



Malays. Appl. Biol. (2018) 47(4): 169–182

IN VITRO ANTIFUNGAL POTENTIAL OF *Lactococcus lactis*

ISOLATED FROM AGRICULTURAL SOILS IN TERENGGANU

AGAINST ANTHRACNOSE PATHOGEN, *Colletotrichum capsici*

MUHAMMAD AIMAN FAKRI¹, MOHD NIZAM LANI^{1*}, CHUAH TSE SENG¹,

ROZILA ALIAS² and ZAITON HASSAN³

¹*School of Food Science and Technology, Universiti Malaysia Terengganu (UMT),*

21030 Kuala Nerus, Terengganu, Malaysia

²*International Halal Institute Universiti Selangor (INSHA), Seksyen 7,*

40000 Shah Alam, Selangor, Malaysia

³*Faculty of Science and Technology, Universiti Sains Islam Malaysia (USIM),*

71800 Nilai, Negeri Sembilan, Malaysia

**E-mail: nizamlani@umt.edu.my*

Accepted 18 September 2018, Published online 25 October 2018

ABSTRACT

Colletotrichum capsici are ubiquitous fungal pathogens that cause anthracnose disease of chilli plant. Although chemical fungicide can be used to manage the disease, excessive use of the fungicide can lead to development of fungicide resistant as well as human health concern. Lactic acid bacteria (LAB) are Gram positive, mostly anaerobic, non-sporulating and acidtolerant bacteria, which produce antifungal compounds. Many LAB strains have been isolated from fermented foods, fresh fruits and vegetables, but very limited study was done on antifungal potential of LAB isolated from agricultural soils. The objectives of this study were to isolate and identify LAB from sandy clay loam soil and sandy loam soil in Terengganu and to perform in vitro evaluation of their antifungal activities against *C. capsici*

i. Results showed that 7 out of 40 presumptive LAB cultures isolated from both soils collected from rice fields and roselle cultivation areas using cultural method (M17 agar and Tomato juice agar) under aerobic and anaerobic conditions were identified as *Lactococcus lactis* subspecies *lactis* using 16S rDNA gene sequencing. All the seven strains of *Lc. lactis* subsp. *lactis* exhibited antifungal activities against *C. capsici* with minimum inhibition concentrations at 10% (v/v) and inhibition zones which ranged from 6.03 mm to 6.30 mm while mancozeb which act as positive control exhibited antifungal activities as low as 1% (w/v) and inhibition zones which ranged between 12.00 mm to 22.00 mm. These results show an important step in order to control fungal growth in chilli by approaching biological control in chilli cultivation area.

Key words: Antifungal activity, biological control, chilli, fungal pathogen, lactic acid bacteria