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Effects of resource competition on evolution and adaptive radiation

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The study is devoted to entanglement of population dynamics, evolution and adaptive radiation for the species sharing common resources. For the population dynamics we modify the competitive Lotka-Volterra equations introducing a new resource contest principles. The functional response of the model differs from linear and ratio-dependent functional response. We implement realistically the effects of beneficial and deleterious mutations on the coefficients in the equations governing the population dynamics and consider the spontaneously occurring reproductive isolation. To trace the phylogeny relations in the evolving ecosystems, we use the effective digital genomes and then use the flexible molecular clock technique. The proposed model is in agreement with the competition exclusion principle and no vacant niche axiom. We demonstrate the mechanism that contributes to prevention of the genomic decay: the competition and selection between the recently diverged species/populations. We demonstrate that the large resource influx and fast speciation are favorable conditions against the genomic decay. The model predicts that in the case of several constant in time resources one observes very rapid specialization and in the unstable environment the omnivory strategy was preferable.

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Choix de session parallèle

2.4 Fluctuation et biologie

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