

Abstract

TOXIC COMPOUNDS FOUND IN SOME SECONDARY METABOLITES EXTRACTS OF ACTINOMYCETES GMY01 AGAINST T47D AND MCF7 CELLS

The world's oceans are extreme environments that require marine microorganisms to develop their physiological capability and synthesize unique metabolites that are not observed in terrestrial microorganisms. Actinomycetes is one of the interesting groups of marine microorganism because of their ability to produce a large variety of biologically active substances for drug development, such as anticancer agents. The present study made an attempt to identify actinomycetes GMY01 based on their morphology characteristics and 16S rRNA sequence analysis. In addition, we also screened their cytotoxicity properties against human breast cancer T47D and MCF7.

Actinomycetes GMY01 was identified based on their 1) colonies and cell morphology, and 2) 16S rRNA sequences analysis and evolutionary relationships. Four extracts (hexane, ethyl acetate, methanol and water) of this secondary metabolites are examined for their cytotoxicity properties against T47D dan MCF7 (breast carcinoma) using MTT assay. The most potent extract was then subjected to partial characterization of its chemical constituents. Further study was conducted to investigate the effects of salinity level on GMY01 culture and its antagonist characterization against eukaryotic cells.

Our results indicate that strain GMY01 isolated from marine environment is a typical member of the genus *Streptomyces* and is most closely related to the type strain of *Streptomyces mutabilis* NRRL ISP-5, sharing 97,3% 16S rRNA similarity. Ethyl acetate fraction demonstrated the highest cytotoxicity against human breast cancer T47D and MCF7, while having low toxicity against normal cell NIH 3T3. Partial characterization showed that active compound which demonstrated growth-inhibitory activity against human breast cancer in vitro was a phenolic compound. The GMY01 isolate exhibited no antagonistic activity against multicellular and unicellular eukaryotic cells. The overall results indicate promising baseline information for the potential uses of *Streptomyces* sp. strain GMY01 extract for cancer treatment.

Key words: *Streptomyces*, GMY01, secondary metabolites, 16S rRNA