

A NEW RIVER BUFFALO CYTOGENETIC MAP: COMPARISON WITH CATTLE AND HUMAN CHROMOSOMES

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River buffalo is an economically important species, especially in the eastern, southern American and Mediterranean countries. It represents about 161 million heads in the world, mainly in Asia (95 million in India alone). In contrast to other domestic bovids, the river buffalo population is growing in the world (2% per year as a mean value) with the highest increase in Italy (8% per year in the last 20 years). This explains the increasing interest of both scientists and breeders in this species. A standard karyotype including six banding techniques is available and conclusive relationships among cattle, sheep, goat and river buffalo standard karyotypes based on both chromosome banding and genetic (loci) homologies have been reported in the latest chromosome nomenclature of domestic bovids (ISCNDB 2001). A cytogenetic map at low resolution (293 loci) is available for river buffalo but both linkage and RH-maps are still lacking in this important species, although preliminary RH-mapping results have been recently reported. Cytogenetic studies on female river buffaloes with reproductive problems (lack of oestrus or pregnancy, even in the presence of the bull) have revealed a high frequency (20%) of sterile females carrying sex chromosome abnormalities. Thus, the genetic improvement of this species is very important and a detailed cytogenetic map will be a useful tool to develop both clinical (use of molecular markers on both metaphase and interphase nuclei) and comparative studies, as well as for a better anchoring and orientating both genetic and RH-maps on chromosomes. In the present study, 77 new autosomal loci, were assigned to river buffalo chromosomes by FISH using both caprine and bovine BAC clones, thus expanding greatly the cytogenetic map of this species to 397 mapped loci. In addition, comparisons between some river buffalo chromosome integrated cytogenetic maps with the corresponding human homologues were performed. This new map can be very useful in clinical (use of molecular markers to study chromosome abnormalities in both metaphase and interphase nuclei or sperms) and comparative studies, as well as to anchor and orientating RH-maps to specific chromosome regions.