

A.M. Aitkulov, V.S. Abukenova*

Karaganda Buketov University, Karaganda, Kazakhstan

*Corresponding author: abu-veronika@yandex.ru

**Soul with beautiful and amazing creatures
(to commemorate Nadezhda Petrovna Slavchenko's 80th birthday and 50th
anniversary of her scientific and educational endeavors)**

Nadezhda Petrovna Slavchenko, a soil zoologist, spent forty years of her life and career as a teacher and scientist at the Karaganda Pedagogical Institute, Karaganda University, and the Department of Zoology. The process of educating scientific and pedagogical staff of the greatest educational institution in Central Kazakhstan is depicted retrospectively on the example of the creative fate of a professional biologist. It was difficult to go from being an assistant to the department chair and a prominent associate professor, but it was made possible by senior colleagues' encouragement and the direction of the newly established University of Karaganda. Soil zoology specialization led to contacts with renowned scientists and great individuals, as well as a fantastic unexplored world. The sole stationary soil-zoological research of invertebrate creatures conducted in Central Kazakhstan by N.P. Slavchenko soil organisms contributed to a better understanding of the relict nature of the Pleistocene island forests' faunistic complex inside the folded nation of Kazakhstan. Invertebrate representatives from over 200 species and 57 families were described; some were reported for the first time for the Sary-Arka or Kazakhstan region. The post-glacial fauna's migration paths were taken into consideration. N.P. Slavchenko's students went on to become naturalists and professors, defended scientific theses, and maintained a passion for zoological study.

Keywords: Central Kazakhstan, Faculty of Natural History of Karaganda Pedagogical Institute, Faculty of Biology of Karaganda State University, Department of Zoology, invertebrate animals, soil zoology, entomology.

Review about life pass

Following her graduation in 1967 from the Karaganda Pedagogical Institute's Faculty of Natural Science, N.P. Slavchenko (Fig. 1) was assigned to the Department of Zoology, where she became a member of the team of working scientists who first exposed her to science. A.N. Mukhachev, a specialist in plant protection, agrochemistry, and entomology; N.B. Shlykov, an entomologist and arachnologist; and N.G. Skopin, an expert on darkling beetles, were among her colleagues and mentors [1]. Every one of them imparted a bit of experience and left a mark on her spirit. As a result, it is reasonable to assume that N.P. had a natural interest in studying invertebrates, the most intricate and diverse group of animals. According to Nadezhda Petrovna's recollections, she first learnt about the existence of soil zoology from Professor N.G. Skopin, who was well familiar with the works of systematists of the scientific school of soil zoologists M.S. Gilyarov.



Figure 1. N.P. Slavchenko

In Kazakhstan, soil zoology — a relatively young field of study that combines soil science with zoology had not gained any traction yet. The majority of the pertinent publications and methods were housed in Moscow leading scientific libraries and were invaluable. N.P. Slavchenko was fortunate to participate in a four-month advanced training program with a focus on “Zoology of vertebrates and invertebrates” at Lomonosov Moscow State University (1971). It brought together 500 teachers from USSR states. Apart from the standard curriculum, every pupil pursued a personalized scientific regimen. N.P. Slavchenko was assigned to the Laboratory of Soil Zoology of the A.N. Severtsov Institute of Evolutionary Morphology and Ecology of Animals (IEMEA) of the USSR Academy of Sciences after deciding to specialize in soil zoology. The laboratory was led by Mercury Sergeevich Gilyarov, who is known as the “father of Soviet soil zoology”. Yulia Borisovna Byzova, his first pupil and assistant, gave her a warm welcome in the lab and played a pivotal role in the future of the burgeoning soil animal population researchers. The first exposure to pertinent methods and works of M.S. Gilyarov; materials of All-Union Meetings on soil zoology; works of the laboratory staff, particularly with the first edition of the “Identifier of invertebrate larvae living in the soil” (1964) and articles by foreign scientists were all made possible under the excellent guidance of Julia Borisovna, a physiologist and zoologist.

In order to perform a thorough inventory of the fauna of soil-dwelling invertebrates and evaluate their significance in soil formation and ecosystem functioning, it was necessary to enlist the services of young specialists who could conduct research in various places. The Mercury Sergeevich laboratory team was involved in a nationwide cycle of training and support for colleagues from other regions. The study of soil fauna greatly benefited by the purposefulness, scientific literacy, stringent consistency, and conscientiousness generated by the degree of knowledge and comprehension of the target of inquiry. These characteristics set Mercury Sergeevich and his students apart, along with their high level of intelligence. The laboratory created an extremely conducive environment for scientific inquiry, which stimulated everyone's creativity. With the backing of seasoned zoologists, N.P. Slavchenko began fieldwork in the distinctive pine woods of the Karkarala mountain range.

Extensive soil excavations turned into an important test for N.P. Slavchenko for this reason, young enthusiasts heading to soil-zoological works were posed a pointed question by renowned zoologist and biogeographer D.A. Krivolutsky: “Are you ready to devote all your time, and maybe your whole life to such activities?” As a passionate field worker who had taken part in several international and all-union trips, he was well-versed in the nuances and difficulty of gathering and preparing soil invertebrates from different taxonomic groupings. Every month for a number of years, N.P. Slavchenko excavated and painstakingly examined dirt monoliths in search of their elusive occupants, frequently by himself in the dense forest. It was essential to go through the multi-pass problem of identifying groupings and species for weeks in the laboratory. N.P. Slavchenko uses humor to describe the details of his field job in the Karkarala woods, recalling amusing situations and unplanned meets. The Karkaralinsk zoology and botany training camp was only starting to take shape in the 1970s of the 20th century. In order to plan their living and working arrangements, explorers frequently traveled alone and had to rely on their creativity. They slept in the forest, traveled, and had to find food someplace. They also drank water from a creek and frequently got cold and wet. The rector of the Pedagogical Institute, S.B. Baimurzin, met in Karkaralinsk with second graduate students and applicants. He was always interested in the progress of scientific activity and helped to resolve problems related to housing, transportation, and other matters during the difficult times of complete shortage.

In 1974-1975 N.P. Slavchenko published her first printed papers on soil entomofauna [2, 3]. Natural scientists might publish in the collection of scientific articles “Experimental studies in chemistry and biology” produced by Karaganda State University. Later on, publications titled “Issues of ecology of flora and fauna of Central Kazakhstan” started to appear. Despite their provincial focus, both journals helped the institution to establish its scientific goals and were important enough to the USSR Higher Attestation Commission to consider when defending dissertations. N.P. Slavchenko continued to be a regular instructor at this time, giving lectures, conducting practical classes, and making time to go through a large number of soil sample contents. She spent a year studying a postgraduate course that helped her to analyze the results of field collection. Her identification of the creatures in the soil also required the help of other specialists. At the Kazakh SSR Academy of Sciences Institute of Zoology in Alma-Ata, the entomological samples from Sary-Arka were often given careful consideration. Hemipteran expert R.B. Asanova and entomologist I.D. Mityaev provided a wealth of insightful guidance and recommendations that aided in the identification of various species. N.P. Slavchenko met several distinguished systematists from the Gilyarov scientific

school in Moscow, including I.H. Sharova (carabidologist and entomologist), N.T. Zaleskaya (centipede expert), and A.L. Tikhomirova (coleopterologist and rove beetle specialist).

When Karaganda State University was first established in 1980, N.P. Slavchenko, as a teacher there, attended in Zoology of Invertebrates courses at Moscow State University's Faculty of Professional Development. All of the lectures were given by renowned zoologists. Lectures on “Zoogeography of the Seas” were given by Prof. V.A. Sveshnikov, the head of the Laboratory of Ecology and Morphology of Aquatic Invertebrates (IEMEA). K.V. Beklemishev was the instructor for “Comparative anatomy and embryology of invertebrates” at Moscow State University. The subject of academician M.S. Gilyarov's lectures was “Zoology of Invertebrates”. N.P. Slavchenko was accredited by the Moscow State University Department of Zoology of Invertebrates after completing a report titled “Soil mesofauna of different forest types of Karkarala forestry” using the materials from her dissertation.

K.S. Baishev, the vice-rector of Karaganda University and a biologist and ecologist, was well aware of the difficulties and scientific importance of handling entomological materials. When crucial consultation travels to Moscow and Leningrad were required, he assisted the dissertant. N.P. turned to scientists at the Zoological Institute of the USSR Academy of Sciences in Leningrad to define complex groups: M.E. Ter-Minasyan, a coleopterologist with expertise in seed beetles, Attelabidae, and Curculionidae; I.M. Kerzhner, a specialist in Hemiptera; and O.L. Kryzhanovsky, an entomologist with expertise in ground beetles and chister beetles.

The deans of the Faculty of Biology, I.M. Anapiev and O.A. Abdrakhmanov, greatly aided in the important research that was done on the fauna of soil invertebrates in the Karaganda region, insect systematics and biodiversity, and pest protection of agricultural plants. Significant assistance was also provided by academician E.A. Buketov, the first rector of Karaganda University, who regarded educating his own trained professionals and developing the most recent scientific directions as top priorities.

The appointment of a scientific supervisor for N.P. Slavchenko's thesis was required to finish the scientific study on soil zoology she had begun in Central Kazakhstan (Fig. 2). Since there were no experts in this sector in Kazakhstan, E.A. Buketov wrote an official letter to the Directorate of IEMEA. Aware of his impending retirement, Evnei Arstanovich made every effort to expedite the commencement of all scientific endeavors at the university. In the final days of his tenure as a rector, he assisted N.P. Slavchenko with an impromptu journey to Moscow to obtain clearance for the head of her thesis from academician M.S. Gilyarov.



Figure 2. N.P. Slavchenko determines entomological collections at KarSU laboratory (70–80s)

Future scientific endeavors were encouraged by the rector of KarSU, Zeinollah Muldakhmetovich Muldakhmetov, taking careful and considerate care to develop his human resource capacity.

N.P. Slavchenko gave a report on the subject of her dissertation study at the VII All-Union meeting on the challenges of soil zoology in Kiev (1981), which served as approbation to her dissertation defense [4].

Subsequently, N.P. Slavchenko took part in several soil zoologist symposia in Ashgabat, Novosibirsk, Tyumen, Leningrad, Vilnius, Moscow, Tbilisi, Kiev [5–8]. For those who were drawn together by the scientific concerns, these were remarkably productive gatherings.

Every trip became a discovery, according to N.P. Slavchenko. The biggest and most memorable ones were the XII International Symposium on Entomofauna of Central Europe (Kiev, 1988) and the IX International Colloquium on Soil Zoology (Moscow, 1985), where she had the chance to report on the soil entomofauna of the Karkarala mountain oasis [9, 10].

Zoologists have always had a fascination in Central Kazakhstan. Most of the invertebrate species found in Sary-Arka were frequently absent in faunistic reviews. The knowledge of the relict nature of the faunistic complex of Pleistocene island forests on the area of the Kazakh Upland has been deepened by N.P. Slavchenko's first and, to date, only soil-zoological research for Central Kazakhstan (Fig. 3).

More than 200 species and 57 groups of invertebrates were described in the works of N.P. Slavchenko; some of these were first identified for the region of Kazakhstan or Central Kazakhstan [11, 12]. Data on individual species and large taxa of soil inhabitants, patterns of biotopic and vertical distribution, and the composition and structure of the complex of soil invertebrates were all collected for the first time, and these details helped to clarify some aspects of the region's general history of the formation of its flora and fauna as well as its historical relationships with the northern forest types.

Species of the Elateridae family provided an excellent illustration of how soil inhabitants may preserve their primary habitats. As a result, the postglacial relict species *Dalopius radiculosus* Gurjeva, 1964, dominated the wet pine forests and small-leaved forests of Karkaralinsk. In the soils of mountain birch forests, the boreal species *Selatosomus melancholicus* (Fabricius, 1798) predominated [13].

According to N.P. Slavchenko's works, relict species of true bugs that are typical of northern pine forests have been preserved in the forests of Karkaralinsk. These species include *Drymus brunneus* (R.F. Sahlberg, 1848), *Drymus sylvaticus* (Fabricius, 1775), *Eremocoris abietis* (Fallén, 1807) *Eremocoris plebejus plebejus* (Fallén, 1807), *Ligyrocoris sylvestris* (Linnaeus, 1758), *Philomyrmex insignis* R.F. Sahlberg, 1848 [14].

Materials on the origins of the soil faunistic complex of the island highland forests of the Kazakh Upland were presented by N.P. Slavchenko at the All-Union Zoogeographical Conference in Leningrad (1985). She arrived at a conclusion in her investigation regarding the postglacial western nature of fauna migratory pathways [15, 16]. It was able to conclude, based on historical geobotany, that human impact led to the isolation of these island woods in the past centuries.



Figure 3. The employees of Karaganda State University's Department of Zoology (70s). Senior lecturer N.P. Slavchenko, associate professor A.B. Fathulova, head of department T.I. Aubakirov, associate professor M.K. Utebaeva, and senior lecturer L.N. Prus are seated on the first row, left to right. Associate professor K.B. Bekishev is on the right, associate professor T.B. Balmagambetov is on the left in the second row

At the university, there were always chances to transmit scientific experience. Students' fieldwork in the Karkaraly mountains was a significant practical phase. It was there that N.P. Slavchenko displayed his extraordinary dedication to his favorite endeavor — the study of invertebrates. Those who attended Karaganda State University in the 1970s through 1990s likely recall the zoology students' summer excursions, when they would arrive carrying field tablets loaded with test tubes, insect bottles, notebooks, pencils, tweezers, and nets. The most odd constructed containers, traps, and butterfly wingspreaders were perched on the window sills of the hostel for students.

Within the students' rooms, entomological artifacts flew, crawled, and buzzed after escaping the crates. Study room displays of binocular microscopes and atlases for identifying insects encouraged the pupils' interest for research. In the same hall, an insect eclector blazed brightly all night. Any practical job, such as creating entomological mattresses and envelopes, keeping track of nocturnal butterflies, identifying, naming of biocenotic collections became the most fascinating thing for everyone while N.P. Slavchenko was around. Research captivated even the pupils who felt uncomfortable handling insects and preferred to work with gloves.

Naturally, students writing theses on the invertebrates of the Karaganda Oblast and other parts of the country received more attention from N.P. Slavchenko at competitions for young researchers, student scientific works under the supervision of N.P. Slavchenko were given certificates and diplomas. While some of N.P. Slavchenko's pupils went on to become instructors and defend their scientific theses on different topics, all of them have strong memories of their time spent conducting entomological research as students.

N.P. Slavchenko led the Department of Zoology from 1988 until 1992. Along with associates M.K. Utebaeva, V.I. Kapitonov, and T.B. Balmagambetov N.P. Slavchenko advocated for the priority study of the Kazakh Upland's animal biodiversity (Fig. 2). Staff members of the Department of Zoology summarized data on the relationship between environmental variables and the distribution of organisms in the main ecosystems for the scientific work “Biological assessment of natural populations of flora and fauna of Karkarala Nature Park”, which was published in 1991 [17].

The USSR State Committee for National Education named N.P. Slavchenko as an Associate Professor in the Department of Zoology in 1990. She served as the University's Deputy Dean of the Faculty of Biology and Geography for scientific work and as a member of the Scientific and Technical Council for a long time. N.P. Slavchenko served as the journal's responsible secretary for a while (Vestnik KarSU, Series “Biology, Medicine, Geography” and was a member of the dissertation council for the specialties of “03.00.08 – Zoology” and “03.00.13 – Physiology”.

“Invertebrate Zoology”, “Practical Invertebrate Zoology”, “Biomethods of Control of Populations of Harmful Species”, “Comparative Embryology of Invertebrates”, and “Theory of Zoological Systematics” are the five main courses that N.P. Slavchenko developed and are still relevant for KarU as a classical university today. She released a number of methodological guidelines for independent work on field practice of invertebrate zoology and individual, control, credit assignments in various years [18–20].

N.P. Slavchenko provided a summary of her extensive observations of rare invertebrate species in Central Kazakhstan in the monograph “Rare and Endangered Animals of the Kazakh Upland” [21]. It was suggested that eight species of butterflies, nine species of beetles, three species of true bugs, four species of bumble-bees, wasps, and bees; three species of earthworms; one species of flies and grasshoppers be added to the regional list of protected species [21]. For over two decades, N.P. Slavchenko authored exclusive content for the reference book “Karaganda. Karaganda Oblast: Encyclopedia” (1986, 2008) concerning insect species that adorn the environment and require preservation [22–28].

Over 70 scientific articles on invertebrate animals of Karaganda region were published by N.P. Slavchenko in the proceedings of international scientific and methodological conferences, symposia and colloquia, in journals of Kazakhstan and other countries [29–30]. Recent publications include theses of reports at the XVIII International Colloquium on Soil Zoology (ICSZ 2021) and XV International Colloquium on Apterygota (ICA 2021) in Italy [31, 32].

Is it possible for a naturalist with professional observation skills and an inquiring mind to have a “well-deserved rest”? These individuals inhabit a world wherein everything surrounding them serves as a biological discovery and inspiration source. When it comes to insects, entomologists never grow old. They can recall the challenging Latin names of small bedbugs and terrible larvae, catch even the most evasive beetles with ease, and search in any weather condition for new photo objects of Kazakhstan's fauna to contribute to the iNaturalist website.

Today, Nadezhda Petrovna assiduously continues the work of her mentors, scientists, and educators. She writes scientific articles, develops training materials, works with colleagues on entomological research projects, and willingly helps with invertebrate identification. It is important to emphasize that the scientific school of invertebrate zoology, which was established by B.N. Mukhachev, N.B. Shlykov, N.G. Skopin, and N.P. Slavchenko, is still in operation and producing results at the Faculty of Biology and Geography at Karaganda University.

We wish the jubilee a long and healthy life, creative success, and many fascinating new discoveries!

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А.М. Айтқұлов, В.С. Абуkenова

Жаратылысы бөлек жан

**(Н.П. Славченконың туғанына 80 жыл және
ғылыми-педагогикалық қызметінің 50 жылдығына орай)**

Қарағанды педагогикалық институты, Қарағанды университетінің зоология кафедрасы — педагог-ғалым, топырақ зоологы Надежда Петровна Славченконың өмірімен тығыз байланысты. Ол зоология кафедрасында қырық жылдан астам жемісті еңбек етті. Кәсіби биологтің ғұмырнамалық өмірбаянында Орталық Қазақстанның ең ірі оқу орнындағы ғылыми-педагогикалық кадрларды дайындау барысы ретроспективті түрде көрсетіледі. Қатардағы ассистенттен бастап жетекші доцент, кафедра меңгерушісі қызметіне дейін ұлағатты өмір жолынан өтті. Ғылым жолына түсіп, топырақ зоологиясын зерттеп, өзінің үлесін қосты. Еңбек жолында танымал ғалымдармен, керемет адамдармен жүздесті. Н.П. Славченконың Орталық Қазақстанның омыртқасыз жануарларын стационарлық топырақ-зоологиялық зерттеуі Қазақ елінің қатпарлы плейстоцен кезеңіндегі арал ормандарының фауналық кешенінің реликті сипаты туралы түсінікті тереңдете түседі. Онда омыртқасыздардың 200-ден астам түрі мен 57 тұқымдасының өкілдері сипатталған, олардың бір бөлігінің алғаш рет Сарыарқа немесе Қазақстан аумағында кездесетіндігі айтылған. Мұздан кейінгі кезеңдегі фауналық миграциялық жолы қарастырылған. Н.П. Славченконың шәкірттері оқытушылар және табиғат зерттеушілері болды. Олардың кейбіреулері өздерінің ғылымға деген құштарлығының арқасында зоологиялық зерттеулер жүргізіп, ғылыми диссертациялар қорғады.

Кілт сөздер: Орталық Қазақстан, Қарағанды педагогикалық институтының жаратылыстану факультеті, Қарағанды мемлекеттік университетінің биология факультеті, зоология кафедрасы, омыртқасыз жануарлар, топырақ зоологиясы, энтомология.

А.М. Айтқұлов, В.С. Абуkenова

**Душой с прекрасными и удивительными созданиями
К 80-летнему юбилею и 50-летию научно-педагогической деятельности
Надежды Петровны Славченко**

Карагандинский пединститут, Карагандинский университет, кафедра зоологии — сорок лет жизни и деятельности преподавателя и ученого, почвенного зоолога Надежды Петровны Славченко. На примере творческой судьбы профессионального биолога в ретроспективе показан процесс подготовки научно-педагогических кадров крупнейшего учебного заведения Центрального Казахстана. Становление от ассистента до заведующего кафедрой и ведущего доцента было непростым и происходило при

поддержке старших коллег и руководства молодого университета Караганды. Специализация по почвенной зоологии открыла удивительный непознанный мир и подарила встречи с известными учеными и замечательными людьми. Единственное для Центрального Казахстана стационарное почвенно-зоологическое исследование беспозвоночных животных, выполненное Н.П. Славченко, углубило понимание реликтового характера фаунистического комплекса островных лесов плейстоценового времени Казахской складчатой страны. Были охарактеризованы представители более 200 видов и 57 семейств беспозвоночных, часть из них впервые указана для территории Сары-Арки или Казахстана. Рассмотрены миграционные пути фауны в послеледниковый период. Ученики Н.П. Славченко стали учителями-натуралистами, защитили научные диссертации и сохранили страсть к зоологическим изысканиям.

Ключевые слова: Центральный Казахстан, факультет естествознания Карагандинского педагогического института, биологический факультет Карагандинского государственного университета, кафедра зоологии, беспозвоночные животные, почвенная зоология, энтомология.

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Information about authors

Aitkulov Aidar Muratovich – Candidate of biological sciences, Associate Professor. Department of Physiology, Karaganda Buketov University, Karaganda, Kazakhstan; fiziokar@yandex.ru;

Abukenova Veronika Sergeevna – Candidate of biological sciences, Associate Professor, Department of Zoology, Karaganda Buketov University, Karaganda, Kazakhstan; abu-veronika@yandex.ru.