

Preface

Until I spoke her name, she had been no more than a mere gesture. When I spoke her name, she came to me and became a flower. Speak my name that fits this color and odor of mine. I may go to her and become her flower. We all wish to become something. You to me and I to you wish to become an unforgettable gaze. (Flower, Kim, Chunsu, 1922–2004).

Like the world famous science fiction adventure films *Jurassic Park* and *Jurassic World*, the Gyeongnam Goseong Dinosaur World Expo and International Dinosaur Symposium has attracted a vast number of people. This Expo is held every three years at the world famous Goseong Dinosaur Track Site in Korea.

The Fourth Gyeongnam Goseong Dinosaur World Expo, held in 2016, attracted over 1.5 million visitors, including several tens of thousands of foreigners. In addition, millions of students have learned about the dinosaurs of Korea through their being introduced in elementary school, middle school, and high school science textbooks.

Furthermore, several hundreds of scientists, including dinosaur experts from around the world, visited the dinosaur, bird, and pterosaur track sites of Korea during the 2012 Eleventh Symposium of the Mesozoic Terrestrial Ecosystems and the Haenam Uhangri International Dinosaur Symposiums held in Korea.

Since 1969—when *Koreanaornis hamanensis*, the second Mesozoic bird tracks to be formally named, were discovered in the Haman Formation, Korea—numerous and well-preserved dinosaur, bird, and pterosaur tracks have been reported. For example, a special issue of the journal *Ichnos* entitled *Tracking on the Korean Cretaceous Dinosaur Coast: 40 years of Vertebrate Ichnology in Korea* was published in 2012 (vol. 19, issue 1–2). The senior author and his colleagues presented a paper entitled “Dinosaur, Bird, and Pterosaur Tracks from the Cretaceous of Korea: The Paradise of Mesozoic Vertebrates” at the 2012 Symposium on Mesozoic Terrestrial Ecosystems (MTE) held in Korea. The symposium was organized by the junior author of this volume, and resulted in the title of this book.

However, unfortunately and surprisingly, to date no science book about the Mesozoic vertebrates of Korea has been published. Therefore, this book is the first science book on Mesozoic vertebrates written for young students, lay readers, and teachers, as well as for scientists who are interested in the dinosaurs, birds, and pterosaurs of Korea. Furthermore, this book can be enjoyed by visitors to the Goseong Dinosaur World Expo and International Dinosaur Symposium in Korea, and the 2024 International Geological Congress (IGC), which will be held in Busan, Korea.

This book consists of seven chapters. Chapter 1 briefly introduces the history of research and the scientific value of Korean dinosaurs, birds, and pterosaurs, and presents the geologic setting and Cretaceous sedimentary basins of Korea. Timelines of important research on vertebrates from the Cretaceous Period in Korea are shown in Chap. 1. Footprints, bones, eggs, teeth, skin and tail impressions of Korean dinosaurs are presented in Chap. 2. Important vertebrate tracks introduced are the smallest theropod tracks (*Minisauripus*), raptor tracks with two-toed impressions (*Dromaeosauripus*), large sauropod tracks with pentadactyl manus traces (*Brontopodus pentadactylus*), clover leaf-shaped ornithopod tracks (*Ornithopodichnus*), and quadrupedal ornithopod tracks (*Caririchnium kyoungsookimi* and *C. yeongdongensis*). Theropod egg clutches (*Macroelongatoolithus*) and dinosaur teeth, including a recently discovered tyrannosaurid tooth, are introduced in Chap. 2. Which also discusses recently discovered dinosaurs including *Koreanosaurus*, *Koreaceratops*, and *Pukyongosaurus*. Dinosaur tracks from North Korea's Cretaceous Period are also briefly introduced in Chap. 2.

Tracks of birds from the Cretaceous Period in Korea are introduced in Chap. 3. Diverse bird tracks named in Korea are explained. They are the second named bird tracks (*Koreanaornis*), web-footed bird tracks (*Hwangsanipes*, *Uhangrichnus*), the oldest bird tracks with web traces (*Ignotornis yangi*), the oldest web-footed bird tracks with feeding traces (*I. gajinensis*), and new semipalmate bird tracks (*Gyeongsangornipes*). Chapter 4 introduced pterosaurs from the Cretaceous Period in Korea. The largest pterosaur tracks (*Haenamichnus*), swimming traces of pterosaurs (*Ptraichnus ichnosp.*), the first bipedal tracks of pterosaurs (*H. gajinensis*), and the tracks of a new pterosaur (*Ptraichnus koreanensis*) are explained in Chap. 4. A pterosaur skeleton and teeth are also briefly discussed in Chap. 4. Turtle tracks and carapace, crocodile bones and teeth, and a new lizard (*Asprosaurus*) are also introduced in Chap. 4. Skeletal remains of birds (the so-called Korean *Archaeopteryx*) and pterosaurs discovered in the Lower Cretaceous area of North Korea are also briefly introduced in Chaps. 3 and 4.

Chapter 5 deals with diverse fossils associated with vertebrate tracks, such as molluscs, fish, arthropods, plants, stromatolites, and invertebrate trace fossils, which are also important for understanding the paleoenvironment during the Cretaceous Period in Korea. Chapter 6 introduces the Korean Cretaceous Dinosaur Coast (KCDC) as a candidate for a UNESCO World Heritage inscription including the Haenam, Hwasun, Boseong, Yeosu, Goseong, Gajinri, and Gainri sites. The new dinosaur track site of Yeongdong and the *Koreanaornis* bird track site of

Haman are also briefly introduced. Chapter 6 also discusses four well-known dinosaur eggshell sites: Boseong, Hwaseong, Hadong, and Tongyeong.

Chapter 7 presents a summary of research into Mesozoic vertebrates in Korea and discusses the prospects of further research. The total number of dinosaur, bird, and pterosaur tracks and trackways discovered in Cretaceous basins is shown in table and figure format. In addition, a geographic map is provided showing the distribution of vertebrate taxa and ichnotaxa described from the Cretaceous Period in Korea, together with a world geographic map showing the distribution of the Cretaceous bird and pterosaur ichnotaxa named in eight countries. Chapter 7 also discusses the present situation and problems for research into Cretaceous vertebrates to be resolved for the future development of Korean Mesozoic vertebrate paleontology. Finally, Fig. 7.7 presents a reconstruction of the Cretaceous Paradise, based on the diverse fossils from the Cretaceous Period in Korea.

References cited in the text are listed at the end of each chapter for readers who wish to learn about the topics in greater detail. An administrative district map showing the locations of vertebrate fossils from the Cretaceous Period in Korea is provided for readers who wish to visit the fossil locations presented in Appendix 1. Major museums and research centers for visitors who are interested in Mesozoic vertebrates in Korea are also introduced in Appendix 2. Finally, for readers an index of locations, strata, vertebrate and invertebrate taxa and ichnotaxa, and author names is provided for the reader.

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Dinosaurs, Birds, and Pterosaurs of Korea

A Paradise of Mesozoic Vertebrates

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