Chemical ecology as an important aspect of biodiversity and ecosystem functioning in marine planktonic environments

Adrianna Ianora*[1]

[1]Stazione Zoologica Anton Dohrn (SZN) – Villa Comunale 80121 Naples, Italy

Abstract

Marine chemical ecology is the study of the production and interaction of bioactive molecules affecting organism behaviour and function. Here I focus on bioactive compounds and interactions in planktonic environments that comprise > 90% of our biosphere and account for roughly half of the primary productivity on earth. These ecosystems are characterized by complex biotic interactions due to the enormous biodiversity of organisms living in the plankton including viruses, prokaryotes, protists and metazoans. Many of the compounds produced by these organisms are structurally and functionally diverse compared to terrestrial organisms, due to the unique environment in which marine organisms have had to evolve. To date, most of the research on chemical ecology has focused on benthic organisms, and there is now considerable information about feeding preferences and deterrent molecules in organisms living on or near the seabed. Much less is known on the chemical ecology of planktonic organisms that live in the open ocean. Chemical interactions in such environments often involve simple molecules derived from primary metabolism (e.g., polyunsaturated aldehydes (PUAs) in diatoms and dimethylsulfoniopropionate (DMSP) in prymnesiophytes). Some of these secondary metabolites seem to have multiple simultaneous functions including roles in chemical defense (antipredator, allelopathic and antibacterial compounds) and/or cell-to-cell signalling and bloom demise. We know very little as to if planktonic grazers avoid certain metabolites, or what happens when these compounds are consumed. My presentation will focus on these interactions and several others, especially in regard to some of the newer emerging areas of research in this field.

Keywords: marine chemical ecology

*Speaker