Comparison of WASP™ and WASPLab™ and InoqulA™ for primary specimens streaking quality

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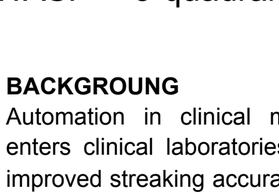
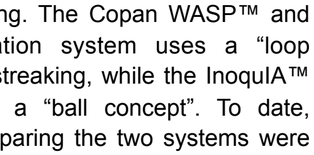
This study evaluated the ability of Copan WASP™ and BD Kiestra™ InoqulA™ streaking automats to generate sufficient single colonies on primary agar plates for further processing, i.e. identification and susceptibility testing in various clinical specimen types. Overall, comparable numbers of single colonies were yielded applying both devices. A practically important difference was seen in the mean distance and average size of grown colonies, both of which were greater using the WASP™ 5-quadrant-streaking pattern as compared to the InoqulA™ 4-quadrant streaking pattern, thereby facilitating colony picking for further processing.

BACKGROUNG

Automation in clinical microbiology increasingly enters clinical laboratories, and the prospects for improved streaking accuracy and related diagnostic accuracy are promising. The Copan WASP™ and WASPLab™ automation system uses a “loop concept” for sample streaking, while the InoqulA™ (BD Kiestra™) uses a “ball concept”. To date, scientific studies comparing the two systems were done using single bacterial strains and urine clinical samples. In order to evaluate the ability of the two systems to generate well-streaked primary agar plates with sufficient single colonies for further processing in various specimen types, high impact and complex clinical specimens were selected and streaked with WASP™ and InoqulA™ benchtop (BD) in parallel. The objectives of this study were to: i) Compare the WASP™ “loop based” and the “ball-based” benchtop InoqulA BT™ to inoculate sputum, wound, vaginal, and stool specimens and positive blood culture broth (PBC); ii) Compare both systems ability to generate single colonies from all specimens; iii) Assess the feasibility of streaking results for a complete diagnostic workup (MALDI-TOF identification, susceptibility testing [AST]).

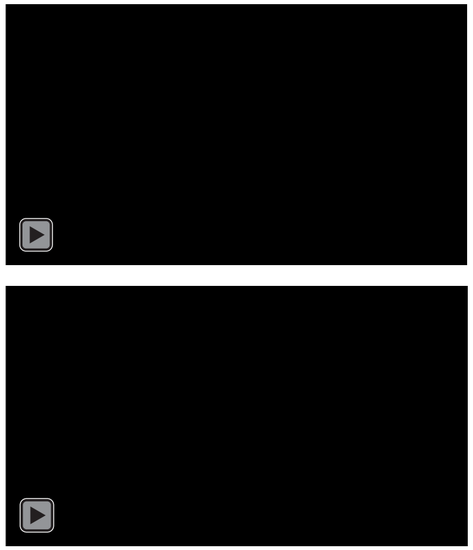


A Fully automated WASP ™ (Copan)



B Fully automated InoqulA™ (BD)

Figure 1 Fully automated inoculation and streaking modules from Copan (A) and BD (B).



METHODS

Consecutive clinical sputum, wound, vaginal, and stool specimens and PBC were included in this study. Sputum samples pre-treated with SLSolution™ (1:1 ratio), wound and vaginal specimens in ESwab™, and stool samples in FecalSwab™ were loaded on the WASP™ and automatically streaked using a 10 µl loop (WASP™) and 4-quadrant streaking pattern (4Q5 SP); PCB were transferred into BC+™ tubes (Copan) and streaked using both 1 µl and 10 µl loops and a 4Q3 SP. For the InoqulA BT™ 10 µl of each sample were manually dispensed on the appropriate agar plates using a manually calibrated pipettor and streaked with the ball using similar SP similar to the WASP™, or SP as suggested by the manufacturer. All plates were incubated in the automated WASPLab™ incubators and images were taken by WASPLab after various periods of incubation. Growth, streaking pattern, CFU counts, and feasibility for further processing were evaluated for all specimen types by experienced personnel on-screen and results were assessed by scores. Points were given for the possibility to perform a MALDI-TOF analysis (1 single colony) and/or additional AST (3 additional single colonies) for each morphology.

RESULTS

Overall, comparable numbers of single colonies were present in all WASP™ “loop based” and “ball-based” benchtop InoqulA BT™ processed specimens. Single colonies feasible for further processing in appropriate numbers were obtained in all specimen types allowing MALDI-TOF based identification, AST and additional testing (Figure 3). WASP™ was superior as compared to the InoqulA BT™ regarding the mean distance and average size of grown colonies leading to, WASP™ produced SP being considered more user-friendly by technical personnel for plate reading and colony picking (Figure 2).

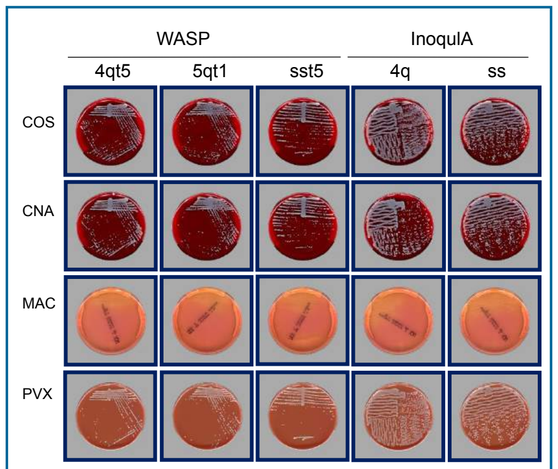


Figure 2 Comparison of WASP 4qt5, 5qt1 and sst5 with InoqulA 4q and ss streaking patterns on sheep blood agar (COS), Columbia CNA agar (CNA), MacConkey Agar (MAC), Chocolate Agar (PVX).

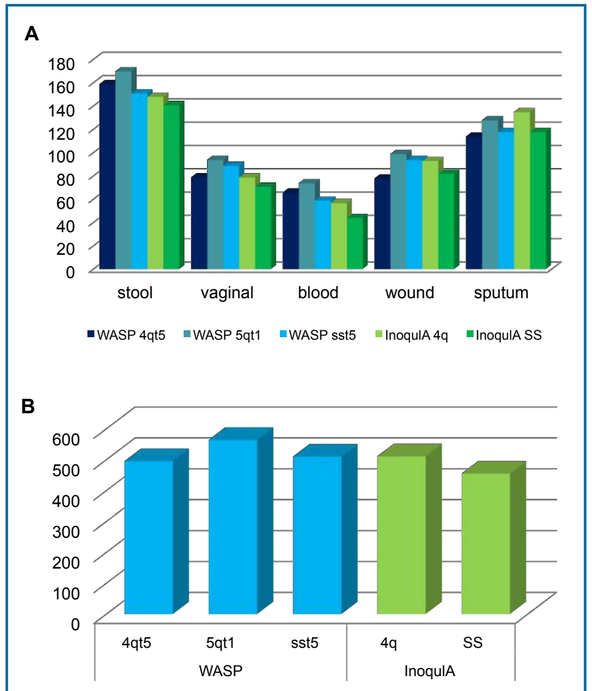


Figure 3 Comparison of WASP (4qt5, 5qt1 and sst5) and InoqulA (4q and ss) streaking pattern performance in stool, vaginal, blood, wound and sputum samples for each specimen (A) and in total (B). Results presented as score values.

CONCLUSIONS

WASP™ and InoqulA BT™ both were able to produce sufficient numbers single colonies for MALDI-TOF based identification and AST. WASP™ 5-quadrant-SP paves the path to fully automated colony picking both for identification and AST since mean distance and average size of grown colonies will most probably be crucial for precision of picking robots.