Contributions of *Bos Indicus* Breed to Genetic Diversity of Sumatra Native Cattle Based on Y-Chromosome Microsatellite Marker

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ABSTRACT

The genetic composition of cattle in the world generally tends to two dominated breeds, *Bos taurus* (European cattle) and *Bos indicus* (Asian cattle). From morphological phenotype could be differed by hump for Asian cattle and humpless for European cattle. Molecular study indicated that any alleles or haplotypes which tend to those dichotomy. Similar condition in Indonesian cattle, including Aceh and Pesisir cattle, previous study showed that any indication introduction of Taurine and Indicine breeds in those cattle, while in the other hand Indonesian native cattle is descendent from the one of common ancestor cattle in the world, Banteng. For advancing study in genetic introduction of other breeds in Aceh and Pesisir cattle, we assayed those Sumatra's breeds by using molecular marker of Y-chromosome microsatellite. The using of Y-chromosome marker by assumption could be a model for detection of male introduction in breed. From this research showed that all of locus have low allele number, both in Aceh and Pesisir cattle. Also from *Polymorphic Information Content (PIC)* value, this marker has lower value (less 0.5) than FAO recomended. But, in these result indicated that *B. indicus* is the one of the genetic composition of Aceh and Pesisir cattle. Because locus INRA 124 was could amplification in those breeds and these locus also the one of *B. indicus* specific allele.

Key words: Bos taurus, Bos indicus, Bos javanicus, Y-chromosome microsatellite, Aceh cattle, pesisir cattle

INTRODUCTION

Asia continent has more or less three hundred millions cows and two hundred millions of them reside in India sub-continent. Cattle breeds in Asia and Africa are generally categorized into hump and humpless. About 170 breeds are already known, including Bali cattle (domesticated from Banteng) in Southeast Asia, including Indonesia and Philippine. So, Asian farmers have been famous in their role in cattle domestication process and agriculture ecology in this continent (Schearf, 2003).

Bali cattle and other breeds have genetic relationship with Banteng (just like Madura cattle) and also have genetic admixture with *B. taurus* and *B. indicus.* Because of economic and political factors in the past (during colonialism era or after the independence), they are brought to Indonesia and finally could adapt to the environment and become part of local cattle. Aceh cattle are believed to be the local breed, but the previous studies by Muhamad *et al.* (2007) and Ugla (2008) shows that the genetic compositions of those cattle came from *B. indicus*. So, the genetic study of native cattle in Indonesia is interesting because the genetic variations are great. This is important because it is related to the efforts characteristics improvement and keep genetic characters conserved. Finally, the quality of those native cattle does not decrease or even extinct.

The recent development on genome and genetic analysis on human population shows a tendency to haplotype of Y-chromosome which is an important tool in studying population naturally (Hurles & Jobling, 2001). Without neglecting pseudo-autosom, Y-chromosome action in general is a non-recombinant unit, which is male specific and effective haploid. This is to make sure that the combinations mutation along male offspring is concentrated as a single un-biased haplotype. Y-chromosome characters are needed in its context as male lineage just like mitochondrial DNA in female lineage. The level of polymorphism characters in non-recombinant area of Y-chromosome area is started from the lowest, that is biallele event in point mutation of