

Preface

Minerals, organic matter and microorganisms are the major solid components in soil systems. These three constituents do not function independently but rather interact with each other constantly at all times and everywhere in the soil ecosystem. The interactions profoundly affect a series of physical, chemical and biological processes of soils including the behavior, transformation and fate of various nutrients and pollutants. The research on these interactions should, thus, be an important issue for Soil and Environmental Scientists. Therefore, the International Society of Soil Science established the Working Group MO in 1990, which was promoted to a new Commission 2.5 Soil Physical/Chemical/Biological Interfacial Interactions of the International Union of Soil Sciences (IUSS) in 2004. To date, the Working Group has sponsored four international symposia and these conferences were held in Edmonton (Canada, 1992), Nancy (France, 1996), Naples (Italy, 2000) and Wuhan (China, 2004), respectively.

The 4th International Symposium on Interactions of Soil Minerals with Organic Components and Microorganisms (ISMOM2004) was the first Inter-Congress Symposium of IUSS Commission 2.5. The conference was cosponsored by the International Union of Pure and Applied Chemistry (IUPAC). Doctors P.M. Huang (Canada), A. Violante (Italy), J. -M. Bollag (USA), J. Berthelin (France), J. Zhou (China) and Q. Huang (China) served in the Symposium Organizing Committee. The meeting attracted 135 delegates from 22 countries and regions in the world including Canada, Chile, China, France, Germany, Hong Kong SAR, India, Indonesia, Iran, Italy, Japan, Kenya, Korea, Malaysia, New Zealand, Russia, South Africa, Thailand, The Netherlands, USA, Venezuela and Zimbabwe. The theme of ISMOM2004 was “Environmental Significance of Mineral-Organic Component-Microorganism Interactions in Terrestrial Systems”. The conference program was divided into the following six sessions: (1) Transformation and Dynamics of Pollutants in Soil Environments, (2) Chemical, Biological and Biochemical Processes in the Rhizosphere, (3) Bioavailability of Metals, Nonmetals and Xenobiotics Immobilized on Soil Components, (4) Distribution and Activity of Biomolecules in Terrestrial Systems, (5) Interactions between Soil Microbial Biomass and Organic Matter/Nutrient Transformations, and (6) Impact of Interactions among Soil Mineral Colloids, Organic Matter and Biota on Risk Assessment and Restoration of Terrestrial Ecosystems. There were 2 plenary lectures, 9 invited speakers, 36 oral presentations and 45 posters. Dr. N. Senesi from University of Bari, Italy, presented an IUPAC lecture entitled Metal-Humic

Substance Complexes in Soil. Dr. P. M. Huang from University of Saskatchewan, Canada, who was the founder of Working Group MO and the founding Chair of Commission 2.5 of IUSS, gave a plenary lecture on Physical-Chemical-Biological Interfacial Interactions in Soil Environments.

The 13 chapters in this book are mainly the papers from the plenary and invited speakers of ISMOM2004. They address the state-of-the-art on the theories and applications of the interactions of minerals with organic components and microorganisms in soil environments. The book presents a variety of issues on the fundamental interactions among soil minerals, organic components and microorganisms and their impacts on soil ecosystems. Part I (Chaps. 1–7) addresses the fundamentals of physical-chemical-biological interfacial reactions, the binding and transformation mechanisms of metals, metalloids, biomolecules and organic pollutants as affected by soil organic, inorganic and microbial components. Part II (Chaps. 8–13) deals with the impacts of the interactions of soil components on the dynamics of soil carbon and biomass, the bioavailability of chemicals, and on soil and environmental quality. These chapters present a variety of topics that address issues of the cutting edges of science of the subject matter. We believe that the publication of this ISMOM2004 special book would promote in-depth studies in this field for years to come. The book should be useful for research scientists, professors, graduate students, and consultants working in soil, microbial ecology and environmental sciences.

We wish to extend our gratitude to the many sponsors including the National Natural Science Foundation of China (NSFC) and Organization for the Prohibition of Chemical Weapons (OPCW). We also acknowledge the contributions from many of the Chinese Institutions such as Huazhong Agricultural University, Institute of Soil Science of the Chinese Academy of Sciences, State Key Laboratory of Agricultural Microbiology, and the Key Laboratory of Subtropical Agricultural Resources and Environment.

In addition to this book, volunteered papers presented at ISMOM2004 and accepted after rigorous external review was published as a special issue by the international journal *Biology and Fertility of Soils*. This special issue serves a companion volume of this IUSS- and IUPAC-sponsored book published by Springer-Verlag.

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Soil Mineral -- Microbe-Organic Interactions
Theories and Applications

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2008, XVI, 354 p., Hardcover

ISBN: 978-3-540-77685-7