

The Induction of NO and Anti-tumor Effects of Extracted and Purified Polysaccharides from *Talinum triangulare*

蔣博豪、蔡明勳

E-mail: 364813@mail.dyu.edu.tw

ABSTRACT

According to the statistic results showed by Department of Health, cancer has been the first cause of death in the past three decades. At present, most anti-cancer drugs are less specific, and they may cause many side-effects. Therefore, extracts or compounds from herbals or natural plants have been good choice for evaluation of anti-cancer therapy. Some health-improving activities of *Talinum triangulare* are widely known and spread, but only anti-oxidative activity and hepatoprotective effect of extracted polysaccharides from *Talinum triangulare* have been reported. In this study, we examined whether the water-extracted polysaccharides (TTP) from *Talinum triangulare* can promotion of inflammation and have anti-tumor activities. We also try to explore their active polysaccharide ingredients and mechanisms of inflammation. We first used orthogonal array L9 to find the optimal extraction conditions of TTP by heat reflux and ultrasonic extractions, respectively. The optimal heat reflux extraction conditions are 95 incubation temperature, 1:20 ratio of material and water, and 150 minutes of incubation time. The optimal ultrasonic extraction conditions are 85 incubation temperature, 1:20 ratio of material and water, and 75 minutes of incubation time. Both methods obtain the maximum 3.1% conversion yield. After ethanol precipitation, TTP were re-dissolved in distilled water. TTP was separated into two molecular weight ranges by dialysis. Various amounts of two kinds of TTP were added into media of RAW264.7 macrophages for analyzing their inflammation activities by measuring nitric oxide (NO) productions. We found that TTP with molecular weights larger than 14kDa could induce more NO synthesis than TTP with molecular weights lower than 14kDa. This result suggests that the larger TTP have higher inflammation activity than the smaller one. Because the NO production is one of inflammatory responses that can suppress tumor cell growth, we analyzed the anti-tumor activity of TTP treated RAW264.7 cells. We collected the media of RAW264.7 cells pre-treated with two types of TTP, virespectively. We treated human cervical cancer HeLa and colorectal cancer SW620 cells with these media. We found the media of TTP pre-treated RAW264.7 cells could significant inhibit HeLa and SW620 cells, and the larger TTP has higher inhibition activity than the smaller TTP. However, both types of TTP have no direct anti-tumor activity. Furthermore, we separated and purified seven kinds of polysaccharides from the large TTP by anion-exchange chromatography, and then we analyzed their inflammation and anti-tumor activities, respectively. Results showed that each separated polysaccharides from TTP has less NO induction and lower anti-tumor activities than the original large TTP. These results may account for that the inflammation and anti-tumor activities are not induced by single type of polysaccharide. From our results, we conclude that TTP has anti-tumor activities through regulating the functions of macrophages.

Keywords : *Talinum triangulare*、 the optimal extraction condition of polysaccharides、 nitric oxide、 promotion of inflammation 、 anti-tumor effect

Table of Contents

目錄	封面內頁	簽名頁	中文摘要	iii	英文摘要	v	誌謝	vii	目錄	viii	圖目錄	xii	表目錄	xiv	1.緒論	1	2.文獻回顧	2	2.1.稜軸土人參	2	2.2.常見中草藥萃取方法簡介	4	2.2.1.冷浸攪拌萃取法	4	2.2.2.熱迴流萃取法	5	2.2.3.超音波輔助萃取	5	2.3.多醣化合物	6	2.4.巨噬細胞之功能	7	2.5.免疫活性評估	7	2.6.癌症	8	2.6.1.大腸癌	8	2.6.2.子宮頸癌	9	3.材料與方法	10	3.1.試驗材料	10	3.1.1.植物來源	10	3.1.2.細胞株來源	10	3.1.3.藥品清單	10	3.1.4.儀器清單	11	3.2.稜軸土人參多醣最佳萃取條件	12	3.2.1.熱迴流萃取稜軸土人參多醣最佳條件	12	3.2.2.超音波最佳萃取稜軸土人參多醣萃取條件	15	3.2.3.成分分析-多醣分析	16	3.3.乙醇沉澱條件評估	17	3.4.透析膜透析分離大、小分子量多醣	17	3.5.陰離子交換樹脂分離純化稜軸土人參多醣	18	3.5.1. DEAE Sepharose Fast Flow樹脂前處理	18	3.5.2.以樹脂層析法分離稜軸土人參多醣	18	3.6.細胞培養	20	3.7.一氧化氮(NO)產量分析	21	3.8.稜軸土人參多醣處理所得RAW264.7細胞條件培養液的製備	22	3.9.免疫調節試驗(抗癌細胞試驗)	22	3.9.1.利用倒立式顯微鏡檢測多醣溶液處理的癌細胞數目與形態	22	3.9.2.細胞存活率試驗(Tetrazolium dye colorimetric assay, MTT assay)	23	3.10.統計分析	24	4.結果與討論	25	4.1.熱迴流萃取單因子探討	25	4.1.1.熱回流萃取稜軸土人參多醣-不同的萃取溫度對多醣產率之探討	25	4.1.2.熱回流萃取稜軸土人參多醣-不同的萃取時間對多醣產率之探討	27	4.1.3.熱回流萃取稜軸土人參多醣-不同的固液比對多醣萃取產率之探討	29	4.2.熱回流萃取稜軸土人參多醣直交表試驗	31	4.3.超音波萃取稜軸土人參多醣單因子探討	35	4.3.1.超音波萃取稜軸土人參多醣-不同的萃取溫度對多醣產率之探討	35	4.3.2.超音波萃取稜軸土人參多醣-不同的萃取固液比對多醣產率之探討	37	4.3.3.超音波萃取稜軸土人參多醣-不同的萃取時間對多醣產率之探討	39	4.4.超音波萃取稜軸土人參多醣直交表試驗	41	4.5.熱回流萃取與超音波萃取稜軸土人參多醣產率	
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之比較45 4.6乙醇沉澱條件評估47 4.7免疫活性評估-測量一氧化氮(NO)產生量49 4.8利用倒立式顯微鏡檢測經多醣溶液處理的癌細胞數目與形態51 4.8.1稜軸土人參多醣對子宮頸癌細胞株(HeLa)癌細胞數目與形態之影響51 4.8.2稜軸土人參多醣對大腸癌細胞株(SW620)的細胞數目與形態之影響55 4.9以樹酯層析法分離不同稜軸土人參多醣59 4.10各多醣分餾液對巨噬細胞產生NO產量及活化細胞免疫活性評估61 4.11稜軸土人參多醣處理的條件培養液培養癌細胞之生長抑制率評估63 5. 結論67 參考文獻69 圖目錄 圖2-1稜軸土人參植株3 圖4-1熱回流萃取稜軸土人參多醣-不同萃取溫度對多醣產率影響26 圖4-2熱回流萃取稜軸土人參多醣-不同萃取時間對多醣產率影響28 圖4-3熱回流萃取稜軸土人參多醣-不同萃取固液比對多醣產率影響30 圖4-4熱回流萃取稜軸土人參多醣-L9直交表試驗中各項萃取因子之訊號與雜訊(S/N)比值34 圖4-5超音波萃取稜軸土人參多醣-不同萃取溫度對多醣產率影響36 圖4-6超音波萃取稜軸土人參多醣-不同萃取固液比對多醣產率的影響38 圖4-7超音波萃取稜軸土人參多醣-不同萃取時間對多醣產率影響40 圖4-8超音波萃取稜軸土人參多醣-L9各項萃取因子之訊號與雜訊(S/N)比值 圖4-9熱回流與超音波萃取稜軸土人參多醣最佳條件之產率比較 圖4-10乙醇沉澱稜軸土人參多醣條件評估-各多醣濃度下乙醇沉澱後多醣回收率之結果48 圖4-11各樣品誘導RAW264.7巨噬細胞產生NO量之比較50 圖4-12利用顯微鏡觀察直接添加大、小分子量稜軸土人參多醣對子宮頸癌細胞數目與形態的影響53 圖4-13利用顯微鏡觀察經由稜軸土人參多醣處理的RAW264.7巨噬細胞條件培養液培養子宮頸癌細胞之數目與形態54 圖4-14利用顯微鏡觀察直接添加大、小分子量稜軸土人參多醣對大腸癌細胞數目與形態的影響56 圖4-15利用顯微鏡觀察經由稜軸土人參多醣處理的RAW264.7巨噬細胞條件培養液培養大腸癌細胞之形態57 圖4-16a利用顯微鏡觀察經由PBS處理的巨噬細胞條件培養液培養大腸癌細胞形態之局部放大圖58 圖4-16b利用顯微鏡觀察經由大分子量多醣處理的巨噬細胞條件培養液培養大腸癌細胞形態之局部放大圖58 圖4-17經由DEAE Sepharose Fast Flow樹酯分離稜軸土人參大分子量多醣60 圖4-18各樣品誘導RAW264.7巨噬細胞產生NO量之比較62 圖4-19條件培養液處理子宮頸癌細胞活性檢測-MTT assay65 圖4-20條件培養液處理大腸癌抗細胞活性檢測-MTT assay66 表目錄 表4-1熱回流萃取稜軸土人參多醣L9直交表各因子與參數範圍32 表4-2熱回流萃取稜軸土人參多醣L9直交試驗表所得結果33 表4-3超音波萃取稜軸土人參多醣L9直交表各因子與參數範圍42 表4-4超音波萃取稜軸土人參多醣L9直交試驗表43

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