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## **FORMULASI DAN UJI AKTIVITAS ANTIOKSIDAN EMULGEL SERBUK SARI JAHE MERAH (*Zingiber officinale* Rosc var Rubrum)**

### **ABSTRAK**

**Latar Belakang:** Kulit dapat secara langsung terpapar oleh radikal bebas, sehingga perlu penambahan antioksidan. Tanaman yang memiliki aktivitas antioksidan salah satunya adalah rimpang jahe merah. Jahe merah dapat dibuat sediaan emulgel. Tujuan dari penelitian ini adalah untuk melakukan formulasi dan uji aktivitas antioksidan emulgel serbuk sari jahe merah.

**Metode:** Metode *freeze drying* digunakan pada pembuatan serbuk sari jahe merah. Evaluasi mutu fisik sediaan emulgel meliputi organoleptis, pH, homogenitas, tipe emulsi, daya sebar, daya lekat, dan viskositas. Aktivitas antioksidan diuji menggunakan metode DPPH dengan parameter nilai  $IC_{50}$ . Analisis data menggunakan statistik.

**Hasil:** Evaluasi mutu fisik sediaan emulgel serbuk sari jahe merah menghasilkan nilai pH basis ( $6,22 \pm 0,04$ ), F1 ( $6,18 \pm 0,09$ ), F2 ( $6,24 \pm 0,18$ ), F3 ( $6,12 \pm 0,04$ ). Sediaan emulgel homogen dan tipe emulsi O/W. Daya sebar basis ( $3,43 \pm 0,15$ cm), F1 ( $3,67 \pm 0,46$ cm), F2 ( $3,73 \pm 0,15$ cm), F3 ( $3,83 \pm 0,29$ cm). Daya lekat basis ( $1,80 \pm 0,13$ detik), F1 ( $1,38 \pm 0,29$ detik), F2 ( $1,44 \pm 0,42$ detik), F3 ( $1,81 \pm 0,34$ detik). Viskositas basis ( $2.584 \pm 651,362$ cps), F1 ( $3.024 \pm 377,762$ cps), F2 ( $3.245 \pm 514,955$ cps), F3 ( $3.562 \pm 252,024$ cps). Nilai  $IC_{50}$  serbuk sari jahe merah yaitu  $14,09 \pm 3,11$ ppm F1 ( $35,08 \pm 1,34$ ppm), F2 ( $32,91 \pm 1,32$ ppm), dan F3 ( $26,53 \pm 2,32$ ppm). Evaluasi mutu fisik menghasilkan data tidak berbeda tetapi nilai  $IC_{50}$  berbeda.

**Kesimpulan:** Sediaan emulgel serbuk sari jahe merah memiliki tipe emulsi O/W, pH, homogenitas, daya lekat, dan viskositas memenuhi syarat sedangkan daya sebar belum memenuhi syarat. Serbuk sari jahe merah, F1, F2, dan F3 memiliki nilai  $IC_{50}$  berturut-turut sebesar  $14,09 \pm 3,11$ ppm;  $35,08 \pm 1,34$ ppm;  $32,91 \pm 1,32$ ppm; dan  $26,53 \pm 2,32$ ppm. Konsentrasi serbuk sari jahe merah berpengaruh terhadap organoleptis, daya sebar, dan nilai  $IC_{50}$ , tetapi tidak berpengaruh terhadap pH, homogenitas, tipe emulsi, daya lekat, viskositas.

**Kata Kunci:** Pengeringan beku, Serbuk sari, Jahe Merah, Emulgel, Antioksidan

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## **FORMULATING AND TESTING OF ANTIOXIDANT ACTIVITY OF EMULGEL RED GINGER POWDER (*Zingiber officinale* Rosc var Rubrum)**

### **ABSTRACT**

**Background:** The skin can be directly exposed to free radicals, so it needs additional antioxidants. One of the plants that has antioxidant activity is red ginger rhizome. Red ginger can be made into an emulgel preparation. The aim of this research was to formulate and test the antioxidant activity of red ginger pollen emulgel.

**Methods:** The freeze drying method is used to make red ginger pollen. Evaluation of the physical quality of emulgel preparations includes organoleptic, pH, homogeneity, emulsion type, spreadability, stickiness and viscosity. Antioxidant activity was tested using the DPPH method with the IC<sub>50</sub> value parameter. Data analysis using statistics.

**Results:** Evaluation of the physical quality of red ginger pollen emulgel preparations resulted in basic pH values (6,22 ± 0,04), F1 (6,18 ± 0,09), F2 (6,24 ± 0,18), F3 (6,12 ± 0,04). Homogeneous emulgel preparation and O/W emulsion type. Base spreadability (3,43±0.15cm), F1 (3,67±0,46cm), F2 (3,73±0,15cm), F3 (3,83±0,29cm). Base adhesion power (1,80 ± 0,13 seconds), F1 (1,38 ± 0,29 seconds), F2 (1,44 ± 0,42 seconds), F3 (1,81 ± 0,34 seconds). Base viscosity (2.584±651,362cps), F1 (3.024±377,762cps), F2 (3.245±514,955cps), F3 (3,562±252,024cps). The IC<sub>50</sub> value of red ginger pollen is 14,09 ± 3,11 ppm F1 (35,08 ± 1,34 ppm), F2 (32,91 ± 1,32 ppm), F3 (26,53 ± 2,32 ppm). Physical quality evaluation produces no different data but the IC<sub>50</sub> value is different.

**Conclusion:** The red ginger pollen emulgel preparation has an O/W emulsion type, pH, homogeneity, adhesive power and viscosity meet the requirements while the spreadability does not meet the requirements. Red ginger pollen, F1, F2, and F3 had IC<sub>50</sub> values of 14,09±3,11ppm respectively; 35,08±1,34ppm; 32,91±1,32ppm; and 26,53±2,32ppm. The concentration of red ginger pollen affects organoleptics, spreadability, and IC<sub>50</sub> value, but does not affect pH, homogeneity, emulsion type, stickiness, viscosity.

**Keywords:** Freeze drying, Pollen, Red Ginger, Emulgel, Antioxidant.