

OBITUARY

**Denzaburo Miyadi (1901-1988)**

Denzaburo Miyadi, Professor Emeritus of Kyoto University, passed away at the age of 87 during the early hours of 20 October 1988 at a hospital in Kyoto, following a long illness. His death occurred only a few hours after that of his beloved wife, Sugako, who was also ill in bed in the same room of the hospital. He was undoubtedly one of Japan's most eminent ecologists, and his far ranging contributions encompassed various aspects of ecology, biogeography, and taxonomy.

Miyadi was born in Innoshima, a small island in the Seto Inland Sea. After an education at Seishikan Middle School in Fukuyama and the Sixth Higher School in Okayama, he entered the Imperial University of Tokyo (now the University of Tokyo) in 1922, where he read zoology and studied fish physiology under Professor Naohide Yatsu.

Following his graduation in 1925, he was appointed Lecturer at the Otsu Hydrobiological Station, College of Science, Kyoto Imperial University (now Kyoto University), where Masuzo Uéno was on the staff. His long university career began here with research on the benthic fauna of lakes. Presumably, this decision was inspired by the distinguished zoologist, Tamiji Kawamura, then Professor of the Department of Zoology in Kyoto, and author of an outstanding book on freshwater biology, later renowned as Kawamura's *Freshwater Biology*. Miyadi's great enthusiasm for research resulted in him soon publishing a series of papers on the benthic fauna of lakes in Japan and adjacent areas, from the Kuril Islands to Formosa. Through the comparison of benthic faunas, he proposed basic criteria which served to characterize and classify the lakes in the Far East. This study was the first comparative hydrobiological study performed outside Europe and North America, where the field was already fairly established. For this pioneering work he was awarded a D.Sc. from Kyoto Imperial University. Subsequently, he began taxonomic and biogeographical research on freshwater fishes and molluscs, and published the first faunal records of the freshwater fishes in both the Kyoto and Shinshu districts, and also studies on the distribution and endemism of several molluscs and mysids.

In 1936, he was promoted to Associate Professor of the Seto Marine Biological Laboratory of Kyoto Imperial University. While at this marine facility, he extended his work to include the benthic fauna of shallow bays along the Japanese coast. Using a similar analysis to that applied to benthic lake fauna, in collaboration with Tetsuo Masui, Tadashige Habe and others, he developed the concept of "the degree of embayment" as an indication of the ecological state of a bay. His association with freshwater biology during this period, however, remained intact. Together with Masuzo Uéno, Masatake Yamazaki and others, he joined a biological expedition to the Manchurian region of northeastern China, which was at that time occupied by Japan. His published findings from this expedition included papers on amphibians, fishes, crabs and leeches.

Fortunately, Miyadi was not called up for military service during the Second World War, and in 1942 he succeeded Professor Tamiji Kawamura in the chair of Physiology and Ecology at the Department of Zoology of the College of Science of Kyoto Imperial University. In this capacity he continued his work on marine communities in shallow coastal areas in collaboration with his research fellows and students. In later years, however, he placed more importance on enabling his students to perform their own research utilizing financial support which he had secured from outside the university. This was possibly partly due to his increasing involvement in administrative duties which deprived him of time to conduct his own research, but more likely because he came to believe that the field of ecology could be advanced by tackling problems related directly to human society, during which process the students could also be trained.

In 1951, Miyadi initiated a study of the ecology of the Ayu fish, *Plecoglossus altivelis*, at the request of the Fisheries Department of Kyoto Prefectural Government. He was requested to ascertain the optimal density for release of young of this highly appreciated food and sport fish into rivers. A succession of students joined the research group for this study, and the description of the territorial social structure of this fish was one of the important early results. It was Miyadi himself who introduced SCUBA equipment of the original Cousteau type for underwater observation early in this study. This SCUBA equipment was later utilized even more extensively in an ecological study of *Zostera* beds, which he initiated in 1952 with financial support from the Fisheries Agency of the Ministry of Agriculture. Students were also part of this research group and the detailed community structure was clarified, providing confirmation of the role of the beds as a nursery ground for some important commercial fishes. For the study of the Japanese monkey, *Macaca fuscata*, which was started in 1948 by one of his students in Kyushu and later attracted many students, he also drew upon various sources of financial support. This study became famous for its fascinating discoveries on the social structure and behaviour of this primate, and later evolved into inspired research on various primates at places all over the world. Miyadi's chief virtue was his ability to attract students of varied disciplines to join his research groups and promote an exchange of ideas on the various problems and to work in collaboration to solve them.

In 1958, on behalf of Shimane Prefectural Government, Miyadi recommended an ecological investigation of Lake Naka-umi and its adjacent areas, shallow brackish waters which at that time were planned to be turned into a freshwater reservoir and be partly reclaimed. Scientists from various fields of aquatic biology were invited to participate in the survey and greatly advanced the knowledge of the biology of the lake. The results contributed to the appraisal of the project, which has just recently been suspended for an unlimited period. Likewise, in 1962, at the request of the Biwa-ko Office of the Ministry of Construction, he began a survey of Lake Biwa-ko, with over fifty participating scientists, which resulted in the first integrative biological investigation of this lake.

From 1961 to 1963, he was Dean of the Faculty of Science (formerly College of Science) of Kyoto University, and, from 1946 until his retirement in 1964, Director of the Seto Marine Biological Laboratory. In 1951, he was elected to the Science Council of Japan and was an active participant until 1963. In addition, he served as President of the Ecological Society of Japan from 1960 to 1971, and also

served as Director of the Japan Monkey Center, a private research body, in the founding and establishment of which he played a major role.

In his later years at the university, his personal interests extended into the examination of the sociological aspects of ecology. He concentrated on the study of the social structure and behaviour of animals and placed great emphasis on the study of the primates. Together with Kinji Imanishi, he founded the Laboratory of Physical Anthropology in the Department of Zoology, and also the Primate Research Institute of Kyoto University.

He invited many distinguished foreign scientists from different disciplines to his laboratory during the hard times in Japan which followed the war; among these visitors were Professor Sir Alister C. Hardy and Professor Eugene P. Odum. He also attended various international conferences held abroad, such as the Pan-Pacific Science Congress in Quezon City and the International Congress of Zoology in London. It was truly remarkable that at that time he also received an invitation from the Akademia Nauk of the U.S.S.R.

In his early days, Miyadi did not write textbooks, choosing instead to write chapters in many biological publications. However, in 1953, in joint authorship with Syuiti Mori, he published a small book on animal ecology, which is nowadays regarded as the pioneering introduction to this field in Japan, and greatly stimulated the ecology students of the day. Books he published later reflected his change in interest and were mostly concerned with the society and behaviour of animals, particularly of monkeys.

We do not know what Miyadi was like as a research worker in his early years, but we have heard an old captain of the Seto Marine Biological Laboratory talking of his experience: "He was 'greedy' in doing research. We were nearly killed on a boat by sweeping bullets from a U.S. fighter. He simply would not stop dredging." As a professor, he was warm, quiet and always generously prepared to listen to his students; we never heard him raise his voice. Rather, he was a man of relatively few, carefully chosen words, which conveyed the depth of his thought.

He was not a narrow-minded scientist. For some time, his poetic feeling led him to write Japanese short verses, haiku, that were shaded with zoological hues. His nom de plume, Hidei (the Chinese characters of this may also be pronounced in Japanese as Hidoro), was obviously adapted from the word hydrobiology, and in his later years he published his haikus in small books, accompanied by relevant essays. Here is one of them, which was composed by him upon the occasion of his retirement.

How cold does it make an aged midge feel
Off the water leaving a lake.

— Hidei

HIROYA KAWANABE

Department of Zoology
Kyoto University
and

EIJI HARADA

Seto Marine Biological Laboratory
Kyoto University



Kawanabe, Hiroya and Harada, Eiji. 1989. "OBITUARY." *Zoological science* 6, 619–621.

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