

## Evaluation of DNA Paternity Testing Accuracy of Child Trafficking Cases

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**Abstract :** Child trafficking has been a serious problem in modern China. The Chinese government has established a national anti-trafficking DNA database to help reunite missing children with their families. The database collects DNA information from missing children's parents, trafficked and homeless children, then conducts paternity tests to find matched pairs. This paper considers the matching accuracy in such cases by looking into the exclusion probability in paternity testing. First, the situation of child trafficking in China is introduced. Next, derivations of the exclusion probability for both one-parent and two-parents cases are given, followed by extension to allow for 1 or 2 mutations. The accuracy of paternity testing of child trafficking cases is then assessed using the exclusion probabilities and available data. Finally, the number of loci that should be used to ensure a correct match is investigated.

**Keywords :** child trafficking, DNA database, exclusion probability, paternity testing

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