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Levels of Pesticides in Mussels from the Middle Black Sea Coast of Turkey

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Abstract

The aim of this study is to determine the pesticide and PCBs pollutions on the Middle Black Sea coast by sampling mussels. The Black Sea is situated between the latitudes 45^0 55' and 46^0 32' N and the longitudes 27^0 27' and 41^0 42' E. It is the largest land-locked inland sea of the world. The maximum depth of sea is 2200 m and average depth of sea is 1240 m. A depth of less than 200 m constitutes 27% of the total area and is mostly found in the north-western Black Sea. Two large rivers, Kızılırmak and Yeşilırmak, rise south of the mountains and flow through agricultural areas on their way to the Middle Black Sea and they transport various contaminants such as organic compunds, pesticides to the Black Sea.

Pesticides are most important materials through the other input in agriculture to get more yield. Pesticides are transported to seas by atmospheric deposition, rivers which pass from the agricultural areas and by other ways. These compunds are not able to biodegradated easily, so these pollutants accumulate in environment. Mussels are lack of essential enzyme system which is necessary to degrade some organic compunds such as pesticides so cannot degrade organic compunds accumulated in the tissues from sea water and food. Because of this, the mussels are used as sentinel organisms to rapidly assess the status of the contamination of marine environment for a large number of pollutants. They offer the advantage of a wide geographic distribution, facilitating comparison of data, and of integrating chemical pollutants over long periods at the same site.
In this study, a sampling program was prepared and according to this program, samples were collected. The samples were extracted by Soxhlet apparatus. After that, they were analyzed by gas chromotography with flame ionisation detection (GC-FID). Also, the reference materials were analyzed for determination of the yield of recovery.

The usage of pesticides in most countries that are on the Black Sea coast include Turkey is banned, but illegal usage of pesticides(especially DDTs) in most countries is documanted and also because of the atmospheric deposition, persistence half life ($T_{1/2}$) of pesticides in marine ecosystem, it is not surprising of determining the pesticides in mussels which are collected from the Middle Black Sea coast of Turkey at the end of this study.