THE EFFECTS OF FORMALIN AND SODIUM CHLORIDE ON ECTOPARASITES OF IMPORTED GRASS CARP (*Ctenopharyngodon idella* CUVIER AND VALENCIENNES 1844) FINGERLINGS

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LIST OF ABBREVIATIONS

L. calcarifer : *Lates calcarifer*

M. latipinna : *Mollienesia latipinna*

M. cupanus : *Macropodus cupanus*

P. panchax : *Panchax panchax*

B. pugnax : *Beta pugnax*

M. strigatus : *Microcanthus strigatus*

A. forsteri : *Aldrichetta forsteri*

B. puntius : *Barbus puntius*

Spec. : Specimen

Nos. : Numbers

asc.piece : ascessory piece

eja.tube : ejaculatory tube

O.sucker : oral sucker

LC_{50} : Median Lethal Concentration

> : More than

< : Less than

L. : Linnaeus

LSD : Least Significant Difference

Avg : Average

repl. : replicate

h : hour

NaCl : Sodium Chloride

Fig./Figs. : Figure/Figures

DO_2 : Dissolved Oxygen

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Four shipments of grass carp imported from Indonesia were used for this study. The grass carp (*Ctenopharyngodon idella* Cuvier and Valenciennes 1844) fingerlings were infected by the monogenean (*Dactylogyrus lamellatus* Akhmerov 1952); protozoans (*Trichodina* spp., *Trichodinella* sp., *Trichophrya* sp., *Cryptobia branchialis* Nie, *Ichthyophthirius multifiliis* Fouquet 1876 and *Piscinoodinium pillulare* Schaperclaus 1954); trematodes (metacercariae of Echinostomatidae and *Transversotrema* sp.) and a crustacean (*Argulus* sp.).

Dactylogyrus lamellatus Akhmerov 1952 obtained in this study were comparatively smaller than those previously described from USSR and Hungary. *Transversotrema* sp. was found underneath the scales of grass carp. It differed in shape, size and certain morphological details to other previously described

species. Histopathological study carried out on the gills infected by echinostomatid metacercariae showed severe swollen chondrocytes, epithelial hyperplasia, squamous metaplasia of epithelial cells, atrophy, haemorrhages, necrosis and obliteration of blood vessels.

The toxicity tests of formalin and sodium chloride to grass carp fingerlings were carried out. Based on the results of the 96h-LC_{50} value, formalin at 25, 50 and 75 mg/L and sodium chloride at 6, 8 and 10 g/L in four hours were used for treatments of ectoparasitic diseases on this fish. In this study, the fish was held for 14 days in experimental tanks and treated using formalin and sodium chloride.

Formalin (25 and 50 mg/L) and sodium chloride (8 and 10 g/L) in four hour baths were found to effectively control monogenean and protozoan parasite infections.

The efficacy of both formalin and sodium chloride in this study showed almost similar results but due to the harmful effect of formalin on human and fish (influence on human tissue and oxygen depletion of water), sodium chloride was preferably used for treatment.