204/B

Identification of potential risk of zinc contamination in tomatoes through fungicide application in Hanguranketha, Sri Lanka

K G S Chaminda*, R A D I Dilhani, K P S R Pathirana, R A U J Marapana, J M J K Jayasinghe and S B Nawarathne

Department of Food Science and Technology, Faculty of Applied Science, University of Sri Jayewardenepura, Gangodawila, Nugegoda

Heavy metal contamination of foodstuffs is a topic of considerable concern nowadays because of increasing health hazards. The objective of this study was to identify the potential risk of Zn contamination through fungicide usage upon farmers at Hanguranketha, Nuwara Eliya. The wet and soggy climate and high vegetable production lead to the selection of this region to research. A field survey using a pre tested questionnaire was carried out to collect data from randomly selected (ISO 2859-1 1989 (E) sampling method) 120 vegetable farmers (20 from each village) in six villages (Kottala, Karalliyadda, Maliyadda, Adikarigama, Damunumeya and Dehipe) in the Hanguranketha DS Division. During *Yala* 2014 tomato (28%) was the major vegetable in the area other than cabbage, beans, knol kohl and brinjol (25, 27, 10, and 10% respectively), mancozeb (73%) and maneb (27%) were identified as the major fungicides applied by the respondent farmers. The identified fungicide samples were bought from the local market and analyzed for Zn by Flame Atomic Absorption Spectrometry. The obtained Zn values of samples were used to calculate the potential Zn contamination in the Hanguranketha DS Division.

Based on the number of fungicide applications by farmers, the possible level of Zn contamination by mancozeb and maneb were calculated as 59.13 and 9.62 mg/kg in 1 kg of tomato. These levels do not exceed the Maximum Permitted Level (MPL) which is 100 mg/kg. However analysis of village-wise fungicide applications revealed that tomatoes grown in Adikarigama have been exposed to higher levels of Zn than the MPL from application of mancozeb (116.2 mg/kg), whereas tomatoes from the other five villages showed lower levels (Avg 47.71 mg/kg) of exposure to Zn. For maneb, all the values (Avg 9.62 mg/kg) were lower than the MPL. The number of sprays per season was increased significantly ($p<0.05$) in Adikarigama (mancozeb 6.2 and maneb 5.86) than in the other villages. This significantly affected the calculation of mancozeb contamination potential. It was concluded that the level of Zn contamination of Hanguranketha is lower than the Maximum Permitted Level, and therefore, the risk is less.

Keywords: Fungicide, contamination, zinc, tomato, Maximum Permitted Level

shanakakatukurunda@gmail.com Tel: +94 112750672 +94 783400717