

Identification and Determination of Synthetic Dyes in Grape Juice in Closed Package

Khesorn Nantachit*, Somporn Putiyanan and Prapart Phooviang

Department of Pharmaceutical Sciences, Faculty of Pharmacy, Chiang Mai University, Chiang Mai 50200, Thailand

*Corresponding author. E-mail: khesorn@pharmacy.cmu.ac.th

ABSTRACT

Ten samples of grape juice packaging in closed package each of which cost 4-17 Baht were analyzed. Four samples were found to have consisted of nonpermitted organic synthetic dyes. Two samples were permissible dyes but their amounts were over the permissible levels. Other 4 samples did not consist of any organic synthetic dye. The dyes were identified by paper chromatography, using 4 different developing solvents and confirmed by comparing their visible absorption peaks with permissible standard dyes. Column chromatographic technique was used to purify food samples and silicagel 60 (0.2-0.5 mm) was used as the adsorbent. The amounts of dyes were determined by visible spectrophotometric method. Indigo carmine 96.09 ppm and ponceau 4R 280.18 ppm were found in one sample. The other sample consisted of indigo carmine 88 ppm and carmoisine 320.9 ppm. This method showed average percent recovery of 111.7, relative standard deviation of 9.2 and the limit of detection was 2 ppm.

Key words: Synthetic dyes, Grape juice

INTRODUCTION

Food dyes are made from organic synthesis. They are useful because colored foods look tasteful. Food dyes are toxic from the dyes themselves and from contaminated trace metals receiving from their producing process. Toxic dyes are amaranth, tartrazine and sunset yellow. Lymphosarcoma and abnormal growth can occur in albino rats taking amaranth, so it is a forbidden dye. Amaranth and tartrazine can also stain stomach, small and large intestine of albino rats, so food absorption is interfered (Sujumnong, 1994). From these reasons, the types and amounts of dyes that can be used in soft drink are declared in Thai Food Act 2004. (Thai Food Act 2004: Food Additives). Permitted red colors are carmoisine 70 ppm, ponceau 4R 50 ppm, erythrosine 70 ppm, permitted yellow colors are tartrazine 70 ppm, sunset yellow FCF 70 ppm and permitted blue colors are fast green FCF 100 ppm, brilliant blue FCF 50 ppm and indigo carmine 70 ppm.

From our preliminary investigation of pesticide residue in vegetable juice, fruit juice and green tea solution (Nantachit and Wongpayapkul, 2007), the mixtures