

The mind and mouth of a predatory worm

Nematodes (roundworms) are some of the most abundant and successful animals on the planet and are found in nearly every environment capable of supporting life. In order to exploit these hugely diverse habitats, different nematode species have acquired distinct adaptations. These adaptations can take the form of anatomical, physiological, and behavioural changes which facilitate their survival in their ecological niche. An example of these adaptations can be seen in the well-studied nematode, *Caenorhabditis elegans*, which is found in rotting fruit and has a diet of bacteria. As such, it has specific adaptations for this food source including the presence of toughened discs called the grinder just behind its mouth opening which help it to crush its food.

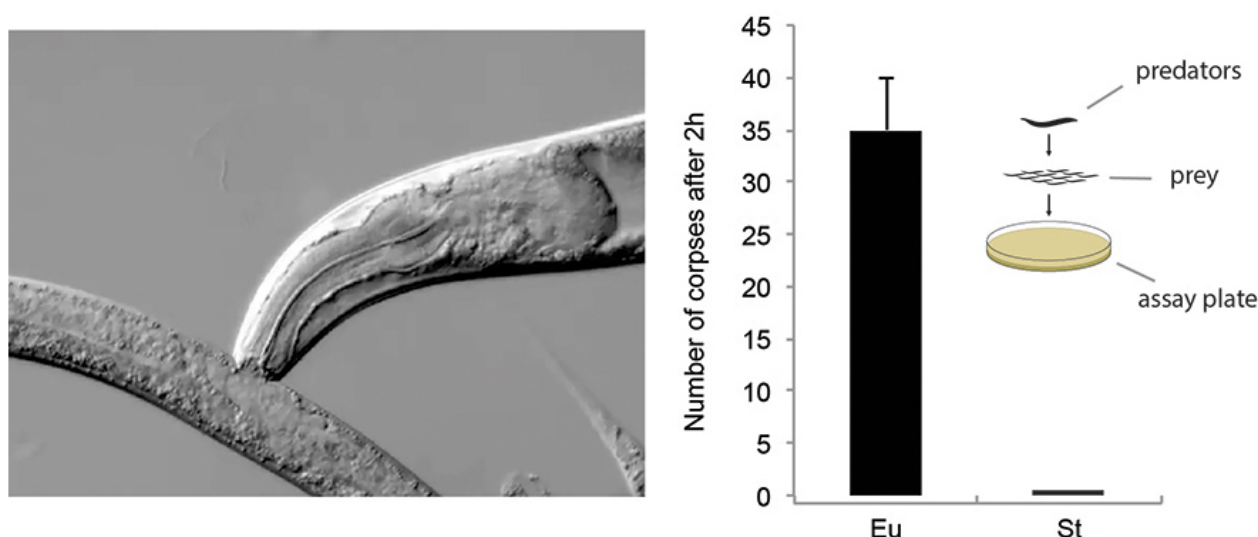


Fig. 1. *Pristionchus pacificus* nematodes can kill other nematodes like *Caenorhabditis elegans*. However, it is only the eurystomatous (Eu) mouth type and not the stenostomatous (St) which can kill.

Other nematode species have however acquired different feeding mechanisms and behaviours in order to exploit different food sources. This includes a group of nematodes capable of predating upon other nematodes in addition to also feeding on bacteria. The best studied of these nematodes are the *Pristionchus* group and in particular *Pristionchus pacificus*. In order to feed on other nematodes *Pristionchus* species have lost the grinder but instead evolved teeth like structures in their mouth which can rip open their prey (Fig. 1). In addition, there is an extra level of complexity as most *Pristionchus* species are dimorphic, so they form one of two different mouth types. These mouth forms are called the eurystomatous and the stenostomatous forms and are both anatomically and behaviourally distinct. The eurystomatous mouth type has a larger mouth opening and has two opposing teeth including a sharp movable tooth while the stenostomatous mouth has

a single blunt tooth. Coinciding with these differences only the eury stomatous animals shows any predatory behaviour and are capable of killing while the stenostomatous animals does not show any killing behaviour at all (Fig. 1). Therefore, in order for the predatory eury stomatous animals to kill they likely make different genetic, developmental and neuronal decisions which we can investigate to better understand the evolution of complex behaviours.

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[Predatory feeding behaviour in *Pristionchus* nematodes is dependent on phenotypic plasticity and induced by serotonin.](#)

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