist.
7 (1991)	No illustrations included.		
8 (1994)	No illustrations included.		

9 (1995)	Dioscoreaceae	9	No acronym/ Anonymous artist.
	Lauraceae	16	No acronym/ Anonymous artist for some drawings. A. ollowi/ Anonymous artist.
	Lentibulariaceae	3	No acronym/ Anonymous artist.
	Meliaceae	2	No acronym/ Anonymous artist.
10 (1996)	Casuarianaceae	1	No acronym/ Anonymous artist.
11 (1997)	Plumbaginaceae	3	No acronym/ Anonymous artist.
	Theaceae	1	No acronym/ M. Tebbs
12 (1998)	No illustrations included.		
13 (1999)	Turnerceae	2	No acronym/ Anonymous artist
14 (2000)	Arecaceae	8	No acronym/ Anonymous artist
	Bromeliaceae	2	No acronym/ Anonymous artist
	Commelinaceae	2	No acronym/ Anonymous artist
	Musaceae	2	No acronym/ Anonymous artist
	Trichopodaceae	2	No acronym/ Anonymous artist
Total number of illustrations		360	

as descriptions, and described plant species used in Ayurvedic practice in Ceylon. All species are illustrated to bring out the characters used in their identification. The number and type of botanical illustrations used in each volume is given in Table 2. Most of the drawings in this book series are line diagrams but some are coloured. B.J. Premasuriya, draughtsman of the Department of Agriculture, prepared the botanical drawings for the book *Medicinal plants (indigenous and exotic) used in Ceylon*. While the revised *Handbook to the flora of Ceylon* gives plant descriptions for more than 3,500 flowering plant species, therein the usage of botanical illustrations is with 360 limited. Jayaweera's *Medicinal plants (indigenous and exotic) used in Ceylon* described 650 species and exceeded with 592 the usage of botanical illustrations compared to the *Flora of Ceylon*.

During the latter part of the 20th century, some more books containing botanical drawings have been published. De Fonseka and Balasubramanium (1984) published line diagrams of 25 plant species in the book *Floral structure of some selected tropical plants*. Suneetha Mendis was the illustrator for this book, where all drawings are of twigs and flowers of different plant species. Mendis tried, occasionally, to draw descriptive floral morphologies. Some botanical sketches are also available in the book *A nature guide to the world's end trail, Horton Plains* by Gunatilleke (1996). *A field guide to the common trees and shrubs of Sri Lanka* by Ashton *et al*. (1997) contains botanical sketches for several plant species The sketches are line diagrams, and mostly illustrate twigs to indicate leaf arrangement and blade morphology, but the illustrations are not descriptive.

The 21st Century

It appears that Sri Lankan botanical illustrations are being produced individually for publication in books, research articles, and other materials. Botanical illustrations are frequently used by scientists in their research publications, although

Table 2. Botanical drawings included in the parts of *Medicinal plants (indigenous and exotic) used in Ceylon* by Jayaweera (1980, 1981a, b, 1982a, b).

Part (published)	Number of species described	Number of botanical line diagrams	Number of botanical paintings	Total number of illustrations
1 (1981a)	105	103	03	106
2 (1980)	122	119	01	120
3 (1981b)	141	137	08	145
4 (1982a)	158	122	11	133
5 (1982b)	124	076	12	088
Total	650	557	35	592

the artists are rarely given credit. Some examples for the inclusion of botanical drawings in research articles are Mudannayake *et al*. (2019) on the morphology of megasporophylls of *Cycas* L., and Bandara *et al*. (2020) of *Gastrodia gunatillekeorum* Bandara. In the latter, the diagram was digitally rendered. *A naturalist's guide to the flowers of Sri Lanka* by Singhalage *et al*. (2018) used mainly photographs of the species described within the book but includes botanical sketches in the catalogue. In addition, some artists such as Inoka Darshani Singhalage and Sandunmali Kulasekara have participated in the *Margaret Flockton Award and Exhibition*, organized by the Sydney Botanical Gardens, exhibiting their original botanical illustrations (*e.g*., Fig. 4).

The Crop Wild Relatives (CWR) conservation project (2005–2010) paid a high emphasis on botanical illustrations of Sri Lankan crop species. The botanical illustrators of the project, Inoka Darshani Singhalage, Tharindu Weeraratne and Isira Ekanayake, provided the drawings for more than 500 crop wild relatives of Sri Lanka. Some of the illustrations completed under the CWR project are given in Fig. 5. All these illustrations are pen and ink line diagrams.

Photography has also somewhat reduced the value of illustrations during the 21st century. As examples of this trend could be listed recently published flora-related books such as the *Illustrated field guide to the flowers of Sri Lanka* (Volume 1 and 2) by Jacob de Vlas and Johanna de Vlas-de

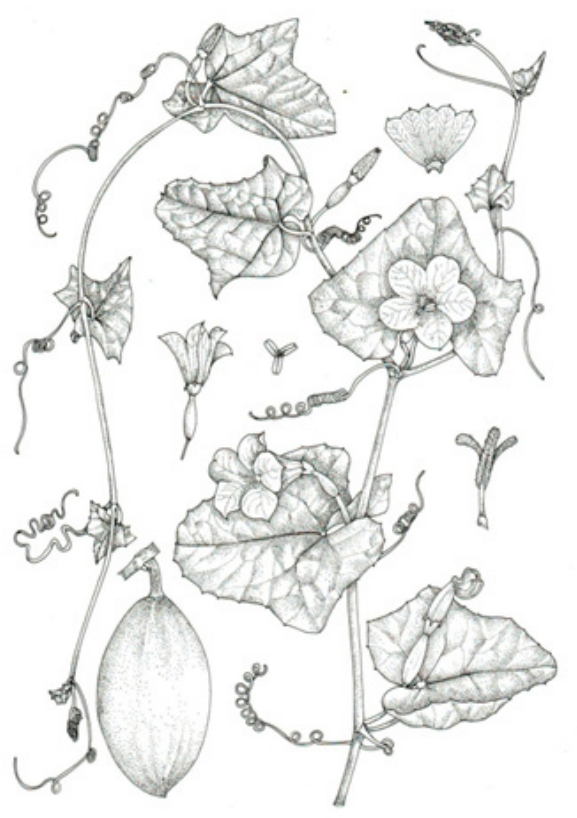

Fig. 4. An original botanical illustration of *Coccinia grandis* (L.) Voigt by Inoka Darshani Singhalage exhibited in the *Margaret Flockton Award and Exhibition* in 2009.

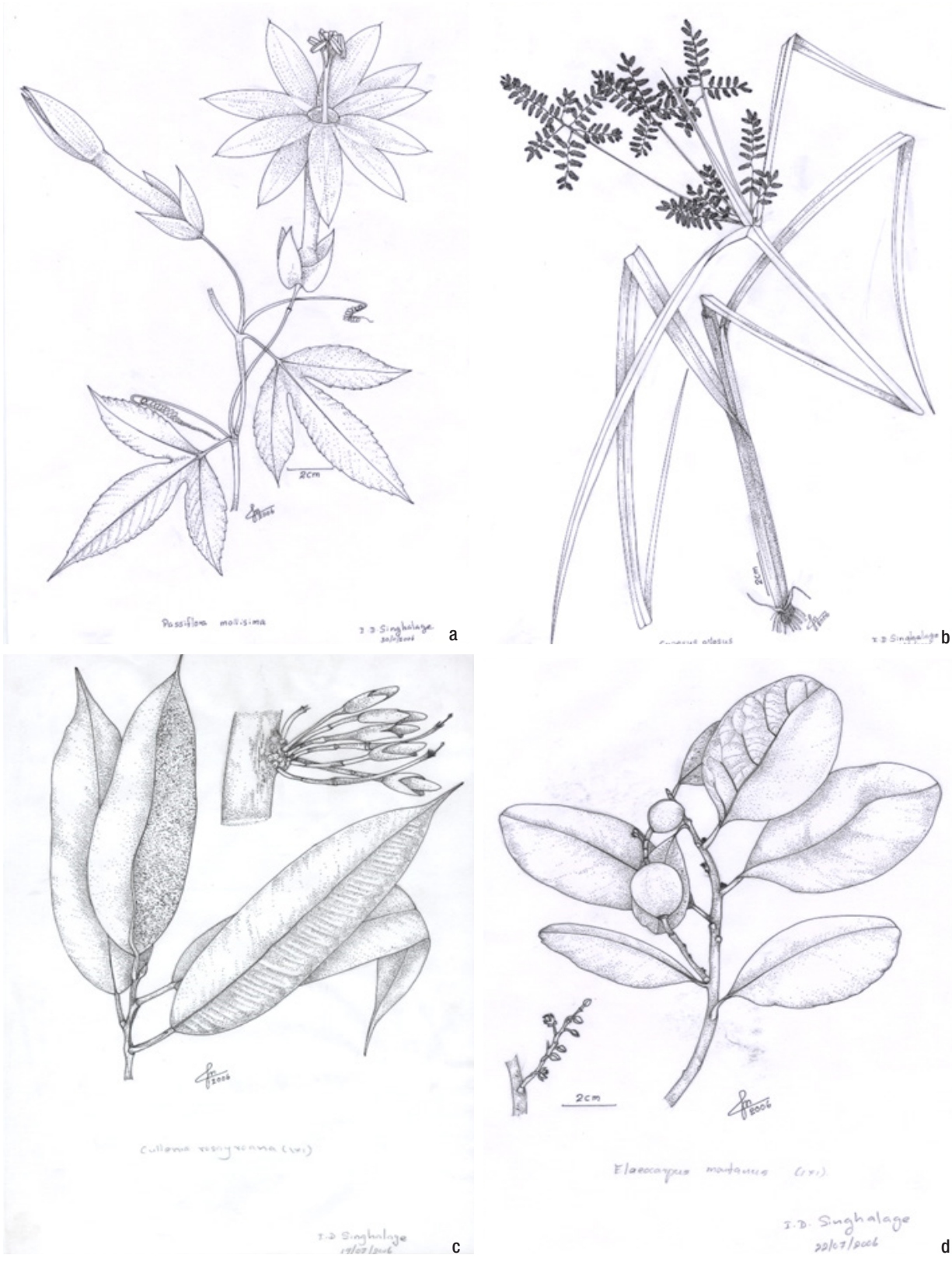

Fig. 5. Selected botanical illustrations from the Crop Wild Relatives conservation project: **a.** *Passiflora mollisima* L.H.Bailey; **b.** *Cyperus pilosus* D Vahl; **c.** *Cullenia rosayroana* Kosterm.; **d.** *Elaeocarpus montanus* Thwaites (drawn by Inoka Darshani Singhalage) © Project Manager, Crop Wild Relative Project, Sri Lanka.

Jong (2008, 2014), *Flowering plants – commonly encountered in Sri Lankan habitats* by Miththapala *et al*. (2011) and *Grown in Sri Lanka – cultivated flowering plants* by Miththapala *et al*. (2015) that included only colour photographs of the species described within these book. The publications by Singhalage (2002, 2018), and Singhalage *et al*. (2012) are mainly concerned with wild flower species and as such are also supplemented by photographs.

Pteridophytes, lower plants, and fungi

Evidence of botanical illustrations of lower group plants of Sri Lanka is limited. However, botanical drawings of ferns are available in the *Handbook to the ferns of British India, Ceylon and the Malay Peninsula* by Beddome (1892). The 300 botanical drawings published in this book are black line diagrams. However, none of these are of Sri Lankan fern species.A few drawings of leafy liverworts have been published by Samarakkody *et al*. (2018) accompanying the description of new species.

Botanists and illustrators have paid attention to document and illustrate local fungi and mushroom species. Koenig (during the period of 1776–1783) published the first drawings of fungi of Sri Lanka depicting *Peziza ceylonsche* Houttuyn (Udugama, 2006). Later, Berkeley and Broome (1873) published an article on the *Enumeration of the fungi of Ceylon*, which contains details of species of Hymenomycetes, and 10 plates of fungal illustrations. All plates are line diagrams. Most of the plates of that article are anonymous, and only some acronym are seen in the lower left corner 'CEB del', and in the lower right corner 'G. Jarmansc'. It is possible that those acronym point to the illustrators. George Gardner, superintendent of the Royal Botanic Gardens, Peradeniya (1844–1849) sent a set of watercolour illustrations to Reverend Berkeley (Pegler, 1986). Later, Thwaites, who became superintendent of the Royal Botanical Gardens, Peradeniya, after Gardner, also sent a large collection of dried specimens of local *Agaricus* L. and water colour paintings drawn by W. de Alwis to Reverend Berkeley in Kew for identification. Cecilia Jane Berkeley made copies of the paintings and the originals were sent back to the Royal Botanic Gardens, Peradeniya (Pegler, 1986). Rev. Berkeley used such specimens and paintings for the identification of the local agaric flora. The colour paintings of W. de Alwis were excellent and provided almost all characters such as colours, texture and gill features. These are important for their identification, because dried mushrooms are not showing these features in high quality. Some of the mushroom paintings of W. de Alwis are deposited at the Horticultural Crop Research and Development Institute (HORDI), Gannoruwa, Sri Lanka (*e.g.,* Fig. 6a & b). In honour of W. de Alwis's work on fungi, Berkeley named a genus of slime

Fig. 6. Selected mushroom watercolour drawings produced by William de Alwis: **a.** *Psalliota subaeruginosa* Br.; **b.** *Psalliota campestris* L. © The Director, HORDI, Gannoruwa, Sri Lanka.

mould after him, *Alwisia* Berk. & Broome (Pethiyagoda, 1999).

Concluding remarks

The present review is focussed on botanical illustrations originating in Sri Lanka and their historical background with view to plant and fungal taxonomy. Botanical artists can emphasize details new to science through these illustrations. The literature suggests that some botanical artists in Sri Lanka in the past have played important roles in discovering and describing the plant and fungal diversity of the country. They also reached a broader audience beyond the scientific community through their artistic abilities. Botanical artists were essential members of botanical exploration in the past, because they accurately recorded morphological character traits critical for recognizing and identifying species before photographic cameras were invented. Most of the artists worked collaboratively with scientists. The nature of this relationship is visible in the high-quality publications of books, monographs and research articles. In the present day, illustrative work is limited because of the rise of digital photography and microphotography. Line drawings still have a place in plant descriptions of new species to highlight certain features. There are around 3,150 native angiosperm species in 186 families in Sri Lanka (Wijesundara *et al*., 2012). In total over 3,400 illustrations have been produced of the Sri Lankan flowering plant species diversity (of which some may have been illustrated repeatedly), suggesting that the majority of higher plants have been illustrated over the last four centuries. However, the estimated species number in fungi (Wijayawardene *et al*., 2022) and other primitive plant lineages of Sri Lanka is very high, and thus, the completion of illustrations for all floristic species remains an ambitious and huge task.

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