

ACCUMULATION KINETICS OF PHOSPHATES BY ULVA RIGIDA
UNDER THEIR DIFFERENT CONCENTRATIONS

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Summary. The field of phosphates concentrations in the environment, in which an algae has the higher ability to accumulate of phosphorus, was found out on the bases of study of accumulation kinetics of phosphates by Ulva rigida.

Study of phosphorus metabolism kinetics by algae and its dependence upon different environmental factors is important for mariculture development as well as for problems of self-purification of marine environment.

Influence of phosphates concentrations ($400, \mu\text{gP}\cdot\text{l}^{-1}$ and $25, \mu\text{gP}\cdot\text{l}^{-1}$) in environment on the Ulva growth was clarified quantitatively (1). Concentration factors of phosphates of U. rigida under their natural concentrations, natural lightning and darkening were equal to $3\cdot 10^3$ (on the dry weight of algae) (2).

Table 1 Concentration factors of phosphates by U. rigida Ag. under different phosphorus concentrations in the medium (the width of confidence interval was not more than 10% of absolute value of a mean). CF - concentration factors of phosphates; t - time, days; C_i - concentrations of phosphates in the medium, $\mu\text{g P}\cdot\text{l}^{-1}$.

t	CF										
	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}
	10	20	30	50	100	150	200	400	1000	1500	2000
0,15	185	208	212	301	322	304	250	221	195	116	45
1	203	263	294	547	922	594	419	377	270	122	98
2	307	365	409	953	1073	993	663	551	292	159	199
4	315	396	417	1873	1471	1371	833	697	301	216	205
5	321	403	438	2119	1926	1592	1065	756	323	253	228
7	323	406	450	2200	2030	1701	1072	786	330	271	231

At present work kinetics of phosphates accumulation under their concentrations in the medium 10 up to 2000, $\mu\text{gP}\cdot\text{l}^{-1}$ was investigated with radioactive indicators and addition of stable phosphorus (3). In the concentrations field up to 150 up to 150, $\mu\text{gP}\cdot\text{l}^{-1}$ concentration factors (CF) were increased to a certain extent at first hours after phosphates injections, however CF were decreased under higher phosphates concentrations in the environment (Table 1).

Maximum values of CF were observed in the concentrations 50-150 $\mu\text{gP}\cdot\text{l}^{-1}$ during increased exposition of time, namely: CF became one order of magnitude higher than such at 10-20 $\mu\text{gP}\cdot\text{l}^{-1}$. Increasing of phosphate concentrations up to 1000-2000 $\mu\text{gP}\cdot\text{l}^{-1}$ leads to decreasing of CF till the steady level (Table 1).

Obtained results characterize adaptation possibilities of U. rigida in relation to environmental phosphates and indicate that U. rigida has a higher capacity of phosphate accumulation out of the environment at concentrations 50-500 $\mu\text{gP}\cdot\text{l}^{-1}$, having the maximum at 50-150 $\mu\text{gP}\cdot\text{l}^{-1}$.

References

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