

THESAURUS PLANTARUM SYBERICARUM. TRACING THE RESEARCH OF AN OUTSTANDING POLISH FLORIST– FERDYNAND KARO (1845-1927)

Dr hab. Iwona Arabas^{1,2,3}

¹ Institute for the History of Science, Polish Academy of Sciences, Nowy Świat 72, 00-330 Warsaw, Poland

² Antonina Leśniewska Museum of Pharmacy, Historical Museum of Warsaw, Piwna 31/33, 00-265 Warsaw, Poland

³ Medical University of Warsaw, Banacha 1, 02-091 Warsaw, Poland

email: iarabas@wp.pl

Ferdynand Karo was an outstanding Polish florist, and one of the naturalists to study the Siberian flora at the turn of the 20th century. His research on the Asian flora concurred with the widespread endeavours for scientific description of the world's flora begun in 19th century. Thus, his research ranks among the studies on biological diversity that followed the works of such explorers as the Forsters, Alexander von Humbolt, Joseph Dalton Hooker, and Charles Darwin. The herbarium sheets prepared by Karo are preserved to this day in numerous libraries and museums around the world.

Ferdynand Karo¹ was born in *Brześć Litewski* (now *Brest*, Belarus) on May 6, 1845 to an Italian immigrant Kajetan Caro and Anastazja née Wołcakiewicz. Yet at the age of twelve he collected herbarium specimens under supervision of his teacher Dr Julius Milde to whom, as Karo later acknowledged [1], he owed his passion for botany. These herbarium sheets were collected in the vicinities of Wrocław and are currently a part of the collection of Department of Systematics and Plant Geography, Faculty of Biology, University of Warsaw.

Karo did his pharmaceutical apprenticeship in the pharmacy of Ludwik Spiess in Warsaw. During the January Uprising (a two-year military conflict with Russian Empire, 1863-1864) the pharmacy was a contact point of the underground post in which Karo served as a secret courier for the Polish National Government. According to Bolesław Hryniewiecki (Polish historian of botany born in 1875) Karo worked in close contact with Romuald Traugutt, commander of the uprising and the head of government. Karo was arrested in March 1864, put in the Warsaw Citadel prison, and sentenced to exile in the Russian far east, a sentence he got away being released on bail given by his family.

He continued his apprenticeship in a pharmacy in Częstochowa until 1866 when, after passing a state pharmaceutical exam, he enrolled for pharmaceutical studies at the Warsaw Main School (the then name of the University of Warsaw). It was then he befriended Józef Rostafiński, the future professor of the University of Warsaw and director of the university botanical garden. In 1867 yet as a student he published the first paper on the flora of the surroundings of Warsaw in the Viennese *Oesterreichische Botanische Zeitschrift* [9]. He graduated with a diploma in pharmacy in 1872 and run his own pharmacy in Łosice,

¹A biography of MPharm Ferdynand Karo, authored by prof. Barbara Kuźnicka, was published as a part of the „Życiorysy Zasłużonych Farmaceutów” series in 1966 [10]. It was possible to establish numerous details regarding Karo's life since that time, in particular with relation to his residence in Siberia. Much information about his passion and determination in pursuing floristic research can be learned from the letters he sent to his family, as well as from the memoirs of his daughter Maria Czarniecka written down by Wanda Sampolska, custodian of the Agricultural Library in Warsaw. I would like to express my sincere gratitude to Prof. Barbara Kuźnicka for donating a set of family documents inherited by Maria Czarniecka, the youngest daughter of Ferdynand Karo.

and later in Częstochowa. In 1880 he moved to Lublin where he worked as a head of a military pharmacy. After seven years, in the spring of 1887, he accepted a transfer for an analogous post in Irkutsk, a Siberian town upon the Angara River. After working there for just two months he was transferred to Nerchinsk from where he returned to the home country in 1893. For the next three years Karo run a pharmacy in Magnuszew, 60km to the south-east of Warsaw. In 1897 he decided on returning to Siberia, this time working in Blagoveshchensk - a town on the border with China at the point where the Zeya River flows into the Amur. Three years later he moved up the river to Zeya-Pristan (former name of the city of Zeya), where he was managing pharmacies till 1902. In 1901 Karo had sent his Siberian herbarium (over 4000 sheets in total) to Warsaw, donating it to the Warsaw Pharmaceutical Society, whose collection he was managing after returning to the country. During his subsequent third Siberian expedition Karo, being based in Blagoveshchensk, explored the right bank of the Amur River, studying flora of the Manchuria region. His fourth and last Siberian visit lasted from 1910 till 1913. For the next seven years he was living in Latowice (a village currently in west-central Poland). In 1920, at the age of 75, Karo took a post of herbal adviser in the pharmacy of Adolf Bukowski in Warsaw. Afterwards, he worked for two years as a custodian of the collection of Warsaw Pharmaceutical Society. It was his last professional occupation, Karo passed away on 3rd September 1927 in Konstancin (currently suburbs of Warsaw).

The large territorial coverage of Karo's research created a unique opportunity for European botanists to get acquaintance with the then unknown Siberian flora of the Dauria and the Amur basin regions. Karo's over twenty-year long non-involuntary stay in Siberia resulted in gathering of a total of eighty thousands specimens including a few dozens of previously unknown species. His herbaria were honoured on exhibitions in Moscow (1892) and Khabarovsk (1899). In his correspondence, Karo recalled that during the first few years spent in Siberia he collected eighteen thousands of vegetable specimens covering four hundred distinct species. The 1897 visit to Blagoveshchensk resulted in collecting of another circa seven thousands specimens of 270 species. His research conducted by the Zeya river bore fruit in enriching his collection by eight thousands specimens of two hundred distinct species. In 1902 Karo reported on his first two Siberian expeditions in a paper entitled *From the botanist's notes* (pol. *Z notatek botanika*) published in the Polish *Pharmaceutical News* (pol. *Wiadomości Farmaceutyczne* journal. He enumerated there the impressive figures describing the volume and geographical coverage of his collection, highlighting the discoveries of new species and varieties. Karo mentioned also the limitations he faced during his exploration including those posed by the proximity of the unsafe territories across the Chinese border. In 1900 he published a description of his stay in Zeya-Pristan in the „Wszecławiat” journal reporting preparation of 8000 herbarium sheets which he then send out to various museums throughout Europe.

Karo, working as a pharmacist in remote locations, had a limited access to the resources essential for conducting his botanical research. He was unable to precisely identify all exotic plants he was collecting. In particular, achieving proper taxonomic diagnosis of previously unknown species posed a significant difficulty, which is why Karo was sending already prepared specimens to botanists from Pest (Hungary), Prague and Vienna. These specimens were subsequently identified and send out primarily to European museums and university centres. Initially Karo was sending the specimens to L. Richter - a Hungarian botanist and herbarium-publisher. It was thanks to him that Karo got in contact with a Czech botanist Joseph Freyn who was identifying the specimens arriving in Budapest. A description of Karo's everyday summertime life can be found in a letter to Freyn [8]. He mentioned setting off for the exploration of neighbouring areas daily at 3 AM till Spetember, and returning to work by eight in the morning. He complained about ubiquitous

mosquitoes, describing his early-morning duties as literally "bloody". He explained he then had to steal time to go about his passion during the day. Freyn was disseminating outcomes of their co-operation by regularly (1889, 1890, 1895, 1896, 1901, 1902 and 1903) publishing lists of the identified species entitled *Plantae Karoanae* in the *Osterreichische Botanische Zeitschrift* journal [4],[5],[6].

At the same time Freyn was sending out Karo's herbarium sheets to the key centres of botanical research throughout Europe and beyond.

A description of Karo's concerns regarding both scientific and financial issues can be found in a letter to a Russian botanist Vladimir Leontyevich Komarov dated April 2² 1904 [2]. He acknowledged there with appreciation the usefulness of a book by Komarov which turned out to be an invaluable aid for his work on identifying the collected plants. Karo admitted the need for selling parts of his collection come from financial problems with keeping his large family. He mentioned sending a set of twelve thousand specimens for sale to Germany, while underlining that working for science was his very dream, in particular in context of studying flora of such an unexplored country.

Herbarium sheets prepared by Ferdynand Karo found their way to numerous European research institutions, and are kept to this date in herbaria in Warsaw, Cracow, Basel, Berlin, St. Louis (USA), Munich, Irkutsk, Chita, Kiev, Saint Petersburg, Genoa, Paris, Göttingen, Vienna, London (Kew), Leiden, Zurich, Lausanne and Florence [7].

Owing to the time and location of Karo's floristic studies, his herbaria are an invaluable source of information on the flora that had been subject to little anthropogenic influence. Moreover, the herbaria include numerous nomenclatural types of the new species and varieties identified by Karo. The vast number of specimens collected by Karo included 28 plant species not known by botanists at the time, eight of which bear Karo's name [3]:

- *Astragalus Karoi* Freyn,
- *Carex Karoi* Freyn,
- *Chenopodium Karoi* Aellen,
- *Euphorbia Karoi* Freyn,
- *Linum Karoi* Freyn,
- *Pedicularis Karoi* Freyn,
- *Saussurea Karoi* Freyn,
- *Rosa Karoi* Borbas.

A part of his heritage remains to this date in the Siberian cities of Irkutsk and Chita. These archival materials are yet to be studied in order to better reconstruct the course and coverage of Karo's exploration and to contribute to the knowledge on the history of Siberian flora. The importance of Karo's contributions to floristics implies placing his name among the most prominent researchers of the world's flora.

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