UNIVERSITI TEKNOLOGI MARA
Kolej
Pengajian Kejuruteraan

DIGEST: RESEARCH & INNOVATION

College of Engineering

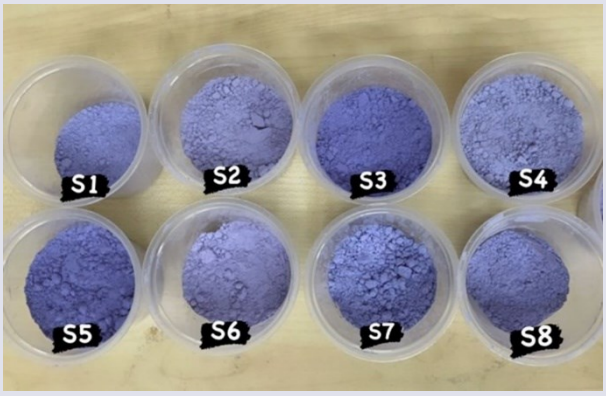
Volume 2, 2024
eISSN : 2805-573X

50 Shades of Blue: The Power of Anthocyanins in Blue Pea (*Clitoria ternatea*) Flower

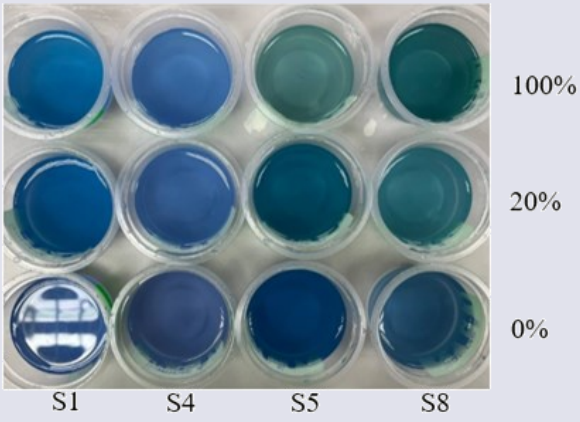
From the garden to your plate, the mesmerizing blue hues of the blue pea flower captivate the eye and offer incredible health benefits. However, beyond their beauty, these vibrant blooms hold the secret to enhancing food preservation and fighting diseases.

Lipid oxidation and free radical production are notorious for degrading food quality, leading to unpleasant flavours and shortened shelf life. Moreover, these processes contribute to serious health conditions like atherosclerosis, diabetes, rheumatoid arthritis, Alzheimer's disease, and cancer. To combat these issues, antioxidants like anthocyanins — responsible for the striking blue colour of the blue pea flower — can be incorporated into functional foods to prolong the shelf life and boosting health.

Anthocyanins are natural pigments found in many plants, and the blue pea flower is a rich source of these powerful compounds. However, their high thermal sensitivity and instability require encapsulation within protective wall materials to preserve their benefits. These materials must exhibit excellent rheological behaviour, dispersibility, and stability, ensuring a stable coating, controlled release, and protection against environmental factors. Spray drying emerges as a popular technique for encapsulating these pigments, converting liquid dispersions into dry, stable products.



Spray-dried encapsulated blue pea flower powder



Various blue shades at different light intensity

Our research focused on the morphological and colour stability of blue pea powder extracts after spray drying at different temperatures. We discovered that powders encapsulated with 100% maltodextrin at higher temperatures resulted in larger particles due to rapid drying and increased feed viscosity. Conversely, particles encapsulated with Arabic gum were smaller, and temperature had a minimal impact on their size. Interestingly, a combination of maltodextrin and Arabic gum produced even smaller particles, likely due to reduced droplet stickiness at lower drying temperatures.

Significantly, the vibrant blue anthocyanins from the blue pea flower were successfully encapsulated using maltodextrin and Arabic gum. This breakthrough encapsulation method not only preserves the stunning colour and health benefits of anthocyanins but also offers a promising solution for improving food handling and extending shelf life.

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