Adomian Decomposition and Variational Iteration Methods for Solving a Problem Arising in Modelling of Biological Species Living Together

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Adomian decomposition and He's variational iteration methods are analytical techniques, which can be used for solving various kinds of problems. The main property of these methods is in their flexibility and ability to solve nonlinear equations accurately. In this paper, the decomposition method and the variational iteration technique are explained, and their merits as well as their drawbacks are discussed. Then a new implementation of these methods is proposed, which yields an approximate solution with high accuracy in large regions and less computational efforts. A system of integro-differential equations arising in modelling of the biological species [1] living together is employed to show how these techniques work efficiently.