

8% NaCl, vs 1.7 ml/kg/hr for 10 ml, 4, 8% NaCl. Response to urea was about half that of to sucrose. With urea-saline or distilled water, the highest rate was 1.4 ml/kg/hr for 35 ml injected solution. The chloride content of the secretion does not vary sufficiently to contradict these results based on rate of flow.

The secretion mechanism seems to respond to NaCl, osmotic load, and volume, but NaCl seems to exert an individual effect separate from osmotic load or volume.

Atropine (2-16 mg/3.5-6 kg fish) blocks the response to NaCl. Epinephrine and pilocarpine in various doses was not stimulatory. Eserin, and eserin followed by acetylcholine gave variable responses. Eserin plus acetylcholine did frequently give maximal or near maximal responses. Acetylcholine alone, as would be expected was ineffectual although marked vaso-motor changes were noted.

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### **Secretion by the Rectal Gland of the Dogfish, *Squalus acanthias***

J. Wendell Burger  
Trinity College

The rectal gland seems concerned solely with sodium chloride excretion. Dogfish were studied by continuous collection of rectal gland fluid (RGF) and urine up to 142 hours. The composition varied between individual fish and for a single fish. The commonest value was 490.9 mM/L with a range of 440-540. Secretion rates varied from 0.4-4.4 ml/kg/hr, but over long periods averaged 0.45, range; 0.11-0.81. Secretion was irregularly oscillatory and not at a constant rate. With or without visible secretion, plasma chloride fell across the gland: v/a, 95-68%. Combining total RGF and urine, and assuming these fluids approximate the net influx of portions of the external sea water, it appears that a slightly dilute solution of sodium chloride enters but that magnesium is largely excluded. When the rectal gland is made inoperative surgically, plasma and urine chloride rose, stabilized at sub-lethal levels, and the urine effected a net loss of chloride. In short term runs of 24 hours, dilute sea water did not change rectal gland flow or blood chloride.

Secretion by the gland can be stimulated by: NaCl = sucrose > urea > antipyrine. Also by volume changes: water, added whole blood. Secretion is not blocked by the local application of Metycaine and not induced or changed by the standard cholinergic and adrenergic agents and their blockers, or by mammalian Pitressin and L-8 vasopressin. It is suggested that the gland is activated by a blood-borne hormone.