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Acute hypoxic stress: effect on blood parameters, antioxidant enzymes, and expression of *HIF-1alpha* and *GLUT-1* genes in largemouth bass (*Micropterus salmoides*)

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1 **Acute hypoxic stress: effect on blood parameters, antioxidant enzymes, and**
2 **expression of *HIF-1alpha* and *GLUT-1* genes in Largemouth bass (*Micropterus***
3 ***salmoides*)**

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15 **Abstract**

16 Dissolved oxygen (DO) plays a crucial role in survival, growth, and normal
17 physiological functions of aquatic organisms. Nevertheless, the mechanisms involved
18 in hypoxic stress and adaptation have not been fully elucidated in Largemouth bass
19 (*Micropterus salmoides*). To reveal the effect of acute hypoxia on Largemouth bass,
20 we simulated acute hypoxia (DO: 1.2 ± 0.2 mg/L) in the laboratory and analyzed
21 physiological parameters (RBCs, Hb, SOD, CAT, Na^+/K^+ -ATPase, GPx, and MDA)
22 and gene expression (*HIF-1alpha* and *GLUT-1*) in Largemouth bass exposed to
23 various durations of acute hypoxia (0, 1, 2, 4, 8, 12, and 24 h). Our results indicated
24 that acute hypoxic exposure significantly increased RBCs but decreased Hb. In
25 addition, antioxidant enzyme activity was enhanced significantly in the liver and
26 muscles at the initial stage of acute hypoxic exposure, but decreased significantly in
27 gills during the entire process of hypoxic exposure. Furthermore, the expression levels
28 of *HIF-1alpha* and *GLUT-1* mRNA were significantly up-regulated in Largemouth

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