STUDIES ON STRENGTH OF AN OPTIMAL SOLUTION ESSENTIAL OIL OF CLOVE MIXED WITH ALCOHOL REQUIRED FOR ANESTHESIA SPECIES *CYPRINUS CARPIO*

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Abstract

This work aimed to establish the optimal concentration of a solution of alcohol and essential oil of cloves used for anesthesia of specimens of carp Cyprinus carpio variety of Podu Iloaie nude. The biological material was divided into five experimental groups, each of which is composed of six specimens each, with a body weight of between 356.87 g and 4000.34 g. The anesthetic used in the experiment was administered in different concentrations of the oil solution of clove mixed with alcohol concentration of 99.25%. The water temperature at which investigations were conducted was located around 20° C, both in the faculty's lab and in the fish farm. During the experiments the anesthetic was used in several concentrations, varying from 0.08 ml / l to 0.5 ml / l. The solution administered was immersed in water, and the monitoring of the fish material was done at the beginning of experiments and up to a total immobilization of biological material. The effect of solution concentration alcohol and clove oil in water administered depend on a number of factors, among which the most important are: the body weight of the fish, water temperature, water concentration in the oxygen solvit and the pH of the water. The anesthetic consisting of clove oil and alcohol, is a natural product that does not cause harm to the fish and does not require the fulfillment of certain conditions for its acquisition as required for some anesthetics used in aquaculture.

Key words: anesthetic, *Cyprinus carpio*, clove oil, alcohol

INTRODUCTION

Fish anesthesia is a method for reducing body beneficial activity in aquaculture, as fish most often struggle when restraint and handling, which can result in injury or even death to them [1, 3, 6, 12].

Anesthetizing the fish facilitates largely the examination, transportation, reproduction, diagnostic sampling and greatly reduce the stress they are subjected fish [2, 3, 5, 7].

Thus, by applying adequate anesthesia techniques, fish can be kept out of the water for longer periods of time. This is particularly important for ornamental fish breeding and fish valuable species [6, 9, 11].

Using anesthetic consisting of clove essential oil mixed with alcohol is relatively new. Clove oil has a local anesthetic used on humans especially in dentistry and as a general stimulant. The fish are anesthetized in aquaculture to not be stressed when handled. Reproduction involves intensive carp artificial reproduction anesthetic This enables us to manipulate breeding them without cause stress or injury.

An anesthetic for fish to be inexpensive and easy to use. Solution used is organic and has no negative effects on fish material [8, 10].

Clove essential oil is extracted from flower buds derived from species Eugenia caryophyllus, Myrtaceae family, which contains 70-90% eugenol, caryophyllene, ethyl eugenil. The buds are harvested before bloom and are dried in the sun. Obtaining oil by distillation is performed and the color of the liquid is yellowish brown.

The effect of the anesthesia solution of essential oil of cloves should be readily when administered both in water and after the material was handled fisheries and ended all the maneuvers measurement, weighing, handling. The recovery of fish after administration of the anesthetic should be between three and five min [4, 8].

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The manuscript was received: 05.09.2016
Accepted for publication: 14.02.2017

MATERIAL AND METHOD

The study was conducted in the laboratory of the Faculty of Animal Aquaculture in Iasi in June-July 2016 and in the fish farm SC Pescom Andrex. SRL.

The biological material studied was comprised of a total of 30 specimens of carp variety nude Podu Iloaie, divided into 5 groups of 6 copies. The first batch consisted of 6 samples of carp with an average weight of 403.64 ± 29.87 per fish g, the second lot 6 specimens weighing on average 800 ± 42.54 g third lot 6 specimens weighing on average 1200 ± 48.32 g, fourth lot 6 specimens weighing on average 2000 ± 119.80 g and the last batch consisted of 6 samples with average individual weight of 3800 ± 127.69g.

To achieve the anesthetic substance, we combined 10 ml of the essential oil of cloves alcohol in 90 ml of 99.25°. Using a graduated pipette, we incorporated into the water different amounts of anesthetic, from 0.08 ml / l to 0.5 ml / l.

The material fisheries was monitored from entering the pond to its total anesthesia. In the experiment water temperature was 20°C both in the lab faculty at the farm under study. Cyprinids were introduced individually in six tanks with a capacity of 30 liters.

After anesthesia total ciprinidae they were photographed, weighed, measured and analyzed visually the presence of species-specific diseases. Handling of fish was easy and it lasted between three and eight minutes without registering mortality among experimental groups.

After anesthetizing the total material fisheries and achieving goals, fish were placed in tanks fitted with aerators, oxygen levels solvit water of 9 mg / l, cyprinids have recovered fully from 2 to 5 minutes, depending on body weight individuals .

RESULTS AND DISCUSSIONS

The 30 fish samples were divided into 5 groups of 6 copies, and were given similar doses of anesthetic from a concentration of 0.08ml / l at a dose of 0.5 ml / l. Ciprinidae studied body mass is found in Table 1.

Table 1 Body weight (g) of specimens of the groups studied

L1	L2	L3	L4	L5
425.13	801.64	1205.87	2136.48	3876.91
387.88	850.12	1301.15	2050.36	4000.34
441.64	756.32	1176.89	1901.76	3788.53
397.55	781.51	1256.88	2230.11	3667.01
356.87	812.06	1212.81	2150.28	3850.28
412.78	870.81	1179.44	2200.01	3998.45

Anesthetic effect studied is presented in the tables below and represent are anesthetized during the cyprinids, based on the total weight and the concentration administered in water.

Table 2 The effect of anesthetic concentration (0.08 ml /l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	13.42±1.09	0	0	0	0
V%	8.10	0	0	0	0
min (minutes)	12.02	0.00	0.00	0.00	0.00
max (minutes)	14.59	0.00	0.00	0.00	0.00

The anesthetic on the basis of oil, clove oil at the concentration of 0.08 ml / l affects only the L1, total anesthesia being achieved after about 13 minutes.

Table 3 The effect of anesthetic concentration (0.15 ml /l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	12.44±0.95	13.50±0.89	14.27±0.66	16.32±0.65	19.43±0.56
V%	7.60	6.58	4.63	4.01	2.87
min (minutes)	11.36	12.39	13.58	15.54	19.02
max (minutes)	13.45	15.11	15.36	17.46	20.54

This concentration had no effect on all experimental groups, total anesthesia fish was statistically 11'36″ between a minimum and 19″02″ the group was registered as L5.

Table 4 Effect of anesthetic concentration (0.20 ml /l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	8.58±0.68	10.29±0.77	12.55±0.77	17.54±1.01	19.58±0.38
V%	7.95	7.50	6.09	5.73	1.94
min (minutes)	7.50	9.36	11.23	16.21	19.13
max (minutes)	9.20	11.32	13.20	18.40	20.08

Higher concentration of oil of cloves mixed with alcohol is made felt by decreasing time so the fish is anesthetized group L3 material between 11'23″and 13'20″.

Table 5 Effect of anesthetic concentration (0.30 ml /l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	5.57±0.54	6.59±0.41	8.11±0.57	9.17±0.76	11.33±0.72
V%	9.66	6.28	7.06	8.33	6.39
min (minutes)	4.80	6.18	7.45	8.22	10.45
max (minutes)	6.23	7.12	9.04	10.28	12.15

Fish material with a weight of about 2000 g has an average of 9.17 to onset of anesthesia total.

Table 6 Effect of anesthetic concentration (0.40 ml / l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	5.02±0.49	6.01±0.40	7.58±0.47	8.24±0.16	9.25±0.19
V%	9.71	6.65	6.19	1.90	2.06
min (minutes)	4.40	5.49	7.09	8.01	9.08
max (minutes)	5.48	6.48	8.18	8.44	9.54

The concentration of anesthetic used is directly proportional to the weight of carp specimens Thus L1 has alesser period of time until the material is anesthetized fish to other lots.

Table 7 Effect of anesthetic concentration (0.50 ml / l) on the specimens of the groups studied

Statistical indicators	L1	L2	L3	L4	L5
X±sx	1.25±0.12	2.21±0.17	3.10±0.08	4.22±0.08	5.35±0.05
V%	9.71	7.73	2.54	1.93	0.85
min (minutes)	1.10	2.01	3.00	4.12	5.28
max (minutes)	1.40	2.38	3.22	4.33	5.40

At a concentration of 0.5 ml/ l anesthetic effect is very fast, L1 appears only 1'10″, and in group L5 is 5'28″.

CONCLUSIONS

The study conducted showed that clove oil mixed with alcohol is a good fish anesthetic material.

Following administration of this solution in water, the fish did not suffer and there were no mortalities .

The total anesthesia had a rapid ciprinidae at a concentration of 0.5 ml/ l.

Anesthetic effect is directly proportional to the weight of specimens .

Fish returned to baseline after anesthesia was performed after 3-5 minutes, without repercussions on fishing material.

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