Effects of anesthesia with MS_{222}, Eugenoland 2-Phenoxyethanol on some immune parameters of *Cyprinus carpio*

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Abstract

Three anesthetic agents; MS_{222}, Eugenol and 2-Phenoxyethanol are the most drugs used in fish anesthesia but their effects on physiological and immunological parameters less investigated. In present study that performed in 2012 in Shahid Chamran University, 400 common carp weghining around 100 g were collected. The effective concentration of each anesthetics were evaluated first. Then the effects of anesthesia with MS_{222}, Clove oil (*Eugenia caryophyllata*) and 2-Phenoxyethanol on some immune parameters of *Cyprinus carpio* were investigated. Firstly, the effective doses of each anesthetic were calculated in *Cyprinus carpio*. Fish were anaesthetized with the effective dose of each anesthetic and blood samples were taken at 0, 1, 12, 24 and 72 hours after anesthesia. Immunological parameters including: serum Lysozyme and antibacterial activity, complement activity, Nitrobluetetrazolium activity (NBT) as well as total serum immunoglobulin and protein were compared among the groups. Results showed that proper anesthetic dose of MS_{222}, Clove oil and Phenoxyethanol in *Cyprinus carpio* were 100, 125 and 400 mg l^{-1} respectively. Serum lysozyme activity of fish anaesthetized with three anesthetics in different sampling periods showed no significant difference ($P>0.05$). Although serum bactericidal activity of fish anaesthetized with Phenoxinyethanol at 24 and 72 hours after anesthesia were significantly lower than control groups, bactericidal activity of other treatments showed no significant difference ($P>0.05$). Other immunological parameters including NBT and complement activity as well as total immunoglobulin and protein didn't affected by anesthesia with these three Anesthetics ($P>0.05$). Results showed it could conclude that although anesthesia with MS_{222} and Clove oil were no adverse effects on immunological parameters of *Cyprinus carpio*, Phenoxyethanole cause light immunesuppression in *Cyprinus carpio*. So Phenoxyethanole isn't recommendable for anesthesia in immunological research in *Cyprinus carpio*.

Keywords: Common carp, Anesthesia, MS_{222}, Clove oil, Phenoxyethanol, Immunological parameters, *Cyprinus carpio*.