Validation and implementation of Colorex™ CHROMagar™ Strep A agar on WASP™/WASPLab™ for screening for *Streptococcus pyogenes* using the ESwab™

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Introduction

Streptococcus pyogenes (Group A) causes "Strep throat" which can also lead to Scarlett fever and Rheumatic fever in children. Traditional culture methods provide poor sensitivity for isolating *Streptococcus pyogenes.* The objective of this study was to validate the use of Colorex™ Strep A agar (CHROMagar™) to screen for *Streptococcus pyogenes on throat swabs set up on the* WASP™ using a 30 ul loop and incubated and analyzed on the WASPLab™ with digital imaging analysis. *Streptococcus pyogenes (Group A)* grows as orange to red colonies on Colorex™ Strep A agar (CHROMagar™).

Materials and Methods

In this study 159 clinical specimens were collected with ESwab™ kits and processed on a WASP™ using Colorex™ Strep A agar (CHROMagar™) plates and a throat culture screening protocol with a 30 ul loop and incubated in WASPLab™ in CO2 for 20 hours at which point imaging analysis was performed. Vitek MS (Maldi-ToF) and PathoDx were performed on target and non-target colour colonies isolated. Results were compared to the same samples set up on Blood agar incubated at 35 degrees C anaerobically for 20 hours. The samples had all been tested for *Streptococcus pyogenes* by LAMP PCR.

Figure 1: Hamilton Microbiology Laboratory

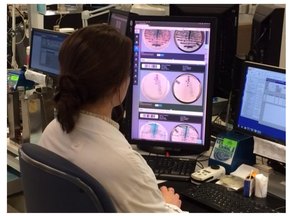

Figure 2:Digital Imaging Analysis

Results

Of the 159 specimens tested, 120 were positive for *S. Pyogenes Group A* by LAMP PCR. Of those 120 specimens, 116 grew on Colorex™ Strep A agar (CHROMagar™) and 109 showed beta hemolysis on blood agar. 56 target positive colonies were tested with Vitek MS (Maldi-ToF) and all 56 identified as *Streptococcus pyogenes.* The other 60 target positive colonies were tested with PathoDx using groups A and C. All tested positive with A and negative with C. White non-target colour colonies identified as other Streptococcus species. Colorex™ Strep A agar (CHROMagar™) showed a sensitivity of 96.7% (95%CI 0.92-0.99) and a specificity of 100% (95%CI 0.95-1) as compared to LAMP PCR. Copan analyzed the images using their Phenomatrix software algorithm and picked up a positive culture (LAMP PCR positive) that appeared negative to the naked eye.

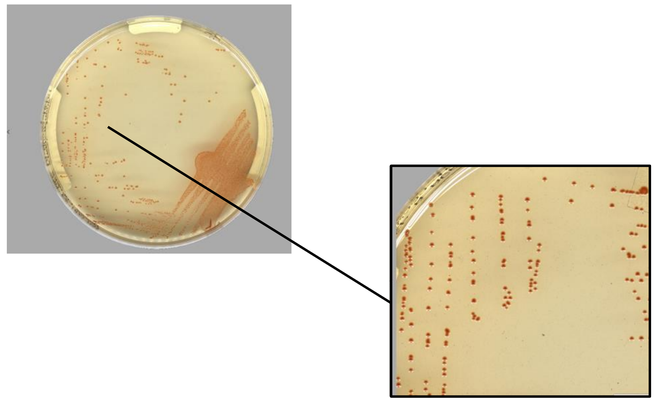

Figure 3: Positive Colorex Strep A culture
Orange to red colonies

Conclusion

Results showed Colorex™ Strep A agar (CHROMagar™) had a significantly greater sensitivity than Blood agar in isolating *Streptococcus pyogenes* in throat culture specimens. The use of the WASP for set up provides efficient and consistent processing and WASPLab™ imaging allows for high resolution digital imaging analysis. The software allows you to zoom in to detect scant growth in the main inoculum that might otherwise be missed. Copan's Phenomatrix software provides a sensitivity better than the human eye.

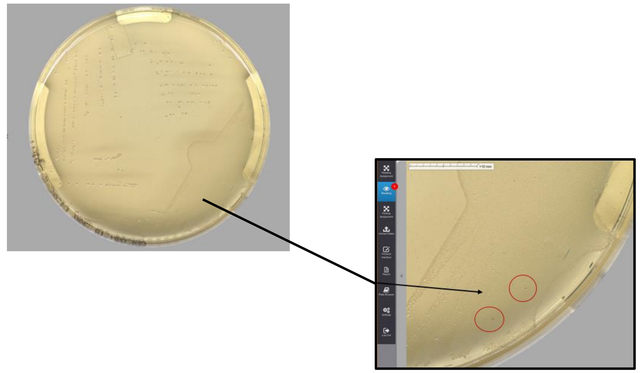

Figure 4: Positive Colorex Strep A culture with 2 tiny colonies

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