

CONTRIBUTION OF THE 5S RIBOSOMAL RNA FOR UNDERSTANDING OF MEGAEVOLUTIVE EVENTS

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The ribosomal RNAs, including 5S ribosomal RNA, have been extensively used as molecular-clock for phylogenetic aims and for dating events of evolutionary divergence, markedly when the fossil record is incomplete or discontinuous. So, the paleontologic investigation and the research in molecular evolution have advanced together improving and recovering the history of life on the Earth. Different dimensions of the evolutive process (microevolution, macroevolution (speciation) and more seldom megaevolution) have been approached in studies on molecular evolution whose main goal has been to establish evolutionary relations based on phylogenetic trees. Traditionally, divergence events separated by long intervals of time are elucidated by the fossil records. Such events (megaevolutive) reflect as a rule the temporal dimension of the evolutionary process related to the increasing macroscopic complexity of biomorphological and phenotypic pattern. On the other hand, studies based on 5S rRNA have demonstrated that the changes fixed on the molecule over geological time, calibrated according to the oldest fossil evidences phenotypically similar to modern forms, occurred in parallel with increasing organismic complexity within well established strains of animals and plants. In addition, the 5S of vertebrate animals and embriophytes exhibited divergent pattern revealing that in the former, the modifications fixed on their 5S rRNAs led to gradual increase in its structural and thermodynamic stability, while in the plants, on the contrary, 5S rRNAs became more and more labile, despite the wide range of terrestrial habitats occupied by the ancient and modern embriophytes. Acknowledgment : FAPESP