

Experiments with the Nematocysts of *Cyanea Capillata*

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ABSTRACT

Vinegar has already been proven to cause de-activation of the nematocysts of many jellyfish and other Cnidarians including the deadly *Chironex fleckeri*, and as such is the ideal immediate treatment on the beach¹.

More recently it has been shown that *Chrysaora quinquecirrha* (the North American sea nettle) reacts in the opposite way and vinegar causes discharge of the nematocysts² and because of its similarity to *Chrysaora*, *Pelagia noctiluca* ("little mauve stinger") must also be suspected of having nematocysts discharged by vinegar.

Recent tests with isolated tentacles of *Cyanea capillata* (the "hair jelly" or "snottie") also show that the nematocysts are actively discharged by vinegar but not by methylated spirits. However there is no difference to the clinical effect of the sting and because of the life saving benefits of vinegar in *Chironex* stings the initial first aid must continue to be vinegar poured in copious quantities all over the envenomated area.

INTRODUCTION

All jellyfish, and many other Cnidarians, possess the nematocyst, a small stinging cell by which they poison, paralyse and consequently trap their prey. Most of these nematocysts have different morphological features and by microscopic study it is often possible to identify the envenomating animal³.

The nematocyst is a specialised capsule, which contains the specific venom of the animal. Inside this capsule is a coiled thread tube, which is hollow to allow the passage of venom.

On the outside of the nematocyst is a cnidocil which is a small 'trigger mechanism' which when touched causes the thread to uncoil itself quickly and it fires, rather like a harpoon, deep into the tissues of its prey. Hydrostatic pressure causes the vigorous 'firing' of the thread tube^{3,4}.

The venom then passes through the hollow centre of the tube and is deposited into the body of the prey where it causes its specific effects.

The action of vinegar and metho is to dehydrate the tentacle, although it is obvious that different chemicals can have different effects on the nematocysts of different species.

Whilst trying different solutions for 'fixing' and then studying the isolated tentacle of *Cyanea capillata* (the "hair jelly"), it was noticed that on a tentacle fixed in vinegar most of the nematocysts had discharged.

Laboratory experiments

Isolated pieces of *Cyanea* tentacle were mounted in solutions of seawater, vinegar (4-6% acetic acid) and methylated spirits ('metho') and studied under the microscope.

The slides with the tentacles in the seawater and the methylated spirits showed that very few of the nematocysts had discharged. Conversely the slide with the tentacle fixed in vinegar showed that most of the nematocysts were discharged.

The experiment was also tried with tentacles still attached to the whole animal to see if there may be a 'nervous' response that cause a reflex discharge of the nematocysts but the results remained exactly the same i.e. vinegar causes discharge of the nematocysts, whereas 'metho' does not.

DISCUSSION

Vinegar is found to cause discharge of the nematocysts of *Cyanea capillata* whether or not these are attached to the animal or on isolated tentacles.

The sting of the *Cyanea* although florid in appearance causes very little pain or discomfort and no systemic effects^{3,5,6}. There is therefore little actual clinical effect of pouring vinegar on to an envenomated victim. There is a great clinical effect if vinegar is not used in victims stung by *Chironex*. By using vinegar you may save a life if the sting is from *Chironex fleckeri*, you will not cause any medical problems by using vinegar on *Cyanea* stings.

First aid teaching must remain simple if it is to work. The Surf Life Savers in north Queensland will be taught to continue the life saving technique:-

Vinegar + Resuscitation = Life!

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