

Preface

It has been well-established that soil biota plays a critical role in breaking down rotting plant material and animal remains, and in turning them into soil nutrients. Soil biota is therefore fundamental to the process of decomposition and material cycling as well as associated ecosystem functions. Soil faunal communities offer opportunities for us to study phenomena such as species interaction, resource utilization, and temporal and spatial distribution.

A number of aspects related to soil fauna have been developed in China. These include the function of soil fauna as bioindicators of ecosystem health, the identification and evaluation of soil organisms by using barcoding technology, soil biota and resource partitioning, soil biodiversity and global climate change, etc. Along a latitudinal gradient from southern to northern China, soil fauna data sets were collected from tropical, subtropical, and temperate regions. Soil faunal habitats investigated include forest, grassland, desert, wetland, farmland, and urban ecosystems. Several relevant books have been previously published, including *Studies on Fauna and Eco-geography of Soil Animal*, *Subtropical Soil Animals in China*, *Pictorial Keys to Soil Animals of China*, *Soil Animals of China*, *Study on Forest Soil Animals in Northeast China*, etc.

However, systematic research related to soil faunal ecology in desertified ecosystems is limited. There is a lack of information regarding the distribution of soil faunal communities and the underlying mechanisms that explain such distribution patterns. Soil fauna is one of the most important components in desertified ecosystems. Relevant studies can offer important evidence that the soil fauna can be used for quality assessments, the maintenance and management of ecosystems, and the restoration of degraded ecosystems.

Since 2007, the authors of this book has gained vast experience in studying soil faunal ecology in the Horqin Sandy Land and the Mu Us Sandy Land in northern China as well as in the Negev desert in southern Israel. In these regions, desertification has become one of the most serious environmental and socioeconomic problems due to overgrazing, cultivation practices, and climatic change. Many measures have been taken to manage sandy grassland, control desertification, and restore degraded ecosystems. In particular, shrub canopies have been found to play an important role in ecological recovery of shifting sandy land. Studies related to the bioprocesses of degradation and recovery of sandy grassland has therefore become a new challenge in soil faunal community research.

Chapter 1 provides details related to the concept and classification of soil fauna and its

research methods. Chapter 2 deals with the effects of desertification and stabilization of shifting sand dunes on soil faunal communities. Chapter 3 examines the effects of restoration management on soil faunal community distribution. Chapter 4 deals with the effects of grassland cultivation on soil faunal community distribution. Chapter 5 examines the effects of land use/cover changes on soil faunal community distribution. Chapter 6 deals with how shrub cover acts as a stimulus to arthropod communities in sandy lands. Chapter 7 examines the spatiotemporal distribution of soil faunal communities in relation to shrub cover. Finally, Chapter 8 deals with the formation of the "Arthropod Island" effect and its relation to grazing management.

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We hope that this book on ecology of soil fauna in a desertified system is useful to soil ecologists, conservation biologists, desert ecologists, geographers, policy makers, lecturers as well as others who are interested in soil faunal ecology in arid and semiarid regions.

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