CHAPTER 5 DISCUSSIONS AND CONCLUSIONS

In this thesis, the tanh method is studied and used to solve the analytical solutions of the generalized Burgers–Huxley equation. It is found that this method give four closed forms for travelling wave of the generalized Burgers–Huxley equation. It is also verified that the tanh method is easy-to-use and straightforward to evaluate physically relevant solitary wave (pulse shape) and shock wave (kink shape) profiles for a long class of nonlinear partial differential equations.

Because of the knowledge of exact travelling waves obtained with the tanh method, the numerical method is constructed and used to determine the solution of the model to the first order in time and the second order in space. This method confirms to be much better in terms of numerical stability than the standard method based on the parameters used in the simulations. Comparisons of the numerical results with exact solutions show that the constructed method has the capability of solving the generalized Burgers–Huxley equation. All the numerical experiments were computed on a notebook computer with 2.10 GHz dual core processor and 2 GB RAM. The software used was MATLAB R2009b running under Windows XP Professional.

Finally, it is worth to mention that the tanh method is reliable and effective and gives several solutions. In further works, the tanh method will be used to establish more entirely new solutions for the generalized Burgers–Huxley equation in three-dimensional space (x, y and z coordinates) by introducing the new wave variable $\eta = \lambda x + \mu y + \tau z - ct$ [1].