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Genetic Status of Asiatic Black Bear (*Ursus thibetanus*) Reintroduced into South Korea Based on Mitochondrial DNA and Microsatellite Loci Analysis

Yung-Kun Kim*, Yoon-Jee Hong*, Mi-Sook Min*, Kyung Seok Kim*, Young-Jun Kim, Inna Voloshina, Alexander Myslenkov, Gavin J. D. Smith, Nguyen Dinh Cuong, Huynh Huu Tho, Sang-Hoon Han, Doo-Ha Yang, Chang-Bae Kim, and Hang Lee

From the College of Veterinary Medicine and Research Institute for Veterinary Science, Seoul National University, Seoul 151-742, Korea (Kim, Hong, K. S. Kim, Y-J. Kim, and Lee); the Conservation Genome Resource Bank for Korean Wildlife, Seoul National University, Seoul, Korea (Y-K. Kim, Hong, Min, and Lee); the Lazovsky State Nature Reserve, Lazo, Primorsky Krai, Russia (Voloshina and Myslenkov); the Program of Emerging Infectious Diseases, Duke-NUS Graduate Medical School, Singapore (Smith); the Forest Protection Department of Ho Chi Minh City, Ho Chi Minh City, Vietnam (Cuong); the Sub-Department of Animal Health HCMC, Veterinary Diagnostic Laboratory Division, Ho Chi Minh City, Vietnam (Tho); the Vertebrates Research Division, National Institute of Biological Resources, Incheon, Korea (Han); the Species Restoration Center, Korea National Park Service, Gurae, Korea (Yang); and the Department of Green Life Science, Sangmyung University, Seoul, Korea (C. B. Kim).

*These authors contributed equally to the work.
Address correspondence to Dr Kyung Seok Kim at the address above, or e-mail: kyungkim@snu.ac.kr.

Abstract

The Asiatic black bear is one of the most endangered mammals in South Korea owing to population declines resulting from human exploitation and habitat fragmentation. To restore the black bear population in South Korea, 27 bear cubs from North Korea and Russian Far East (Primorsky Krai) were imported and released into Jirisan National Park, a reservoir of the largest wild population in South Korea, in 2004. To monitor the success of this reintroduction, the genetic diversity and population structure of the reintroduced black bears were measured using both mitochondrial and nuclear DNA markers. Mitochondrial D-loop region DNA sequences (615 bp) of 43 Japanese black bears from previous study and 14 Southeast Asian black bears in this study were employed to obtain phylogenetic inference of the reintroduced black bears. The mitochondrial phylogeny indicated Asiatic black bear populations from Russian Far East and North Korea form a single evolutionary unit distinct from populations from Japan and Southeast Asia. Mean expected heterozygosity (H_E) across 16 microsatellite loci was 0.648 for Russian and 0.676 for North Korean populations. There was a moderate but significant level of microsatellite differentiation (F_{ST} = 0.063) between black bears from the 2 source areas. In addition, genetic evidences revealed that 2 populations are represented as diverging groups, with lingering genetic admixture among individuals of 2 source populations. Relatedness analysis based on genetic markers indicated several discrepancies with the pedigree records. Implication of the phylogenetic and genetic evidences on long-term management of Asiatic black bears in South Korea is discussed.

Key words: *Asiatic black bear, conservation, endangered species, genetic diversity, microsatellites, reintroduction,* Ursus thibetanus

The Asiatic black bear (*Ursus thibetanus*) is threatened in much of its native habitat. In South Korea, *U. thibetanus* has been designated as an Endangered Species I (Ministry of Environment of Korea 2005) and a Natural Monument Species (No. 329; Cultural Heritage Administration Korea 1982, http://search.cha.go.kr/srch/jsp/search_top.jsp), and, elsewhere, as a vulnerable (IUCN 2010) and noncommercial trade species (IUCN 2010).

The Asiatic black bear has been of culturally and religiously importance to Koreans for thousands of years. Despite this, the species was systemically eradicated under the "Injurious Animal Destruction" program during the Japanese occupation of Korean