

TEST REPORT FOR MECHANICAL FILTRATION: ONE OF THE FIGHTING METHODS WITH ZEBRA MUSSEL IN THE PRESSURIZED IRRIGATION SYSTEMS

INTRODUCTION

During the works that are executed with filters having a mesh size of 25 μ and 40 μ , it is declared that these filters can capture all the Zebra mussel larvae that freely float, except the negative conditions such as high opacity (ZMIS, 2001).

An application test is performed in April 2006 in order to observe the effectiveness and feasibility of the filtration method. The assessments regarding the analysis results of the samples that are taken during the test performed at the spring of the regulator on the main channel of Mardin Ceylanpinar, and feasibility of the method are given at the voyage report in ANNEX-1.

In the present report, the results of the second test carried out in the Harran Regulator in June 7th, 2007 are presented.

METHODS AND EQUIPMENT

Samples are derived by operating the filter system with 40 μ mesh size mounted on the pump that is established on the root of the radial cover of the Harran Regulator with the own resources of ANTEL firm. The water temperature during sampling is measured as 25°C. Samplings are performed with three iterations in raw water, filtered water and backflush water by extracting from the water in still condition with a pump while the cover of the regulator is closed. The samples are intensified by being filtered from a *plakton* net with a mesh size of 55 μ and protected with 4% formaldehyde.

ANALYSIS RESULTS

The results of the countings executed at the Public Waterworks Administration (DSI), Biology Laboratory Ankara, are given at **Table-1**, and the images taken by inverted microscope of raw water, backflush water and filtered water are given at the **Figures 1, 2, 3**.

Table-1. Zebra Mussel Larvae Countings at the Harran Regulator (unit/m³)

SAMPLE	Raw Water	Backflush Water	Filtered Water
1st sample	15 789	167 272	0
2nd sample	11 052	840 000	0
3rd sample	23 157	511 578	0
Average	16 666	506 283	0

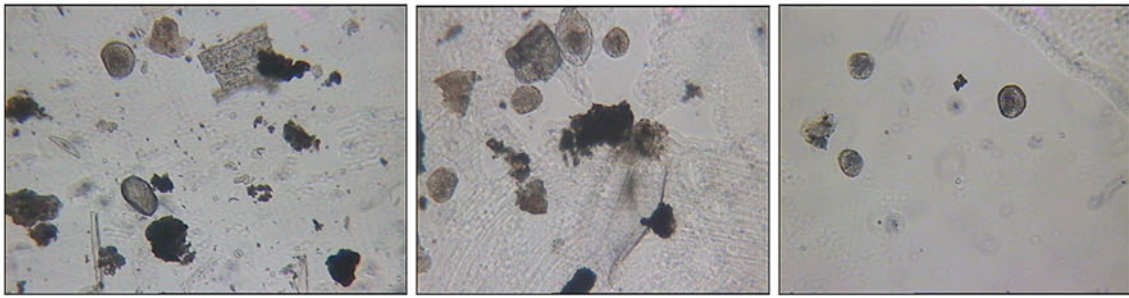


Figure 1.- 100 times Enlarged Microscope Images of D-Shape Zebra Mussel Larvae, Different Type of Plaktons and Suspended Solids Contents, in the Raw Water.

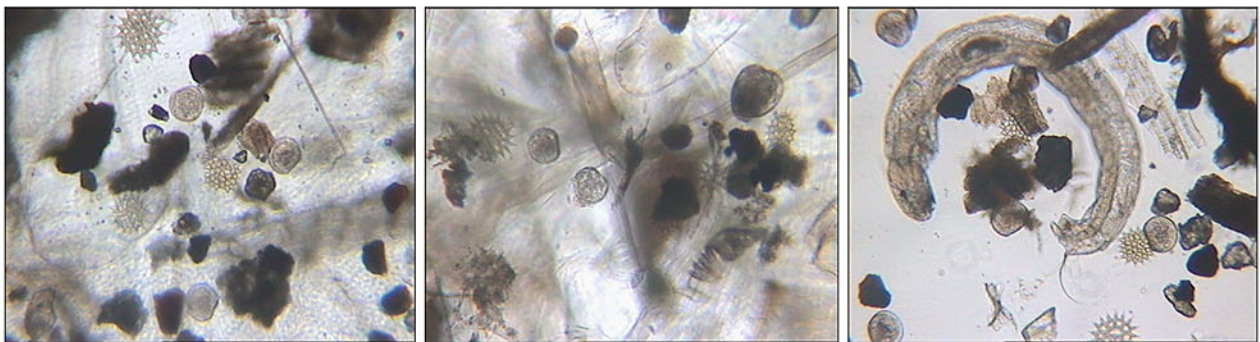


Figure 2.- 100 times Enlarged Microscope Images of D-Shape Zebra Mussel Larvae, Different Type of Plaktons and Suspended Solids Contents, in the Backflush Water.

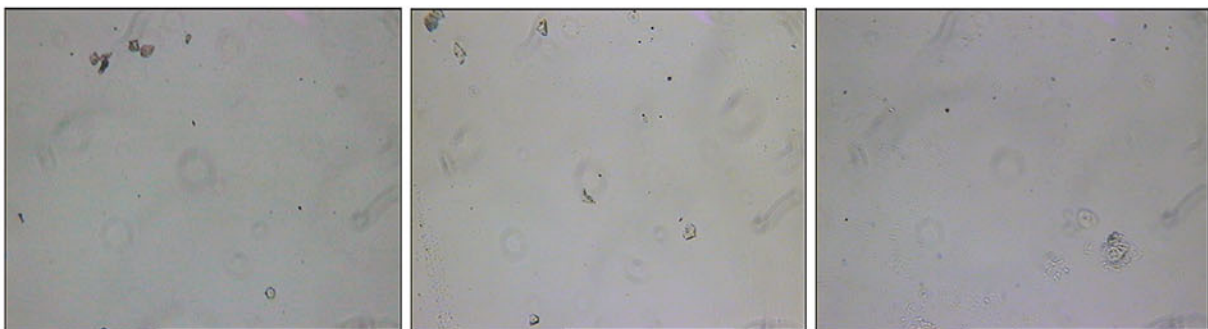


Figure 3.- Samples of Water after Filtering at 40 μ mesh.

RESULTS AND RECOMMENDATIONS

The countings that are performed on the taken water samples show that the test filtration systems established on the Mardin Regulator in April 2006 and on the Harran Regulator in June 2007, capture the entire Zebra Mussel larvae. It is understood that the filters with 40 μ mesh will be effective in protecting the pressurized irrigation systems from the effects of the Zebra Mussel.

It is declared that the filtration system that is tested will be able to operate without requirement of further energy in case the water pressure is at 20 m (2 bar), the filtration will be performed if the water pressure is 5 m, however electrical energy is required for the backflush process. The technical and economical feasibility in both of the cases is discussed at the travel report in ANNEX-1.

Filters with 100-150 μ mesh size are being used in the networks where drip irrigation method is applied in order to prevent the blockages caused from sediments and algae. If the filters with 40 μ mesh size are applied during filtration, it is observed to be possible to terminate the damages that the Zebra Mussel will cause.

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