# INTISARI

Kulit merupakan salah satu bagian tubuh yang secara langsung memperlihatkan terjadinya proses penuaan. Semakin banyaknya polusi dan radikal bebas di lingkungan merupakan salah satu penyebab penuaan. Upaya untuk mengurangi kerusakan kulit dari paparan radikal bebas adalah dengan menggunakan sediaan topikal atau mengkonsumsi makanan dan suplemen yang mengandung antioksidan. Buah naga merah (*Hylocereus polyrhizus*) dan wortel (*Daucus carota* L.) diketahui mengandung senyawa fenolik, karotenoid, flavonoid, antosianin, vitamin C dan E yang memiliki aktivitas antioksidan yang cukup tinggi. Penelitian ini bertujuan untuk menguji aktivitas antioksidan dan efek sitoprotektif dari ekstrak etanolik buah naga merah dan wortel, serta pengukuran kandungan fenolik dan flavonoid totalnya.

Sampel buah naga merah dan wortel dimaserasi menggunakan etanol 70 % selama 7 hari. Maserat dievaporasi sehingga didapatkan ekstrak kental. Kedua ekstrak kental tersebut kemudian diuji aktivitas antioksidannya dengan metode *β-carotene bleaching* (BCB) dan C*upric ion Reducing Antioxidant Capacity* (CUPRAC). Selanjutnya ekstrak diuji efek sitoprotektif terhadap sel primer fibroblas dari paparan hidrogen peroksida secara *in-vitro* dengan metode MTT *assay*. Kemudian ekstrak akan dilakukan pengukuran kandungan fenolik dan flavonoid total serta dianalisis korelasi antara kandungan fenolik dan flavonoid total terhadap aktivitas antioksidan dan efek sitoprotektif.

Aktivitas antioksidan ekstrak buah naga merah dengan metode CUPRAC sebesar 0,60 ± 0,03 µmol EK/g bahan segar dan 3,16 ± 0,14 µmol EAT/g bahan segar, sedangkan ekstrak wortel sebesar 1,14 ± 0,02 µmol EK/g bahan segar dan 5,99 ± 0,12 µmol EAT/g bahan segar. Aktivitas antioksidan ekstrak buah naga merah dan wortel dengan metode BCB memiliki $IC_{50}$ 1362,51 ± 92,58 µg/mL dan 954,89 ± 52,17 µg/mL. Pada uji sitoprotektif, ekstrak buah naga merah dengan konsentrasi 150 µg/mL dan ekstrak wortel konsentrasi 200 µg/mL, belum mampu melindungi sel dari paparan radikal bebas $H_2O_2$. Kandungan fenolik total ekstrak buah naga merah dan wortel sebesar 31,51 ± 0,43 dan 76,97 ± 2,32 mg EAG/100 g bahan segar. Kandungan flavonoid total ekstrak buah naga merah dan wortel sebesar 0,75 ± 0,01 dan 1,74 ± 0,07 mg EK/100 g bahan segar.

Kata kunci: **Buah naga merah, wortel, antioksidan, sitoprotektif**

# ABSTRACT

Skin is a part of body which can directly reflected of aging process on human being. It was believed that pollution exposure and the existence of free radicals in environment have corelation with aging process occurred. There are several ways to reduce skin damage from free radicals exposure, for example by avoiding excessive sun exposure, use sunsblocks or topical medications that contain antioxidants, as well as consuming a antioxidant contained in food or supplement. Red dragon fruit (*Hylocereus polyrhizus*) and carrot (*Daucus carota* L.) has been known composed of phenolic compounds such as carotenoid, flavonoid, anthocyanin, ascorbic acid and tocopherol which are antioxidants. This research was aimed to investigate antioxidant activity and cytoprotective effect of extract of red dragon fruit and carrot as well as to investigate its phenolic and total flavonoid content.

In this research red dragon fruit and carrot sample were macerated using ethanol 70% during 7 days. The macerate was evaporated to produce an viscously extract. The viscous extract were investigated antioxidant activity using β-carotene bleaching (BCB) and Cupric ion Reducing Antioxidant Capacity (CUPRAC) respectively. Then, the extracts were investigated for cytoprotective effect in vitro on fibroblast primary cell which has been exposurred previously by hydrogen peroxide using MTT assay method. Phenolic and flavonoid content were measured, and correlation between phenolic and flavonoid content on antioxidant activity and cytoprotective effect were also investigated.

Antioxidant activity of red dragon fruit extract with CUPRAC method were have 0,60 ± 0,03 µmol EQ/g fresh weight (fw) and 3,16 ± 0,14 µmol EAT/g fw, while the carrot extract were have 1,14 ± 0,02 µmol EQ/g fw. and 5,99 ± 0,12 µmol EAT/g fw. Antioxidant activity of red dragon fruit and carrot extracts were have $IC_{50}$ 1362,51 ± 92,58 µg/mL and 954,89 ± 52,17 µg/mL using BCB method. It was also found that ethanolic extract of red dragon fruit with the greatest concentration 150 and ethanolic extract of carrot at a concentration 200 µg/mL, was has not been able to protect cells from $H_2O_2$ exposure. Total phenolic content of red dragon fruit and carrot extract were of 31,51 ± 0,43 and 76,97 ± 2,32 mg GAE/100 g fw respectively. Total flavonoid content of red dragon fruit and carrot extract was of 0,75 ± 0,01 dan 1,74 ± 0,07 mg QE/100 g fw.

**Keywords: Red dragon fruit, carrot, antioxidant, cytoprotective**