

In the present work we study interpretation of forensic DNA evidence from the point of view of probability theory and mathematical statistics. We provide a detailed mathematical formalization of the problem, which enables us to formulate mathematically accurate and consistent results. We deal with evaluation of a given evidence in terms of a likelihood ratio, which compares two hypotheses specified by genotypes of known contributors and the number of unknown contributors to the DNA mixture. We further analyze the case of a subdivided population, performing a thorough revision of the formulas for homozygous and heterozygous genotypes, their general version and a theorem for calculating the probability that an assumed number of random individuals explain a given genetic evidence.