

Alexey V. Zhirmunsky as a malacologist



Konstantin A. Lutaenko
A.V. Zhirmunsky National Scientific Center of Marine Biology FEB RAS,
Vladivostok 690041, Russia
e-mail: lutaenko@mail.ru

“Academician Zhirmunsky devoted his life to marine biology research, building international cooperation ... founding the Institute of Marine Biology in the Far East, and was truly an Academician of The Sea.”

*Li-chun (Chu) Wu, a retiree
Los Altos, California, USA
(co-author of A.V. Zhirmunsky in the 1960s)*



This year, 2021, marks the 100th anniversary of the birth of Prof. Alexey Viktorovich Zhirmunsky (October 15, 1921 – October 20, 2000), member of the USSR/Russian Academy of Sciences (Academician), founder and first Director of the Institute of Marine Biology in Vladivostok, an outstanding biologist, physiologist, ecologist and organizer of the Far Eastern Marine Biosphere Reserve, Soviet Journal of Marine Biology and the Marine Biological Station Vostok. The Institute, re-organized in 2016 as the National Scientific Center of Marine Biology, was established in 1970 (and its predecessor, Department of Marine Biology within the USSR Academy of Sciences, in 1967) and celebrated the 50th anniversary in 2020. The IMB/NSCMB became home for various activities including conferences, science societies, and informal seminars in the 1970s–1990s as well as international meetings, especially since the 1990s, and despite Prof. A.V. Zhirmunsky stepped down as Director of the institute since 1988, he was very active in these events and gatherings. I was especially lucky to travel with him and two other colleagues to my very first international meeting in Beijing, China in 1994, to participate in a global change project, and to get his support in the organization of the Institute Museum in the 1990s but this time, I would like to emphasize his role as malacologist and one of the founder of the Russian Far East Malacological Society in 1994.

A.V. Zhirmunsky was specialist in physiological ecology, and a number of his early papers were based on studies of marine invertebrates and mollusks. In a series of papers published in the 1950s–1970s, he presented results on interrelations between the vertical distribution of some common species of the bottom animals living in the upper subtidal zone of the Chinese seas, White Sea, Black Sea and the Sea of Japan in dependence on temperature conditions, substrate and animal mobility; these data were compared with cell heat resistance (the thermostability), which may be used as a species characteristic (e.g., Zhirmunsky A.V. 1960. Studies of the temperature adaptations in invertebrates of the South China Sea. *Cytology*, v. 2, p. 675–691; Zhirmunsky A.V. 1969. A comparative study of cellular thermostability in mollusks of the White Sea in relation to the vertical distribution of species and history of fauna formation. *Journal of General Biology*, v. 30, p. 685–702; Zhirmunsky A.V. 1973. Vertical distribution and cellular heat resistance of bottom animals from the Posseyt Bay (Japan Sea). *Helgoländer Wissenschaftliche Meeresuntersuchungen*, Bd. 24, S. 247–255.). In the latter paper, he considered 15 species of bottom animals including gastropods (2 species) and bivalve mollusks (9 species).

A.V. Zhirmunsky spent four months in 1959–1960 in expeditions to Hainan and Qingdao (China) during the period of intensive Russian-Chinese marine biological researches. He published results of these expeditions in several papers in the Russian and Chinese languages on the physiological ecology of both gastropod and bivalve mollusks jointly with Chinese specialists (e.g., Zhirmunsky A.V., Chu Li-Chun. 1960. Thermal stability of ciliated epithelium in the sympatric tropical mollusks of the genus *Nerita* in relation to temperature conditions of their habitat. *Cytology*, v. 2, p. 478–482; Zhirmunsky A.V., Chu Li-Chun. 1963. The cell thermostability of sympatric species of *Donax* in relation to the temperature conditions of their habitat. *Acta Zoologica Sinica*, v. 15, p. 21–27).

Mollusks have always been the most important object of various research in the IMB including such aspects as ecology, physiology, genetics, biochemistry, reproduction, etc. A.V. Zhirmunsky supported all these studies, and initiated several projects, publication of comprehensive monographs and several conferences as well as invited to the IMB many leading figures in these fields. In the 1970s, Vladimir L. Kasyanov organized the Laboratory of Embriology and specialized in reproductive biology of bivalves and echinoderms; Alexander I. Kafanov and Vladimir V. Gulbin were taxonomists contributed to biogeography, paleontology and faunistic studies of bivalves and gastropods; Laboratory of Invertebrate Cultivation, Laboratory of Benthic Ecology, Laboratory of Genetics and Laboratory of Shelf Ecology contributed much to ecological, genetic and aquaculture aspects and molluscan biofouling. Zhirmunsky paid special attention to biology and cultivation of the Pacific mussel *Mytilus trossulus* and co-authored several papers, and prepared a special volume of the Soviet Journal of Marine Biology/Biologiya Morya (introductory paper: Zhirmunsky A.V. 1986. Problems of biology and cultivation of the mussel *Mytilus edulis*. *Biologiya Morya*, N 4, P. 3–6.). In fact, his first paper on ecological physiology of mussels was published in 1960 and dealt with reaction of the Black Sea mussels to heat (Zhirmunsky A.V. 1960. Sensitivity of the Black Sea mussels and their ciliated epithelium to effect of elevated temperature. *Doklady (Reports) of the USSR Academy of Sciences*, v. 133, p. 683–685). In 1979, he presented a talk about studies of bivalve mollusks in the IMB at the all-Soviet meeting on mollusks in Leningrad (St. Petersburg) (abstract was published in English later in the US journal: Zhirmunsky A.V. 1984. Studies of bivalve mollusks at the Institute of Marine Biology. *Malacological Review*, v. 17, p. 126), and he took part in these research during the 1970s–1980s and co-authored a number of papers on ecology of biofouling communities dominated by mollusks, mollusk' aquaculture, mollusk' growth, cell thermostability (e.g., Zhirmunsky A.V., Krasnov E.V., Zolotarev V.N. 1977.

Studies of growth temperatures of scallops estimated by isotope method. Motoda (ed.). *Proceedings of the Second Soviet-Japan Joint Symposium on Aquaculture*, November 1973, Moscow, USSR. Tokyo: Tokai University. P. 151–163). In 1980, he co-authored a paper on first finding of the abalone *Haliotis discus* in Russian Far Eastern unique Moneron Island in *Priroda* journal (Nature).

A significant chapter on mollusks was included in the identification book “Animals and Plants of Peter the Great Bay” (1976) published under editorship and by initiative of A.V. Zhirmunsky; it was first book of this kind published by the IMB and it is still in use by amateurs and zoologists. His special attention to conservation of nature and natural environments led to organization of the first marine reserve in Russia, Far Eastern Marine Biosphere Reserve which is the richest area in terms of biodiversity of mollusks. Finally, A.V. Zhirmunsky fully supported founding of the Russian Far East Malacological Society in Vladivostok (1994), and made many efforts to establish the journal of the society, the *Bulletin of the RFEMS* (first published in 1996), in that difficult financial situation of transformation to a market economy of the 1990s. So, he is a co-founder of the society, along with Prof. A.I. Kafanov. I would like to merely mention that he could care even about this small society while his many projects were much more grand and massive. In addition, the Institute Museum (IMB) founded in 1994 received much support from A.V. Zhirmunsky, and the molluscan collection is a major part of this museum. In my archive, there is a written note from Zhirmunsky suggesting to make a separate malacological library of the RFEMS/IMB Library to promote research and assist with bibliographic search.

The real value of great intellectuals is not just the value of their scientific contribution but the impact. Alexey Viktorovich was inspiring for many, and his role in science and development of research organizations and other enterprises/facilities/initiatives was huge and amazing. We are lucky to have malacology among numerous fields he impacted and promoted.

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ИНФОРМАЦИИ

СОЗДАНО ДАЛЬНЕВОСТОЧНОЕ МАЛАКОЛОГИЧЕСКОЕ ОБЩЕСТВО

Малакология – раздел зоологии, комплексно изучающий современных и ископаемых моллюсков. Моллюски известны специалисту прежде всего как деликатесный пищевой объект (мидии, гребешки, устрицы, кальмары, осьминоги и др.). Отечественным гурманом он тоже, к сожалению, еще слишком мало знаком. Роль моллюсков в экономике природы этим, конечно же, не ограничивается. Моллюски – очень важный пищевой компонент в рационе многих видов промысловых рыб и ракообразных, морских млекопитающих (киты, моржи). Крайне важна роль ископаемых моллюсков для определения относительного геологического возраста отдельных осадочных слоев земной коры и сопоставления таких слоев в разных регионах. Все сказанное определяет внимание многих ученых к всестороннему изучению этой обширной группы животных, повсеместно распространенных в Мировом океане, на суше и в континентальных водоемах.

В 1991 г. было организовано Малакологическое общество при Отделении общей биологии РАН. К сожалению, продолжающаяся экономическая дезинтеграция российской экономики и тяжелое финансовое положение науки в нашей стране резко уменьшают действенность общероссийских научных и научно-технических обществ и вызывают необходимость активизации деятельности их региональных отделений или создания независимых региональных обществ. В полной мере это относит-

Все это показывает, что дальневосточные малакологи имеют весомый потенциал для создания самостоятельного Дальневосточного малакологического общества. Такое общество было создано в начале ноября 1994 г. Учредителями его выступили Дальневосточная ассоциация ученых и ряд биологов и палеонтологов научных, учебных и научно-производственных учреждений Дальневосточного региона. Президентом общества избран д.б.н. А.И.Кифанов, вице-президентом к.б.н. В.В.Гульбин (оба из Института биологии моря ДВО РАН). Официальный адрес Дальневосточного малакологического общества: 690041, г. Владивосток, ул. Пальцевого, 17, Институт биологии моря ДВО РАН. Институт биологии моря является также базовым учреждением Дальневосточного малакологического общества. Это и неудивительно, если учесть, что в этом Институте работает более 70 специалистов, круг научных интересов которых в той или иной мере охватывает практически все аспекты изучения моллюсков. Более трети (38,9%) научных работ, опубликованных сотрудниками института в 1986–1995 гг., посвящено в основном исследованиям, выполненным на морских моллюсках. Морская биология, таким образом, в значительной степени является и малакологической наукой.

Социальное, политическое и экологическое разнообразие стран Азиатско-Тихоокеанского ре-

Helgoländer wiss. Meeresunters. 24, 247–255 (1973)

Vertical distribution and cellular heat resistance of bottom animals from the Posseyt Bay (Japan Sea)

A. V. ZHIRMUNSKY

Laboratory of Physiological Ecology, Institute of Marine Biology, Far-Eastern Scientific Center, Academy of Sciences, Vladivostok, USSR

KURZFASSUNG: Vertikalverteilung und zelluläre Hitzeresistenz von Bodentieren an der Posseyt-Bucht (Japanisches Meer). Die vertikale Zonierung verschiedener benthischer Tiere, die an helgoländischen Stationen des Japanischen Meeres untersucht wurden, weist von den im gleichen Gebiet an Inseln und Seelandschaften festgestellten Tiefenverteilungen ab. Diese Unterschiede können von der Art des Substrats, der Grenzschicht, den Strömungsverhältnissen und insbesondere von den Temperaturbedingungen abhängen. Ein experimenteller Vergleich der zellulären Hitzeresistenz von Cilierepithelien verschiedener Muschel- und Austernarten und deren Verteilung konnte vor allem den Einfluß der Temperatur deutlich machen. Es wird die Schlussfolgerung gezogen, daß artspezifische Anpassungen an die Umgebungstemperatur, die offensichtlich auf Unterbinden in der Proteinstruktur beruhen, die Vertikalverteilung von Bodentieren entscheidend beeinflussen.

INTRODUCTION

The phenomenon of vertical zonality, i.e. regular change of community composition during the transition from coastal sea sites to deeper horizons was established early last century in works by ALMOND & MILNE-EDWARDS (1832), FOKSAS (1846) and others. A large amount of literature has been devoted to this problem, including a series of surveys (GILMAN 1930, ECKMAN 1953, ZOLKOVSKAYA 1951, and others). Nevertheless, only the intertidal zone has been studied comparatively well. In the majority of the USSR seas, however, for the upper sublittoral (from 0 to 30–40 m) there is insufficient knowledge of the bottom communities, the population density and biomass of species which comprise them, and their vertical distribution and composition.

However, the first investigations carried out in this area previously studied only by comparison have discovered some new species in the fauna of the Posseyt Bay.

In contrast to the French (PILLET) terminology adopted by the majority of authors in English, “littoral” comprises the 150–250 m upper sublittoral.



A.V. Zhirmunsky · V.I. Kuzmin

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