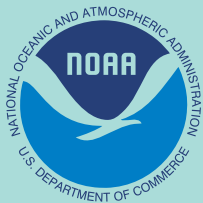




FLORIDA KEYS WATER WATCH

Sponge Restoration Aquaculture



Shelly Krueger

Florida Sea Grant Extension Agent

UF/IFAS Monroe County, Key West, FL



Acknowledgements

- US EPA Region 4 Water Division, South Florida Program
- Florida Fish and Wildlife Conservation Commission
- Project Team: Drs. Josh Patterson, Shirley Pomponi, Cristina Diaz
Doug Gregory, Mimi & Simon Stafford
- FAU Harbor Branch Oceanographic Institute
- University of California Santa Cruz

Project Overview



- Year 1: Document spawning seasons in Loggerhead and Sheepswool sponges using histology and light microscopy
- Year 2: Investigate propagule reproduction following nursery propagation for 6 sponge species
- Create the first Florida Keys nearshore sponge identification field guide for 31 species



Vase sponge propagules inside FWC-permitted nursery, Marathon, FL (Jennifer Stein)



Vase sponge propagule 2-years later (Shelly Krueger)



Vase sponge propagules 4-years later (Dr. Mark Butler)

Objective 1: Spawning seasonality of adult donor candidate sponges

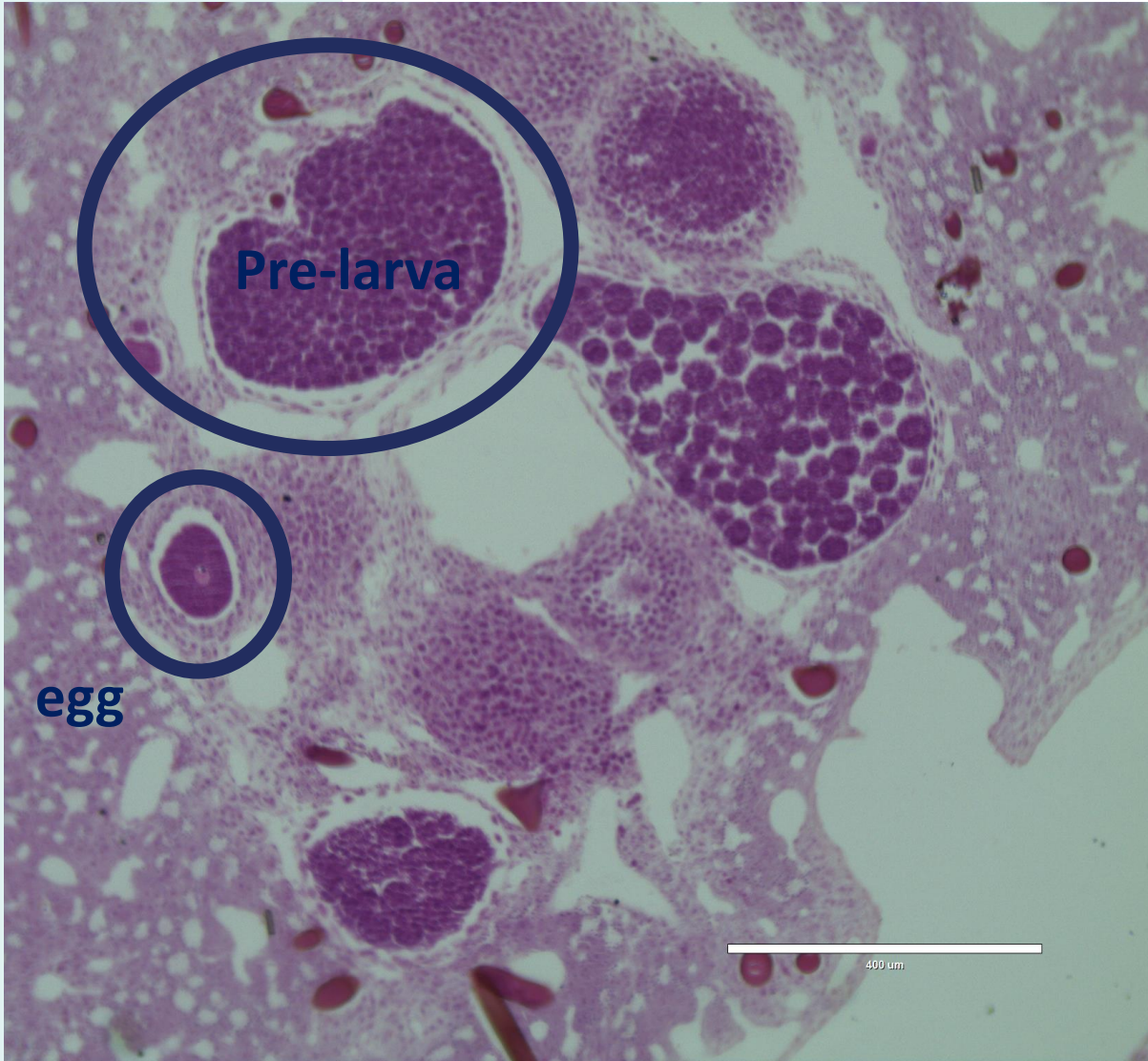


Fig. 1. Sheepswool eggs and fertilized ciliated pre-larva, scale bar 400 μm.

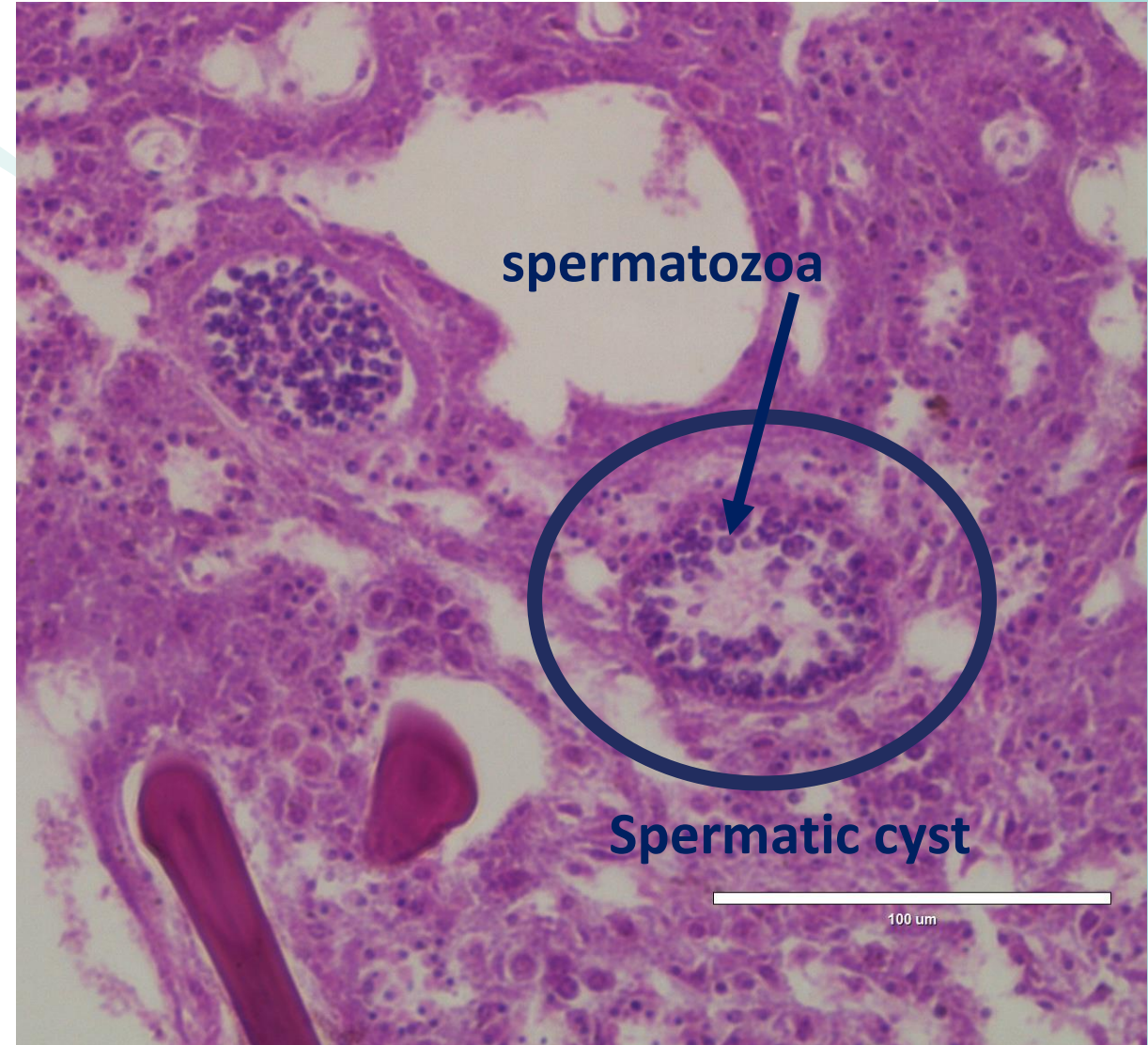


Fig 2. Sheepswool spermatic cysts, scale bar 100 μm (Shelly Krueger)

Objective 1: Sheepswool *H. lachne* gametogenesis, May-22 to Apr-23

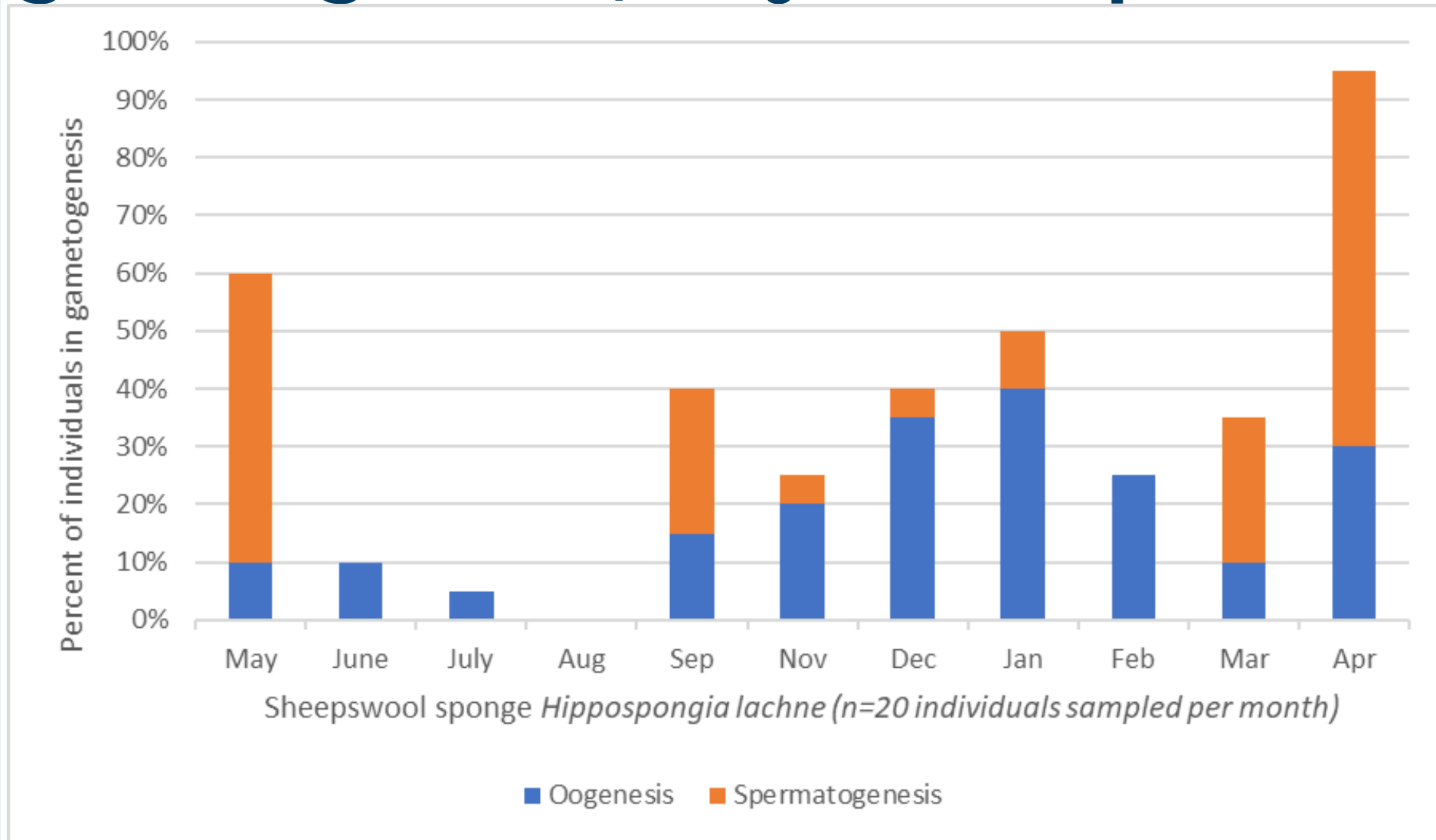


Figure 3. Sheepswool *H. lachne* gametogenesis, May 2022 to April 2023. Presence of larvae recorded but not represented in these figures.

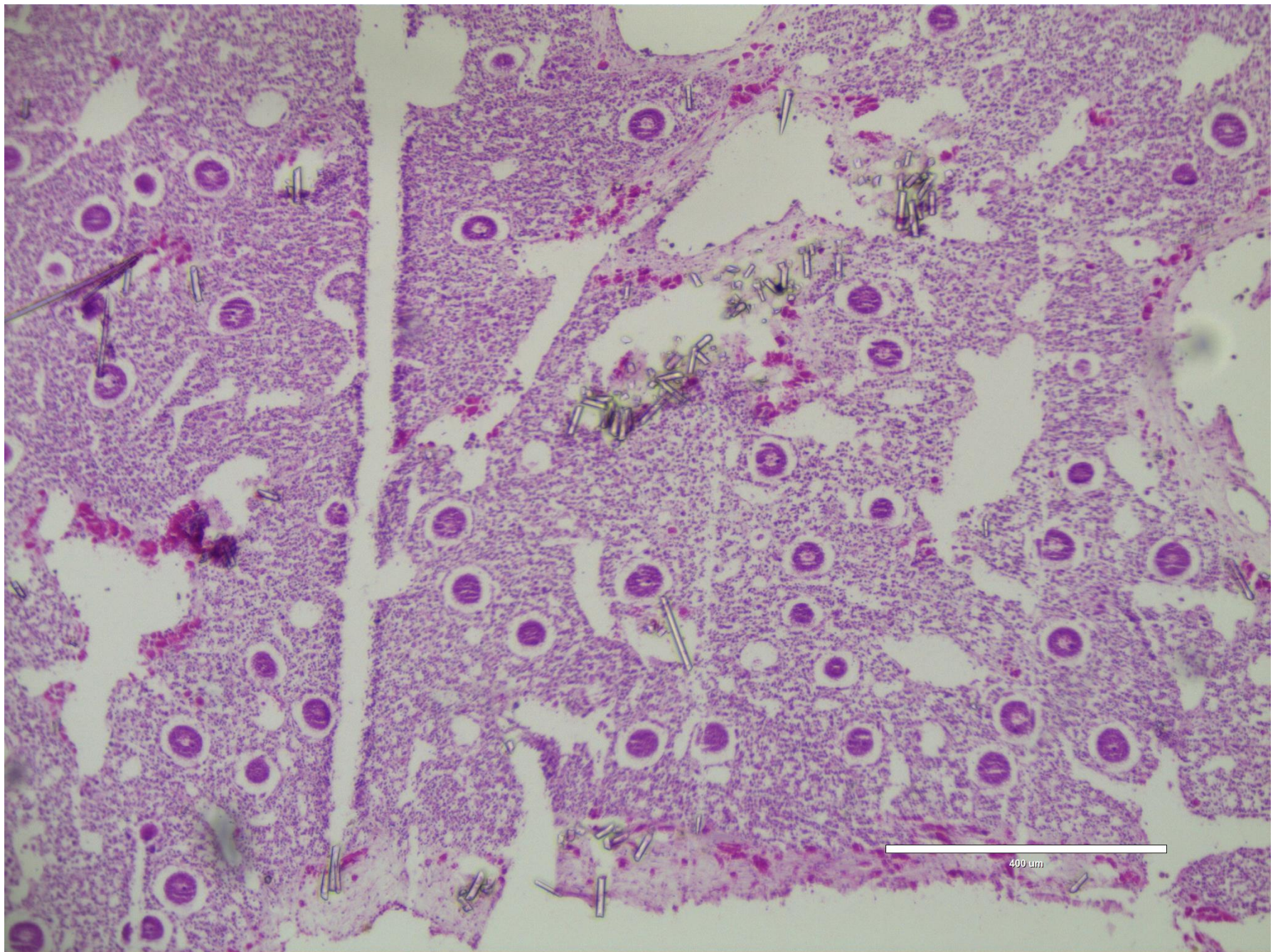


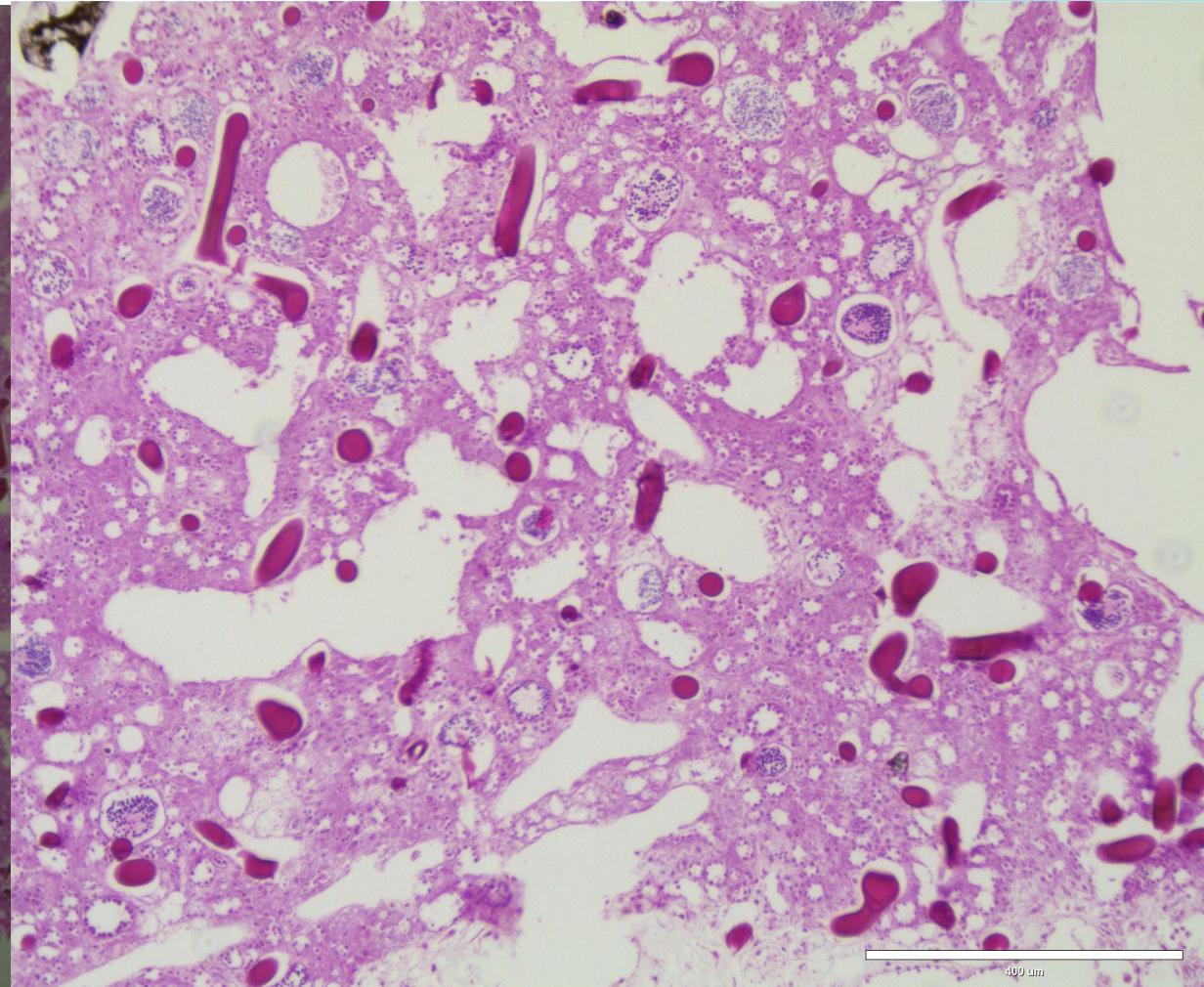
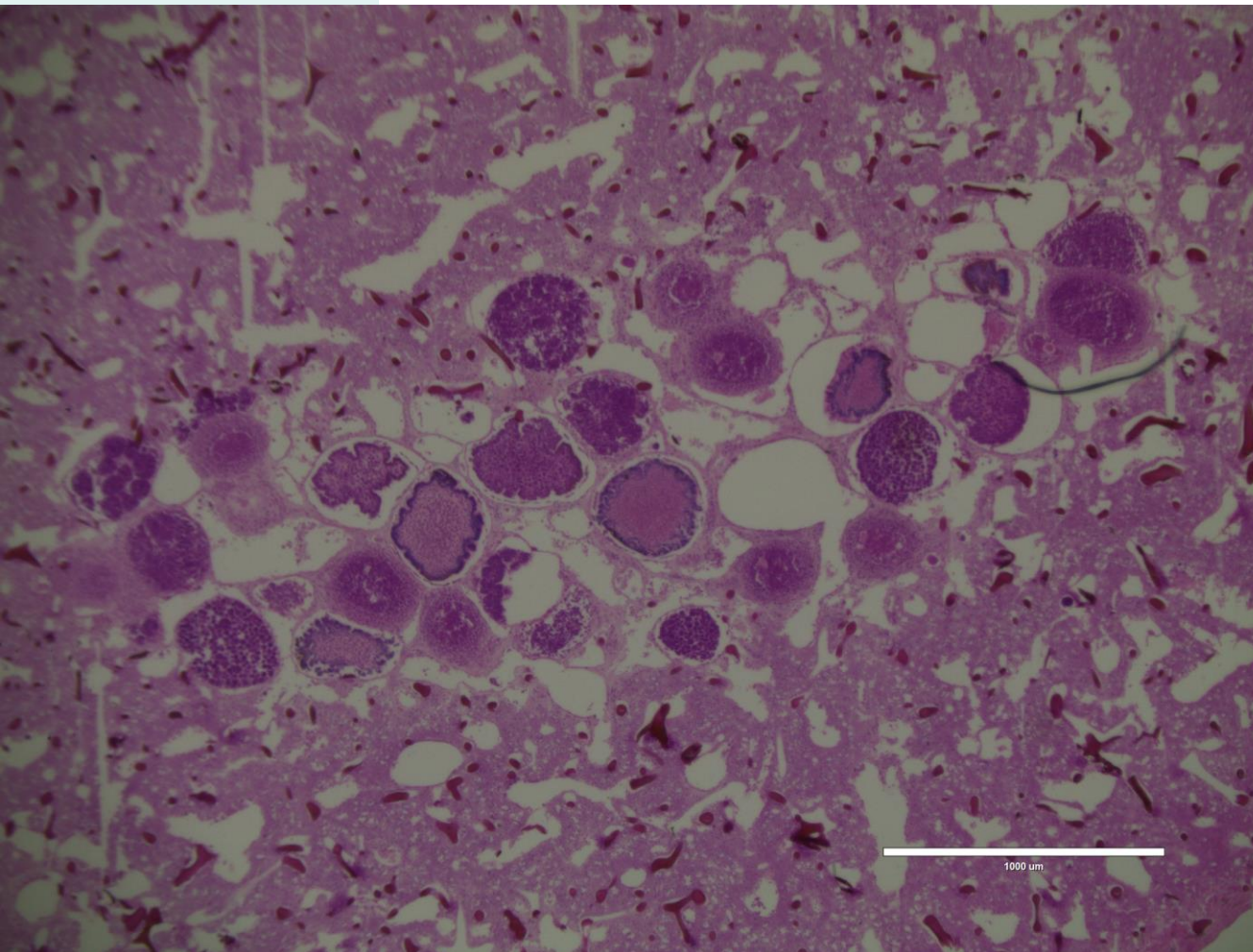
Fig. 4. May 2023: Slide 18 Loggerhead *S. vesparium* eggs (1 of out 211 sponges). Scale bar 400 μ m.

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Research Plan – Year 2



Are the sponge propagules reproducing? YES!!



Yellow sponge eggs and larva, scale bar 1,000 μm. Yellow sponge spermatocysts, scale bar 400 μm (Shelly Krueger)

Objective 2: Propagule reproduction



June 2023 only; resume March-June 2024

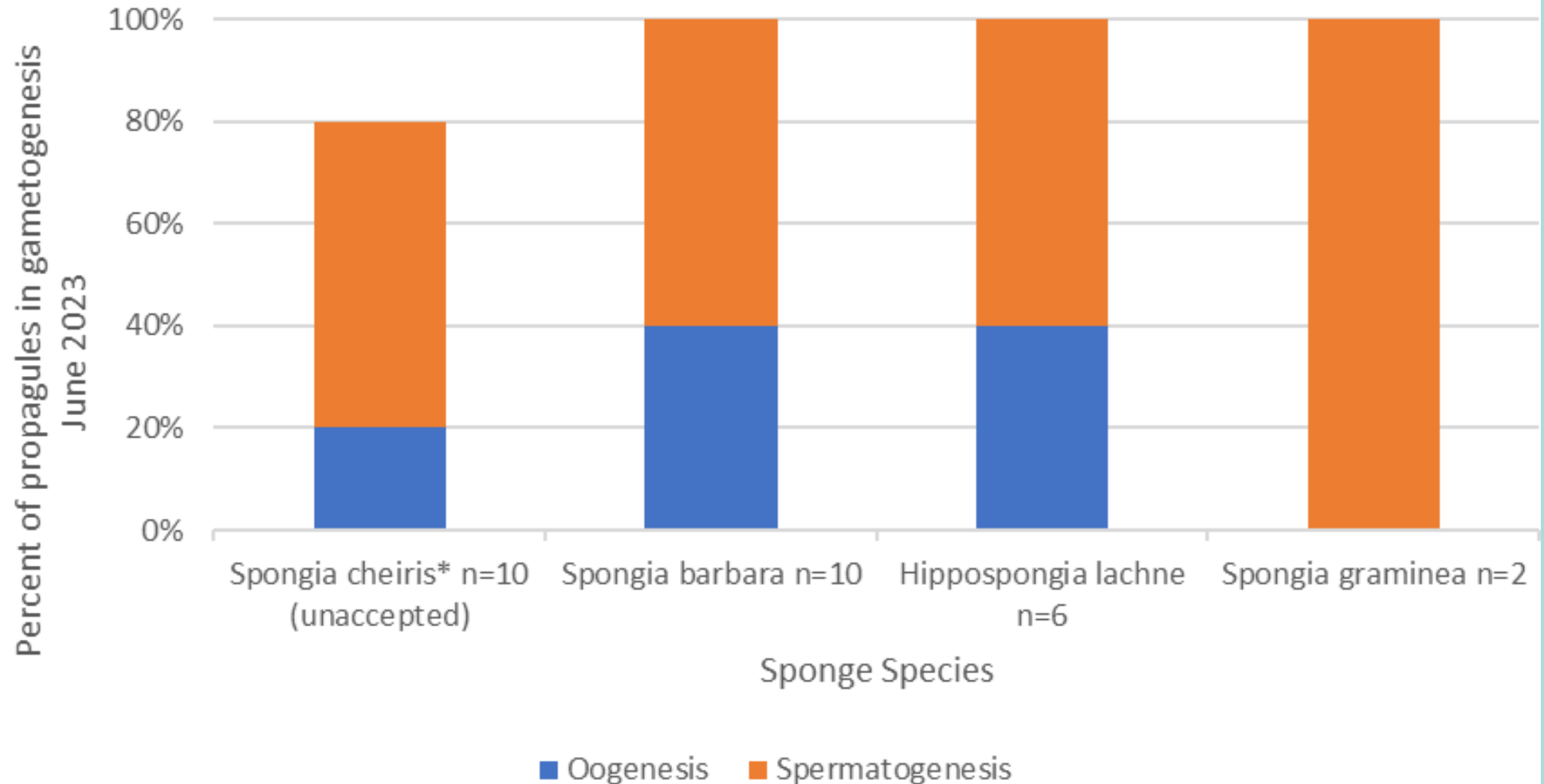
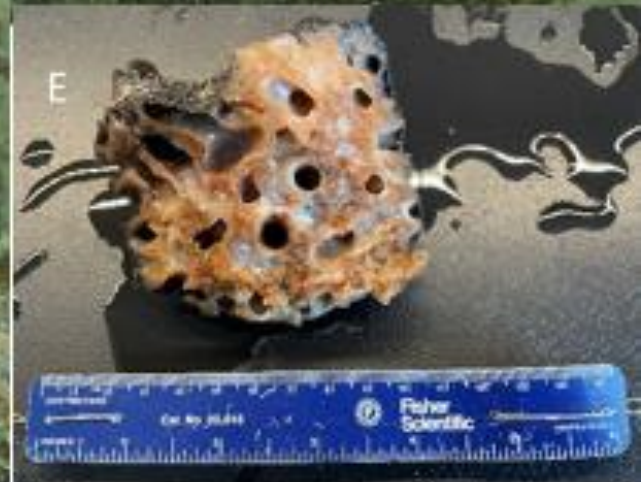
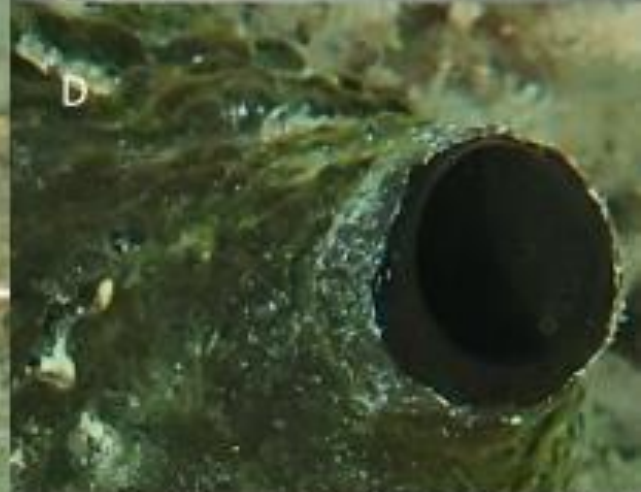
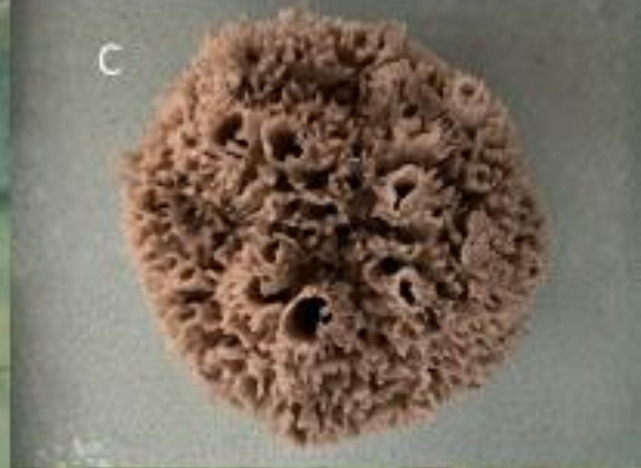
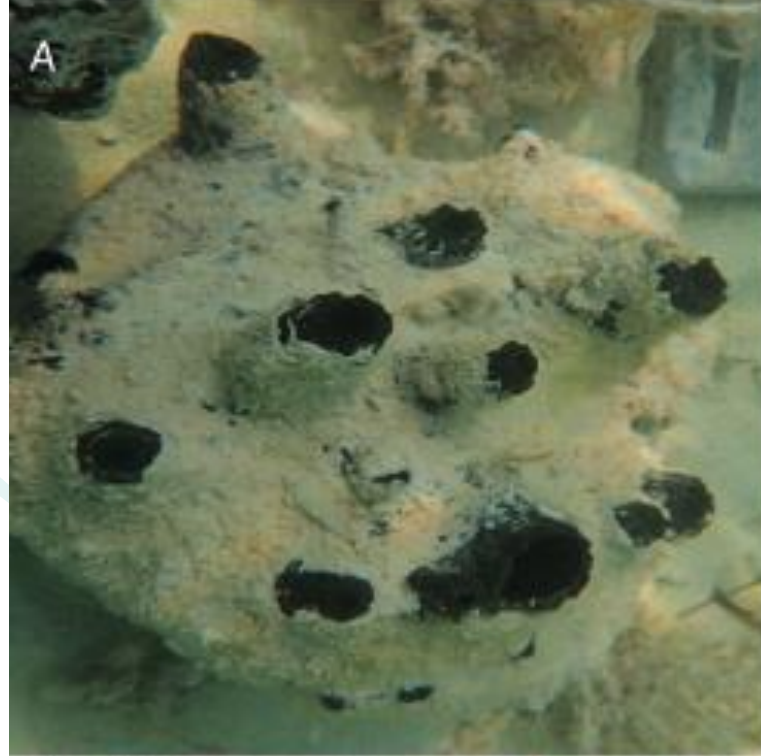


Fig. 5. Percent of sponge propagule gametogenesis in June 2023 for 4 species

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Florida Keys Nearshore Sponge ID Guide

Sample photo page for
Sheepswool Sponge
Hippospongia lachne



Sponge Restoration Aquaculture

- Summer 2023 Marine Heatwave: Sponge Die-Off in Lower Keys
- Sponge propagules are reproductively viable and can contribute to sponge recruitment

