

- Title:** Using bees hill flux balance analysis (BHFBA) for in silico microbial strain optimization
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- Abstract:** Microbial strains can be manipulated to improve product yield and improve growth characteristics. Optimization algorithms are developed to identify the effects of gene knockout on the results. However, this process is often faced the problem of being trapped in local minima and slow convergence due to repetitive iterations of algorithm. In this paper, we proposed Bees Hill Flux Balance Analysis (BHFBA) which is a hybrid of Bees Algorithm, Hill Climbing Algorithm and Flux Balance Analysis to solve the problems and improve the performance in predicting optimal sets of gene deletion for maximizing the growth rate and production yield of desired metabolite. *Escherichia coli* is the model organism in this paper. The list of knockout genes, growth rate and production yield after the deletion are the results from the experiments. BHFBA performed better in term of computational time, stability and production yield.