Genetic diversity in zoysiagrass ecotypes based on morphological characteristics and SSR markers

M. Hashiguchi[1], S. Tsuruta[1], T. Matsuo[1], M. Ebina[2], M. Kobayashi[3], H. Akamine[4] and R. Akashi[1]
[1]Faculty of Agriculture, University of Miyazaki, Miyazaki 889-2192, Japan, [2]Okinawa Prefectural Livestock Experimental Station, Okinawa 905-0426, Japan, [3]National Institute of Livestock & Grassland Science, Tochigi 329-2793, Japan, [4]Faculty of Agriculture, Ryukyu University, Okinawa 903-0213, Japan
E-mail: mashiguchi@miyazaki-u.ac.jp

Keywords: zoysiagrass, genetic resource, genetic diversity, morphological characteristics, SSR markers

Introduction Zoysiagrass consists of a number of interfertile species, some of which are important grasses for turfgrass and grazing pasture in Japan. Recently, we developed simple sequence repeats (SSRs) markers from *Zoysia japonica* "Asagake" genomic DNA by enriched genomic library method (Yamamoto *et al*., 2002). Here we identify genetic diversity in 38 ecotypes of zoysiagrass (*Z. matrella* and *Z. tenuifolia*) from a group of southwest islands of Japan based on morphological characteristics and SSR markers.

Materials and methods Thirty-eight zoysiagrass ecotypes and 3 cultivars were used in this study. These accessions were screened for 7 morphological characteristics and 13 SSR markers, which could produce 1 or 2 discrete amplified fragments in all ecotypes and cultivars.

Results Thirty-eight zoysiagrass ecotypes, except "Tanegashima 2", were classified into 2 groups based on 7 morphological characteristics. Cluster I consists of *Z. matrella* and 2 cultivars (Emerald and Tottori-kourai). On the other hand, cluster II contained *Z. tenuifolia* except "Minatogawa 2". Thirteen SSR markers were polymorphic in 38 ecotypes of zoysiagrass within 2 to 22 alleles per locus. 157 putative alleles were obtained, with an average of 12. Cluster analysis based on the 157 SSR bands revealed that the 38 ecotypes of zoysiagrass were classified into 6 groups.

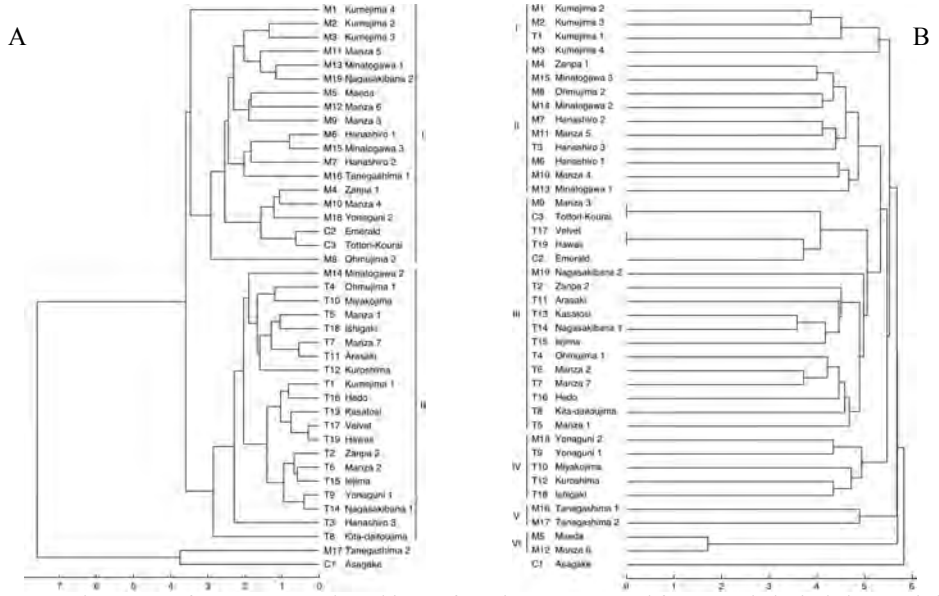

Figure 1 Phenogram of 38 ecotypes and 3 cultivars of zoysiagrass generated from morphological characteristics (A) and SSR markers (B) using UPGMA method. Scale on bottom indicates dissimilarity index

Conclusions Thirty-eight ecotypes of zoysiagrass were identified with morphological and SSR marker. Because of a high correlation between leaf width and other morphological characters, these accessions were classified into *Z. matrella* and *Z. tenuifolia* by 7 morphological characteristics. On the other hand, they could not be classified into two species using SSR markers. However, that classification tends to follow geographical origins. These SSR markers could be a useful tool to investigate genetic diversity of ecotypes of zoysiagrass as well as to identification and construction of genetic linkage map of agronomically and commercially important traits.

References Yamamoto *et al*. (2002) Mol. Eco. Notes, 2:14-16