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Stochastic Modeling of a Shrimp-Octopus System under External Environmental Effects

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Abstract

The objective of this study is to introduce the effect of external factors that can disrupt the balance of the mathematical model of Shrimp and Octopus populations, making the modeling more realistic. To achieve this objective, we determined the equilibrium points of the system and tested their stability. We then introduced the stochastic term, which ultimately allowed us to find more reasonable results.

This study gave us the opportunity to predict the influence of external factors on population development. We were able to distinguish the difference between deterministic and stochastic models using numerical simulations, which showed us the importance of integrating random effects into mathematical models.

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