

• 系統編號	RC9008-0292		
• 計畫中文名稱	省產石花菜對於誘導癌細胞程序化凋亡的探討		
• 計畫英文名稱	Induction of Apoptosis by a Red Agar, Gelidium amansii, Cultivated in Northeast Taiwan		
• 主管機關	行政院國家科學委員會	• 計畫編號	NSC89-2320-B038-037
• 執行機構	台北醫學院保健營養研究所		
• 本期期間	8808 ~ 8907		
• 報告頁數	5 頁	• 使用語言	中文
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• 中文關鍵字	石花菜；抗癌作用；細胞凋亡；生長抑制；癌症		
• 英文關鍵字	Gelidium amansii；Anticancer effect；Apoptosis；Growth inhibition；Cancer		
• 中文摘要	<p>本研究在探討省產石花菜對於癌細胞之生長是否具有抑制作用，且觀察其生長之抑制作用是否具有選擇性，同時共探討此作用是否因誘導細胞程序化凋亡(Apoptosis)之故。乾燥之石花菜經磨碎後分別以 PBS 及 methanol 萃取之，或依照一般食用方式製備石花凍，經冷凍乾燥後溶解於 DMSO 中，而後偵測不同之萃取物對 Hepa-1(Murine hepatoma cells)、HL-60(Human promyelocytic leukemia cells)二株癌細胞以及正常之 NIH3T3(Murine embryo fibroblast cells)細胞生長的影響。細胞數目使用 Coulter counter 計算之，細胞增殖則使用 MTS assay kit 偵測，並以 DNA 電泳以及 Annexin V-FITC 螢光染色法觀察細胞是否產生 apoptosis 的現象。結果顯示，石花菜之 PBS 萃取物對於 3 種細胞株之生長及增殖都沒有抑制的效果($p > 0.05$)；但 methanol 萃取物對 Hepa-1 及 NIH3T3 細胞、以及 DMSO 萃取物對 3 種細胞株之生長及增殖皆有抑制的作用($p < 0.05$)；螢光染色及 DNA 電泳分析顯示，Hepa-1 及 NIH3T3 細胞經 methanol 萃取物處理，3 種細胞株經 DMSO 萃取物處理後，都有 annexin V positive 反應，細胞之 DNA 亦有斷片之產生，顯示這些石花菜萃取物會誘導細胞 apoptosis 的發生。總言之，石花菜之 methanol 及 DMSO 萃取物具有抑制細胞生長的效果，且其生長抑制作用可能藉由其誘導細胞 apoptosis 的發生而造成，但是此作用並不具有選擇性。</p>		
• 英文摘要	<p>The objective of this study was to investigate the effect of Gelidium amansii, a red agar found in the North coast of Taiwan, on the growth of the cultured cells. Besides, its potential role on the induction of apoptosis was also explored. Two lines of cancer cells, murine hepatoma cells (Hepa-1) and human leukemia cells (HL-60), and a normal cell line, murine embryo fibroblast cells (NIH3T3),</p>		

were used in this study. *Gelidium amansii* was extracted with PBS, methanol or DMSO, and the effects of these extracts on the cell growth and on the cell proliferation were measured. The results indicated that the PBS extract of the *Gelidium amansii* did not have any effect on the cell growth in all lines of cells, whereas the methanol extract had the growth inhibitory effect on the Hepa-1 and NIH3T3 cells ($p < 0.05$), and the DMSO extract inhibited the growth of all lines cells ($p < 0.05$). The methanol extract treated Hepa-1 and NIH3T3 cells, and the DMSO extract treated cells showed annexin V positive response and fragmented DNA ladders on the agarose gels indicating the cells underwent apoptosis. In summary, the methanol and DMSO extracts of *Gelidium amansii* possess the antiproliferation effect on the cultured cells and this may be due to the induction of the apoptosis. In addition, this inhibitory effect did not show cell specificity.