

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

Jean-Marie Bouchet

Institut Universitaire de Biologie Marine d'Arcachon (Université de Bordeaux I), 2, rue du Pr. Jolyet, 33120 Arcachon (France)

*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

Patricia Dinneen & Sinead Neiland

Zoology Department, University College, Galway, Ireland

Keywords: macrobenthos, sublittoral infauna, community composition, spatial distribution, temporal distribution, Ireland coast

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

- (a) a qualitative survey at 68 sites in 1978;
- (b) a quantitative characterisation of the infauna at 50 soft-bottom sites in 1979-81;
- (c) 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;
- (d) 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 m<sup>3</sup> s<sup>-1</sup> which equals or exceeds 50 m<sup>3</sup> s<sup>-1</sup> 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 homogenous 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) *Neptyys hombergi* Audouin & Milne-Edwards, *Melinna palmata* Grube, *Ampelisca tenui-*

*cornis* Lilljeborg, *Venerupis pullastra* (Montagu), *Sihenelais boa* (Johnston), *Amphipholis squamata* (delle Chiaje), *Harmothoe impar* (Johnston), *Eteone flava/longa*, *Venus striatula* (da Costa), *Hiatella arctica* (L.), *Iphinoe trispinosa* (Goodsir),

*Ensis* sp., *Gari fervensis* (Gmelin), *Dosinia lupinus* (L.), *Scalibregma inflatum* Rathke, *Glycera tridactyla* Schmarda and *Thyasira flexuosa* (Montagu) increased in importance. The reasons for these changes in abundance patterns are not known.

### Population dynamics of *Thyasira flexuosa* (Bivalvia: Thyasiridae) in inner Galway Bay, West Coast of Ireland

Mark Costelloe

Zoology Dept., University College Galway, Ireland

*Thyasira flexuosa* (Montagu) occurred in high densities over a restricted area of Inner Galway Bay. As part of a broader study being carried out in the bay, the population dynamics of this bivalve were investigated, at a single site, over the two year period November 1982 to October 1984. Monthly sampling (five 0.1 m<sup>2</sup> van Veen grabs washed on a 0.5 mm sieve) revealed a mean population density of  $72.6 \pm 42.4/0.1 \text{ m}^2$ .

Recruitment took place between October and July of each year sampled and the growth rate of the Y<sub>0</sub> year class (1983/'84) was followed from length frequency histograms.

During the course of the study there was a major change in the *Thyasira* population at the sampling station. From November 1982 to September 1983, the size-frequency structure did not alter greatly, as was the case from November 1979 to April 1981 (Conneely, 1983). In October 1983, the numbers fell dramatically, but a similar drop had been noted in February 1983 and it was assumed that this reflect-

ed a patchiness in the bivalves microdistribution. In January 1984, however, numbers were down again on the previous months and this intensified to a point in October 1984 where the majority of individuals recovered were those that had settled in the previous months.

The reasons for this population crash are, as yet, unknown. Temperature and salinity data over the sampling period show the same seasonal trend since 1979. Sediment data, on the other hand, did indicate some change.

This work is continuing and the crash of *T. flexuosa* will be viewed in context of the returns for the total macrofauna over the same study period.

#### References

- Conneely, M. E., 1983. Benthic ecological studies in Inner Galway Bay (West Coast of Ireland) with particular reference to Bivalvia. (Unpubl. Ph.D. Thesis). University College Galway. National University of Ireland, 144 pp.