Elevating the predatory effect: Sensory-scanning foraging strategy by the lobate ctenophore Mnemiopsis leidyi

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The influential predatory role of the lobate comb jellyfish Mnemiopsis leidyi has largely been attributed to the generation of a hydrodynamically silent feeding current to entrain and initiate high encounter rates with prey. However, for high encounter rates to translate to high ingestion rates, M. leidyi must effectively capture the entrained prey. To investigate the capture mechanisms, we recorded and quantified, using three-dimensional videography, the outcome of encounter events with slow swimming Artemia prey. The auricles, which produce the feeding current of M. leidyi, were the primary encounter structures, first contacting 59% of the prey in the feeding current. Upon detection, the auricles manipulated the Artemia to initiate captures on the tentillae, which are coated with sticky cells (colloblasts). Using this mechanism of sensory-scanning to capture prey entrained in the feeding current, M. leidyi uses a similar foraging strategy to that of feeding-current foraging copepods. As such, M. leidyi has a higher capture efficiency than do medusae, contributing to the greater predatory effect of M. leidyi in both its endemic and invasive ecosystems.
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