

# DETERMINATION AND QUANTIFICATION OF ALGAE IN A WASTEWATER TREATMENT SYSTEM (CONTINUOUS CLOSED PHOTOBIOREACTOR)

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## Introduction

Characterization of algae population in a closed photobioreactors system was carried out at genus level. This system can be included in the so-called Modified Natural Technologies and it can be used for urban wastewater treatment. It's shown that Oxygen provided by algae as a result of their photosynthetic activity can be used, at high concentrations, to eliminate pathogens in water. Evolutions of algae and several physico-chemical parameters during a reactor cycle are studied.

## Methods

Wastewater treatment: Two closed glass photobioreactors, called Debugger System and Disinfector System, in continuous operation.

Quantification and identification of algae until genus level by Neubauer counting chamber and direct optical microscope.

Measures of pH, EC, DO, REDOX Potential and coliforms content following the Standards Methods.

## Results and Discussion

Table 1. Classification of taxa in the photobioreactors system

Division	Family	Genus
Chlorofyta	Scenedesmaceae	<i>Scenedesmus</i>
	Oocystaceae	<i>Chlorella</i>
	Selenastraceae	<i>Selenastrum</i>
		<i>Ankistrodesmus</i>
	Chlamydomonadaceae	<i>Chlamydomonas</i>
Euglenophyta	Euglenaceae	<i>Euglena</i>
Chrysophyta	Nitzschiaceae	<i>Nitzschia</i>
Cyanophyta	Oscillatoriaceae	<i>Oscillatoria</i>

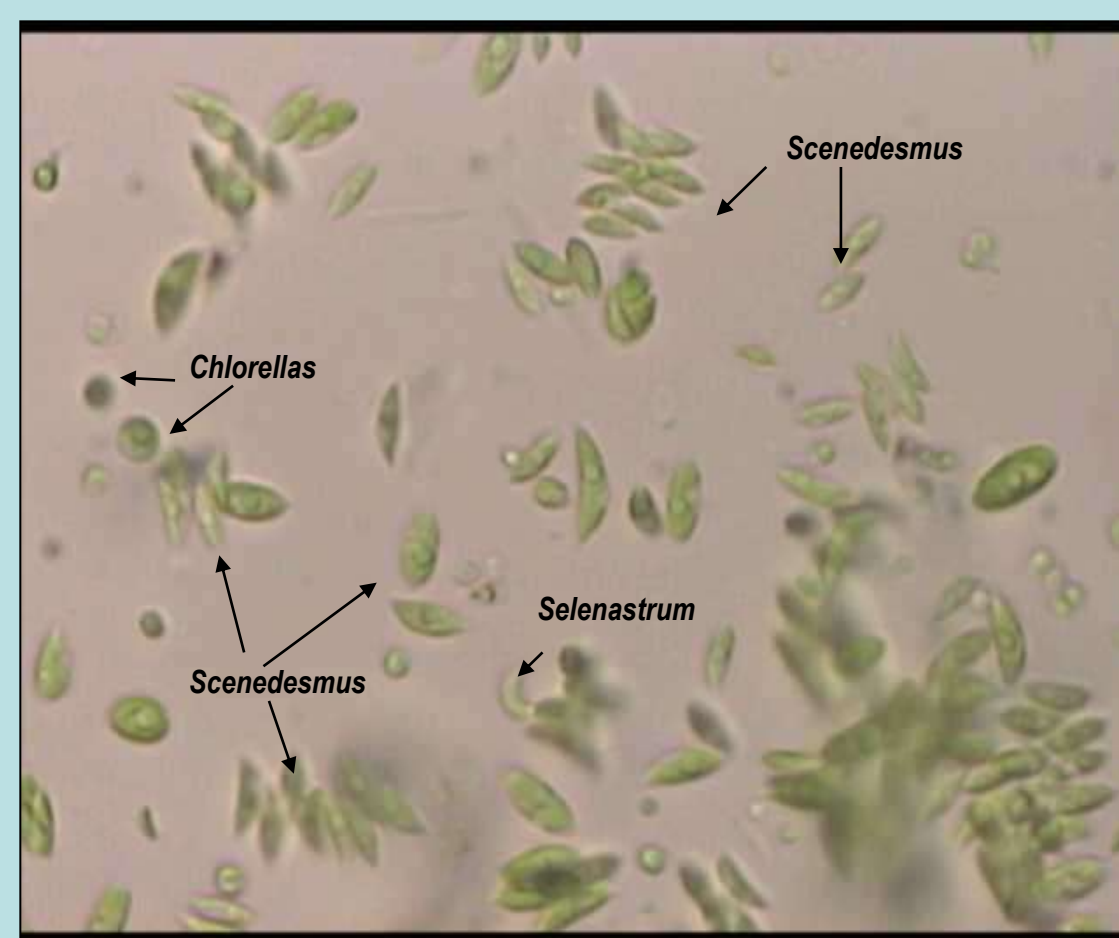
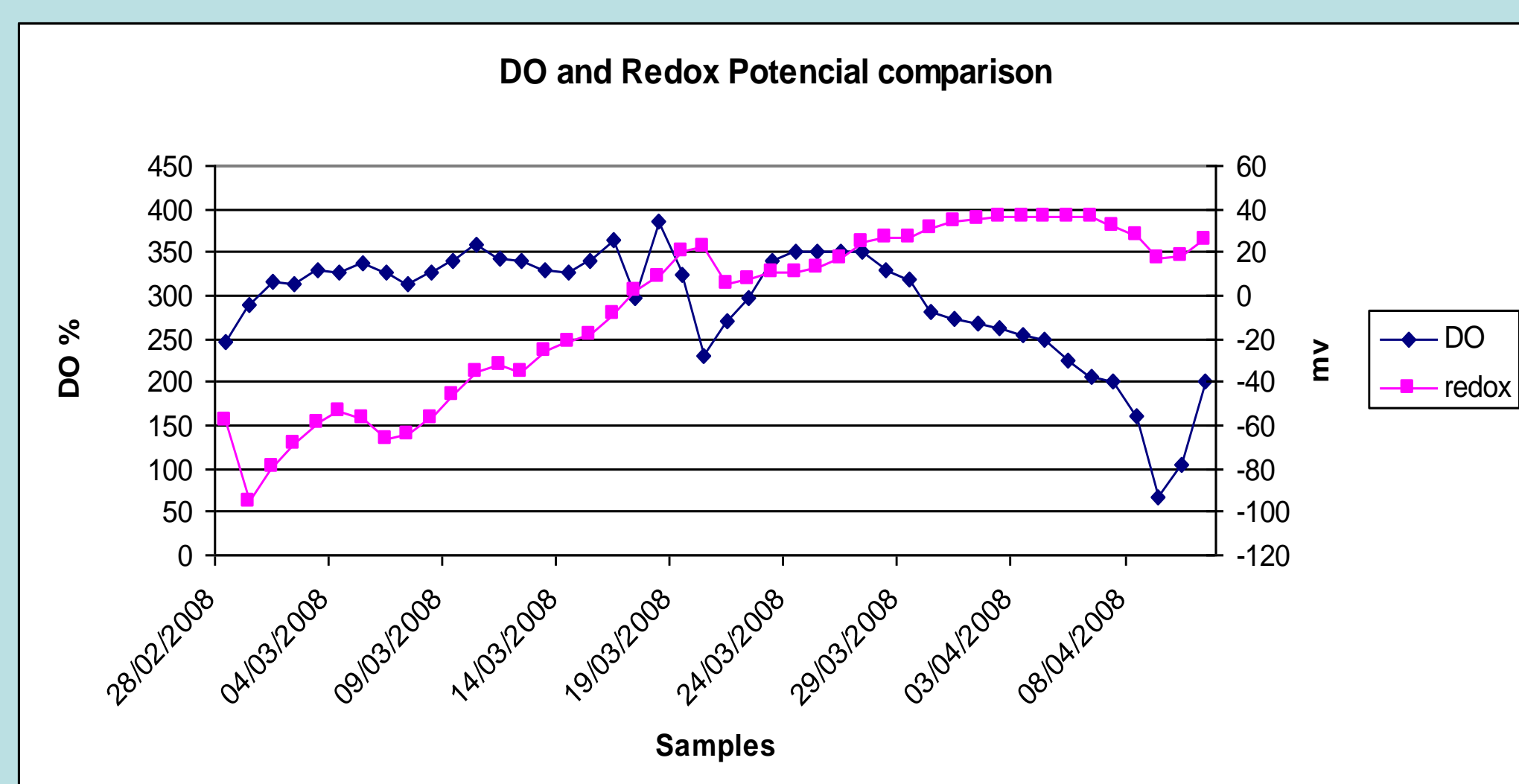


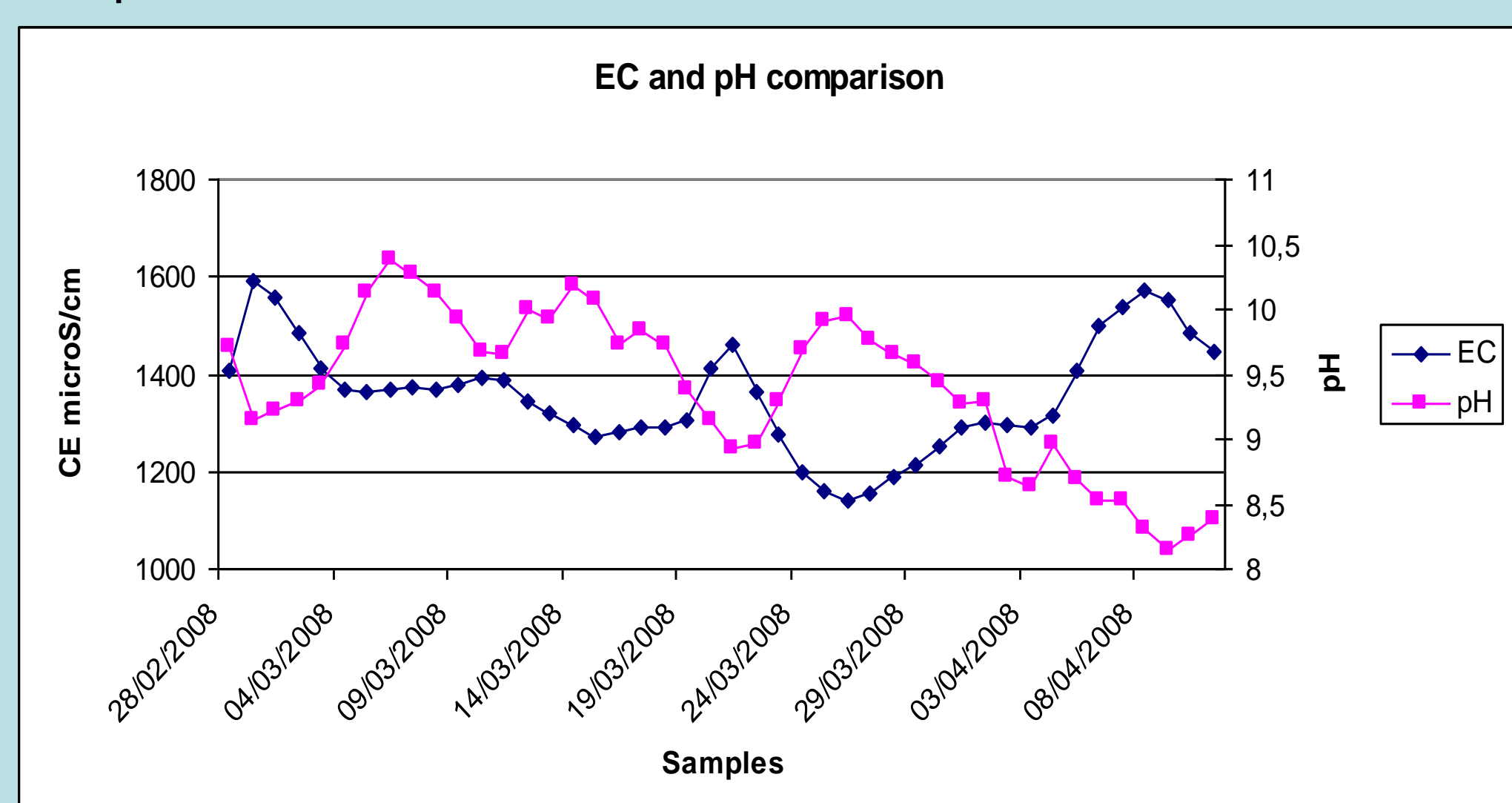
Figure 1. Main genus of algae population found.



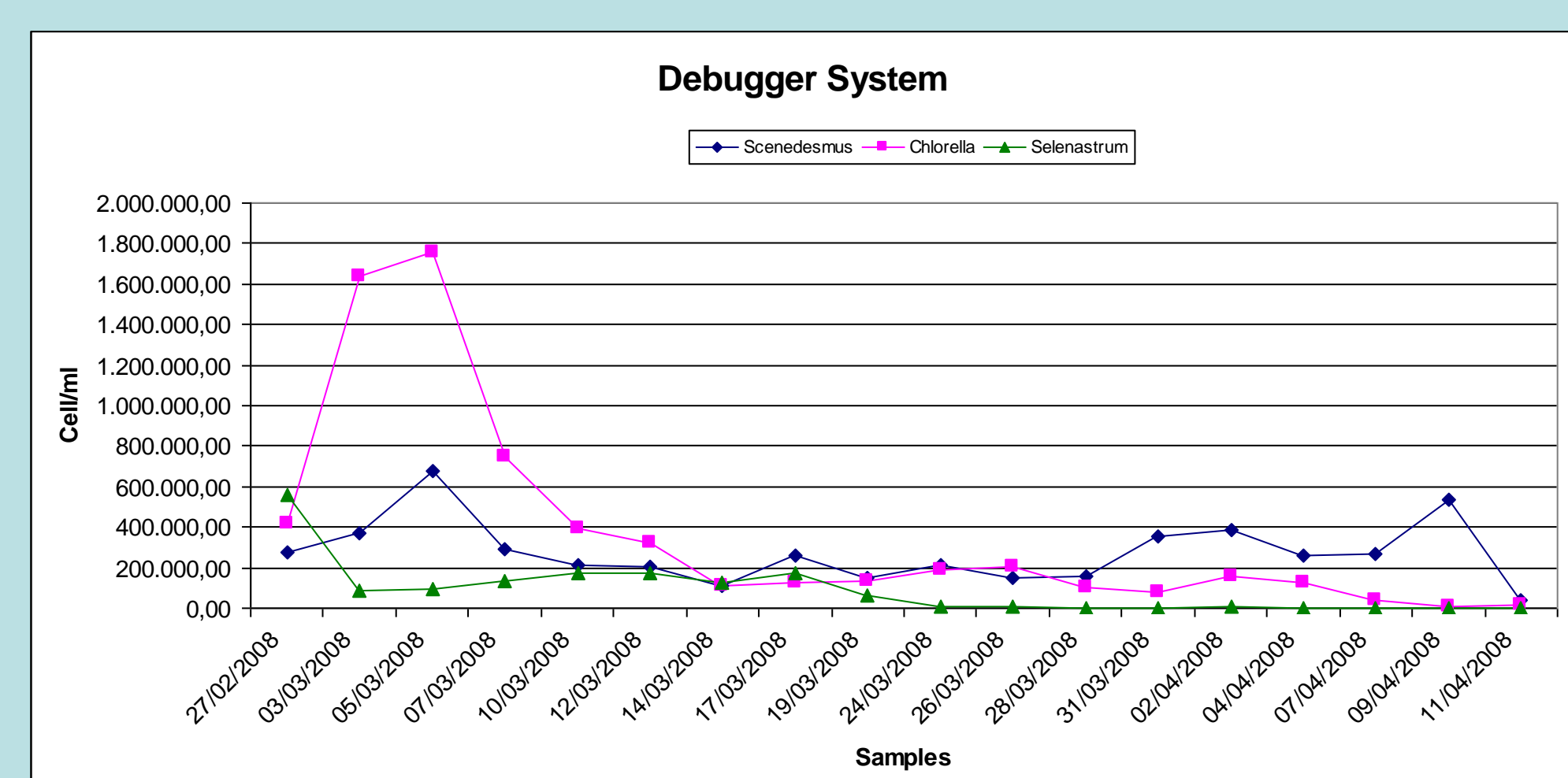
Figure 2. Debugger and Disinfector System



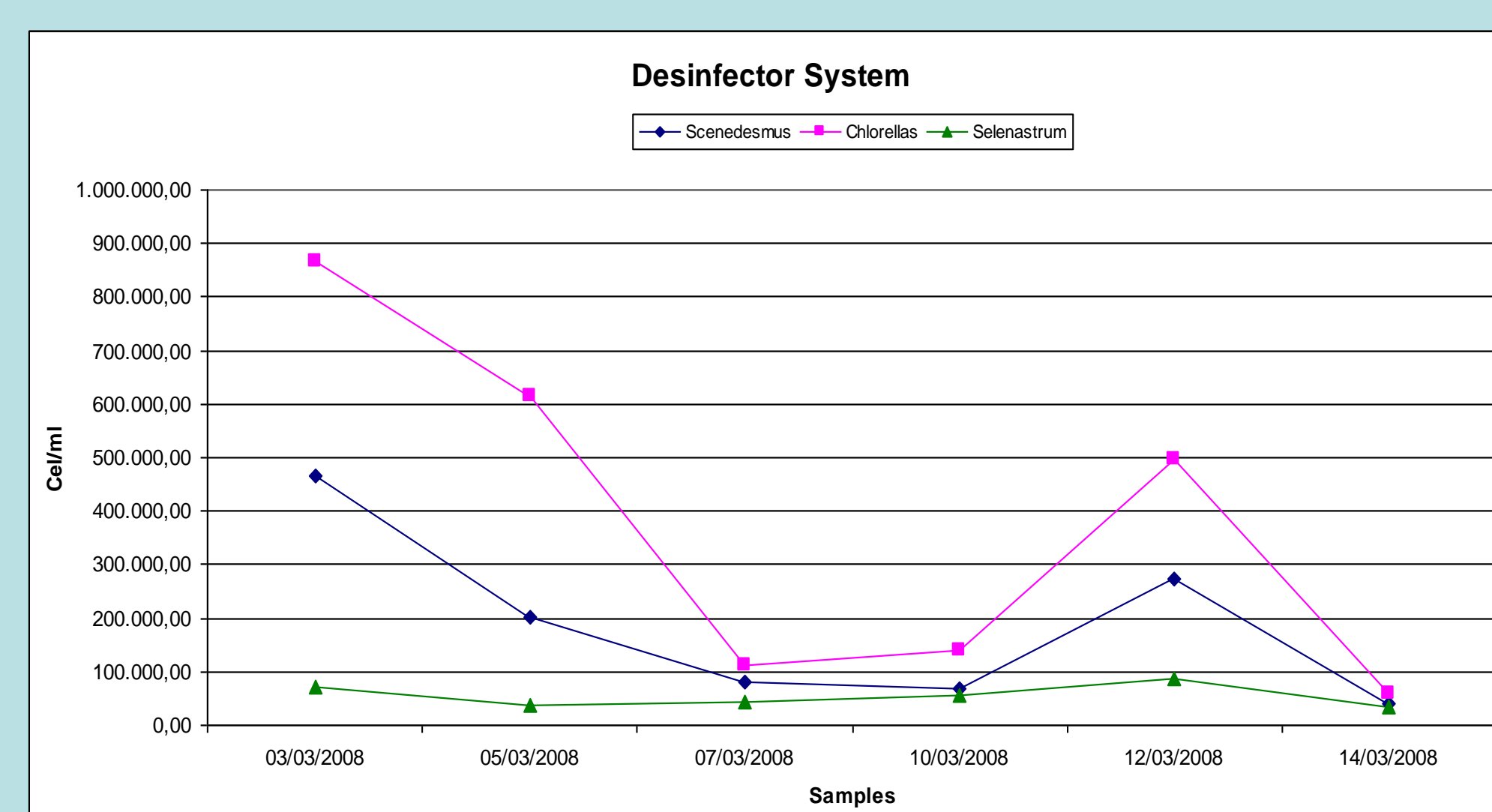
Graphic 1. DO and Redox Potential evolution



Graphic 2. EC and pH evolution



Graphic 3. Algae in the Debugger system evolution



Graphic 4. Algae in the Disinfector System evolution

## Conclusions

•Three are the mainly developed algae genus, belonging to the Division Chlorofyta: *Scenedesmus*, *Chlorella* and *Selenastrum*, all of them suffering a population decline towards the end of the investigation period.

•Disinfector photobioreactor always presented fewer algal populations that Debugger photobioreactor.

•Physico-chemical parameters (pH, Redox Potential, EC and DO) showed a clear evolution over the experience, in line with the population development of the studied genera, being able to explain their behavior through the algae activity.

•Measures of coliform in treated water showed that total disinfection is reached.

## References

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