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Józef Warszewicz (1812–1866) and taxonomical history of *Warszewiczia coccinea* (Vahl) Klotzsch

Abstract

Józef Warszewicz (1812–1866) – traveler and naturalist, the main horticulturist (inspector) of the Botanic Garden of the

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Jagiellonian University in Kraków, was one of the first plant collectors in the tropical regions of Central and South America. From his travels (1844–1850, 1850–1853) he sent and brought to Europe hundreds of previously unknown plants, primarily orchids, in addition to representatives of other families.

One of the collected species was *Warszewiczia coccinea* (red *warszewiczia* in English, *warszewiczia czerwona* in Polish), described by Johann F. Klotzsch and named after the collector. It is a small tree or shrub with large, red inflorescences, growing wild in the American tropics and often cultivated as an ornamental. It plays a significant role in the culture of the island country of Trinidad and Tobago in the Little Antilles archipelago, where it is considered a “national plant”.

The aim of this article is to highlight one of the chapters in the history of systematics (taxonomy) relating to Józef Warszewicz and the plants described on the basis of his collections, especially red *warszewiczia*.

Many of the so-called “Warszewicz species” have survived in the taxonomy to this day. His unique collection is stored in the Herbarium of the Jagiellonian University – Herbarium Universitatis Iagellonicae Cracoviensis – KRA. There are specimens important to the science – lectotypes (model representations) of the species *Warszewiczia pulcherrima* (= *W. coccinea*).

Keywords: *Central and South America, Johann Friedrich Klotzsch, Julius von Rohr, Martin Vahl, plant collector, herbarium*

Józef Warszewicz (1812–1866) i taksonomiczna historia *Warszewiczia coccinea* (Vahl) Klotzsch

Abstrakt

Józef Warszewicz (1812–1866) – podróżnik i przyrodnik, główny ogrodnik (inspektor) Ogródu Botanicznego Uniwersytetu Jagiellońskiego w Krakowie, był jednym z pierwszych zbieraczy roślin w tropikalnych regionach Ameryki Środkowej i Południowej. Ze swoich podróży (1844–1850, 1850–1853) przysłał i przywiózł do Europy setki nieznanymi wcześniej roślin, w tym przede wszystkim storczyków i przedstawicieli innych rodzin.

Jednym z przywiezionych gatunków była *Warszewiczia coccinea* (w języku angielskim *red warszewiczia*, w języku polskim *warszewiczia czerwona*), opisana przez Johanna F. Klotzscha i nazwana na cześć zbieracza. Jest to niewielkie drzewo lub krzew o dużych, czerwonych kwiatostanach, rosnące dziko w amerykańskich tropikach i często uprawiane jako ozdobne. Odgrywa ono znaczącą rolę w kulturze wyspiarskiego kraju Trynidad i Tobago w archipelagu Małych Antyli, gdzie uznane jest za „roślinę narodową”.

Celem artykułu jest naświetlenie jednego z rozdziałów historii systematyki (taksonomii) związanego z Józefem Warszewiczem oraz roślinami opisanymi na podstawie jego zbiorów, zwłaszcza z warszewiczą czerwoną.

Wiele tzw. „gatunków Warszewicza” przetrwało w taksonomii do dnia dzisiejszego. Jego unikatowa kolekcja przechowywana jest w Zielniku Uniwersytetu Jagiellońskiego – Herbarium Universitatis Cracoviensis – KRA. Znajdują się tutaj m.in. ważne dla systematyki lektotypy (okazy modelowe) gatunku *Warszewiczia pulcherrima* (= *W. coccinea*).

Słowa kluczowe: *Ameryka Południowa i Środkowa, Johann Friedrich Klotzsch, Julius von Rohr, Martin Vahl, zbieracz roślin, zielnik*

1. Introduction

We believe that the history of science is not only about publishing previously unknown sources or facts on a given topic, but also about analyzing how scientists of the past come to the truth. In this article, we show on a “micro-example” in the field of “microtaxonomy” what the stages of taxonomic studies of species are. This „micro contribution” concerns a distinguished Pole, Józef Warszewicz, and shows one of the episodes in the history of biology (taxonomy), which is very rarely the subject of research by historians of science.

In the following parts of the article, we will present the figure of Józef Warszewicz and his achievements connected with discovering and describing species from the genus *Warszewiczia*.

2. Exploration of overseas flora until Warszewicz’s travels

Józef Warszewicz (1812–1866) – traveler and naturalist, the main horticulturist (inspector) of the Botanic Garden of the Jagiellonian University in Kraków, was one of the first plant collectors in the tropical and

subtropical regions of Central and South America. From his travels, he sent and brought to Europe hundreds of previously unknown plant species, especially orchids. Among them was *Warszewiczia coccinea* (Vahl) Klotzsch (warszewiczia czerwona in Polish, red warszewiczia in English) named in his honor. It is worth recalling the history of studies on this beautifully blooming tree or shrub, which grows in the wild and is also cultivated in the American tropics. For over 150 years, its name has been connected with the name of a Pole – Józef Warszewicz.

Around the middle of the 18th century, the exploration of overseas floras began to develop with increasing intensity, in search of new species of useful plants, especially ornamental ones, highly valued in European gardens. As a result, the basic branch of botany – systematics (taxonomy) – flourished. Carl Linnaeus (1707–1778), who introduced the principles of Latin plant naming used to this day, contributed significantly to its development.¹ He had dozens of students – “plant hunters” going on expeditions to various parts of the world.² Learning about exotic flora always took place in two stages. The first stage was collecting plants in the field, often in very difficult, pioneering conditions. Living plants, or much more often dried specimens in the form of herbaria and/or prepared underground parts and seeds, were sent to scientific centers in Europe. The most important were botanical gardens and herbaria of colonial countries, including Berlin, London, and Paris, as well as nurseries in today’s Belgium and the Netherlands. There was a network of links: the plant collector – a person or institution financing the expedition – and a botanist specializing in systematics (taxonomy). When a taxonomist received a plant specimen that had not been described in the literature or found in a herbarium, a new taxon³ was described and a name created. If the name and description already existed, and the analysis of previously unknown materials provided new data – the former description was supplemented, often with some modifications made in the systematic depiction of the given taxon, and a change was made to its name (this was the case with the red warszewiczia).

A large role in systematics has been played by research documentation in the form of herbaria i.e. dried plant specimens attached to paper

¹ Mägdefrau 2004, pp. 67–83.

² Stafleu 1971.

³ A taxon is a species or other systematic (taxonomic) unit.

sheets with labels bearing the specimen's scientific name, date, and place of collection, the name of the collector, and sometimes other information. The nomenclature type is a specimen (generally a herbarium sheet) that was used by the researcher to describe and name the taxonomic unit, usually in the rank of species. This specimen, designated by the author, is referred to as the holotype, whereas when it has not been precisely designated by the author or when it has been lost (as in the case of *Warszewiczia*), then it is selected from the original material that served as the model for the taxonomic description, the so-called lectotype, i.e. the specimen of the plant in the herbarium considered its model representation.⁴ Herbarium sheets collected in specific regions of the world are deposited in museum research units, i.e. in herbaria, which are also the workshops of taxonomists. In the Herbarium of the Jagiellonian University – Herbarium Universitatis Cracoviensis – KRA, Warszewicz's unique collection is stored, containing, among others, specimens of the *Warszewiczia pulcherrima* (= *W. coccinea*), which are the lectotypes of this species.

3. Józef Warszewicz – life and travels

The name Warszewicz is mentioned in dictionaries and studies concerning both the history of Central and South American research, especially of orchids, as well as the history of science.⁵ Several articles on his life or selected periods of activity have also been published.⁶ Nevertheless, the biography of this tireless explorer and expert on exotic nature is full of mysteries, especially when it comes to his travels. The most important facts are presented below.

Józef Warszewicz (Fig. 1a., 1b.) was born in 1812 in Lithuania to an impoverished noble family, whose hereditary symbol was the Rawicz coat of arms. He was sometimes known abroad as “Josef Ritter von Rawicz Warszewicz”. Foreigners misspelled his name as e.g. “Warczewicz” or “Warscewicz”. In his youth, he worked in the Botanical Garden

⁴ Szweykowscy 2003, p. 941; Turland *et al.* 2018.

⁵ E.g. Sampolinski 1963, K.G. [Krystyna Güntherowa] 1987, Reinikka 1995, Majewski, Zemanek 2010, AZ [Alicja Zemanek] 2015.

⁶ E.g. *Ogrodnictwo* 1927, Wróbel-Stermińska 1966, Savage 1970, Micherdziński 1971, Sauter 2010, Zemanek 2012/2013, Köhler 2014.

of Vilnius University under the direction of Professor Józef Jundzill (1794–1877). Poland did not exist on the map at that time, divided between three empires: Austria, Prussia, and Russia. In 1831, he took part in the November Uprising against Russia, and after its fall, he entered the territory of Prussia, where he was interned. After his release from internment, he worked initially as a gardener in East Prussia, in Insterburg near Königsberg (today Chernyakhovsk, Kaliningrad Oblast, Russia), then in the royal gardens in Potsdam, and finally as an assistant to the main horticulturist in Schöneberg near Berlin, in the Botanic Garden of the Friedrich Wilhelm University. The natural sciences were then developing under the influence of Alexander von Humboldt (1769–1859), a naturalist, traveler, and explorer of Central and South American nature (during an expedition in 1799–1804), co-creator of physical geography, and creator of plant geography as a separate research discipline.⁷ The great scientist always supported young researchers and travelers who, like him, wanted to explore unknown corners of the world. Among his protégés was Józef Warszewicz, who, thanks to Humboldt's letters of recommendation, left for Central America.

In 1844, Warszewicz joined an expedition of the Belgian Horticultural Society to Guatemala to learn about its natural resources, collect seeds and explore the possibilities of colonizing the area. Unfortunately, the expedition ended tragically. Almost all the participants, with the exception of Warszewicz and a Flemish physician, died of yellow fever. The Polish horticulturist recovered after a few months and set off alone to explore the area. His first stay in Central America lasted just over 5 years (1844–1850). The exact route of these peregrinations is difficult to recreate. He probably traveled from Guatemala, through Honduras and Nicaragua to Costa Rica and Panama. He traveled on foot or on a mule, alone or with Indians. He collected natural specimens, mostly plants – seeds, seedlings, or whole specimens, and made herbaria. Initially, his main recipient and sponsor was Louis van Houtte (1810–1876)⁸ associated with the Botanical Garden of Brussels, the owner of nurseries near Ghent, where he cultivated new species imported from different regions of the world for commercial purposes. Warszewicz also sent plants to many botanical and private gardens, mainly

⁷ Mägdefrau 2004, pp. 121–129.

⁸ See IPNI [2021a](#).

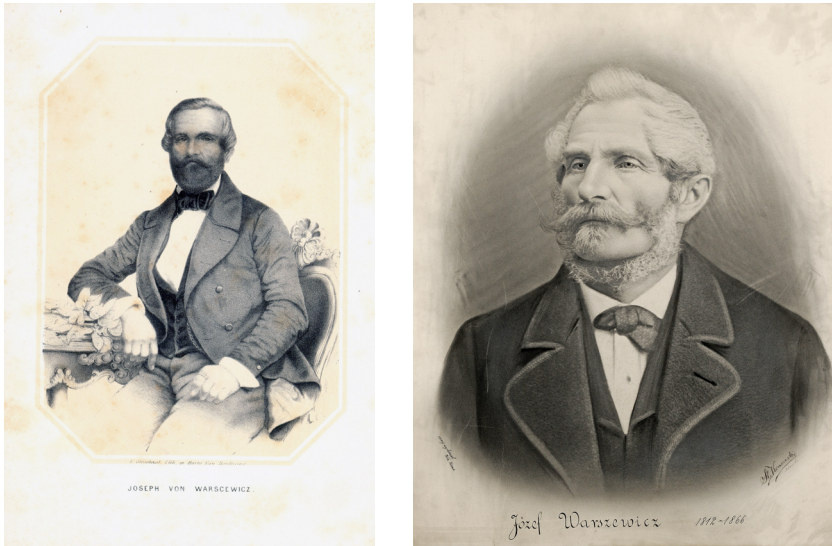


Fig. 1. Józef Warszewicz (1812–1866): a. Colored lithograph ‘Joseph von Warszewicz’. Signature at the bottom: L.Stroobant Lith. In Horto Van Houtteano. Museum of the Botanic Garden JU. b. The well-known portrait photograph of Józef Warszewicz, which, until the second half of the 20th century, hung in his former living quarters in the western pavilion in the Botanic Botanic Garden JU. Photo by Stanisław Konarski. Currently in the Museum of the Botanic Garden of the Jagiellonian University.

in Berlin, Hamburg, London and Zurich, thus obtaining funds to continue the expedition. He collected animal specimens: snails, amphibians, reptiles, and birds for natural history museums, but with less intensity. In 1850, he returned to Europe for several months. He stayed in Berlin, where he worked for some time as a private assistant to the outstanding orchid researcher Heinrich Gustav Reichenbach son (filius) (1824–1889).⁹ At the end of the year, he set off on a second voyage to Central and South America (1850–1853), during which he traveled vast areas in Panama, Ecuador, Peru, Bolivia, Brazil and perhaps other parts of the continent.¹⁰

The botanical yield of Warszewicz’s expeditions was impressive. He sent and brought to Europe up to a thousand (or even tens

⁹ See IPNI [2021b](#).

¹⁰ F.B. [Felix Berdau] 1861, p. 210; Czerwiakowski 1864, pp. 191–192; *Ogrodnictwo* 1927; Micherdziński 1971, pp. 320–321; Reinikka 1995; Jungfer [2017](#).

of thousands) specimens of plants. The material included several hundreds of new taxa, especially orchids (about 300), but also cycads, canas, and other groups of tropical plants. The Polish collector did not conduct any scientific research. The new species were described by Western European researchers, including Albert Gottfried Dietrich (1795–1856),¹¹ Johann Friedrich Klotzsch (1805–1860),¹² John Lindley (1799–1865),¹³ Christoph Friedrich Otto (1783–1856),¹⁴ Eduard August von Regel (1815–1892),¹⁵ above-mentioned Heinrich Gustav Reichenbach and others. Some of them, especially Reichenbach, added an abbreviation of Warszewicz's surname (Warsz.) or an abbreviation of his own surname and Warsz., because sometimes Warszewicz himself proposed new names for the previously unknown plants, and also provided information about their structure and life in their natural habitat. As a result, there are about 180 names of species,¹⁶ where Warszewicz is the author or co-author of the first description, although he was not a professional botanist. Regardless of this, to honor his service, over 60 eponyms were created, i.e. Latin names of taxa derived from Warszewicz's surname,¹⁷ among others: *Brassia warszewiczii* Rchb.f., *Calathea warszewiczii* (Lem.) Körn., *Eugenia warszewiczii* Hemsl., *Gesneria warszewiczii* C.D.Bouché & Hanst., *Howardia warszewiczii* Klotzsch ex Duch., *Mormodes warszewiczii* Klotzsch, *Oncidium warszewiczii* Rchb.f., *Philodendron warszewiczii* K.Koch & C.D.Bouché, *Ribes warszewiczii* Jancz., *Urostigma warszewiczii* Miq., as well as two generic names: *Warszewiczella* (sic!) (Reichenbach f. 1852) of the family Orchidaceae and *Warszewiczia* (Klotzsch 1853) of the family Rubiaceae.

Warszewicz was a man of great physical condition, courage, and resistance, which was admired by many people who knew him. Feliks Berdau (1826–1895), who worked with him for a time as an assistant in Kraków's Botanic Garden, wrote:

¹¹ See IPNI [2021c](#).

¹² Staffeu, Cowan 1979, pp. 569–571; IPNI [2021d](#).

¹³ See IPNI [2021e](#).

¹⁴ See IPNI [2021f](#).

¹⁵ See IPNI [2021g](#).

¹⁶ IPNI (2021). International Plant Names Index. Published on the Internet <http://www.ipni.org>

¹⁷ Ziobrowski 1927.

[...] a quiet and indefatigable traveler, who, in order to enrich his studies, climbed the precipitous cliffs of the inaccessible Andes, traveled the huge rivers of the new world on flimsy rafts, with an axe in his hand cutting a passage through the virgin forests of South America, ventured into the main villages of the wildest Indian generations, endured hunger and thirst, happy if, as a reward for these unspeakable hardships, he was able to snatch some unknown plant and add it to his collection.¹⁸

After recovering from yellow fever, he began struggling with malaria, which in part contributed to his return to Europe in 1853. He was sufficiently well known at that time to be able to work in England or Prussia, but he chose Kraków (then part of the Austrian partition) in his homeland, Poland. From 1854 he worked as the main horticulturist (supervisor) of the Botanic Garden of the Jagiellonian University, established in 1783.¹⁹ Thanks to the plants he brought, as well as his knowledge, passion for horticulture, and contacts abroad, the Garden became one of the richest in Europe. The post of director was held by Ignacy Rafał Czerwiakowski (1808–1882),²⁰ Professor of the Chair of Botany. In 1864, on the occasion of the 500th anniversary of the foundation of the Jagiellonian University, together with Warszewicz he published a catalog of cultivated plants – *Catalogus plantarum*,²¹ which lists an impressive number of over 9,000 species and varieties, including many new ones brought from America, for example, the orchid *Cattleya warszewiczii* Rchb. fil.²² with beautiful, purple-pink flowers – a parental species for many varieties still cultivated in greenhouses around the world today. Apart from orchids, many palms, cacti, and cannas (*Canna* sp.), which Warszewicz had introduced to European cultivation, grew in the greenhouses. The *Catalogus* does not include representatives of the *Warszewiczia* genus, which means that they were not cultivated at that time.

¹⁸ F.B. [Feliks Berdau] 1861, p. 209.

¹⁹ Piekielko [Zemanek] 1983.

²⁰ Zemanek 2000.

²¹ Czerwiakowski, Warszewicz 1864.

²² Currently, the taxonomy uses the name recorded in Reichenbach's first description, with the incorrect spelling of the name: *Cattleya warszewiczii* Rchb. f. IPNI (2021). *International Plant Names Index*. Published on the Internet <http://www.ipni.org>.

Warszewicz died on 29 December 1866 after a short illness, in his living quarters in the Botanic Garden. Many years later, Professor Władysław Szafer (1886–1970), director of this institution in the 20th century, wrote:

Warszewicz enjoyed great authority in Kraków. He was a man generally respected for his ardent patriotism (he took part in the November Insurrection and was Czerwiakowski's comrade in arms), for his extensive knowledge of horticulture and botany, and for his noble character.²³

In 1869, a monument was unveiled in the Garden with a marble bust of Warszewicz, carved around 1862 by Franciszek Wyspiański (1837–1901). A plaque decorates the stone pedestal with a poem by Wincenty Pol (1807–1872), a poet and professor of geography at the Jagiellonian University. In the greenhouses of the Botanic Garden still exist several plant specimens brought by Warszewicz from his travels, such as over 150-year-old palms, cycads, and one orchid. Important evidence of the “plant hunter’s” activity is the herbarium specimens he collected, found in various herbaria throughout the world,²⁴ including the Herbarium of the Jagiellonian University (KRA).

4. *Warszewiczia coccinea* (Vahl) Klotzsch – an ornamental plant from tropical America

Warszewiczia coccinea (red warszewiczia) (Fig. 2.a) is a member of the Neotropical genus from the family Rubiaceae.²⁵

The genus comprises eight well-distinguished species. The *Warszewiczia coccinea* is an evergreen tree or shrub occurring in Central and South America (Costa Rica to equatorial Peru), the Caribbean – Trinidad, and the Windward Islands.²⁶ It produces beautiful inflorescences from 30 to 50 cm long, with a structure unique in the world of plants. It has bunches of thousands of small, inconspicuous yellow flowers on

²³ Szafer 1969, pp. 64–65.

²⁴ Stafleu, Cowan 1988, pp. 92–93.

²⁵ Szafer 1927; Rova *et al.* 2002; Duncan 2007; Bremer, Eriksson 2009; Kainulainen *et al.* 2010; Delprete 2019.

²⁶ Pantoja 1994, Lorence 1999, Kainulainen *et al.* 2010, Baksh-Comeau *et al.* 2016; Tropicos 1995-2020.



Fig. 2. *Red warszewiczia* – *Warszewiczia coccinea* (Vahl) Klotzsch: a. wild form of the inflorescence; photo published by E. J. Duncan (2007); b. double form of the inflorescence – ‘David Auyong’ cultivar; photo by Yasmin S. Baksh-Comeau.

a long axis. Some of them have one of the sepals transformed into a bright red bract over 10 centimeters long that attracts butterflies and hummingbirds, which pollinate this plant.²⁷ In Trinidad, it is known as

²⁷ Andersson *et al.* 2002, p. 131; *Trinidad pride* 2020.

the “pride of Trinidad” and “chaconia”, a very attractive ornamental tree planted in gardens and used in landscaping. Locals sometimes collect this plant as a source of medicine and fuelwood. The anise-scented roots are said to exhibit aphrodisiac properties. The plant is referred to as the “Flag Tree” in MANU Native and Medicinal Plants.²⁸ When emblems were chosen for the new island country of Trinidad and Tobago, established in 1962 in South America in the Lesser Antilles archipelago, *Warszewiczia coccinea* was named the national flower because

[...] as an indigenous flower it has been witness to our entire history. It can therefore be said to represent the imperishability of life and the continuity of our Nation.²⁹

In 1957 a form of *Warszewiczia* with double inflorescence (a natural mutation), much more ornate than the natural form, was accidentally discovered (Fig. 2.b.). It was propagated vegetatively and is now very often cultivated as the variety *David Auyong* (Fig. 2.b), named in honor of its discoverer.³⁰ An image of this plant (wild form) is represented on the 25 cent coin of Trinidad and Tobago (Fig. 3).



Fig. 3. The image of warszewiczia on the 25 cent coin of Trinidad and Tobago (obverse). Museum of the Botanic Garden of the Jagiellonian University. Photo by Beata Sikora-Majewska.

²⁸ MANU *Native and Medicinal Plants* [2020](#).

²⁹ Duncan [2007](#), p. 6.

³⁰ Duncan [2007](#), p. 4.

Kraków's Botanic Garden received *Warszewiczia* seeds on 19 July 2018 from Professor E. Julian Duncan from the Plant Biotechnology Laboratory of the University of the West Indies in Trinidad and Tobago. Tomasz Głuszak sowed them on 28 August 2018 in the Jubilee Greenhouse and used them to grow, for the first time in the history of the Garden, live specimens of this beautiful plant.

5. Establishing the genus *Warszewiczia* and the species *Warszewiczia coccinea*

5.1 Earlier descriptions and names of the studied genus

As ethnobotanical data indicate (see above), it has been used since ancient times by the local inhabitants.³¹ In the 18th century, it was observed by a European – the Danish surveyor, agronomist and soldier Julius von Rohr (ca. 1737–1793), who lived in Trinidad between 1787 and 1791. He sent his collected herbarium to Europe to Martin Vahl (1749–1804).³² Martin Vahl was a Danish botanist of Norwegian descent, a pupil of Linnaeus, associated, among others, with the Copenhagen Botanical Garden, a traveler in Europe and North Africa, as well as a professor at the University of Copenhagen.³³ He published a three-part work *Symbolae botanicae* (Pars 1–3, 1790, 1791, 1794). In the second part of this work, he included a description of the tree, based on herbarium specimens sent to him by von Rohr. He named it *Macrocnemum coccineum* Vahl. Apart from the Latin diagnosis, at the end of the volume, he inserted plate XXIX with an engraving illustrating the inflorescence and the leaf. He also defined the place and author of the collection: *In Insula Trinitatis legit Dn. Von Rohr*³⁴ (Fig. 4). The herbarium specimen of this species (lectotype) is preserved in a herbarium in the British Museum [lectotype designated by Turner.³⁵]

Jean Louis Marie Poiret (1755–1834), a French botanist and traveler in North Africa, collaborated with the famous biologist Jean Baptiste Lamarck (1744–1829), who published the *Encyclopédie Méthodique*,

³¹ Lorence 1999, p. 176.

³² Stafleu, Cowan 1986, pp. 628–631.

³³ Stafleu, Cowan 1986, pp. 628–631.

³⁴ Vahl 1791, p. 38, Tab. XXIX.

³⁵ Turner 2019, p. 153, Figure 2.



Fig. 4. Engraving of a flowering branch and the leaf of warszewiczia (known then under the name of *Macrocnemum coccineum*) in the work of Martin Vahl *Symbolae botanicae*, Pars secunda (Vahl 1791, p. 38, Tab. XXIX).

Botanique.³⁶ Poiret participated in the development of several editions of the *Encyclopédie Méthodique*. Among his works for this publication, he studied *Macrocnemum*, transferring it to the Linnaeus genus of *Mussaenda*, and created the name *Mussaenda coccinea* (Vahl) Poiret 1797.³⁷

Augustin Pyramus de Candolle (1778–1841), a professor of the University of Montpellier and honorary professor of the Academy of Geneva (University of Geneva), the founder of the Botanical Garden³⁸ (now the Conservatory and Botanical Garden of the City of Geneva), and a co-creator of the natural system of the plant

³⁶ Stafleu, Cowan 1983, pp. 319–321.

³⁷ Poiret 1797, p. 394.

³⁸ Stafleu, Mennega 1995, p. 378.

world – named this plant *Calycophyllum coccineum* De Candolle 1830 in the fourth part of the monumental work *Prodromus systematis naturalis regni vegetabilis* [...].³⁹

5.2. J. Warszewicz collecting the plant

Warszewicz collected the plant later named after him during his first expedition (1844–1850), from the province of Veragua (now Panama) in South America.

5.3. Sending the specimens to a taxonomist in a botanical center

The taxonomist's name was Johann Friedrich Klotzsch. He was a curator of the Herbarium of the University of Berlin, Herbarium Berolinense (B), from 1833 to 1860. He was a mycologist and “stationary researcher” of vascular plants, which he described mainly on the basis of herbarium material. The Polish traveler probably became acquainted with him during his work in the Botanic Garden in Schöneberg near Berlin, later sending him herbarium specimens.⁴⁰ As a token of his gratitude, Klotzsch described, among others, the new genus *Warszewiczia* in his honor. The first note on Warszewicz's plant collection, as well as the new genus of *Warszewiczia*, appeared in 1849 in the journal *Allgemeine Gartenzeitung*, edited by Albert Dietrich and Friedrich Otto, in an unattributed note entitled *Pflanzen Sendung des Herrn v. Warszewicz* [The plants sent by Mr. v. Warszewicz], possibly prepared by Klotzsch. The note contains a list of plants sent by the Polish researcher, including, on p. 224, [...] *ein anscheinend neues Genus Warszewiczia mit herabhabgenden Trauben und grüner Blumen* [an apparently new genus of *Warszewiczia*, with cascading [bunched] inflorescences and green flowers.⁴¹] However, Klotzsch described it officially several years later, in 1853, as the type of this genus, which he designated as *Warszewiczia coccinea* (Vahl) Klotzsch.⁴² This plant had been described over fifty years earlier by Danish taxonomist, Martin Vahl, as *Macrocnemum coccineum* Vahl, on the basis of Julius von Rohr's collection of plants (see above). Due to the

³⁹ Candolle de 1830, p. 367.

⁴⁰ Stafleu, Cowan 1979, p. 569.

⁴¹ [N.N.] 1849, pp. 223–224.

⁴² Klotzsch [1853](#), p. 496.

specific morphological features, Klotzsch transferred this species to the new genus *Warszewiczia* and placed the following annotation in the footnote next to the new genus name:

Dem Andenken des fleissigen und verdienstvollen Reisenden in Mittel- und Süd-Amerika, Herrn Joseph von Warszewicz, dem Berlin die Einführung einer grossen Menge von Ziergewächsen und eine noch grössere Anzahl interessanter Pflanzen für die Herbarien verdankt, als ein Zeichen aufrichtiger Anerkennung gewidmet [Presented as a token of sincere appreciation to the memory of the industrious and meritorious traveler in Central and South America, Mr. Joseph von Warszewicz, to whom Berlin owes the introduction of a large number of ornamental plants and an even larger number of interesting plants for herbaria.]⁴³

In 1853, Klotzsch, within the new genus *Warszewiczia*, whose nomenclature type he designated as *W. coccinea* (Vahl) Klotzsch (basionym: *Macrocnemum coccineum* Vahl, *Symbolae bot. fasc. II. p. 38, vol. 29*; synonym: *Calycophyllum coccineum* De Cand. *Prodr. IV. P. 367, n. 2 I*) described three new species: *W. schomburgkiana*, *W. poeppingiana*, and *W. pulcherrima*.⁴⁴ The latter species was described on the basis of the herbal collection of J. Warszewicz from Central America (Veragua). Klotzsch also provides information on its distribution: *Wächst auf der Insel Trinitat* [Grows on Trinidad Island] (von Rohr, Sieber).⁴⁵

This ornamental plant functions under the name *Warszewiczia coccinea* to this day. Unfortunately, the original collection – nomenclature types of these species stored in Berlin – were destroyed during World War II.

6. The Warszewicz collection in Herbarium Universitatis Cracoviensis – KRA

Over 650 sheets with specimens collected by Warszewicz during his trips to Central America in 1844–1850, and to north-western South

⁴³ Klotzsch [1853](#), p. 496.

⁴⁴ These three species were included by later researchers to *Warszewiczia coccinea*: *The plant list. A working list of all plant species* [2019](#); Nobis et al. [2020](#).

⁴⁵ Klotzsch [1853](#), p. 497; *The plant list. A working list of all plant species* [2019](#).

America in 1850–1853, are preserved in the Herbarium of the Jagiellonian University (Herbarium Universitatis Cracoviensis – KRA). These specimens are kept separately from the main collection. Unfortunately, all the herbarium specimens collected by Warszewicz only have the label *Reliquiae Warszewiczianae, America merid: Columbia. Ig. J. Warszewicz* without the date or collection site. However, it is worth noting that Warszewicz's specimens kept at Herbarium Berolinense also did not have any information about the date and collection site.⁴⁶ Most of the specimens from Warszewicz's collection were identified in 1915 by Stanisław Kulczyński (1895–1975) and his colleague Antoni Żmuda (1889–1916) of the Botanical Institute of the Jagiellonian University, Kraków. They were able to determine only part of this collection, and numerous specimens remain unidentified. Warszewicz's herbarium in Kraków preserves duplicates of the original specimens of taxa described by J. Klotzsch and several other 19th-century plant taxonomists (the holotypes of which, having been preserved at Herbarium Berolinense were destroyed during WW II), which can be designated as lectotypes for many taxa, e.g. for *Warszewiczia pulcherrima* (now the synonym of *Warszewiczia coccinea*).⁴⁷

Four herbarium sheets of this plant have been preserved in Kraków. They were in 2 folders; in each of them, the inflorescences and leaves of this plant are attached to sheets measuring 45 x 34 cm. In 1915, Stanisław Kulczyński determined them to be *Warszewiczia pulcherrima*. On the label under the name of the species, Kulczyński placed a note *Walpers Repet.* (He probably determined this taxon based on the description in this publication; the correct name for this journal is *Annales Botanices Systematicae*.⁴⁸) Because this material is the only existing part of Warszewicz's original collection of *W. pulcherrima* described by Klotzsch, it was designated by Nobis et al.⁴⁹ as one of the duplicates of the lectotype of this species, based on the International Code of Nomenclature (ICN).⁵⁰ Figure 5 presents a photograph of the herbarium sheet of *Warszewiczia pulcherrima* (= *W. coccinea*).

⁴⁶ See: *Berlin negatives at the Field Museum of Natural History, U.S.A, Illinois, Chicago* (F) [2020](#).

⁴⁷ Nobis et al. [2020](#), pp. 47–48.

⁴⁸ Mueller 1858.

⁴⁹ Nobis et al. [2020](#).

⁵⁰ Turland et al. [2018](#).



Fig. 5. Herbarium sheet with specimen of *Warszewiczia pulcherrima* Klotzsch (= *Warszewiczia coccinea* (Vahl) Klotzsch) preserved in the Herbarium Universitatis Jagellonicae Cracoviensis – KRA. Photo by Marcin Nobis.

There are three labels on the sheet to which leaves with a fragment of an inflorescence are attached: in the middle, there is a label with *Reliquiae Warszewiczianae* printed with the determination by S. Kulczyński, the second at the bottom with an overprint: *Notae criticae* contains a revision made by T. Głuszak and M. Nobis in 2017; the third at the top has the designation by M. Nobis of Lectotypus! from 2019.

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Bibliography

- Andersson, Susanna; Nilsson, L. Anders; Groth, Inga; Bergström, Gunnar 2002: Floral scents in butterfly-pollinated plants: possible convergence in chemical composition. *Botanical Journal of the Linnean Society* 140(2), pp. 129–153. Available online (17.11.2020): <https://doi.org/10.1046/j.1095-8339.2002.00068.x>.
- AZ [Alicja, Zemanek] 2015: Warszawicz Józef [...]. [In:] Bolesław, Orłowski (scientific editor) *Polski wkład w przyrodoznawstwo i technikę. Słownik polskich i związanych z Polską odkrywców, wynalazców oraz pionierów nauk matematyczno-przyrodniczych i techniki*. [The Polish contribution to natural sciences and technology. Dictionary of Polish and Polish-related explorers, inventors and pioneers of the mathematical and natural sciences and technology]. Vol. 4. Warszawa: Instytut Historii Nauki im. L. i A. Birkenmajerów PAN, ISBN: 978-83-86062-28-7, ISBN: 978-83-86062-97-3; Instytut Pamięci Narodowej, ISBN: 978-83-7629-828-3, ISBN: 978-83-7629-832-0, pp. 353–355.
- Baksh-Comeau, Y. S.; Maharaj, S. S.; Adams, C. D.; Harris, S.A.; Filer, D. L.; Hawthorne, W. D. 2016: An annotated checklist of the vascular plants of Trinidad and Tobago with analysis of vegetation types and botanical 'hotspots'. *Phytotaxa* 250(1), pp. 1–431. Available online (17.11.2020) <https://doi.org/10.11646/phytotaxa.250.1.1>.
- Berlin negatives at the Field Museum of Natural History*, U.S.A., Illinois, Chicago (F) 2020: Available online (4.03.2020): <https://collections-botany.fieldmuseum.org/list>.
- Bremer, B.; Eriksson, O. 2009: Time tree of Rubiaceae: phylogeny and dating the family, subfamily, and tribes. *International Journal of Plant Science* 170, pp. 766–793. Available online (17.11.2020): <https://doi.org/10.1086/599077>
- Candolle, [Augustin Pyramus] de 1830: *Prodromus systematis naturalis regni vegetabilis* [...]. Pars quarta [Vol. 4]. Parisiis: [Treuttel et Würtz].

- Czerwiakowski, Ignacy Rafał 1864: Rys historyczno-statystyczny Ogrodu Botanicznego krakowskiego, od jego zawiązku aż do r. 1864. [Historico-statistical outline of the Kraków Botanic Garden from its beginning up to 1864]. [In:] *Zakłady uniwersyteckie w Krakowie*. Kraków: C. K. Towarzystwo Naukowe Krakowskie, pp. 144–233.
- Czerwiakowski, Ignatio Raphaële; Warszewicz, Josepho 1864: Catalogus plantarum, quae in C.R. Horto Botanico Cracoviensi anno 1864 – ab erecta C.R. Universitate Studiorum Jagellonica quingentesimo. a fundato vero horto octogesimo educantur; secundum system Endlicherianum ab Ignatio Raphaële Czerwiakowski Med. Dre, Professore p.o. ac Directore ejusdem Horti et Josepho Warszewicz Inspectore editus. Cracoviae: Typis C.R. Universitatis Jagellonicae.
- Delprete, P.G. 2019: Notes on calycophyllous Rubiaceae. Part V. A succinct overview of genera with calycophylls, and a revision of *Pteridocalyx* (Sipaneaaceae) with observations on distyly and calycophyll variation. *Phytotaxa* 391, pp. 81–92. Available online (17.11.2020): <https://doi.org/10.11646/phytotaxa.391.1.6>.
- Duncan, E. Julian 2007: A review on *Warszewiczia coccinea* (Vahl) Klotzsch – the ‘Chaconia’. *Living World. Journal of The Trinidad and Tobago Field Naturalists’ Club* 2007, pp. 1–7. Available online (17.11.2020): <http://tfnrc.org/livingworld/index.php/lwj/article/download/212/203>.
- F.B. [Feliks Berdau] 1861: Józef Warszewicz. *Tygodnik Ilustrowany* 3(89), pp. 209–210.
- IPNI 2021: International Plant Names Index. The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Botanic Gardens. Available online (16.03.2021): <http://www.ipni.org>.
- IPNI 2021a: Van Houtte, Louis Benoît (1810-1876). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/34342-1>.
- IPNI 2021b: Reichenbach, Heinrich Gustav (filius) (1824–1889) [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/8254-1>.
- IPNI 2021c: Dietrich, Albert Gottfried (1795–1856). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/2206-1>.
- IPNI 2021d: Klotzsch, Johann Friedrich (1805–1860). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/4855-1>.
- IPNI 2021e: Lindley, John (1799–1865). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/22383-1>.

- IPNI 2021f: Otto, Christoph Friedrich (1783–1856). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/7204-1>.
- IPNI 2021g: Regel, Eduard August von (1815–1892). [In:] *International Plant Names Index*. Available online: <https://www.ipni.org/a/8237-1>.
- Jungfer, Karl-Heinz 2017: On Warszewicz's trail: the identity of *Hyla molitor* O. Schmidt, 1857. *Salamandra* 53(1), pp. 18–24. Available online (17.11.2020): <http://www.salamandra-journal.com>.
- Kainulainen, K.; Persson, C.; Eriksson, T.; Bremer, B. 2010: Molecular systematics and morphological character evolution of the Condamineae (Rubiaceae). *American Journal of Botany* 97, pp. 1961–1981. Available online (17.11.2020): <https://doi.org/10.3732/ajb.1000090>.
- K.G. [Krystyna, Güntherowa] 1987: *Warszewicz Józef (1812–1866), florysta, ogrodnik*. [Warszewicz Józef (1812–1866), florist, horticulturist]. [In:] Stanisław, Feliksiak (ed.) *Słownik biologów polskich* [Dictionary of Polish biologists]. Warszawa: Państwowe Wydawnictwo Naukowe, ISBN: 83-01-00656 0, pp. 565–566.
- Klotzsch, J.F. 1853: Einige neue Gattungen der Rubiaceen. Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin 1853, pp. 494–502. Available online (17.11.2020): <https://www.biodiversitylibrary.org/item/109942#page/4/mode/1up>.
- Köhler, Piotr 2014: The life of Józef Warszewicz (1812–1866): the Kraków period. *Acta Baltica Historiae et Philosophiae Scientiarum* 2(2), pp. 18–36. Available online (17.11.2020): <https://doi.org/10.11590/abhps.2014.1.02>.
- Lorence, David H. 1999: A nomenclator of Mexican and Central American Rubiaceae. *Monographs in systematic botany from the Missouri Botanical Garden* 73, pp. 1–177. Available online (17.11.2020): <https://www.biodiversitylibrary.org/ia/mobot31753002705538/#page/1/mode/1up>.
- Mägdefrau, Karl 2004: *Historia botaniki. Życie i dokonania wielkich badaczy*. [History of botany. The life and achievements of great researchers]. [Translated by M. Mularczyk], ser.: Prace Ogródu Botanicznego Uniwersytetu Wrocławskiego Vol. 7(1) („Acta Universitatis Wratislaviensis” 2258)]. ISSN 0239–6661 ISBN 83–229–2523–9, pp. 357.
- Majewski, Tomasz; Zemanek, Alicja 2010: Józef Warszewicz [..]. [In:] Irena, Stasiewicz-Jasiukowa (ed.). *The contribution of Polish science and technology to world heritage*. Committee of History of Science and Technology, Polish Academy of Sciences. Kraków – Warszawa: Jesuit University of Philosophy and Education „Ignatianum”, ISBN: 978-83-7614-093-3; Wydawnictwo WAM, ISBN: 978-83-7505-657-0, p. 130.

- MANU Native and Medicinal Plants: Available online (4.03.2020): (http://www.enjoyperu.com/peru_travel_tours).
- Micherdziński, Wiktor 1971: W Ameryce o Warszewiczu [On Warszewicz in America]. *Wszczęświat* 1971(12), pp. 319–321.
- Mueller, C. 1858: Synopsis plantarum phanerogamicarum novarum omnium per annos 1851, 1852, 1853, 1854, 1855 descriptarum. *Annales Botanices Systematicae* 5, pp. 1–966.
- [N.N.] 1849: Pflanzen Sendung des Herrn v. Warszewicz. *Allgemeine Gartenzeitung* 17(28), pp. 223–224.
- Nobis, Marcin; Gluszak, Tomasz; Zemanek, Alicja; Zemanek, Bogdan 2020: Lectotypification of *Warszewiczia pulcherrima* (Rubiaceae) with note on Józef Warszewicz's plant collection preserved at KRA herbarium from his trip to Central and South America. *Phytotaxa* 442(1), pp. 047–051. Available online (17.11.2020): <https://doi.org/10.11646/phytotaxa.442.1.9>.
- Ogrodnictwo* 1927: Miesięcznik wydawany przez Towarzystwo Ogrodnicze w Krakowie. Zeszyt poświęcony pamięci J. Warszewicza [Periodical published by Horticultural Society in Kraków. An issue dedicated to memory of J. Warszewicz] 23(1), pp. 2–32 (edited by Józef, Brzeziński; Kazimierz, Simm; Stefan, Ziobrowski). [Artykuły dotyczące m.in. życia Warszewicza, jego podróży, roślin nazwanych na jego cześć oraz kilka listów]. [Papers concerning life of Warszewicz, his travels, plants named in his honour, and several letters].
- Ossenbach Sauter, Carlos, 2010: Josef Ritter Von Rawicz (sic!) [Rawicz] Warszewicz (sic!) [Warszewicz] (1812–1866). *Biocenosis* 23(1), pp. 56–61.
- Pantoja, S.C.S. 1994: Revisão taxinômica do gênero Warszewiczia Klotzsch (Rubiaceae, Rondeletieae). Master Dissertation. Rio de Janeiro: Universidade Federal de Rio de Janeiro, pp. 110.
- Piekielko [Zemanek], Alicja 1983: *Historia Ogrodu Botanicznego Uniwersytetu Jagiellońskiego w Krakowie. Historia Horti Botanici Universitatis Iagellonicae Craconiensis. (The history of the Jagiellonian University Botanical Garden in Cracon).* Warszawa – Kraków: Uniwersytet Jagielloński, Varia 164, PWN, Nakł. UJ. ISBN: 83-01-04814-x.
- Poiret, J.L.M. 1797: Mussaenda coccinea. [In:] [Jean, Baptiste, Lamarck] *Encyclopédie Méthodique, Botanique*. Vol. 4. Paris: H. Agasse, p. 394. Available online (17.11.2020): <https://bibdigital.rjb.csic.es/viewer/9710>.
- Reinikka, Merle A. 1995: Josef Ritter von Rawicz Warszewicz (1812–1866). [In:] *A history of the orchid*. [In:] Merle, A. Reinikka (ed. 2). Oregon: Timber Press, Portland, ISBN: 0-88192-325-7, pp. 189–192.

- Rova, J.H.E.; Delprete, P.G.; Andersson, L.; Albert, V.A. 2002: A trnL-F cpDNA sequence study of the Condamineae-Rondeletieae-Sipaneae complex with implications on the phylogeny of the Rubiaceae. *American Journal of Botany* 89, pp. 145–159. Available online (17.11.2020): <https://doi.org/10.3732/ajb.89.1.145>.
- Sampolinski, J. 1963: Josef Warszewicz – A famous orchid collector. *The Orchid Review* 71 (840): pp. 213–214.
- Savage, J.M. 1970: On the trail of the golden frog: with Warszewicz (sic!) [Warszewicz] and Gabb in Central America. *Proceedings of the California Academy of Sciences, Fourth Series* 38, pp. 273–288.
- Stafleu, Frans A. 1971: *Linnaeus and the Linneans. The spreading of their ideas in systematic botany, 1735–1789*. Utrecht, Netherlands: Published by A. Oosthoek's Uitgeversmaatschappij N.V. for the International Association for Plant Taxonomy. ISBN: 90 60 460642.
- Stafleu, Frans Antonie; Cowan, Richard S. 1979: *Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types*. Second edition. Vol. 2: H-Le. Bohn, Scheltema & Holkema, Utrecht: dr. W. Junk b.v., Publishers, The Hague. Complete work ISBN: 90 313 0224 4; Volume 2 ISBN: 90 313 03437.
- Stafleu, Frans Antonie; Cowan, Richard S. 1983: *Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types*. Second edition. Vol. 4: P-Sak. Bohn, Scheltema & Holkema, Utrecht/Antwerpen: dr. W. Junk b.v., Publishers, The Hague/Boston. Complete work ISBN: 90 313 0224 4; Volume 4 ISBN: 90 313 0549 9.
- Stafleu, Frans Antonie; Cowan, Richard S. 1986: *Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types. Second edition*. Vol. 6: Sti-Vuy. Bohn, Scheltema & Holkema, Utrecht/Antwerpen: dr. W. Junk b.v., Publishers, The Hague/Boston. Complete work ISBN: 90 313 0224 4; Volume 6 ISBN: 90 313 07149.
- Stafleu, Frans, Antonie; Cowan, Richard S. 1988: *Taxonomic literature. A selective guide to botanical publications and collections with dates, commentaries and types*. Vol. 7: W-Z. Bohn, Scheltema & Holkema, Utrecht/Antwerpen: dr. Junk b.v., Publishers, The Hague/Boston. Complete work ISBN: 90 313 0224 4; Volume 7 ISBN: 90 313 08536.
- Stafleu, Frans A.; Mennega, Erik A. 1995: *Taxonomic literature. A selective guide to botanical publications and collections with dates, commentaries and types*. Supplement 3: Br-Ca. Königstein, Germany: Koeltz Scientific Books. The whole supplement ISBN: 3-87429-339-4; The present volume ISBN: 3-87429-376-9.

- Szafer, Władysław 1927: *Warszewiczia pulcherrima* Kl. (*W. coccinea* Kl.). *Ogrodnictwo* 23(1), pp. 10–12.
- Szafer, Władysław 1969: *Concise history of botany in Cracow against the background of six centuries of the Jagiellonian University* (Zarys historii botaniki w Krakowie na tle sześciu wieków Uniwersytetu Jagiellońskiego). Translated from Polish [by Witold Kulerski and Halina Markiewicz]. Published for the Smithsonian Institution and the National Science Foundation, Washington, D.C., by the Scientific Publications Foreign Cooperation Center of the Central Institute for Scientific, Technical and Economic Information. Warsaw, Poland, Springfield, Virginia 22151.
- Szwejkowscy, Jerzy, Alicja (eds.) 2003: *Słownik botaniczny*. [Botanical dictionary] (ed. 2). Warszawa: Wiedza Powszechna. ISBN: 83-214-1305-6.
- The plant list. A working list of all plant species* 2019: Available online (22.01.2019): <http://www.theplantlist.org/tpl/record/kew-214231/>.
- Trinidadpride* 2020: Available online (4.03.2020): <https://newsday.co.tt/2018/12/16/trinidad-pride/>.
- TROPICOS* 1995–2020: [continuously updated]. Available online (28.10. 2019): <http://www.tropicos.org/>.
- Turland, N.J.; Wiersema, J.H.; Barrie, F.R.; Greuter, W.; Hawksworth, D.L.; Herendeen, P.S.; Knapp, S.; Kusber, W.-H.; Li, D.-Z.; Marhold, K.; May, T.W.; McNeill, J.; Monro, A.M., Prado, J., Price, M.J.; Smith, G.F. 2018: International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code). *Regnum Vegetabile* 159. Glashütten: Koeltz Botanical Books. Available online (17.11.2020) <https://doi.org/10.12705/Code.2018>.
- Turner, I.M. 2019: *Warszewiczia* and sixteen other names in the Rubiaceae authored by J. C. Klotzsch: when and where were they published? *Willdenowia* 49, pp. 151–154. Available online (17.11.2020): <https://doi.org/10.3372/wi.49.49203>.
- Vahl, Martin 1791: *Symbolae botanicae, sive Plantarum, tam earum, quas in itinere, imprimis orientali, collegit Petrus Forskål, quam aliarum, recentius detectarum, exactiores descriptiones, nec non observationes* [...]. Pars secunda. Hauniae [Copenhagen]: Nicolaus Möller et Filius.
- Wróbel-Stermińska, Wanda 1966: W setną rocznicę śmierci Józefa Warszawicza [On the 100th anniversary of Józef Warszawicz death]. *Hasło Ogrodnictwo-Rolnicze* 23(11), pp. 335–336.
- Zemanek, Alicja 2000: Ignacy Rafał Czerwiakowski (1808–1882) Botanik. [In:] Alicja Zemanek (ed.), *Uniwersytet Jagielloński. Złota Księga Władzania Biologii i Nauk o Ziemi. Część I: Biografie uczonych. Universitas Iagellonica. Liber aureus Facultatis*

Biologico-Geographicae. Pars I: Virorum Doctorum Vitae. Kraków: Nakl. UJ, ISBN: 83-7188-322-8, pp. 37–43.

Zemanek, Alicja 2012/2013: Łowca roślin Józef Warszewicz (1812–1866) – w 200-lecie urodzin [Plant hunter Józef Warszewicz (1812–1866) – on the 200th anniversary of his birth]. *Alma Mater* 2012/2013 (152–153), pp. 43–46.

Ziobrowski, Stefan 1927: Rośliny nazwiskiem J. Warszewicza oznaczone. [Plants named after J. Warszewicz]. *Ogrodnictwo* 23(1), pp. 14–25.