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ABSTRACT:

Swabs are frequently used to collect and transport specimens to clinical laboratory. However they are often considered to be a less desirable specimen collection device. In the last years new swab systems were designed to improve the absorbance of the sample and at the same time, optimize release of microorganisms into the liquid transport medium, ensuring optimum sensitivity for subsequent test procedures. The aim of this study was to evaluate two of these new swab systems to transport and maintain fastidious bacteria: ESwab Transport System (Copan, USA) and Sigma Transwab System (MW&E, UK), both with liquid Amies medium. Methods: The following isolates were evaluated for survival after incubation at room (25°C) and refrigerator (4°C) temperatures: *Streptococcus pyogenes*: ATCC 19615, *N. gonorrhoeae*: ATCC 43069, *H. influenza*: ATCC 10211, *S. pneumonia*: ATCC 6305, *P. anaerobius*: ATCC 27337 and *F. nucleatum*: ATCC 25586. A vortex elution method (CLSI M40-A) was performed using a 0.5 McFarland suspension of each strain and a 1:10 dilution was prepared. Swabs were inoculated in triplicate with 100µL of each microorganism suspension and held at 25°C and 4°C for 0h, 24h and 48h. Bacterial survival was evaluated after 48h incubation at 35°C. Results: Cultures from all swabs dilutions were averaged. Bacterial recovery from swabs held for 0h was similar for both systems. However, after 24h and 48h incubation, bacterial recovery rates from Sigma Swab were lower compared to the ones from the ESwab. Both swab systems maintain bacterial viability up to 48h when stored at 4°C, and for both species of *Streptococcus* when stored at 25°C. None of the swabs maintained viability for *N. gonorrhoeae*, *P. anaerobius* and *F. nucleatum* after 48h at 25°C and only Copan ESwab was able to maintain viability of these species for 24h at 25°C. *H. influenzae* survived for up to 48h at 25°C in the ESwab and up to 24h at 25°C in the Sigma Swab. Conclusion: Bacteria tested showed greater survival in the Copan ESwab system compared to Sigma Swab. In summary, it was possible to conclude that Copan ESwab performed better than Sigma Swab for transport and storage of fastidious bacteria at room temperature.

INTRODUCTION:

In the last years new swab systems were designed to improve the absorbance of the sample and at the same time, optimize release of microorganisms into the liquid transport medium, ensuring optimum sensitivity for subsequent test procedures. Two of these new swab systems are: ESwab Transport System (Copan, USA) and Sigma Transwab System (MW&E, UK), both with liquid Amies medium.

The ESwab (Elution Swab) Transport System is a new liquid based transport system for bacteriology swab samples. Unlike traditional fiber wound swabs Copan’s nylon flocked swabs provide superior sample absorption and release characteristics. The entire patient’s sample is instantly eluted on contact with the ESwab transport medium; there is no need for the operator to rim, ring or vortex the swab.

Sigma Transwab System (Σ-Swab®) is a new specimen collection device that incorporates a screw cap tube and Liquid Transport Medium. The specimen is collected using Σ-Swab®, an open celled, polyurethane foam-tipped swab which allows complete flow through of reagents and microorganisms. After the specimen is placed into the tube of liquid medium, the microorganisms in the specimen are dispersed through the medium, producing a uniform suspension ready for use.

OBJECTIVES:

- To evaluate 2 new swab systems to transport and maintain fastidious bacteria:

ESwab Transport System (Copan, USA)

X

Σ-Swab® (Sigma) Transwab System (MW&E, UK)

METHODS:

- Bacteria tested:

- *Neisseria gonorrhoeae* ATCC 43069
- *Haemophilus influenzae* ATCC 10211
- *Streptococcus pyogenes* ATCC 19615
- *Streptococcus pneumoniae* ATCC 6305
- *Peptostreptococcus anaerobius* ATCC 27337
- *Fusobacterium nucleatum* ATCC 25586

- Swab Transport Systems Brands Tested:

- ESwab Transport System (Copan, USA)
- Sigma Transwab System (MW&E, UK) (Both with Liquid Amies Medium)

- Temperatures:

- RT (25°C)
- Refrigerated (4°C)

- Protocols tested (M40-A, CLSI):

- Vortex Elution Method

- Periods of time:

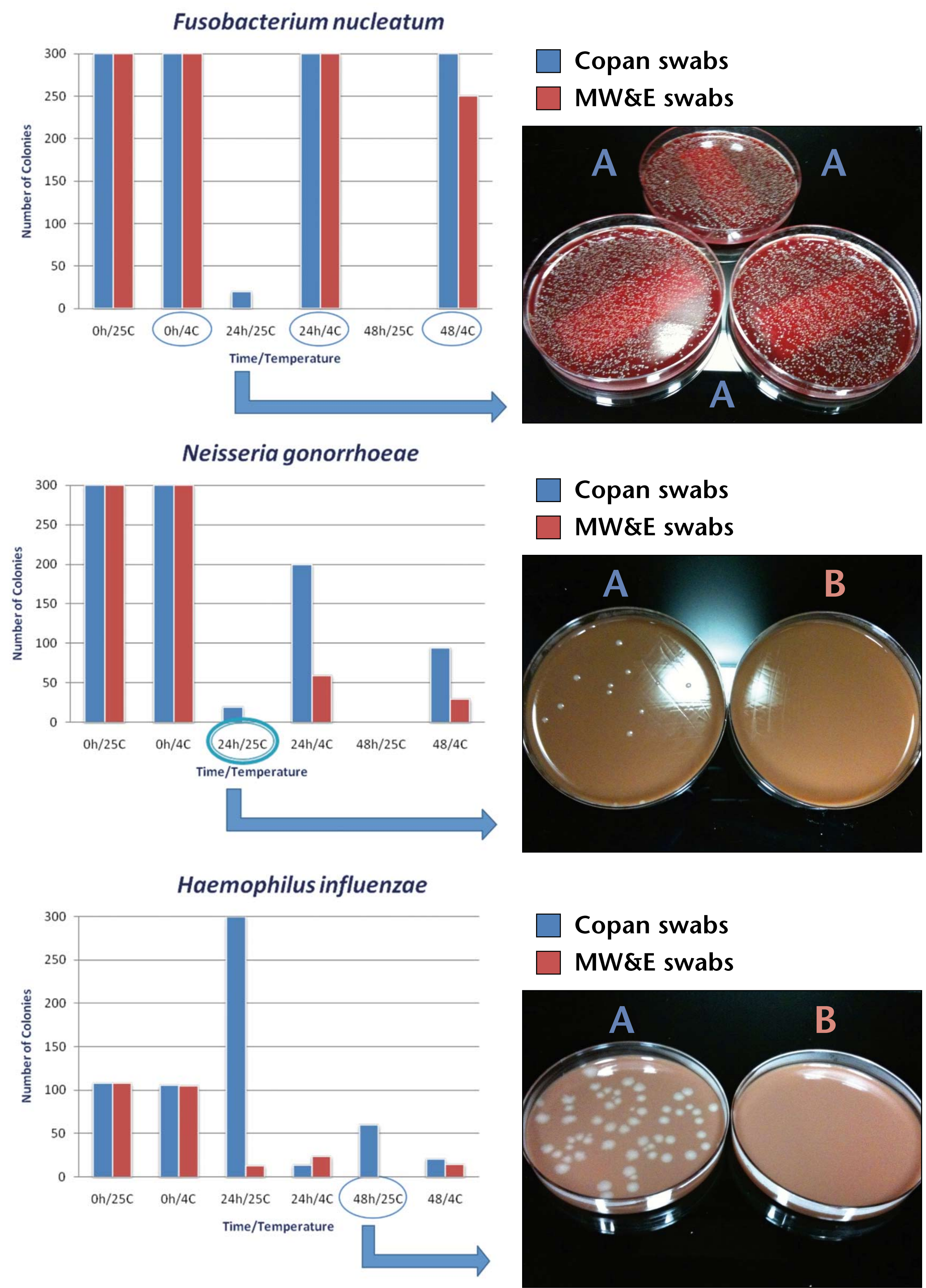
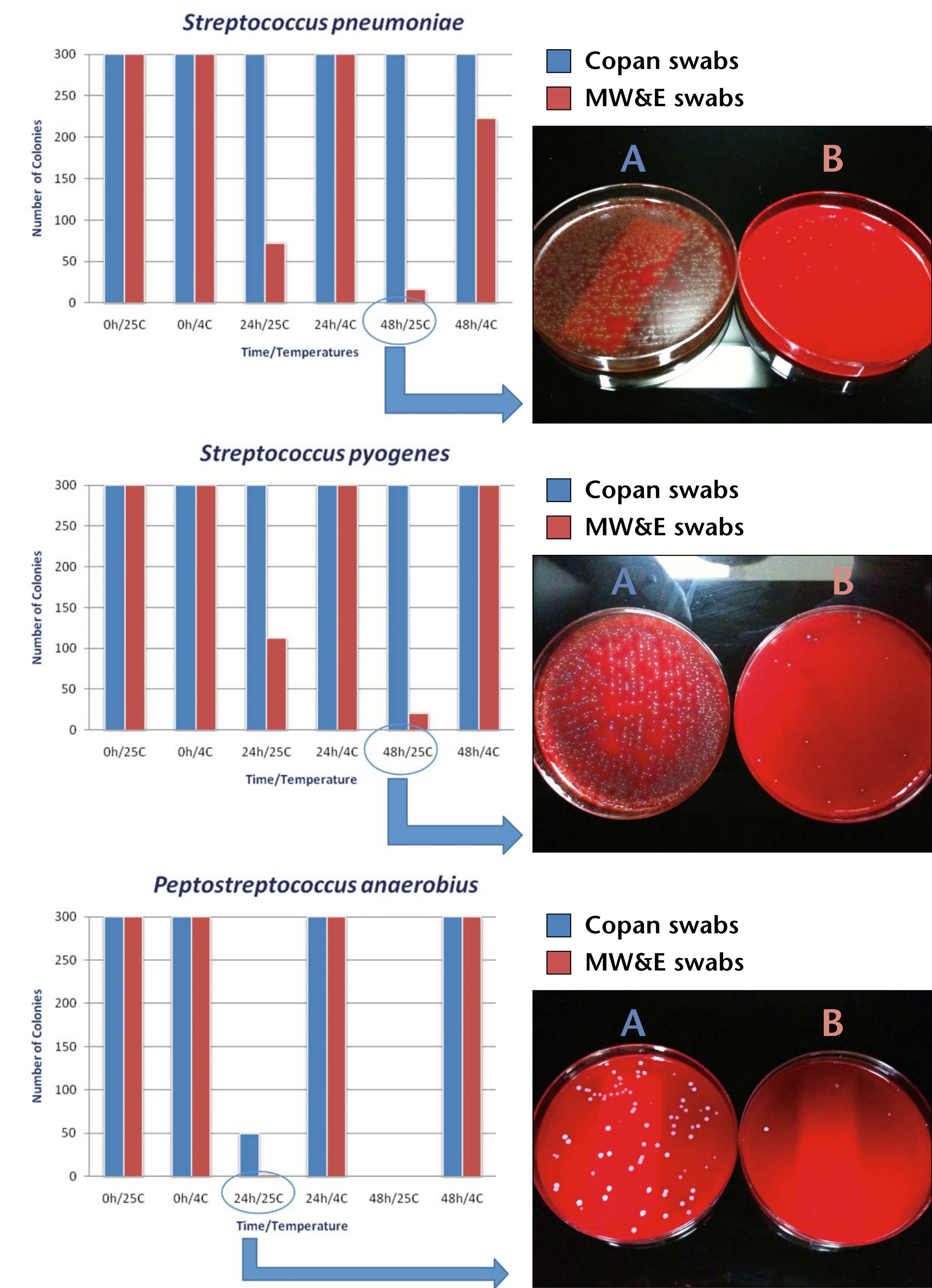
- 0h, 24h, 48h

- All the tests were done in triplicate

VORTEX ELUTION METHOD:

- A 0,5 McFarland suspension in saline (85%) was prepared from an 18-24hr culture of each organism. The 0,5 suspension was diluted (1:10) in saline;
- 100µl of each organism suspension was transferred into wells of a microtiter plate using a volumetric pipette;
- Tests were performed in triplicate for each swab brand, lots and time points (0, 24 and 48 hours);
- Each swab was rolled into the 100µl suspension (10 seconds) to completely absorb the inoculum and then placed into the transport device and held for the appropriate time at room temperature (25°C);
- The first swab (time point zero hour) were cultivated from within 15 minutes;

RESULTS:



CONCLUSIONS:

Bacterial recovery from swabs held for 0h was similar for both systems. However, after 24h and 48h incubation, bacterial recovery rates from Sigma Swab were lower compared to the ones from the ESwab.

Both swab systems maintain bacterial viability up to 48h when stored at 4°C, and for both species of *Streptococcus* when stored at 25°C. However, after 24h and 48h incubation, bacterial recovery rates from Sigma Swab were lower compared to the ones from the ESwab.

Bacteria tested showed greater survival in the Copan ESwab system compared to Sigma Swab.

In summary, it was possible to conclude that Copan ESwab performed better than Sigma Swab for transport and storage fastidious bacteria at room temperature.