

## **Alteration in morphological features of *Puntius javanicus* liver exposed to copper sulfate**

### **ABSTRACT**

The environmental toxicants such as copper are known to affect vital organ especially liver. This study examined the effects of copper sulfate ( $\text{CuSO}_4$ ) on the liver morphological structure of *P. javanicus*. The untreated control, 0.1 and 0.3 mg/L  $\text{CuSO}_4$  treated groups displayed normal polygonal structure of the hepatocyte. However, at the concentrations of 0.5, 1.0 and 5.0 mg/L  $\text{CuSO}_4$ , the hepatostructure was significantly affected, as shown by the increasing number of dilation and congestion of sinusoids, vacuolation, macrophage activities and peliosis. The damage level and HSI value were increased while the number of hepatic nuclei per  $\text{mm}^2$  was decreased with the increasing of copper concentration. In conclusion, this study shows that the degree of liver damage in *P. javanicus* is dependent to the dose exposure.