Cardiolipin and Plasmalogens in Marine Mollusk Bivalves – Contributions to Resistance and Adaptation to Prevailing Environmental Conditions.

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Membrane lipids are responsive to the needs of animals and environments that they inhabit. Phylogeny, pathologies, oxygen levels, diet, temperature, are known to modulate the membrane lipid composition and the physiology of marine poikilotherms. The extensive class Bivalvia is represented by more than 10 000 living species that have to cope with radically different biotic and abiotic factors. Cardiolipin and plasmalogens were two phosholipid classes explored as possible key contributors to bivalve adaptation upon environmental variability. The fatty acid compositions of cardiolipin analyzed in 37 bivalve species showed three characteristic profiles according to their levels of 22:6n-3 and 20:5n-3. These profiles appeared to be correlated with bivalve phylogeny and habitats and could reveal one specific adaptation of the mitochondrial respiratory processes during bivalve evolution. Plasmalogens constitute a subclass of phospholipids also thought to contribute to bivalve resistance and adaptation to their changing environment. Bivalve tissues are indeed particularly rich in plasmalogens that in addition contain high levels of unusual non-methylene-interrupted fatty acids. At the cellular level, a recent study demonstrated that plasmalogens reach high levels in circulating haemocytes and that plasmalogen molecular species of haemocytes were profoundly affected by biotic factors such as disseminated neoplasia (a leukemia *like* pathology).