

Environmental Sampling Kits Evaluation

Puritan Hydra Flocked Swabs vs. Puritan Polyester Spun Swabs



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1.0 Introduction

This evaluation was conducted to compare the microbial recovery characteristics of the Puritan Hydra Flocked Swabs compared to the standard currently used Polyester Spun Swabs. The Polyester Spun Swabs are used in the Puritan Environmental Sampling Kits (ESK). This evaluation was designed to compare the plating abilities of both swabs. The Puritan ESK product line consists of the following media; Letheen Broth, Butterfield's Solution, Neutralizing Buffer, and Buffered Peptone Water. Each media was inoculated with a known concentration of microorganisms that were selected according to recommendations from the manufacturers. After inoculating the ESK transport systems, the swabs were removed from their corresponding system and used to plate directly onto an appropriate agar plate.

2.0 Procedure

A loopful from each fresh culture (18-24 hours old) was suspended in a separate tube containing 9mL of 0.85% physiological saline and verified by 0.5 McFarland Standard to obtain 1.5×10^8 CFU/mL suspensions. The 1.5×10^8 CFU/mL suspensions were then serially diluted in 0.85% saline solution to obtain working suspensions of 1.5×10^7 to 1.5×10^4 CFU/mL. Only the 1.5×10^4 CFU/mL dilution was used to inoculate the ESK transport systems. Using the 1.5×10^4 CFU/mL, 1mL was transferred into 9mL of each ESK transport system to make 1.5×10^3 CFU/mL suspensions. Within ten minutes the swabs were removed from the corresponding ESK transport system and streaked onto the surface of an appropriate solid agar plate. The inoculated tubes were then discarded and the plates were incubated at 35-37°C in the appropriate environment for 24-48 hours or until countable colonies were visible. Colony counts were completed at both time intervals for each swab-organism combination and recorded. Refer to tables 1-4 for results.

The control plates were made by diluting the original suspension to 1.5×10^3 CFU/mL. Using this suspension, 100µl was pipetted onto an agar plate. Inoculated plates were incubated at 35-37°C in the appropriate environment for 24-48 hours or until countable colonies were visible.

3.0 Results

Refer to Tables 1-4 to observe the microbial percent recoveries for the Puritan Hydra Flock Swab and the Puritan Polyester Spun Swab. Refer to Figures 1-4 to view pictures showing the microbial release capabilities between the Puritan Hydra Flock Swab and the Puritan Polyester Spun Swab.

Table 1. Lethen Broth

Organism	Lethen Broth Polyester Spun Swab		Lethen Broth Hydra Flocked Swab		Control Plate
	0h	% Recovered	0h	% Recovered	0h
<i>S. enterica</i>	160	45.7%	327	93.4%	350
<i>S. aureus</i>	39	16.8%	188	81.0%	232
<i>E. coli</i>	62	22.1%	260	92.8%	280

Table 2. Butterfield's Solution

Organism	Butterfield's Solution Polyester Spun Swab		Butterfield's Solution Hydra Flocked Swab		Control Plate
	0h	% Recovered	0h	% Recovered	0h
<i>B. cereus</i>	10	14.2%	56	80.0%	70
<i>C. albicans</i>	2	9.5%	15	71.4%	21

Table 3. Neutralizing Buffer

Organism	Neutralizing Buffer Polyester Spun Swab		Neutralizing Buffer Hydra Flocked Swab		Control Plate
	0h	% Recovered	0h	% Recovered	0h
<i>S. aureus</i>	62	26.7%	202	87.0%	232

Table 4. Buffered Peptone Water

Organism	Buffered Peptone Water Polyester Spun Swab		Buffered Peptone Water Hydra Flocked Swab		Control Plate
	0h	% Recovered	0h	% Recovered	0h
<i>S. enterica</i>	225	64.2%	380	108.5%	350

Figure 1. *E.coli*



Figure 2. *B. cereus*

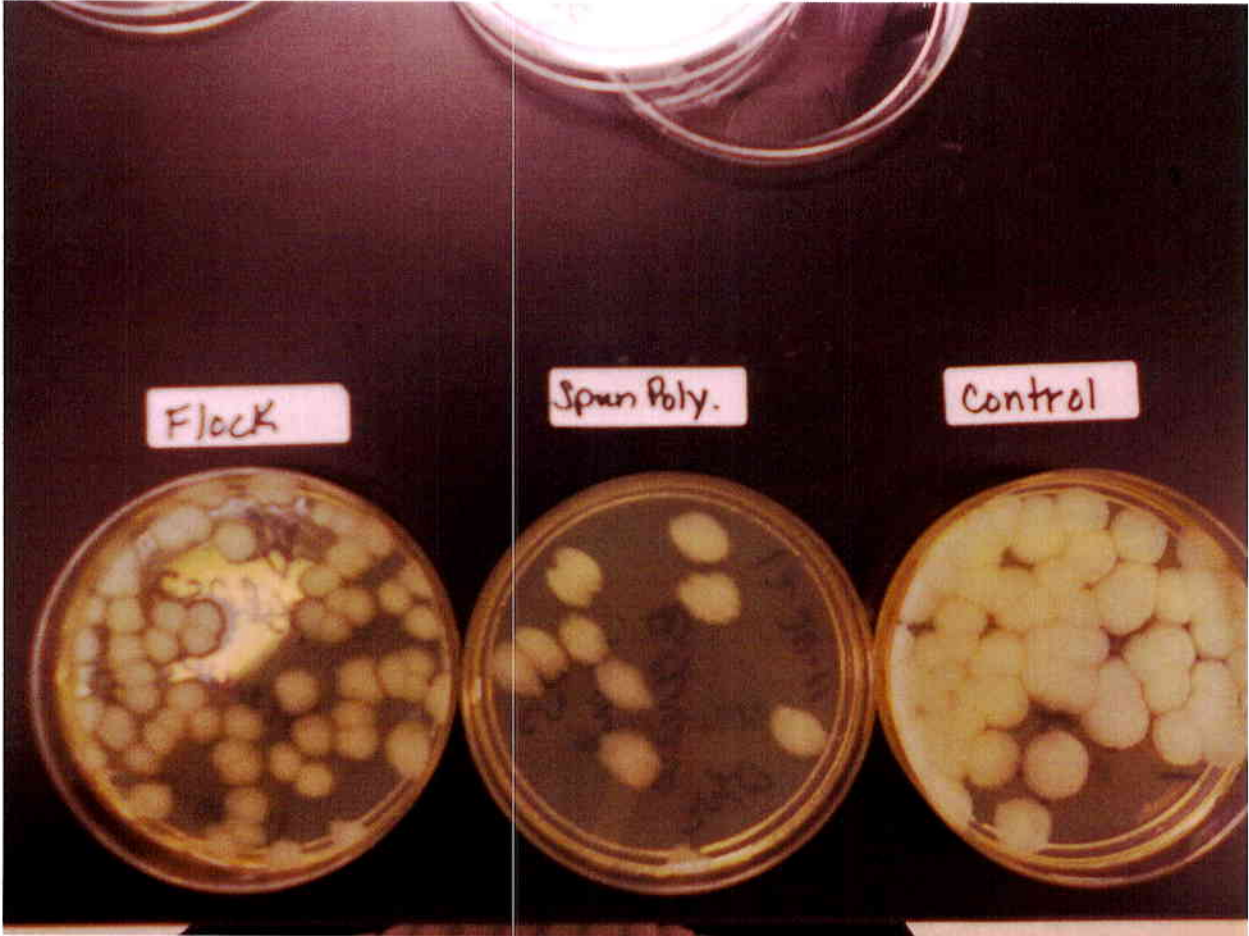


Figure 3. *S. aureus*

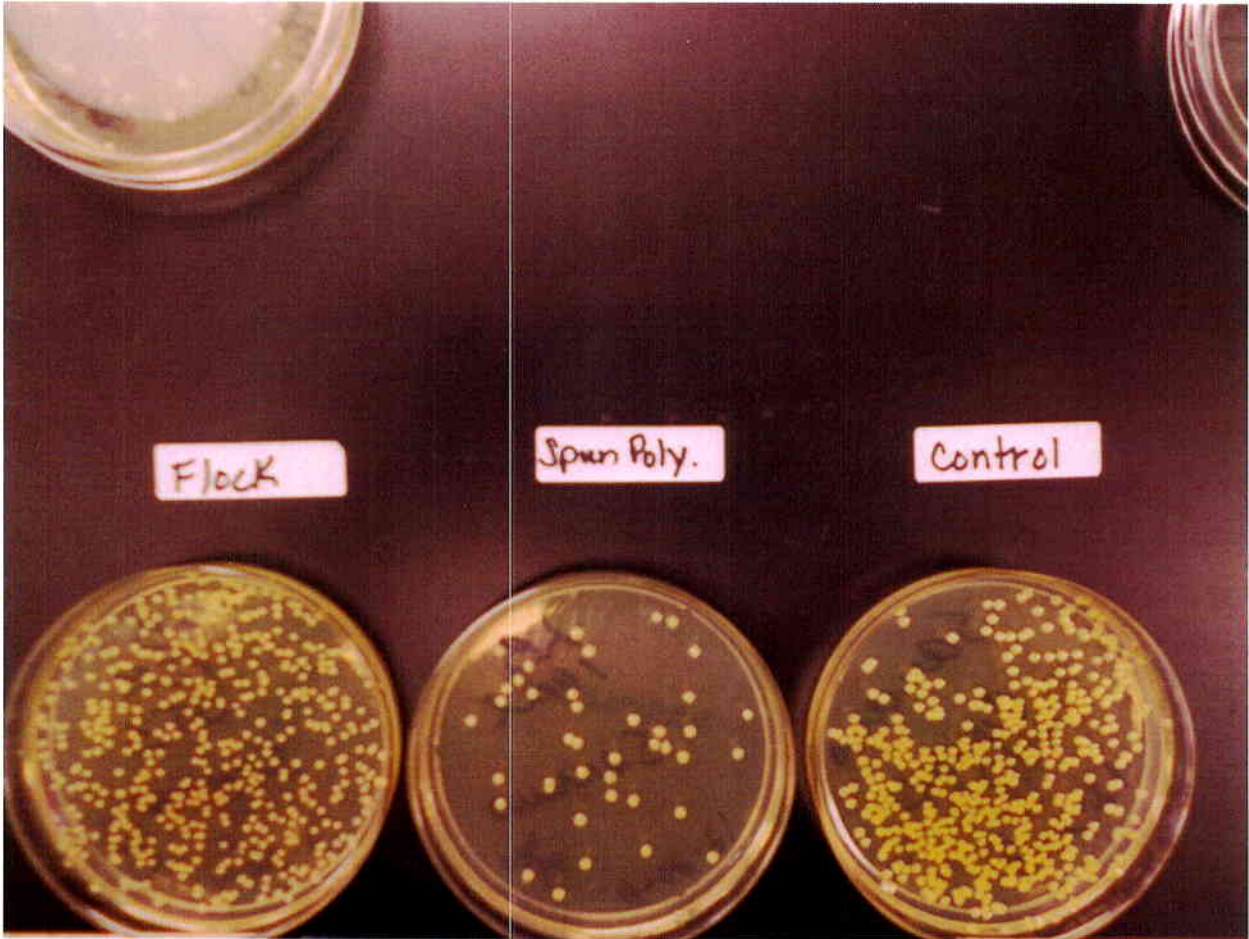


Figure 4. *S. enterica*



4.0 Conclusion

In Tables 1-4, it can be observed that the Puritan Hydra Flocked Swabs were able to deliver a colony count that was closer to our control plates. Puritan Hydra Flock Swabs were able to release no less than 71% microbial recovery compared to the control plates. The Puritan Hydra Flock Swabs were able to release The Puritan Polyester Spun Swabs were able to release no greater than 64% microbial recovery compared to the control plates. Figures 1-4 demonstrate visual evidence that Puritan Hydra Flock Swabs are capable of releasing more microbial cells compared to the Puritan Polyester Spun Swabs. Based on the results presented, it can be concluded that the Puritan Hydra Flock Swabs performed superior to the Puritan Polyester Spun Swabs based on microbial recovery.