Johan Fredrik Wallenius – Demonstrator in Botany at old Åbo Akademi

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Wallenius was the Demonstrator in Botany (1800–1805) at Åbo Akademi. His main duty was to instruct medical students on the subject of medicinal plants. In his own thesis supervised by Professor Carl Niclas Hellenius was introduced surrogate food to compensate grain due to the repeated years of crop failures in 18th century. That theme was repeated by him also in some publications. He supervised six theses with botanical content, of which two provided important historical information of Åbo Akademi Botanical Gardens. In thesis of genus Ammi one species is described as new to science, Ammi boerberi Höckert. This neglected name is synonymous to A. majus L. Höckert was third one in Finland who described a new species to science.

Introduction

Johan Fredrik (Johannes Fridericus) Wallenius, Ph.D., was born at Åbo, on 14 August 1765. His parents were Professor in Mathematics Martin Johan Wallenius and Renata Frosterus. Unmarried. He died at Åbo on the 12 January 1836. On 13 September 1777 Wallenius graduated from Åbo secondary school. He studied natural sciences and medicine from 1777 to 1790 at Åbo Akademi, with botany, zoology and medicine as his major subjects. He specialised first in medicine under the supervision Johan Johansson Haartman (1725–1787), Professor of Medicine from 1765 to 1787 and defended to him his Pro Exercitio -thesis Sciagraphia morborum VI (“Sketch of diseases Part six”) on 8 June 1781 (Haartman & Wallenius 1781). On 14 June 1782 he defended his Pro Gradu -thesis Finska allmogens nödbröd (“On substitute food of common people during years of crop failure”) (Hellenius & Wallenius 1782) under the supervision of Carl Nicla Hellenius (1745–1820). Hellenius was Demonstrator in Botany 1778–86, later extra ordinary Professor 1786–1793 and Professor in Economic and Natural History in 1793–1816. Wallenius obtained his Phil. Cand. degree on March 1782, Phil. Mag. degree on 20 June 1782 and Phil. Lic. degree December 1785. Doctor in Medicine in 28 May 1790.

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The Royal Academy of Turku (Regia Academia Åboensis, in Swedish Åbo Akademi) was founded in 1640 when Finland was still a part of Sweden. Main languages of Åbo Academy were Latin and Swedish. It was renamed the Imperial Academy of Åbo in 1809 after Finland was incorporated into the Russian Empire as an autonomous Grand Duchy. Following the Great Fire of Åbo in 1827 an Imperial decree laid down that the Academy was to be transferred to Helsinki as the Imperial Alexander University of Finland. The name University of Helsinki was adopted after Finland became independent in 1917. In this article is used Swedish version Åbo Akademi.
Career


Secretary of Finnish Economy Society

Due to repeated years of crop failure, government encouraged universities to study how to moderate famine. Consequently Finnish Economy Society ordered reports based on practical experiences in how to achieve these requirements. This theme had already been the subject of Wallenius’ thesis, where many surrogates for bread are recommended, e.g. Arctostaphylos uva-ursi, Betula, Bistorta major, Brassica napus subsp. napus, B. oleracea, B. rapa subsp. rapa, Bryonia alba, Calla palustris, Calluna vulgaris, Dryopteris filix-mas, Fagopyrum esculentum, Juniperus communis, Lathyrus japonicus subsp. maritimus, L. tuberosus, Lens culinaris, Menyanthes trifoliata, Nuphar lutea, Picea abies, Pinus sylvestris, Pisum sativum, Polygonatum odoratum, Polygonum aviculare, Pteridium aquilinum, Quercus robur, Rhamnus cathartica, Rubus idaeus, Sanguisorba minor, Sambucus nigra, Sparganium erectum, Symphytum officinale, Taxus baccata, Thalictrum aquilegifolium, Vaccinium myrtillus, Viola pallida, Vicia faba and V. sativa. Also cryptogams Cetraria islandica, Cladonia rangiferina, Lobaria pulmonaria and Fucus vesiculosus are listed as surrogates (Hellenius & Wallenius 1782).

As the secretary of the Society, Wallenius continued his educational publishing: advice on reindeer lichen (Cladonia) bread (Wallenius 1801a), on Rumford’s soup, which was cheap and nourishing vegetarian food made essentially of potato to, peas, onions and barley (Wallenius 1801b), and also recipe for the bread of turnip and rutabaga leaves was given (Wallenius 1801c). These articles written in Swedish were also translated to Finnish (Wallenius 1814a,b,c). These were all published anonymously, but according to Cygnaeus (1897) they were written by Wallenius.

Based on Professor Willdenow’s studies on life cycle of rust fungi Uredo linearis (Puccinia graminis), Wallenius (1806a,b) stressed the importance to recognize the detrimental consequences it caused to grain yield which also results in famine. Berberis vulgaris was important alternate host, and it should be eradicated on the vicinity of grain fields.

Government approved an appropriation to the Society, aimed to facilitate the cultivation of potatoes (Wibelius 1802, Rosenblad 1807). Reports on results by Wallenius (1807) and Roos & Wallenius (1807) were detailed. Many farmers contributing cultivation trials in practice are mentioned. When Wallenius acted as chairman in the Society, emperor of Russia granted 10 000 rubles to the society to improve cultivation of flax (Linum usitatissimum) and hemp (Cannabis sativa) (Sandström 1947:29).

As the secretary of the Society compiling annual reports on its activity belonged to the duties of Wallenius (1801d, 1802, 1803k, 1804, 1805).

Demonstrator in Botany

Wallenius supervised 50 doctoral theses, of which six have botanical content. Most of these were defended when Wallenius already kept the position of Professor of Eloquence and Poetics.

1. Plant physiological theses De calore planatarum proprio ("Inner temperature regulation of plants") (Fig. 1) were defended by two students. These treat the importance of temperature to the plants based on literature, e.g. in fluid movements. Opinions divided, some considered that only sun is of importance, while others also emphasized the influence of geological temperature. Plants were able to regulate their inner temperature against fluctuation in air temperature. Seeds and buds were hardy, when exposed to extreme cold (Wallenius & Enckell 1801, Wallenius & Rönnbäck 1801). The first part was defended by
Gottlieb Kristoffer Enckell (1780–1804), and the second part by the forthcoming vicar of Mynämäki, Anders Johan Rönnbäck (1778–1856).

2. Hellenius & Mollin (1779) initiated a series of theses entitled Sistens hortum Academiæ Aboensis (“Academy Botanical Gardens”). It consists of eight parts. It was aimed to describe important events and collections in the Academy Botanical Gardens. Forthcoming vicar of Kungälv, Sweden, Carl Fredrik Kunckel (1779–1837) defended the second part (Fig. 2) of it (Wallenius & Kunckel 1803). In this part it is indicated, that the establishment of the position of Demonstrator in Botany was financed by nobleman Johan Hisinger (1727–1790), patron of Fagervik ironworks in today’s southern Finland, and by Professor in Medicine, J. J. Haartman, on 13 February 1778. First prefect of the Gardens, Professor of Economics and Natural History Pehr Kalm (1716–1779) had died in 1779, and was followed by Adjunct in Justice, Salomon Kreander (1755–1792). As a professor he was unexperienced in this new field. Therefore a new position, Demonstrator in Botany was needed. As government of Sweden was unwilling to finance new positions to Åbo Akademi, it was founded by the aid of above mentioned donators. According to the thesis, herbarium of Olaus Rudbeckius junior (1660–1740) was given to Professor Kalm during his years at Uppsala. Academy Herbarium was established in 1751. New specimens to the collections were donated by Professor C. N. Hellenius, Demonstrator in Botany Carl Birger Rutström (1758–1826), by baron Clas Alströmer (1736–1794) in 23 December 1790, and by Professor of Anatomy Gabriel Bonsdorff (1762–1831). After the death of S. Kreander, C. N. Hellenius became the new Professor of Economics and Natural History. His follower as a Demonstrator in Botany was Johan Gustaf Justander (1764–1833).

3. The third part of Sistens hortum Academiæ Aboensis was defended by the forthcoming precision mechanic Josef Ikalén (1778–1818). As a typical feature of the era, eight statements with nothing to do with subject are given in opening section. These were aimed to qualify Wallenius in his attempt to compete for upcoming position in Professor of Eloquence and Poetics. These statements are followed by historical information about the Botanical Gardens. The very first Professors of Physics (in early years of Åbo Akademi natural history was included to that professor-
ship) are presented. According to Academy Consistory minutes of 10 May 1643, the first Academy "Botanical Gardens" was established in 1643. Same information is given in minutes of 24 November 1678 and 15 October 1710. In 1643 merely vegetables were cultivated. Main subject was to interpret the current meanings of those 135 cultivated species Professor in Medicine Elias Tillandz (1640–1693) listed in the catalogue of species met in surroundings of Åbo (Tillandz 1683). Names in that catalogue were given in a pre-Linnaean phrase style, and in Ikalén’s thesis corresponding binomials by Linnaeus’ are given. These interpretations were apparently successful, as most of them are repeated later (O. E. A. Hjelt 1869, Wein 1930). Erroneous or unclear suggestions by (Wallenius & Ikalén 1804) were Rumex alpinus, Cheiranthus inanus, Erigeron tuberosus and Zea mays. Plantations of P. Kalm and P. A. Gadd (1727–1797) are briefly described. Demonstrator in Botany Anders Dahl (1751–1789) donated an extensive herbarium to Åbo Akademi, when he was given position of Demonstrator in Botany in 1787 (Wallenius & Ikalén 1804).

4. Forthcoming notary of the Academy, Josef August Höckert (1789–1811) defended a taxonomic thesis (Fig. 3) on genus Ammi, in which one new species is described, Ammi boerberi Höckert. Botanical Gardens had received seeds from St. Petersburg Botanical Gardens, and this new taxon was cultivated at Åbo Akademi Botanical Gardens. Closely related species Ammi majus L. is also described for comparison. Other species of Ammi were A. capillaceum Michx. 1803, A. daucifolium Scop. 1771, A. divaricatum (Walter) Pers. 1805, A. glaucifolium L. 1753.
and *A. meoides* Pers. 1805 (Wallenius & Höckert 1810). According to L. J. Prytz and Bonsdorff (1814) this thesis was written by Höckert himself. This seems credible, as Wallenius was not a taxonomist. Recent Demonstrator in Botany (1806–09) had been Fredrik Wilhelm Radlof (1766–1838), and the next one Carl Reinhold Sahlberg (1779–1860) was appointed in 12 September 1810. Höckert defended his thesis here between, on 4 July 1810. They, like no others, are acknowledged, which further strengthens the view that Höckert was the responsible author. The latest proof is written by cousin on the reverse side of the isolectotype specimen (Figs. 4 and 5), that this species was described by Höckert. Species name honor the state counselor Joh. Jac. von Boerber, who provided seeds to Höckert. In spite of the Great Fire of Åbo in 1827, original material survived as it was located at Professor Carl Reinhold Sahlbergs private collection (indicated by CRS in Fig. 6). That collection was sold 1828 to the Botanical Museum of Alexander University at Helsinki in Finland. Only Finnish botanists who had described new species to science before Höckert were Carl Niclas Hellenius (5 species) and Johan Gustaf Justander (1 species).


5. Forthcoming Professor on Botany and Zoology, Johan Magnus af Tengström (1793–1856) defended a thesis (Fig. 7) on bishop Isak Rothovius (1572–1652), who had been the first appointed vice chancellor of Åbo Akademi. It was the last thesis of a series entitled Vitam & merita M[agistri] Isaaci B[irgeri] Rothovii, episcopi q[uondam] Aboënsis, expositurae, consisting of 18 parts. In opening section seven statements concerning botany are given: botany and zoology had a lot in common, like analogic concept of genus. By studying anatomy it was possible to understand movements of liquids in plants. There existed both female and male plants, and so on. The Linnaeus’ classification was artificial, but eventually only natural classification will be acceptable.

The aim of these statements was obviously to show, that af Tengström will become botanically orientated. His father Jacob Tengström was Archbishop of Finland, which smoothed the career.

6. Regional description of Mäntyharju, southern Finland, which appeared as three theses, contains in one part trivial botanic information. Some agricultural and forest species are mentioned (Wallenius & Törnudd 1814). It was defended by the forthcoming chaplain of Töholammi, Andreas Gustavus Törnudd (1793–1835).
In thesis "List of Finnish animals" (Wallenius & Sadelin 1810) there is an important note concerning the first *Flora Fennica* (Kalm & Granlund 1765), which is the first list of Finnish vascular plants. Preparation of the list was started by Professor in Physics, Johan Browallius (O. E. A. Hjelt 1868), who left the manuscript to Professors Johan Leche (1702–1764), Pehr Adrian Gadd (1727–1797) and Pehr Kalm. They had all studied the plants of Finland since 1740’s and 1750’s (Kalm & Granlund 1765). This manuscript was once at the library of Wallenius (Wallenius & Sadelin 1810). Probably he obtained it after the death of Kalm. It was most likely lost in the Great Fire of Åbo in 1827, which totally destroyed the Academy Library.

Wallenius was an active assistant in magazine *Allmän Litteratur-Tidning*. He especially wrote
reviews of the literature (W. Lagus 1875). He presented to readers J. W. Palmstruhs’s Svensk Botanik part 1 numbers 1–8 (Wallenius 1803a), Handbuch der pharmaceutischen Botanik (Wallenius 1803b), Ny Journal uti Hushållningen volumes 1801 and 1802 (Wallenius 1803c), Chief Director Carl August Grevesmöhl’s Handbooks on farming (Wallenius 1803d,f), Kurt Sprengel’s botany (Wallenius 1803e), Funk’s textbook introducing science to youth, especially sections treating botany (Wallenius 1803g), de Buffon’s Histoire naturelle (Wallenius 1803h), Bordeaux science Society and its prize question how to grow pines in dry sandy soil (Wallenius 1803i), good fodder plants to cows were Trifolium repens, T. pratense, Medicago lupulina, Lolium perenne and Poterium sanguisorba = Sanguisroba minor (Wallenius 1803c). In the last number of volume 1801 of Ny Journal uti Hushållningen Lysimachia thyrsiflora and Swietenia mahagoni are presented as dye plants (Wallenius 1803c). Wallenius was editor in chief from 1810 to 1814 of newspaper Åbo Allmänna Tidning, assisted by Frans Mikael Franzén (1772–1847), F. W. Radloff and Daniel Johan Myrén (1782–1831).

In a family book of commoners in Finland Wallenius is characterised as especially gifted in classical arts and science, feared due to severe criticism and conceit (Aspelin et al. 1879–83, Heikel 1940, Holmberg 1932, Sacklén 1823, Tengström 1836). On the other hand, he was known as a conscientious person in his duties (Cygnaeus 1897).

He was the promotor in the promotion of Philosophic faculty in 28 June 1819 and kept the speech to the new Magisters of Philosophy. The speech treated Academic degrees (Holmberg 1932).

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References


