



***Basic Research in Chemistry and  
Biotechnology for Elimination of Halogenated  
Hydrocarbon Pollutants of Aquifers and Ground  
Water***

**Toxicology/Hydrobiology WORKING  
GROUP**

**IAB kick-off meeting**

**Debrecen, 10/10/2009**





# Toxicology approach

**Toxicology** (from the Greek words *toxikos* and *logos*) is the study of the adverse effects of manufactured chemicals and other anthropogenic and natural materials on living organisms.



The **chlorinated hydrocarbons** have significant toxicity to living organisms



# Participants of the workgroup

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# Experiences

long-term experiences with

- Investigation of long term water quality changes of rivers and shallow lakes in Hungary
- Investigation of toxicology of algal toxins
- Toxicological analyses of pollutant by routine biotest



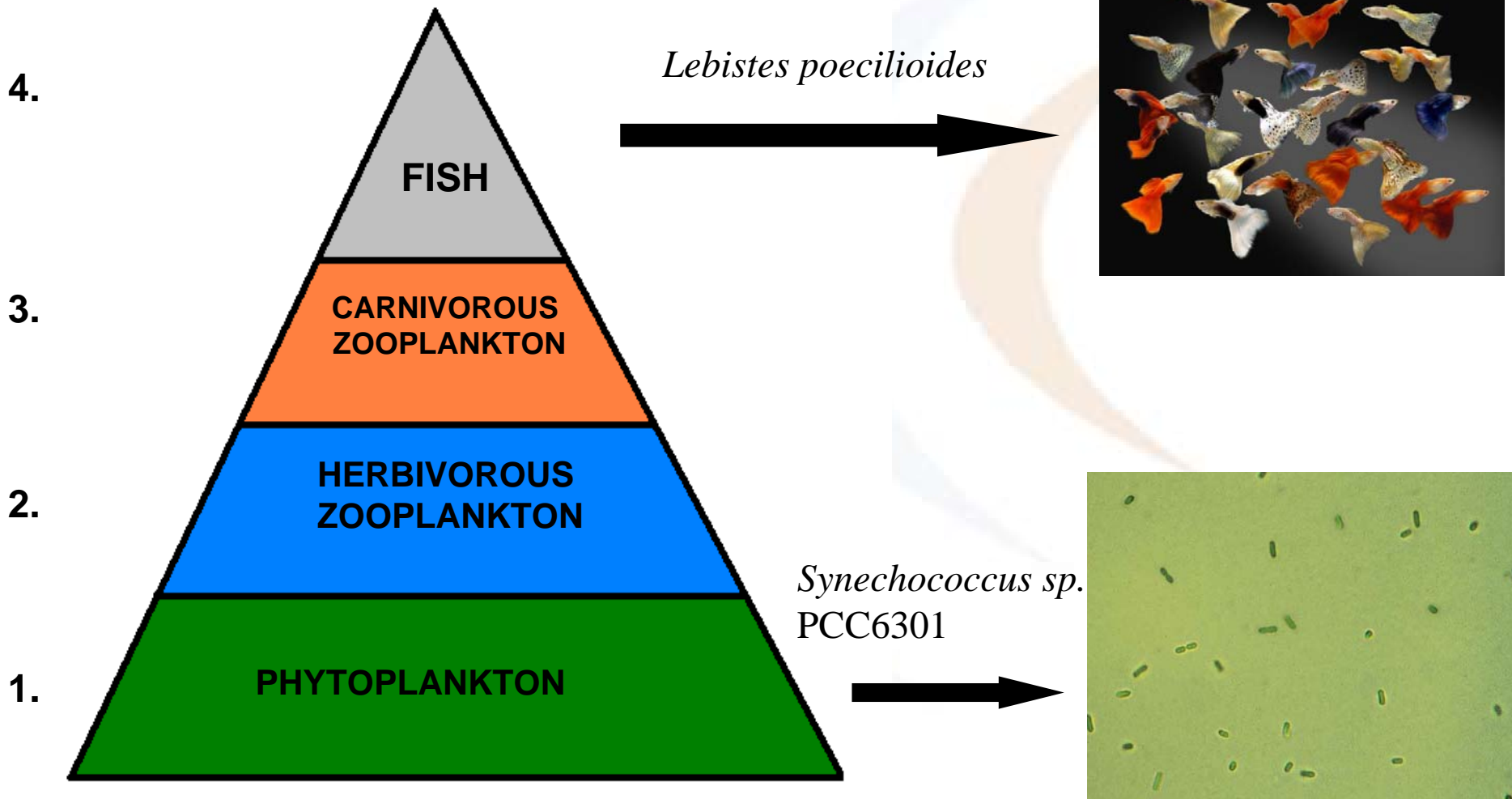
# Importance of the biological test

**The biological test** (bioassay or ecotoxicological test) is a procedure or method which aims to provide quantitative data about the effects of a substance or an environmental factor by using the biological-physiological reactions of an organism, mixed population or isolated organ.

The studied or measured quality could be

- a parameter of behavior of the living system
- survival rate
- amount of nutrient or toxin or physiological phenomenon: respiration, photosynthesis, muscle or nerve function, enzyme activity etc.

# Importance of the biological test



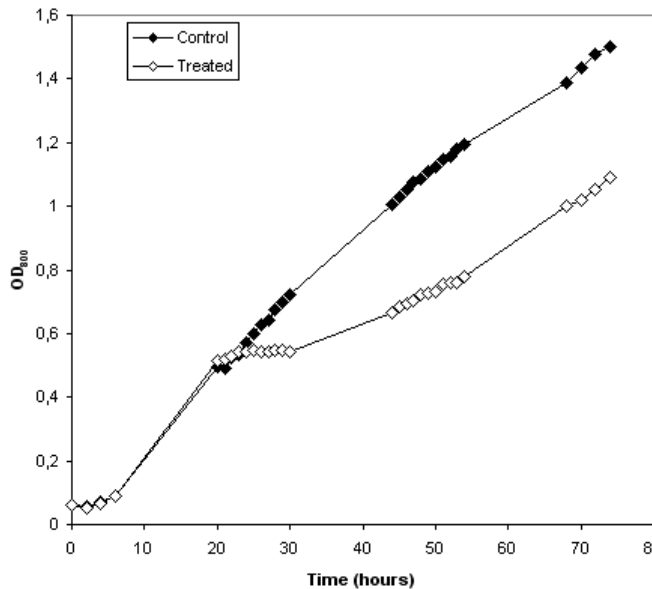


# Research directions

- Testing the toxicity of the basic chlorinated hydrocarbon compound; stating the safety levels during the algal and fish tests.
- Testing the toxicity of the compound produced by the chemical workgroups; stating the safety levels during the algal and fish tests.
- Measuring the activity changes of the “general stress enzymes” in *Synechococcus sp.* PCC6301 with continuous sampling during the treatments. Stating a more detailed physiological background of the effect of chlorinated hydrocarbons on an aquatic photosynthetic microorganism



# Preliminary results



- Alkaline phosphatase
- Peroxidase
- Catalase
- Nucleases