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CONCLUSION AND RECOMMENDATIONS

The results obtained from the present investigation revealed that presence of both surface and ground water samples with various insecticide residues in different concentrations. The probable sources of insecticidal contamination of water include direct application for control of aquatic insects, runoff from agricultural lands, drift from aerial and land application, discharge of industrial wastes and discharge of waste water from cleaning up of equipments used for insecticidal application.

Although the use of organochlorine insecticides is for bidden according to the recommendations of since 1971 however, these compounds were detected in reasonable amounts in natural water supplies which necessitate a particular attention about their distribution and destruction of their residues in nature. Recently, there is a gradual increase in the use of the more readily degradable organophosphate and carbamate insecticides instead of chlorinated hydrocarbons.

From the health point of view, water pollution with insecticide residues is undoubtedly injurious and harmful to human and animal health that requires a particular concern. One of the main tasks of hygiene necessitating the presence of urgent scientific solution of insecticide pollution. The regulation within the framework of governmental planing, for

sanitary protection againest pollution of water sources supplying both human and livestock collections.

It can be concluded that the removal of organic insecticides by chlorination seems to be inefficient, and the use of activated carbon filter appears to be the most effective and safe method for reducing most of the insecticide residues in water supplies.

In the light of the results obtained from the present investigation, the following recommendations can be suggested :

1. A continous monitoring for insecticidal application.
2. A special attention should be paid by authorities and organizations to the point source of water pollution.

This control process requires joint efforts of both water supply and surveillance authorities.

3. It is recommended that when it is necessary to use a specific insecticide for control of aquatic life, complete information must be available so that the risk to water quality from residues can be directly evaluated.

4. The conditions under which residues disappear from water

sources, the efficiency of water treatment, the level of the daily intake and the body accumulation level as well as the permissible limit of insecticide residues in drinking water must be known before its proposal.

5. Using different clarifying designs, different filter media and adjustment of the operational conditions for improving insecticidal removal.

SUMMARY

The importance of synthetic organic insecticides to the national economy and the potential hazards to public health associated with their widespread use for agricultural purposes and veterinary practice as well as other purposes of preventive medicine require an early control of polluted water.

The present study was carried out to evaluate the seasonal levels of insecticide residues in different water sources distributed in Behera Governorate. On hundred and eight water samples were analysed for insecticide residues and the following results were revealed :

1. ORGANOCHLORINE RESIDUES :

D.D.T. residues in streams and drains ranged from 6.7 to 153.3 ng/liter and higher concentrations were recorded in water samples collected in autumn. Lindane residues of the examined samples varied rom 5 to 58.3 ng/liter, Chlordane residues lies between 4.7 and 60.7 ng/liter and Endrin residues varied from 3.3 to 33 ng/liter. It has been noticed that there were no seasonal variations lindane, Chlordane and Endrin concentrations.

2. ORGANOPHOSPHORUS RESIDUES

Dursban residues were only detected in surface water samples

collected in autumn varying from 16.7 to 183.3 ng/liter. Diazinon, Malathion and Dimethoate residues could be detected only in autumn and summer. Diazinon residues varied from 4.4 to 186.2 ng/liter, Malathion residues lies between 33.3 to 216.7 ng/liter while Dimethoate residues ranged from 13.3 to 263.3 ng/liter.

3. CARBAMATE RESIDUES

Lanate residues in surface water samples ranged from 16.7 to 66.7 ng/liter. The highest concentrations were met with in water samples collected in summer could not be detected in winter. Sevin could be detected only in autumn and summer with a value ranged from 10 to 46.7 ng/liter. Aldicarb residues were only detected in summer, varying from 16.7 to 36.7 ng/liter.

4. D.D.T. and Lindane were the only chlorinated hydrocarbon insecticides detected in ground water samples.

D.D.T residues ranged from 3.3 to 66.6 ng/liter. The lowest value was detected in spring rather than other seasons. Lindane residues of examined ground water samples varied from 3.3 to 31.6 ng/liter.

5. ORGANOPHOSPHORUS RESIDUES

Diazinon residues could be detected in ground water samples

collected in autumn and summer with values ranged from 8.9 to 146.3 ng/liter while Malathion residues were only detected in summer, varying from 16.7 to 83.3 ng/liter.

6. Aldicarb was the only carbamate insecticides detected in ground water samples.

It could be detected only in summer and autumn where the residues ranged from 96.7 to 283.3 ng/liter with a mean values of 126.7±17.8 and 68.9±7.7 ng/liter in summer and autumn respectively.

7. The effectiveness of water treatment on the insecticidal content was investigated.

It has been found that the mean values of D.D.T, Lindane and Chlordane in inffluent water were 25, 7.5 and 19 ng/liter respectively while in effluent water were 12.5, 11.5 and 8 ng/liter respectively.

Diazinon residues could be detected in raw surface and treated water with a mean of 26.6 and 19.5 ng/liter respectively. Non of the carbamate insecticides could be detected in water samples of Damanhour water treatment plant.

8. It has been found that drinking water filter containing activated carbon has a high efficiency in removing the

insecticide residues from water. The reduction percentage were found to be 94,95,91 and 100% for D.D.T, Lindane, Chlordane and Endrin respectively. In case of organophosphorus insecticides, the removal percentage of Diazinon, Dursban, Malathion and Dimethoate were found to be 80.1, 85, 75 and 82 respectively. Moreover, a reduction of 86,82 and 81% in concentrations of Lannate, Sevin and Aldicarb respectively was detected.

Consequently this filter could be applied with success in minimizing the insecticidal residues in water.

9. It has been found that a significant relationship between the presence of some chemicals and the level of insecticide residues in water.