

中文摘要

本研究運用傳統方法以成熟與未成熟之果實生產 noni 果汁，並探討果汁於熟成過程中，(1) 功能性化合物含量之變化，包括：總酚類化合物含量、類黃酮含量、縮合單寧含量和東莨菪素 (scopoletin) 及其衍生物之含量。(2) 抗氧化能力之變化，包括自由基清除能力、超氧陰離子清除能力、過氧化氫清除能力和亞鐵離子螯合能力。(3) 血管收縮素轉化酶 (Angiotensin converting enzyme ; ACE) 抑制活性之變化。(4) 分離及鑑定 noni 果汁中 scopoletin 及其衍生物之化學結構。研究發現，成熟果實所得之果汁具有較高含量之功能性化合物，而 noni 果汁對自由基與超氧陰離子皆具有極佳之消除能力；且成熟果實所得之果汁其 ACE 抑制活性皆顯著地大於未成熟之果汁，故成熟果實所得之 noni 果汁具有較佳之保健潛力。根據 Mass, $^1\text{H-NMR}$ 和 $^{13}\text{C-NMR}$ 之鑑定結果，本研究為首次自 noni 果汁中分離並鑑定出三種 scopoletin 衍生物，分別為 scopoletin 7-*O*-glucosyl-(6'-1'')-glucoside、scopoletin-7-*O*- β -glucoside (scopolin)、scopoletin 7-*O*-glucosyl-(6'-1'')-apioside (xeroboside ; hymexelsin)。此外，初步分析已知 noni 果汁具有良好之 ACE 抑制活性，其中之 ACE 抑制物主要為高極性物質。

ABSTRACT

This study used the traditional ripening method to prepare the noni juice with the ripe and unripe fruit. During ripening, juices were sampled for following investigations: (1) Changes in the content of functional compounds including total phenolic compounds, flavonoids, condensed tannin, scopoletin and its derivatives. (2) Changes in the anti-oxidative activity including free radical scavenging, superoxide anion scavenging, H₂O₂ scavenging and Fe²⁺ chelating activity. (3) Changes in the inhibitory activity of ACE (Angiotensin converting enzyme). And (4) Structural resolution of scopoletin and its derivatives isolated from noni juice. Results showed that the contents of functional compounds in the ripe fruit juice are higher than those in the unripe fruit juice. And the fruit noni juice exhibited extremely good scavenging activity to DPPH free radical and superoxide anion. The ACE inhibitory activity of ripe fruit juice is also higher than that of unripe fruit juice. Therefore, the ripe fruit juice possessed better health care potentiality. Based on Mass, ¹H-NMR and ¹³C-NMR analysis, three scopoletin derivatives isolated from the noni juice were identified as scopoletin 7-*O*-glucosyl-(6'-1'')-glucoside, scopoletin-7-*O*-β-glucoside, and scopoletin-7-*O*-glucosyl-(6'-1'')-apioside, respectively. Furthermore, noni juice had high ACE inhibitory activity, and the ACE inhibitors of noni juice would be polar compounds based on their elutions from RP-HPLC.