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Tissue culture of stevia sp. / by Ahmad Ariff Azuan Munshi.

PERPUSTAKAAN SULTANAH NUR ZAHIRAH UNIVERSITI MALAYSIA TERENGGANU (UMT) 21030 KUALA TERENGGANU 1100099147		

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PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

TISSUE CULTURE OF *STEVIA SP.*

By

AHMAD ARIFF AZUAN BIN MUNSHI

A PITA report submitted in partial fulfilment of
the requirements for the award of the degree of
Bachelor of Science (Biological Sciences)

**DEPARTMENT OF BIOLOGICAL SCIENCES
FACULTY OF SCIENCE AND TECHNOLOGY
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **TISSUE CULTURE OF *Stevia* sp.** oleh **AHMAD ARIFF AZUAN BIN MUNSHI**, no. matrik: **UK17251** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi **Ijazah Sarjana Muda Sains (Sains Biologi)**, Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this PITA research report entitled Tissue culture of *Stevia sp.* is the result of my own research except as cited in the references.

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TISSUE CULTURE OF *Stevia* sp.

ABSTRACT

Stevia had been used as an alternative for sweetener. World demand for *stevia* is increasing dramatically; however, low vegetative propagation and seed limited the source of plant materials to meet high demand. Tissue culture technique was shown as a promising tool to overcome this problem. Current study reports the shoot tip proliferation and growth of *Stevia rebaudiana* grown in tissue cultures. Complete random design (CRD) applied to induced shoot tips, leaf, nodal segment and leaf length proliferation in MS medium with various combinations of IBA and cytokinins such as Indole-3-acetic acid (IAA), or indole-3-butyric acid (IBA) with 6-Benzylaminopurine (BAP), Zeatin (ZEA) and Thidiazuron (TDZ) under concentration 0, 0.5, 1.0 and 2.0 mg/l. Treatment with 1.0 mg/l TDZ demonstrated the highest number of shoot tips (3 to 4 shoot tips per explants) compared with other treatments. This medium also produces higher number of leaf and nodal segment, and plant length. The use of tissue culture technique with appropriate concentration of plant growth regulator such as TDZ should produce sufficient *stevia* plant to meet the market demand. Production of phenolics content in the explant do not correlated with the effect of phytohormone to the growth. There were similar pattern of secondary metabolite within treatment shown by Flavonoid/Phenolic and Flavone/Phenolic Ratio.

KULTUR TISU *Stevia sp.*

ABSTRAK

Stevia telah digunakan sebagai sumber bahan pemanis alternatif. Permintaan dunia terhadap *stevia* meningkat secara mendadak; walaubagaimanapun, propagasi secara vegetasi dan biji benih yang rendah menghadkan sumber pokok untuk memenuhi permintaan. Teknik kultur tisu merupakan satu cara yang menyakinkan untuk mengatasi masalah ini. Kajian terkini melaporkan bahawa pembiakan tunas dan pertumbuhan *Stevia rebaudiana* dalam tisu kultur. 'Rekabentuk rawak lengkap'(CRD) telah digunapakai untuk merangsang pembiakan tunas, daun, keratan batang dan panjang tunas dalam medium MS dengan pelbagai gabungan auxin dan cytokinin; asid Indol-3-asetik (IAA) and asid indol-3-butirik (IBA) dengan 6-Benzilaminopurin (BAP), Zeatin (ZEA) dan asid Tidiazuron (TDZ) dalam kepekatan 0, 0.5, 1.0 dan 2.0 mg/l. Rawatan 1.0 mg/l TDZ menunjukkan tunas terbanyak (3 hingga 4 tunas setiap eksplan) berbanding rawatan lain. Planlet di dalam medium ini juga menunjukkan bilangan terbanyak untuk daun, keratan batang dan panjang tunas. Teknik kultur tisu menggunakan hormon tumbesaran tumbuhan seperti TDZ dengan kepekatan yang berlainan boleh menghasilkan *stevia* yang mencukupi untuk memenuhi permintaan pasaran. Penghasilan kandungan bahan fenolik di dalam eksplan tidak menunjukkan kesinambungan dengan kesan phytohormone terhadap pertumbuhan. Terdapat persamaan dalam metabolit sekunder di dalam rawatan yang ditunjukkan oleh nisbah Flavonoid/Fenolik dan Flavon/Fenolik.