

Individual Identification of Cats and Dogs using Mitochondrial DNA Tandem Repeats

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Domestic animals, especially cats and dogs are very frequent in the human environment. In Switzerland, there is about 1 cat for 6 persons and 1 dog for 12 persons. Animal hair easily clings on to various objects which are in daily contact with these animals. In forensic sciences, hairs are very similar to fibres regarding their transfer process and to the situations where they can be encountered: if somebody breaks into an apartment where a cat or a dog lives, it is certain that he will take with him some hair of these animals.

The morphological examination of animal hair is principally used for the identification of the species. However, with the arrival of DNA analysis, this kind of evidence could lead to a real identification by methods similar to those used in human identification. However, the samples which are analysed often have roots of bad quality or even no roots at all. It is therefore necessary to rely on mitochondrial DNA.

Several animal species, including cats and dogs, have tandemly repeated sequences in both the peripheric domains of the control region of their mitochondrial DNA. We show here that these tandem repeats are very polymorphic but they are also the cause of a very high level of heteroplasmy. We have evaluated to which extent the heteroplasmy might prevent their use in forensic identification.