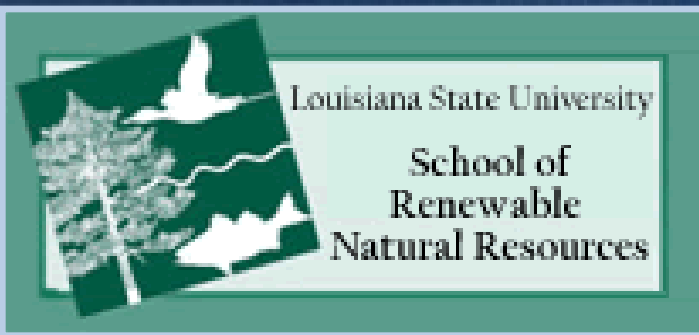


Substrate preference, survival and developmental ontogeny of Gulf Killifish eggs incubated in air

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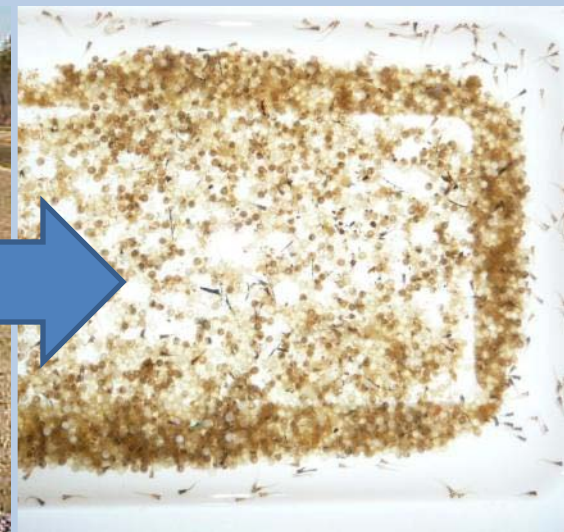
Gulf Killifish (*Fundulus grandis*)

- ◇ Estuary topminnow
- ◇ Wide range of salinities
- ◇ Familiar prey item for common sport fish
- ◇ Popular baitfish among anglers



Culture Potential

- ◇ Research gaps
- ◇ Low fecundity
- ◇ Baitfish industry depends on wild stock
- ◇ Seasonal spawning → Supply fluctuations





Air Incubation

- ◇ estuarine adaptation
- ◇ synchronous hatch
- ◇ hatchery technique
- ◇ practical use

<10 Minutes!!



Objectives

- ◇ Develop **materials** and **conditions** suitable for successful air incubation
- ◇ Investigate the influence of substrate on **embryo size** after an **extended incubation** period

Methods – Egg Collection

- ◇ Spawned indoors during fall/winter
- ◇ Eggs deposited on synthetic mats
- ◇ Egg collections every 4 days



Methods – Incubation Substrate

◇ 4 Treatments:

- H₂O
- Synthetic foam
- Burlap cloth
- Bamboo cloth



Methods – Incubation Substrate

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◇ 1 ml of eggs (≈110 eggs)



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◇ 1 ml of eggs (≈110 eggs)

◇ Humid environment at 72° F

- 3.5 ppt
- 7.5 ppt
- 14 ppt
- 20 ppt
- 27 ppt



Methods – Incubation Substrate

◇ 4 Treatments:

- H₂O
- Synthetic foam
- Burlap cloth
- Bamboo cloth

◇ 1 ml of eggs (≈110 eggs)

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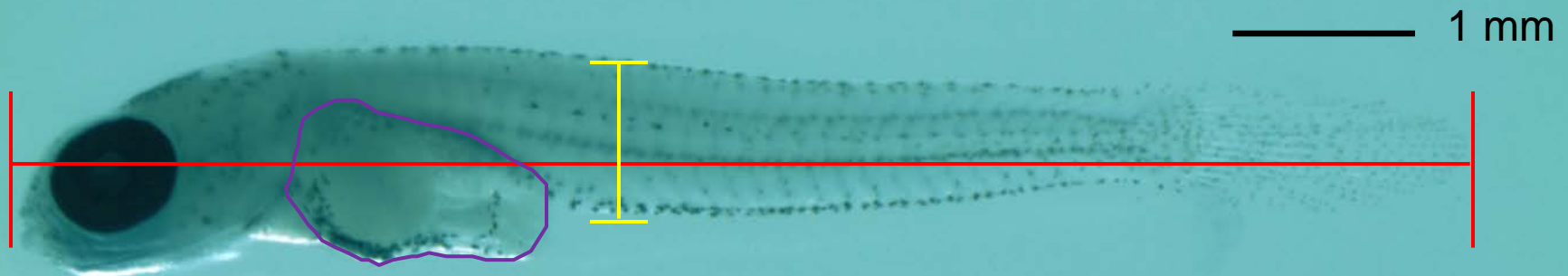
- 3.5 ppt
- 7.5 ppt
- 14 ppt
- 20 ppt
- 27 ppt

◇ % live embryos examined every 4 days



Methods – Data Collection

- ◇ Induced hatch at ≈ 19 days
- ◇ Specimens kept in 10% formalin solution
- ◇ Propylene glycol
- ◇ Digital camera attached to microscope
- ◇ Measurements obtained w/ image analysis software



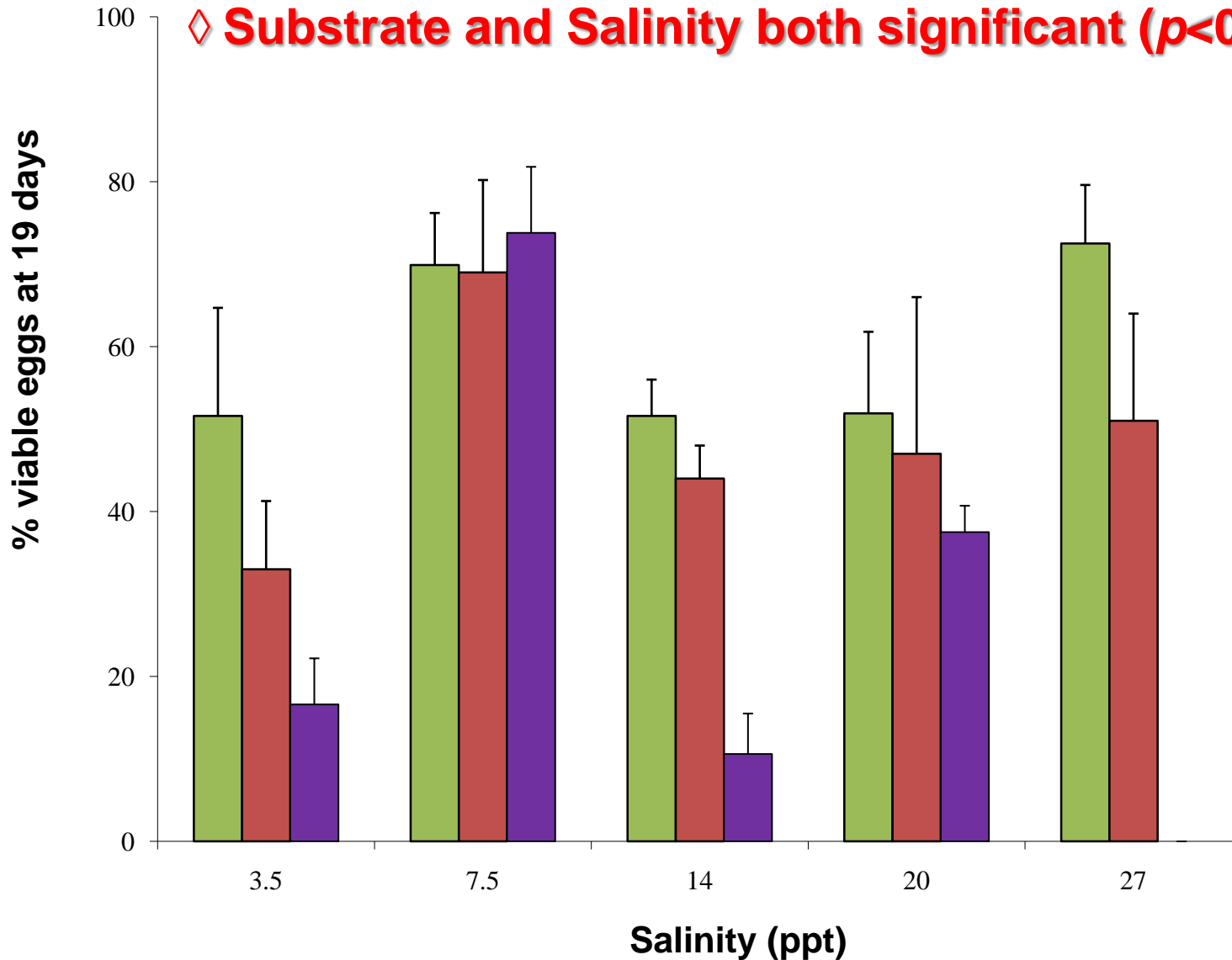
◇ Total length

◇ Depth at Vent

◇ Area of abdominal cavity

Results- Survival

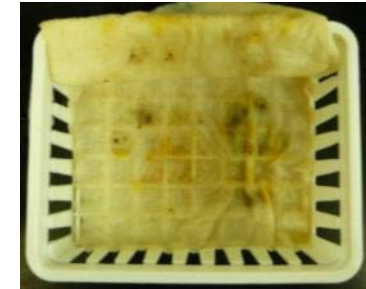
◇ Substrate and Salinity both significant ($p < 0.01$)



■ Foam



■ Bamboo

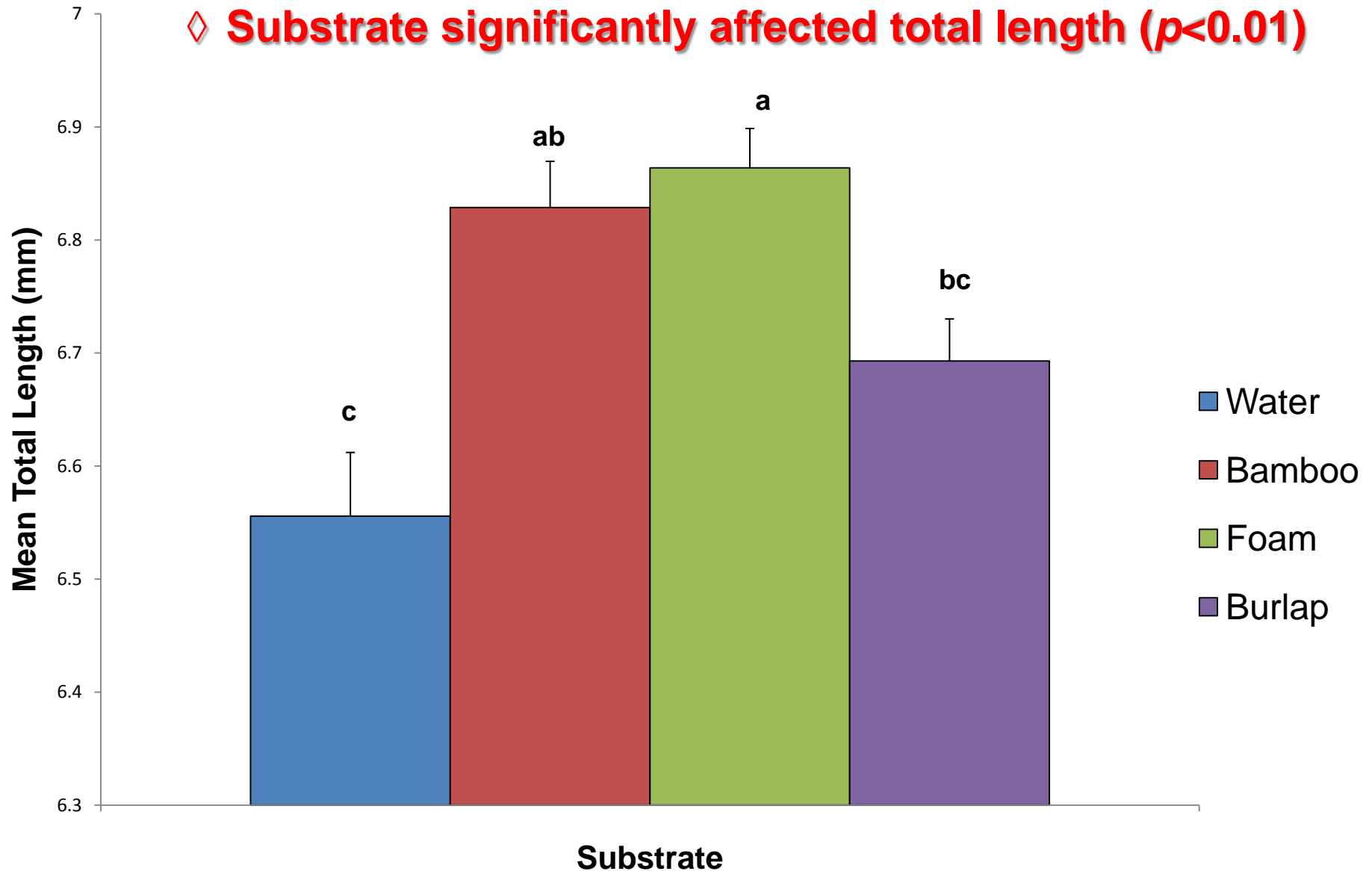


■ Burlap



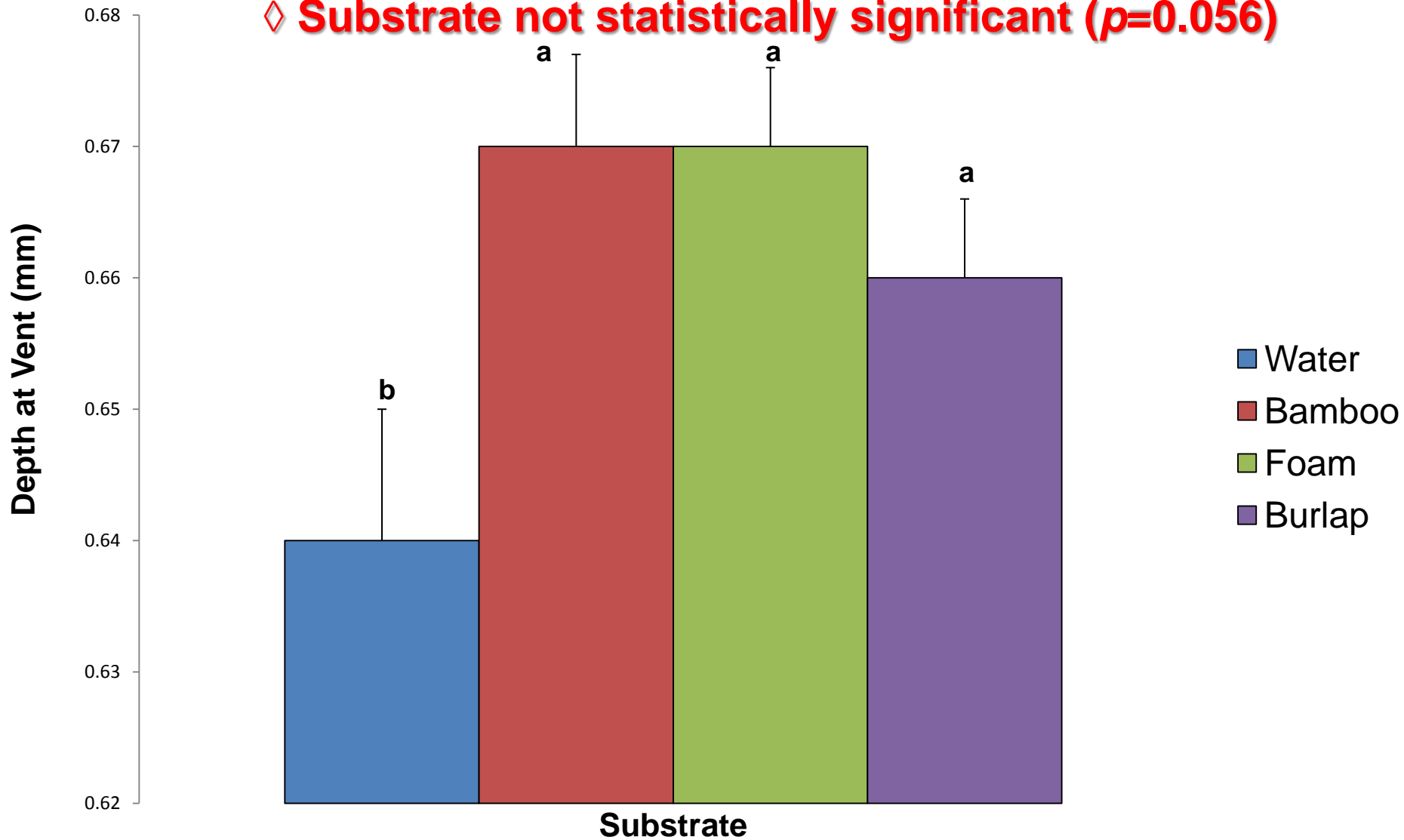
Results- Total Length

◇ Substrate significantly affected total length ($p < 0.01$)



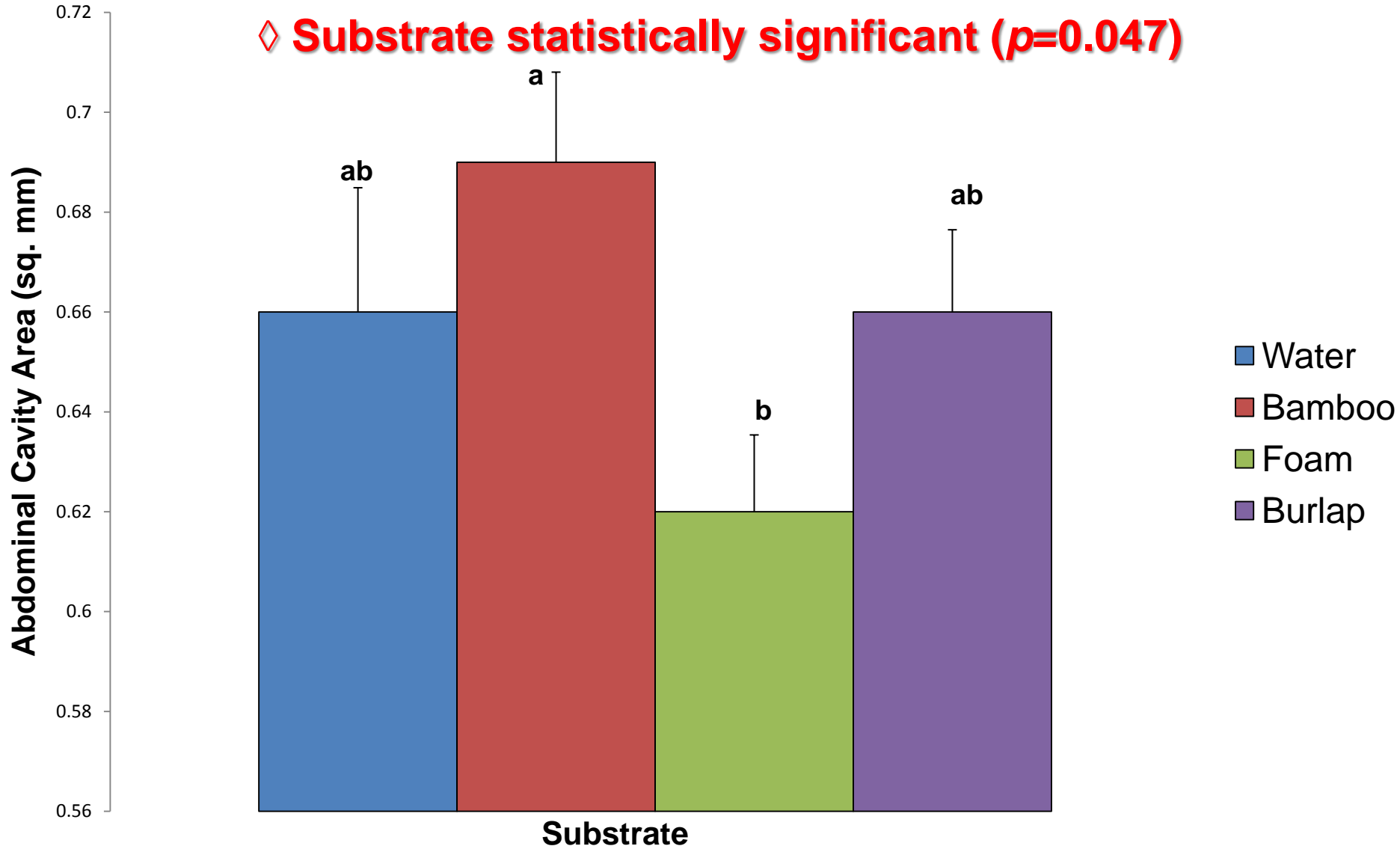
Results- Depth at Vent

◇ Substrate not statistically significant ($p=0.056$)



Results- Area of Abdominal Cavity

◇ Substrate statistically significant ($p=0.047$)



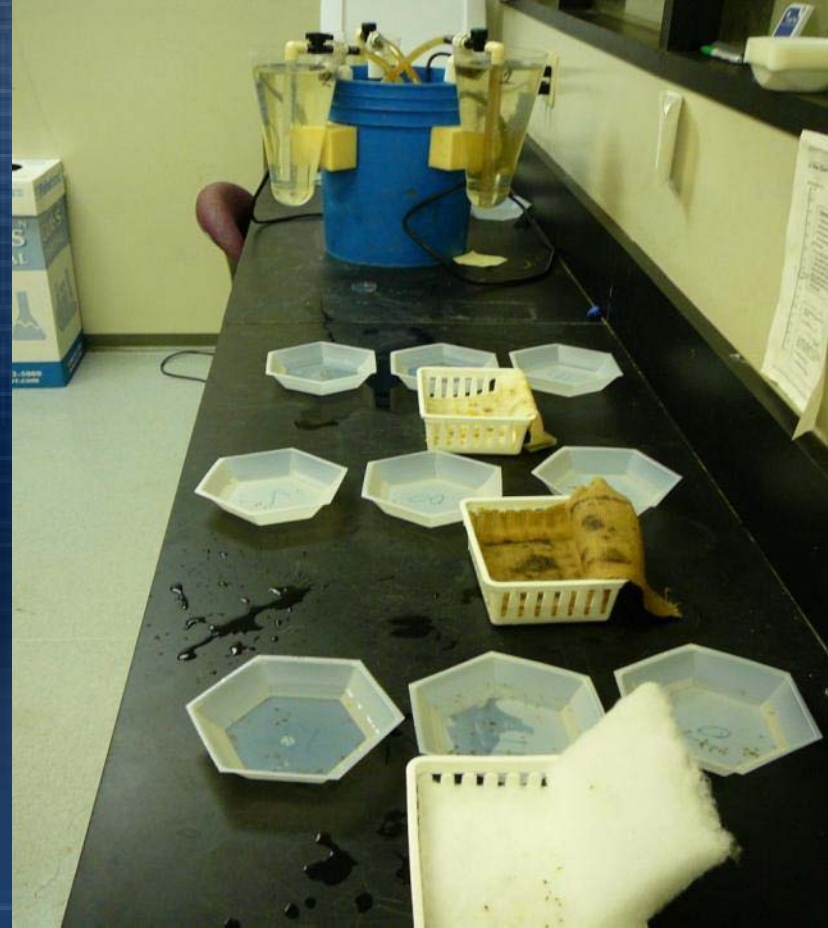
Discussion

- ◇ Efficient hatchery and larval rearing technique



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- ◇ Similarly sized batches of larvae



Discussion

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- ◇ Similarly sized batches of larvae
- ◇ **Allows eggs to be shipped**



Discussion

- ◇ Efficient hatchery and larval rearing technique
- ◇ Similarly sized batches of larvae
- ◇ Allows eggs to be shipped
- ◇ **Potential technique for baitfish industry**



Ethics

- ◇ The Institutional Animal Care and Use Committee (IACUC) of Louisiana State University approved in advance all procedures used in this study (Protocol # AE2009-22)

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- ◇ Mike Billings, Charles Brown, Ben Dubansky
- ◇ LSU School of Renewable Natural Resources
- ◇ Aquaculture Research Station
- ◇ SeaGrant Program Development Fund, USDA Special Grant Fund



Questions?

