

INTISARI

Latar Belakang: Diabetes Melitus (DM) menyebabkan komplikasi luka kronis akibat gangguan penyembuhan luka pada berbagai fase. Hiperglikemia memberikan efek buruk pada sel termasuk fibroblas melalui stres oksidatif dan pembentukan ROS. Studi terdahulu menunjukkan pemberian antioksidan (AO) dapat mengembalikan efek buruk tersebut. Sirsak (*Annona muricata* L.) merupakan tanaman obat tradisional dengan aktivitas antiinflamasi, antihiperglikemia, serta AO poten melalui kandungan metabolit sekundernya terutama senyawa fenolik dan flavonoid, sehingga Ekstrak daun sirsak (EDS) memiliki potensi dalam penyembuhan luka.

Tujuan: Menguji pengaruh pemberian EDS terhadap model sel fibroblas manusia yang berada dibawah pengaruh hiperglikemia secara *in vitro* yang diukur dengan uji proliferasi dan sintesis kolagen fibroblas dalam medium glukosa tinggi.

Metode: Studi ini merupakan penelitian eksperimental dengan subyek fibroblas manusia jaringan preputium. Sel diinkubasi dalam medium glukosa tinggi (FMGT) dan normal (FMGN) sebagai kontrol. Pada uji MTT pengaruh EDS dalam 10 konsentrasi (0,019% - 10%) diuji untuk menilai efek terhadap proliferasi sel. Lima konsentrasi optimal digunakan sebagai intervensi untuk menilai deposisi kolagen dengan *Sirius Red Collagen Assay* (SCA). Analisis statistik dilakukan untuk melihat perbedaan antara kelompok perlakuan dan kontrol.

Hasil: Penurunan signifikan proliferasi serta deposisi kolagen tampak pada hari ke-7 (MTT) serta hari ke-5 dan -7 (SCA). Uji MTT h-7 menunjukkan EDS konsentrasi 0,156%, 0,078%, 0,039%, dan 0,019% meningkatkan indeks proliferasi diatas 100% dengan signifikansi statistik pada 3 konsentrasi terendah. Uji SCA hari ke-5 dan -7 menunjukkan peningkatan indeks deposisi kolagen yang signifikan pada EDS 0,078%, 0,039%, dan 0,019% ($p < 0.05$).

Kesimpulan: EDS (*Annona muricata* L.) memiliki efek meningkatkan proliferasi fibroblas dan deposisi kolagen dalam medium glukosa tinggi *in vitro*

Kata Kunci: proliferasi fibroblas, sintesis kolagen, ekstrak daun sirsak, *Annona muricata* L., *Fibroblas Medium Glukosa Tinggi*

ABSTRACT

Diabetes Mellitus (DM) causes severe complications including chronic wound or ulcerations due to disruptions of normal wound healing phases. DM is characterized by hyperglycemia and its deleterious related effect to various cells including fibroblasts, possibly via oxidative stress and ROS generations. Previous studies showed the benefits of exogenous antioxidant (AO) in reversing such unwanted effects. Sirsak or soursop is a popular folk medicinal plants (*Annona muricata* L.) with some known pharmacological activities such as antiinflammation, antihyperglycemic, and AO which are attributed to its secondary metabolites content especially phenolics and flavonoid compounds, hence gaining our interest to prove its prospect and efficacy for wound healing under a scientific manner.

We conducted an *in vitro* experimental research using human preputium primary culture fibroblasts. Cells were incubated in high glucose (HG, 25 mM) and normal glucose (NGF, 5 mM) medium and tested against each other as controls. The MTT assays were conducted to test the effect of interventions *Annona muricata* leaves extract (AMLE) in 10 different concentrations (0,019% - 10%) to cell proliferation. Five best concentrations were used to determined the collagen deposition effect by *Sirius Red Collagen Assay* (SCA). Statistical analyses were conducted to tests the significances between interventional and control groups.

Significant suppression of proliferation and collagen deposition were seen on 7th day (MTT) and 5th and 7th day (SCA). MTT assay on 7th day showed significant increases of proliferation index compared with HGF control in 4 concentrations (0,156%, 0,078%, 0,039%, dan 0,019%). During SCA, the last 3 lowest concentrations showed significant increase in collagen deposition against HGF and NGF control on both 5th and 7th day ($p < 0.05$).

In conclusion, *Annona muricata* leaves extract has the potency to increase fibroblasts proliferation and collagen deposition in high glucose medium based on *in vitro* study.

Keywords: *Soursop, Annona muricata leaves ethanol extract, fibroblasts proliferation, collagen deposition, wound healing, high glucose*