

Chapter 1

Professor Oscar Ravera: Long Life in Science



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Abstract The long scientific way of Dr. Oscar Ravera started soon after the Second World War and lasted for more than 60 years. A vast number of his research projects covered practically all main fields in limnology of the twentieth century.

Keywords Aquatic ecology · Limnology · Bioindication · Radioactivity · Sediment dating · Environmental ethics



Professor Oscar Ravera getting an award in limnology

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V. R. Alekseev, B. Pinel-Alloul (eds.), *Dormancy in Aquatic Organisms. Theory, Human Use and Modeling*, Monographiae Biologicae 92,
https://doi.org/10.1007/978-3-030-21213-1_1

Just after graduation in Natural Sciences (1949), he started his research career at the Istituto Italiano di Idrobiologia under the direction of Edgardo Baldi. Here, he spent 8 years focusing on basic research in limnology, mainly dealing with zooplankton and zoobenthos demography. During this period, he also took the opportunity to perform a research on the relative stability of benthic populations at the Biological Station of Lunz am See (Austria) under the direction of Prof. Franz Ruttner. In 1956, he moved to Sicily to run the Micropaleontological Service of the mining company Edison Co., which he directed until 1959. He returned to research in 1960 with a position as a hydrobiologist at CNEN (National Committee on Nuclear Energy) and then as a Senior Scientist at the Joint Research Center (JRC), Commission of the European Communities (CEC), Ispra, where he spent the following 30 years of his scientific career. Qualified as university lecturer in hydrobiology (University of Milan 1962) and as a full professor in “biogeography” (University of Catania 1976), he taught ecology at the Universities of L’Aquila, Venice, and Urbino. After retirement in 1997, he decided to continue his research as a private scientist at the Institute where he had started over 40 years earlier. Here, he worked until 2012, when age forced him to permanently discontinue a career that spanned 62 years. During his stay at the CNR Institute of Ecosystem Studies (previously Istituto Italiano di Idrobiologia), he continued his research on bioindicators and populations dynamics of freshwater mollusks and zooplankton.

During his long career, he led or collaborated to several CEC, OECD, UNESCO, INTECOL, NATO, and EEA projects. He was a founding member and President of the Italian Ecological Society (S.It.E.), a member of many Italian and foreign scientific societies, and national representative of SIL and European Ecological Federation (EEF). In addition to his scientific research, Ravera has had broad involvement as adviser to the Commission of the European Communities (CEC, Brussels) in formulating environmental research programs (1971–1990). He was a member of the Technical Bureau of the OECD International Program on Eutrophication (1972–1980); a member of the Technical-Scientific Committee of the International Commission for the protection of Italian-Swiss waters (1972–1987); the scientific coordinator of the UNESCO International Expert Group on the Lagoon of Venice (1997–1999); a member of the “Special Program Panel on Eco-Sciences” of the NATO Brussels (1979–1983); and several others. In addition, he collaborated with the International Expert Commission, coordinated by Prof. Ph. Bourdeau, on the environmental impact of the mobile flood barriers on the Venice Lagoon (1998). Thanks to his long-term experience on bioindicators and bioaccumulators, he has been for many years a coordinator of the working group of the SIL. He published more than 200 scientific papers and 3 books on general ecology, radioecology, and environmental ethics.

The 30 years of scientific activity of the research group that O. Ravera coordinated at the Joint Research Center (JRC) of the Commission of the European Communities (CEC) and his activity as an adviser to the CEC in Brussels have made the JRC one of the most important points of reference in Europe in the field of aquatic ecology.

His research interests have covered a very wide range of basic and applied ecology topics, which, starting from radioecology, have addressed crucial issues such as eutrophication, acidification, heavy metal contamination, the use of bioindicators for monitoring fresh and marine waters, and the assessment of human impacts on the ecosystem and its different components. This broad spectrum of interests is reflected by its most significant achievements, among which the following deserve particular mention:

- He was the first to measure fallout ^{54}Mn in European lakes and to use fallout radioactivity for dating lake sediments. His discovery of the great accumulation by freshwater mussels of ^{54}Mn from fallout (100,000 times the concentration in the lake water) was one of the most convincing demonstrations for ameliorating the CEC legislation on the radiocontamination risks (Ravera 1964).
- Using freshwater snails and mussels as models, i) he traced the distribution and fate and turnover rate of fall-out radioisotopes and of phosphorus in biotic and abiotic compartments of the lake ecosystem; ii) he evidenced the variations of X-ray effects at various life stages from germ cells to adults (Ravera 1967).
- He was a pioneer in the use of zooplankton remains as a proxy for trophic change in lakes, and he developed a new approach for the analysis of plankton community structure based on combined assessment of species/stage density with their relative biomass.
- The same methods used in the study of radiocontamination were transferred to the study of heavy metal pollution, producing important results in the assessment of the fate and the biological effects of low concentrations of toxic metals.

He numbers among his major achievements the promotion of ecology in Italian universities, the training of many Italian and foreign students, and helping to raise the consciousness of the general public as regards ecological concepts and the principles of environmental ethics (Ravera 1989).

His passion for research, continued actively even after retirement, is evidenced by the organization of two workshops of great scientific importance and lasting impact: one dealing with bioindicators (“Biological Monitoring,” Verbania Pallanza, Italy, September 4–5, 2000) and one with dormancy/diapause in freshwater animals (“Diapause In Aquatic Invertebrates,” Verbania Pallanza, Italy, October 21–23, 2003) (Alekseev et al. 2004). These workshops gave rise to collaborations and produced valuable scientific publications. For example, the diapause workshop promoted the publication of the first monograph on “Dormancy in aquatic invertebrates” published by Springer in 2007. As a pebble in the pond can generate a wave that is slow to die out, a bit of merit for the production of the current updated monograph goes back to the workshop of the now distant 2003.

The public recognition of his scientific merits, their amount of influence, success and originality, arrived in 2001, when he was awarded by the Global 500 Roll of Honor of the UNEP.

His enthusiasm for science, and ecology in particular, kept him active for over 60 years, only illness and death could defeat his optimistic and perennially young spirit. He “slipped away to the next room” just after turning 90, but even if out of sight, he will never be out of mind, *just around the corner*.

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