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found in the dogfish plasma, small amounts of a free amine have been detected in the urine. The identity of this amine has not been established but apparently it is not ammonia, since it remains volatile in alkaline solution in the presence of formalin. This volatile amine has been assumed to be trimethylamine pending further investigation. The ratio TMAO/FREE AMINE in the urine varied considerably. In seven dogfish, this ratio ranged from 0.8 - 33. Although high ratios (up to 13) were present during control observations, the highest TMAO/FREE AMINE ratios were found following the administration of epinephrine. Thus, the rise in the rate of TMAO excretion was always greater than the rise in free amine excretion.

Further studies are planned to clarify these observations and to obtain more information concerning the origin of TMAO in the dogfish.

Esterases and Peptidase in Marine Invertebrate Embryos

William L. Doyle University of Chicago

Early embryonic stages of the sand-dollar, Echinarachnius parma, starfish, Asterias vulgaris and beach flea, Marinogammarus sp. have been examined with respect to the properties and content of certain esterases and peptidases. The work has been directed to the properties of similar enzymes in widely variant marine genera and also to changes in amount of enzyme during embryogenesis.

Phenyl benzoate and alpha-naphthyl acetate were used as substrates for esterases. In the species examined the rate of hydrolysis of alphanaphthyl acetate exceeded by several times the rate obtained with phenyl benzoate. In sand-dollar plutei and in several organs of juvenile starfish this esterase activity was not materially reduced after fixation in acetone and approximately 20 percent of the activity remained after fixation in formol. Appreciable esterase activity was retained in some desalted specimens dried in air at room temperatures. In gammarus embryos the rate of hydrolysis of alpha-naphthyl acetate was fairly constant from fertilization through the embryonic shield stage. Thereafter, the enzyme content rose to a value six or seven times higher prior to hatching.

Studies on peptidases were primarily concerned with the embryonic content of leucyl amino peptidase in the sand-dollar and gammarus embryos. In the sand-dollar from fertilization through the late pluteus stage the content of this enzyme remained constant. Similarly in gammarus stages from the fertilized egg through the embryonic shield stage indicated a constant content of leucyl amino peptidase.