

ABSTRACT

The utilization of naturally occurring bioactive compounds has been increasing in recent years. These compounds possess various pharmacological activities to improve the health state or act as prophylactic agents. Kombucha is a fermented beverage that employs the symbiotic relationship of bacteria and yeast (SCOBY) to produce secondary metabolites consisting of bioactive compounds, which offer health benefits including antioxidant and antiproliferative activity. The anticancer activity of kombucha in previous studies has been showing inconsistency, which may have resulted from the presence of various unidentified microorganisms from the SCOBY. Therefore, the present study was conducted to characterize the chemical properties of kombucha beverages prepared through the inoculation of known cultures, *Komagataeibacter intermedius* and *Dekkera bruxellensis*, while as well identifying the antiproliferative activities against human cervical cancer cell line. The inoculation of known strains may help control the fermentation process better in order to adjust to the most favorable conditions to enhance the potent anticancer activity. Two kombucha brews were prepared during the fermentation consisting of inoculation *K. intermedius* and inoculation of *Komagataeibacter intermedius* and *Dekkera bruxellensis*, lastly, an uninoculated tea serves as control. Treatment of kombucha against human cervical cancer (HeLa) cell line and non-cancerous HEK293T cell line significantly reduced the cell viability compared to the untreated control. Furthermore, HEK293T demonstrated lower sensitivity towards the treatment, as shown by IC50. Treatment of tea control showed the greatest inhibition towards the cell lines, suggesting the antiproliferative effects of kombucha extensively come from the tea polyphenols.

Keywords: Kombucha, HeLa, Antiproliferative, *Komagataeibacter intermedius*, *Dekkera bruxellensis*