

Origins of the North East and North West Atlantic marine biota

Mark J. Costello (1), Edward Vanden Berghe (2)*, Cliff Cunningham (3), Serge Rotenberg (2)

(1) Leigh Marine Laboratory, University of Auckland,
PO Box 349, Warkworth 0941, New Zealand.
Email m.costello@auckland.ac.nz

(2) Flanders Marine Data and Information Centre
Flanders Marine Institute
Wandelaarkaai 7, 8400 Oostende, Belgium
Tel +32 59 342130; Fax +32 59 342130

(3) Duke Biology Department, Box 90338, Duke University, Durham, NC 27708,
USA

* Presenting author.

The North Atlantic marine fauna and flora is believed to have evolved from trans-Arctic dispersal of Pacific species, in-situ speciation, and perhaps northward dispersal of southern Atlantic species. Subsequent influences include trans-Atlantic dispersal, human introductions from other oceans, and natural events such as glaciations that may have created dispersal barriers and/or caused regional extinctions. Recent online species information systems, including the European Register of Marine Species and North West Atlantic Register of Marine Species, facilitate comparison of species composition and richness across the North Atlantic. We used this data to test the hypotheses that (1) most trans-Atlantic species are pelagic or planktonic for all or significant periods of their lives, and (2) the benthic NW Atlantic fauna and flora is a random subset of that of the NE Atlantic. If the above are true, we would also expect patterns to hold at both species and higher taxonomic levels, i.e. similar proportions of species per genus, and genera per family in the NW and NE Atlantic. Exceptions to these patterns are discussed, including the locations of introduced species. The implications of these hypotheses are that dispersal, not local habitat conditions, are the most important factor in the origins of the North Atlantic biota, such that human introductions may radically alter species composition and ecosystem structure.