樟芝固體栽培及其生物活性之研究

Study on solid cultivation and bioactivity of Antrodia camphorata

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摘要

樟芝爲臺灣特有種，生長於保育類的牛樟樹上，菌種生長緩慢且尚無人工栽培記錄，產學界多數以液體深層發酵培養爲主，但無法令其合成三帖類。本研究即以特殊培養基配方及環控條件成功地以固體栽培方式培育出與野生樟芝相近之三帖類成份及有效的生物活性。經研究發現樟芝固體栽培萃取物具有優於野生樟芝及松杉靈芝的總抗氧化活性達 7，950 μg/g ascorbic acid；抗子宮頸癌、肝癌、胃癌及乳癌活性平均達 80%左右，亦高於野生樟芝及松杉靈芝；以老鼠作爲急毒性試驗， LDS(下標 50)爲 2000mg/Kg，顯示爲無急毒性物質；以原子光譜分析其金屬元素含量，並未檢則出含有砷、汞、鎘、鉻等重金屬。本突破性研究成果可以作爲日後進一步成份純化分析及其他機能，試驗之參考，並適合進入量化生產階段。

Abstract

Chang-Zhi, namely Antrodia camphorata, is an endemic species in Taiwan growing on the wood of Cinnamomum kanehirai. Most of scientists study the culture through deep fermentation, which is unable to get triterpenoids from harvest mycelia. This study aimed to explore a specific solid medium and setup an environmental control to cultivate Chang-Zhi in vitro. Our strategy is using triterpenoids as an indicator to evaluate the medial composition and growing condition. Successfully similar and higher content of triterpenoids were extracted and assayed by HPLC compared with wild Chang-Zhi fruitbody. Bioactivity assays proved that solid culture could be better than that of wild one and Ganoderma tsuga in many aspects. Hot water crude extract indicates that antioxidant activity reaches to 7，950 μg/g ascorbic acid; antitumor cell activities, such as Hela, AGS, Hep G2, MCF-7, are around 80% averagely; LD50 treatment is 2000 mg/Kg suggested nontoxicity; heavy metal, such as As, Hg, Cd, and Cr, are not detectable. The result strongly reveals that the study can be commercialized and supports further research in other bioassay systems.