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THE COMBINED EFFECTS OF Ca^{2+} AND Mg^{2+} IONS AND ORGANIC
MOLECULES ON DISCHARGE OF NEMATOCYSTS IN THE SEA
ANEMONE AIPTASIA PALLIDA

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It is known that both calcium and magnesium ions are present in the whole nematocyst in large quantities, calcium is given off from the nematocyst during the discharge, and that removal of calcium from the nematocyst causes discharge. It has also been found that organic molecules, specifically EGTA, citrate, proteins and N-acetylated sugars cause nematocyst discharge. But no direct link has ever been shown between the two.

It is proposed that a link exists between the discharge of nematocysts with organic molecules and the giving off of Ca^{2+} and Mg^{2+} by the nematocyst during discharge.

It is also proposed that this link is simple. The organic molecules are detected by the anemone and this triggers nematocyst discharge by removing calcium from its bound position within the nematocyst capsule. This in turn causes a rapid influx of water and then discharge.

Ca^{2+} and Mg^{2+} were measured with aequorin and 12-crown-4 ether, respectively, and the results analyzed to show a direct link between the induced discharge of the nematocyst and the release of Ca^{2+} and Mg^{2+} .

Preliminary data for magnesium are promising, magnesium seems to be given off in large quantities during discharge. Present data for calcium are inconclusive.