

# ANTIOXIDATIVE SYSTEMS DEFENSE AGAINST OXIDATIVE STRESS INDUCED BY BLOOD MEAL IN *Aedes Aegypti*

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**Abstract.** The release of iron from hemoglobin via the digestion of a blood meal in female mosquitoes can potentially induce oxidative damage and even death. These mosquitoes need an effective antioxidant to prevent this. We carried out this study to determine the antioxidant activities of ferritin, glutathione peroxidase (GPx), glutathione S-transferase (GST) and catalase, and glutathione (GSH). These enzymes had their greatest activity among 4 day old virgin female mosquitoes. Using a single blood feed model, groups of female mosquitoes were tested at 4, 7 and 20 days post-emergence. They were allowed to feed on a hamster for 1 hour. The engorged mosquitoes were collected at 48 and 72 hours after their blood meal. There were no changes in GSH, GPx, GST or catalase levels, but ferritin levels increased markedly (about 2-3 fold) by 48 hours post blood-feed in all mosquito age groups. On repeated blood-feed experiments, mosquitoes aged 4 days were blood fed, once every 3 days and were collected 48 hours after their most recent blood meal. A significant decrease in GSH and GPx activity and a further increase in ferritin, were detected. Ferritin levels were  $0.19 \pm 0.03$  and  $0.14 \pm 0.02$  ng/ g protein in the repeat and single blood-feed groups, respectively. These results suggest ferritin is an inducible, sensitive defense system protecting against oxidative stress caused by iron derived from blood meals in *Aedes aegypti* mosquitoes.

**Keywords:** *Aedes aegypti*, blood feeding, catalase, ferritin

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