

Abstrak

FORMULASI GRANUL EKSTRAK ETANOL BUAH MENGGKUDU (*Morinda citrifolia*) DENGAN VARIASI LAKTOSA DAN MALTODEKSTRIN

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Latar Belakang: Buah mengkudu (*Morinda citrifolia*) mengandung banyak nutrisi, namun tidak banyak diminati masyarakat karena baunya yang tidak sedap. Ekstrak etanol buah mengkudu memiliki aktivitas antioksidan, antidiabetes, antihipertensi dan secara praktis ekstrak mengkudu dalam bentuk granul dapat mengurangi bau dari mengkudu. Penelitian ini bertujuan untuk memperoleh formula optimum granul ekstrak etanol buah mengkudu berdasarkan metode *simplex lattice design*.

Metodologi: Buah mengkudu diekstraksi dengan metode maserasi, kemudian dibuat dalam bentuk granul dengan kombinasi laktosa dan maltodekstrin. Optimasi formula dilakukan dengan metode *simplex lattice design*. Granul dibuat 8 formula dengan variasi laktosa dan maltodekstrin F1 (2187,5 : 2187,5), F2 (2187,5 : 2187,5), F3 (4375 : 0), F4 (0 : 4375), F5 (3281,25 : 1093,75), F6 (4375 : 0), F7 (1093,75 : 3281,25), F8 (0 : 4375) menggunakan metode granulasi basah. Respon uji meliputi organoleptik, kadar air, kecepatan alir, sudut diam, waktu larut, dan distribusi partikel. Penentuan formula optimum dilakukan dengan analisis persamaan dan *countour plot* setiap respon untuk mendapatkan nilai *desirability* tertinggi.

Hasil Penelitian: Hasil evaluasi granul pada uji organoleptik pada semua formula memiliki bentuk granul, warna coklat muda, bau khas mengkudu (lemah), serta rasa manis pada pengisi laktosa dan rasa kurang manis pada pengisi maltodekstrin. Semua formula granul memenuhi persyaratan dengan kadar air (< 5 %), kecepatan alir (4 - 10 g/detik), sudut diam (25° - 30°), waktu larut (< 5 menit), dan distribusi partikel > 0,025 cm. Variasi laktosa dan maltodekstrin tiap formula mempengaruhi kadar air, kecepatan alir, sudut diam, dan waktu larut secara signifikan. Hasil formula optimum yang didapatkan yaitu laktosa sebanyak 4375 mg dan maltodekstrin 0 mg, dengan nilai *desirability* 1,000. Formula tersebut mempunyai poin prediksi kadar air 2,799 %, kecepatan alir 12,14 gr/detik, sudut diam 25,408°, dan waktu larut 3,40 menit.

Kesimpulan: Komposisi laktosa dan maltodekstrin dalam formula memiliki pengaruh terhadap sifat fisik granul. Formula optimum granul yaitu formula dengan komposisi laktosa 4375 mg dan maltodekstrin 0 mg dengan sifat fisik yang memenuhi persyaratan dan dapat menjadi alternatif sediaan yang praktis untuk konsumsi buah mengkudu.

Kata Kunci: *Morinda citrifolia*., granul, laktosa, maltodekstrin, *simplex lattice design*.

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Abstract

FORMULATION GRANULE OF NONI FRUIT (*Morinda citrifolia*) ETHANOL EXTRACT WITH VARIATION LACTOSE AND MALTODEXTRIN

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Background: Noni fruit (*Morinda citrifolia*) contains many nutrients, but is not much in demand by the public because of its unpleasant smell. The ethanol extract of noni fruit has activities antioxidant, antidiabetic, antihypertensive, and practically noni extract in granules from can reduce the smell of noni. This study aims to obtain the optimum formula of noni fruit ethanol extract granules based on the *simplex lattice design* method.

Methodology: Noni fruit is extracted by maceration method, then it is made in the form of granules with a combination of lactose and maltodextrin. Formula optimization was carried out using the simplex lattice design method. Granules were made of 8 formulas with variations of lactose and maltodextrin F1 (2187,5 : 2187,5), F2 (2187,5 : 2187,5), F3 (4375 : 0), F4 (0 : 4375), F5 (3281,25 : 1093,75), F6 (4375 : 0), F7 (1093,75 : 3281,25), F8 (0 : 4375) using the wet granulation method. Test responses include organoleptic, moisture content, flow rate, angle of repose, dissolves time, and particle distribution. Determination of the optimum formula is carried out by analyzing equations and contour plots for each response to obtain the highest desirability value.

Research result: The results of the evaluation of granules in the organoleptic test for all formulas had a granule shape, light brown color, smell noni typical (weak), as well as the sweet taste of the lactose filler and the less sweet taste of the maltodkestrin filler. All granule formulas meet the requirements with water content (< 5%), flow rate (4 - 10 g/sec), angle of repose (25° - 30°), dissolves time (< 5 minutes), and particle distribution > 0.025 cm. Variations of lactose and maltodextrin for each formula significantly affect the water content, flow rate, angle of repose, and dissolves time. The optimum formula results obtained were 4375 mg of lactose and 0 mg of maltodextrin, with a desirability value of 1,000. The formula optimum has a predicted water content of 2.799%, flow rate of 12.14 g/sec, angle of repose of 25.408°, and dissolves time of 3.40 minutes.

Conclusion: The composition of lactose and maltodextrin in the formula has an influence on the physical properties of the granules. The optimum granule formula is a formula with a composition of 4375 mg lactose and 0 mg maltodextrin with physical properties that meet the requirements and can be alternative preparation for consumption of noni fruit.

Keywords: *Morinda citrifolia*., granule, lactose, maltodextrin, *simplex lattice design*.

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