



**Fig. S1 Predatory feeding assays.** Schematic of predatory feeding behaviour assays. (A) Bite assay schematic. The appropriate prey species were filtered through 0.2  $\mu\text{m}$  filter and after centrifuging, 2  $\mu\text{l}$  of nematode larval pellet placed onto NGM plate. A single predator was added to the centre of the plate and observed for 10 min. Bites, kills and feeding events could be quantified as appropriate. (B) Corpse assay schematic. The appropriate prey species were filtered through 0.2  $\mu\text{m}$  filter and after centrifuging, 2  $\mu\text{l}$  of nematode larval pellet placed onto NGM plate. Five young adult predators were added to the centre of the plate and allowed to feed for 2 hours after which the number of corpses was quantified.



**Movie 1. Predatory feeding behaviour in *P. pacificus* Eu mouth morphs.** A single *P. pacificus* Eu mouth morph animal bites and feeds on young *C. elegans* larvae.



**Movie 2. *P. pacificus* response to the neurotransmitter serotonin.** 10 mM serotonin induces predatory-like rhythms in *P. pacificus* including tooth stimulation and a slowed pumping rate in comparison to bacterial feeding rhythms.



**Movie 3.** *P. pacificus* bites *C. elegans* of all developmental stages including adults. *P. pacificus* predators (middle and top animals) bite *C. elegans* adults (left and right animals) inducing a strong touch response and movement away from the bite impact.



**Movie 4.** Predatory feeding behaviour is absent in *P. pacificus* St mouth morphs.