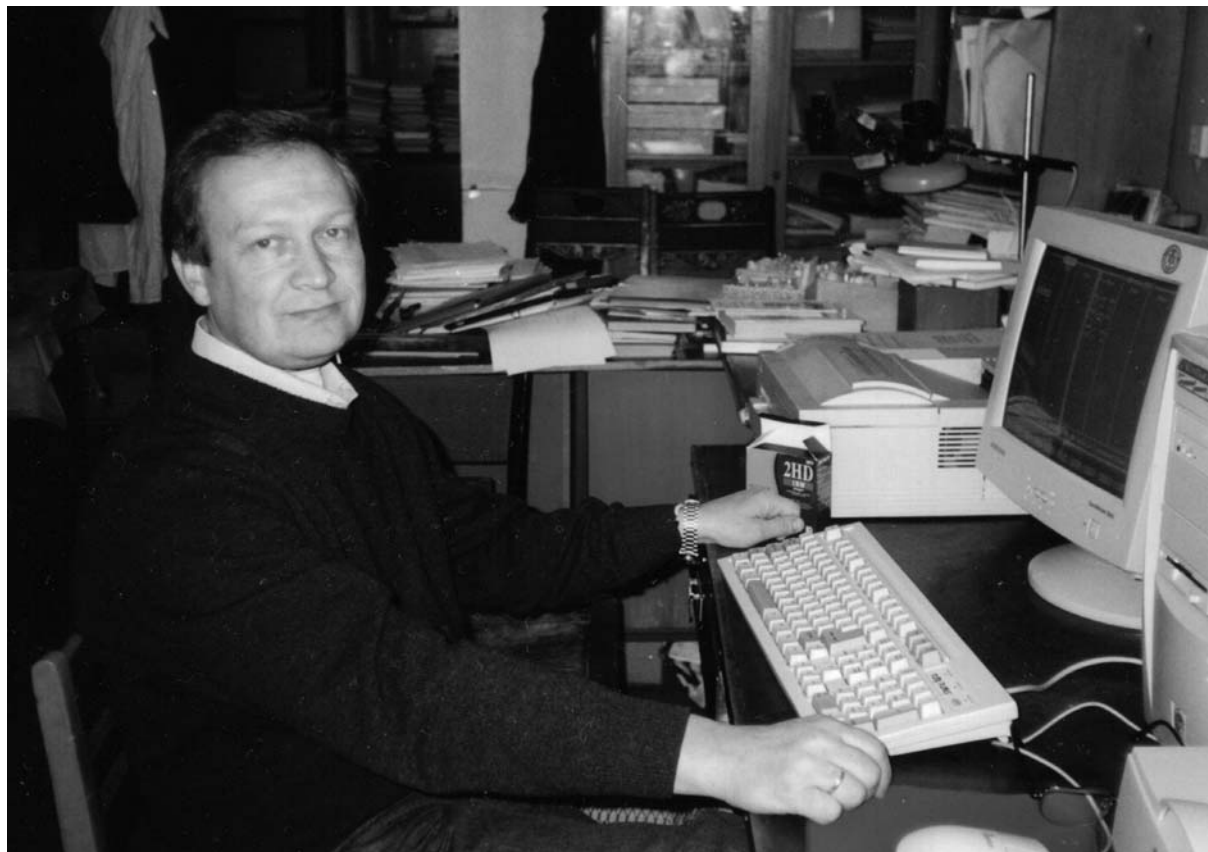


Obituary



Mikhail Vyacheslavovich Zaitsev (1954–2005) The steps of scientific way. Professionalism and courage

Two years have passed since we lost Mikhail Zaitsev, our friend and colleague. In the first days when we got this terrible news we were shocked first of all by the loss of a close friend with whom we worked in the Zoological Institute for nearly 30 years. We, his friends, were together with Mikhail in expeditions, scientific trips, visited each other at home, traveled in his old “Renault” to his “dacha” and picked mushrooms. And only now we, his colleagues, start to understand the scale of this loss to the science. Quite recently, we celebrated 50th anniversary of Misha, the prime time for a scientist and the maturity for a systematist. All scientific activity of Mikhail was devoted to the systematics of insectivores. It is well known that a systematist should have a number of unique qualities developing during continued work on the objects. Then separate properties and characters finally blend in the researcher’s head into the integral picture of the group and the mosaics of dispersed data transform into a multi-dimensional view of processes. Mikhail had just achieved this stage. Unfortunately, death interfered with many of

his plans. Many of these are will not be finished even though his students continue Misha’s research. Here we want to recall the main landmarks of his biography and creative activity in order to further promote the study of scientific heritage of Mikhail Zaitsev.

Mikhail Vyacheslavovich Zaitsev was born on June 12, 1954 in Leningrad. From the age of 14 he joined the nature-study club at the Leningrad Zoo and participated in the expeditions to the Valdai Plateau, to the Central Forest Nature Reserve and Kandalaksha Nature Reserve. First scientific interests of M. Zaitsev were related to ornithology and after entering the extra-mural department of the Leningrad State University in 1971, he continued his education at the Department of vertebrates. At the same time, during the first year course he began to work as a senior technician and then as a preparatory. Next year he changed to the full-time education at the University. His diploma thesis was devoted to the ecology of plover (*Pluvialis apricaria*) in the western Taimyr area, where he worked for two field seasons with the Polar expedition of the Botanical Insti-

tute of RAS. Starting from his very first trips, Zaitsev always showed liveliness, charm, sociability and powers of observation that helped him a lot in long expeditions. At that time he decided to devote himself to field ornithology after the graduation from the University. But his ornithological introduction to science had come to end.

In 1976, Mikhail Zaitsev was employed as a probationer at the Laboratory of mammals of the Zoological Institute RAS. As to every beginner in our lab, it was suggested to Mikhail to start his investigations with a certain group, specifically insectivores. The task was very complex not only because Misha had to quickly change from birds to mammals. Moreover, insectivores are among the most difficult groups as concerns systematics. At this point Mikhail manifested another of his remarkable qualities: the ability of careful planning and consistent performance of all what was planned. Within a year he managed not only to acquaint himself with the group but started independent research focusing primarily on the morphology of insectivores. According to the tradition of the laboratory, Zaitsev was supposed to start with the morpho-functional approach ("morphological kitchen" in a figurative expression of Prof. I.M. Gromov). Before Mikhail started his studies, the insectivores in ZIN RAS were "supervised" by A.A. Gureev, who published the monograph on the group (1979) in the series "Fauna of USSR". This fundamental work embraced the fauna of recent and fossil insectivores of three families: hedgehogs, moles, and shrews (Erinaceidae, Talpidae, Soricidae). A.A. Gureev relied on classical cornerstones of systematics, i.e. morphology and paleontology, leaving aside both the data of functional morphology and rapidly developing comparative karyology and multivariate statistics. In micro-systematics, at that time, a transition continued from the typological species concept to the biological concept developed within the Synthetic Theory of Evolution. This opened new perspectives in the work on the group. Mikhail attempted to contribute to the field. Hedgehogs and white-toothed shrews were kept in the vivarium of the laboratory. However, due to practical problems with keeping and breeding of these animals these studies had no success. On the other hand, in the work on morphobiological features of the subfamily Erinaceinae M. Zaitsev got results of a significant scientific interest. He analyzed masticatory musculature (1978), the structure of the middle ear (1990), the structure and function of the locomotory apparatus. In 1982, he successfully defended his PhD thesis "Systematic analysis of taxa of the subfamily Erinaceinae of the fauna of USSR". Unfortunately, the data obtained during the work on the thesis was only partially published. Many of these results can be found only in the manuscript of the thesis. The system and classification of hedgehogs was essentially revised due to the application of multiple methods. This work also included the drastically revised classification of the group at the level of species and subspecies.

Zaitsev continued to study the complex and poorly known group of white-toothed shrews using proven

research methods. The collection of ZIN RAS and other scientific centers appeared to be insufficient for the taxonomic revision of this group and M. Zaitsev carried out a number of expeditions during the field seasons of 1985-1989 to the European parts of Russia, Central Asia and Caucasus. Mikhail managed to collect unique materials from *terrae typicae* of a number of rare species, in particular several specimens of *Crocidura pamirensis* from poorly accessible regions of Pamir near the Lake Drumkul', and of *C. serezhkyensis* from the Sarezkoe Lake area. Some individuals of white-toothed shrews were brought alive and were later used for karyological (1988) and isozyme studies. This multidisciplinary approach allowed Zaitsev to corroborate the species status for *C. suaveolens*, *C. gueldenstaedtii*, *C. caspica*, *C. sibirica*, *C. lasiura*, *C. pergrisea*, *C. serezhkyensis*, and *C. leucodon* (1991).

In his studies, M. Zaitsev tried to use all available material on the order Insectivora as a whole. Simultaneously with the work on hedgehogs and white-toothed shrews, he issued a paper on common shrews (1988) and then on moles (1999a) and water shrews (1999c). All his studies were based on a thorough statistical analysis of the material. M. Zaitsev did not simply use software but always examined in details the essence of every method, sometimes introducing new algorithms addressing tasks of diagnostics and systematics.

Quite fruitful was Zaitsev's approach to the study of fossil material. In 1989, he published a small but very important paper devoted to the identification of common shrews on mandibular characters. The study of a vast material on recent shrews allowed Mikhail to compile the table of diagnostic characters, extremely useful in the work on fossil soricids mostly represented by mandibles. The measurement system included 40 mandibular characters and allowed a most reliable diagnostics (ca. 75-100%) of 13 recent species of common shrews. This technique was applied to the identification of Late Pleistocene insectivores of the South Urals (1992, 1998).

Mikhail Zaitsev showed a great interest in information systems and databases. He ported the classificatory of animals names "ZOOCOD" to computer zoological databases (1991b).

But not everything went smoothly. In the late 80-s and early 90-s, at the time of "perestroika", the state support of fundamental science was quickly reduced nearly to zero. Most researchers found themselves in a very hard financial situation. Having family and children, Misha had no alternative to the change of department within the Zoological Institute. He joined the computer group. At those times, most of us were enthusiastic about "perestroika", not noticing its pitfalls. Mikhail was among the first to enter the Democratic party of Russia. In 1991 he graduated from commercial courses in external economics in order to take part in commercial and business development of the Institute. The new approach and new views on the economic activity of the Zoological Institute under the new political conditions could indeed bring notable results both

for the Institute and its staff. But as for the country in general, it appeared to be a utopia for the Institute as well. In 1995, M. Zaitsev returned to his home laboratory.

Quite soon, formidable news on his illness arrived. In 1996, Misha successfully survived a severe surgery and returned to work. Since then, an everyday struggle with his illness began. But in spite of anything, he continued intensive scientific work, processing material, writing papers, delivering talks on congresses and conferences, supervising his students. M. Zaitsev made reports at the annual session of ZIN RAS (2001), at conferences and congresses in Moscow (1999, 2003) and St. Petersburg (2003). During this period, he studied material in museums abroad, in Great Britain (2001), Poland (2000), and USA (2002). He also actively and fruitfully collaborated with a number of foreign colleagues who always highly valued his professional skills as a specialist in systematics of insectivores.

M. Zaitsev became more and more involved in paleontology. In these years, he published a series of papers on Pleistocene Soricidae of Caucasus (2002, 2003, 2004, 2005). Based on these materials, Zaitsev's postgraduate student, Vera Osipova, successfully defended her dissertation in 2006. Here we must emphasize another talent of Misha, his pedagogical skills. He always had students and took care of them from the very first steps in science up to the defense of a qualification work. He was simultaneously able to be a friend and a rigorous teacher amazingly combining these qualities. Even after finishing the work with Zaitsev, his students continued to come to him for advice and as to a close friend and a lifetime supervisor.

One of the significant contributions of M. Zaitsev is the description, jointly with G. Baryshnikov, of three Pleistocene shrews (*Sorex dornichevi*, *Drepanosorex rupestris*, *Neomys hintoni*) from the Treugolnaya Cave (North Caucasus) (2002). By that time, the improved methods of studies with more characters introduced allowed a more reliable taxonomic identification of fossil forms.

Zaitsev's heritage includes theoretical publications too. One of the most remarkable is the paper on taxonomic modeling for the evaluation of taxonomic diversity. Zaitsev's general idea is the analysis of the species as an integral system instead of comparisons of its individual populations. Several alternative hypotheses were put forward and the resultant model presented a comprehensive description of the species geographic variation. The comparison was supported by three quantitative coefficients, i.e. adequacy, differentiation, and taxonomic diversity. In our view, this approach is most adequate for the modern analysis of such a multilevel phylogenomic system as a species with a mosaic of morphological and genomic characters. The paper on environmental and morphological features of shrew masticatory apparatus (2005) also contains a number of theoretical issues. After 30 years M. Zaitsev addressed the functional interpretation of morphological charac-

ters of insectivores. He proposed a model of mammalian mastication, the "horizontal grazing".

A collaborative paper on the phylogeography of the Eurasian group of *Crocidura suaveolens* was published (2006) after Mikhail's demise. Different colonization routes from putative refugiums in Pliocene and Pleistocene were suggested based on results the analysis of sequences of cytochrom *b* and BRCA1.

Mikhail did not live to see the international conference "Evolution in the *Sorex araneus* group: cytogenetic and molecular aspects" in St. Petersburg (2005), of which he was one of the organizers.

It should be noted that a number of papers started and partly completed by Mikhail Zaitsev are not published yet. It is first of all the "Key to insectivores of the fauna of Russia and adjacent countries". The material for this work was collected during 10 years and original key tables on all groups of insectivores are almost completed. Morphological descriptions of a number of groups of insectivores are also finished. The paper on the phylogeny of genera *Sorex* and *Crocidura* based on the cladistic analysis is awaiting publication too.

No doubt that M. Zaitsev succeeded in enlarging our knowledge of insectivores and elevated it to a new level. He published a number of classical papers, his results and new techniques could be applied far beyond the systematics and paleontology of insectivores, fitting well to studies of other mammalian groups.

Natalia Abramson

List of publications of Dr. Mikhail Zaitsev

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