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Polychlorinated Biphenyls and Chlorinated Pesticides in Sediments along the Semi-Closed Areas of Alexandria, Egypt

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ABSTRACT

The residues of 19 EPA-organochlorine pollutants were analyzed in sediments collected from 49 different locations along the semi-closed areas of Alexandria, Egypt. The pollutants studied were 7 individual polychlorinated biphenyl (PCB) congeners, α, β, γ -hexachlorocyclohexane (HCHs), cyclodienes (aldrin, endrin, dieldrin) and dichlorodiphenyltrichloroethanes (DDTs) (o,p-DDE, p,p-DDE, o,p-DDD, p,p-DDD, o,p-DDT, p,p-DDT). The concentration of total DDTs ranged between ND and 123.76 ng.g⁻¹ (dry wt) whereas the concentration of PCBs, HCHs and cyclodienes ranged from ND to 192.24 ng.g⁻¹; ND to 20.78 ng.g⁻¹ and ND to 8.04 ng.g⁻¹ dry wt, respectively. The average total organic carbon (TOC) percent was varied from 0.04 to 7.65%.

KEYWORDS

Surface Sediment; Organochlorine Pollutants; Alexandria; Egypt; GC-ECD; GC-MS

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References

- [1] A. Binelli, S. K. Sarkar, M. Chatterjee, C. Riva, M. Parolini, B. deb-Bhattacharya, A. K. Bhattacharya and K. K. Satpathy, " A Comparison of Sediments Quality Guide- lines for Toxicity Assessment in the Sunderban Wetlands (Bay of Bengal, India)," *Chemosphere*, Vol. 73, No. 7, 2008, pp. 1129-1137. doi:10.1016/j.chemosphere.2008.07.019
- [2] Y. Sapozhnikova, O. Bawardi and D. Schlenk, " Pesticides and PCBs in Sediments and Fish from the Salton Sea, California, USA," *Chemosphere*, Vol. 55, No. 6, 2004, pp. 797-809. doi:10.1016/j.chemosphere.2003.12.009
- [3] A. Gomez-Gutierrez, E. Garmacho, J. M. Bayona and J. Albaigés, Screening Ecological Risk Assessment of Persistent Organic Pollutants in Mediterranean Sea Sediments," *Environment International*, Vol. 33, No. 7, 2007, pp. 867-876. doi:10.1016/j.envint.2007.04.002
- [4] B. Bhattacharya, S. K. Sarkar and N. Mukherjee, " Organochlorine Pesticide Residues in Sediments of a Tropical Mangrove Estuary, India: Implications for Monitorin," *Environment International*, Vol. 29, No. 5, 2003, pp. 587- 592. doi:10.1016/S0160-4120(03)00016-3
- [5] S. H. Hong, U. H. Yim, W. J. Shim, D. H. Li and J. R. Oh, " Nationwide Monitoring of Polychlorinated Biphenyls and Organochlorine Pesticides in Sediments from Coastal Environment of Korea," *Chemosphere*, Vol. 64, No. 9, 2006, pp. 1479-1488. doi:10.1016/j.chemosphere.2005.12.056
- [6] L. Guzzella, C. Roscioli, L. Vigano, M. Saha, S. K. Sarkar and A. Bhattacharya, " Evaluation of the Concentration of HCH, DDT, HCB, PCB and PAH in the Sediments along the Lower Stretch of Hugli Estuary, West Bengal, Northeast India," *Environment International*, Vol. 31, 2005, pp. 523-534. doi:10.1016/j.envint.2004.10.014

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- [7] K. L. Willett, E. M. Ulrich and A. Hites, "Differential Toxicity and Environmental Fates of Hemachlorocyclo- hexane Isomers," *Environmental Science and Technology*, Vol. 32, No. 2, 1998, pp. 197-207.
- [8] H. Nakata, K. Kannan, L. Jing, N. Thomas, S. Tanabe and J. P. Giesy, "Accumulation Pattern of Organochlorine Pesticides and Polychlorinated Biphenyls in Southern Sea Otters (*Enhydra lutris nereis*) Found Stranded along Coastal California, USA," *Environmental Pollution*, Vol. 103, No. 1, 1998, pp. 45-83. doi:10.1016/S0269-7491(98)00136-5
- [9] T. Colborn and M. J. Smolen, "Epidemiological Analysis of Persistent Organochlorine Contaminants in Cetaceans," *Review Environmental Contamination and Toxicology*, Vol. 146, 1996, pp. 92-172. doi:10.1007/978-1-4613-8478-6_4
- [10] USEPA, "EPA Proposes Comprehensive Plan to Clean Up Hudson River PCBs," United States Environmental Protection Agency, Washington, DC, 2000.
- [11] USEPA, "Method 3545. Accelerated Solvent Extraction- Organics," US Environmental Protection Agency, Washington DC, 1996.
- [12] USEPA, "Method 8081A. Organochlorine Pesticides by Gas Chromatography," US Environmental Protection Agency, Washington DC, 1996.
- [13] USEPA, "Method 8082. Polychlorinated Biphenyls (PCBs) by Gas Chromatography," US Environmental Protection Agency, Washington DC, 1996.
- [14] USEPA, "Method 8270. Semi Volatile Organic Compounds by GC/MS Cap Column," US Environmental Protection Agency, Washington DC, 1996.
- [15] L. Zhao, H. Hou, Y. Zhou, N. D. Xue, H. Li and F. Li, "Distribution and Ecological Risk of Polychlorinated Biphenyls and Organochlorine Pesticides in Surficial Sediments from Haihe River and Haihe Estuary Area, China, (2010).
- [16] P. M. Hoai, N. T. Ngoc, N. H. Minh, P. H. Viet, M. Berg, A. C. Alder and W. Giger, "Recent Levels of Organochlorine Pesticides and Polychlorinated Biphenyls in Sediments of the Sewer System in Hanoi, Vietnam," *Environmental Pollution*, Vol. 158, No. 3, 2010, pp. 913- 920. doi:10.1016/j.envpol.2009.09.018
- [17] A. Sudaryanto, T. Isobe, S. Takahashi and S. Tanabe, "Assessment of Persistent Organic Pollutants in Sediments from Lower Mekong River Basin," *Chemosphere*, Vol. 82, No. 5, 2011, pp. 679-686. doi:10.1016/j.chemosphere.2010.11.004
- [18] K. Kannan, S. Tanabe and R. Tatsukawa, "Geographical Distribution and Accumulation Features of Organochlorine Residues in Fish in Tropical Asia and Oceania," *Environmental Science & Technology*, Vol. 29, No. 10, 1995, pp. 2673-2683. doi:10.1021/es00010a032
- [19] N. L. Howell, M. P. Suarez, H. S. Rifai and L. Koenig, "Concentrations of Polychlorinated Biphenyls (PCBs) in Water, Sediment, and Aquatic Biota in the Houston Ship Channel, Texas," *Chemosphere*, Vol. 70, No. 4, 2008, pp. 593-606. doi:10.1016/j.chemosphere.2007.07.031
- [20] N. A. El-Naggar, "Studies on Chlorinated Pesticides and Polychlorinated Biphenyls in Seawater, Sediment, and Some Biota in Related to Physicochemical Characteristics of the eastern Harbour, Marine Environment, Alexandria, Egypt," MSc. Thesis, Al-Azhar University, Cairo, 2009, p. 171.
- [21] H. A. Morsy and A. M. A. Abdallah, "Assessment and Distribution of Organic Chlorine Pesticides (HCHs) and (DDTs) in Marine Environment of Eastern Harbour, Alexandria, Egypt," *Egyptian Journal of Aquatic Research*, Vol. 32, No. 2, 2006, pp. 83-94.
- [22] A. M. Abd-Allah and M. M. Abbas, "Residue Levels of Organochlorine Pollutants in the Alexandria Region, Egypt," *Toxicology and Environmental Chemistry*, Vol. 41, No. 3-4, 1994, pp. 239-247. doi:10.1080/02772249409357979
- [23] T. O. Said, "Determination of Persistent Organic Pollutants in Sediment and Fish of the Western Coast of Alexandria, Egypt," *Chemistry and Ecology*, Vol. 23, No. 4, 2007, pp. 289-302. doi:10.1080/02757540701443695
- [24] A. O. Barakat, K. Moonkoo, Q. Yoarong and T. L. Wade, "Organochlorine Pesticides and PCB Residues in Sediments of Alexandria Harbour, Egypt," *Marine Pollution Bulletin*, Vol. 44, No. 12, 2002, pp. 1421-1434. doi:10.1016/S0025-326X(02)00313-2
- [25] T. O. Said, M. K. El Moselhy, M. A. Rashad and A. M. Shreadah, "Organochlorine Contaminants in

- [26] M. Abo-Elamayem, M. A. Saad and A. H. EL-Sebae, " Water Pollution with Organochlorine Pesticides in Egyptian Lakes," *Proceedings of the International Egyptian- German Seminar on Environmental Protection from Hazards of Pesticides*, Alexandria, 24-29 March 1979, pp. 94-108.
- [27] A. M. Abd-Allah, " Determination of DDTs and PCBs Residues in Abu-Quir and El-Max Bays, Alexandria, Egypt," *Toxicological and Environmental Chemistry*, Vol. 36, No. 1-2, 1992, pp. 89-97. doi: 10.1080/02772249209357830
- [28] A. G. Guitierrez, E. Garnacho, J. M. Bayona and J. Albaiges, " Screening Ecological Risk Assessment of Persistent Organic Pollutants in Mediterranean Sea Sediments," *Environment International*, Vol. 33, No. 7, 2007, pp. 867- 876. doi:10.1016/j.envint.2007.04.002
- [29] W. E. Periera, F. D. Hostettler, J. R. Cashman and R. S. Nishioka, " Occurrence and Distribution of Organochlorine Compounds in Sediments and Livers of Striped Bass (*Morone Saxatilis*) from the San Francisco Bay-Delta Estuary," *Marine Pollution Bulletin*, Vol. 28, No. 7, 1994, pp. 434-441. doi: 10.1016/0025-326X(94)90129-5
- [30] M. C. Kennicutt, T. L. Wade, B. J. Presley, A. G. Requejo, J. M. Brooks and G. I. Denoux, " Sediment Contaminants in Casco Bay, Maine: Inventories, Sources and Potential for Biological Impact," *Environmental Science and Technology*, Vol. 28, No. 1, 1994, pp. 1-15. doi:10.1021/es00050a003
- [31] I. Tolosa, J. M. Bayona and J. Albaiges, " Spatial and Temporal Distribution, Fluxes and Budgets of Organochlorinated Compounds in Northwest Mediterranean Sediments," *Environmental Science and Technology*, Vol. 29: No. 10, 1995, pp. 2519-2527. doi: 10.1021/es00010a010
- [32] D. Dannenberger, " Chlorinated Microcontaminants in Surface Sediments of the Baltic Sea- Investigation in the Belt Sea, the Arkona Sea and the Pomeranian Bight," *Marine Pollution Bulletin*, Vol. 32, No. 11, 1996, pp. 772-781.
- [33] W. E. Pereira, J. L. Domagalski, F. D. Hostettler, L. R. Brown and J. B. Rapp, " Occurrence and Accumulation of Pesticides and Organic Contaminants in River Sediments, Water and Clam Tissues from the San Joaquin River and Tributaries, California," *Environmental Toxicology and Chemistry*, Vol. 15, No. 2, 1996, pp. 172-180. doi:10.1002/etc.5620150216
- [34] A. Sarkar, R. Nagarajan, S. Chaphadkar, S. Pal and Y. S. Singbal, " Contamination of Organochlorine Pesticides in Sediments from the Arabian Sea along the West Coast of India," *Water Resources*, Vol. 31, No. 2, 1997, pp. 195- 200.
- [35] P. K. Phuong, C. P. N. Son, J. J. Sauvain and J. Tarradellas, " Contamination by PCBs, DDTs and Heavy Metals in Sediments of Ho Chi City' s Canals, Viet Nam," *Bulletin of Environmental Contaminants and Toxicology*, Vol. 60, No. 3, 1998, pp. 347-354. doi:10.1007/s001289900633
- [36] R. A. Doong, Y. C. Sun, P. L. Liao, C. K. Peng and S. C. Wu, " Distribution and Fate of Organochlorine