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Biogeochemistry and Contaminant Geochemistry of Marine and Estuarine Sediments, New Haven, Connecticut (USA)

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The urbanized shore areas of Long Island Sound in the vicinity of New Haven, Connecticut (USA) have a long history of exposure to and resultant sediment contamination. New Haven harbor has been one of the battlegrounds of the industrial revolution. At an uncontrolled consequence of such activities, the region's sedimentary system has incorporated a complex mixture of organic and inorganic contaminants generated during the industrial revolution and the multiplicity of sedimentary environments. New Haven harbor, a prominent example of organic and inorganic contamination in a compact geographical area, the region is idealized as a natural laboratory to conduct long-term environmental assessment techniques. The conditions of this densely-populated region offer an exceptional host environment for microbial activity and bioaccumulation processes, including the history of natural and anthropogenic mobilization of organic and inorganic contamination that also addresses public health impacts.

New Haven harbor, an embayment approximately 3 to 3 km in an active terrain for mariners and mariners' work, the mouth of which is the site of docking facilities, a petroleum tank farm, a power generation station, sewage treatment facilities, a busy waterfront industry, housing, and park land. The approach channel leading into the inner harbor is maintained by periodic dredging. A variety of shallow water ecosystems exist within the embayment, and the river mouth and the inner harbor and in the open water. The composition of nearshore sediments is mixed with the composition of the inner harbor sediments. The Guilford marina, a residential section of New Haven, has lower density housing and a pleasant hilltop.

For molecular organic analysis, an automated pyrolysis-gas chromatography/mass spectrometry (Py-GC/MS) using milligram quantities of the whole sediments. The combustion is performed from a constant amount of thermally excitable components, the results of the thermal degradation of compounds present in the sample. The Py-GC/MS technique as used here offers a practical alternative to high-cost time-consuming analytical procedures, particularly in a natural system operating on a large scale.

The New Haven harbor samples were also analyzed for XY genes. The Py-GC/MS results indicate a predominance of aquatic OM in the river mouth and inner harbor.

CONCLUSIONS

Phenomena of aquatic OM in the open water sediment samples:

-Phenomena of aquatic OM in the river:
  -Phenomena of aquatic OM in the inner harbor:
    -Phenomena of aquatic OM in the outer harbor:
      -Phenomena of aquatic OM in the outer harbor:
        -Phenomena of aquatic OM in the outer harbor:

-Phenomena of aquatic OM in the open water:
  -Phenomena of aquatic OM in the open water:
    -Phenomena of aquatic OM in the open water:
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