

# **Evaluation of tilapia fish (*Oreochromis niloticus*) skin collagen hydrogel potential as burn wound healing agent**

## **ABSTRACT**

Tilapia collagen consists of a complex structural protein that possesses biomaterial to accelerate wound healing activity. The aim of this study is to evaluate the potential effects of *Oreochromis niloticus* collagen hydrogel, as a burn wound healing agent. Collagen hydrogel of concentrations 0.05 mg/ml and 0.1 mg/ml were prepared via acid soluble collagen extraction and crosslinked with Carboxymethylcellulose. Sprague Dawley rats were used as test subjects and were grouped into negative control (with normal saline), positive control (using 1% silver sulfadiazine cream), two treatment groups (using 0.05 mg/ml and 0.1 mg/ml collagen hydrogel) and a normal group. A second degree burn wound was induced on the rats by using an electrical heater (at 100 °C), and collagen hydrogel of both concentrations were given daily for 14 days. The wound size, gross and histopathological changes were recorded. The burn wound treated with the collagen hydrogel of both concentrations had shown a decrease in size with an average diameter of 4 cm on day 0, and 2 cm at day 14, which was significant with  $p < 0.05$ . The gross examination showed a decrease in diameter of the wound from day 0 to day 14. Histopathology result showed an increase of fibroblast presence, regeneration of hair follicles and sebaceous glands, decrease in inflammatory cells, increase in blood vessels, and restored epidermis layer on the 14th day of the treatment groups compared to the 14th day of the positive control. As a conclusion, the collagen hydrogel extracted from the skin of *O. niloticus* had displayed its potential as a burn healing agent, primarily by reducing inflammation and facilitating rapid proliferation of fibroblast.