

عنوان مقاله:

Quantitative Microbial Risk Assessment of Urban Wastewater Pertaining to Irrigation of Agricultural Products in Qom, Iran, in ۲۰۲۰

محل انتشار:

فصلنامه بهداشت محیط و توسعه پایدار، دوره 8، شماره 1 (سال: 1401)

تعداد صفحات اصل مقاله: 11

نویسندگان:

.Ahmad Reza Yari - Research Center for Environmental Pollutants, Qom University of Medical Sciences, Qom, Iran

.Yadollah Ghafari - Research Center for Environmental Pollutants, Qom University of Medical Sciences, Qom, Iran

.Rahim Aali - Research Center for Environmental Pollutants, Qom University of Medical Sciences, Qom, Iran

خلاصه مقاله:

Introduction: The present study aims to evaluate adverse health effects caused by the use of wastewater for the irrigation of fields in Qom province, Iran. Materials and Methods: An environmental monitoring program was designed for ۳ pathogens-Escherichia coli, Vibrio cholerae, and E. coli O157 and carried out on ۱۲۰ samples from raw wastewater, effluent, and irrigated products with wastewater. In the next phase, exposure assessment and microbial risk assessment were performed using a questionnaire and interviewing ۲۰۰ participants. Results: Concentrations of E. coli, V. Cholerae, and E. coli O157:H7 in raw wastewater were determined to be $3.4 \times 10^3 \pm 500$ cfu/100ml, $2.1 \times 10^3 \pm 100$ cfu/100ml, and 3.12 cfu/100ml, respectively. Concentrations of E. coli, V. Cholerae, and E. coli O157:H7 in effluent were determined to be $2.1 \times 10^3 \pm 100$ cfu/100ml, $0.8 \times 10^3 \pm 100$ cfu/100ml, and 176 cfu/100ml, respectively. The conventional wastewater treatment system was effective in removing E. coli, V. Cholerae, and E. coli O157: H7 by ۵۰%, ۵۹%, and ۴۳%, respectively. Crops irrigated with effluent contained 400 ± 250 cfu/100ml, $0.1 \times 10^3 \pm 0.019$ cfu/100ml, and 52 cfu/100ml of E. coli, V. Cholerae, and E. coli O157:H7, respectively. According to the exposure scenarios, the total annual probability of infection in the studied population for E. coli, V. Cholerae, and E. coli O157:H7 was determined to be 8×10^{-2} , 8×10^{-4} , and 17×10^{-2} , respectively. Conclusions: In irrigating agricultural crops with wastewater implementing wastewater safety plans (WWSP) is crucial

کلمات کلیدی:

.Wastewater, Vibrio Cholerae, Escherichia Coli O157, Qom City, Crops, Agricultural

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1633964>

