

Some strange sensing tools

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Pycnogonids are particularly understudied marine arthropods despite their wide distribution. The main reason is that they usually display low population densities. However, the northern pacific species *Ammothea hilgendorfi* is now considered invasive in Europe and a proliferating population was discovered in 2022 at the North Sea (Knokke-Heist, Belgium), reaching record breaking densities. A 24-month monitoring was consequently conducted to better understand the dynamic of this population. Such a great biological material quantity was the opportunity to deepen the understanding of these unique yet poorly known animals. Indeed, pycnogonids present quite specific ecology and morphology, including an abdomen and trunk reduction, which induced the extension of internal systems into the legs. Sea spiders also display ovigers, specialized egg-carrying appendages used by males to take care of their offspring; and a tubercle, periscope-like structure bearing the eyes and providing a 360° vision field. They also feature peculiar sensory organs (*i.e.*, lateral sense organ, Gabelborsten, slit organ, hinged bristles) for which the functions remain hypothesized. Only the structure was described in model species. To provide insight on how such organisms perceive their environment, the aim of this study was to describe the sensory organs of *A. hilgendorfi*. In the same perspective, their chemotaxis was investigated in a set-up that would also help elucidate other stimuli (*i.e.* multimodal communication).

Keywords

Pycnogonids; Sea Spiders; *Ammothea Hilgendorfi*; Sensory Organs; Multimodal Communication