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Abstract

PoZymorphism. An RFLP was detected in the superoxide dismutase 2 (SOD2) locus of swine using the restriction enzyme StuI. Source and Description of Probe. An 827-bp human cDNA clone for SOD2 was excised from the EcoRI site of plasmid pHmSOD4 (Xiang et al., 1987).

Keywords

Porcine, SOD2, RFLP

Disciplines

Agriculture | Animal Sciences | Genetics and Genomics

Comments

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Rapid Communication: Restriction Fragment Length Polymorphism at the Porcine *Superoxide Dismutase* Locus^{1,2}

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Polymorphism. An RFLP was detected in the superoxide dismutase 2 (*SOD2*) locus of swine using the restriction enzyme *StuI*.

Source and Description of Probe. An 827-bp human cDNA clone for *SOD2* was excised from the *EcoRI* site of plasmid pHmSOD4 (Xiang et al., 1987).

Method of Detection. DNA was isolated from blood, digested with *StuI*, separated by agarose gel electrophoresis, and transferred to charged nylon membranes. Hybridizations were performed at 65°C for 16 to 20 h (10% dextran sulfate, .5 M NaCl, .05 M sodium phosphate pH 6.5, 5× Denhardt's solution, .5% SDS, 100 g/mL sonicated denatured salmon sperm DNA). Final washes were done at 68°C in .7× SSC, .5% SDS for 20 min.

Description of Polymorphism. Hybridization of *StuI* digests with the human *SOD2* probe revealed three fragments (Figure 1). The 7.5- and 6.2-kb fragments were allelic. In addition, a null allele was detected in some Landrace families (see Figure 1, Landrace dam). The 6.9-kb fragment was monomorphic. No polymorphisms were detected with *BamHI* (28 animals) or *TaqI* (16 animals).

Inheritance Pattern. Autosomal Mendelian segregation of the 7.5- and 6.2-kb alleles was demonstrated in a three-generation Meishan-Landrace reference family, in a three-generation Meishan-Yorkshire reference family, and in a two- and three-generation Minzhu-Landrace reference family.

Frequency. The Landrace and Yorkshire breeds were the only breeds that exhibited polymorphism at the *SOD2* locus, with estimated frequencies of .35 and .53 for the 7.5- and 6.2-kb fragments, respectively (17 animals). Frequency was 1.0 for the 6.2-kb fragment in Meishan, Minzhu, Duroc, Hampshire, Chester

White, Stress, and NIH Minipig animals (45 animals).

Comments. The superoxide dismutase 2 (*SOD2*) gene is a nuclear-encoded, manganese-dependent, mitochondrial enzyme that protects the mitochondrion from the toxic effects of superoxide radicals generated from the biological oxidations occurring within this organelle.

Literature Cited

Xiang, K., R. A. Hallewell, and G. I. Bell. 1987. Multiple *TaqI* RFLPs at the human manganese superoxide dismutase (*SOD2*) locus on chromosome 6. *Nucleic Acids Res.* 15:7654.

Key Words: Porcine, *SOD2*, RFLP

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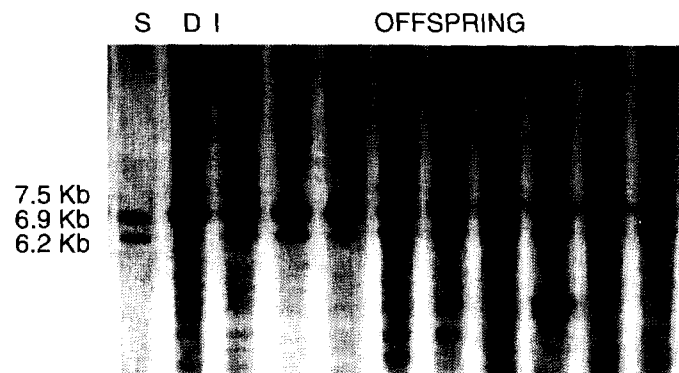


Figure 1. A Meishan × Landrace two-generation pedigree including a Meishan sire (S) and a Landrace dam (D) with the null allele and offspring.

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