Influence of Magnetic Field (80-100 ers.) and Laser Irradiation (º=899 nm) on Blue-Green Microalgae Spirulina platensis Heat Production

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The heat effects of *Sp. pl.* suspension, subjected to influence of magnetic field and laser irradiation have been studied with the help of high sensitive differential scanning microcalorimeter destined for study of complex biological systems.

It is shown that total heat (-Q) evolved by *Sp. pl.* cells, in the temperature range from 5 to 55 ^{0}C in the dark, in the non-aerobic conditions and in stationary state, depends on quantity of water in the samples. It is established that the heat production value of cells subjected to influence of magnetic field and laser irradiation, (with equal content of water in suspension) is significantly higher than the value of native (non-treated) *Sp. pl.* cells. For example, at 90% water content in suspension, -Q for native and subjected to influence of magnetic field and laser irradiation cells is equal to 27.1; 40.3; 71.5 J/g, accordingly.

It is supposed that the change of dependence profile -Q=f(T) and sharp increase of the main exotherm with T_{max} at about 48 ^{0}C for treated cells in comparison with native ones says about increase of biochemical processes responsible for keeping of cell viability. It is also shown that intensity of magnetic field and laser irradiation used in the experiments does not influence on stability of subcellular structures including genetic material.

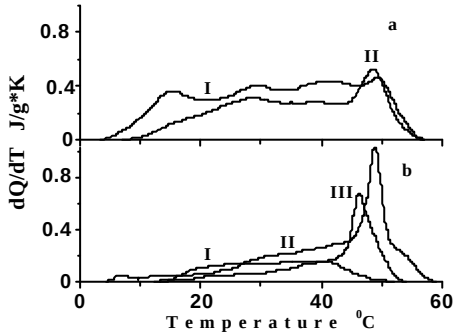

Fig. 1. Heat absorption curves as function of temperature (dQ/dT, J/g*K) of *Spirulina platensis* in Zarrouk's medium in stationary regime, in dark and in closed vessel (pH 10.05):

a) **I** - *Sp.pl*. subjected to influence of magnetic field during 48 hour at 34 ^{0}C; quantity of W% H_2O 95.1.
II - native *Sp.pl*., quantity of W% H_2O 94.8.

b) **I** - native Sp.pl., quantity of W% H_2O 90.1;
II - *Sp.pl*. subjected to influence of magnetic field; quantity of W% H_2O 89.9, conditions as in a);
III - *Sp.pl*. irradiated with laser λ=980 nm during 30 min at 25 ^{0}C.

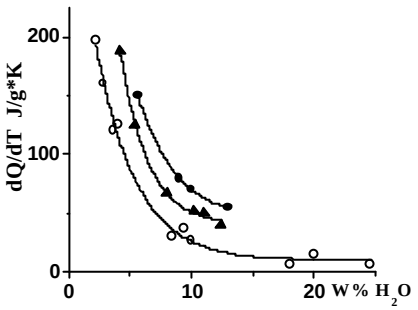

Fig. 2. The dependence of *Spirulina platensis* cell heat production (-Q) on various water content (conditions as in Fig. 1.)
Ï - native *Sp.pl*.
- *Sp.pl*. subjected to influence of magnetic field.
- *Sp.pl*. subjected to influence of laser irradiation.