IMPORTANCE OF DRYING PERFORMANCE FOR THE CONSERVATION OF DNA

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Successful DNA analysis critically depends on both DNA yield and DNA integrity after extraction from the sample. In our study we show that rapid drying after sampling with cotton swabs completely preserves DNA for later analysis, while conventional sample drying methods result in an approximately 90% DNA loss. Our results demonstrate that this dramatic loss of DNA using conventional methods is caused by microbial degradation. Such loss can be prevented when using ultra fast drying methods which repress microbial growth immediately after sampling: Swabs spiked with human saliva suffered virtually no DNA degradation when stored for 14 days at room temperature in the new forensiX sample collection tubes which use the novel SafeDry™ desiccant technology for ultra-fast sample mummification. Conversely, swabs stored in conventional sample collection tubes with slower drying curves – such as tubes with semi-permeable ventilation membranes or tubes with sub-optimal desiccant – suffered up to a 90% DNA loss due to degradation. This is the first time that the drying kinetics of cotton swab sampling tools and its influence on microbial degradation of DNA has been systematically studied. Our results corroborate the usefulness of reliable ultra fast-drying tubes for sample transport and storage to prevent massive loss of DNA due to microbial degradation. ⌘