

energy density of the scalar particles, which is initially encoded at the singularity, is deduced. An informational aspect of the problem is discussed. As a result, we have demonstrated that the momentum wave packet could be well-defined at the cosmological singularity so that: 1) some amount of matter could be «placed» at the singularity, and, thereby, 2) some information could be encoded into it. It is not a creation of the particles from vacuum, because a vacuum does not exist before the field oscillators begin to oscillate. Creation of particles from the vacuum is widely considered at 1960th. However, the amount of matter occurs to be very low for the power law expansion including the linear expansion in cosmic time. From the other hand, a vacuum could be defined only after the moment when the field oscillators begin to oscillate, that is relatively far from the singularity. In contrast, in the approach considered it seems evident that one could place any amount of matter and information into the singularity.

We have considered only an illustrative example with the simple formulas. However, it could be a prototype of how really information about Everything could be stored at the singularity [1].

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Ishchenko O. O., Volkov R. A.

Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine,
e-mail: r.volkov@chnu.edu.ua

APPLICATION OF 5S rDNA FOR PHYLOGENY RECONSTRUCTION IN *ACER* AND *DIPTERONIA*

The genus *Acer* is one of the biggest ones in the family Sapindaceae. The taxonomic history of the genus is complicated involving numerous rearrangements of species into different sections or even in separate genera. One of the most surprising recent findings is that the related small genus *Dipteronia* (2 species) should be placed into *Acer* [1], although these two genera clearly differs morphologically.

The phylogeny of genus *Acer* still remains poorly studied at the molecular level. The 5S rDNA represents a useful tool for molecular taxonomy [2]. However, the molecular organization of this genomic region remains insufficiently studied for representatives of the genera *Acer* and *Dipteronia*. Therefore, we cloned and sequenced the 5S rDNA intergenetic spacer region (IGS) of six species of genus *Acer* (*A. campestre*, *A. cissifolium*, *A. morofolium*, *A. negundo*, *A. platanoides*, *A. pseudoplatanus*) and one species of *Dipteronia* (*D. sinensis*).

Our data show that the IGS of *Acer/Dipteronia* contain sequence motives, which are similar to that ones, involved in 5S rDNA transcription regulation in species representing other families of angiosperms [3]. These motives include putative “TATA”-box, GC and C elements, which are necessary for transcription initiation, as well as “Oligo-T region” required for termination.

Among the species studied the highest level of IGS similarity – 96.7% – was found between *A. campestre* and *A. platanooides* (section *Platanoidea*) whereas the lowest level – 50.2% – was observed between *A. negundo* (sect. *Negundo*) and *A. pseudoplatanus* (sect. *Acer*). The sequence similarity between *D. sinensis* and species of *Acer* ranges from 64.5 (*A. morofolium*) to 91.4% (*A. cissifolium*). On the phylogenetic ML-dendrogram *D. sinensis*, *A. cissifolium* and *A. negundo* were combined in the same clade with the boot-strap support of 73. Hence, our novel data strongly support the proposition that the species of *Dipteronia* should be replaced into genus *Acer* in spite of morphological difference.

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Tynkevich Y. O., Gerasymchuk I. V., Volkov R. A.

Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine,
e-mail: r.volkov@chnu.edu.ua

5S RIBOSOMAL DNA OF DISTANTLY RELATED *QUERCUS* SPECIES: MOLECULAR ORGANIZATION AND TAXONOMIC APPLICATION

The genus *Quercus* (oak) is a widespread and economically important genus of tree plants. The intrageneric taxonomy of this group remains controversial due to widely distributed interspecific hybridization and convergent similarity of morphological traits. Further progress in this problem requires application of molecular methods. Still, cpDNA-based markers were mainly used in taxonomic studies of *Quercus*. However, considering the role of reticular evolution in oaks phylogeny [1], wider use of nuclear markers appears to be desirable.