

# ASSESSMENT OF POLLUTION FROM LAND-BASED SOURCES OF TURKISH NE MEDITERRANEAN COAST AND ITS IMPACT ON THE MARINE ENVIRONMENT IN THE LAST TWO DECADES

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Population increase in the last decades together with the urbanization and industrialization in the southern coast of Turkey create coastal pollution problems. The annual fresh water input from the main rivers in this region amounts about  $3 \times 10^{10} \text{ m}^3$  and it constitutes about 7% of the total fresh water input into the whole Mediterranean. The total annual industrial and domestic discharge make contribution of about  $14 \times 10^7 \text{ m}^3$  for the same region. The coastline between Mersin and İskenderun provinces in the northeastern Mediterranean is intensively industrialized such as textile, plastic, soda, paint, pulp and paper products, ferro-crome, food, artificial fertilizers and petroleum industry. In this work, state of pollution from land-based sources in the Northeastern Mediterranean will be presented by the evaluation of 16 years data (1982-1997), including the implementation on the trends against time and the impacts of pollutants on the marine environment especially on the marine life. Water samples were collected from land-based source points and the coastal stations were fixed in front of these source points and they are located in the continental shelf area -mostly in İskenderun and Mersin bays. A couple of offshore stations were visited in order to compare the background levels with the polluted coastal waters. The parameters monitored at the source points and in sea water (mostly 2-4 times per a year) were total suspended sediment, Faecal Coliform (not for the industrial effluents), o-phosphate, total phosphorus (not for the sea water), nitrate+nitrite, total nitrogen (not for the sea water), biological oxygen demand, chemical oxygen demand (in water samples from effluents but on particulate samples from sea water), poliaromatic petroleum hydrocarbons and heavy metals such as mercury and cadmium (both in water and adsorbed on suspended particles). Sediment samples from continental shelf area were collected on a yearly basis (although some years are missing) in order to understand the accumulation characteristics of some pollutants such as heavy metals and petroleum hydrocarbons. Such toxic pollutants were also determined in marine biota (in some common fish species such as *Solea solea*, *Mullus barbatus*, *Mugil auratus*, *U. moluccensis* and some other sea products such as *M. galloprovincialis* and shrimps). The poliaromatic petroleum hydrocarbon (PAHs) concentrations in the NE Mediterranean waters varied between  $<0.1\text{--}5 \mu\text{g L}^{-1}$ . The concentrations were highly variable and relatively high in İskenderun bay where the pipe lines (e.g. Iraq-Yumurtalık line) and filling stations are located. An unexpected accident happened in 1982 which has caused a leak of 8000 tons of oil from Iraq pipeline and consequent increase of instant sea water concentration up to  $25 \mu\text{g L}^{-1}$ . The Gulf War also influenced the PAHs content of Bay's waters. The average PAHs concentrations ranged between  $1\text{--}15 \mu\text{g g}^{-1}$  (dry weight) in marine biota. The highest PAHs concentration in the sediment was recorded as  $<20 \mu\text{g g}^{-1}$  (dry weight). The total mercury and cadmium concentrations in sea water ranged between  $<0.1$  and  $10 \text{ ng L}^{-1}$  and  $<5 \text{ ng L}^{-1}$  respectively and they were mostly adsorbed onto particles. The mercury concentration detected in the marine biota up to  $165 \text{ ng g}^{-1}$  and up to  $2503 \pm 1205 \text{ ng g}^{-1}$  (dry weight) in *U. Molluccensis* while the concentrations in sediment ranged in between  $16\text{--}47 \text{ ng g}^{-1}$  (dry weight).

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