

动物遗传学

### 小尾寒羊高繁殖力候选基因ESR的研究

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**摘要** 利用PCR-SSCP技术对高繁殖力绵羊品种(小尾寒羊、湖羊、德国肉用美利奴羊)和低繁殖力绵羊品种(多赛特羊、萨福克羊)的雌激素受体(estrogen receptor, ESR)基因第一外显子部分序列进行单核苷酸多态性研究。结果表明:小尾寒羊、湖羊和德国肉用美利奴羊中存在3种基因型(AA、BB、AB),而在多赛特羊和萨福克羊中只存在两种基因型(AA、AB)。统计结果表明:湖羊、德国肉用美利奴羊、小尾寒羊、萨福克羊和多赛特羊A等位基因频率分别为0.672、0.786、0.846、0.857和0.867, B等位基因频率分别为0.328、0.214、0.154、0.143和0.133。测序结果表明:BB型和AA型相比在外显子1第363位发生1处碱基突变(C→G)。独立性检验表明:小尾寒羊和湖羊之间基因型分布差异极显著(P<0.01),湖羊和多赛特羊之间基因型分布差异显著(P<0.05),其他各个绵羊品种之间基因型分布差异均不显著。AB基因型和BB基因型小尾寒羊产羔数比AA基因型分别多0.51只(P<0.05)和0.7只(P<0.05)。研究结果表明:ESR基因可能是控制小尾寒羊多胎性能的一个主效基因或与之存在紧密的遗传连锁。

**关键词** [绵羊](#); [高繁殖力](#); [候选基因法](#); [雌激素受体基因](#); [PCR-SSCP](#)

分类号

## Estrogen Receptor as a Candidate Gene for Prolificacy of Small Tail Han Sheep

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#### Abstract

Single nucleotide polymorphism of exon 1 of estrogen receptor (ESR) gene was detected in both high fecundity sheep breeds (Small Tail Han sheep, Hu sheep and German Mutton Merino sheep) and low fecundity sheep breeds (Dorset sheep, Suffolk sheep) by PCR-SSCP. The results indicated that there were three genotypes (AA, AB and BB) in Small Tail Han sheep, Hu sheep and German Mutton Merino sheep. Two genotypes (AA, AB) were detected in Dorset sheep and Suffolk sheep. In Hu sheep, German Mutton Merino sheep, Small Tail Han sheep, Suffolk sheep and Dorset sheep, frequency of A allele was 0.672, 0.786, 0.846, 0.857 and 0.867 respectively, frequency of B allele was 0.328, 0.214, 0.154, 0.143, and 0.133 respectively. The sequencing results showed that there was a mutation (C→G) at 363bp of exon 1 of ESR gene in BB genotype compared to AA genotype. The genotype distribution was significantly different (P<0.01) between Small Tail Han sheep and Hu sheep. The genotype distribution was different (P<0.05) between Dorset sheep and Hu sheep. The genotype distribution had no difference between other sheep breeds. The ewes with genotype AB and BB had 0.51 (P<0.05) and 0.7 (P<0.05) lambs more than those with genotype AA in Small Tail Han sheep, respectively. These results showed that the estrogen receptor locus is associated with a major gene influencing prolificacy in Small Tail Han sheep. In view of our results, marker-assisted selection using ESR is warranted to increase litter size in sheep and will be of considerable economic value to mutton

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**Key words** [sheep](#); [prolificacy](#); [candidate gene approach](#); [estrogen receptor gene](#); [PCR-SSCP](#)

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