

The environment isotopy and the evolution of biosphere.

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There is a great deal of knowledge on biofractionation of isotopes as well as on the very nature of this phenomenon [Vernadsky-1926, Vinogradov-1957, Galimov-1981].

This report deals with evaluation of a tight link between the environment isotopy and the level of the "living substance" reproduction during a certain geological time intervals. In particular, one of the most massive extinctions of living organisms in entire Earth natural history had happen nearby the Perm-Trias border which corresponds to a marked change in the atmosphere isotopy towards ¹³C content decrease [1]. This change mentioned had caused, presumably, by a catastrophic yield of CH₄ from the World's Ocean bottom. The isotopically light methane oxydizes into even a more isotopically light carbon dioxide with its a following photosynthesis-directed incorporation into a biosphere. This should affect the cell differentiation mechanisms requiring a definite ¹³C content needed for a normal DNA functioning. The cause of it could be specified as this:

A new standpoint on the nature of blastomer determination is in a focus of present study. According to the concept proposed, a key initiatory role in this phenomenon belongs to the isotopy conformational effect originated during a non-equal distribution of the isotope-different nucleotide forms among a pair double-helical DNA chains. In a course of this study, a regularity of the high-ordered conformational polymorphism self-organization has been found for chemically identical blastomer DNA species in a closed (self-isolated) zygote cleavage cycle. This leads to conclusion regarding the individual distribution of the DNA genetic activity expression in blastomers which corresponds to a DNA conformational status.

A mutual correspondence between experimental data and a whole concept related conclusions is now treated in the light of a cause-consequence relations to an ontogenetic nature of cell differentiation deriving it from molecular interactions conformational principle. Taking into account everything stated above, it should be logical to come up with a conclusion on either random or not a coincidence of the biosphere isotopy change and the evolution processing really was.

References

[1] Galimov Eric M., The biological fractionation of isotopes, Moscow, "NAUKA", 1981 (in Russian).