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Kailash C. Patidar* (kpatidar@uwc.ac.za), Department of Math. and Appl. Math., University of the Western Cape, Private Bag X17, Bellville 7535, South Africa, Bellville, RSA, and **Jo-anne Wyngaardt**, Department of Math. and Appl. Math., University of the Western Cape, Private Bag X17, Bellville 7535, South Africa, Bellville, RSA. *On the Validity and Order of Convergence of a Novel Numerical Method for Models in Population Biology.*

It is known that due to complex in nature, it is difficult to find the analytical solution of the mathematical models for various problems in population Biology. One can consider the example of an HIV model of two subtypes where (s)he is looking for co-existing equilibria. Though some qualitative properties can be used as some indicator to check whether the numerical method used to obtain some quantitative information is suitable for the underlying problem, it is not fully satisfactory unless one recognizes its order of convergence for the obvious reasons. It is to be remarked that due to the presence of various parameters in the model, the conventional methods tend to have a different order of convergence than one usually expect. At this stage one start doubting whether the numerical method is correct. To this end, we recall that the approach of finding the order of convergence which is known to many researchers is the one which incorporates exact solution. However, as we mentioned, we do not have exact solutions available all the times and therefore we propose another approach here to see appropriate convergence and then its order when applied to evaluate the steady-state solution of various interesting models. (Received July 31, 2007)