Pumping Water or Producing Larvae? Oscula Occlusion during the Reproductive Period of the Sponge *Svenzea zeai*

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The sponge *Svenzea zeai* (Demospongiae: Halichondrida), a common inhabitant of the Caribbean Sea, is known to brood the largest larvae recorded in sponges all year round (Rützler et al. 2003). In June 2008, we observed several specimens of *S. zeai* in the Bahamian islands of Little San Salvador (~10% of observed colonies) and Plana Cay (~80%) with some or all oscula partially or totally occluded by a thin veil (Fig. 1A). All sponges that exhibited closed oscula were brooding embryos (Fig. 1B), but not all brooding sponges had occluded oscula. The development of the veil appeared to interfere with water flow through the osculum, suggesting a reduction in water circulation throughout the sponge. We subsequently analyzed the oscular rims using transmission electron microscopy (TEM) and observed that the sponge mesohyl in the rim of the veil was occupied by a cell type (~30% of the section surface) filled with inclusions that had a granular content. Our observations suggest that the contents of these vesicles were continuously being released and were forming the mucus material of the veil (Fig. 1C).

Disruption of the aquiferous system in sponges is uncommon and is generally associated with pollution and disease (Olesen and Weeks 1994), or resting stages (Turon et al. 1999). The benthic communities present at Little San Salvador and Plana Cay appeared healthy, and no diseased sponges were observed. We postulated that the sponge aquiferous system may become partially disorganized during reproductive activities, temporarily decreasing the water flow through the sponge and allowing the accumulation of mucus in the oscula. A disorganization of the aquiferous system may also disrupt filter-feeding, respiration, and waste-removal activities.


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REFERENCES


Fig. 1. (A) The sponge *Svenzea zeai* with closed and open oscula (scale bar = 6 cm); (B) brooding larvae in sponge tissue beneath a closed osculum (scale bar = 2 cm); (C) TEM image of spherulous cells in the rim of a closed osculum. Inset shows the release of granular material into the mesohyl (scale bars = 5 μm).

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