Aktivitas Ekstrak Daun Pegagan (*Centella asiatica* L. Urb) Terhadap Regenerasi Sirip Kaudal Ikan Zebra Berdasar Pengamatan Ekspresi *col1a2* (*collagen type 1 alpha 2*)

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INTISARI

Luka adalah rusaknya jaringan tubuh yang akan mengalami perbaikan melalui proses penyembuhan luka. Daun pegagan dipercaya sebagai tanaman penyembuh luka, karena mengandung senyawa asiatikosida golongan triterpenoid yang berperan memacu produksi kolagen tipe I melalui *col1a2*. Salah satu model pengujian luka dan ekspresi gen dapat menggunakan sirip kaudal ikan zebra. Penelitian ini bertujuan untuk mengetahui pengaruh ekstrak daun pegagan (EDP) terhadap regenerasi sirip kaudal ikan zebra berdasarkan pengamatan ekspresi *col1a2* . Daun pegagan diekstraksi dengan metode maserasi yaitu menggunakan pelarut etanol 96% kemudian dilakukan identifikasi golongan senyawa melalui tabung reaksi dengan perubahan warna. Ikan zebra terbagi menjadi 3 kelompok (n = 50 ekor/kelompok) yaitu kontrol normal dan 2 perlakuan (EDP dosis 2,5 dan 5 ppm). Pengamatan sirip kaudal dilakukan sebelum dan sesudah amputasi, serta hari ke-5 menggunakan mikroskop stereo dan dilanjutkan dengan pengambilan blastema untuk pengamatan ekspresi *col1a2* dengan RT-PCR. Persentase regenerasi sirip kaudal dan nilai ekspresi *col1a2* dianalisis secara statistik dengan uji *one way ANOVA* ($p < 0,05$) dan uji *Post Hoc* Tukey HSD ($p < 0,05$). EDP mengandung alkaloid, flavonoid, saponin, steroid, tanin, dan terpenoid. Rerata persentase regenerasi pada kontrol normal, EDP dosis 2,5 ppm, dan EDP dosis 5 ppm sebesar 26.55%; 32.22%; 41.46%. Nilai rerata ekspresi *col1a2* sebesar 2.03; 1.20; 40.70. Hasil analisis statistik diperoleh regenerasi sirip kaudal pada dosis 5 ppm berbeda signifikan ($p < 0,05$) dibandingkan kelompok uji lain. Ekspresi *col1a2* pada EDP dosis 2,5 ppm dan 5 ppm terdapat perbedaan namun tidak berbeda signifikan ($p>0,05$). EDP dosis 5 ppm terbukti berpengaruh dalam meningkatkan kemampuan regenerasi sirip kaudal ikan zebra yang sebanding dengan peningkatan ekspresi *col1a2* yang menggambarkan mekanisme penyembuhan luka.

Kata kunci: Daun pegagan, *Centella asiatica,* ikan zebra, sirip kaudal, regenerasi, *col1a2*

The Activity of Pegagan Leaf Extract (*Centella asiatica* L. Urb) against Zebra Fish Caudal Fin Regeneration Based on The Observation of *col1a2 (collagen type 1 alpha 2)* Expression

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ABSTRACT

The wound is a damaged of body tissue that will recover through a wound-healing process. The pegagan leaf are believed as wound healing plants, due to asiaticoside triterpenoid compound that stimulate the type I collagen production via *col1a2* expression. The zebra fish caudal fin can be used as a wound healing model and its gene expression. This study aimed to understand the effect of pegagan leaf extract (PLE) against caudal fin regeneration of zebra fish based on the observation of the *col1a2* expression. Pegagan leaf was extracted by maceration method by using 98% ethanol was identified compounds through a test tube by discoloration. Zebra fish were divided into 3 groups (n = 50 fishes/group) namely normal control and 2 treatments (PLE dose 2,5 and 5 ppm). Caudal fins were observed before and after amputation, and the day 5 post amputation using stereo microscope and the blastema was collected to observe *col1a2* expression by RT-PCR. The percentage of the caudal fin regeneration and the value of the *col1a2* expression was statistically analysed by one way ANOVA test ($p < 0.05$) and a post-hoc Tukey HSD test ($p < 0.05$). PLE contained alkaloid, flavonoid, saponin, steroids, tannin, and terpenoid. The average regeneration value of caudal fin for normal control, PLE 2.5 ppm, and 5 ppm were 26.55%; 32.22%; 41.46% respectively. Value of average *col1a2* expression were 2.03; 1.20; 40.70 consecutively. The statistical analysis on the regeneration of caudal fins of zebra fish at PLE 5 ppm was significantly different ($p<0.05$) than other test groups. There were no significant differences ($p<0.05$) between PLE 2.5 and 5 ppm for the gene expression. PLE 5 ppm possessed the ability of zebra fish caudal fin regeneration in conjunction to the increasing of *col1a2* expression that strongly correlated with the wound healing mechanism.

Keyword: Pegagan leaf, *Centella asiatica*, zebra fish, caudal fin, regeneration, *col1a2*