Validation of Copan new FecalSwab device for the preservation of clinical specimens for the detection of enteric pathogens

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Introduction:

Collection, preservation and transportation of stools or rectal swab specimens are important for accurate laboratory diagnosis of pathogens causing gastrointestinal infections.
Copan is always improving the Liquid Based Microbiology (LBM) devices used with the Walk Away Specimens Processor (WASP). The FecalSwab device (a flocked swab and a tube with 2 ml of semi-liquid medium), has now been improved in order to be in compliance with the new CLSI M40-A2 standards. Moreover a fill line has been inserted on the label to indicate the maximum amount of sample to add.

Objective:

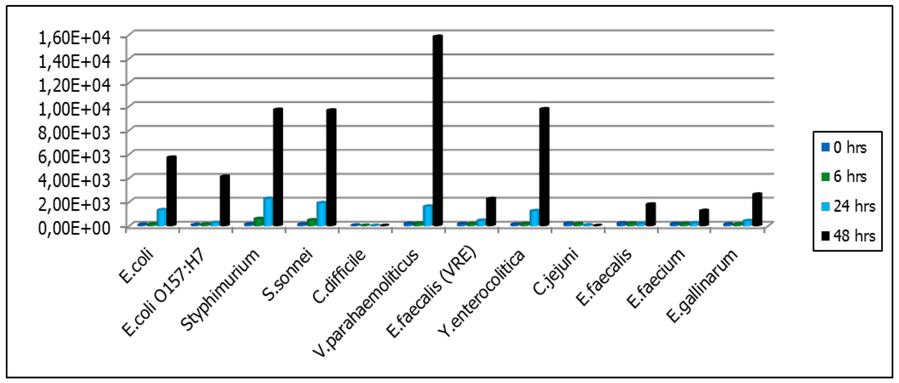
The objective of this study was evaluate Copan FecalSwab (FS) against Copan Cary-Blair Agar Gel transystem (CBT) to support the viability of enteric pathogens using ATCC strains according to the current CLSI M40-A2 standards.

Method:

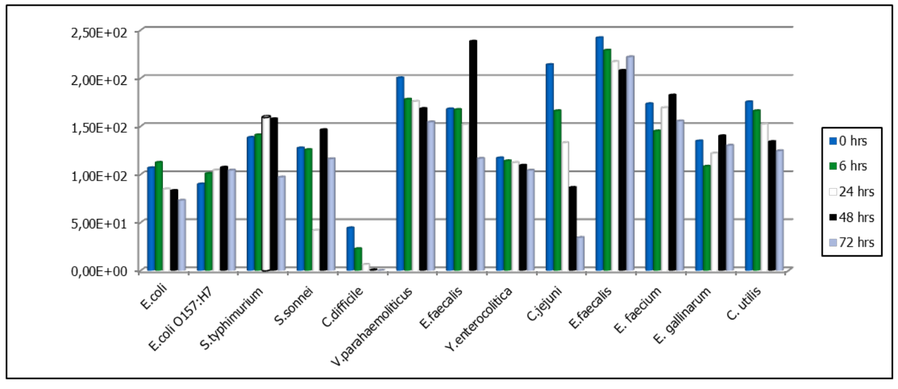
- ATCC strains of *S. typhimurium* 14028, *S. sonnei* 9290, *Y. enterocolitica 9610, E.coli* 25922, *E. faecalis* 29212, *C. jejuni* 33291, *V. paraheamolyticus 17802, C. difficile 9689, C. utilis 9950, E. faecium (VRE) 700221, E. faecalis (VRE) 51299, E. gallinarum 700425, E.coli O157-H7* (700728), C. utilis (9950) were used for this validation study.
- Bacteria suspension for each strain was prepared starting from a 0.5 McF, diluted tenfold in physiological saline to provide working suspensions of approximately 1.5 x 10^4 CFU/mL, 1.5 x 10^3 CFU/mL and 1.5 x10^2 CFU/mL.
- Both FS and CBT were inoculated with 100 uL of inoculum in order to obtain a valid time 0 colony count (25-250 CFU/plate) with the above concentrations.
- All testing was performed in triplicate at different times and temperature (6, 24, 48 hours at RT and 6, 24, 48, 72 hours at 4^{0}C). At each interval, all dilutions for both devices were plated by direct swabbing on appropriate agar plates. After incubation, colonies were counted and recorded.
- Results on CBT are not reported.

Results:

Results of bacterial performance at RT



Results of bacterial performance at 4° C



Tab.1: Log variation after 48 at RT and 72 hours at 4° C

	ΔLOG after 48h at RT	ΔLOG after 72h at RT
Escherichia coli ATCC 25922	**1.73**	**-0.17**
Escherichia coli O157:H7 ATCC 700728	**1.66**	**0.06**
Salmonella typhimurium ATCC 14028	**1.85**	**-0.15**
Shigella sonnei ATCC 12022	**1.88**	**-0.04**
Clostridium difficile ATCC 9689	**-1.92**	**-1.85**
Vibrio parahaemoliticus ATCC 17802	**1.90**	**-0.11**
Enterococcus faecalis ATCC 51299 (VRE)	**1.13**	**-0.16**
Yersinia enterocolitica ATCC 9610	**1.92**	**-0.05**
Campylobacter jejuni ATCC 33291	**-1.70**	**-0.80**
Enterococcus faecalis ATCC 29212	**-0.13**	**-0.04**
Enterococcus faecium ATCC 700221	**0.86**	**-0.05**
Enterococcus gallinarum ATCC 700425	**1.29**	**-0.02**
Candida utilis ATCC 9950	**-0.02**	**-0.15**

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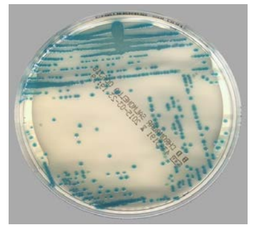
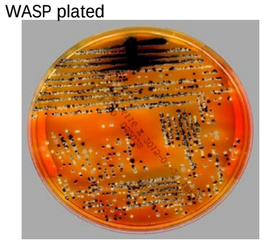
V. parahaemolyticus on TCBS WASP plated



Salmonella spp negative sample on CHROMagar WASP plated



Salmonella spp positive sample on XLD WASP plated

Salmonella spp positive sample on CHROMagar manually plated

Conclusions:

- All bacterial strains were recovered at each storage time, except for *C. difficile* that was only recovered after 24 hours at RT and 48 hours at 4° C.
- FecalSwab was able to maintain bacteria viability at levels in compliance with the current CLSI M40-A2 standards.

Take home messages:

- Copan FecalSwab is a device for transferring, preserving and transporting stool samples that supports the viability of all relevant enteric pathogens.
- It can be used for collection of rectal swab or as transfer tool for feces.
- The improved labelling eliminates the risk of overloading the device with excess stool sample.

Further studies with clinical fecal specimens are in progress foe validation of FecalSwab with molecular assays and rapid kits.