

# Performance of gradient strip tests for detection of vancomycin resistance in Enterococci

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## Introduction

Detection of vancomycin-resistant enterococci (VRE) can be challenging in case of **low level resistance**. EUCAST has recently issued a warning with regard to unreliable test results of gradient strip tests for **VRE confirmation**. Our study evaluates the performance of **gradient strip tests** in comparison with the reference **broth microdilution (BMD)** method for the detection of vancomycin resistance in enterococci.

## Results

The sensitivity of **gradient strip tests** for detection of vancomycin resistance was **79.3%** compared to **89.7%** for **BMD**. 1/12 *vanA* (8%), 4/11 *vanB* (36%) and 1/3 *vanC* (33%) enterococci were interpreted as sensitive, with MIC values below the EUCAST breakpoint, using gradient strip tests. **BMD resulted in higher MIC values** and misclassification of 1/11 *vanB* (9%) and 1/3 *vanC* (33%) positive strain as vancomycin sensitive.

## Material & Methods

### Strains:

- 39 VRE resistant *Enterococcus spp.* strains, submitted to the Belgian National Reference Centre for Enterococci between 2017 and 2021, were selected based on different MIC values for vancomycin and different resistance mechanism.

### Methods:

- A 0.5 McFarland bacterial suspension was prepared to apply the vancomycin ETEST® (bioMérieux, France) or prepare the EUENCF microdilution plate (Sensititre™; Thermo Fisher Scientific, Cleveland, OH, USA). MIC values were interpreted after 24h of incubation at 35 °C.
- Glycopeptide resistance was confirmed by detection of a vancomycin resistance gene (*vanA - D*) by in-house PCR.

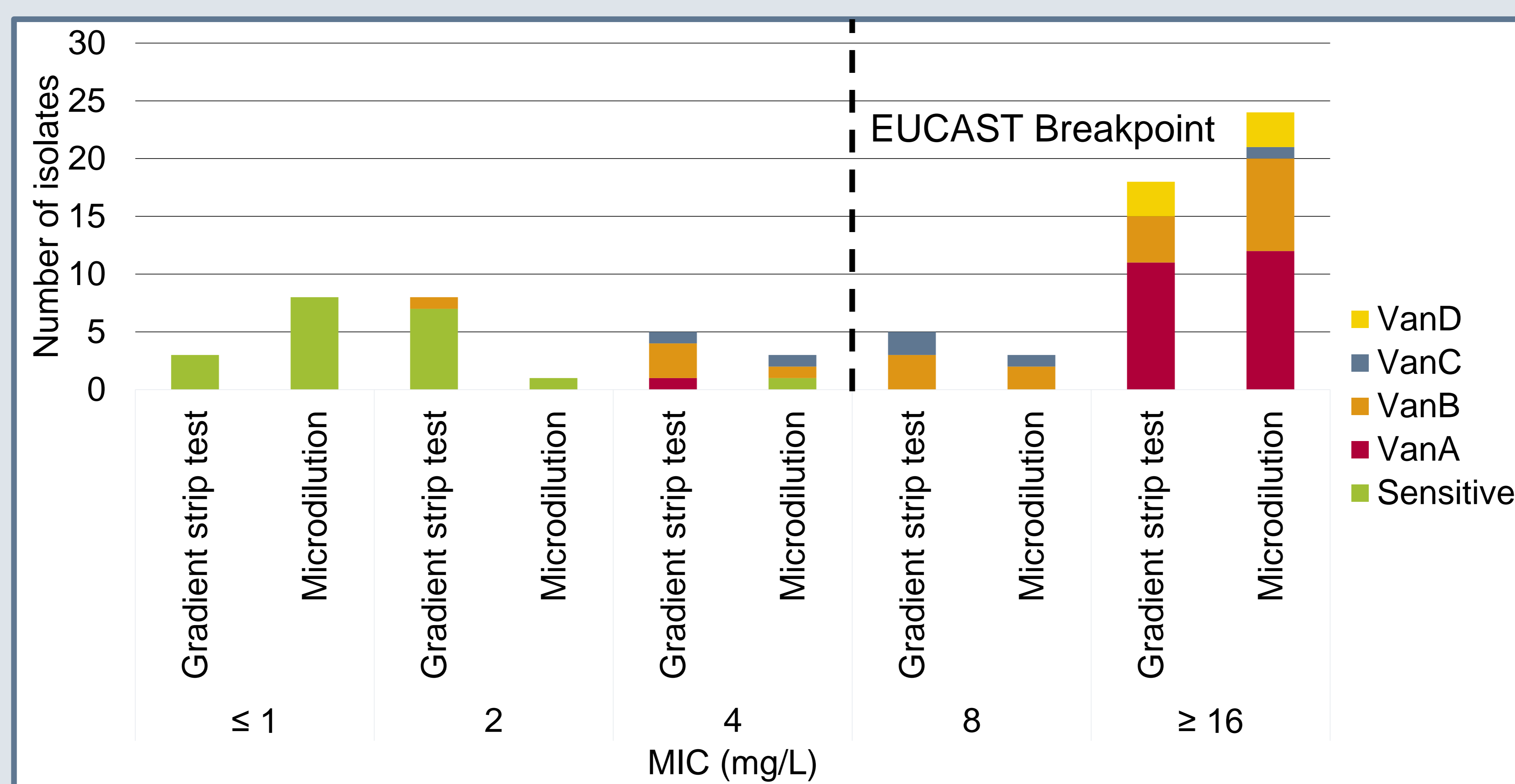


Figure 1: Number of genetic different isolates per vancomycin MIC value detected with gradient strip test and broth microdilution

## Conclusion

Mainly ***vanB* positive enterococci** are difficult to detect with gradient strip tests compared to BMD. It should therefore be recommended to use an additional technique (like *van* gene PCR) to confirm/exclude vancomycin resistance when **MIC values of 2 and 4 µg/ml** are obtained by gradient strip tests.

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