The Effects of Turmeric and Bovine Collagen on the Regeneration of Dugesia dorotocephala

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Infection, inflammation, and other factors that inhibit tissue regeneration pose a major challenge in medicine. However, research on increasing regeneration capabilities, particularly in the model organism of planaria, has the potential to resolve such medical concerns. In this project, Dugesia dorotocephala was exposed to different concentrations of turmeric (a natural antibacterial and antioxidant) and bovine collagen (a structural protein) after injury induction to determine the effects of the two compounds on regeneration. It was hypothesized that both collagen and turmeric would increase regeneration rates, with the highest turmeric levels being the most effective. 28 planaria were decapitated below the eyespots and randomly assigned a treatment type of 0.6g/L, 0.4g/L, or 0.2g/L of turmeric or collagen solutions. Poland Spring water was used as the control. Four planaria were exposed to each treatment type during each of two 9-day trials. Images under 4X magnification using a dissecting microscope were taken and tissue areas were measured using ImageJ. Modest increases in tissue area were observed in samples treated with 0.2g/L collagen and turmeric solutions. Statistical analysis revealed that planaria treated with 0.4g/L turmeric concentrations had significantly lower regeneration than the controls ($p<0.05$), while 0.6g/L concentrations of turmeric and collagen were lethal. Therefore, the hypothesis was rejected, although the goal of determining impacts of the two compounds was reached. Turmeric inhibited immediate regeneration while collagen resulted in slower regeneration overall. Additional research must be conducted with larger sample sizes and combinations of both collagen and turmeric for maximum regeneration and significance in results.

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