

Social shrimp (Crustacea: Decapoda: Alpheidae: *Synalpheus*)

Resources for teaching

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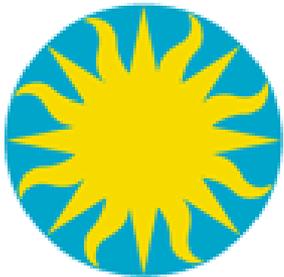
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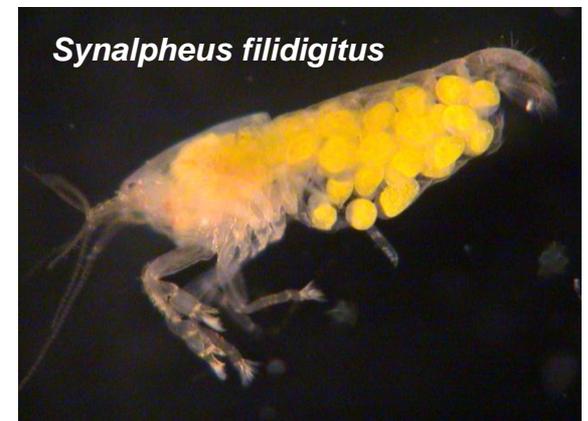
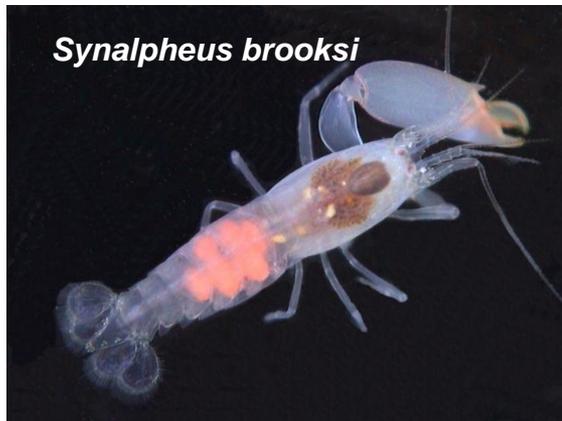
**The Smithsonian Institution's
Caribbean Coral Reef Ecosystem (CCRE) Program**

And

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The five currently recognized species of eusocial shrimps

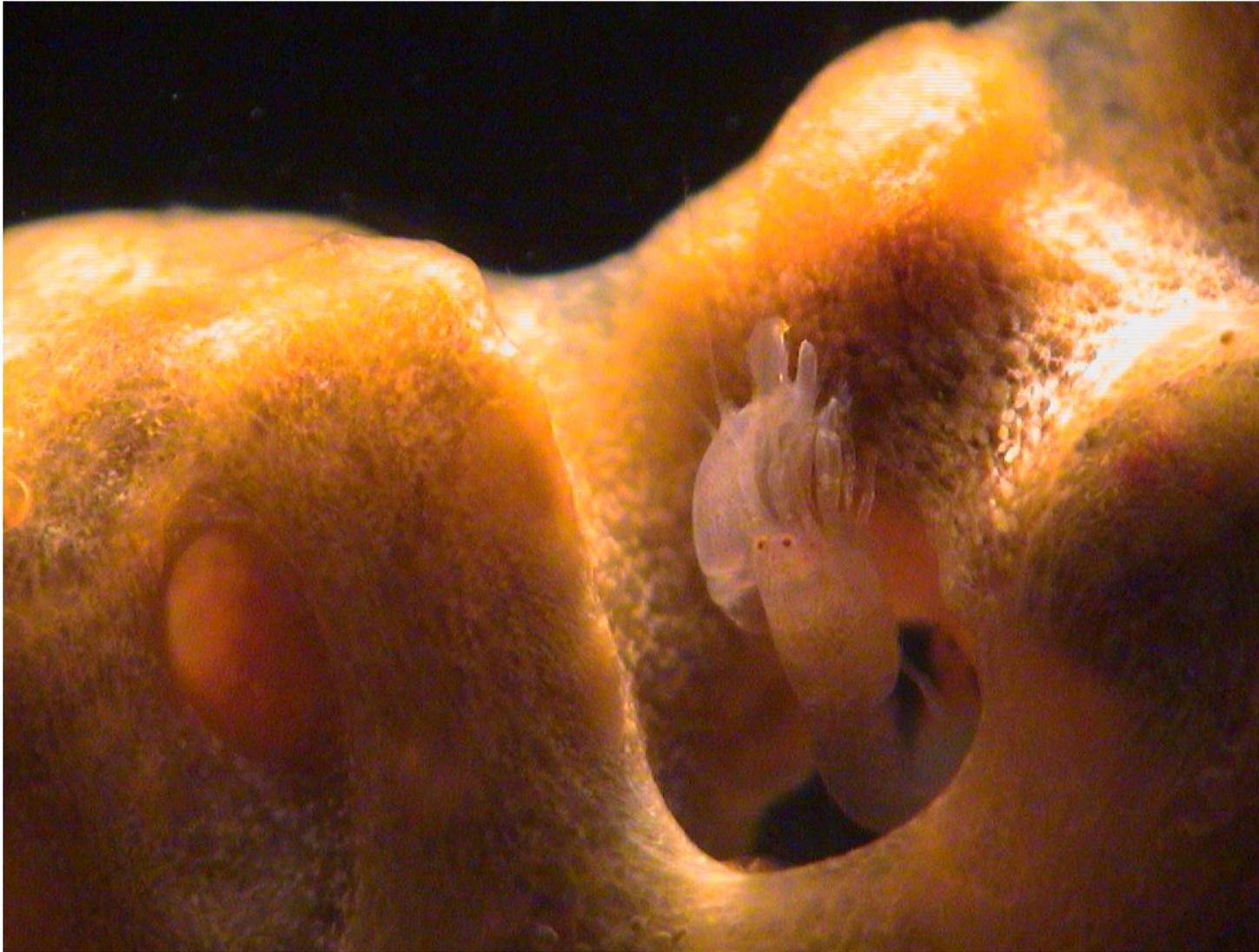




Synalpheus regalis. A mature queen. The pale green ovaries are visible dorsally through the transparent body. The clutch of late-stage embryos, some with visible eyes, can be seen in the brood chamber beneath the queen's abdomen. Normally, shrimp would rarely be found on the exterior of the sponge.



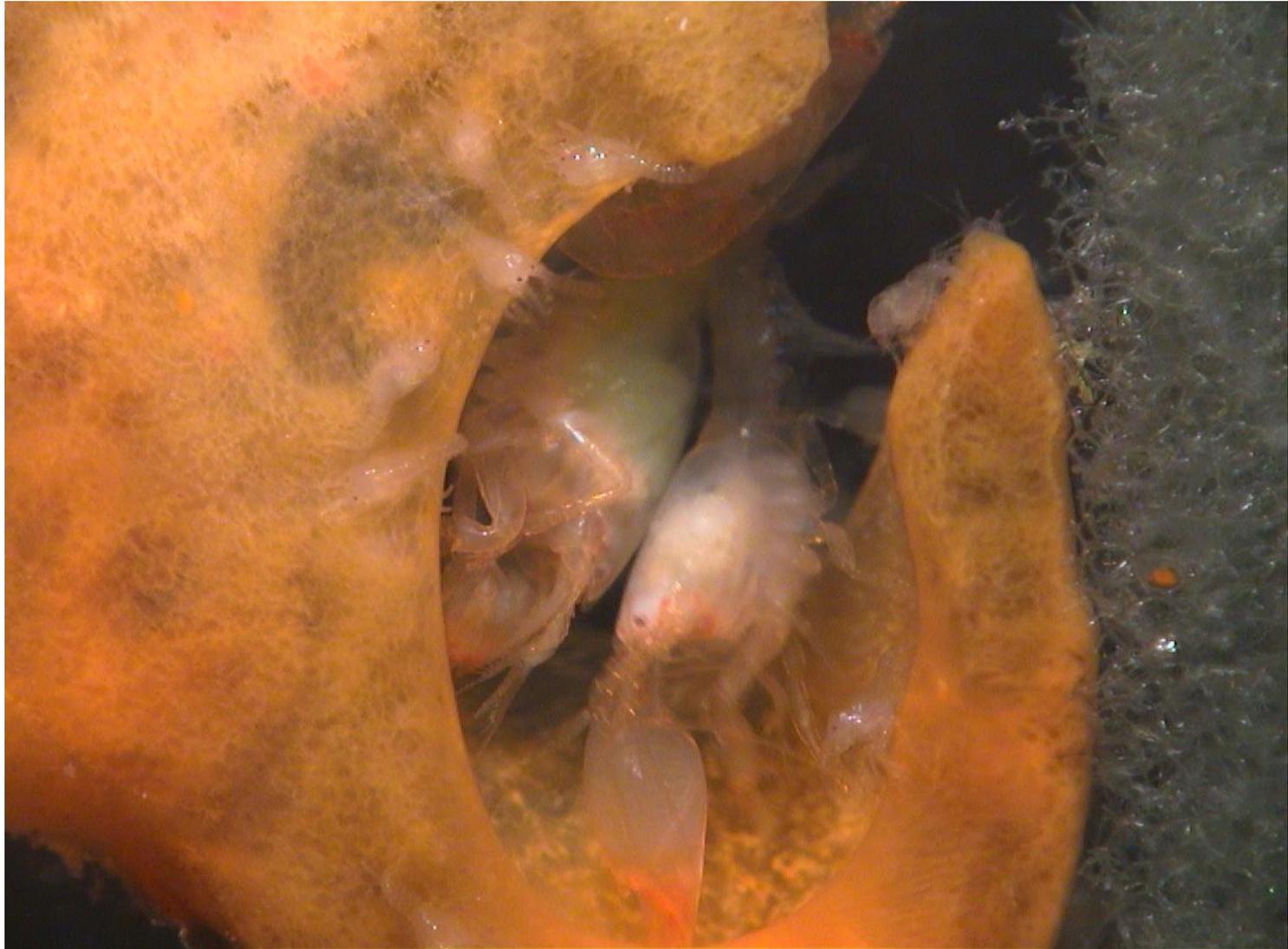
Synalpheus regalis. A newly hatched benthic juvenile, only hours after being born, walking on the surface of the sponge in the laboratory observation chamber.



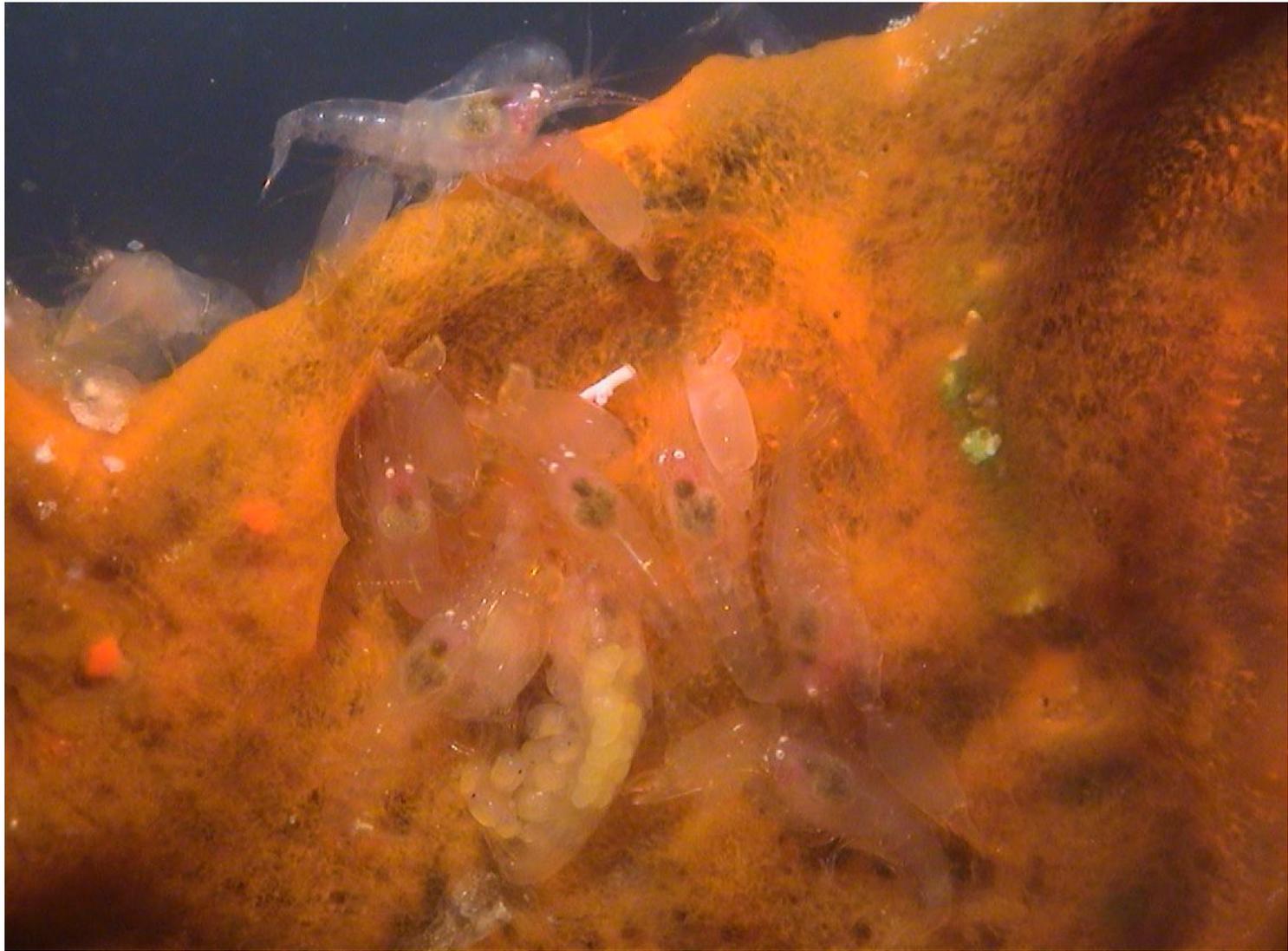
Synalpheus regalis. An adult defender guards the entrance to a hole in its host sponge (*Lissodendoryx colombiensis*) in the laboratory.



Synalpheus regalis. Two adults face off in an agonistic encounter.



Synalpheus regalis. A mature queen and male with a clutch of newborn juveniles.



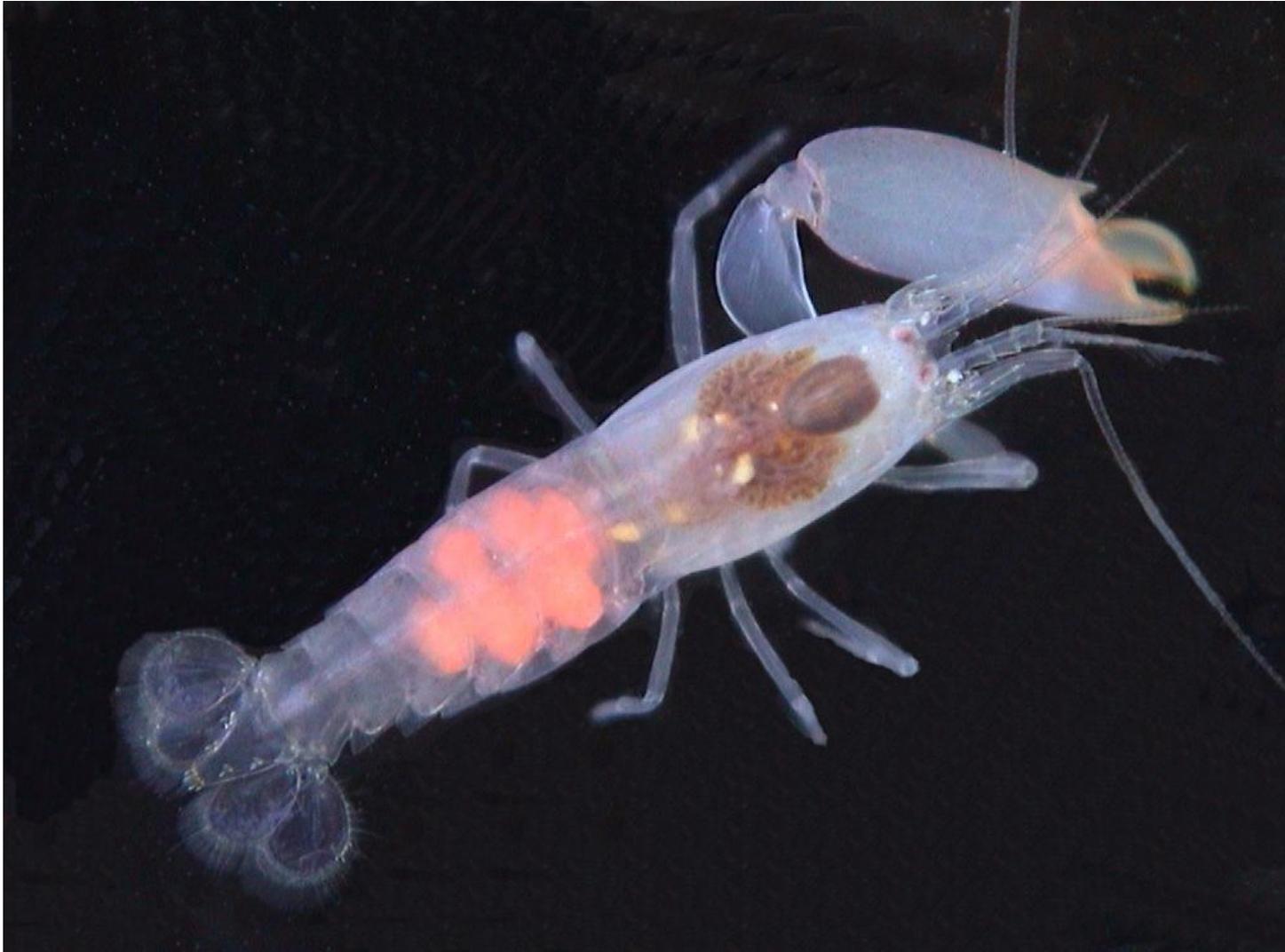
Synalpheus filidigitus. A group of individuals, including the queen with pale yellow ovaries and embryos, defends the sponge space in which they are sheltering from an attempted intruder in this laboratory observation colony. Note the cocked snapping claws of the several defenders facing outward toward the intruder.



Xestospongia rosariensis. A cross-section of this sponge, used by the social shrimp *Synalpheus rathbunae* in Caribbean Panama, shows the Swiss cheese-like internal canals in which the shrimps live.



A view of the sponge-encrusted dead branches of finger coral (*Madracis mirabilis*) in which social shrimps are very abundant, Belize Barrier Reef.

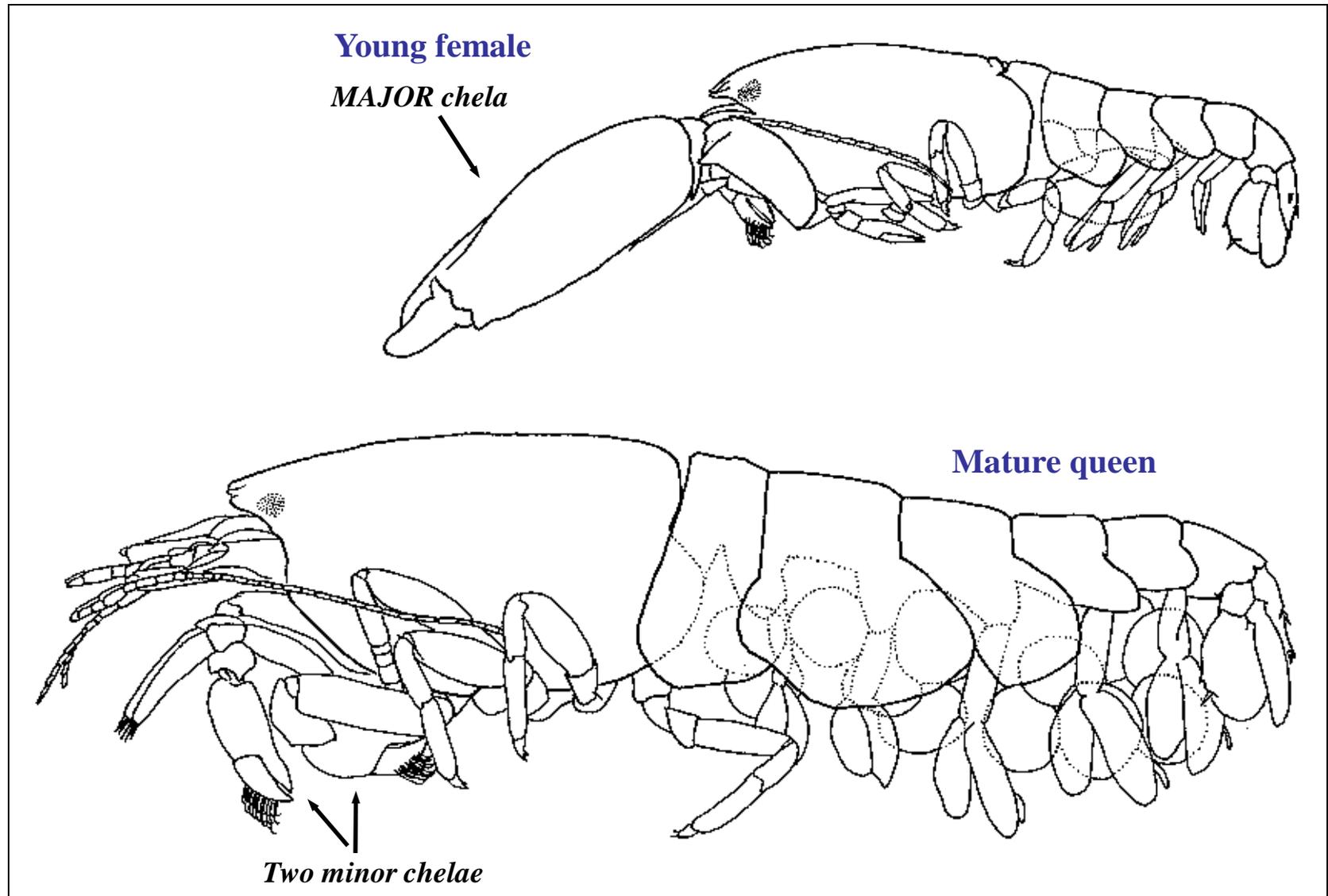


Synalpheus brooksi. This species also lives in large social colonies, but usually with several reproducing females in a sponge. Note the relatively small number of pale red embryos.



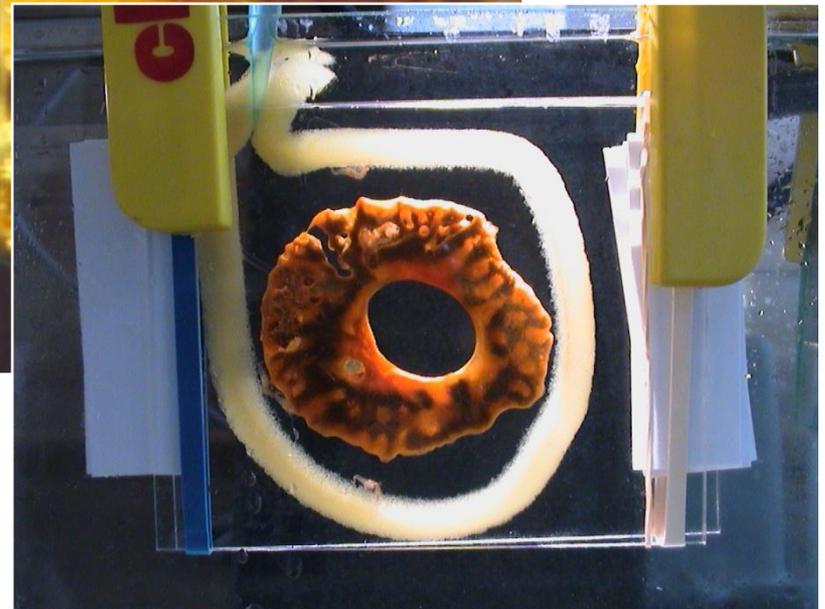
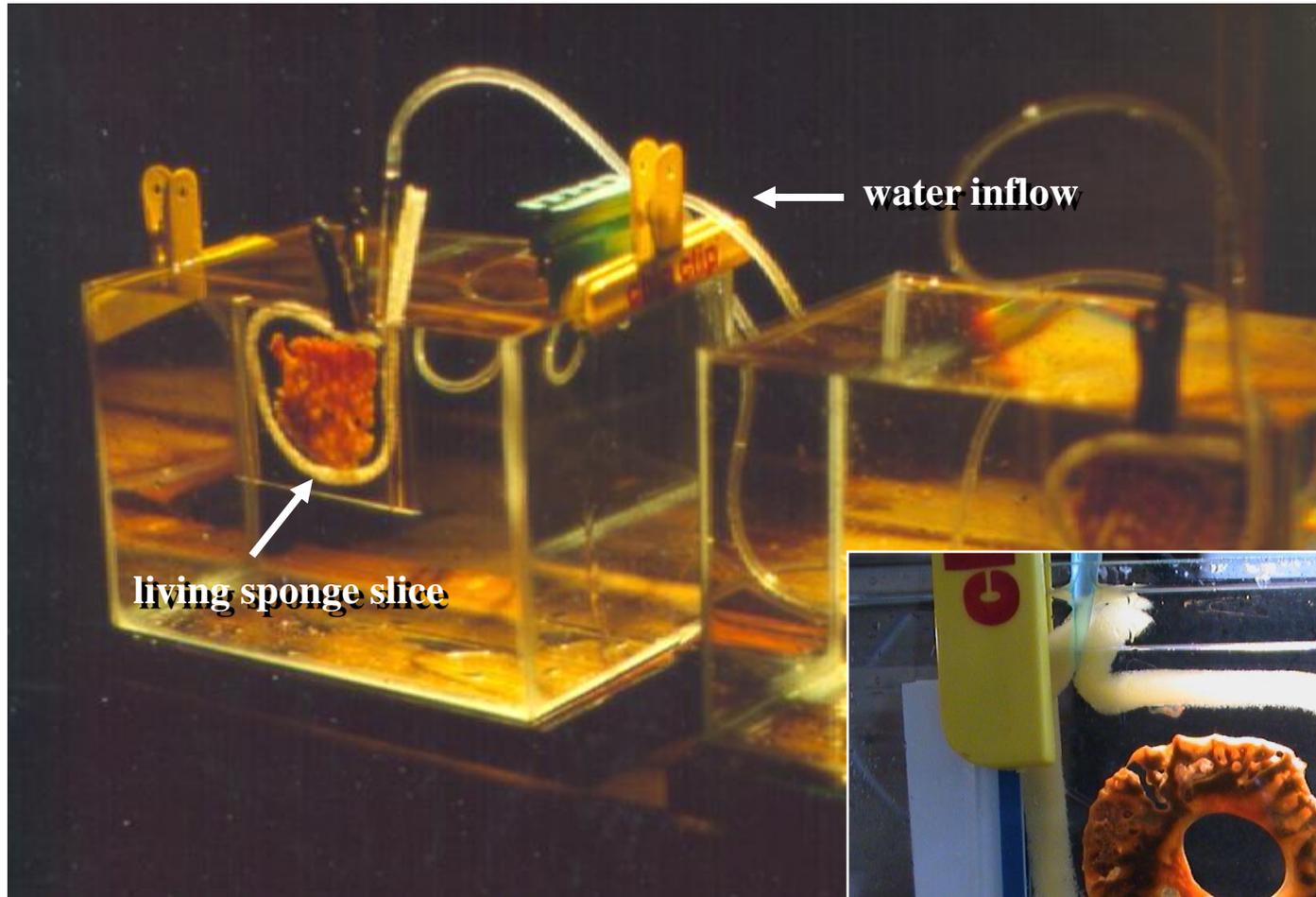
Synalpheus filidigitus. The queen of this eusocial species shows the only consistent evidence of morphological “caste” differentiation known among social shrimps, namely the replacement of the large snapping claw with a second, minor-form claw used for feeding.

Morphological caste differentiation in *Synalpheus filidigitus*

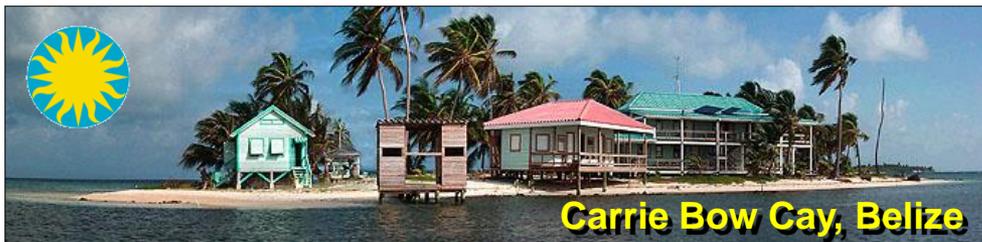
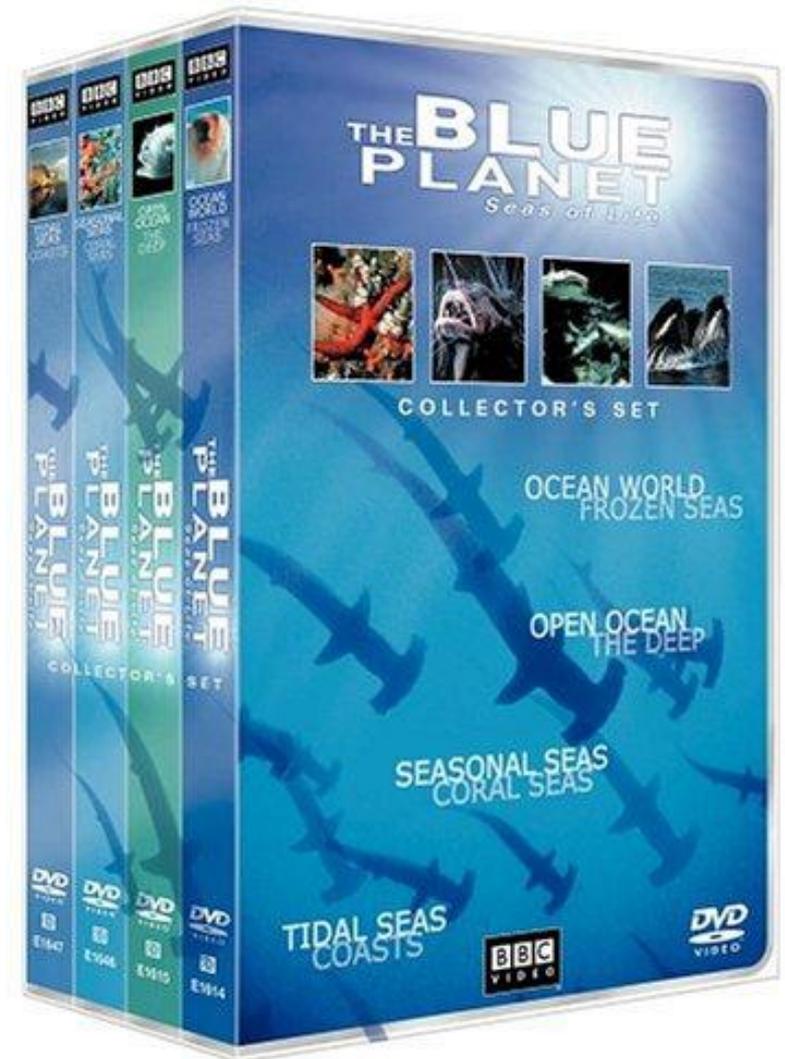


From: Duffy, J.E. & K.S. Macdonald. 1999 Colony structure of the social snapping shrimp, *Synalpheus filidigitus*, in Belize. *Journal of Crustacean Biology* 19:283-292.

The flow-through seawater observation chamber used to study social shrimp behavior at the Smithsonian Institution's Carrie Bow Cay field station on the Belize Barrier Reef. Inset shows a slice of the sponge *Lissodendoryx colombiensis* in which shrimp are housed.



A short segment on social *Synalpheus regalis* was filmed at the Smithsonian Institution's Carrie Bow Cay field station on the Belize Barrier Reef in 1999, and is included in the "Coral Seas" episode of the BBC's *Blue Planet* educational video series. This is a fantastic series—don't miss it!



Social shrimp References

(many available at <http://www.vims.edu/bio/mobee/duffypub.html>)

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