



LEVELS AND EVOLUTION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) IN WILD MUSSELS FROM GALICIAN COAST (NW SPAIN) BEFORE AND AFTER THE PRESTIGE OIL SPILL

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INTRODUCTION

Adult mussels (*Mytilus galloprovincialis*) were collected in October 2000, February, June and November 2003 from indigenous populations in different sites from Galician coast. Three sites with varying degrees of affectation after the Prestige oil spill have been selected in order to estimate the spatial and temporal evolution of PAH levels.

RESULTS AND DISCUSSION

Two years before the Prestige oil spill, the sum of 13 PAHs varied from 63.4 µg/kg d.w. in Muxia, located far from main pollution sources, to 235 µg/kg d.w. in Ferrol-Palma, a very industrialized area (Figure 4)

However, three months after the Prestige accident, the lowest pollution levels were found in Ferrol-Palma with 186 µg/kg d.w. and the most contaminated mussels were observed in Muxia with 3550 µg/kg d.w. a location very affected by the fuel-oil spill. Cabo Home that is also located far from great contamination inputs, was affected too.

In June 2003 a decrease in the concentrations was observed in all the stations, but a decrease in late spring/early summer coinciding with spawning, has been described in other works (Webster, et al 1997)

Finally, in November 2003, a new increase in the total concentrations was produced in all the sites with respect to the previous sampling carried out in June.

A year after the Prestige oil spill the pollution levels in Muxia were still over the levels previous to the Prestige accident, while in Cabo Home and Ferrol-La Palma similar pollution levels to October 2000 have been observed.

In October 2000, the compound distributions were dominated by Fluoranthene, Pyrene and Chrysene in all sites, but after the Prestige oil spill there was a change in the distribution of aromatic hydrocarbons.

One of the main features in the more affected sites, is the predominance of Chrysene. The radial type figures show this characteristic profile of the accumulation of the PAHs in mussels, mainly from Muxia (February, June and November 2003) and Cabo Home (February 2003)

An elevated relative proportion of Chrysene has also been described after the *Aegean Sea* oil spill (Porté et al, 2000) and after Erika oil spill (RNO, 2002)

MATERIALS AND METHODS

The wild mussels were collected, frozen and stored at -20°C in the laboratory until their preparation. When the samples were defrosted, the tissue was removed from the shell and the individuals from each station were pooled (each pool contains a 50 individuals minimum), homogenised and after the freeze-drying process, were stored until they were analysed.

The 13 aromatic compounds studied were: Phenantrene (Phe), Anthracene (Ant), Fluoranthene (Fluo), Pyrene (Pyr), Benz(a)Anthracene (BaA), Benzo(g,h,i)Perylene (BghiP), Chrysene (Chry), Benzo(e)Pyrene (BeP), Benzo(b)Fluoranthene (BbF), Benzo(k)Fluoranthene (BkF), Benzo(a)Pyrene (BaP), Dibenz(a,h)Anthracene (dBaA) and Indeno (1,2,3-c,d)Pyrene (In123cdP). After Soxhlet extraction followed by extract cleaning using column chromatography with deactivated alumina, PAHs have been determined by High Performance Liquid Chromatography (HPLC) coupled with a wavelength programmable fluorescence detector (Viñas, 2002)

The analytical method was subject to a continuous external quality control process by participating in the Quality Assurance of Information for Marine Environmental Monitoring in Europe (QUASIMEME) obtaining satisfactory results in previous rounds.

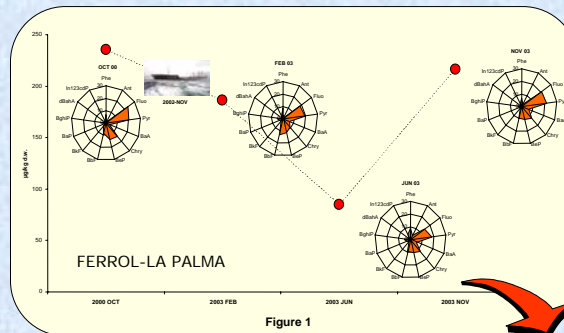


Figure 1

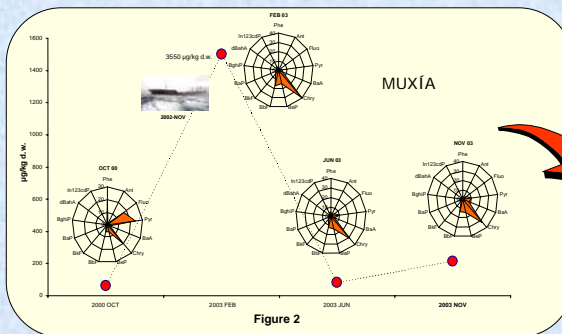


Figure 2

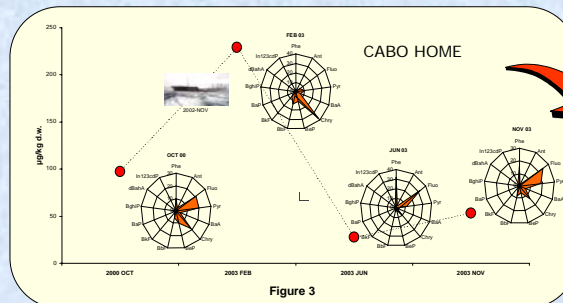


Figure 3

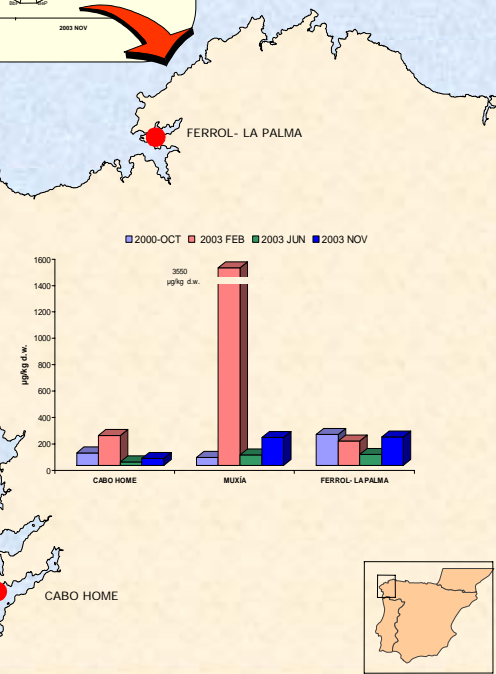


Figure 4

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