Recovery of Streptococcus pneumoniae Using the New Puritan Liquid Amies Transport System and Copan ESWab System at Room Temperature

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Revised Abstract
Objective: To assess the performance of two modified liquid Amies transport systems, Puritan Liquid Amies Transport System with a standard uncoated flocked swab (Puritan Medical Products Company LLC) and Copan E swab (Elution Swab) with a coated flocked swab (EP) (Copan Diagnostics Inc.) intended for processing using automated plating systems for the recovery of Streptococcus pneumoniae (SPN).

Method: The CLSI M40A Roll Plate method at room temperature was followed to test the recovery rate and viability for up to 48 hours of 18 SPN strains acquired from the Toronto Invasive Bacterial Disease Network (TIBDN) stock and other clinical laboratories in Canada. As well, two reference strains (ATCC 6303 and ATCC 49619) were also tested. At time 0, 24, and 48 hours, the average colony counts were calculated based on triplicate swabs for each organism/dilution/time combination.

Conclusion: Our study suggests that based on the CLSI M40A standard roll plate protocol the Puritan system appears to outperform the E system. The mucoid strains appear to be a problem with the E system. Further study is required to understand the inhibitory nature of the Copan transport system on SPN.

Introduction
Transport systems continue to undergo improvements in their ability to maximize the absorption of clinical specimen during collection, maintain viability of bacterial pathogens involved in infectious diseases during transport and subsequent recovery of pathogens in the laboratory.

Recently, flocked swabs have become a subject of great interest. Flocked swabs differ from the traditional fibre wound swabs. They are made using nylon fibres and blends attached perpendicularly to the plastic applicator thus preventing subsequent recovery of pathogens in the laboratory.

The present study is an assessment of two brands of flocked swabs placed in liquid Amies broth using a flocked aerobic organism, Streptococcus pneumoniae and comparing how well they comply with the CLSI M40A standards.

Method

Bacterial Strains:
- Streptococcus pneumoniae ATCC 6303 (mucoid strain)
- Streptococcus pneumoniae ATCC 49619 (non mucoid strain)
- Streptococcus pneumoniae (18 wild strains)

Organism: Streptococcus pneumoniae
Matrix: Puritan Liquid Amies Transport System
Incubation Temperature (°C): 37
Accession:
- Puritan Swabs
- Copan swabs

Table 3. Recovery times for several strains of Streptococcus pneumoniae using the Puritan and Copan swabs

Results
1. Based on this study, Puritan flocked swabs demonstrated superior absorption and release abilities as evident by the higher counts. Copan E Swab also demonstrated superior absorption but it is difficult to assess if the E swab released all the inoculum based on its viability performance.
2. Possibilities for this could be the flocked swabs has impurities in the glue/adhesives or substrates/inert in the new material which may have some antibacterial effect on SPN or the Copan modified Amies broth formulation is not optimal for the growth of this organism to permit it to survive up to 48hrs in most cases.
3. When culturing numerous other factors, not presently examined which can affect swab performance.
4. Strains that survived up to 46 hrs were mucoid strains which were not affected by any antibacterial effect due to their polysaccharide capsule.
5. Other researchers have also documented the poor recovery of Streptococcus pneumoniae with the Copan E swab system.
6. Further studies are warranted using more strains both mucoid and non-mucoid and at 4°C.

References