

CELEBRATING
COMMERCIALISATION
YEAR 2014

iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention
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exposition 2014

INNOVATEUR
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2014

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA

*Bridging
the valley of death :
advancing the
commercialisation
of research*

RESEARCH BOOK

iiindex2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

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FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed
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EFFECT OF EPIGENETIC REGULATORS ON THE SECONDARY METABOLITES PRODUCTION OF ASPERGILLUS LONGIVESICA

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Fungi are important source of novel bioactive microbial metabolites. Microbial metabolites derived from secondary metabolism of microorganisms evolved in response to the needs and challenges of the natural environment. These compounds are used for communication, defence against predators and in response to stress to increase their survival capacity. Secondary metabolites that are biologically active in some in-vitro and in-vivo can be developed as drugs such as antifungal, antibacterial, antiviral and immunosuppressant agent. *Aspergillus longivesica* used in this study was isolated from soil sample collected from rainforest in Sungkai, Perak. It was isolated using the phenol treatment method. This filamentous fungus appearing white to cream in colour and produces blue-green conidia in 14 days culture on potato dextrose agar (PDA). When grown on potato dextrose broth (PDB), this interesting fungus produces long phototropic conidia which elongate in the presence of light. The fractions of the extract were active against bacteria and fungus *S. aureus*, *C. albicans* and *A. niger*. A minor change in the culture condition and the presence of epigenetic regulators may affect the growth and secondary metabolism of fungi. Most fungi were responsive to one or more chemical epigenetic modifiers by producing new metabolites or enhancing the levels of secondary metabolites produced. In this study, the secondary metabolites produced by *A. longivesica* cultured in media supplemented with different epigenetic regulators were examined to determine whether it will give equal results in the secondary metabolism. The main objective is to verify that the presence of epigenetic regulators will produce additional metabolites and/or increase the level of secondary metabolites produced by this fungus. *A. longivesica* was grown in potato dextrose broth (PDB) at 100% (full strength) and 40% supplemented with histone deacetylase and DNA methyltransferase inhibitors namely suberoylanilide hydroxamic acid (SAHA), sodium butyrate (SB), valproic acid (VA), 5-azacytidine (5AC) and S-adenosylhomocysteine (SAHC). As a control, the fungus also grew in the same medium without epigenetic regulators. After 2 weeks of incubation, the cultures were extracted using solid phase extraction (SPE). The process of SPE was started by conditioning the SPE sorbents with methanol. The SPE sorbents were then equilibrated with ultra-purified water. Then, the samples were loaded and after elution of the compounds of interest using methanol and acetonitrile, the extracts were collected in the collection plate. The extracts were then subjected to high performance liquid chromatography (HPLC) analysis. All analysis were carried out in a reverse phase mode. The diode array detector (DAD) was set to display the absorbance at 210 nm, 254 nm, 254 nm and 360 nm. The mobile phase consisted of purified water (solvent A) and acetonitrile (solvent B). The separations were carried out at flow rate of 1 mL/min from 0% to 100% acetonitrile in 30 minutes. The chromatographic profile of the control shows more metabolites were produced at 100% PDB than at 40% PDB. At 100% PDB added with epigenetic regulators, SAHA, 5AC and VA enhanced the level of secondary metabolites production while the presence of SB produced additional metabolites *A. longivesica*. SAHA, 5AC and SAHC increased the level of secondary metabolites production at 40%. As a conclusion, this work evaluated the impact of using potato dextrose broth at two different strengths (100% and 40%). It was found that more metabolites were produced on PDB at full strength than at reduced strength. Levels of metabolites were increased and a number of additional metabolites were observed in the presence of epigenetic regulators. The above results support the concept of using a series of media and growth conditions to explore the fungal secondary metabolism in a controlled and extensive manner.