



A study on degradation kinetics of ascorbic acid in Amla (*Emblica officinalis*)

ABSTRACT

The kinetics of ascorbic acid degradation in amla as well as in pure ascorbic acid solutions at initial concentration present in amla (686 mg/100 g) over a temperature range of 50-120°C (steady state temperature process) was studied. The degradation kinetics of ascorbic acid in normal open pan cooking, pressure-cooking and a newly developed and patented fuel-efficient 'eco – cooker' was also studied (unsteady state heating process). The ascorbic acid degradation followed first order reaction kinetics where the rate constant increased with an increase in temperature. The temperature dependence of degradation was adequately modeled by Arrhenius equation. The activation energy for ascorbic acid in the present study was found to be 4.1 kcal/mole for amla and 4.48 kcal/mole for pure vitamin solution. A mathematical model was developed using the steady state kinetic parameters obtained to predict the losses of ascorbic acid from the time-temperature data of the unsteady state heating processing method. The results obtained indicate a greater degradation of ascorbic acid in open pan cooking followed by pressure-cooking and 'eco - cooker'.