

# **Experimental and mathematical model of the interactions in the mixed culture of links in the “producer-consumer” cycle**

T.I. Pisman (1), Ya.V. Galayda (2)

(1) Institute of Biophysics SB RAS, Russia, (2) Krasnoyarsk State University, Russia

(pech@ibp.ru/ Phone: +7 3012 494455)

The paper presents experimental and mathematical model of interactions between invertebrates (the ciliates *Paramecium caudatum* and the rotifers *Brachionus plicatilis*) and algae (*Chlorella vulgaris* and *Scenedesmus quadricauda*) in the “producer – consumer” aquatic biotic cycle with spatially separated components. The model describes the dynamics of the mixed culture of ciliates and rotifers in the “consumer” component, feeding on the mixed algal culture of the “producer” component. It has been found that metabolites of the algae *Scenedesmus* produce an adverse effect on the reproduction of the ciliates *P.caudatum*. Taking into account this effect, the results of investigation of the mathematical model were in qualitative agreement with the experimental results. In the “producer – consumer” biotic cycle it was shown that coexistence is impossible in the mixed algal culture of the “producer” component and in the mixed culture of invertebrates of the “consumer” component. The ciliates *P.caudatum* are driven out by the rotifers *Brachionus plicatilis*.