A Comparison Of Two Commercially Available Chromogenic Agars For The Rapid Detection And Speciation Of VRE

S. Reed.
Thermo Fisher Scientific, Wade Road, Basingstoke, Hampshire, RG24 8PW, UK

Overview

Purpose: Comparison of performance of Thermo Scientific™ Oxoid™ *Brilliance*™ VRE Agar (Thermo Fisher Scientific) and chromID™ VRE Agar (bioMérieux) for detection of Vancomycin-resistant enterococci (VRE).

Methods: VRE and non-VRE isolates were streaked onto *Brilliance* VRE Agar and chromID VRE Agar prior to incubation. Performance of both media was calculated.

Results: *Billiance* VRE Agar is effective for the screening and speciation of VRE, giving rapid and reliable results within 24 h.

Introduction

VRE have recently emerged as important nosocomial pathogens due to increased use of vancomycin for the treatment of meticillin-resistant *Staphylococcus aureus* and the use of vancomycin-like glycopeptide as a growth promoter in animal husbandary in Europe[1]. Enterococci are frequently found in the gut and stomach and in healthy individuals, these bacteria rarely cause disease. However in the U.S.A, the Centers for Disease Control and Prevention stated that up to 1 in 3 infections amongst intensive care patients were caused by VRE[2].

Wounds or sores exposed to these bacteria can quickly become infected and lead to more serious disease, such as potentially fatal sepsis, especially in immunocompromised individuals. *Brilliance* VRE Agar (figure 1) is a new chromogenic screening medium designed to give a presumptive identification of VRE direct from clinical samples within 24 hours, producing either light blue colonies (*E. faecalis)* or indigo-purple colonies *(E. faecium).* ChromID VRE Agar produces blueish-green colonies (*E. faecalis)* and violet colonies *(E. faecium).*

Methods

33 VRE strains (sourced from the UK and Canada), including *E. faecalis, E. faecium* and *E. gallinarum* and 79 non-VRE cultures (sourced from the UK), including Salmonella, Streptococci, Pseudomonas spp., *E. coli,* Bacillus spp., Proteus spp., Klebsiella, Enterobacter, Serratia and Citrobacter were tested. Each isolate was first grown on Tryptone Soya-Agar (TSA) and incubated at 35-37°C overnight before a 0.5 McFarland suspension was made. 10 µl were streaked onto TSA (control), *Brilliance* VRE Agar and chromID VRE Agar and incubated aerobically at 35-37°C. Results were read at 24 h and 48 h. Colony size, growth recovery and colour were recorded at each interval. Each of these results from the two test agars were then compared results found on TSA.

Results

Results are summarised in tables 1 and 2**.**

Overall, *Brilliance* VRE Agar provided better sensitivity and specificity than the other chromogenic medium tested. *Brilliance* VRE Agar gave good results at both 24 h and 48 h. However, it is recommended that positive results are read at 24 h and incubated for a further 24 h to confirm negatives. This allows for a reduced turnaround time in comparison to traditional media which require a 48 h incubation time.

Although the results shown for this trial are lower than expected, more recent clinical trial data (soon to be published) has shown greater sensitivity. The percentage recovery of *Brilliance* VRE Agar (compared to TSA) was better than that of chromID VRE Agar (also compared to TSA), with 6% more samples tested achieving greater than 70% recovery at 24 h on *Brilliance* VRE Agar.

The average colony size on *Brilliance* VRE Agar was almost double the colony size seen on TSA at 24 h and were noticeably larger than those seen on chromID VRE Agar at both 24 h and 48 h. Coupled with the semi opaque background (patent pending), creating a greater contrast between colonies and the plate, the detection and correct identification of coloured colonies was made much easier.

Brilliance VRE Agar plates can also be left at room temperature for up to 6 h prior to inoculation and incubation. Internal validation has shown excellent compatibility with the commonly used transport media including Amies Gel, Liquid Amies, Liquid Stuarts and Cary-Blair without Indicator. This greatly increases user flexibility and reduces waste.

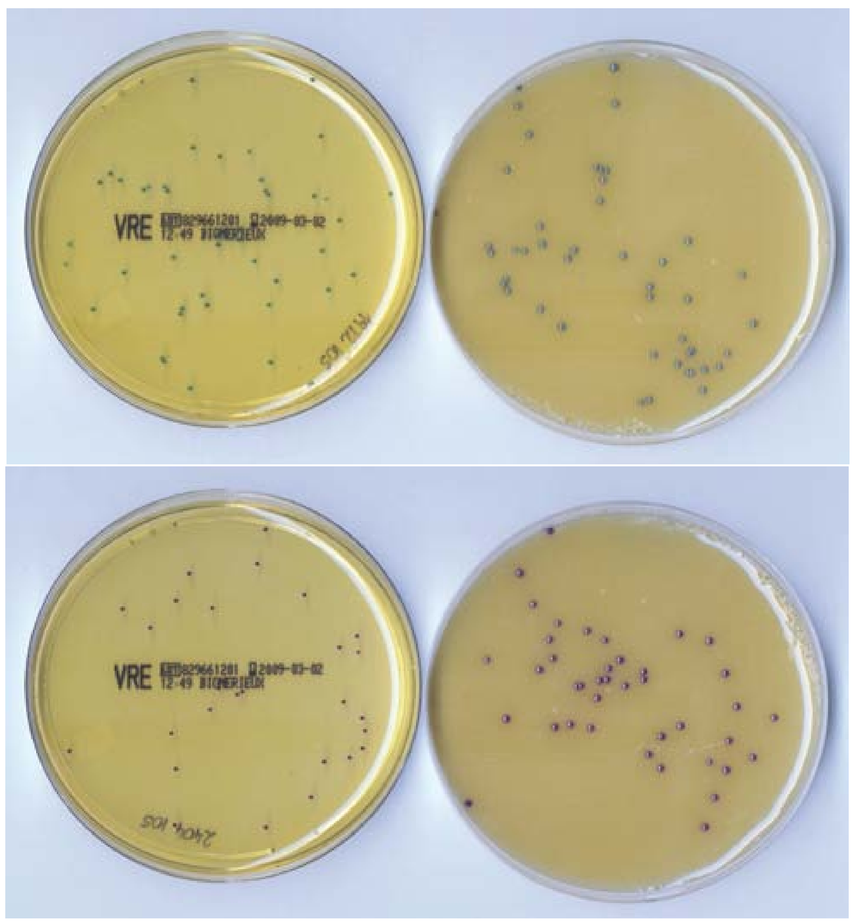
TABLE 1. Performance of two commercially available chromogenic media for detection and speciation of VRE at 24 h and 48 h (in brackets) incubation.

Performance	*Brilliance* VRE Agar	chromID VRE Agar
Sensitivity (%)	70.0 (75.0)	67.5 (72.5)
Specificity (%)	89.3 (89.3)	87.1 (81.7)
Accuracy (%)	83.5 (85.0)	81.2 (79.0)

TABLE 2. Average size of VRE colonies when compared with colonies growing on TSA (mm)

Product	24 h incubation	48 h incubation
Brilliance VRE Agar	1.99 (0.5-4)	2.4 (1-4)
chromID VRE Agar	1.2 (0.5-3)	1.4 (0.5-3)

FIGURE 1. *E. faecalis* NCTC 12201 on chromID VRE Agar at 24 h, *E. faecalis* NCTC 12201 on *Brilliance* VRE Agar at 24 h, *E. faecium* NCTC 12202 on chromID VRE Agar at 24 h and *E.* faecium NCTC 12202 on *Brilliance* VRE Agar at 24h.



Conclusion

Brilliance VRE Agar is effective for the screening and speciation of VRE, giving rapid and reliable results within 24 h. This robust and easy to read medium can be easily adopted by any laboratory as part of an effective infection control and screening programme.

References

1. Bell J.M., Paton J.C., Turnidge J. (1998). Emergence of Vancomycin Resistant Enterococci in Australia: Phenotypic and Genotypic Characteristics of Isolates. *J. Clin. Microbiol. B36B, 2187-2190.*
2. Centres for Disease Control and Prevention (2006). Recommendations for Preventing the Spread of Vancomycin Resistance: HICPAC.

LT1337A November/2009

Thermo SCIENTIFIC