

Characterization and sequence analysis of fibroblast growth factor 2 gene in buffalo (Bubalus bubalis)

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Growth factors play important role during gestation in livestock species. One such growth factor is Fibroblast Growth Factor 2 (FGF2) which has placentogenic and embryo-protective role during pregnancy. Studies in cattle reveal that specific mutations at intron 1 region of FGF2 gene contribute to embryonic mortality and thereby results in poor reproductive performance. The present study was conducted to characterize and find putative nucleotide changes at buffalo FGF2 gene intron 1 segment. For this study buffalo genomic DNA was isolated from blood. PCR amplification of FGF2 gene intron 1 region was carried out in 25 µl of reaction mixture containing approximately 50-100 ng of genomic DNA. Specific PCR product of 167 bp for FGF2 gene was got sequenced (SciGenom Ltd). BLAST analysis in NCBI nucleotide Database of buffalo FGF2 gene show 92% similarity with bovine FGF2 gene sequence. Sequence analysis using CLUSTALW2 software of the obtained sequence revealed eight nucleotide differences in the intron 1 region of buffalo FGF2 gene in comparison with bovine sequence (HM597774.1). These distinct differences were at position 329 (A/T), 360 (G/C), 368 (C/A), 375-6 (C/A, C/T), 381 (T/C), 385 (C/T), 401-2 (G/C, G/A) which include 4 transitions and 5 transversions as compared to bovine sequence. Using promoter prediction software (BDGP) it was deduced that two distinct promoter regions (323-72; 338-387) with scores 0.83 and 0.92, respectively were present in the buffalo intron 1 sequence. Analysis with TFMATRIX software also revealed 12 potential transcription binding sites with a threshold ranging from 85-100% in the obtained buffalo FGF2 intron 1 nucleotide sequence. It is concluded that nucleotide sequence changes near the transcription sites in the promoter region may subsequently affect the secretion and biological function of Fibroblast Growth Factor during pregnancy in buffaloes.

Keywords: Buffalo, Pregnancy, FGF2, Embryonic mortality

Biography

Jerome A has done his Master's in Animal Reproduction discipline from Indian Veterinary Research institute. He obtained Junior Research Fellowship (JRF) and Senior Research Fellowship (SRF) from ICAR for his Master and PhD Degree programs. At present he is working as scientist in Central Institute for Research on Buffaloes, India. His area of research is Reproductive Biotechnology. At present he is working on role of candidate genes polymorphism contributing to embryonic mortality in buffaloes.

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