

# LIMITING THEOREMS ASSOCIATED WITH TWO-PARAMETER POISSON-DIRICHLET DISTRIBUTION

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**Abstract:** Two-parameter Poisson-Dirichlet Distribution arises naturally in Bayesian statistics, macroeconomics, ecology, genetics, and physics. Comparing to the one-parameter (population size parameter) Poisson-Dirichlet distribution, the role of the additional parameter is to redistribute the masses evenly. Limiting theorems such as large deviations will be presented for the two-parameter Poisson-Dirichlet distribution and two-parameter Dirichlet process. The motivation for these results is to understand the differences between the two-parameter models and their one-parameter counterparts when the population size is large. New insight is obtained about the role of the additional parameter through a comparison with the corresponding results for the one-parameter Poisson-Dirichlet distribution and Dirichlet process.