

Poster presentation

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Chaos game representation of mitochondrial DNA: is it useful in phylogenetic studies?

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Chaos Game Representation (CGR) is an iterative mapping method which can convert a nucleotide sequence to a unique and scale-independent image. There are some studies indicating different applications of CGR images of nucleotide sequences but there is still limited information on their possible application in phylogenetics. In this study we have tried to have an evolutionary evaluation of CGR images of mitochondrial DNA (mtDNA) in different species using different image processing tools. In this study the algorithm of chaos game for four points as four bases in nucleotide sequences were coded in Matlab 7.0 language licensed by the Mathworks Inc. <http://www.mathworks.com>. We produced CGR images of complete mtDNA genomes of 15 species. We used different methods of image processing for comparing these images in different species. Our results showed that there is some evolutionary information in CGR images of mtDNA. In CGR images of a DNA sequence both global and local patterns are displayed. These images allow us to investigate patterns in the sequence and help our eye to recognize hidden structures. Our results indicated that CGR images of mtDNA may be useful tools in phylogenetic studies although we need more studies to build a hypothesis about possible applications of these images in molecular evolutionary studies.