



invertebrate facts

## Cone shells

FS08040

About cone shells –  
Preparing for the kill

<http://grimwade.biochem.unimelb.edu.au/cone/feeding.html>

Reproduced with permission of Dr Bruce Livett,  
University of Melbourne

You are here: [Home](#) --> [About Cone Shells](#) --> Feeding

# Feeding: Preparing for the Kill

- [Detection of the Prey](#)
- [Injection of the Venom](#)
- [Composition of the Venom](#)
- [Classification](#)

Cone shells are found in all habitats from shallow to moderate depths. The sand-dwelling species possess very clean shells while those that live on top of sand or among rocks or rubble have a layer called a periostracum that obscures the pretty patterns on the shell. This layer prevents organisms from growing on the shell and helps to camouflage it. Most cone shells are nocturnal - or crepuscular (ie. active at twilight or just before dawn). In the dynamic [marine environments](#) in which the cone shell resides , it has been necessary for these gastropods to develop an effective mechanism for immobilizing their otherwise speedy prey . The solution to the snail's lack of physical agility has been the development of a highly potent concoction of neuronal toxins which it uses to paralyze it's prey (an especially vital factor for the fish eating species).

## Detection of the Prey

The cone shell detects prey in it's environment using a 'siphon' which bristles with chemoreceptors. It then extends it's proboscis out towards the unfortunate target.

## Injection of the venom

The venom is produced in a long tubular duct that is often several times the length of the snail itself and at one end is attached to a muscular bulb which is thought to contract to provide the necessary force of venom injection through the 'tooth'. Hollow spear-like radular teeth , which are made in the 'radular sac' and filled with venom, are transported through the 'buccal cavity' to the tip of the proboscis where they are retained by radular muscle. Upon contact with the prey, the proboscis impales the harpoon like tooth into any exposed tissue and injects the venom through this. The harpoon is attached to the gastropod via a 'thread' so that the prey is actually tethered to the snail (although the organism is often paralyzed within one or two seconds, leaving little opportunity to escape). Once the prey is paralyzed, the gastropod retracts the cord by which the prey is attached and engulfs the prey through it's the radular opening of it's proboscis and into its distensible stomach where it is digested. The cone shell can reload further teeth from the radular sac for multiple envenomation by retracting the proboscis into the radular sac and grasping another tooth with the radular muscle.

## Composition of the Venom

The composition of the venom is different with each injection. The pharmacological activity also changes, the venom containing lethal and paralytic neurotoxic peptides as well as components which elicit specific and varied

physiological and behavioral responses when tested in mice.

The paralysis of the prey by the killer-snail venom permits correct presentation of the prey to the gastropod so that it can be engulfed and enzymatically digested by the killer snail's distensible stomach.

In mollusc-eating cones the feeding process is rather complex, and involves the sequential injection and release of several radular teeth into the prey. Allan Kohn has illustrated this process with a video. See [Kohn \(2001\)](#), [[entry for 8 September 2001](#)].

## Classification

Cone shells are classified according to their prey:

- [Piscivorous](#) ..... fish eaters
- [Molluscivorous](#) .... mollusk eaters
- [Vermivorous](#) ..... worm eaters

(see also list of [Cone shells - by habitat and food preference](#))

CG and BGL , August 1996

[What's New](#)

[About Cone Shells](#)

[More Information](#)

[Resources](#)

[Contact Us](#)

*Do you have any positive comments or/and questions ? Please send to [Dr. Bruce Livett](#)*

---

Copyright © 1998 [Dynamix@WORK!](#) All rights reserved. Last updated on December 17, 2003.