



## Selection of an effective microsatellite marker system for genetic control and analysis of gerbil populations in China

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**ABSTRACT.** Although gerbils have been widely used in many areas of biological research over many years, there is currently no effective genetic quality control system available. In the present study, we sought to establish a microsatellite marker system for quality control and conducted an optimized analysis of 137 microsatellite loci in two laboratory gerbil populations and one wild population. Independent sample *t*-tests on the mean effective allele number, mean of Shannon's information index, and mean  $H_E$  suggested that 28 of the 137 microsatellite markers were informative for gerbil genetic control. Analysis of 4 laboratory gerbil populations and 1 wild population using the 28 microsatellite loci indicated that allele numbers varied from 1.9639 (Guangzhou, GZ) to 6.6071 (North-West wild, NW). The average of  $H_O$  versus  $H_E$  was 0.6236/0.3802, 0.6671/0.4159, 0.4185/0.3464, 0.4592/0.3821, and 0.3972/0.4167 for the Beijing, NW, Hangzhou, Dalian, and GZ popula-

tions, respectively. The GZ population showed the greatest differentiation, having higher  $R_{ST}$  and Nei's standard genetic distances. An AMOVA revealed high genetic differentiation among the five populations ( $F_{ST} = 0.296$ ). The microsatellite system established here is effective and will be important in future studies for genetic quality control and monitoring of gerbil breeds.

**Key words:** Microsatellites; Population variation; Genetic control; Genetic differentiation; Gerbil