Improved isolation of bacteria in stool cultures using the COPAN FecalSwab™ processed by COPAN WASP™ compared to manual plating methods

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Abstract

The COPAN FecalSwab™ is a transport device developed for the transport of fecal samples in Cary Blair transport media for use in various culture and molecular testing platforms. The purpose of this study is to demonstrate the performance of the COPAN FecalSwab™ in enhanced colony isolation and plating of fecal samples. In this study, fecal samples collected in routine Cary-Blair transport medium were plated manually. Samples that were received with a secondary container with fresh-unpreserved stool were included in the study and an aliquot of stool was sampled using the COPAN FecalSwab™ and planted using the COPAN WASP ™. Cultures were plated semi-quantitatively onto MacConkey agar, Hektoen-Enteric agar and Campylobacter agar using a 10µl loop. Cultures were assessed for detection of pathogens and ability to observe isolated colonies in quandrants 1-4. 146 clinical samples were analyzed for recovery of organisms and isolation of colonies using the automated system. Of the 146 cultures, 4 pathogens were detected with the FecalSwab/Wasp plating and 3 were detected with manual plating. When evaluated for the ability to achieve isolated colonies, 38% of the cultures demonstrated no difference between the manual and automated plating. In 51% samples, there was improved colony isolation in the Wasp plated fecal swabs compared to the manually plated culture, while only 7% of cultures demonstrated improved manual isolation. In 4% of the cultures the plates were no growth by both methods. This study demonstrates that the COPAN FecalSwab™ plated using the COPAN WASP™ is an effective tool to recover stool pathogens and achieve isolated colonies in these cultures with high bacterial burden.

Results

	MacConkey Agar	Hecktoen Enteric Agar	Campy Isolation Agar
Manual	4	3	2
FecalSwab	4	1	1

Table 1. Cultures were reviewed to determine the quadrant with at least 50% isolated colonies

Method with Optimal Isolation		
	n	**%**
Manual	10	6.8%
FecalSwab	74	50.7%
Same	56	38.4%

Table 2. Each culture was reviewed to determine which method had the most isolated colonies overall.

Plating Method	Pathogens Recovered
Manual	3
FecalSwab™	4

Table 3. The number of stool pathogens recovered from each method. Campylobacter was the only pathogen identified in this study.

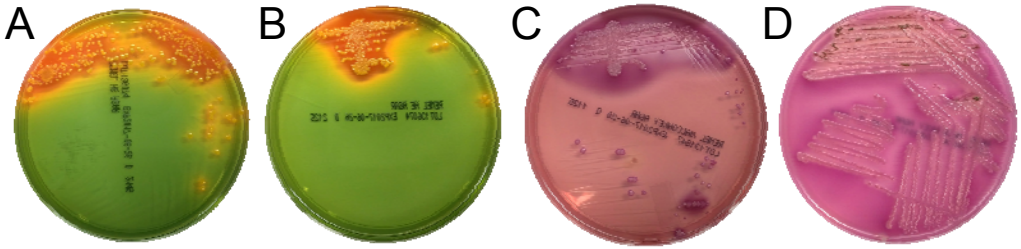

Figure 2. Representative images of Hektoen Enteric Agar (A, B) and MacConkey Agar (C, D) plates inoculated manually (A, C) or with FecalSwab™ on WASP™ (B, D).

Introduction

Figure 1. COPAN FecalSwab™

Use of liquid based culture media has demonstrated improvement in isolation and preservation of specimens for bacterial cultures. Eswabs™ have shown improvement in specimen stability and pathogen recovery. Recently, COPAN developed the FecalSwab™ for stool specimens. The FecalSwab™ is a flocked swab that is eluted into 2 mL of Cary- Blair media. This allows the fecal specimen to be used for a variety of purposes, including molecular testing, antigen detection and culture. Studies have demonstrated the functionality of the FecalSwab™ for molecular based testing. Here, we demonstrate the functionality of the FecalSwab™ plated on the WASP™ to improve isolation of bacteria in routine stool cultures.

Methods

146 unpreserved stool cultures received for routine culture were plated using routine manual methods. Each sample was then used to innoculate a FecalSwab™ container by inserting a flocked swab into the fresh stool. The swab was then transferred into tube and mixed well to evenly disperse the specimen. Once mixed, the swab was broken at the scored line and the tube was capped.

The FecalSwabs™ were struck for isolation using the WASP™. Both sets of cultures were incubated at 37 C and and were reviewed at 24 and 48 hours. The earliest quadrant with at least 50% isolated colonies was documented. Cultures were reviewed for the routine stool pathogens, *Salmonella, Shigella and Campylobacter.*

Conclusions

- Use of FecalSwabs™ on WASP™ results in improved isolation of colonies from stool cultures
- Identification of isolated colonies occurred in earlier quadrants
- WASP™ planted cultures using FecalSwabs™ resulted in recovery of one additional pathogen

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