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Isolation of active compounds from Streptomyces sennicomposti GMY01 and cytotoxic activity on breast cancer cells line

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Abstract
The occurrence of resistance to anticancer and the emergence of serious side effects due to chemotherapy is one of the main problems in cancer treatment, including breast cancer. The need for effective anticancer with a specific target is urgently required. Streptomyces are widely known as the potential producers of new anticancer molecules. Previously reported that the methanol extract of Streptomyces sennicomposti GMY01 isolated from Krakal Coast, Gunungkidul had very strong cytotoxic activity against MCF-7 and T47D breast cancer cells with IC50 values of 0.6 and 1.3 μg/mL, respectively. The following study aimed to isolate and identify active compounds of the S. sennicomposti GMY01 and evaluate its cytotoxic activity. The study was started by re-culturing and re-fermented optimization of S. sennicomposti GMY01 in a larger volume, then the bacteria were extracted using methanol following the bioassay-guided isolation of the extract obtained. The active compounds obtained were then structurally determined using UV/Vis spectroscopy, Fourier Transform-Infrared (FT-IR), Liquid Chromatography-Mass Spectroscopy (LC-MS), 1H NMR, and 13C NMR and analyzed for their cytotoxic activity using MTT assay on MCF-7 and normal Vero cells line. The results showed that the culture of the S. sennicomposti GMY01 using Starch Nitrate Broth (SNB) media yields the best results compared to other culture media. An active anticancer compound namely mannotriose was successfully isolated from the methanol extract with an IC50 value of 5.6 μg/mL and 687 μg/mL against the MCF-7 and Vero cells lines, respectively, indicating that this compound showed strong cytotoxic activity with high selectivity. © 2024 The Authors

Author Keywords
Anti-Breast cancer; Compound isolation; In vitro; Mannotriose; Streptomyces

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