Rapid communication: Nucleotide sequence of the river buffalo kappa-casein cDNA

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Name of the Sequence. River buffalo kappa-casein cDNA.

Genus and Species. Bubalus arnee bubalis.

Origin of the Clone. Ten micrograms of total RNA from mammary tissue of lactating buffalo was reverse-transcribed using an oligo d(T)17 primer and superscript II reverse transcriptase (GIBCO-BRL, Grand Island, NY). The forward primer (5′GTGACAAGGAAAGGTGCAATG3′) was designed from conserved regions, through a multiple alignment of bovine, ovine, caprine, and porcine kappa-casein cDNA sequences. Second-strand synthesis was performed using a dilution of the cDNA as template. The specific PCR product was purified and cloned into pMOSblue T-vector (Amersham, U.K.). Two individual positive clones were sequenced on both the strands by an automated sequencer (ABI 377, Applied Biosystems, Foster City, CA) and characterized.

Comparison with Related Sequences. The coding region of river buffalo kappa-casein cDNA is 573 bp long and reveals a homology of 96, 94, 94, and 68%, at the nucleotide level, with cow (Stewart et al., 1984), goat (Coll et al., 1993), sheep (Furet et al., 1990), and pig (Levine et al., 1992), respectively. At the amino acid level, it is 93, 89, 87, and 57% identical to bovine, caprine, ovine, and porcine cDNA sequences, respectively. The coding regions of caprine and ovine cDNA are longer by two amino acids and porcine cDNA is shorter by one amino acid than the buffalo kappa-casein cDNA. Our sequence is comparable to some earlier GenBank entries (Acc. Nos. U96662, D14369.1, and D14370.1) that are genomic in origin and partial in nature. The coding sequence of the cDNA reported here differs from Acc. No. U96662 at nucleotide positions 467 and 471 (T to C at both the positions), resulting in one amino acid substitution at the first position. This variation may be a polymorphism.

Sequence Data. The 794-bp amplified fragment (Figure 1) contains the cDNA coding region in a single open reading frame encoding the complete expressed product of kappa-casein. The first 21 amino acids constitute the putative signal peptide and the mature peptide is 169 amino acids long.

EMBL/GenBank Accession Number. AJ011387.

Comments. Kappa-casein is one of the major protein constituents of milk belonging to the first family of caseins. It plays an important role in milk undergoing O-glycosylation and O-phosphorylation (Mercier et al., 1990). The mature peptide contains one casein kinase II phosphorylation site (CK-2).

Literature Cited


