KINSHIP DETERMINATION USING SNP LOCI WITH LR CUTOFFS

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The usefulness of single nucleotide polymorphism (SNP) loci for kinship testing has been demonstrated in many case works, and suggested as a promising marker for relationship identification. For the interpretation of the result based on likelihood ratio (LR) value in kinship testing, it is important to prepare the cutoff value for respective relatives which are dependent on the genetic relatedness. For this, data analysis based on true pedigrees is significant. In this study, kinship index were explored through 1209 pairs of parent-child, 1373 pairs of full-siblings, and 247 pairs uncle-nephew set using 136 SNP loci. The LR values were assessed in a stepwise manner with the increasing number by 10 loci up to 136 SNP loci. The accuracy, sensitivity, and specificity of the each cutoff value were also explored. In the result, the LR distributions for true relatives shifted toward to be more discriminated from the unrelated in all tested relationship, which was remarkable in parent-child relationship. It was possible to determine the relationship using 80 and 136 SNP loci for parent-child and full-siblings, respectively. It is expected that our study could support the application of SNP-based kinship determination by providing the cutoff values. In further study, it might be needed to explore for different ethnic groups.