Numerical study for fractional model of non-linear predator-prey biological population dynamical system

ABSTRACT

The key objective of the present paper is to propose a numerical scheme based on the homotopy analysis transform technique to analyze a time-fractional non-linear predator-prey population model. The population model are coupled fractional order non-linear PDE often employed to narrate the dynamics of biological systems in which two species interact, first is a predator and the second is a prey. The proposed scheme provides the series solution with a great freedom and flexibility by choosing appropriate parameters. The convergence of the results is free from small or large parameters. Three examples are discussed to demonstrate the correctness and efficiency of the used computational approach.

Keyword: Homotopy analysis transform technique; Biological systems; Fractional non-linear predator-prey population model