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# Anticancer agents from non-edible parts of *Theobroma cacao*

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In order to establish anticancer and antioxidant properties from the non-ediblecocoa (*Theobroma cacao*) plant parts, the studies on cocoa leaf, bark, husk, shell (fermented), shell (unfermented), pith, root and cherrele were performed by extracting in methanol to obtained crude extracts. In this study, antioxidant activitywas determined using DPPH method, total phenolics content was performed using Folin-Ciocalteu method, antilipid peroxidation was determined using MDA method and anticancer activities were evaluated using MTT method. The extract with potent anticancer activity was further fractionated using bioassay guided fractionation and identified using GCMS. Based on the $EC_{50}$ values, cocoa root extract showed the highest antioxidant activity about 358.33 ± 6.96 µg/ml. However, no $EC_{50}$ values were obtained from cocoa husk, shell (unfermented), shell (fermented) and pith extract. Cocoa root extract was found to be highest for total phenolics content about 22,000.00 ± 1069.27 mg/100 g extract. At the maximum concentration of 10 mg/ml only cocoa cherrele extract showed antilipid peroxidation activity about 10.39 ±1.09% but other extracts demonstrated no activity. The MTT assay revealed that the cocoa leaf extract presented the highest anticancer activity with moderately active against breast estrogen receptor positive (MCF7) cancer cell line with IC50 value was 41.43 ± 3.26 µg/ml. Subfraction (II/SF7) of cocoa leafextract was the most active against MCF7 and more than 6 major of synergistic active compounds were identified using GCMS. From this study also, result demonstrated that plant extract possesses a cytotoxic effect on cancer without causing toxicity to normal cells.

## Biography

Zainal Baharum currently is a PhD candidate in the Department of Biomedical Science at Faculty of Medicine and Health Sciences, University Putra Malaysia. He is interested on natural products. His thesis project, which he is investigating with his supervisor Dr. Abdah Md Akim, was looking at antiproliferative activity from non-edible cocoa plant parts. He received his master degree from same university in Environmental Biotechnology. He is also a Research Officer at Biotechnology Division, Malaysian Cocoa Board, Malaysia since 2003 until now. He also has experienced on study of antibacterial activity from tree.

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