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## IMPACT OF EFFLUENTS FROM WASTEWATER TREATMENTS REUSED FOR IRRIGATION: STRAWBERRY AS CASE STUDY

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### Abstract

This research is intended to study the possible transfer of the residual chemical contamination from treated wastewaters reused for irrigation purposes of *Fragaria x ananassa* strawberry (cv. *Camarosa*). Different sewages from urban, and mixed urban-textile origins treated according to different treatment trains were used for the irrigation of strawberry in pots. Organic and inorganic chemical contamination indicators, i.e.: PCBs, including dioxin-like congeners, PAHs, and Cr(VI), were monitored along the whole agricultural production chain (wastewater treatment effluents, soil and crop). Robust analytical procedures were specifically developed for the determination of contaminants in the above-mentioned matrices with quantitation limits (MQLs) ranging from 1.3 (Phe) to 11.0 ng/L (PCB169) for wastewaters; from 3 (PCB180) to 10 µg/kg (BbF1) for soils; from 1.0 (Phe) to 10.9 µg/Kg (PCB169) for strawberries. For Cr(VI), limits were 0.15 µg/L (waters) and 0.018mg/kg (soils). These performances fully satisfy limits fixed by Italian or European regulations on maximum admitted concentration of pollutants in treated water intended for irrigation, in soils and crops. Even if selected PAHs and PCBs were detected in wastewaters (highest concentrations observed for phenanthrene, 429 µg/L, and PCB52, 110 µg/L) their presence was not observed in soils and in strawberries above the MQLs. On the contrary, chromium content in strawberries and soils irrigated with TWs suggested a possible transfer of the metal during irrigation, which however does not represent a hazardous situation for consumers since calculated daily intake does not exceed the Tolerable Daily Intake of 300 µg/kg b.w.

*Key words:* food chain; reuse impact; strawberry; treated wastewater

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