

Critical comments to the tradeoff theory for lifespan and sexual reproduction

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SUMMARY

The tradeoff theory for lifespan and sexual reproduction postulates that the latter results in genomic diversification. However, this is not true for autogamy in *Paramecium*, which usually results in genetically identical progeny and yet marks a new life cycle, resetting the developmental time to zero. I propose that the original form of sexual reproduction was the genomic alternation between diploid and haploid, which had nothing to do with genomic diversification. For early eukaryotes with huge haploid genomes, diploidization was an adaptive means to protect from harmful mutations, and haploidization was a process to evaluate the accumulated mutations. The simplest form for diploidization is genomic duplication (Du) and that for haploidization is distribution of the duplicated genome (Di), the common process of asexual division of haploid cells. If Du is repeated in the haploid division cycle, the resulting $Du \rightarrow Du \rightarrow Di \rightarrow Du \rightarrow Di$ cycle is the asexual division of diploid cells. If Di is repeated in the diploid division cycle, the resulting $Du \rightarrow Di \rightarrow Du \rightarrow Di \rightarrow Di$ cycle is the asexual division of haploid cells. Therefore, diploidization connotes fertilization, and haploidization connotes reduction division, which later evolved into authentic sexual reproduction involving genomic diversification.