

[Home](#) > [Journal](#) > [Earth & Environmental Sciences](#) > [JEP](#)
[Indexing](#) | [View Papers](#) | [Aims & Scope](#) | [Editorial Board](#) | [Guideline](#) | [Article Processing Charges](#)
[JEP](#) > Vol.2 No.6, August 2011



## PAHs in Sediments along the Semi-Closed Areas of Alexandria, Egypt

PDF (Size: 314KB) PP. 700-709 DOI : 10.4236/jep.2011.26081

### Author(s)

Mohamed A. Shreadah, Tarek O Said, Mohamed I. Abd El Monem, Eiman M. I. Fathallah, Mohamed E Mahmoud

### ABSTRACT

Sediment samples were collected from 49 sampling stations along the semi-closed areas of Alexandria coasts, Egypt. Total concentrations of 15 out of 16 EPA-PAHs in sediments were varied from 4.2 to 886 ng.g<sup>-1</sup> with an average value of 176 ng.g<sup>-1</sup> (dry wt). The average total organic carbon (TOC) percent was varied from 0.04 to 7.65%. Higher concentration of total pyrolytic hydrocarbons ( $\Sigma$ COMB) than total fossil hydrocarbons ( $\Sigma$ COMB), declared that atmospheric fall-out is the significant source of PAHs to marine sediments of the semi-closed area of Alexandria. The selected marked compounds and special PAHs compound ratios (phenanthrene/anthracene; fluoranthene/pyrene;  $\Sigma$ COMB/  $\Sigma$ EPA-PAHs) suggest the pyrogenic origins, especially traffic exhausts, are the dominant sources of PAHs in most locations. Interferences of rather petrogenic and pyrolytic PAH contaminations were noticed in the harbours, especially marine area due to petroleum products deliveries and fuel combustion emissions from the ships staying alongside the quays.

### KEYWORDS

Surface Sediment, PAHs, Alexandria, Egypt, GC-MS

### Cite this paper

M. Shreadah, T. Said, M. Monem, E. Fathallah and M. Mahmoud, "PAHs in Sediments along the Semi-Closed Areas of Alexandria, Egypt," *Journal of Environmental Protection*, Vol. 2 No. 6, 2011, pp. 700-709. doi: 10.4236/jep.2011.26081.

### References

- [1] U. Varanasi, "Metabolism of PAHs in the Aquatic Environment," CRC Press, Boca Raton, 1989.
- [2] C. Porte and J. Albaiges, "Bioaccumulation Patterns of Hydrocarbons and Polychlorinated Biphenyls in Bivalves, Crustacean and Fishes," *Archives of Environmental Contamination and Toxicology*, Vol. 26, No. 3, 1993, pp. 273-281.
- [3] P. Baumard, H. Budzinski and P. Garrigues, "Determination of Polycyclic Aromatic Hydrocarbons (Pahs) in Sediments and Mussels of the Western Mediterranean Sea," *Environmental Toxicology & Chemistry*, Vol. 17, No. 5, 1998, pp. 765-776. doi: 10.1002/etc.5620170501
- [4] J. Y. Cho, J. G. Son, B. J. Park and B. Y. Chung, "Distribution and Pollution Sources of Polycyclic Aromatic Hydrocarbons (Pahs) in Reclaimed Tidelands and Tidelands of the Western Sea Coast of South Korea," *Environmental Monitoring and Assessment*, Vol. 149, No. 1-4, 2009, pp. 385-393. doi: 10.1007/s10661-008-0214-9
- [5] T. K. Benlahcen, A. Chaoui, H. Budzinski, J. Bellocq and P. Garrigues, "Distribution and Sources of Polycyclic Aromatic Hydrocarbons in Some Mediterranean Coastal Sediment," *Marine Pollution Bulletin*, Vol. 34, 1997, pp. 298-305. doi: 10.1016/S0025-326X(96)00098-7
- [6] L. Sanchez-Garcia, J. Cato and O. Gustafsson, "Evaluation of the Influence of Black Carbon on the Distribution of Pahs in Sediments from along the Entire Swedish Continental Shelf," *Marine Chemistry*, Vol. 119, No. 1-4, 2010, pp. 44-51. doi: 10.1016/j.marchem.2009.12.005

- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

[JEP Subscription](#)
[Most popular papers in JEP](#)
[About JEP News](#)
[Frequently Asked Questions](#)
[Recommend to Peers](#)
[Recommend to Library](#)
[Contact Us](#)

Downloads:	301,517
Visits:	673,861

[Sponsors, Associates, and Links >>](#)

- [The International Conference on Pollution and Treatment Technology \(PTT 2013\)](#)

- [7] J. Dachs, J. M. Bayona, J. Fillaux, A. Saliot and J. Albaiges, "Evaluation of Anthropogenic and Biogenic Inputs into the Western Mediterranean Using Molecular Markers," *Marine Chemistry*, Vol. 65, No. 3-4, 1999, pp. 195-210. doi:10.1016/S0304-4203(99)00002-X
- [8] M. A. Khairy, "Risk Assessment of Polycyclic Aromatic Hydrocarbons in a Mediterranean Semi-enclosed Basin Affected by Human Activities (Abu Qir Bay, Egypt)," *Journal of Hazardous Materials*, Vol. 170, No. 1, 2009, pp. 389-397. doi:10.1016/j.jhazmat.2009.04.084
- [9] UNEP/IOC/IAEA, "Determination of Petroleum Hydrocarbons in Sediments," *Reference Methods for Marine Pollution Studies*, UNEP, Vol. 20, 1992, p. 75.
- [10] C. T. Chiou, S. E. Mc Groddy and D. E. Kile, "Partition Characteristics of Polycyclic Aromatic Hydrocarbons on Soils and Sediments," *Environmental Science & Technology*, Vol. 32, No. 2, 1998, pp. 264-269. doi:10.1021/es970614c
- [11] E. R. Long, D. D. MacDonald, S. L. Smith and F. D. Calder, "Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments," *Environmental Management*, Vol. 19, 1995, pp. 81-97. doi:10.1007/BF02472006
- [12] USEPA, "Proposed Sediment Quality Criteria for the Protection of Benthic Organism. EPA-882-R-93-012, EPA- 882-R-93-013, EPA-882-R-93-014," US Environmental Protection Agency, Office of Water, Washington, DC, 1993.
- [13] International Agency for Research on Cancer, "IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Human. Polynuclear Aromatic Hydrocarbons, Part I, Chemical, Environmental, and Experimental Data," Agency for Research on Cancer, Lyons, Vol. 32, 1983, pp. 1-477.
- [14] C. A. Menzie, B. B. Potocki and J. Santodonato, "Exposure to Carcinogenic PAHs in the Environment," *Environmental Science & Technology*, Vol. 26, No. 7, 1992, pp. 1278-1284. doi:10.1021/es00031a002
- [15] G. P. Yang, "Polycyclic Aromatic Hydrocarbons in the Sediments of the South China Sea," *Environmental Polls*, Vol. 108, No. 2, 2000, pp. 163-171. doi:10.1016/S0269-7491(99)00245-6
- [16] W. F. Rogge, L. Hildemann, M. A. Mazurek, G. R. Cass and B. R. T. Simoneit, "Sources of Fine Organic Aerosol: 2. Noncatalyst and Catalyst-Equipped Automobiles and Heavy Duty Diesel Trucks," *Environmental Science & Technology*, Vol. 27, 1993, pp. 636-651. doi:10.1021/es00041a007
- [17] P. M. Gschwend and R. A. Hites, "Fluxes of Polycyclic Aromatic Hydrocarbons to Marine and