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Stability of anthocyanins from butterfly pea (*Clitoria tematea*)
flower extracted after storage at different conditions / Azidah
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Lihat Sebelah

STABILITY OF ANTHOCYANINS FROM BUTTERFLY PEA (*Clitoria ternatea*)
FLOWER EXTRACTED AFTER STORAGE AT DIFFERENT CONDITIONS

By
Azizah binti Suhaimi

Research Report submitted in partial fulfilment of
the requirements for the degree of
Bachelor of Food Science (Food Technology)

DEPARTMENT OF FOOD SCIENCE
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITY MALAYSIA TERENGGANU
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ENDORSEMENT

The project report entitled **Stability of anthocyanins from Butterfly pea (*Clitoria ternatea*) flower extracted after storage at different conditions** by **Azizah bt Suhaimi**, Matric No **UK16713** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfilment of the requirement of the degree of Food Science (Food Technology), Faculty of Agrotechnology and Food Sciences, Universiti Malaysia Terengganu.


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Date: 8/2/2012

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

Flower from Butterfly pea (*Clitoria ternatea*) is known to contain the anthocyanins pigment in the petals. However, there was no widely research carried out to study the anthocyanins pigment in aqueous extracted from Butterfly pea flower. Therefore, this study was conducted to determine which extraction methods can produce the highest yield of anthocyanins pigment and to study the color properties through storage at different conditions (pH, temperature and light exposure). Three different solvent extraction methods were used to extract anthocyanins pigment which were ethanol acidified method, hydrochloric acid method and distilled water method. Meanwhile, for stability study the highest extracted anthocyanins pigment were stored at seven different conditions which were 4 °C and 27 °C (pH 1±0.5, dark), dark and bright conditions (pH 1±0.5, chill temperature) and pH 4, pH 7 and pH 10 (dark, chill temperature). The storage stability study of anthocyanins pigment was carried out (every week) within a month. The pH-differential method was used to determine the total anthocyanins pigment by taking the absorbance reading at 520nm for pH 1.0 and 700nm for pH 4.5. The color readings of lightness, 'a' and 'b' values measured using colorimeter and the 'a' and 'b' values were converted into chroma and hue. Findings showed that extraction using ethanol acidified method produced the highest yield of anthocyanins pigment. Therefore, this method was applied for the rest of the experimental works. Storage at different temperatures showed no differences of anthocyanins pigment and lightness with chroma value was unstable at both temperatures. However, hue was maintained towards storage as red in color. Storage at different light exposures also resulted no differences for anthocyanins pigment and lightness property showed stability in dark condition. Chroma values for both light condition was maintained but hue more predominant as red color in bright condition. Meanwhile, anthocyanins pigment showed stability as stored at pH 4 with hue in red color. While, chroma for all pH storage was maintained through storage periods. Overall, anthocyanins pigment was stable for storage in acidic condition with full dark condition.

ABSTRAK

Bunga dari pokok Kacang Telang (*Clitoria ternatea*) telah diketahui mengandungi pigmen antosianin. Walaubagaimanapun, masih sedikit kajian yang dijalankan mengenai pigmen antosianin dalam bentuk cecair yang diektrak dari bunga Kacang Telang. Oleh itu, kajian ini dijalankan untuk menentukan kaedah pengekstrakan yang boleh menghasilkan kandungan pigmen antosianin yang paling tinggi dan untuk mengkaji ciri-ciri warna melalui penyimpanan pada keadaan berbeza (pH, suhu dan pendedahan cahaya). Tiga kaedah pengekstrakan digunakan untuk mengekstrak pigmen antosianin iaitu kaedah menggunakan pelarut etanol berasid, asid hidroklorik dan air suling. Sementara itu, untuk kajian kestabilan, jumlah pigmen antosianin yang paling tinggi akan disimpan dalam tujuh keadaan yang berbeza iaitu suhu 4 °C dan 27 °C (pH 1±0.5, gelap), keadaan gelap dan terang (pH 1±0.5, suhu sejuk), dan juga pada pH 4, pH 7 dan pH 10 (suhu sejuk, gelap). Kajian mengenai kestabilan ini dijalankan pada setiap minggu dalam jangkamasa sebulan. Kaedah pH-berbeza digunakan untuk menentukan jumlah pigmen antosianin dengan mengambil bacaan penyerapan pada 520nm untuk pH 1.0 dan 700nm untuk pH 4.5. Bacaan warna juga diambil iaitu nilai kecerahan, 'a' dan 'b' menggunakan colorimeter dan nilai 'a' dan 'b' ditukar kepada nilai chroma dan hue. Keputusan menunjukkan pengekstrakan menggunakan kaedah etanol berasid menghasilkan kandungan antosianin yang paling tinggi. Oleh itu, kaedah ini telah diaplikasikan untuk keseluruhan kajian. Penyimpanan pada suhu berbeza menunjukkan tiada perbezaan untuk pigmen antosianin dan kecerahan serta chroma tidak stabil pada suhu 4°C dan 27°C. Walaubagaimanapun, hue kekal sebagai warna merah. Penyimpanan pada pendedahan cahaya yang berbeza memberi keputusan yang sama untuk pigmen antosianin dan kecerahan stabil dalam keadaan gelap. Chroma untuk kedua-dua keadaan cahaya adalah kekal tetapi hue lebih berwarna merah dalam keadaan cerah. Sementara itu, pigmen antosianin adalah stabil apabila disimpan pada pH 4 dengan hue berwarna merah. Manakala, chroma untuk semua pH penyimpanan adalah kekal sepanjang tempoh penyimpanan. Keseluruhannya, pigmen antosianin adalah stabil untuk simpanan dalam keadaan berasid dan gelap.