«Effects of low fields and radiation of the environmental nature factors on the water medium»

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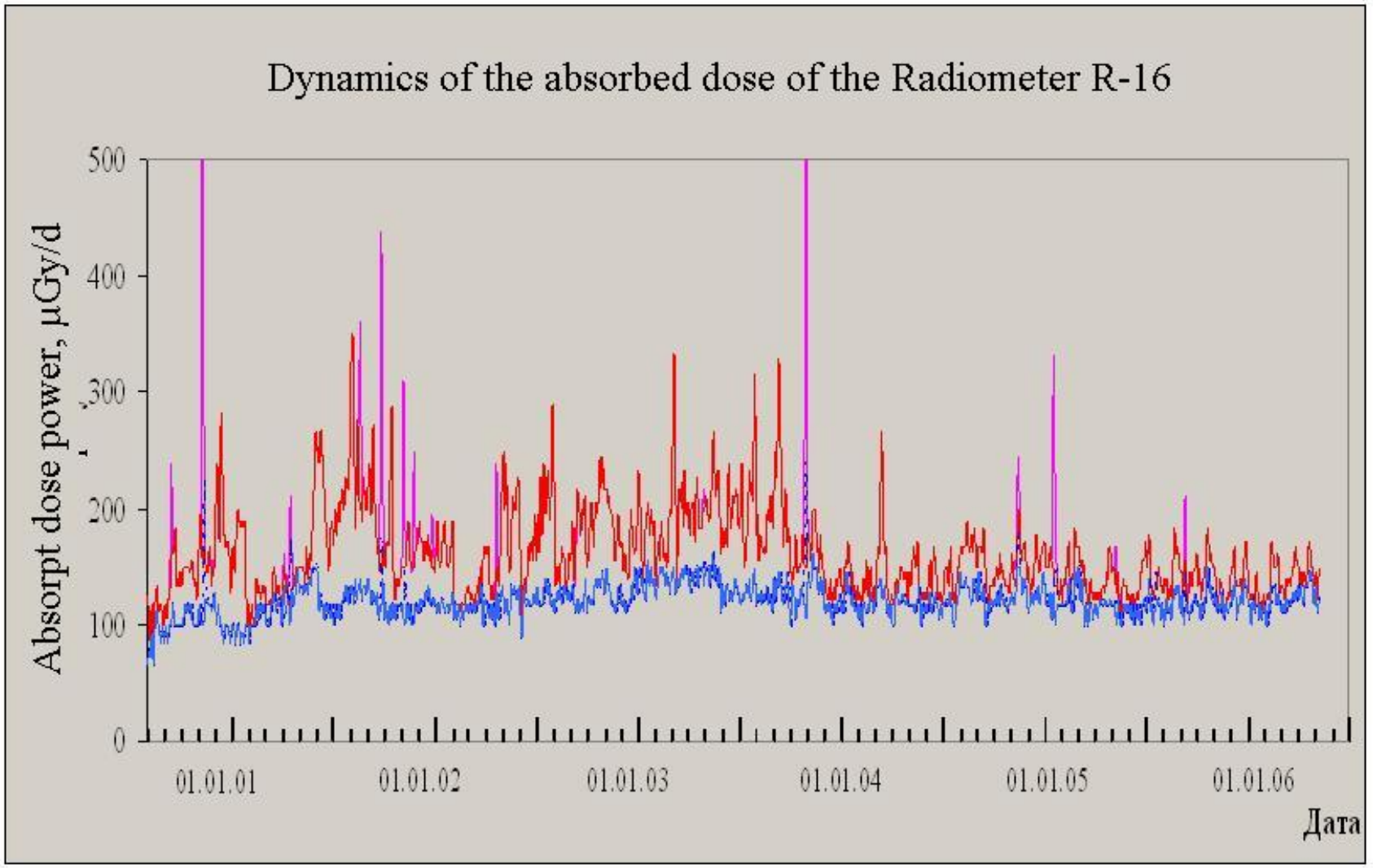
The result of the laboratory

Dynamics of radiation power dose on ISS for the period of 2000-2006



Summary characteristics of the radiation conditions of the environment of orbit cosmic crew

- ***OS «MIR» - absorbed power dose (PAD) – 50-80 μ Gy/day, and absorbed dose (AD) of crew member from 1 mGy to 10-15 cGy.***

  ISS: PAD 50-350 μGy/day, ***AD from 1μGy to 3 cGy***

- ***The content of the primary cosmic radiation:***

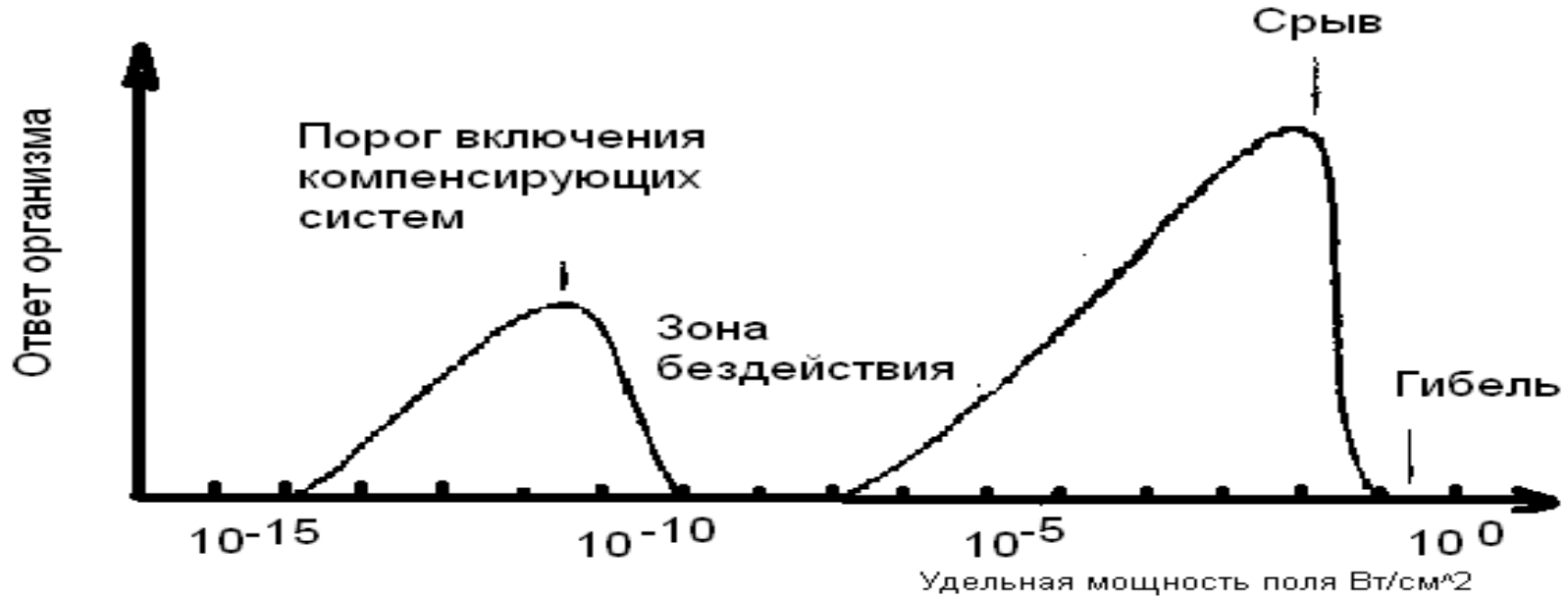
  protons RBE with the energy E from 70 to 500 MeV;

  multi-charged ions with E to 1000 MeV/nuclon;

  electrons with energy E 100 keV to 10 MeV.

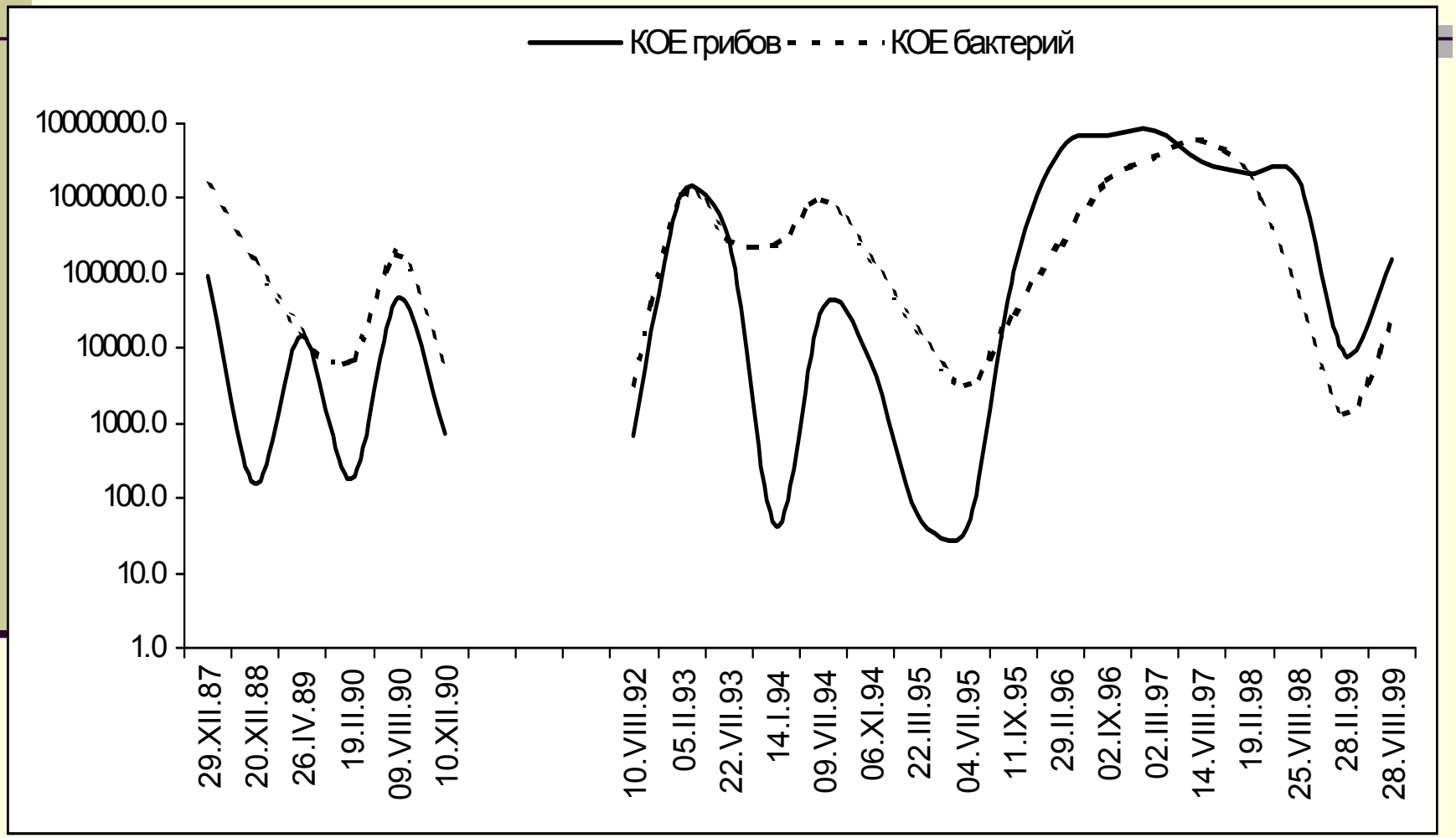
  primary and secondary neutrons E in range from thermal energy to 10 MeV, density flux from 0,1 to 30 particles/s sm^2

Bimodal curve of living systems reaction on the outer energy factors (from L.D. Kislovskyi in «Biological effect of EMF». 1984.)

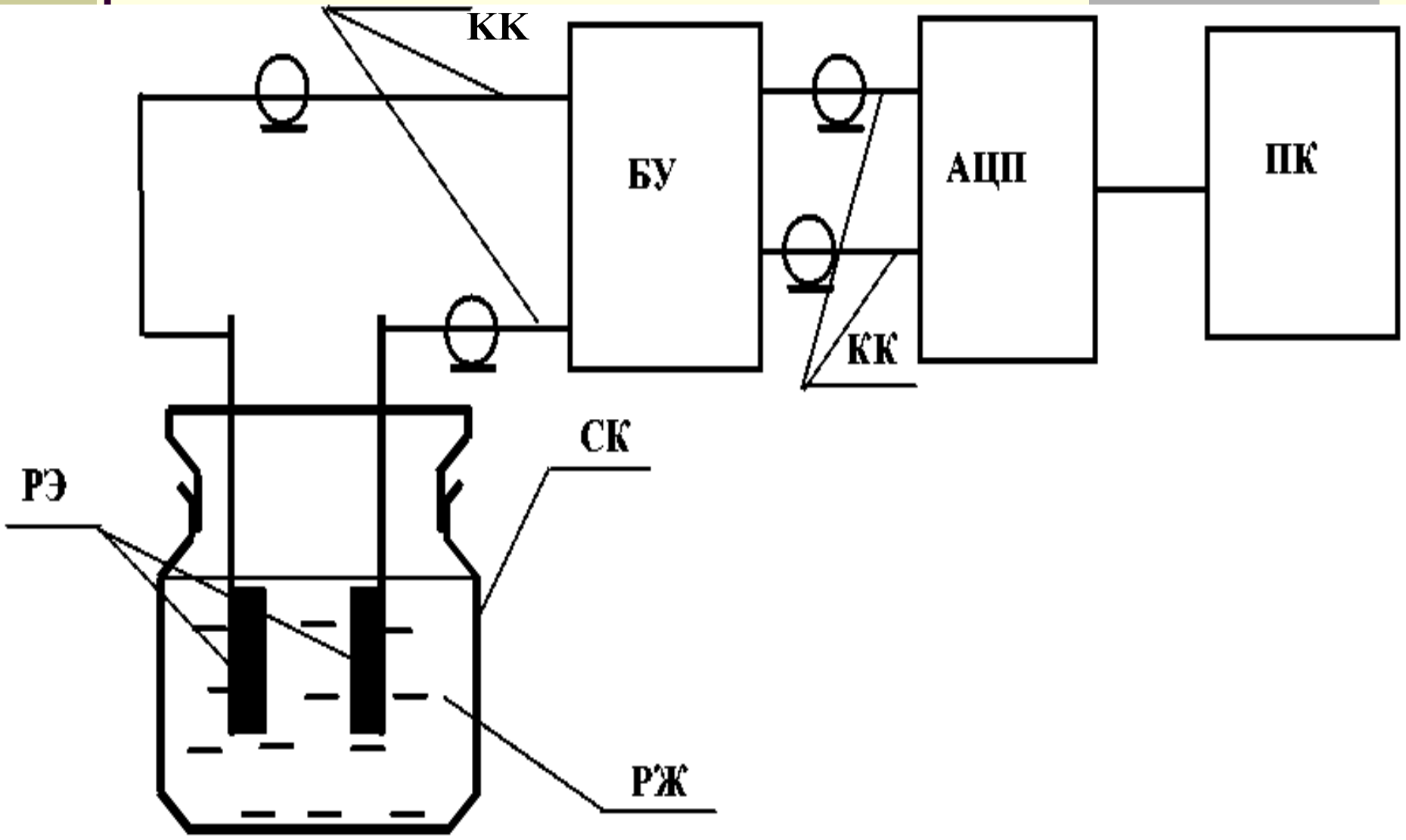


Фазовая реакция сложной системы на возрастающий стимул

Dynamics of compartment contamination of OC MIR by microbe association

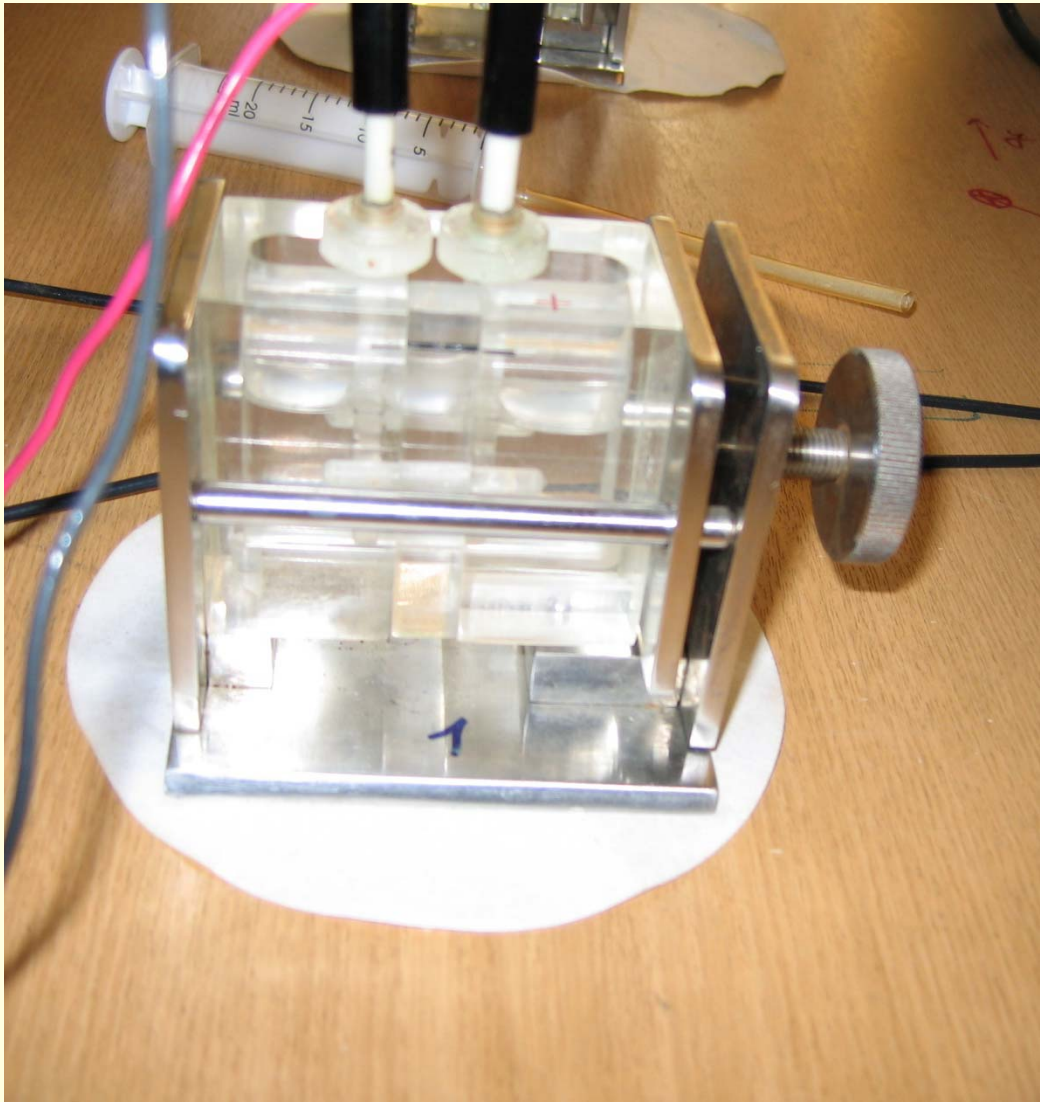


Plan of setting: IB – intensifying block; WL – working liquid – water; WE – working electrodes; GC – glass cells; CC – coaksial cable; ADR – block of amplitude-digital reformer; PC – personal computer



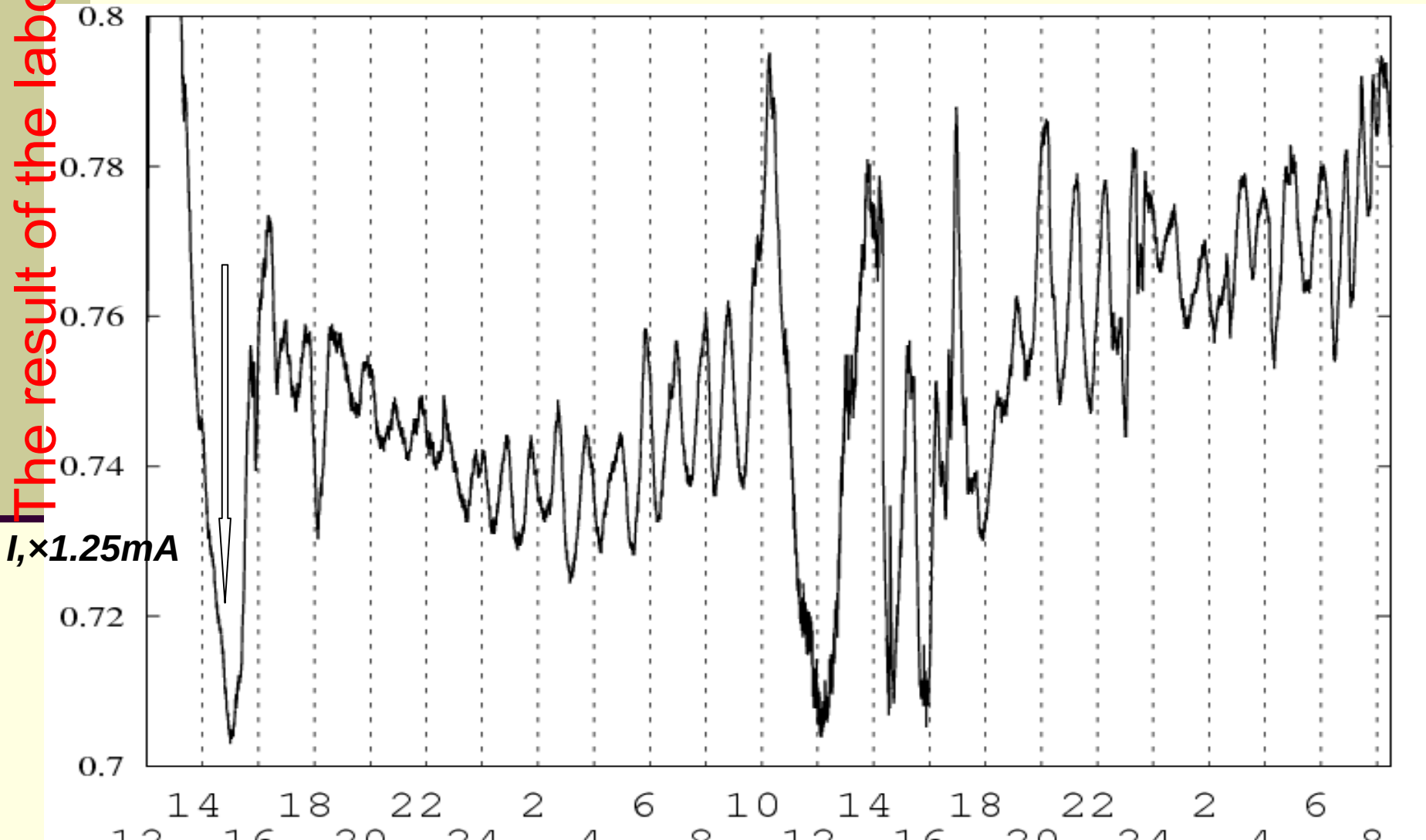
The result of the laboratory

Electrochemical cells



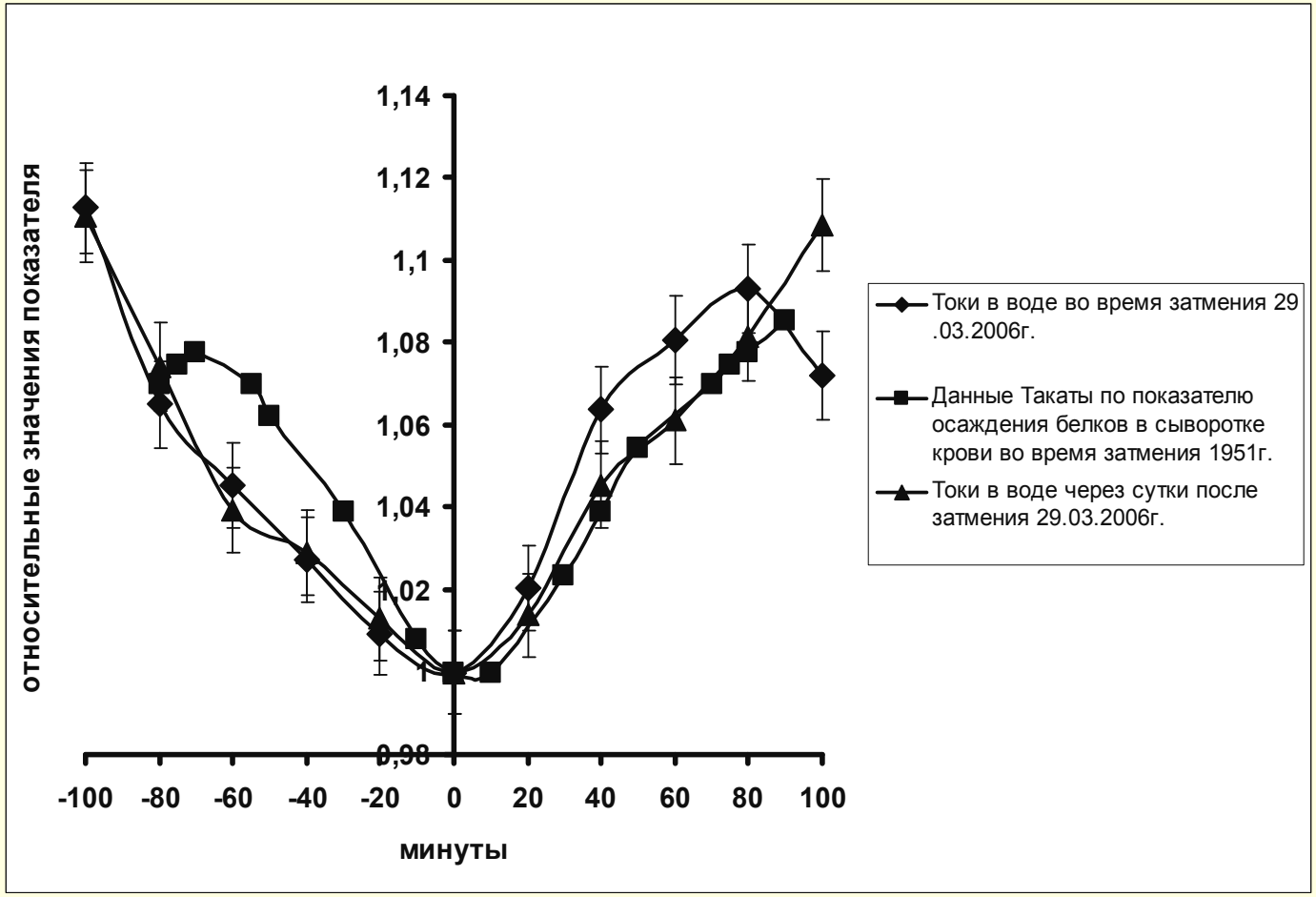
The temporal course of electric currents in time and at once after the solar eclipse occurred in Moscow 15:06. 29-th of March 2006

The result of the laboratory



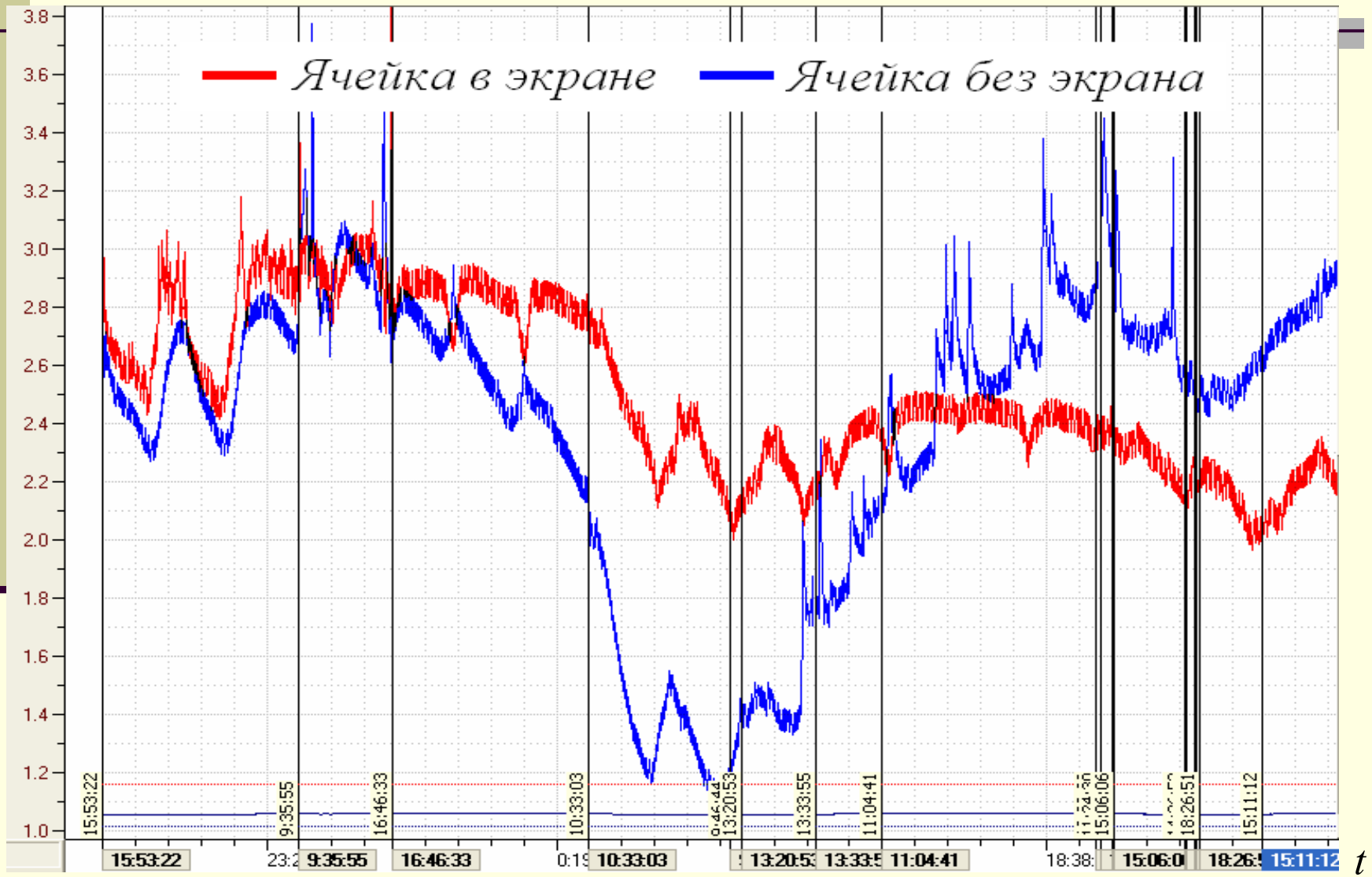
The result of the laboratory

Precipitation of blood serum protein (Tokata,1951) and dynamics of electric currents in the cell 29 th of March 2006

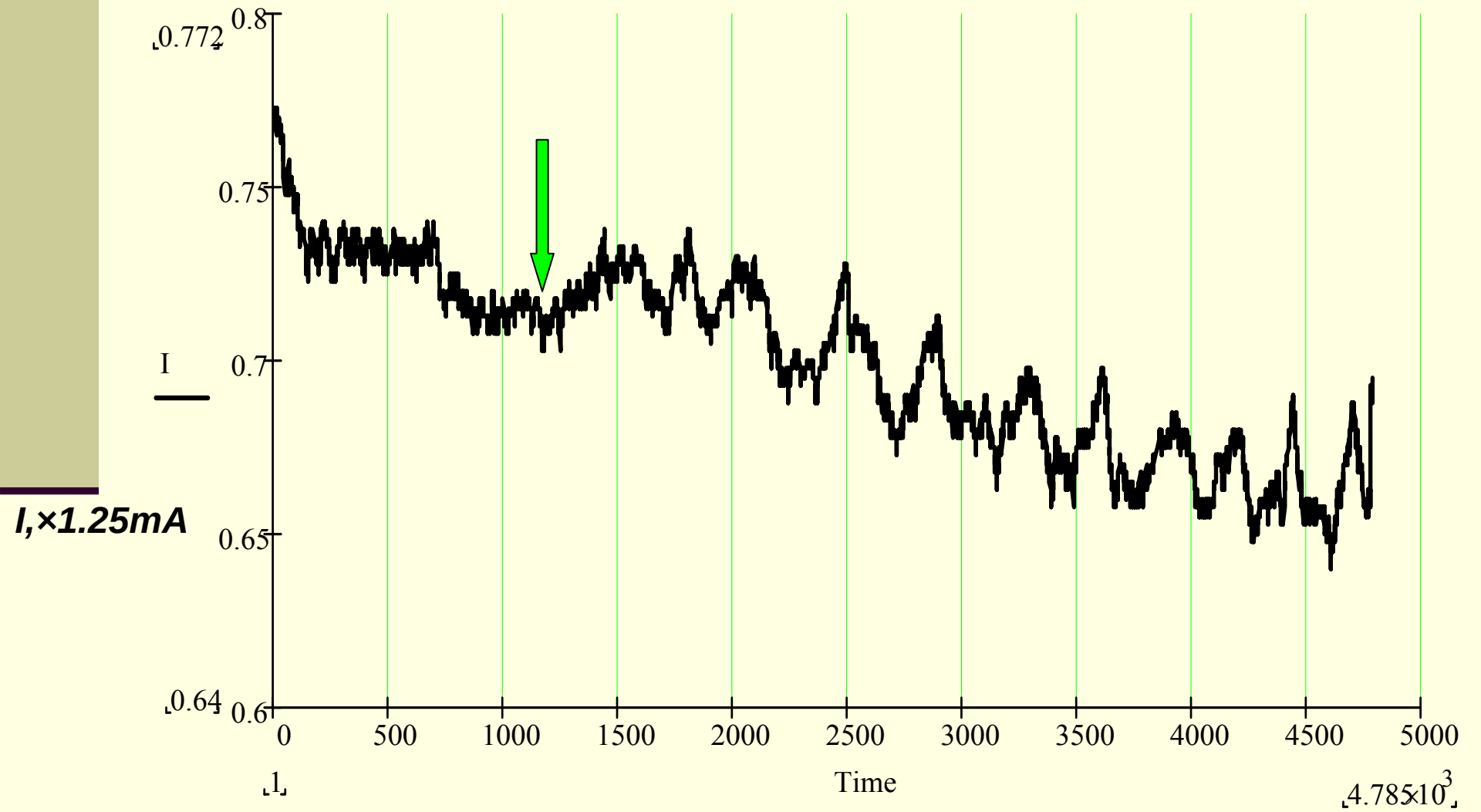


Dynamics of currents in screening and non-screening electrochemical cells during the dodging of Eyjafjallaiekull volcano

I x *0,5мВ*

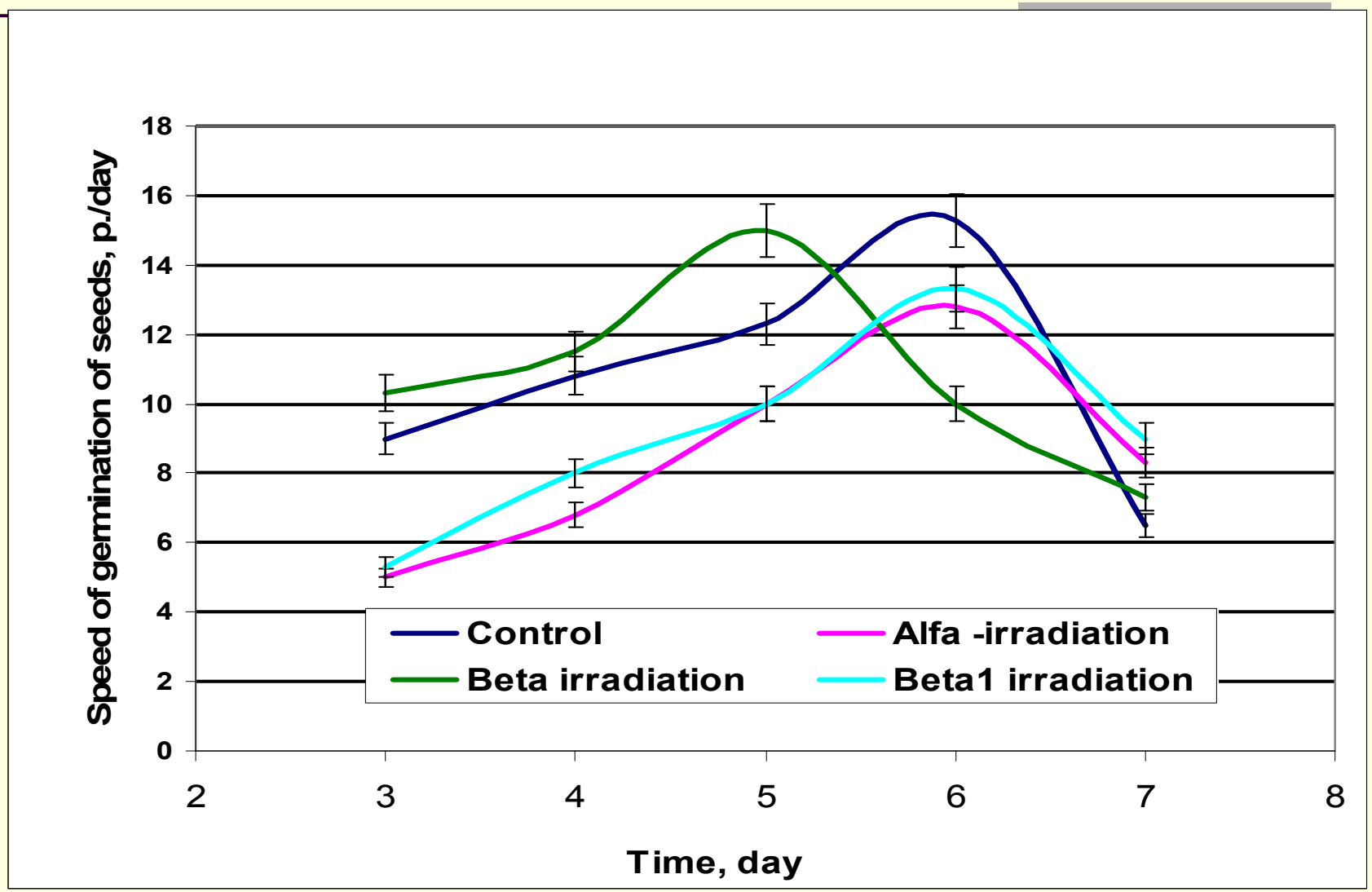


The course of electric current in water in electrochemical cell after the earthquake on Sumatra 13-th of September 2007

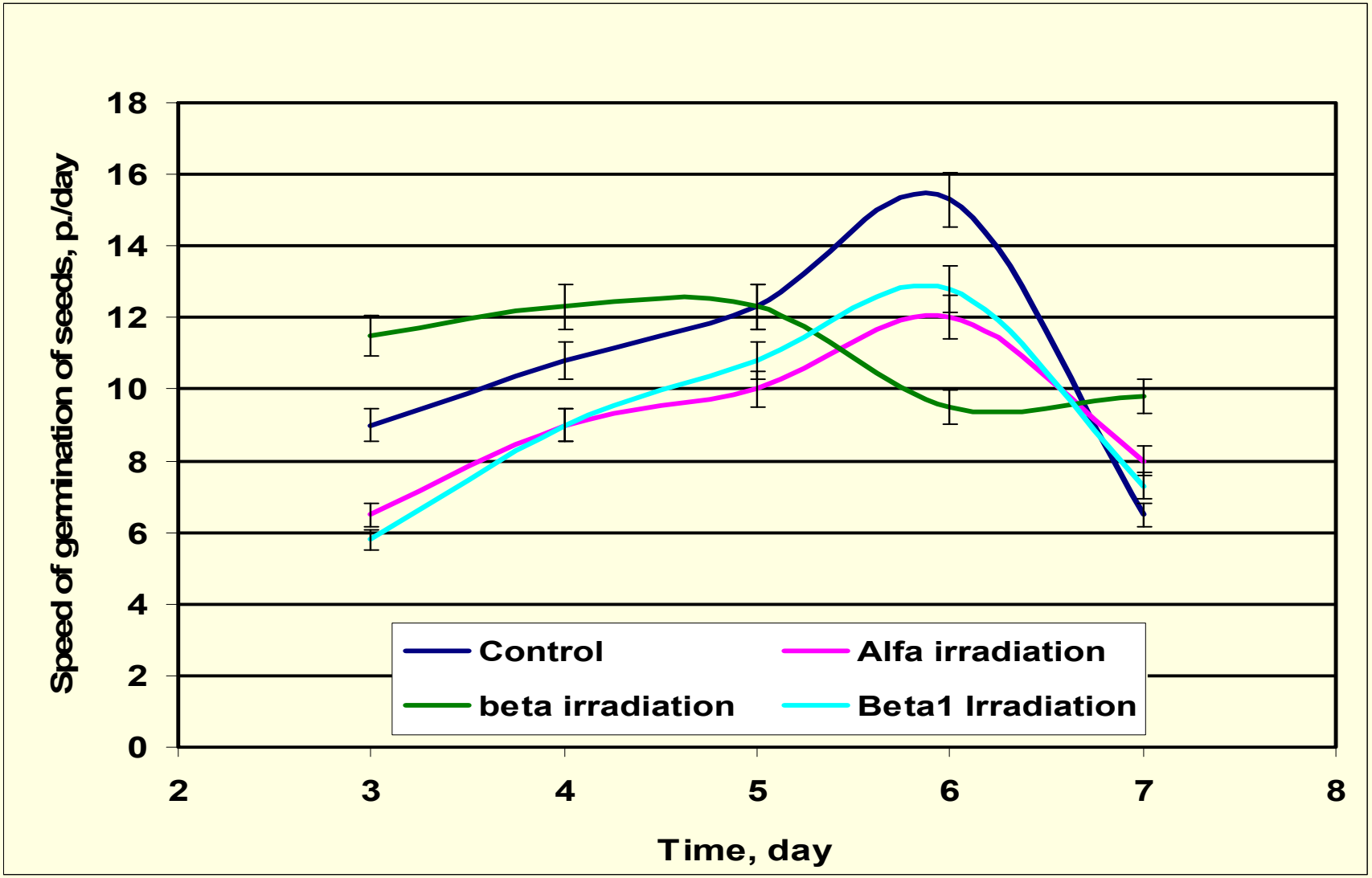


It is established that in dry seeds of the highest plants wetting in water of preliminary irradiation at low doses α- and γ-particles <10 cGy (over nature radiation background in 100-500 times) and accommodating in hypomagnetic camera (induction of magnetic field in 200-300 times lower geomagnetic) the germination of seeds was higher approximately twice under γ-radiation. The low doses of γ-radiation decreased and α- radiation increased a negative influence of hypomagnetic field on the seeds and the development of germinating seeds.

Dynamics of growing radish seeds in radiation water



Dynamics of growing radish seeds wetting indirectly radiation water

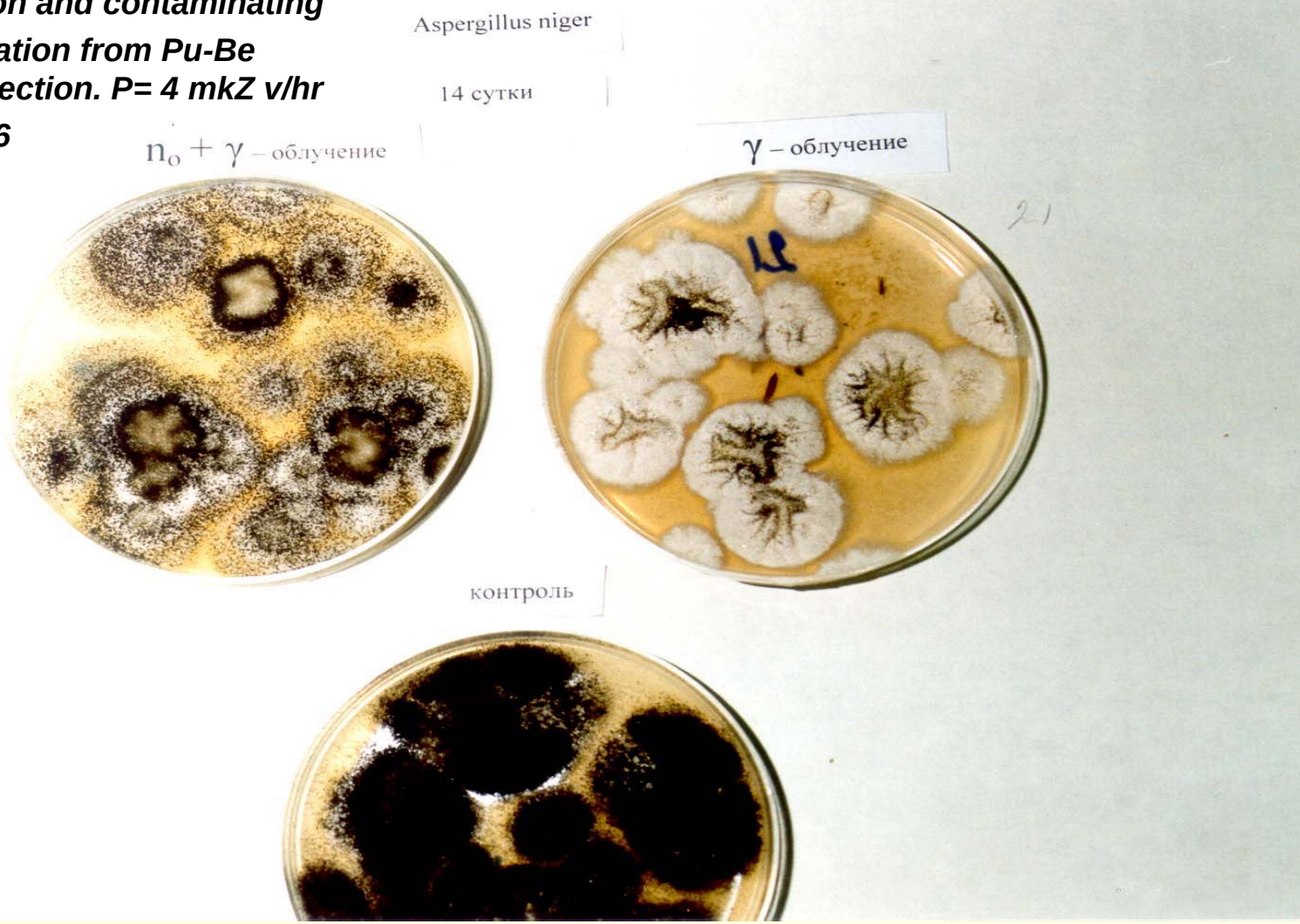



МАРС - ВРЕМЯ ПОШ
Февраль
Март
Апрель
Май
Июнь
Август
Сентябрь
Октябрь
Ноябрь
Декабрь

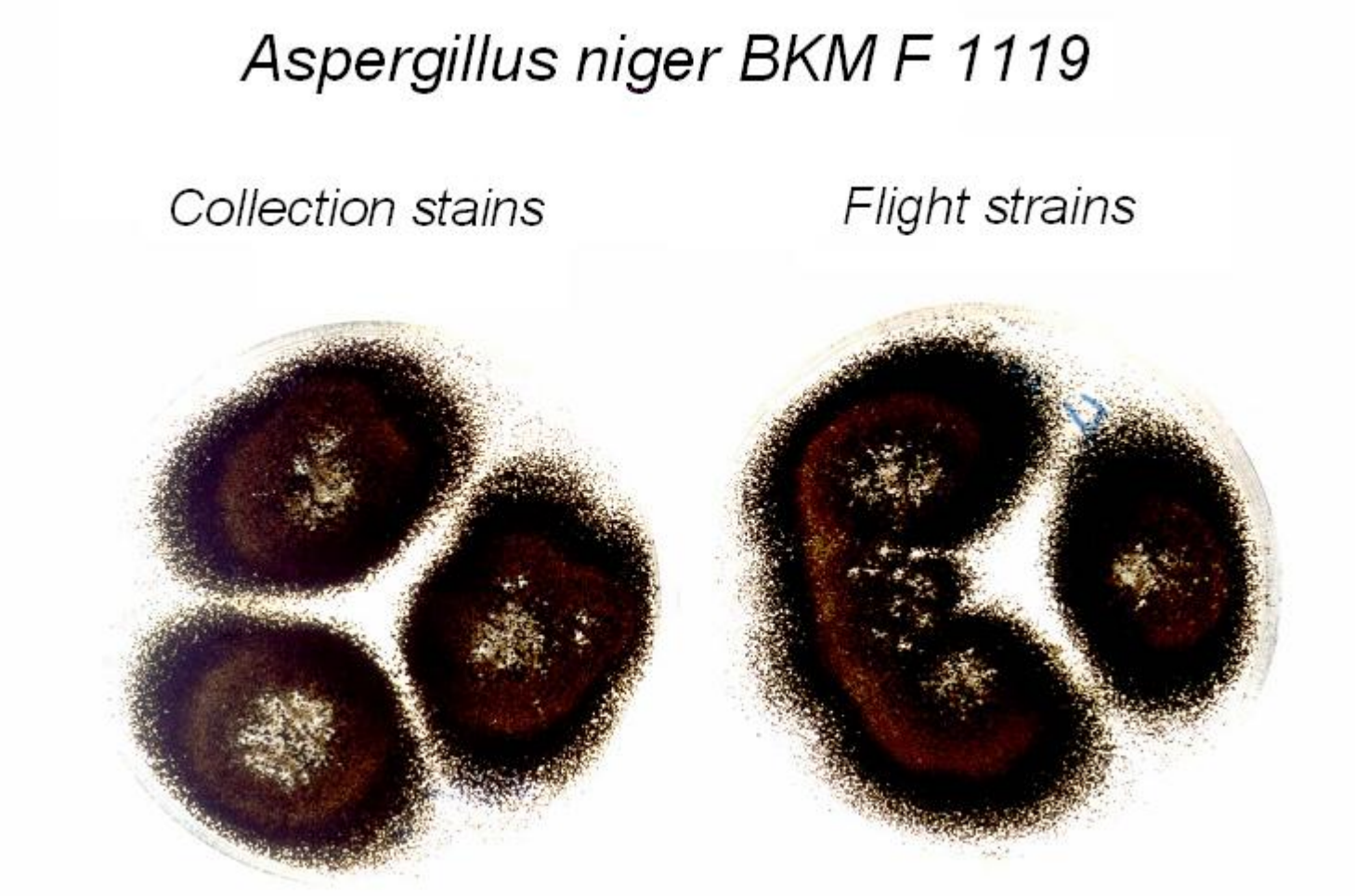
- **Low γ-neutron radiation doses provoked the increasing of biomass of *Aspergillus niger* that corresponds the radiation hormezis. Moreover there are some deviations in morphology of supporting cell and numerous head falls of *Aspergillus niger* under γ-neutron radiation.**

Radiation effects of flight strain micromycets *Asp. Niger* by neutron and gamma-emanation on Earth on the 14-th day of exposition

- ***Under neutron and contaminating***
- ***Gamma-radiation from Pu-Be source in protection. P= 4 mkZ v/hr***
- ***N= 1,8 n/s026***



Development of flight and cjkkection strains of micromycets *Asp.niger* in control



- **Spontaneous motion activity of spirostoms (*Spirostomum ambiguum Ehrbg.)* accommodated in the water processing by mixed γ-neutron radiation decreased twice that testified the fact that the definite factor of γ-neutron radiation effect is the changing of water medium condition.**

Data of measurement of IMA Spirostomum ambiguum Erbg.

№ series of test	Conditions of processing water and condition of exposition *Spirostomum* in it	Control	Radiation effect,%		Date of the test
			Alfa-particle	Beta-particle	
1	Water and *Spirostomum* under radiation during 20 min	16,0±1,0 17,0±1,2	151 164	142 145	03.03.2004г. 12.05.04
2	Water under radiation during 20 min, then *Spirostomum* were accommodated in it	14,8±1,0 18,6±1,1 17,0±1,5	81 55 134	89 80 170	14.04.2004г. 26.04.2004г. 12.05.2004г.
3	Water distantly processing during 20 min by preliminary irradiated water	14,8±1,6 18,6±1,8	81 75	- 85	14.04.2004г. 26.04.2004г.
		15,1±1,4	Combined radiation alfa- and beta-particles 136		12.05.2004г.
4	Water processing during 20 min distantly via screen by the water preliminary irradiated during 20 min by alfa-and beta-particles	15,1±1,7	Combined radiation alfa- and beta-particles 96 108		12.05.2004г.

The diagram of the main stages of biological oxidation in mithochonria

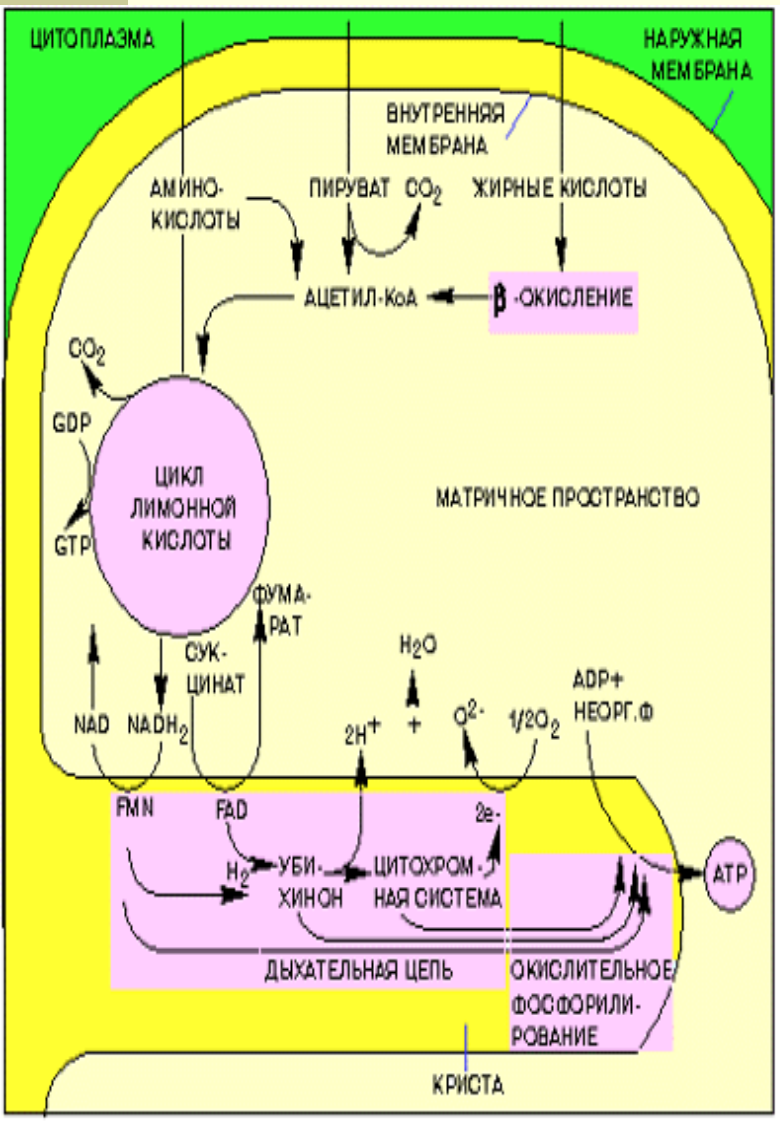


Схема важнейших этапов биологического окисления в митохондрии.

(Schmidt R.F., Thews G., "Human Physiology", 1983.)

The daily oscillation of water redox-potential evoked by excitement of electron membrane by electromagnetic radiation of geosphere and the environment in whole. Transport of electrons via mitochondria membrane of living cell can increase due to the outer effect of electron-donor factors.In case of the radiation effect in biological mediums redox-potential and electron-donor background are increased that can reduce the process of oxidative phosphorilation on the inner mitochondria membrane.

As it is known the electrons are generated in consequence of the excitement and ionization of water under the effect of ionized and electromagnetic fields. The universal receptor of these fields and their amplifier is water, more specifically the water medium of living organisms. Under the radiation the number of exciting water molecules are increased, the capacity of giving the electrons, the value of redox-potential and dissolving properties of water are changed. Redox-potential characterizes the state of inner biological medium of organism. It operates the transport of electrons and protons in liquid mediums of organism. Under the penetration of exciting molecules of water into the cells the cytoplasm and organelles water medium and biochemical functions taking place there are activated. Under the effect of low fields of ionized radiation the reduction properties of water, the chemical electron activity, the current are increased, the value of redox-potential is changed and the cell damage, the decreasing of ATP level and the increasing of electron density and selectivity to Na^+ are occurred that are accompanies with the pathological swelling of injuring cells which degree of swelling depends of the Na^+ level in environmental medium. The desorption of water and K^+ are occurred and the cell death become.

- **In model experiments under acute effect in low doses (<300 mkGy) of ionized radiation redox-potential decreases. During the period after the radiation (10-20 min) in dependence of power of accumulating dose redox-potential can exceed the initial meaning of water before the radiation that creates preconditions of possibility of radio-resistance regulation.**


Thanks for your attention