Tatyana Yakovlevna Serebryakova: a forgotten hemp expert

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Tatyana Yakovlevna Serebryakova (1893-?) conducted taxonomic research on Cannabis sativa L. for 20 years. She published important papers and a book on the subject. Next to every great man stands a great woman, and Serebryakova was Vavilov’s hemp expert. Yet her biography has never been written, and many details are lost. We have reconstructed her history based on historical archives, her publications, and herbarium specimen labels. Highlights of her scientific contributions are presented.

Key words: Cannabis sativa, taxonomy, nomenclature.

Introduction

Research on Cannabis sativa by Tatyana Yakovlevna Serebryakova has been cited by many researchers in Russia, Western Europe, and the United States. Her specimens of Cannabis sativa L. can be found in such herbaria as VIR (held by the N.I. Vavilov All-Russian Institute of Plant Genetic Resources, VIR) and LE (maintained by the Komarov Botanical Institute of the Russian Academy of Sciences). Yet not even her name is known for certain.

Vavilov (1926) first gave her name as “Zinserling-Serebryakova”. The name appearing on her first research publication is “Serebryakova (Zinserling)” (Fig. 1, A). A year later, Vavilov and Bukinich (1929) cited the work of “T. Ya. Serebryakova” and Serebryakova (1929) published a book on hemp. Serebryakova-Zarina (1933) wrote about Anatolian hemp (Fig. 1, B). The authorship on her final publication was Serebryakova and Sizov (1940). A collection of Vavilov’s correspondence identified her as “Serebryakova (Zarina) Tatyana Yakovlevna (1893-?)”, an employee of VIBiN (Editor’s note: the All-Russian Institute of Applied Botany and New Crops; from 1930, the All-Russian Institute of Plant Industry), a hemp expert” (Nikolai Ivanovich..., 1997, p. 571).

Biography

The Archives of St. Petersburg have information about Tatyana Yakovlevna and her family. She was born in August 1893, in Saratov, nationality Velikorus. Her father, Yakov Aleksandrovich Serebryakov, was a hereditary honorary citizen, then an employee. Yakov Aleksandrovich was the head of the city pawnshop of Saratov, and one of the most famous activists of the municipal lending movement. He was invited to St. Petersburg as the manager of the St. Petersburg city pawnshop. He served as director of the city pawnshop in St. Petersburg from 1902 to 1913 and was the author of several published works on the activities of urban pawnshops in Russia. He was married twice. From the first marriage, two children were born (only know about one child: daughter – Tatyana Yakovlevna). He died in 1913, when Tatyana Yakovlevna was 20 years old.

Her mother, Aleksandra Vasilyevna Ostrogloyazova (after her marriage, Aleksandra Vasilyevna Serebryakova), was the daughter of a merchant, a housewife, two children. The Serebryakovs left the city of Saratov in connection with the transfer of Yakov Aleksandrovich to a new place of service in St. Petersburg. The house in Saratov was sold in 1916.

Tatyana Yakovlevna attended the Women’s Gymnasium of Emilia Pavlovna Schaffe in St. Petersburg, graduated with a medal (1913). Her languages included German, French, English, Italian. She studied at the Stetobot Higher Women’s Agricultural Courses (St. Petersburg), but only three years out of four. She did not graduate for family reasons, the death of

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her father and a disastrous position. According to the statement of Serebryakova herself, she began to live on her own since 1915.

From 1915 to 1918 she worked in various institutions: the Stebutov Higher Women’s Agricultural Courses, the Botanical Museum of the Imperial Academy of Sciences [Editor’s note: from 1917, the Russian Academy of Sciences], the Department of Land Improvements. At the end of 1918 she entered the service as a senior technician of the Department of Animal Science in the Agricultural Scientific Committee. At the beginning of 1919 she held the post of a senior technician, then a laboratory assistant at the Department of Applied Botany [Editor’s note: from 1924, the All-Russian Institute of Applied Botany and New Crops, VIPBiNK; after 1930, the All-Russian Institute of Plant Industry, VIR], then headed by R. E. Regel.

The Department of Land Improvements sent an expedition to Russian Turkestan in 1915–1916 to study the vegetation of the Chuy Valley. At the Vasilyevka site [Editor’s note: the village of Vasilyevka is now in the Republic of Kyrgyzstan], the herbarium of the Botanical Museum (https://ru.m.wikipedia.org/wiki/Васильевка_Юрьевич_Дмитриевич). He would later publish a study on the flora of the Arctic northwest (Zinserling, 1925, 1934). [Editor’s note: Beginning from 1924, Yury Dmitrievich was a research scientist of the Geobotany Department at the Botanical Institute; after 1934, the head of the Geobotany Department; after 1935, a consulting scientist at the Cola station of the USSR Academy of Sciences].

Tatyana Yakovlevna presumably took his name (a family name of German origin, so it had no Russian female ending). Zinserling (1925) studied the Arctic flora, while Serebryakova (Zinserling) (1927/1928) studied the Arctic l mor -

Hemp research

Vavilov (1926) stated that Zinserling-Serebryakova worked in his Saratov laboratory. She grew experimental crops of wild and cultural hemp, and she studied the variety of forms. Perhaps she first noticed wild hemp in the Chuy Valley. Today, it is the Chuy Valley where the world’s largest wild Cannabis population grows. Indigenous people say that it has always been there (Nikitin, 2014).

In 1921, after R. E. Regel’s death, Nikolai Vavilov was appointed to lead the Department of Applied Botany in Petrograd [Editor’s note: as St. Petersburg was renamed in 1914]. He departed Saratov University for Petrograd. At first, Serebryakova stayed in Saratov. A letter from Dmitry Erastovich Yanishevsky in Saratov, dated June 6, 1923, stated “There is little work on hemp with us, T. Ya. Zinserling is working, but I am not satisfied with her work” (Scientific legacy, 1980). It is worth noting that Yanishevsky and Vavilov competed for priority regarding the nomenclature of wild hemp, naming it Cannabis ruderalis and Cannabis sativa var. spontanea, respectively.

Soon Serebryakova left Saratov. Herbarium labels from 1925 indicate that she grew Cannabis germplasm collected by Vavilov and others at Pushkin (Detskoeye Sel’o) Experiment Station near Leningrad [Editor’s note: as Petrograd was renamed in 1924] and the Steppe Experiment Station in Voronezh Province (Kamennaya Steppe), founded by the Bureau of Applied Botany. She also processed Cannabis specimens grown by her colleagues in Kharkiv (Ukraine), Maikop (Krasnodar Territory) and Shatilo Experimental Station (Orel Province).

Colleagues who sent Cannabis specimens included E. N. Sinskaya (from Altai and Semipalatinsk Province), An- tropova (from Saratov), Chernyakovskaya (from Transcaspian Province), Paskevich (from Azerbaijan), and P. M. Zha- kovsky (from Turkey). Vavilov’s Cannabis specimens came from many places: Saratov, Romania, Persia, Afghanistan, Turkestan, Italy, Morocco, even the USA. Herbarium labels indicate that Serebryakova herself collected Cannabis in Moscow, Arkhangelsk Province, Udmurtia, Komi Republic, Krasnodar Territory, Crimea. Some of these herbarium labels do not have her signature, but her handwriting is recognizable.

Data in her publications (Serebryakova (Zinserling), 1927/1928, 1929 in the list of references; Serebryakova, Sizov, 1940) indicate that she examined Cannabis from many other places, but specimens did not survive. Vavilov explored Afghanistan for five months in 1924. He collected germplasm from cultivated and wild-type Cannabis. Serebryakova evaluated the plants in a common field experiment. Vavilov and Bukinich (1929) published her results, including a table of morphological characters (plant height, length of leaves, number of leaflets per leaf, and 1000 seed weight). Photographs of the herbarium specimen of C. indica var. kafiristanica prepared by Serebryakova appear in several publications (Vavilov, Bukinich, 1929; Small, Cronquist, 1976; McPartland, Guy 2017; McPartland, Small, 2020). It may be the most frequently photographed Cannabis herbarium specimen (Fig. 2).

Based on her studies of Cannabis from around the world, Serebryakova (1929) published an 84-page monograph entitled “Konoplya” [Editor’s note: Hemp]. As early as in the author’s preface Serebryakova pointed out that cultivated hemp was present within Cannabis sativa L. as well as within C. indica Lam. As far as the former species is concerned, no varieties were reported, but for C. indica the varieties identified by Vavilov were mentioned: var. cultura Vav. (cultivated), and the wild ones, var. aghanica Vav. and var. kafiristanica Vav. The main focus of this work was the production qualities of hemp, its utilization, its processing features, cultivar-specific studies, breeding, and standardization of cultivars. Hemp processing practices were described, plus the damage inflicted on hemp by pests. A detailed discussion was dedicated to the distribution of this crop, supported by original maps of hemp cultivar acreage in the European part of Russia. Botanical descriptions were provided using the original drawings from life made, as a rule, by A. Naftulina. The following geographic types of cultivated hemp were identified on the basis of the studied plant characters: 1. Common hemp cultivated for
rested in July 1938, and died in November 1939, presumably in a pretrial detention cell [Editor’s note: He was exonerated in 1957]. Her co-author Ivan A. Sizov (1900–1968) “began energetically to liquidate the remnants of Vavilov traditions” (Medvedev, 1969). No articles by Vavilov were cited. In Serebryakova and Sizov (1940) Vavilov disappeared from the taxonomy of Cannabis: the taxon C. sativa var. spontanea Vav. was raised to the rank of subspecies, without naming the basionym by Vavilov. Vavilov’s taxa for Afghan plants were omitted – C. indica f. afghanica and C. indica var. kafirstanica (Fig. 3).

The publication by Serebryakova and Sizov (1940) for Cultivated Flora is excellent, and profusely illustrated. For example, the illustration of wild-type versus domesticated fruit phenotypes, in plants from Afghanistan and Southeast Europe (see Fig. 3), Serebryakova collaborated with the artist M. P. Lobanova.

Serebryakova emended the description of C. sativa L., and provided an excellent synonymy, having analyzed the history of species and cultivar studies by the end of the 1930s. The species was divided into subspecies culta Serebr. (domesticated) and subspecies spontanea Serebr. (wild-type). She reported the distribution of wild-type plants recorded by V. S. Semenov, B. A. Keller, A. A. Khrebtov, E. N. Sinskaya, O. E. Kioring, Z. A. Minkvits, V. L. Komarov, K. I. Maksimovich, D. I. Litvinov, V. E. Pisarev. We see microscopic comparisons of pollen from Middle Russian hemp versus Italian hemp, and histological sections of stalks. A detailed scheme of variability is presented for the main plant characters. Leaf variation is illustrated. Data are provided concerning cytology, genetics, anatomical and chemical analysis of stalks. The most important cultivars and their features are discussed. She summarized the breeding research by N. N. Gridshko, L. H. Dewey, and O. Bredemann.

Serebryakova created a Cannabis taxonomy unsurpassed in complexity, which was built on Vavilov’s classification system. The authors themselves stated that the taxonomy was based “…on a set of morphological and biological characters, most of which have environmental and geographic natures” (Serebryakova, Sizov, 1940, p. 7). Geographic distribution is shown for representatives of the genus. A key was developed to identify spp. C. sativa (L.) Serebr. (emend.) and C. indica (Lam.) Serebr. (emend.), and another key for subsp. culta and subsp. spontanea. In her publication of 1940, Serebryakova divided C. sativa subsp. culta into four groups: three groups of fiber-type plants (North European, prolo borealis; Central European, prolo mediorathercula; and Southern hemp, prolo australis), and three types of drug-type plants (var. narcotica Serebr., var. narcotica f. flavo-viridis Serebr., var. sub-narcotica Serebr.). She classified C. sativa subsp. spontanea into four varieties, or forms. Each of the three groups of fiber-type plants was divided into three to seven varieties. All in all, she identified 15 varieties and five forms within C. sativa. All the varieties are described morphologically, and with geographic distributions. The weakness of her system is the brief treatment of Cannabis indica. Compared to the complexity of C. sativa, Serebryakova recognized only one unique form, C. indica f. monstruosa Serebr. In comparison, de Can-

1 Note: The figure legend is taken from the original publication by Vavilov and Bukinich Agricultural Afghanistan (1929, p. 380), which was not cited (typographical errors corrected). Left to right: 1. From Northern Afghanistan – cultivated (Cannabis sativa L.) is grown for the sake of “anaiza”; 2. Common Russian Orlov hemp; 3. Wild hemp of Saratov Province – Cannabis sativa var. spontanea Vav. (= Cannabis ruderalis [lancehew.]); 4. Cannabis indica var. kafirstanica Vav.; 5. Cannabis indica f. afghanica Vav. The upper row enlarged 6 times, the lower row showing the bases of achenes enlarged 10 times.
Fig. 3. The original legend to the figure with hemp achenes in Cultivated Flora:
“Fig. 8. Seeds of different geographic races of hemp: 1 – Afghanistan, large-sized; 2 – Orel Province; 3 – Northern Caucasus, wild; 4 – Kafiristan, wild; 5 – Afghanistan, cultivated; enlarged: upper row – 6 times, lower row – 10 times (Orig.)”
(Serebryakova, Sizov, 1940, p. 13)

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Dolde (1869) recognized two subvarietal forms, and Dewey (1914) recognized four. Serebryakova recognized the mentioned wild-type plants (“in Kafiristan”), but did not assign taxonomic names to them.

Serebryakova’s taxonomic scheme was adopted by others (Scholz, 1957; Clarke, 1987), sometimes without citing her (Schultes et al., 1974; Böcsa, Karus, 1998). Small and Cronquist (1975) called Serebryakova’s taxonomic system a “quasi-formal treatment that appeared to provide a useful, if artificial, guide to cultivars”. De Meijer (1995) updated Serebryakova’s system.

Then Tatyana Yakovlevna disappeared from the historical record. She may have died during the Leningrad siege (September 1941 – January 1944). We do not even have a photograph of her. We hope this brief article brings her work to a wider audience.

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