



**EVENT: DESALINATION WEEK**

**TITLE OF THE DISSERTATION:**

**Silent Invasions vs Hydraulic Infrastructures. An alternative biotechnology**

**AUTHOR:**

**José Luis Soler Martínez**

**POSITION:**

**CEO**

**COMPANY:**

**ECOWATER TECHNOLOGIES, S.L.**

Good afternoon. Thanks victor and thanks to all. My name is jose luis soler and I am here in the quality of CEO of Ecowater Technologies, a pioneer Spanish company in the development of biotechnology for the control of invaders mussels in hydrological systems or hydraulic applications.

Invasions of bivalves molluscs is included as a new complexity and unbalance factor which notably devilies the functional and operational performances of industrial facilities.

We are before a serious problem. A single individual of any of the species that we treat, can generate in the reproductive cycle of a year (2 or three times), up to 1.5 million of new individuals.

If we consider that in a square meter can be settled between 120,000 and 700,000 adult examples, we can estimate that the generation of new specimens reaches figures out of the reach of any control.

It is the denominated silent invasion. Involving bivalves molluscs cause monthly and valued damages in more than 545,000 million euros / year worldwide.

These consequential damages and costs are generated in any hydraulic system that use or use the sweet or salt water for the performance of its function and affected by the presence of invaders bivalves.

We must also consider the damages, often irreversible, caused by the environmental imbalance over native aquatic fauna and flora.



TECHNOYMAR SOLUCIONES, S.L. Real,41 2º Of. 9 11300- La Línea de la Concepción-CADIZ

Mediterrani, 16 46980-Paterna-VALENCIA

Tlf.: +34856910236 +34 960815545- +34 622677255- +34 622623723

Email [ecowatervalencia@gmail.com](mailto:ecowatervalencia@gmail.com)

Web: <http://ecowatertechnologies.weebly.com/>



But I have not come to talk about statistics, not even of the exceptional characteristics that make these organisms the second major environmental pollution problem after CO<sup>2</sup> emissions.

I will try to explain and after show in the video that we will see below, how can we minimize this colossal risk factor in affected hydrological facilities or at serious infestation risk.

### Chemicals vs Biotechnology

The chemical methods that are currently used to establish controls, as manufactured, are inefficient as recognized, researchers, scientists, national and international organizations, ecologists and what is most relevant, the owners affected.

What if we can ensure is that the collateral effects of the use, (in practice) of chemicals and other toxic products, cause contamination of water, land, affect non-objective species and health of people. Without the corrosive effect and demerit of the life of materials and equipment, which produce the treatments in the infrastructures treated with these products.

We have taken several years in developing a biological technology that causes the elimination of invaders bivalves settings in industrial hydraulic systems, without affecting the biotope or the aquatic ecosystem or the health of the persons.

### What is ECOWATER INNOVA?

It is a technique, based on static and dynamic biological inhibitors and support equipment,

The first, prevent the settlements and the seconds eliminate the individuals in any phase of vital development

To carry out the model, we deepen the factors concerned by an invasion in depth (aquatic factor, study of the infrastructures affected, environmental conditions, location and study of the characteristics of the settlements) and the individuals.

After obtaining the results, we design the model of action.



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## ECOWATER BIOBOX TEST.

Prior to any treatment, we perform a scale test through the ECOWATER BIOBOX TEST and we check that the studies carried out are fitted to the technical predictions resulted from the study

This test allows us to know anticipadly:

1. The mortality we will get, (always above 90%)
2. What will not affect fresh water
3. That non-objective species will not be affected.

## How does ECOWATER INNOVA?

We act in 3 critical lines for the existence and development of mussels.

1. Food
2. Fixation in substrates
3. Reproduction

- 1) Bivalves molluscs eat zooplankton, bacteria and other organisms.

We give food to them: *Pseudomonas protegens* dead, also designed the bacteria of the earth, for its benefact and protective effect of the roots of the plants.

However, 90% of the zebra and quagga mussels, when ingesting ZEQUANOX, die for intestinal collapse in a time level between the 2 hours and 72 hours after the ingestion.

Only affects the mentioned species and the *L. fortunei* called also golden mussel, which are the species that make the most damages.

- 2) Invaders mussels need to fix to continue the adult phase. We prevent the fixation by covering the surface to protect with a liquid ceramic barrier for submerged structures. This static inhibitor called ECOWATER CERAMICS, is a liquid ceramic



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specifically created to protect from organic incrustations any submerged infrastructure, without residual toxic effect.

- 3) Thousands of millions of larvae of bivalves are born for 2 or 3 times a year (an adult of mussels can produce up to 1.5 million of new individuals)

These new colonizers, displaced exclusively in vertical sense. They have no capacity to swim. In this phase, the same as the algae, have a vacuole that allows to maintain, by impulsion, in certain levels of depth. Through variable ultrasonic action, we get break this organ and die.

This set of actions do not emit any kind of pollution to water, or affect other species, or the infrastructure materials.

#### 100% safety.

How we can observe, the ECOWATER INNOVA method, is a set of adequate complementary actions to eliminate seated adults and prevent that the youngest surviving individuals, do not reach the adult state to form new colonies.

The result of the applied biotechnological compound, static and dynamic inhibitors, is the mortality of 100% of the alevin and adult specimens in the treated systems

#### Validity of the ecowater innova treatment.

A system invaded and consolidated, by invaders bivalves molluscs, and which is affected in the origin, is to say, crude water, fresh or saline water (dams, lakes, maritimes waters, etc.) As occurs in most cases it will cause cyclic waves of bivalves in industrial subsidiary systems (closed or semi closed) in the future.

We consider subsidiary systems the infrastructures generating hydroelectric energy, nuclear, irrigation systems, desalation systems of water, residual water plants, farms or factories of water customs,

Subsidiary systems affected by invasion of bivalves molluscs, should establish a permanent control system.

Making a simile: a person affected by type 1 diabetes, can only maintain a healthy life, if you perform a permanent control of the insulin level.



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The ECOWATER INNOVA method act similarly in the case of the systems affected, as we will see in the video.

Our biotechnological model, position in the North American and Canadian market in 2012 and since 2018 in Europe, offers results that are not only effective as a shock method.

The effects of a treatment with the ECOWATER INNOVA method endures in the middle term.

- dynamic biological inhibitors, will be applied as a preventive measure once a year.
- the treatment has a duration of 2 hours.
- static inhibitors have an effect between 5/7 years.
- supervision and control revisions will be performed every six months.

#### Other factors in consideration

1. The maintenance costs of the affected infrastructures shall be reduced in a notable way
2. The forced stops due to cause of colmatation, or any obstruction, will be removed.
3. We will avoid anticipated structure demerit
4. We eliminate the contaminating collateral effect on water, land and natives species.
5. We contribute to minimize the environmental impact on biological means

#### Adaptation of infrastructures

To adapt the new biotechnological technologies of control to the current infrastructures, these will have to adapt through the incorporation of some elements needed to carry out the control and implementation.



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# ECOWATER TECHNOLOGIES



These changes do not mean changing the infrastructures significantly.

Must be located at the points indicated by the biotechnological study,

Control elements and valves required for dynamic inhibitor controls.

For static inhibitors, no changes or incorporations of new elements are required.

To obtain these results, each case is studied in depth, as indicated above.

We enter a new cycle in which biotechnology will have a relevant role, for the solution of water-related problems as an alternative to procedures and few methods compatible with environmental health.

There are no magical solutions.

Solutions to large and complex problems can only be solved with new technologies establishing a narrow relationship with our customers and establishing collaborative synergies that allow to obtain the objectives to this new challenge.

Now we'll watch the video

Thank you very much for your attention.



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