

Wound healing potential of *Spirulina platensis* extracts on human dermal fibroblast cells

ABSTRACT

Blue-green alga (*Spirulina platensis*) is a well renowned nutri-supplement due to its high nutritional and medicinal properties. The aim of this study was to examine the wound healing efficiency of *Spirulina platensis* at various solvent extracts using in vitro scratch assay on human dermal fibroblast cells (HDF). Various gradient solvent extracts (50 µg/ml of methanolic, ethanolic and aqueous extracts) from *Spirulina platensis* were treated on HDF cells to acquire its wound healing properties through scratch assay and in this investigation we have used allantoin, as a positive control to compare efficacy among the phytoextracts. Interestingly, aqueous extract were found to stimulate proliferation and migration of HDF cells at given concentrations and enhanced closure rate of wound area within 24 hours after treatment. Methanolic and ethanolic extracts have shown proliferative effect, however these extracts did not aid in the migration and closure of wound area when compared to aqueous extract. Based on phytochemical profile of the plant extracts analyzed by LC-MS/MS, it was shown that compounds supposedly involved in accelerating wound healing are cinnamic acid, narigenin, kaempferol, temsirolimus, phosphatidylserine isomeric derivatives and sulphoquinovosyl diacylglycerol. Our findings concluded that blue-green algae may pose potential biomedical application to treat various chronic wounds especially in diabetes mellitus patients.

Keyword: *Spirulina platensis*; Wound healing activity; Aqueous extract; LC-MS/MS; Wound scratch assay