**ABSTRACT**

Background: Clinical specimens containing anaerobic bacteria require special handling to enable satisfactory recovery of these important pathogens. ESwab transport system (Copan, USA) incorporates a flocked nylon swab for sample collection and a liquid Amies transport medium. The system potentially collects more material and maintains higher percentage of microorganisms than fibers swabs with agar transport media. The aim of this study was to evaluate the ESwab system for maintaining viability of clinically important anaerobic bacteria.

Methods: Three ATCC strains (8. vulgatus ATCC 8482, Bacteroides fragilis ATCC 25285, and P. acnes ATCC 6919) and 10 clinical samples containing anaerobic clinical isolates were selected for this study. Bacteria viability was evaluated by two different tests: Gram stain and Culture, using the vortex elution method according to the CLSI-ANA document. swabs were inoculated in triplicate with 10μl of each organism suspension. After inoculation, swabs were placed in the transport system and kept at 35°C for 0h, 24h and 48h. At 0h, Gram stain was performed on 50μl of the ESwab transport system slides. At 24h and 48h, Microscopic examination of 18 slides from 3 specimens showed that the ESwab Gram slides were more distinguishable in ESwab slides. For comparison, the TRANBAC System (Probac, Brazil) and the Amies Gel Traditional Swabs (Copan, USA) were tested.

**RESULTS**

<table>
<thead>
<tr>
<th>Organism</th>
<th>ESwab GR</th>
<th>Amies Gel</th>
<th>Traditional Swabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridium perfringes</td>
<td>55 CFUs</td>
<td>0 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Fusobacterium nucleatum</td>
<td>12 CFUs</td>
<td>12 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Peptostreptococcus</td>
<td>15 CFUs</td>
<td>80 CFUs</td>
<td>20 CFUs</td>
</tr>
<tr>
<td>Prevotella melaninogenica</td>
<td>55 CFUs</td>
<td>60 CFUs</td>
<td>27 CFUs</td>
</tr>
<tr>
<td>Propionibacterium acnes</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The ESwab system was superior to those observed in the traditional swabs. The system includes a nylon flocked swab and a polypropylene screw-cap containing 1ml modified Liquid Amies to transport anaerobic clinical isolates for 0h, 24h, and 48h. Microscopic examination of 18 slides from 3 specimens showed that recovery of bacteria (aerobes, anaerobes, and fastidious bacteria) in clinical specimens for up to 48h at 35°C was superior to those obtained using the Traditional Swabs. More microorganisms were recovered in Brucella agar after placed in an anaerobic atmosphere at 35°C for at least 48 hours, before being tested.

**METHODS**

**TRANBAC System**

The TRANBAC System (Probac, Brazil) and the Amies Gel Traditional Swabs (Copan, USA) were tested.

**MATERIALS**

**Transport Systems**

- Gram Stain
- Amies Gel Traditional Swabs (Copan, USA)
- ESwab with liquid Amies (Copan, USA)
- Culture
- TRANBAC System (Probac, Brazil)
- ESwab with Liquid Amies (Copan, USA)

**CHALLENGE ORGANISMS**

- **ATCC Strains**
  - Bacteroides vulgatus ATCC 8482
  - Bacteroides fragilis ATCC 25285
  - Propionibacterium acnes ATCC 6919
- **Clinical Samples**
  - Bacteroides fragilis (n=3)
  - Bacteroides uniformis (n=1)
  - Clostridium sporogenes (n=2)
  - Clostridium perfringes (n=2)
  - Clostridium acetobutylicum (n=2)
  - Peptostreptococcus anaerobius (n=2)
  - Peptostreptococcus micros (n=1)
  - Propionibacterium acnes (n=5)

**RESULTS**

<table>
<thead>
<tr>
<th>Organism</th>
<th>ESwab CTG</th>
<th>Amies Gel</th>
<th>Traditional Swabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridium perfringes</td>
<td>55 CFUs</td>
<td>0 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Fusobacterium nucleatum</td>
<td>12 CFUs</td>
<td>12 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Peptostreptococcus</td>
<td>15 CFUs</td>
<td>80 CFUs</td>
<td>20 CFUs</td>
</tr>
<tr>
<td>Prevotella melaninogenica</td>
<td>55 CFUs</td>
<td>60 CFUs</td>
<td>27 CFUs</td>
</tr>
<tr>
<td>Propionibacterium acnes</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The ESwab system was superior to those observed in the traditional swabs. More microorganisms were recovered in Brucella agar after placed in an anaerobic atmosphere at 35°C for at least 48 hours, before being tested.

**METHODS**

**TRANBAC System**

The TRANBAC System (Probac, Brazil) and the Amies Gel Traditional Swabs (Copan, USA) were tested.

**MATERIALS**

**Transport Systems**

- Gram Stain
- Amies Gel Traditional Swabs (Copan, USA)
- ESwab with liquid Amies (Copan, USA)
- Culture
- TRANBAC System (Probac, Brazil)
- ESwab with Liquid Amies (Copan, USA)

**CHALLENGE ORGANISMS**

- **ATCC Strains**
  - Bacteroides vulgatus ATCC 8482
  - Bacteroides fragilis ATCC 25285
  - Propionibacterium acnes ATCC 6919
- **Clinical Samples**
  - Bacteroides fragilis (n=3)
  - Bacteroides uniformis (n=1)
  - Clostridium sporogenes (n=2)
  - Clostridium perfringes (n=2)
  - Clostridium acetobutylicum (n=2)
  - Peptostreptococcus anaerobius (n=2)
  - Peptostreptococcus micros (n=1)
  - Propionibacterium acnes (n=5)

**RESULTS**

<table>
<thead>
<tr>
<th>Organism</th>
<th>ESwab CTG</th>
<th>Amies Gel</th>
<th>Traditional Swabs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridium perfringes</td>
<td>55 CFUs</td>
<td>0 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Fusobacterium nucleatum</td>
<td>12 CFUs</td>
<td>12 CFUs</td>
<td>0 CFUs</td>
</tr>
<tr>
<td>Peptostreptococcus</td>
<td>15 CFUs</td>
<td>80 CFUs</td>
<td>20 CFUs</td>
</tr>
<tr>
<td>Prevotella melaninogenica</td>
<td>55 CFUs</td>
<td>60 CFUs</td>
<td>27 CFUs</td>
</tr>
<tr>
<td>Propionibacterium acnes</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
<td>&gt;300 CFUs</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The ESwab system was superior to those observed in the traditional swabs. More microorganisms were recovered in Brucella agar after placed in an anaerobic atmosphere at 35°C for at least 48 hours, before being tested.

**METHODS**

**TRANBAC System**

The TRANBAC System (Probac, Brazil) and the Amies Gel Traditional Swabs (Copan, USA) were tested.

**MATERIALS**

**Transport Systems**

- Gram Stain
- Amies Gel Traditional Swabs (Copan, USA)
- ESwab with liquid Amies (Copan, USA)
- Culture
- TRANBAC System (Probac, Brazil)
- ESwab with Liquid Amies (Copan, USA)

**CHALLENGE ORGANISMS**

- **ATCC Strains**
  - Bacteroides vulgatus ATCC 8482
  - Bacteroides fragilis ATCC 25285
  - Propionibacterium acnes ATCC 6919
- **Clinical Samples**
  - Bacteroides fragilis (n=3)
  - Bacteroides uniformis (n=1)
  - Clostridium sporogenes (n=2)
  - Clostridium perfringes (n=2)
  - Clostridium acetobutylicum (n=2)
  - Peptostreptococcus anaerobius (n=2)
  - Peptostreptococcus micros (n=1)
  - Propionibacterium acnes (n=5)