INVESTIGATION OF VOLTAMMETRIC BEHAVIOUR OF ELECTROACTIVE PESTICIDES USED IN GRAPE PEST CONTROL

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Turkey is the sixth country in the world from the view point of the area planted grapevines [1]. The grapevine is subject to attack numerous parasites. A wide range of pesticides are used in vineyards to control pests that affect the grape [2]. Atrazine (ATR), Bromopropylate (BRP), Chlorpyrifos (CP), Iprodione (IP), Lambda-Chyalothrin (LMD), Monocrotophos (MCP), Penconazole (PNC) and Procymidone (PRO) were types of pesticides used in grape pest control in Turkey. MRLs of these pesticides for grape according to Turkish Food Codex are given as 0.1 mg/kg, 0.2 mg/kg, 0.5 mg/kg, 2 mg/kg, 0.2 mg/kg, 0.02 mg/kg, 0.05 mg/kg and 1.0 mg/kg respectively. Compared to that of the others CP was the most used type of pesticide.

Chlorpyrifos (CP) is known to be electroactive and differential pulse cathodic adsorptive stripping voltammetric behaviour of this pesticide was investigated [3]. In this study, electroactive properties of other mentioned pesticides were examined and evaluated for simultaneous determination of CP. For this reason the electroactive properties of the whole pesticide were studied under voltammetric conditions optimized for the CP. In the experiments, pesticides were accumulated at a hanging mercury drop electrode (HMDE) containing 5% aqueous ethanol solution. An accumulation potential of -0.5 V and an accumulation time of 60 s was applied. CP, ATR and BRP were given a well resolved peak at -1.0 V, -0.9 V and -1.2 V (vs. Ag/AgCl) respectively, in pH: 2.0 media. MCP has no signal under optimized conditions for CP. For MCP a reduction peak at around -1.0 V was appeared for pH higher than 5. Results have revealed that PRO, IP, PNC and LB pesticides were not having electro-active properties under experimental conditions.

References