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## In-vitro cytotoxicity of Trigona itama honey against human lung adenocarcinoma epithelial cell line (A549)

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### Abstract

**Introduction:** Many efforts have been made to identify natural alternatives to reduce the side effects of cytotoxic drugs in cancer treatment. With this in mind, the current study aimed to investigate the cytotoxicity effects of one of the multifloral Malaysian honey, Kelulut honey (*Trigona itama*), as a potential natural anticancer agent in stimulating apoptosis and cell cycle arrest to a human lung adenocarcinoma epithelial cell line (A549).

**Methods:** The cells were treated with various concentrations of *T. itama* honey for 24, 48 and 72 h. The cytotoxicity and cell viability were determined using trypan blue exclusion assay (TBEA) and flow cytometric analysis.

**Results:** The moisture content in the analysed honey was 14.3 +/- 0.8%, which was within the accepted international standard. The pH, electrical conductivity and proline content were 3.17 +/- 0.02, 0.47 mS/cm - 0.55 mS/cm and 19.1 mg/kg 20.2 mg/kg respectively. The findings demonstrated a significant dose and time-dependent inhibitory effect of *T. itama* honey with the maximum cytotoxic effects observed at 72 h with 20% concentration of *T. itama* honey, indicating 100% growth inhibition. Meanwhile, IC50 of *T. itama* honey treatment for A549 cells was determined as 0.62% v/v. Moreover, *T. itama* honey had a promising cytotoxic effect and proven capable of inducing cell cycle arrest at G2/M phase at 72 h of exposure with IC50 concentration.

**Conclusion:** This study provided prefatory evidence on *T. itama* honey's significant anticancer activity against human lung cancer cell lines.

### Keywords

**Author Keywords:** Anti-cancer; Honey; Human lung adenocarcinoma epithelial cell; In-vitro cytotoxicity; Natural medicine; Trigona itama

**KeyWords Plus:** CANCER; CHEMOTHERAPY; APOPTOSIS; HEALTH; ALPHA

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