INTISARI

Berdasarkan desain faktorial dengan 2 faktor (Avicel PH 101 dan Starch1500) dan 2 level (level rendah dan level tinggi) maka untuk pembuatan granul ekstrak kental bengle, pada penelitian ini digunakan 4 formula yaitu : formula (1) menggunakan Avicel PH 101 dan Starch 1500 masing-masing pada level rendah, formula (a) menggunakan Avicel PH 101 pada level tinggi dan Starch 1500 pada level rendah, formula (b) menggunakan Avicel PH 101 pada level rendah dan Starch 1500 pada level tinggi, formula (ab) menggunakan Avicel PH 101 dan Starch 1500 masing-masing pada level tinggi. Level rendah dan level tinggi untuk Starch 1500 dan Avicel PH 101 berturut-turut adalah 50% dan 150% dari berat ekstrak kental rimpang bengle. Berat ekstrak kental bengle tiap tablet adalah 250 mg. Granul dari keempat formula tersebut diuji sifat fisiknya meliputi densitas, waktu alir, kapasitas penyerapan air, kadar air, dan kompaktibilitasnya. Berdasarkan desain faktorial, digunakan persamaan $Y = Bo + B_1(X_1) + B_2(X_2) + B_{12}(X_1)(X_2)$. Dimana, Bo, B_1, B_2, B_{12}, dapat dihitung dari data hasil uji sifat fisik granul.

Dari persamaan tersebut dapat diperoleh *contour plot*, sehingga dapat diketahui komposisi campuran Avicel PH 101-Starch 1500 untuk mendapatkan respon dengan nilai tertentu agar dihasilkan granul dan tablet yang memenuhi persyaratan. Metode desain faktorial juga dapat digunakan untuk mengetahui besarnya efek masing-masing eksipien dan interaksinya terhadap sifat fisik granul. Penelitian ini juga menggunakan analisis *Univariate Analysis of Variance* untuk mengetahui eksipien dan interaksi yang berpengaruh secara bermakana terhadap sifat fisik granul. Formula terpilih adalah formula dengan komposisi Avicel PH 101, 150% berat ekstrak kental bengle dan Starch 1500, 50% berat ekstrak kental bengle berat ekstrak kental bengle. Tablet formula terpilih diuji keseragaman bobot, kekerasan, kerapuhan, dan waktu hancur.

Hasil penelitian menunjukkan besarnya efek tiap eksipien dan interaksinya berbeda-beda. Starch 1500 berpengaruh dominan terhadap densitas massa, kadar air dan waktu alir granul, Avicel PH 101 berpengaruh dominan terhadap kapasitas penyerapan air dan kompaktibilitas granul, interaksi Starch 1500-Avicel PH 101 tidak berpengaruh dominan terhadap sifat fisik granul. Tablet dengan formula terpilih memenuhi persyaratan tablet yaitu bobotnya seragam, kekerasan rata-rata 4,42 kg, kerapuhan rata-rata 0,23%, waktu hancur rata-rata 1,23 menit.

ABSTRACT

Based on the factorial design with 2 factors (Starch 1500 and Avicel PH 101) and two levels (low level and high level), to produce bengle extract granules it was needed 4 formulas, i.e: formula (1) using Avicel PH 101 and Starch 1500, each at low level, formula (a) using Avicel PH 101 at high level and Starch 1500 at low level, formula (b) using Avicel PH 101 at low level and Starch 1500 at high level, formula (ab) using Avicel PH 101 and Starch 1500, each at high level. Low level and high level of Avicel PH 101 and Starch 1500 are 50% and 150% of the bengle rhizome weight extract respectively. The weight of bengle extract in each tablet was 250 mg. The physical character of the granules i.e : the bulk density, flowability, water absorption capacity, water content, and compactibility were examined. Based on factorial design equations $Y = Bo + B_1 (X_1) + B_2 (X_2) + B_{12} (X_1) (X_2)$, where Bo, B_1, B_2, B_{12} can be calculated using the data of granules physical character were determined.

From the equations, contour plot will be obtained, by which the composition of Avicel PH 101-Starch 1500 mix will be found out to get response with certain value of physical characters of the granules. These granules were tableted and fulfilled the tablet requirements. Factorial design method can also be applied to find out the dominant efect of each excipient and its interaction of the granules physical characters. Univariate Analysis of Variance was applied to find out excipient, and their interaction that significantly influenced the granules physical characters. The chosen formula was the formula with the composition of Avicel PH 101 150% of bengle extract weight and Starch 1500 50% of bengle extract weight. Tablets used this formula were examined their weight uniformity, hardness, friability, and disintegration time.

The results indicated that the effect of each excipient and its interaction were varies. Starch 1500 dominantly influenced the bulk density, water content, and flowability of the granules. Avicel PH 101 dominantly influenced the water absorption capacity, and compactibility of the granules. The interaction of Avicel PH 101-Starch 1500 did not dominantly influence granule physical characters. Tablets of the chosen formula fulfilled the tablet requirements, i.e weight uniformity, hardness (4,42 kg), friability (0,234%), and disintegration time (1,23 minutes).