These changes are physiologically significant since the turtle is exposed to similar temperatures during the course of normal existence. If CO_2 tension and pH turn out to be temperature dependent functions in most poikilotherms, it may well be that from the evolutionary standpoint, close regulation of temperature and narrow regulation of pH and CO_2 tension are parallel developments.

Dogfish Coelomic Fluid: I. Chemical Anatomy

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The coelomic cavity of the dogfish, S. acanthias, contains a considerable volume of a generally clear watery fluid. In 1929 Homer Smith defined some of the chemical characteristics of this fluid in a variety of elasmobranchs. It seemed of interest to re-investigate and extend these classical observations. Particular emphasis has been placed on a comparison of the relative composition of coelomic fluid and plasma. Nine fish were obtained relatively fresh from the trawl and approximately simultaneous samples of plasma and coelomic fluid withdrawn. Analyses were performed for the following constituents: total osmolarity, sodium, potassium, calcium, magnesium, pH, bicarbonate, urea, uric acid, total protein, and protein electrophoresis. The results are as follows:

These data indicate the following:

1. Dogfish coelomic fluid is significantly more acid than plasma. The distribution of chloride, bicarbonate and sodium ions between plasma and coelomic fluid cannot be explained on a simple Donna basis.

2. Dogfish coelomic fluid contains substantially more Cl^- than does plasma. This anion excess (79 meq/L) is partially but not fully explained by an excess of Na^+ (33 meq/L). If NH_4^+ ion obeys non-ionic diffusion in this fluid, then a substantial part of the cation gap may be related to this ion.

3. The protein concentration of coelomic fluid is low, in this respect resembling other relatively isolated fluid compartments like spinal fluid and aqueous humor.

4. Coelomic fluid is in osmotic equilibrium with plasma.

5 The ratios $\dfrac{(Ca^{++})\ C.F.}{(Ca^{++})\ P}$ and $\dfrac{(Mg^{++})\ C.F.}{(Mg^{++})\ P}$ show a reasonably reciprocal relationship.

I. Chemical Anatomy (Table of Analyses

Substance	Plasma Concentration	Coelomic Fluid Concentration	Ratio	Conc CF / Conc Plasma	"P" Values
Osmolarity (mO/L)	1007 ± 44	1005 ± 41	1.002		N.S.
Sodium (meq/L)	263 ± 16	296 ± 7	1.13		<.001
Potassium (meq/L)	4.1 ± 0.7	4.4 ± 0.3	1.07		N.S.
Calcium (meq/L)	6.6 ± 1.6	4.3 ± 0.2	0.65		<.001
Magnesium (meq/L)	3.1 ±0.6	7.3 ± 2.1	1.97		<.001
(H^+) (M/L)	3.3×10^{-8} (pH = 7.43)	2.0×10^{-6} (pH = 5.70)	61		<.001
Chloride (meq/L)	249 ± 11	328 ± 14	1.32		<.001
(HCO_3^-) (mM/L)	6 ± 2	Negligible	--		<.001
Urea (mM/L)	357 ± 32 (2.14 gms%)	415 ± 86 (2.49 gms%)	1.16		N.S.
Uric Acid (mg%)	1.8 ± 0.7	1.2 ± 0.2	0.67		N.S.
Total Protein (gm%)	4.0	0.020	--		<.001