Abstract

Mathematical models for predicting the plenum chamber temperatures developed by a solar tunnel dryer and the drying of Tilapia fish (*Oreochromis niloticus*) in the solar tunnel dryer was developed, and simulated in Visual Basic 6 (Microsoft Visual Basic 6.0™). Based on Student's *t*-test, the simulated and actual data for both plenum chamber temperature and moisture ratio did not differ significant at 5% level of significance. In addition, the simulated and actual moisture ratios showed similar trends, and reduced exponentially with drying time. Further, the performances of models at 10% residual error interval were 83% and 81% for plenum chamber temperature and moisture ratio, respectively. Finally, strong linear correlations existed between simulated and actual data for plenum chamber temperature ($R^2 = 0.961$), and for moisture ratio ($R^2 = 0.995$). Therefore, the model can be used to predict the drying of Tilapia fish in a solar tunnel dryer.