

## Abstract

The aim of study was to determination of sedation and anaesthesia dosages of clove oil conjunct to nanoparticles for common carp (*cyprinus carpio*) and, using values of biochemical profiles of blood and histological tissue examination, to assess the effect of fish exposure to that anaesthetic. Anaesthetics are used with increasing frequency in aquaculture, mainly to reduce the stress and to prevent mechanical damage to fish during handling. Their use is particularly common in stripping, marking, biometry, health checks, etc. Clove oil, containing the active ingredient eugenol, has been reported to be an inexpensive and effective fish anaesthetic. A total of 50 Carps were examined. The fish were divided into five groups for determination of sedation and anaesthesia dosages of clove oil. The groups were a control group and 4 groups with 10, 25, 50, 100 ppm, dosages. And also, for biochemical examinations of blood and histological examinations of tissues, in 2 time (3 and 24 hours later of exposure) do sampling. Clove oil at the concentrations ranging from 10 to 100 ppm induced general anaesthesia. Average induction time below 3 min was at 10 ppm. Recovery was concentration-independent and lasted for about 5 min. No histopathological changes were demonstrate into tissues following anaesthesia. Results of the examinations suggest that the use of clove oil at a concentration of 10 ppm does not cause irreversible damage in carp. Clove oil conjunct to nanoparticles is a potent anaesthetic for carp, the safest and most effective at the concentrations of 10 ppm.

## Key words:

clove oil, eugenol, anaesthesia, *Cyprinus carpio*, sedation.



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Determination of Sedation and Anaesthesia  
doses of clove oil loaded on iron nanoparticles  
in common carp (*Cyprinus carpio*)

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