ON THE EQUILIBRIUM POINTS OF THREE MUTUALLY COMPETING, SYMMETRIC AND CONTINUOUS TIME REPRODUCING ORGANISMS

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ABSTRACT

This work deals with the problem of three mutually competing species within a stable ecosystem. The model is represented by a system of non-linear ordinary differential equations. As much as six non-extinction equilibrium states have been obtained depending on the value of various interaction or efficiency parameters. A set of numerical schemes for the discrete solution of the resulting system have been developed using the technique of non-local approximation and renormalisation of the denominator function which are the bedrock of non-standard finite difference method. The new scheme confirms that the analytic equilibrium points of the system compares favourably with a Runge kutta scheme of order four.

Keywords: Mutually competing, Continuous time reproducing organism, Nonstandard Method, Equilibrium point, Non-local approximation.