Larval Fish Diversity at Little Cayman Island, Caribbean Sea

Eric Post, undergraduate research, Heppell lab, 2013-2014
Background

- Nassau grouper (*Epinephelus striatus*) study
  - Spawning aggregations vulnerable to overfishing
  - IUCN listed—endangered

- Interested in recruitment of grouper larvae
  - Deployment of light traps around Little Cayman
  - Result: no grouper larvae found
    - *Many other species collected!*
New questions

• How diverse is the larval fish community around Little Cayman Island?

• Which fishes might be using areas around Little Cayman Island as nursery habitats?

• Does larval fish diversity vary around Little Cayman Island, and if so, how?
Methods

Light traps

- Larvae collected 32-45 days after peak grouper spawning 2007, 2008, 2009
- Larvae preserved in 70% ETOH

Jones (2006)
Methods: Larvae identification

- Initial sorting—body form

- Stereomicroscope
  - Meristics and morphometrics
  - Ultra-fine tools!

- I.D. guides: Richards et al (2006); Smith et al. (1989); coralreeffish.com (Victor 2014); fishbase.com

- Digital photography
Results

- All species
- Charles Bay, Mary’s Bay, Kingston Bight (2007)
- Traps 1-6 (2009)
Results (continued)…

Little Cayman species abundance 2007

Abundance (count)

Species

- Jenkinsia sp.
- Jenkinsia stolfiera
- Albula vulpes
- Apogon pseudomaculatus
- Apogon maculatus
- Astrapogon punctulatus
- Phaeoptyx condinio
- Atherinomorus stipes
- Stethomous striatus
- Chaetodon striatus
- Unknown clupeid
- Guanina guainia
- Thalassoma bifasciatum
- Doratotus megalops
- Malacocentrus nigricans
- Labisomus sp.
- Malacocentrus ciliatus
- Labidomera sp.
- Labisomus sp.
- Thalassoma sp.
- Stegastes planifrons
- Stegastes keleucitis
- Evermannichthys sp.
- Ctenogobius boleosoma
- Ctenogobius saepelpellens
- Ctenogobius sp.
- Unknown gobid
- Bathus ocellatus
- Symphodus sp.
- Bryunmedia sp.
- Canthigaster sp.
Results (continued)...
Results (continued)…

Little Cayman species abundance 2009
traps 1-6

Abundance (count)

Species

T= trap
Results (continued)…

Selected Species Abundance
Little Cayman 2009

Abundance (count)

Species

Jenkinsia stolfera, Albula vulpes, Halichores sp., unknown Labrisomid, Sparisoma sp., Unknown Scarid

T = trap
Jenkinsia stolifera

Jenkinsia sp. (stolifera? parvula?)
Meristics for *Jenkinsia parvula* & *stolifera*

<table>
<thead>
<tr>
<th>Species</th>
<th>Vertebrae</th>
<th>Dorsal rays</th>
<th>Anal rays</th>
<th>Pectoral rays</th>
<th>Pelvic rays</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Jenkinsia parvula</em></td>
<td>38-39</td>
<td>10-13</td>
<td>12-16</td>
<td>11-12</td>
<td>8</td>
</tr>
<tr>
<td><em>Jenkinsia stolifera</em></td>
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</tr>
</tbody>
</table>

Richards (2006)
**Jenkinsia stolifera**

- “Florida round herring”
- Florida, Belize, Venezuela
- IUCN: not evaluated

**Jenkinsia parvula**

- “Short-striped round herring”
- Venezuela
- IUCN: Threatened, 1996 (needs updating)

[fishbase.org](http://fishbase.org)
Albula vulpes leptoccephali
Atherinomorus stipes

Apogon maculatus

Astrapogon puncticulatus
Bothus ocellatus

Family: Gobiidae

Chaetodon striatus

Stegastes sp.
Synodus sp.
Canthigaster sp.  

Monacanthus ciliatus
Un-ID Eel
Gymnothorax moringa

ventral melanophore pattern
Lutjanus sp.

Stathmonotus sp.
Melanophores

*Ctenogobius boleosoma* or *C. saepepallens*
Bryx dunckeri
Microdesmus carri

Acanthostracion quadricornis
Un-ID juvenile eels

Gymnothorax moringa
Time consumers

bent specimens

invert-dense sample
Discussion

➢ Major portion of larval fish diversity at Little Cayman
  ✓ Herrings (genus *Jenkinsia*)
  ✓ Bonefish (*Albula vulpes*)

➢ Other contributing taxa
  ✓ Parrotfishes (family Scaridae)
  ✓ Gobies (genus *Ctenogobius*)

➢ Future research possibilities
  ✓ Shannon’s biodiversity index
  ✓ Species distribution around Little Cayman
  ✓ Investigate nursery habitats
Photo file name format

Genus_species_SiteName_date(mmmdyyyy, no slashes)


