Inhibitory Effect of Norgen's Saliva DNA Preservative on the Growth of Bacteria and Yeast

APPLICATION NOTE #32

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INTRODUCTION

In recent years attention has been turning to the use of non-invasive samples for genetic and diagnostic analysis, including the use of saliva. In contrast to blood samples, saliva can be self-collected, is less costly to ship and easier to store and process. Human genomic DNA extracted from buccal epithelial cells and white blood cells found in saliva can be used in various applications including diagnostic assays, epidemiological studies and surveys.

Norgen Biotek Corp. has developed a Saliva DNA Preservative which allows for the long-term preservation of saliva samples at ambient temperature, making this buffer ideal for saliva storage and shipping. This buffer is available as a product on its own, and is also included with our different saliva DNA collection, preservation, shipping, storage and purification devices and kits. The Saliva DNA Preservative is an aqueous storage buffer designed for rapid cellular lysis and subsequent preservation of saliva DNA from fresh specimens. This buffer stabilizes the DNA for long-term storage at ambient temperature. Here, we show that the buffer also prevents the growth of microorganisms, thereby resulting in a non-infectious sample that can be handled and shipped safely, as safety is a primary concern when working with any human samples including saliva.

MATERIALS AND METHODS

Bacteria and Yeast

Two microorganisms were used in this study. The first is the bacteria *Escherichia coli* DH5α and the second is the yeast *Saccharomyces cerevisiae*.

Incubation and plating

Microorganisms were grown overnight in LB (for bacteria) and YPD (for yeast). The next day, the copy number of each culture was counted and 1 million cells of eachmicroorganism were pelleted and resuspended in 500 µL of fresh saliva preserved in Norgen's Saliva DNA Preservative. From each condition five 100 µ L aliquots were plated on agar-LB plates (for bacteria) and agar-YPD (for yeast). Controls from both microorganisms were pelleted and resuspended in 500 µ L of LB or YPD with no Preservative, Saliva/Medium mixture and Medium / Preservative mixture (Table 1). All treatments were plated as mentioned earlier. Plates were incubated overnight at 37°C (bacteria) or 30°C (yeast). The next day, colonies from each plate were counted.

Table 1. Spiking Mixtures and Composition

Mixture	Diluent	Saliva DNA Preservation Buffer (2x)	Growth Status
Saliva/Preservative	Saliva	Yes	
Saliva/Medium	Saliva	No	+
Medium/Preservative	LB or YPD	Yes	
Medium	LB or YPD	No	+

RESULTS AND DISCUSSION

Determination of microorganism growth rate in the saliva/preservative mixture is important to estimate the related risk in preserving saliva samples that contain potential infectious microorganisms. In the present study, no growth was detected from microorganisms mixed with the preservative and saliva, or preservative and growth medium. However, other conditions that did not contain the preservative showed positive growth (Table 1). Therefore, Norgen's preservative is inhibiting the growth of bacteria and yeast, thereby resulting in non-infectious samples that can be handled and shipped safely.

CONCLUSION

Norgen's Saliva DNA Preservative inhibits the growth of bacteria and yeast, thereby resulting in non-infectious samples that can be handled and shipped safely.

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