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Anaesthetic effects of sodium bicarbonate, 2-phenoxy ethanol, clove extract and thyme extract on hematological indices and cortisol amount in common carp (*Cyprinus carpio*)

***M. Bahrekazemi**

Assistant Prof., Dept., of Fisheries, Qaemshahr Branch, Azad University, Qaemshahr, Iran

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Abstract

In order to introduce an anaesthetic with lower stressful effects on common carp, the effect of anaesthesia with two chemical compositions, sodium bicarbonate and 2-phenoxyethanol and two natural materials, clove extract and thyme extract on the number of red and white blood cells (RBC, WBC) and the amount of hematocrit, hemoglobin (HCT, HB) and Cortisol hormone were studied. In this regard, the hematological indices were evaluated in fish anesthetized with 30 mg/l clove oil, 100 ppm thyme extract, 30 mg/l of sodium bicarbonate and 0.3 ml/l 2-phenoxyethanol and a control group with no anesthesia, at the time 10 minutes and 24 hours after anesthesia. The results showed a significant decrease in the number of RBC, WBC and the amount of HB and cortisol and an increase in the amount of HCT in clove extract and thyme extract, 10 min after anesthesia. Also, a significant increase was observed in the number of RBC and WBC and the amounts of hematocrit and cortisol in sodium bicarbonate treatment, compare to the control group, 10 min and 24 hours after anesthesia ($P < 0.05$). But a significant decrease was found in the amount of hemoglobin in all treatments, 24 hours after anesthesia ($P < 0.05$). About 2-phenoxyethanol, although the numbers of RBC and WBC and the amount of HCT increased 10 min after anesthesia but, it showed decreasing trend with no difference compare to the control group, 24 hours after anesthesia. So, the lower stressful effects were belonged to clove extract and thyme extract and the negative irreversible effects were not observed in 2-phenoxyethanol treatment.

Keywords: Anaesthesia, Common carp, Stressful, Cortisol, Hematological indices

*Corresponding author: bahr.kazemi@gmail.com.