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**Pendugaan Umur Simpan Granula Fikosianin Arthrospira platensis dengan Pengisi Maltodekstrin dan
Carboxymethyl Cellulose Menggunakan Metode Kadar Air Kritis**
M. Riski Ramadhana, Dr. R.A. Siti Ari Budhiyanti, S.T.P., M.P.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

INTISARI

PENDUGAAN UMUR SIMPAN GRANULA FIKOSIANIN *Arthrospira Platensis* DENGAN PENGISI MALTODEKSTRIN DAN *Carboxymethyl Cellulose* MENGGUNAKAN METODE KADAR AIR KRITIS

Penelitian ini bertujuan untuk mengetahui umur simpan granula fikosianin *Arthrospira platensis* dengan pengisi maltodekstrin dan *carboxymethyl cellulose* pada berbagai jenis kemasan menggunakan metode *Accelerated Shelf Life Testing* (ASLT) dengan pendekatan kadar air kritis. Granula dengan penambahan fikosianin dan tanpa fikosianin digunakan sebagai sampel. Penelitian dilakukan dengan beberapa tahapan meliputi penentuan kadar air awal, kadar air kritis, kadar air kesetimbangan, kemiringan kurva (*slope* b), dan perhitungan umur simpan produk pada berbagai kemasan yaitu tabung *polypropylene*, *standing pouch polypropylene*, dan *standing pouch aluminium foil*. Model isotermis sorpsi air terbaik adalah model Caurie. Parameter karakteristik kemasan terdiri atas permeabilitas uap air (k/x, g/m^2.hari.mmHg) pada kemasan tabung *polypropylene*, *standing pouch polypropylene*, dan *standing pouch aluminium foil* dengan nilai berturut-turut sebesar 0,0516; 0,1914; dan 0,0236. Selain itu, tekanan uap air (Po) sebesar 31,824 mmHg, sedangkan luas permukaan per padatan (A/Ws, m^2/g) sebesar 0,0409 pada kemasan tabung *polypropylene*; 0,0576 pada kemasan s*tanding pouch polypropylene*; dan 0,0600 pada kemasan *standing pouch aluminium foil*. Hasil penelitian menunjukkan nilai kadar air awal (Mi), kadar air kritis (Mc), kadar air kesetimbangan (Me), dan kemiringan kurva (*slope* b) pada granula fikosianin berturut-turut sebesar 2,10%; 5,07%; 10,31%; dan 17,242, sedangkan pada granula tanpa fikosianin sebesar 2,12%; 5,06%; 10,57%; dan 17,568. Umur simpan granula dalam kemasan tabung *polypropylene,* s*tanding pouch polypropylene*, dan *standing pouch aluminium foil* berturut-turut sebesar 176 hari, 33 hari, 257 hari pada granula fikosianin dan 168 hari, 32 hari, dan 250 hari pada granula tanpa fikosianin.

Kata kunci : umur simpan, granula fikosianin, *Arthrospira platensis*, *Accelerated Shelf Life Testing*, kadar air kritis

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ABSTRACT

ESTIMATION OF THE SHELF LIFE OF *Arthrospira platensis* PHYCOSIANIN GRANULES WITH MALTODEXTRIN AND CARBOXYMETHYL CELLULOSE AS FILLERS USING THE CRITICAL MOISTURE CONTENT METHOD

This study aims to determine the shelf life of *Arthrospira platensis* phycocyanin granules with maltodextrin and carboxymethyl cellulose fillers in various types of packaging using the Accelerated Shelf Life Testing (ASLT) method with a critical water content approach. Granules with and without added phycocyanin were used as samples. The study was conducted in several stages, including the determination of initial moisture content, critical moisture content, equilibrium moisture content, curve slope (slope b), and calculation of product shelf life in various packaging types, namely polypropylene tube, polypropylene standing pouch, and aluminium foil standing pouch. The best isothermal model for water sorption is the Caurie model. The characteristic parameters of the packaging consist of water vapor permeability (k/x, g/m^2.hari.mmHg) for polypropylene tube, polypropylene standing pouch, and aluminium foil standing pouch, with values of 0.0516, 0.1914, and 0.0236, respectively. In addition, the water vapor pressure (Po) was 31.824 mmHg, while the surface area per solid (A/Ws, m^2/g) was 0.0409 for polypropylene tube packaging; 0.0576 for polypropylene standing pouch packaging; and 0.0600 for aluminium foil standing pouch. The results of the study showed that the initial moisture content (Mi), critical moisture content (Mc), equilibrium moisture content (Me), and curve slope (slope b) for phycocyanin granules were 2.10%; 5.07%; 10.31%; and 17.242, while for granules without phycocyanin, they were 2.12%; 5.06%; 10.57%; and 17.568. The shelf life of the granules in polypropylene tube, polypropylene standing pouch, and aluminium foil standing pouch is 176 days, 33 days, and 257 days, respectively, for phycocyanin granules, and 168 days, 32 days, and 250 days for granules without phycocyanin.

Keywords: shelf life, phycocyanin granules, *Arthrospira platensis*, Accelerated Shelf Life Testing, critical moisture content