

Abra alba populations in and off Arcachon bay (France): mean seasonal evolution of benthic temperatures and salinities from 1971 to 1984

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Abra alba populations occur on fine sands outside the Arcachon bay and in several biotopes of the bay, according to the distance from the ocean and the variability of temperatures and salinities. Numerous sectional elevations at the time of high spring tides, show the temperature stratification and the thermal differentiation between the open sea and the inner part of the bay. Only superficial waters penetrate into the lagoon. For example, during summer (July 1983) on the offshore *Abra alba* community, at depths greater than 30 m, temperatures are 13 °C. A thermal amplitude of 8 degrees separates the two extreme biotopes (distance 27 kilometers), the inner attaining 22 °C. There exists from March to May, and from October to November, a relative thermal homogenization between the bay and the ocean. Salinities are always stratified, and may be very heterogeneous, especially during spring (April and May), when precipitation is particularly frequent. The Eire river, and its numerous tributaries located on the south east of the bay, are the principal sources responsible for lowering salinities.

Five diagrams corresponding to the main biotopes, show the mean seasonal evolution of bottom temperatures and salinities. Months are characterized by fan-shaped curves showing strong tendencies to overlap from year to year. Curves also represent a relative prediction of T and S evolution. A serious cut exists between the ocean and the bay. In the bay itself, another cut marks the Eire estuary. The corresponding diagram may overlap considerably for low salinities during spring and early summer.

Abra alba populations never extend beyond the geographic boundary shown on this last diagram. Their disappearance from the inner part of the Bay occurs during October. Stocks may persist or disappear (Arguin bank, at the mouth of the bay), during winter. Recruitment takes place during spring (March) from the ocean (not yet proven), or from a surviving stock in the bay.

Spatial and temporal distribution patterns within an *Amphiura filiformis* – *Abra alba* community

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The benthic macrofauna of Kinsale Harbour on the south coast of Ireland was investigated by members of the Zoology Department. This involved:

- a qualitative survey at 68 sites in 1978;
- a quantitative characterisation of the infauna at 50 soft-bottom sites in 1979–81;
- an evaluation of the stability of faunal assemblages by means of annual recharacterising surveys at a reduced, i.e. relative to the initial, number of selected sites;
- monthly monitoring, over a two year period, of assemblage structure and development together with the population dynamics and reproduction of some numerically important species. This presentation gives an outline of the infaunal assemblages found to characterise the area over the period 1979–81 to 1984. More specifically, an intercomparison of the species dominance patterns within four faunal groupings is made with respect to the years 1979–81 and 1984.

The study area comprises the euhaline zone of the Bandon River estuary with a mean river discharge of 15.25 m³ s⁻¹ which equals or exceeds 50 m³ s⁻¹ for less than 5% of the time. Sediments in the inner harbour area (Group 1) are heterogeneous muddy sands with some coarse material. Clean fine sands characterise the middle ground (Group 2) while homogeneous muddy sands prevail in the outer harbour (Groups 3).

Wind and tidal induced currents turbate the bottom sediments in all but the innermost part of the harbour.

In terms of faunal composition four faunal assemblages were identified for the area using classificatory analyses. Affirming that the faunal

groups are no more than convenient abstractions from continua, Group 1 approximates an admixture of *Abra alba* and *Venus striatula* communities with elements of an *Amphiura* assemblage too; Group 2a resembles the *Tellina fabula* facies of the *Venus striatula* community; Group 2b approximates the classical *Venus striatula* community; Group 3 is equivalent to the *Amphiura filiformis* community.

The broadscale spatial pattern of the assemblages (Groups) essentially remained constant over the six year period. However, some intra-group fluctuations in species abundances took place. Of the numerically dominant species within the various faunal assemblages, between 1979–81 and 1984:

(i) *Abra alba* (Wood), *Mysella bidentata* (Montagu), *Owenia fusiformis* delle Chiaje, *Euclymene oerstedii* (Claparède), *Scoloplos armiger* (O. F. Müller), *Anaitides maculata/mucosa*, *Pariambus typicus* (Kröyer), *Magelona mirabilis* (Johnston), *Chaetozone* spp., *Spisula* spp., *Amphiura filiformis* (O. F. Müller), *Lumbrineris gracilis* Ehlers, *Nucula turgida* Leckenby and Marshall, and *Cylichna cylindracea* (Pennant) maintained their status;

(ii) *Mediomastus fragilis* Rasmussen, *Myriochele* cf. *oculata* Zachs, *Spiophanes bombyx* (Claparède), *Pholoe minuta* (Fabricius), *Magelona filiformis* Wilson, *Exogone hebes* (Webster & Benedict), *Urothoe elegans* (Bate), *Corophium crassicornis* Bruzelius, *Mya arenaria* L., *Harpinia antennaria* Meinert, *Tellina fabula* Gmelin, *Spio filicornis* (O. F. Müller), *Magelona minuta* Eliason and *Spiophanes kroyeri* Grube decreased in abundance;

(iii) *Nephtys hombergi* Audouin & Milne-Edwards, *Melinna palmata* Grube, *Ampelisca tenui-*