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DIPARTIMENTO DI SCIENZE VETERINARIE PER LA SALUTE, LA PRODUZIONE ANIMALE E LA SICUREZZA ALIMENTARE

Analyses of organochlorine pesticides residues in eels (*Anguilla anguilla*) from Lake Garda using Gas chromatography coupled with Tandem Mass Spectrometry (GC-MS/MS)

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Abstract

Lake Garda is located in one of the most populated and industrialized area of Italy (Camusso *et al.*, 2001). Therefore, the Lake water, and also the fish species present, could be affected by environmental contamination. European eels (*Anguilla anguilla*) are considered as suitable matrix for biomonitoring environmental contaminants in European water (Belpaire *et al.*, 2007), being widespread in many European waters and highly contaminated by lipophilic compounds, due to the high lipid content (up to 40%) (Larsson *et al.*, 1991). Moreover, eel is an edible species (its farming currently supplies approximately 45,000 tons/year) (Nielsen *et al.*, 2008), so it also represents a public health issue. Based on these considerations, the aim of this study was to evaluate the occurrence of fourteen organochlorine pesticides (OCs) in forty-five eels (*Anguilla anguilla*) from Lake Garda, using Accelerated Solvent Extraction (ASE) procedure for the analytes extraction and Gas chromatography coupled with Tandem Mass Spectrometry (GC-MS/MS) for the analysis of OCs. GC-MS/MS analysis was developed and validated according to the SANTE/11945/2015 guidelines. Uncontaminated eel sample (previously checked for the presence of OCs and considered blank with a concentration of compounds < Limit of Detection) were used for all procedure's optimization steps. For all the OCs, satisfactory results were achieved in terms of linearity (R2 higher than 0.985); recovery (ranging between 70–120 %) and repeatability (coefficient of variation % lower than 20 %). The results met the validation criteria required by EU guidelines. Regarding eel samples, several pesticides were detected, but DDT and its metabolites were found with the highest prevalence (92 %). The concentration range was from not detected (n.d.) to 19000 ng g-1. Although DDTs levels in the environment are declining (Albaiges *et al.*, 2011), they continue to bioaccumulate in tissues of human and animal and biomagnify in food chains.

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