PERBEDAAN PROFIL DISOLUSI KURKUMIN DALAM SISTEM DISPERSI PADAT EKSTRAK KUNYIT (Curcuma longa L.) DENGAN VARIASI RASIO HYDROXYPROPYLMETHYL CELLULOSE (HPMC)/ POLYVINYLPYRROLIDONE K30 (PVP K30)

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ABSTRAK

Kunyit (*Curcuma longa L.*) mengandung kurkumin yang bermanfaat sebagai antiinfamasi dan antibakteri. Kurkumin termasuk dalam obat BCS kelas II yang memiliki kelarutan rendah di dalam air namun memiliki permeabilitas yang tinggi, sehingga timbul masalah dalam bioavailabilitas oral obat karena kelarutan yang rendah dapat menyebabkan absorpsi yang rendah. Salah satu upaya agar disolusi obat meningkat dan menghasilkan bioavailabilitas oral yang tinggi yaitu dengan metode dispersi padat.

Tujuan dari penelitian ini adalah mengetahui perbedaan profil disolusi kurkumin dalam dispersi padat ekstrak kunyit dengan variasi rasio *Hydroxypropylmethyl Cellulose* (HPMC)/*Polivinil Pirolidon K30* (PVP K30) dibandingkan dengan campuran fisik. Dispersi padat kurkumin/HPMC/PVP K30 dibuat dengan metode *spray drying* dengan *drug load* 30%. Parameter yang diukur yaitu *drug load,* kelarutan dan disolusi. Analisis sampel ditetapkan dengan menggunakan spektrofotometer visibel.

Hasil penelitian menunjukkan bahwa dispersi padat terner kurkumin/HPMC/PVP K30 dapat memberikan perbedaan profil disolusi berupa peningkatan disolusi kurkumin dibandingkan dengan campuran fisik. Selain itu juga terdapat perbedaan nilai *dissolution efficiency* $(DE)_{180}$ antar rasio dispersi padat ($p<0,05$). Dispersi padat dengan rasio 1:2 memberikan hasil peningkatan kelarutan 12,1 kali dibanding campuran fisik dan hasil *dissolution efficiency* (DE) paling tinggi yaitu sebesar 58,89% $\pm$ 0,28%.

Kata kunci: kurkumin, HPMC, PVP K30, disolusi, dispersi padat, *spray drying*.

THE DIFFERENCES OF CURCUMIN DISSOLUTION PROFILE IN TUMERIC EXTRACT (*Curcuma longa L.*) SOLID DISPERSION SYSTEM WITH VARIANCE OF *HYDROXYPROPYLMETHYL CELLULOSE (HPMC)/POLYVINYLPYRROLIDONE K30* (PVP K30) RATIOS

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ABSTRACT

Turmeric (*Curcuma longa* L.) contains curcumin which is useful as anti-inflammatory and anti-bacterial. Curcumin belongs to BCS II, which has a very low solubility in hydrophilic medium but has a high permeability. So there is a problem in oral bioavailability of the drug, because low solubility cause low absorption. Solid dispersion is one of the methods to increase curcumin dissolution and produce high oral bioavailability.

The purpose of this research is to know the difference of curcumin dissolution profile in solid dispersion of turmeric extract with variation ratios of *Hydroxypropylmethyl Cellulose* (HPMC)/*Polivinil Pirolidon K30* (PVP K30) compared with physical mixture. The solid dispersion of curcumin/HPMC/PVP K30 was prepared by spray drying method with 30% *drug load*. In this study the parameters measured were *drug load*, solubility and dissolution. The sample analysis was determined by visible-spectrophotometer.

The results showed that the dissolution rate of the solid dispersion by HPMC/PVP K30 is much higher than the dissolution rate of the physical mixture by HPMC/PVP K30. There was also a difference in the value of solubility test and dissolution efficiency $(DE)_{180}$ between solid dispersion ratio (p <0.05). Solid dispersion with 1:2 ratios gives the increase in solubility was 12,1 fold compared with physical mixture and the highest dissolution efficiency (DE) which is $58,89\% \pm 0,28\%$.

Keywords: curcumin, HPMC, PVP K30, dissolution, solid dispersion, spray drying