

UNIVERSITI TEKNOLOGI MARA

**SCREENING OF ANTAGONISTIC
BACTERIA FROM HEALTHY
PINEAPPLE VARIETY MD2 AND ITS
POTENTIAL AGAINST BACTERIAL
HEART ROT DISEASE**

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ABSTRACT

Bacterial heart rot disease caused by pathogenic bacteria *Erwinia chrysanthemi* is one of the common diseases of pineapple. Current industry practices for controlling the disease through cultural practices and application of chemical synthetic of Benomyl which is not a long lasting control method. This study aims to evaluate the potential of beneficial bacteria isolated from healthy pineapple leaves against the disease pathogen. The disease pathogen was isolated from symptomatic pineapple leaves with the appearance of water soaked and heart rot disease symptoms such as rotten basal tissues. Pathogenicity test was conducted to fulfil the Koch's Postulates. The same procedure for isolation of beneficial bacteria from healthy pineapple plant variety MD2 was carried out. A total of 25 bacterial isolates were successfully isolated from the healthy pineapple leaves and tested against the bacterial pathogen via agar well diffusion method. *In vitro* assay was utilized to measure the ability of isolated beneficial bacteria in the form of inhibition zone and its growth on media. An isolate identified as *Bacillus cereus* (BC3) showed the potential of antagonistic activity towards the pathogen. The isolate was further assessed *in vivo* under rain shelter conditions. The result showed that the isolate was able to suppress the disease symptoms. This study suggested that *B. cereus* (BC3) could be further explored for its potential as biological control agent for controlling the disease under field condition.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

Pineapple (*Ananas comosus*) is one of the important fruit crops that belongs to the family Bromeliaceae and originated from South America (Joy and Sindhu, 2012). According to Food and Agriculture Organization (FAO) in 2016 the pineapple production in Malaysia is a relatively small scale as compared to other top producing countries such as Costa Rica, Brazil, Philippines, India and Thailand (Figure 1.1).

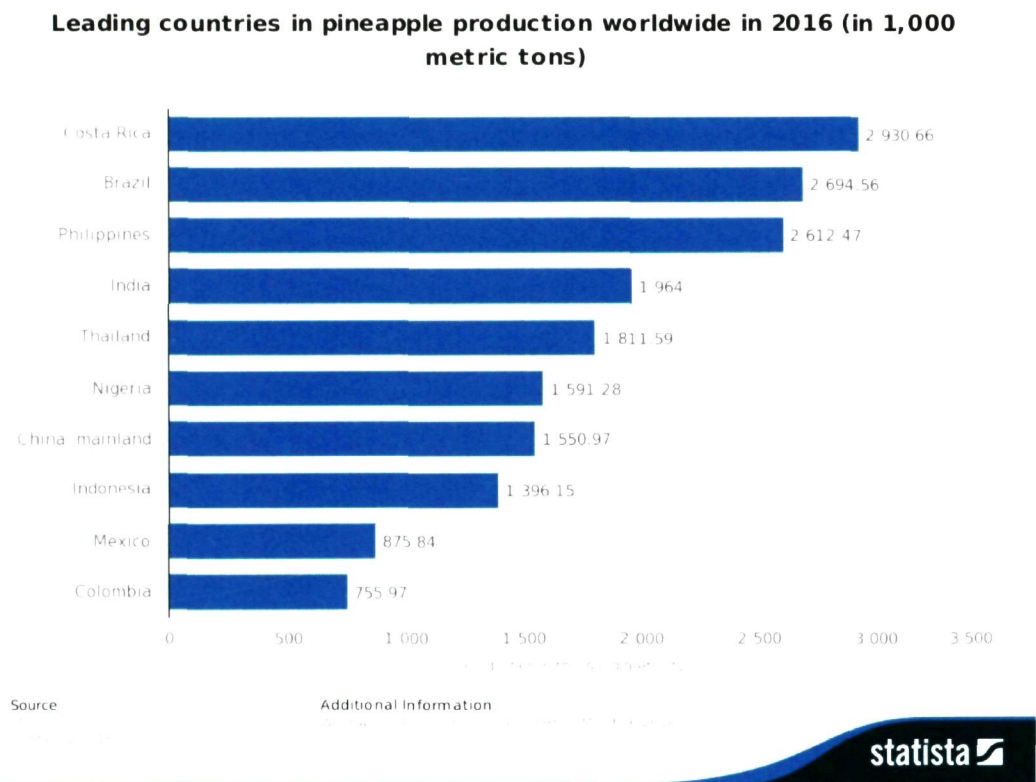


Figure 1.1 Statistics of Leading Countries in Pineapple Production Worldwide in 2016. (Source: FAO, 2016)

However, Malaysia has high potential to boost its pineapple production. This aspiration is carried out by Malaysian Pineapple Industry Board (MPIB) with the aim to help pineapple industry in achieving significant export target yearly. The first effort can be seen in 2014, the export value increased to \$30 million (USD) as compared to