
SYSTEMATIC STUDY OF ARID TERRITORIES

F. A. Höfft's Caucasian Herbarium

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Abstract—The history of the botanical studies by F.A. Höfft in the northern Caucasus, as well as the location and size of storage of his herbarium collections and the means of their obtainment in different herbaria of Russia and Europe are outlined. It is established that the herbarium of F.A. Höfft, which is estimated at 7000–8000 samples (including the Caucasian section of 1800–2100 samples) is the most valuable botanical collection of the mid-19th century. Its value is underestimated by modern researchers, because the main researchers of the flora of the Caucasus had left Yuriev University by the beginning of the First World War, and a quarter of the herbarium collection was evacuated to the inner regions of Russia and returned to Tartu only in the mid-1950s. The publication of *Materials for the Flora of the Caucasus* should be resumed in order to return F.A. Höfft's Caucasian herbarium to scientific circulation.

Keywords: F.A. Höfft, flora of the northern Caucasus, herbarium of the University of Tartu

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INTRODUCTION

Among the botanists who studied the flora of the Caucasus, the name of Franz Andreevich Höfft (Franz M.S.V. Höfft) was undeservedly forgotten. There is no mention of him in the *Flora of the Caucasus* by Grossheim (1928–1934), nor in the recently published *The List of Flora of Caucasus (Konspekt..., 2003)*. Meanwhile, F.A. Höfft actively assembled a herbarium in the first half of the 19th century, mainly in the central part of the northern Caucasus. Among the plants he collected, there are taxa that were new to science (Kechaikin, 2017).

F.A. Höfft was born in 1797 in Prussia. He graduated from the Prussian Medical-Surgical Academy, after which he worked for two years in a military hospital. He then studied at the University of Berlin for three years, where he received the academic title of Doctor of Medicine and Surgery in 1819 (Shcherbakova, 1979). Like other doctors of that time, he had a good botanical training, since substances of natural (mainly plant) origin predominated in the pharmacopoeia until the end of the 19th century.

Höfft was invited to Russia in the early 1820s (his first herbarium collections here are dated 1822) as a personal physician to Count M.Yu. Vielgorsky.

In addition to his medical practice, Höfft began scientific studies. In particular, he carried out meteorological observations and assembled a herbarium. In

1823, Höfft received the Russian title of Doctor of Medicine, probably at Moscow University (Shcherbakova, 1979; Kartashev and Tsapko, 2017), joined the Moscow Society of Nature Experts as a nonresident member (Address-calendar..., 1824, p. 452, 457), and met the famous botanist Fyodor Kondratyevich Biberstein. In 1826, he published a book about plants in the Dmitriev district of the Kursk province (Hoefft, 1826), a short introduction to which was written by the famous botanist A. Bunge. The book became the first published synopsis of the local natural flora on the territory of central Russia (*Flora Srednei ...*, 1998).

In 1826, Höfft traveled to the region of the Caucasian Mineral Waters, but he left the following year to improve his medical knowledge in Europe. After his return, he was appointed a district doctor of the Pyatigorsk medical district in 1830 (Kartashev and Tsapko, 2017). In 1832, he received a promotion, becoming an inspector of the medical council of the Kuban region in Stavropol (Address-calendar..., 1833, p. 479; Kartashev and Tsapko, 2017).

The last time F.A. Höfft visited the northern Caucasus was in 1842, as the chairman of a commission to investigate the reasons for the disappearance of the Aleksandrovskoe mineral spring near Pyatigorsk (Polyakova and Chegutaeva, 2013). In 1844, he left for Berlin due to illness, where he died on May 26 of the same year (Shcherbakova, 1979).

Table 1. Chronological and geographical distribution of collections from F.A. Höfft's herbarium on the territory of the Caucasus and Ciscaucasia.

Place	Year							Total
	1826	1827	1832	1833	1842	1843	1844	
Pyatigorsk	1				1	1	21	24
Mashuk Mountain	16	1					22	39
Beshtau Mountain	2				2		5	9
Essentuki							1	1
Podkumok							4	4
Kislovodsk and Narzany			1		2		32	35
Georgievsk							6	6
Kislovsk-on-Terek							1	1
Mozdok							7	7
Kizlyar							3	3
Stavropol	1		7				44	52
Cherkassk*					4		7	11
Caucasus							11	11
Total	20	1	8	1	9	1	166	206

* Cherkassk (today, the village of Starocherkasskaya in the Aksai district of the Rostov region) was probably an intermediate point that F.A. Höfft visited during or on the return from the 1842 expedition.

Leaving for treatment, F.A. Höfft handed over his herbarium for storage to the director of the Petersburg Imperial Botanical Garden, Fyodor Abramovich Fisher, with whom he maintained close ties during the Petersburg period of his life (Shevchuk, 2011).

After Höfft's death, Fischer saw to labeling the herbarium. Unfortunately, the majority of the draft labels with collection dates was probably lost. There are three types of labels with varying degrees of detail indicating that the herbarium collections belong to F.A. Höfft (Fig. 1).

After the death of F.A. Fischer, his successors transferred his personal herbarium to the University of Derpt (later successively renamed as Yuryevsky and Tartu), where they have been kept to this day.

MATERIALS AND METHODS

In 2012–2020, we undertook a special search for Höfft's collections in the herbariums of Voronezh (VOR), Moscow (MW), and Tartu (TU) universities, as well as in the Herbarium of the Komarov Botanical Institute of the Russian Academy of Sciences (LE). In total, more than 50000 herbarium specimens were studied and about 1500 of Höfft's collections were found. Of them, 250 were of Caucasian origin, mainly from the arid foothill part of the modern Stavropol Territory.

RESULTS AND DISCUSSION

We examined 83 herbarium sheaves at the Herbarium Generale of TU, which is about 11% of this collection. A total of 815 collections were found, of which a quarter (204) originated from the Caucasus or Ciscaucasia. In light of the uneven distribution of collections by packs, the Höfft herbarium can be estimated to consist of approximately 7000–8000 collections, with 1800–2100 in the Caucasian section. Table 1 gives the chronological and geographical distribution of Caucasian herbarium collections.

Several conclusions can be drawn from Table 1.

1. Eighty percent of collections do not have any indication of the actual dates of collection (1844, as we noted earlier, is the year of F.A. Höfft's death).

2. Two collections have dates on which F.A. Höfft was not present in the Caucasus (1827 and 1843). In addition, the majority of the 11 collections indicated in the "Caucasus" line were made in the Transcaucasus, which Höfft had never visited. Perhaps these collections were received from F.K. Biberstein and Karl Antonovich Meyer, who repeatedly visited the Caucasus and with whom F.A. Höfft, according to some notes on labels in Tartu and other herbaria, exchanged herbarium samples.

3. Höfft collected most actively when he visited the Caucasus as a private person in 1826 and with an expedition in 1842. During the years of his work as an inspector of the regional medical council, especially as a district doctor, there were significantly fewer opportunities for herborization.



Fig 1. Samples of F.A. Höfft's labels (photo by O.S. Grinchenko).

About half of the collections from the Caucasian herbarium of F.A. Höfft are cited in the studies of Kuznetsov et al. (1901–1916), but this work remained unfinished.

Several hundred of Höfft's collections are kept in the Herbarium of the LE. They primarily arrived together with collections of other botanists. Thus,

when discussing the collections from Höfft's herbarium kept in the Herbarium of the TU, we indicated that he exchanged samples with F.A. Biberstein and K.A. Meyer.

In 1837, Höfft transferred a significant amount of herbarium collections to Meyer: they are regularly found in various taxonomic groups in the sectors of

eastern Europe and the Caucasus. Moving from TU to the St. Petersburg Botanical Garden in 1895, Ivan Gustavovich Klinge took with him the majority of the herbarium collections of Orchidaceae from eastern Europe and the Caucasus, as well as some other collections.

Five herbarium collections belonging to two species are kept in the historical fund of the B.M. Kozo-Polyansky Herbarium of VOR. In 1915, when German troops were approaching Riga, it was decided that the TU herbarium would be evacuated to the inner regions of the Russian Empire. In pursuance of this decision, about a quarter of the herbarium was removed, but then the evacuation was stopped and the majority of the collection remained in Tartu (*Istoriya ...*, 1972).

In 1920, these evacuated collections, together with the herbariums of the Voronezh provincial zemstvo, the Stone-Steppe Experimental Station, and the personal herbarium of B.M. Kozo-Polyansky served as the basis for the creation of the Herbarium of VOR (Agafonov et al., 2015). In the summer of 1942, this herbarium was captured by German troops and sent to Berlin. There, it happily escaped destruction on the night of March 1–2, 1943, when the Berlin-Dahlem Botanical Museum was destroyed in an air raid (Pilger, 1953; Hiepkö, 1987). In 1945, the Voronezh collections were found and repatriated to the Botanical Institute of the Academy of Sciences of the Soviet Union in Leningrad (Kozo-Polyansky, 1945). In the mid-1950s, the repatriated herbarium was divided between the TU, the Botanical Institute of the Academy of Sciences of the Soviet Union, and VOR. However, about 1% of the collections did not end fulfilled their intended purpose (Shcherbakov et al., 2017).

Several sheets of Höfft's Caucasian herbarium are kept in the Syreishchikov Herbarium of MW. Shvedchikova (2006) noted the presence of such collections with stamps of the Botanical Garden of Yuryev University from the territory of the northern Caucasian and Dagestan regions. However, these collections were not submitted to the herbarium as a separate collection (Nazarov, 1939). They probably came to MW as part of the collection of some other botanist.

There is reason to believe that some of the Caucasian collections of Höfft (probably several hundred sheets) are kept in herbaria in western Europe. Approximately one third of Höfft's herbarium collections in the Herbarium of TU are of western European origin.

The dates indicated on the majority of labels for these collections do not coincide with Höfft's stay in western Europe. Many herbarium sheets expressly indicate that they were received from Nicolas-Charles Serenge, who was the director of the Lyon Botanical Garden in France in 1830–1858. Many herbarium collections were collected by F.A. Höfft from the Botanical Gardens in Montpellier (Languedoc, Southern France), Berlin Botanical Gardens, and sev-

eral other places. Although F.A. Höfft was a wealthy person, there is reason to believe that at least some of these materials were received by him in exchange for his collections, including Caucasian collections.

CONCLUSIONS

Thus, F.A. Höfft's herbarium, including its Caucasian section, is the most valuable botanical collection of the mid-19th century, and its value is underestimated by modern researchers who study vegetation cover. To a large extent, this happened due to the fact that the main researchers of the flora of the Caucasus (N. Kuznetsov, N. Bush, and A. Fomin) left Yuryev University during the First World War or prior to it. The herbarium was divided into two parts between two countries and was reintegrated only after 40 years. It was probably only by a miracle that this herbarium was completely preserved during the Second World War. In order to return the Caucasian herbarium of F.A. Höfft and a number of other collections stored at TU to scientific circulation, it is advisable to resume the publication of *Materials for the Flora of the Caucasus*, which was interrupted more than a century ago.

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COMPLIANCE WITH ETHICAL STANDARDS

Conflict of interest. The authors declare that they have no conflicts of interest.

Statement on animal welfare. This article does not contain any studies involving animals performed by any of the authors.

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