

Tatyana Yakovlevna Serebryakova: a forgotten hemp expert

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**Татьяна Яковлевна Серебрякова:
забытый знаток конопли**

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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.

Татьяна Яковлевна Серебрякова (1893-?) в течение 20 лет проводила таксономические исследования вида *Cannabis sativa* L. Она опубликовала важные статьи и книгу по этой теме. Рядом с каждым великим мужчиной находится место для великой женщины: так и Серебрякова стала для Николая Ивановича Вавилова источником знаний о конопле. Однако ее биография никогда не была написана, а многие детали уже утрачены. Мы реконструировали ее историю на основе исторических архивов, ее публикаций и этикеток с гербарных образцов. Представлены основные моменты ее научного вклада.

Ключевые слова: *Cannabis sativa*, таксономия, номенклатура.

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 WIR (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 VIPBiNK [*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 Ostroglazova (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 Stebutov Higher Women's Agricultural Courses (St. Petersburg), but only three years out of four. She did not graduate for family reasons, the death of

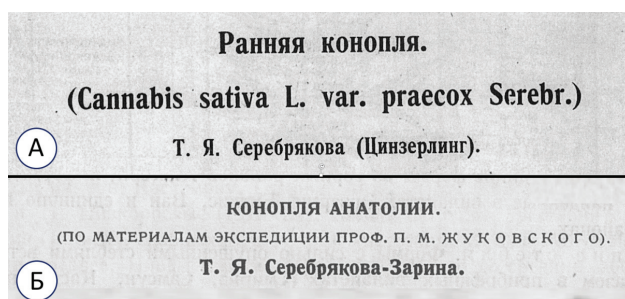


Fig. 1. Different names in the titles of publications:
A - Serebryakova (Zinserling) (1927/1928);
B - Serebryakova-Zarina (1933)

Рис. 1. Разные имена в заголовках публикаций:
A - Серебрякова (Цинзерлинг) (1927/1928);
B - Серебрякова-Зарина (1933)

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], botanists included Yu. D. Zinserling and T. Ya. Zinserling (Abolin, 1930; Nikitina, 1958). The Central Asian revolt ended the expedition *prematurely*. Nevertheless, herbarium specimens collected by Yu. D. and T. Ya. Zinserling can be found in the LE herbarium, and these collections are cited in various flora. "Yu. D. Zinserling" is most likely Yury Dmitrievich Zinserling (1894–1939). He was a botanist, studied at St. Petersburg University from 1912 to 1920. At the same time he worked in the herbarium of the Botanical Museum (https://ru.m.wikipedia.org/wiki/Цинзерлинг,_Юрий_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 hemp. The LE herbarium contains a specimen of *Cannabis sativa* marked "Zinserling and Serebryakova", collected near Lipovsky, Arkhangelsk Province. Not a single specimen in the VIR herbarium has the name "Yury Dmitrievich", and his name does not appear together with "Serebryakova (Zinserling) (1927/1928)". In the annals of St. Petersburg Central Archives of Scientific and Technical Documentation there is information (documents dated 1922) about Tatyana Yakovlevna Zinserling: she is an employee of the Agricultural Scientific Committee (SKhUK). From 1926 to 1936 she is listed in the staff records as "ZARINA, TATYANA YAKOVLEVNA". Since 1919, Tatyana Yakovlevna's labor activity has been associated with VIR.

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 (Detskoye Selo) 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 Shatilovo Experiment Station (Orel Province).

Colleagues who sent *Cannabis* specimens included E. N. Sinskaya (from Altai and Semipalatinsk Province), Antropova (from Saratov), Chernyakovskaya (from Transcaspiian Province), Paskevich (from Azerbaijani), and P. M. Zhukovsky (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. *culta* Vav. (cultivated), and the wild ones, var. *afganica* 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



Fig. 2. Type specimen prepared by Serebryakova (VIR): *Cannabis indica* Lam. var. *kafiristanica* Vav.

Рис. 2. Типовой образец, подготовленный Серебряковой (ВИР): *Cannabis indica* Lam. var. *kafiristanica* Vav.

both fiber and seeds – A. European: type a: Early northern; type b: Central Russian, common; type c: Italian cultivars; B. East Asian: type a: Maritime; type b: Japanese; type c: American cultivars; type d: Chinese hemp cultivars; 2. Indian, or hashish hemp: type a: Indian hemp; type b: hems from Central Asian republics.

Serebryakova-Zarina (1933) evaluated 81 accessions of *Cannabis* from across Anatolia, collected by P. M. Zhukovsky. She classified them into six types, and mapped their geographic locations. Characters included stem height, stem width, stem branching, inflorescence height, seed size, seed weight, and a chemical measurement: percentage of oil in seeds.

In July 1936, Tatyana Yakovlevna was dismissed due to staff reduction. The era of Lysenko had just begun, with its persecutions targeted at geneticists and Vavilov himself. Four years remained until his arrest. Vavilov personally dismissed key staff that he wanted to protect, such as Evgenia Nikolaevna Sinskaya (1889–1965), another hemp researcher (Sinskaya, 1925). “Evgenia Nikolaevna almost burst into tears when she saw herself on the lists of those dismissed” (Filatenko, 2009). “Only a few months later, we realized that with this order N. I. had saved our lives,” added Evgenia Nikolaevna.

Tatyana Yakovlevna was not done working, and her best publication was yet to come: Serebryakova and Sizov (1940). The last few years must have been difficult. Vavilov was arrested (in August 1940). The Kamennaya Steppe Station was shut down. Her former husband, Yuri Dmitrievich, was ar-

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. *kafiristanica* (Fig. 3)¹.

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. Kiorring, 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. Grishko, 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, prol. *borealis*; Central European, prol. *medioruthenica*; and Southern hemp, prol. *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. *monstrosita* 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 “anasha”; 2. Common Russian Orlov hemp; 3. Wild hemp of Saratov Province – *Cannabis sativa* var. *spontanea* Vav. (= *Cannabis ruderalis* Janishew.); 4. *Cannabis indica* var. *kafiristanica* Vav.; 5. *Cannabis indica* f. *afghanica* Vav. The upper row enlarged 6 times, the lower row showing the bases of achenes enlarged 10 times.

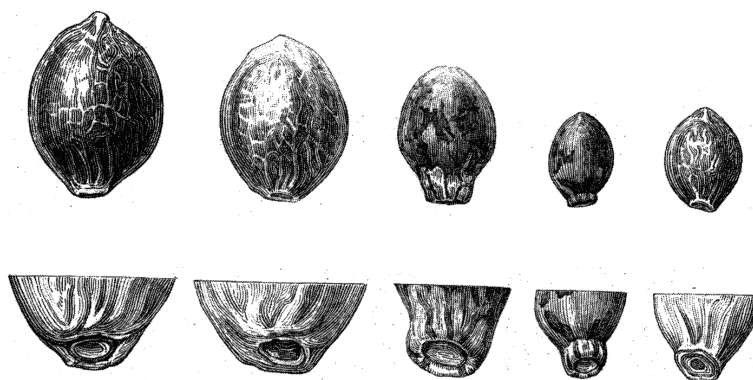


Fig. 3. The original legend to the figure with hemp achenes in *Cultivated Flora*:

“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)

Рис. 3. Оригинальная подпись к рисунку плодов конопли в «Культурной флоре»: «Рис. 8. Семена различных географических рас конопли: 1 – Афганистан, крупная; 2 – Орловская область; 3 – Северный Кавказ, дикая; 4 – Кафиристан, дикая; 5 – Афганистан, культурная; увеличено: верх – в 6 раз, низ – в 10 раз (Ориг.)»
(Serebryakova, Sizov, 1940, p. 13)

dolle (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; Bócsa, 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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