Studies on pesticide residues in drinking water

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In Egypt, monitoring of pesticide residues in food and the environment began as limited program in 1985 (Dogheim et al.,1988). The aim of this work could be summarized in the following:Monitoring of some pesticide residues levels in different types of water samples from different locations in Delta region and the sample locations were shown in the maps.The samples were taken from Nile river, canals, lakes, drains, drinking water and underground water.New approaches to minimize pesticide residues in waterby using Zeolite, peanut crushed shells, plant charcoal and micronized charcoal.The technique used in residue analysis was performedaccording to previous references and accepted methodology (Ernst, 1974).One liter of water sample from each site was extracted with 80 ml n-hexane and cleaned up on a column of aluminiumoxide to remove interference contaminants and assayed on GC equipped with electron capture detector.The adsorbents used for minimizing pesticide residues in water were as follows: micronized charcoal, plant charcoal, crushed peanut shells and Zeolite. The removing efficiency was calculated by dividing the free amounts after filtration (residue)by spiked amount and compared the different efficiencies between the absorbents used.In the tap water samples, a-HCH was detected in almost all samples and the highest level of p'p-DDE was found in Rosetta tap water samples. There was a negative correlation between aldrin and dieldrin level in tap water samples.The samples of underground water were collected from different villages around Etay El-Baroud town. The levels of organochlorine compound were ranged from 0.09 to 50.2 ppb. Heptachlor-epoxide was detected in most sites, while P'P-DDT was not found in any water sample.On the other hand, some lakes in Egypt were monitored to detect the level of organochlorine compounds, as follows: Maryout, Edku, Karoun, Bardaweel and Borolus. Lindane was the mostly detected in all sites, where the highest level was found in El-Bardaweel lake (51.1 ppb) and the lowest was 0.44 ppb in Edku lake site or location No. 2. p'p-DDE was not found in all the samples except in Borolus (location 2) to be 2.94 ppb.p'p-DDE, the major breakdown compound from DDT was detected in water samples from Mahmoudiya (Behera and Alexandria governorate). p'p-DDD was not found in any fresh water samples. Sequence of organochlorine levels in Rosetta branch could be said that, highest level of most compounds were found in Benofer (24.05, 28.47, 7.8, 3.6 and 1.96 ppb) for a-HCH, linden, (3-HCH, aldrin and P'P-DDE, respectively.The main compounds detected in Delta drains were HCH isomers and heptachlor-epoxide. Bahr El-Bakar drain exhibited the highest level of a-HCH (234.33 ppb) followed by Abou-Hammad (33.24 ppb).Micronized charcoal was the most efficient adsorbent for chlorinated hydrocarbon pesticide residues contaminant in water, where the removing efficiency ranged from 80 to 100% for OCC. Generally, it could be said that the residue levels of OCC in water differed from fresh water to drains and HCH isomers were the main detected compounds in most analyzed samples. The high moiety of OCC for biological systems accumulation results in adverse risks on the cell function and indenting carcinogenic effects in some cases. (IRLG, 1979 and US EPA, 1986) On the other hand, the side effects of these groups of pollutants on the aquatic organisms are more sufficient and danger (Abdel Gawaad and Shams El-Din, 1989).