

Determination of Sucrose, Glucose and Fructose Levels in Low Grown Black Tea Using High Performance Liquid Chromatography Technique

J.A.P.N. Alwis¹, G.A.A.R. Perera^{1*} and K.R.W. Abeywickrama²

^{1*}*Department of Animal Science and Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka*

²*Pesticide Laboratory, Sri Lanka Tea Board, Colombo, Sri Lanka*

No extraneous matters are allowed to add during tea manufacture. Nevertheless, some of the manufacturers add sugar to withered tea leaves to develop better appearance in black tea. Sugar adulteration adversely affects the reputation of Ceylon Black Tea. As stipulated by the Tea Research Institute of Sri Lanka, maximum permissible levels of fructose, glucose, and sucrose for low grown black teas are 25 mg/g, 20 mg/g, and 35 mg/g respectively. The present study was conducted to determine whether the black tea manufactured in the low country in Sri Lanka was adulterated with sugar. Sample collection was done according to stratified random sampling keeping administrative districts; Galle, Matara, and Rathnapura as strata. Sixty-three black tea samples (Dust 1 grade) were collected during three consecutive weeks. Coldwater extracts of samples were prepared and their sugar levels were determined using a High-Performance Liquid Chromatograph fixed with a Zorbax NH₂ column and a RI detector. The mobile phase comprised of 75% Acetonitrile and 25% de-ionized water. The average fructose, glucose, and sucrose contents of low grown tea were 6.3±2.7, 6.1±3.1, and 7.3±5.5 mg/g respectively. Fructose, glucose, and sucrose contents of all tea samples collected from Matara and Rathnapura districts were below the maximum permissible limits. Further, fructose and sucrose contents of Galle district's black tea samples were also below the maximum permissible limits. The highest fructose, glucose, and sucrose contents were detected from the Rathnapura district's black tea samples. It can be concluded that Matara and Rathnapura Districts' black tea samples comply with the stipulated maximum permissible levels of fructose, glucose, and sucrose whereas Galle District's black tea samples comply with the maximum permissible levels of fructose and sucrose.

Keywords: Black tea, Fructose, Glucose, Sucrose, Adulteration