

**ANTICANCER STUDIES OF CRUDE EXTRACT AND ESSENTIAL OIL
FROM *EUGENIA AROMATICUM***

BY :

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Tuan/Puan,

TAJUK PROJEK PENYELIDIKAN DANA KECEMERLANGAN : "ANTICANCER STUDIES OF CRUDE EXTRACT AND ESSENTIAL OIL FROM EUGENIA AROMATICUM."

Dengan hormatnya perkara di atas adalah dirujuk.

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**LAPORAN AKHIR PENYELIDIKAN “ANTICANCER STUDIES OF
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Merujuk kepada perkara di atas, bersama-sama ini disertakan 2 (dua) naskah Laporan Akhir Penyelidikan bertajuk “**Anticancer Studies of Crude Extract and Essential Oil from *Eugenia Aromaticum*”**”.

Sekian, terima kasih.

Yang benar,



WAN NOR IZZAH BT WAN MOHAMAD ZAIN

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Projek Penyelidikan

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ABSTRACT

ANTICANCER STUDIES OF CRUDE EXTRACT AND ESSENTIAL OIL FROM *EUGENIA AROMATICUM*

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Spices are the source of antioxidants, which prevent the oxidative stress caused by the reduction process of oxygen that leads to DNA damage and several diseases inclusive of cancer. Therefore they represent a potential source of new compounds with anticancer and antioxidant properties. Methanol crude extract and essential oil isolated from *Eugenia aromaticum* or clove, were investigated for anticancer and antioxidant activities. The essential oil which was obtained by hydrodistillation and analysed using GC-MS was mainly made up of isoeugenol (62.11%), followed by caryophyllene (14.54%), isoeugenol acetate (5.40%), octasane (2.43%), α -humulene (2.22%), triacontane (1.95%), octadecane (1.66%), nonacosane (1.40%), octacosane (1.38%), and hexacosane (1.35%). The effect of methanol crude extract and essential oil against four human cancer cell lines: HepG2 (hepatic cancer), MCF-7 (hormone-dependent breast cancer), MDA-MB-231 (non-hormone-dependent breast cancer), and HeLa (cervical cancer) and normal cells; 3T3 was measured using the MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. It was shown that both the methanolic extract and essential oil inhibited 50% cancer cells growth at the concentrations $> 100 \mu\text{g/ml}$. However, tamoxifen (control positive) inhibited 50% cancer cells at the concentrations $< 15 \mu\text{g/ml}$. Effect could also be seen on normal cells growth. Among all cancer cell lines tested, both *E. aromaticum* methanolic extract and essential oil were more effective in inhibiting MCF-7 estrogen dependent breast cancer cell line. Thus, the growth inhibitory effect of the sample was measured which illustrated that *E. aromaticum* methanolic extract did not inhibit the cancer cells growth rate but it caused the shrinkage of the cells. The results were similar to tamoxifen. Since the cell shrinkage is one of the