



Dimethyl sulfide triggers search behavior in copepods

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ABSTRACT: The oceans are nutritionally dilute, and finding food is a major challenge for many zooplanktonic predators. Chemodetection is necessary for successful prey capture, but little is known about the infochemicals involved in the interaction between herbivorous copepods and their phytoplankton prey. We used females of *Temora longicornis* to investigate chemodetection of dimethyl sulfide (DMS) in this calanoid copepod and quantified its behavioral response to plumes of DMS using video-microscopy in combination with laser-sheet particle image velocimetry (PIV). Slow injection of a 1- $\mu\text{mol L}^{-1}$ DMS plume into the feeding current resulted in a characteristic behavioral pattern ("tailflapping"), a redirection of flow equivalent to 30% of the average current velocity, and changes in the location of flow-induced vortices. In free-swimming individuals, this likely results in somersault-type movements that are associated with search behavior in copepods. In comparison to seawater controls, DMS injections significantly increased the average number of tail-flaps per copepod during the first 2 s after exposure to DMS gradients. Our results demonstrate that copepods can detect and react to plumes of DMS and suggest that this biogenic trace gas can influence the structure and function of pelagic foodwebs.

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