https://doi.org/10.17816/ecogen19140

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Cite this article as: Inge-Vechtomov SG. N.I. Vavilov, "VIR", University. *Ecological genetics*. 2020;18(1):5-10. https://doi.org/10.17816/ecogen19140.

Received: *26.01.2020* Revised: *30.01.2020* Accepted: *19.03.2020*

❀ Contacts between N.I. Vavilov (VIR) and Yu.A. Filipchenko (Dept. of Genetics, Leningrad State University) reflect close interaction of science and education in fundamental and applied genetics at the first halve of XX century. This interaction put the basis for the future Institute of Genetics of the USSR Academy of Sciences, the first director of which became N.I. Vavilov at 1933. 1932 by Vaviliv's initiative there had been organized Dept. of Plant Genetics in the University under leadership of Karpechenko. Müller and Bridges had been teaching in the University being invited by Vavilov in Institute of Genetics. The revival of genetics in the University at 50-s of XX century, after lysenkoism period, proceeded under the influence of Vavilov even perished 1943 in prison. The role of Lobashev and Feodorov in those events is evident.

❀ **Keywords:** Vavilov; Filipchenko; Karpechenko; genetics; VIR; Leningrad State University; Institute of Genetics; Müller; Bridges; Lobashev; Feodorov.

Н.И. ВАВИЛОВ, ВИР, УНИВЕРСИТЕТ...

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Для цитирования: Инге-Вечтомов С.Г. Н.И. Вавилов, ВИР, университет... // Экологическая генетика. – 2020. – Т. 18. – № 1. – С. 5–10. https://doi.org/10.17816/ecogen19140.

Поступила: *26.01.2020* Одобрена: *30.01.2020* Принята: *19.03.2020*

❀ Контакты Н.И. Вавилова (ВИР) и Ю.А. Филипченко (кафедра генетики Ленинградского ГУ) отражают тесное взаимодействие науки и образования в фундаментальной и прикладной генетике в первой половине XX в. Это сотрудничество заложило основы будущего Института генетики АН СССР, первым директором которого стал Н.И. Вавилов в 1933 г. По его инициативе в университете была организована кафедра генетики растений (1932 г.), которую возглавил Г.Д. Карпеченко. В университете преподавали Г. Мёллер и К. Бриджес, приглашенные Вавиловым в Институт генетики. После лысенковщины возрождение генетики в университете в 50-е гг. XX в. происходило под влиянием идей Вавилова, погибшего в 1943 г. в заключении. В этих событиях несомненны роли Лобашёва и Фёдорова — в прошлом сотрудников Вавилова и Карпеченко.

❀ **Ключевые слова:** Вавилов; Филипченко; Карпеченко; генетика; ВИР; Ленинградский ГУ; Институт генетики; Мёллер; Бриджес; Лобашёв; Фёдоров.

Celebrating the 125th anniversary of the N.I. Vavilov All-Russian Institute of Plant Genetic Resources (VIR) in 2019, alongside the 100th anniversary of its senior institution – the Department of Genetics and Biotechnology of SPBU – emphasizes the significant symbolic link between these research institutions. This link was established by two outstanding biologists of the first half of the 20th century – N.I. Vavilov (Fig. 1) and Yu.A. Filipchenko (Fig. 2) – through their scientific interests and contributions to the development of genetics and genetic education.

It is fitting that the First All-Union congress of geneticists and breeders, held on January 10th 1929 in Leningrad, was opened with the reports of N.I. Vavilov ("Problem of origin of the cultivated plants and animals in modern understanding") and Yu.A. Filipchenko ("Problem of the gene"). It was an important event that not only reflected the close ties between these scientists but also the value of their work in the area of fundamental and applied biology. N.I. Vavilov collaborated closely with Yu.A. Filipchenko, the founder and head of the first department of genetics in our country (formerly

Fig. 1. N.I. Vavilov (1887–1943)

Fig. 2. Yu.A. Filipchenko (1882–1930)

Fig. 3. Yu.A. Filipchenko at the test field of Peterhof natural sciences institute

known, from 1919, as the Department of Genetics and Experimental Zoology of Leningrad University). The wide range of Yu.A. Filipchenko's interests in the genetics of animals and plants became the basis for training the first employees of N.I. Vavilov at the University, continuing until the death of Yu.A. Filipchenko in 1930.

N.I. Vavilov had links with our city (beginning with an internship under supervision of R.E. Regel in 1911 at the Petrograd Bureau of Applied Botany and Breeding) and with teaching genetics and breeding in Saratov, where from 1918 he was a professor at Saratov Agricultural Institute and the Head of the Department of Arable Farming and Genetics. This institute shortly became part of Saratov University in the form of the Department of Agriculture. It was here that Vavilov presented his Law of homology in inherent variation, in 1920 [1, 2].

It is therefore natural that Vavilov, being the head of the Department of applied botany and breeding in our city since 1921 (known from 1924 as the All-Union Institute of applied botany and new crops, and since 1930 as VIR), established close contact with Yu.A. Filipchenko and the Department of genetics and experimental zoology of Petrograd University, established by the latter in 1919. Indeed, it was with Filipchenko that Vavilov discussed plans to establish VIZh (similar to VIR).

The concurrence of the scientific interests of these two outstanding scientists in relation to the genetics of plants is interesting. Despite the fact that Filipchenko's department was called "Genetics and experimental zoology", Filipchenko actively developed the field of plant genetics, especially after 1920 when PENI (Peterhof natural sciences institute) was established at the University, with Filipchenko becoming its first academic secretary. He arranged test fields where experiments in plant genetics were performed, particularly with wheat (Fig. 3). It was here that Filipchenko created the well-known Peterhofka variety of wheat. Another result of the work was the monograph "Genetics of soft wheat" in the plants genetics. This was published in 1934 after the death of Filipchenko in 1930, having been co-authored with one of his first students – T.K. Lepin [3].

In our country, the study of genetics developed a little bit later than in Western countries, but advanced rapidly. This was promoted by the wide international contacts of domestic genetic scientists. The photo made at PENI in 1925 during the celebration of the anniversary of the USSR AS (Fig. 4) shows the meeting of Vavilov and Filipchenko with the greatest geneticists of that time.

The cooperation and interaction between Vavilov and Filipchenko was crucial in the process of establishing the Institute of Genetics of the USSR AS. This started with the report, on February 14th 1921, of Yury Aleksandrovich Filipchenko, professor of Petrograd University, at the meeting of the Council of KEPS – Committee on the natural productive forces of Russia. In the report he justified the need for establishing the Bureau of eugenics in Petrograd. The influence of N.K. Koltsov, who promoted eugenics in Moscow, was obvious. The Council decided to "arrange the Bureau of eugenics at the

KEPS and authorize the board to work out the issue of expenses" (cit. ex: Konashev, 1994 [4]). The word "eugenics" caused mixed feelings. Comments regarding the term and field-specific topics of the future Bureau were made at the meeting. In particular, the minutes of the meeting state: "expansion of the topics in terms of studying inheritance in the wild nature in general rather than only inheritance in humans is desirable". The comment was made by botanist I.P. Borodin. The works of N.I. Vavilov were referenced as examples. The rational approach taken to resolve the issue should be noted: first, the decision was taken to create an institution for the study of genetics; and second, it was agreed that future work would not concentrate solely on human genetics, thereby avoiding the association with eugenics. It should be noted that the development of the Bureau of eugenics proceeded in exactly this way.

During its life, the Bureau was renamed several times: the first time, in 1925, it became the "Bureau of genetics and eugenics"; the second time, in 1929, it was renamed the "Bureau of genetics"; and the third time, in 1930, (the year of Filipchenko's death) it was shaped as an individual institution due to the rearrangement of the USSR AS and became known as the "Laboratory of genetics of the USSR AS".

Obviously starting from 1925, thanks to the influence of N.I. Vavilov, the Bureau of genetics and eugenics paid more and more attention to the genetics of animals, namely, to the study of small and bovine cattle and their wild relatives. Together with the department, several expeditions related to livestock (cattle-breeding) were arranged to Kazakhstan, Turkmenia, and Mongolia among others. This was in line with expeditions arranged by N.I. Vavilov. The future head of the department of genetics and breeding of LSU, M.E. Lobashev, who was then a student, and later a postgraduate scholar in the department of genetics, participated in the last of these livestock expeditions in 1935 [2].

In 1930, the Laboratory of genetics of the USSR AS was headed by N.I. Vavilov, and in 1933 he rearranged the Laboratory into the Institute of genetics of the USSR AS, which moved to Moscow in 1934. Currently, this is the N.I. Vavilov Institute of General Genetics of RAS. After the Institute of genetics of AS moved to Moscow in 1934, Leningrad no longer had a genetic institution within the Academy of Sciences.

Fig. 4. Left to right: top row – W. Bateson, O. Vogt, H. Federley, bottom row – N.I. Vavilov, Yu.A. Filipchenko, V.A. Dogel, I.I. Sokolov (Peterhof scientific institute of LSU, 1925)

While Vavilov was the Director of the Institute of genetics in Moscow, he also headed VIR in Leningrad until 1940, when he was put under arrest. Let's remember that M.E. Lobashev, the graduate of the department headed by A.P. Vladimirsky after the death of Filipchenko, started working at the Institute of genetics (when it was in Leningrad).

It should also be noted that Vladimirsky was a supporter of the inheritance of acquired characters. This probably affected the development of events around genetics at the University. In 1932 Vavilov initiated the establishment of an additional department of genetics at Leningrad University – the Department of plant genetics. He recommended his young (33 years old) but well-known employee, G.D. Karpechenko, already highly regarded for his work on plant hybridization [5] (Fig. 5), to head the department. Karpechenko did so until his arrest in 1941, soon after which he was shot dead; preceding Vavilov who died in prison in Saratov in 1943.

Let's go back to 1930s. This was a short but very vibrant period for N.I. Vavilov who was interacting with both departments of genetics at LSU. Thanks to his invitation, K. Bridges (Fig. 6) and the future Noble Prize Winner (1946) G.J. Müller (Fig. 7) worked at the Institute of genetics [6]. Müller conducted experimental work at the Institute of genetics and read the course of lectures on genetic analysis of *Drosophila* at the University for the students of both departments of

Fig. 5. G.D. Karpechenko (1899–1942)

Fig. 6. K. Bridges (1889–1938)

Fig. 7. G.J. Müller (1890–1967)

genetics. Müller's research group included employees of the by then deceased, Filipchenko: M.L. Belgovsky, Yu.Ya Kerkis, N.N. Medvedev, A.A. Prokofyeva, R.L. Berg, and others.

The role of G.J. Müller in the story deserves particular mention. In 1933 he became the corresponding member of the USSR AS, but in 1948 rejected his membership in protest against persecution of geneticists in the USSR. This resulted in his exclusion from the USSR AS in 1949, a title that he eventually recovered in 1990.

In 1932 M.E. Lobashev graduated from the Department of the genetics of animals (Fig. 8) and was enrolled for postgraduate study at LSU, being at that time a junior researcher at the Institute of genetics. It was there that M.E. Lobashev met N.I. Vavilov and was absolutely charmed by him. Lobashev there got in touch also with "the best drosophilists in the world", as he called G.J. Müller and K. Bridges.

The impact that N.I. Vavilov had on events at the University continued even after his tragic death. Following the session of the All-Union Academy of Agricultural Sciences n.a. Lenin (VASHNIL) in 1948 both University departments of genetics were fused into the Department of genetics and breeding, headed by N.V. Turbin. The personality of this individual, who wrote the textbook of Michurin's genetics in 1950, can be evaluated in different ways. One characteristic is, however, most telling. Being the head of the department of genetics and breeding, N.V. Turbin kept close watch of his students, and would call up someone and give them a list of references for recommended reading in the Gorky library (at the University). The list would invariably include the works of Mendel, Morgan, Johannsen and other "reactionary" genetic scientists (Personal information of L.A. Alekseevich) [2].

A final fact of this history remains. During the process of spreading Michurin's (Lysenko's) biology at the department of genetics and breeding, a new lecturer appeared in 1948 – V.S. Fedorov (Fig. 9) – who had previously worked in the Leningrad agricultural institute. This was probably a lapse in vigilance of the policy makers. V.S. Fedorov was a previous employee of N.I. Vavilov and G.D. Karpechenko, and taught genetics to the postgraduates of VIR and at the All-Union courses of advanced training arranged by N.I. Vavilov. V.S. Fedorov read the course of lectures at LSU on "criticism" of the chromosome theory of inheritance. Based on the belief that "in order to debate, one needs to know", V.S. Fedorov read the detailed course of chromosome theory and usually did not have time for criticism of the theory. As a result, Fedorov trained a number of researchers who would work successfully during the period of revival in genetic research in our country: I.A. Zakharov (now the corresponding member of RAS), professor K.V. Kvitko (1933–2014), professor I.B. Surikov (1930–2016), professor A.L. Yudin (1932–2017), professor Yu.B. Vakhtin (1932–2006), and others [7].

Associate professor V.S. Fedorov read the fundamental course on genetic analysis at the department of genetics headed by Lobashev after 1957,

Fig. 8. G.J. Müller (second from the left in the first row) and A.P. Vladimirsky (fourth from the left in the first row) with the employees of the department of genetics and experimental zoology. Third from the right in the second row – M.E. Lobashev (1930s)

Fig. 9. V.S. Fedorov (1903–1976)

which I had the good fortune to attend. Certainly, Vavilov's school affected the events at LSU during a dramatic period of our history. Likewise, the name of V.S. Fedorov is linked with a huge body of work on plant genetics, most notably on rye [8], which he successfully performed at the department of genetics and breeding, creating the first domestic variety of tetraploid rye Leningradskaya tetra.

In conclusion, the value of the scientific school, in particular, the domestic school of genetics should be emphasized, together with the great contribution of N.I. Vavilov to the foundation of the school through his understanding of the value of the University education and the unity of science and education. Traditions established by N.I. Vavilov are still alive. The Department of genetics of SPbSU trains specialists who work in VIR, Vavilov Institute of General Genetics of RAS, and in other genetic and breeding institutions of our country and abroad.

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