開發機能性膨發米點心
Development of functional puffed rice snacks

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紫米本身含有豐富花青素及多酚類化合物，具有抗氧化、抑制動脈粥狀硬化、降血壓、調節血脂等功能，對人體有益；蝶豆花富含許多機能性成分包含: 酚酸、類黃酮、花青素、三帖類化合物以及類固醇等，而蝶豆花的花青素能夠提供鮮豔色彩且具有良好清除自由基的能力，可作為一種天然色素及抗氧化素材。研究結果顯示，模具溫度110℃下的總花青素及總酚含量有最好表現，同樣模具溫度，螺軸轉速320 rpm時，產品有最多的花青素，而螺軸轉速提升為380 rpm時，產品的總酚含量最高。添加5%蝶豆花之糙米擠出物，雖具有最好的接受度但卻與10%蝶豆花添加之糙米擠出物無顯著差異，且10%蝶豆花添加之糙米擠出物具有最佳的抗氧化性質，因此，在10%蝶豆花添加、模具溫度120℃、螺軸轉速380 rpm操作條件下，所得到的糙米擠出物最具機能性。

Purple rice itself is rich in anthocyanins and polyphenols, which have functions of anti-oxidation, inhibiting atherosclerosis, lowering blood pressure, and regulating blood lipids, and is beneficial to the body. *Clitoria ternatea* is rich in many functional ingredients including: phenolic acid, flavonoids, anthocyanins, triterpenoids and steroids. The anthocyanin of *Clitoria ternatea* can provide bright colors and good antioxidant capacity which can be the natural pigments and antioxidant materials. The results showed that the total anthocyanin and total phenol content of extrudate at 110 ℃ die temperature were the highest, and increasing screw speed from 320 rpm to 380 rpm, its total phenol content was the highest. The brown rice extrudates of 5% *Clitoria ternatea* addition are the most acceptable but not significantly different with the brown rice extrudates of 10% *Clitoria ternatea* addition which have the best antioxidant properties. When the die temperature 120˚C and screw speed 380 rpm is the optimum processing conditions for the brown rice extrudates of 10 % *Clitoria ternatea* addition.

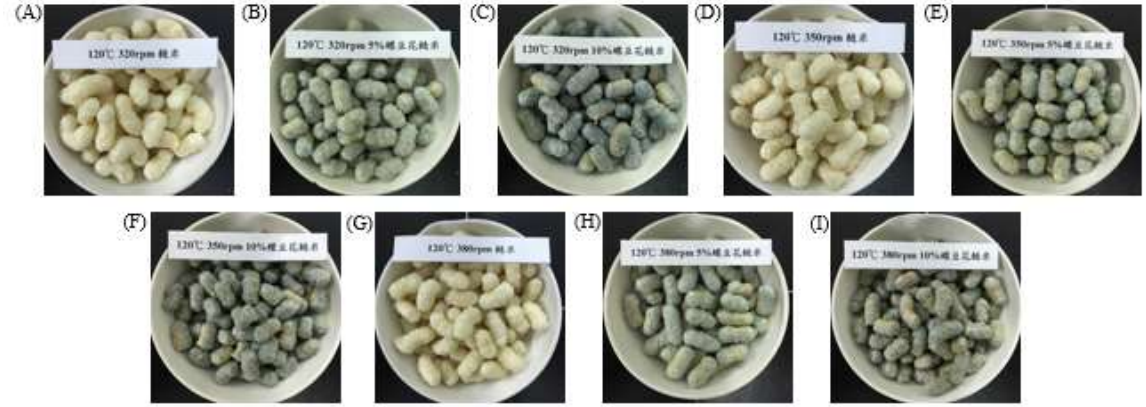

Figure 1. Extrudates (A)-(I) produced under different *Clitoria ternatea* addition and screw speed at die temperature 120°C.

圖1、模具溫度120℃，在不同蝶豆花添加及螺軸轉速下糙米擠出物(A)-(I)。

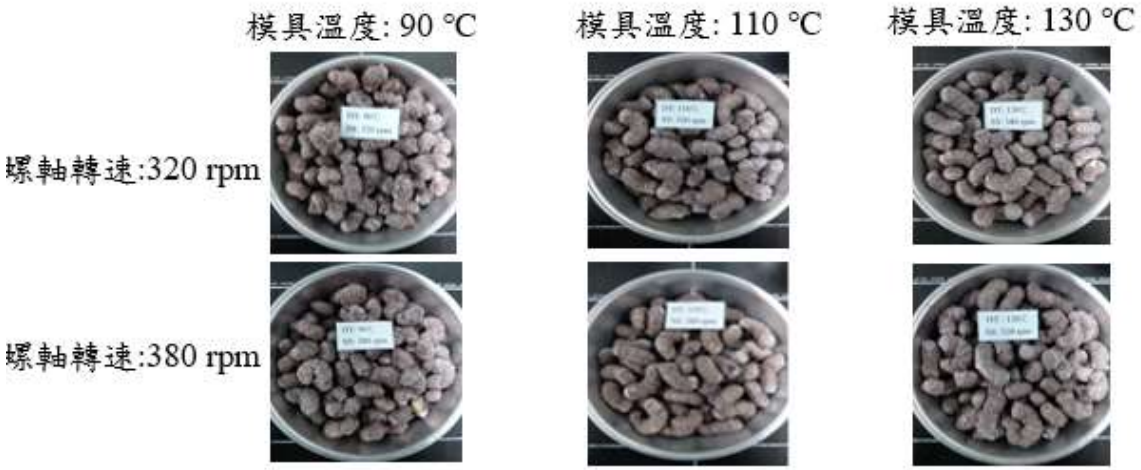

圖2、紫米擠出物在不同螺軸轉速及模具溫度下外觀

Fig. 2 Purple rice extrudates obtained at different screw speed and die temperature.