Growth Response of Candida albicans towards treatment of eugenol

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Abstract

Objectives: The aim of this study is to determine the growth responses of Candida albicans towards treatment of eugenol.

Methods: Candida albicans was propagated overnight in yeast peptone dextrose (YPD) broth at 37°C on a horizontal shaker. The cells were standardized to concentration of 10^6 cells/mL (OD_660=0.144). Eugenol treatments were then prepared at 0.5%, 1.0% and 2.0% v/v eugenol extract in absolute ethanol. Amphotericin B and ethanol respectively used as positive and negative controls. An untreated cell of Candida albicans was also included. Growths of candida were measured periodically every one hour over a period of 16h. Graph of log_{10} CFU/mL versus incubation time was plotted. The changes in specific growth rate (μ) and doubling time (g) were measured.

Results: The Minimum Inhibitory Concentration (MIC) was determined at 1% v/v. All eugenol treated cell populations were decreased after 2h incubation time whereby the cell population dropped to 2.912x10^6 CFU/mL (sub-MIC concentration), 2.153x10^5 CFU/mL (MIC) and 0.631x10^5CFU/mL (2xMIC concentration). Moreover, the cells population was completely kill at 6h and 8h incubation time for cells undergo treatment of 1% v/v and 2% v/v respectively. Both the doubling time (g) and specific growth rate (μ) were affected with the presence of eugenol extract. It was found that, g- and μ-values were significantly (p<0.05) reduced more than 50% with treatment of 1% v/v eugenol at 2 to 6h.

Conclusions: The presence of eugenol has made the cells experienced an environmental stress mode, thus could interrupted the normal growth.