

## Differential reproductive strategies of two bivalves in the Dutch Wadden Sea

Joana F.M.F. Cardoso<sup>1,2</sup>, Johannes I.J. Witte<sup>1</sup>, Henk W. van der Veer<sup>1</sup>

<sup>1</sup> NIOZ Royal Netherlands Institute for Sea Research, P.O. Box 59, 1790 AB Den Burg Texel, The Netherlands

<sup>2</sup> CIMAR/CIIMAR Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, Rua dos Bragas 289, 4050-123 Porto, Portugal

### Abstract

*Cerastoderma edule* and *Mya arenaria* are two common bivalve species in European waters. Longevity and maximum size are much greater in the latter species. Because comparison of species life-history strategies states that a long life span (i.e. high annual survival) generally goes with lower fecundity, we hypothesise that reproductive output would be lower in *M. arenaria* than in *C. edule*. In the present paper, we studied the reproductive strategies of these two species in an intertidal and a subtidal area of the western Dutch Wadden Sea, by following seasonal changes in absolute and relative weights of somatic and gonadal tissues in these bivalves. Starting of spawning was similar in the two species, around May, except for intertidal *M. arenaria*, which initiated spawning in August. Individual energy investment in reproduction was similar for the two species but, unlike *M. arenaria*, *C. edule* spawned completely, releasing all energy of gonadal mass in the form of gametes. *Mya arenaria* used the gonad not only for reproduction but also for storage. In the intertidal area, we found a trade-off between longevity and reproduction, i.e. maximum reproductive output (expressed as a proportion of body mass) was higher in *C. edule* than in *M. arenaria*. However, since body size is larger and life span longer in *M. arenaria* than in *C. edule*, mean lifetime reproductive output per individual must be higher in the first than in the latter. Based on the differences in reproductive strategies of these two species, we hypothesise that the negative effects of warming climate on bivalve population dynamics in the Wadden Sea will be stronger in *C. edule* than in *M. arenaria*.