

P33**Is the terrestrial genetic code universal all around the universe?**Vladimir I. *sh*Cherbak

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Science is longing for a simple and strict arrangement of its underlying items. So a considerable amount of chemical elements was tabled by Dmitri Mendeleev, using the mathematic notion of the natural sequence as a general systematization principle. Much later Murray Gell-Mann classified the elementary particle “zoo” by means of the mathematic notion of symmetry. It was obvious *a priori* that those arrangements would be valid everywhere in the universe and not just on the earth.

There are 192 bases gathered in triplets, 20 amino acids, and 2 syntactic signs within the genetic code. So far, that manifold has not been concerted suitably. Almost half a century ago the idea of chemical evolution waited for the newly deciphered code as a future paradigm of its origin. The Procrustean bed of the paradigm is improper for detecting any general law, similar to those mentioned above.

The origin of the genetic code in primordial conditions of the earth is still an outstanding problem. If the problem were transferred from the earth somewhere else in the universe, its solving becomes even more difficult. Therefore, one should continue to study the local version of the genetic code whose universality applies to the terrestrial beings only. Even if anyone imagined that this version is not local, such idea will be impossible to prove when only terrestrial samples are on hand.

However, this opinion seems to be not quite correct. It turned out that the genetic code is, first and foremost, a perfect alphabet of an algorithmic language that retains neatly both genetic semantics and underlying abstracts of arithmetic (*sh*Cherbak, 2003). Such essence of the genetic code became apparent due to the new paradigm. Namely, arithmetic is the only tool for producing information systems of extremely high efficiency. Life, being an information phenomenon, could use arithmetic for the sake of control, safety, and precise alterations of its genetic texts. Recall a linguistic milieu of genetics is an appropriate habitat for arithmetic power. In this case, the underlying abstracts of arithmetic should be incorporated into the alphabet, *i.e.* the genetic code.

There are the zero, notions of number, decimal numerical system, *etc.* among arithmetic abstracts incorporated into the genetic code. Moreover, remarkable physical relations are superposed perfectly onto the abstracts. The cooperative symmetry of the genetic code – one of the newly revealed regularities – entirely depends on the abstract position of zero that anticipates the beginning of the natural sequence. What a strange origin the genetic code should have in order to be determined by the sign for nothing? Clearly, the chemical evolution does not describe this history. (*sh*Cherbak, 2005).

Let us go back to the question in the title. The chemical evolution, whatever time length, cannot stumble upon the abstracts of arithmetic and set them going. Therefore, the origin of the genetic code hardly ever went through chemical evolution on the earth or somewhere else in the universe. Seemingly, the genetic code originated as pure information under more mysterious circumstances than a casual interaction of terrestrial molecules. The genetic code, probably, is not universal all the universe, but what is no doubt is that its new charm did not extend only to the life on the earth.

*sh*Cherbak, V. I., 2003. Arithmetic inside the universal genetic code. *BioSystems* 70, pp. 187-209.

*sh*Cherbak, V. I., 2005. The origins of life and arithmetic zero. *Book of Abstract ISSOL'05*, Beijing.