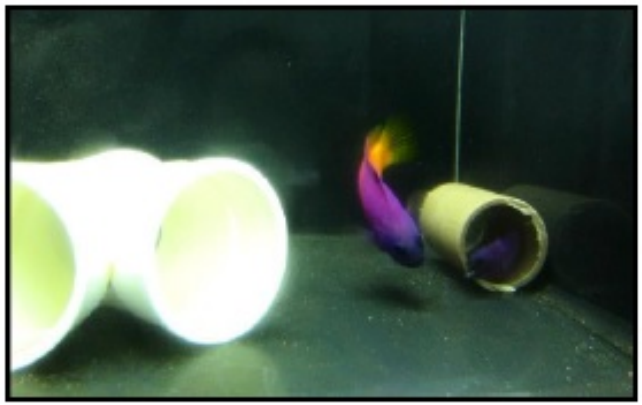
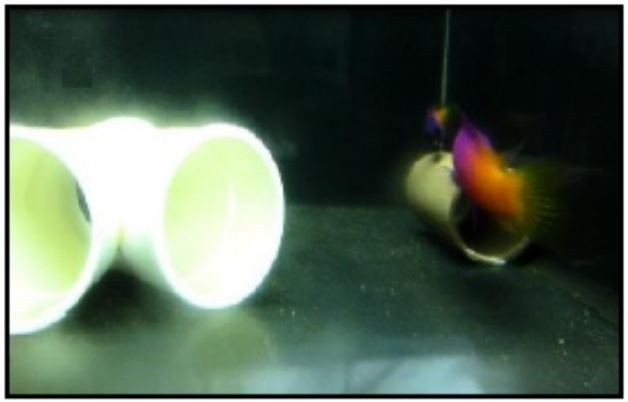
ATTEMPT OF PAIR FORMATION OF THE BRAZILIAN GRAMMA *Gramma brasiliensis* IN CAPTIVITY

Mônica Yumi Tsuzuki*, Daniela Gonçalves-Soares, Paulo Sérgio Miranda, Marina Nunes Alexandre

Marine Ornamental and Fish Laboratory, Aquaculture Department, Agricultural Science Center
Federal University of Santa Catarina, CP: 476, Florianópolis-SC, CEP: 88040-970, Brazil

monica.tsuzuki@ufsc.br

SKRETTING
WORLD AQUACULTURE ADELAIDE 2014
CREATE / NURTURE / GROW
7-11 June

- ✓ The ornamental fish *Gramma brasiliensis* is a Brazilian fish
- ✓ Degradation of coral reefs and its capture for the aquarium trade

list of **THREATENED TO EXTINCTION** and overexploited fish and invertebrate species from Brazil

Normative Instruction (MMA n.5- 21/05/2004)

National Action Plan for the Conservation of the Coral Ecosystems from Brazil

- ✓ Before this actions gramma was the 5th species most collected and exported to USA, Japan and Germany

- ✓ **Aquaculture** → one of the measures to alleviate fishing pressure on the natural stocks



- ✓ Number of ornamental marine species that can be commercially produced in captivity is still limited (cultivated species contribute to 1-2% of the market)

- ✓ **Difficulties in producing ornamental marine fish**

Gramma loreto

Gramma brasiliensis

✓ Easy to adapt to aquarium conditions and disease resistant

✓ Male (3.5 cm) and female (2.5 cm) sexually mature

✓ Males larger than females: territorial and more aggressive

✓ Male builds a nest/parental care

✓ 20 to 200 eggs /spawning

Gramma brasiliensis

- ✓ Distribution: state of Maranhão to São Paulo, and the archipelago of Fernando de Noronha

- ✓ Measure: 6.5 cm long
- ✓ reef or rocky environments, from 3 to 30 m depth
- ✓ Unique coloration (bicolor body)
- ✓ occasionally cleaner

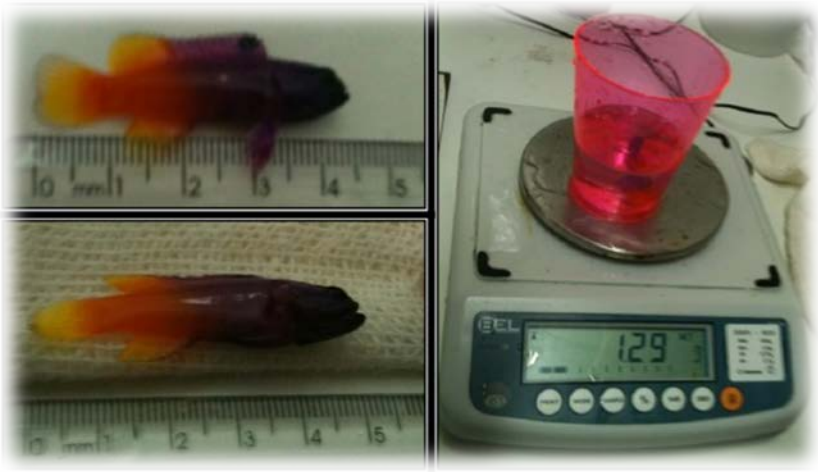
OBJECTIVE

REPRODUCE THE BRAZILIAN GRAMMA IN CAPTIVITY

- ✓ To start its production in captivity
- ✓ minimize the harvesting pressure on natural stocks

MATERIALS AND METHODS

- Fish (4.2 g and 6.2 cm in length) were collected from the northeastern region (state of Bahia)



- ✓ Temperature: 26°C
- ✓ Salinity: 35 ppt
- ✓ Photoperiod: 14h L: 10h D
- ✓ Water quality: weekly
  - ammonia 0 mg/L
  - nitrite

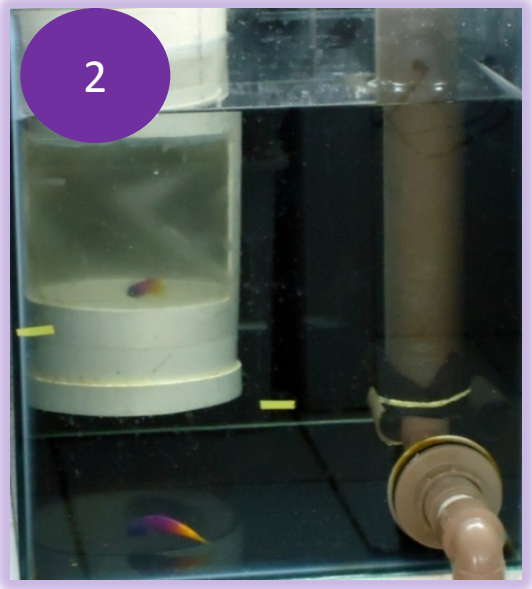
✓ Feeding

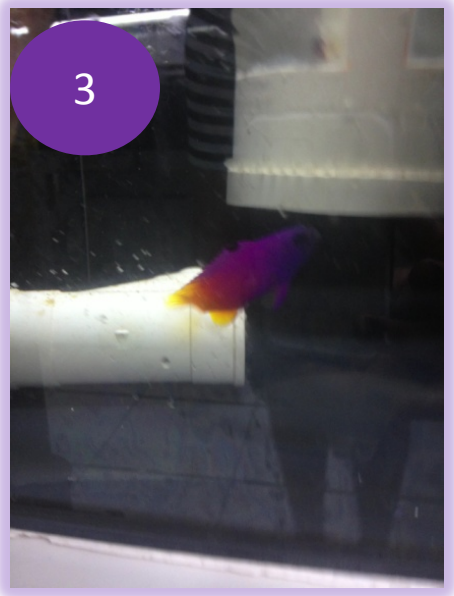
✓Three systems were assembled to test pair formation

✓Behavior observations 3 times a day: at dawn, during the day, and at dusk, occasionally at night

SYSTEM 1

- ✓ 2 RAS
- ✓ each RAS: six 40-L aquariums
- ✓ each aquarium 2 fish (total 24 fish)
- ✓ One fish isolated from the other → Acclimation 10 days → Release)
- ✓ 3 hours behavioral observations





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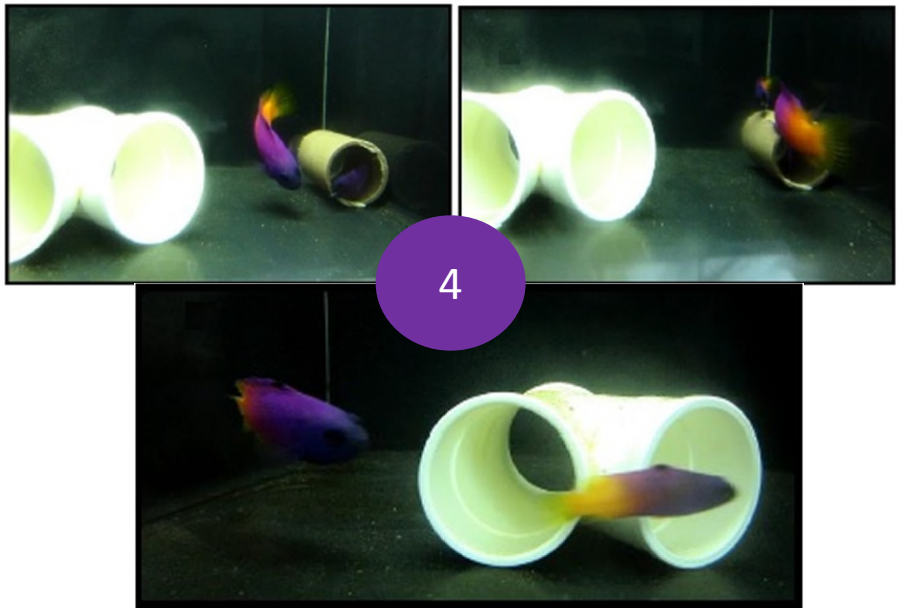
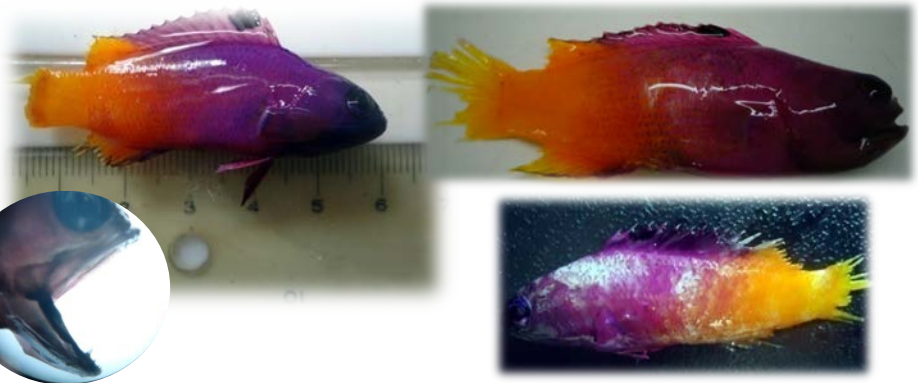


✓ 1 month: 3 pairs

✓ 25% good socialization

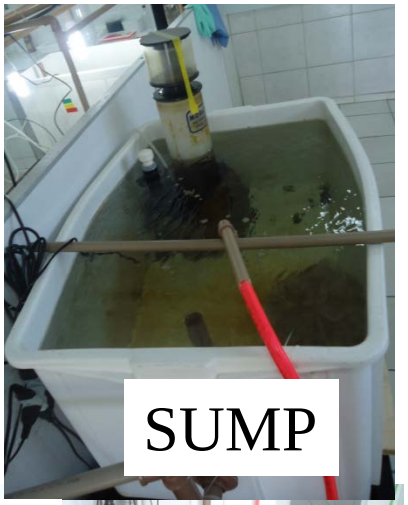
✓NO REPRODUCTIVE BEHAVIOR



✓ **DIFICULTIES:** Highly aggressive, many fights (fatal ones)

SYSTEM 2

- ✓ Tank: volume 500L (3.0m x 0.5m x 0.55m)
- ✓ Several substrates for hiding and nest formation (PVC pipes and shells of oysters and scallops)



30 fish
G. brasiliensis

30 fish
Elacatinus figaro
(barber goby)

UV

SYS2: HAREM

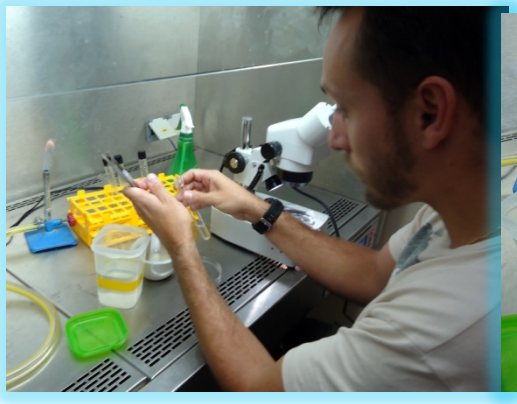
SYSTEM 2

- ✓ Over a period of 6 months: possible interactions and attempts to form couples were observed;
- ✓ Good intra and inter-specific social behavior;
- ✓ Despite being considered as a cleaner fish, no cleaning behavior of the barber goby on the gramma was observed in this system.

SYSTEM 2

DIFFICULTIES:

- ✓ Territorialism of larger fish defending specific sites of the tank was noted;
- ✓ No pair formation was observed;
- ✓ Bacterial related motalities occurred after 6 months;
- ✓ After the population declined, more aggressive behavior of fish was noted and the system was disassembled.

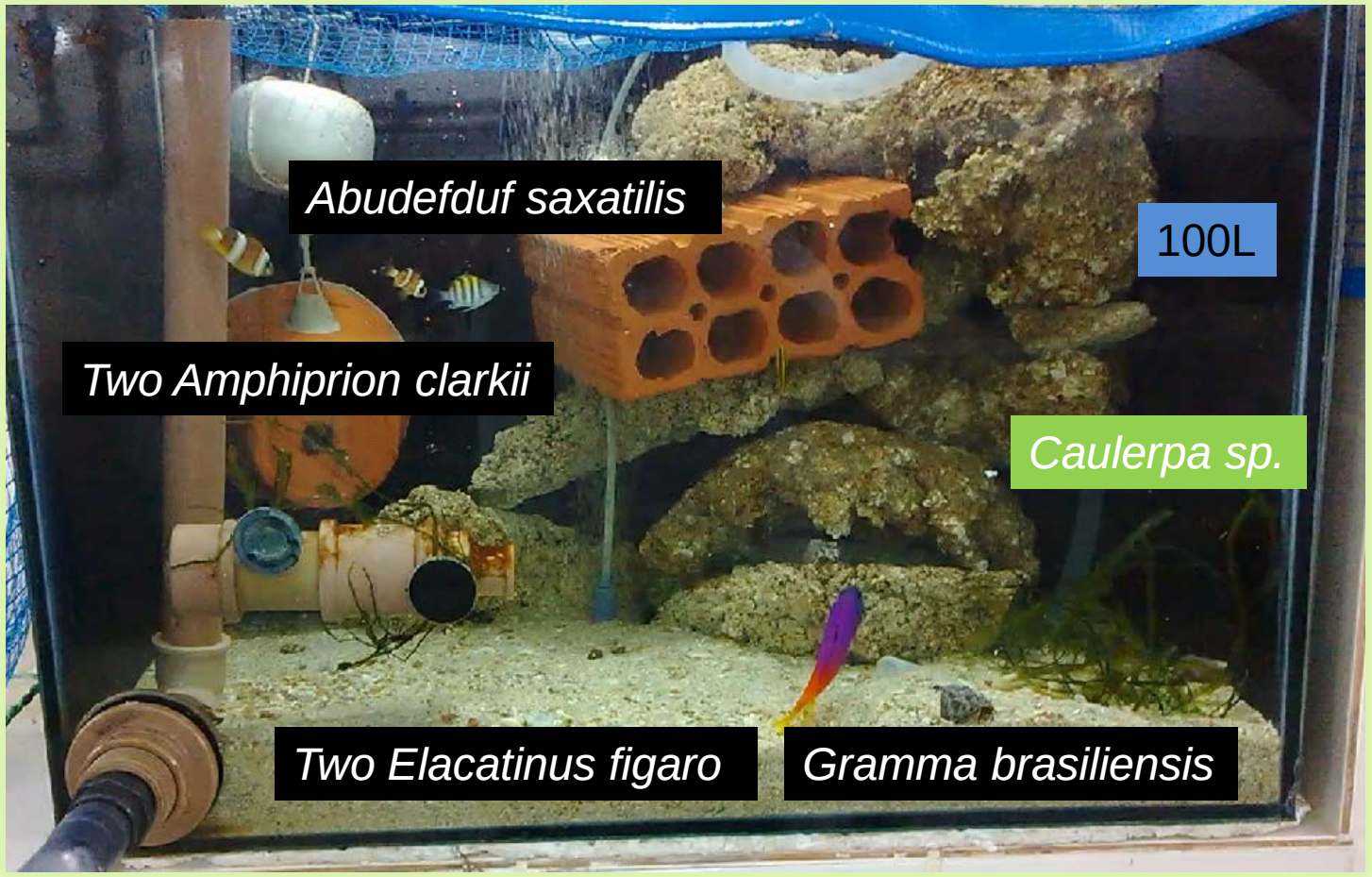



SYSTEM 3

- ✓ Simulating what occurs in nature
- ✓ 100 L tank – recirculation system (SUMP)
- ✓ Indirect illumination

SYSTEM 3

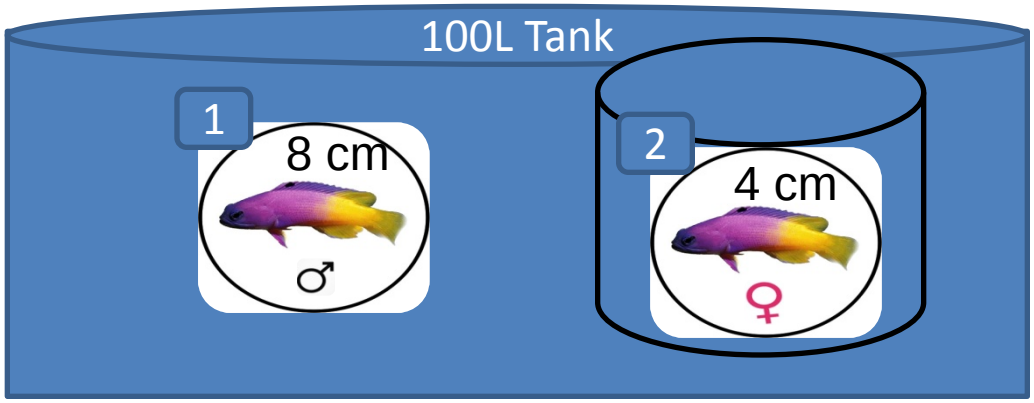
- ✓ Various types of shelters (rocks forming burrows, brick with holes) and a sand substrate were placed in the tank



- ✓ Territory definition

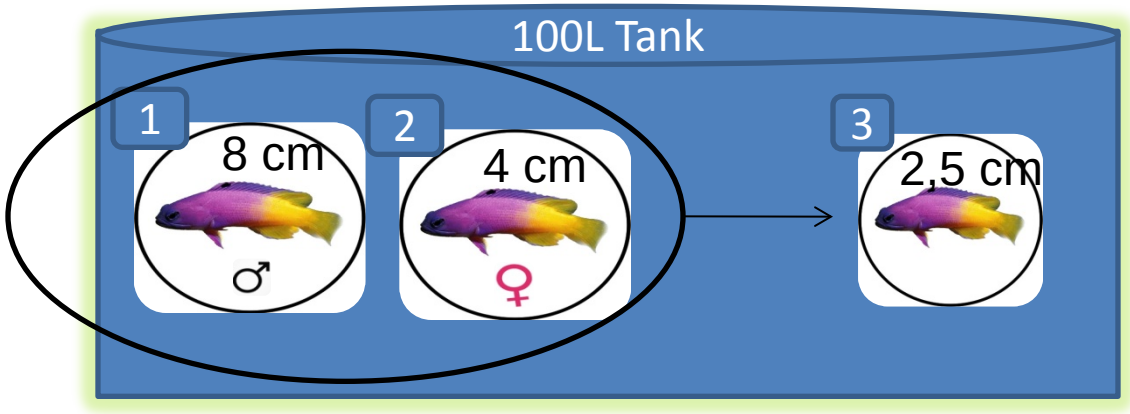
SYSTEM 3

- ✓ 1 gramma (8cm) → After 1 week the 2nd gramma was placed in a transparent plastic bottle with small perforations



- ✓ After 2 days the 2nd gramma was released in the tank

- ✓ The 3rd gramma was released directly in the tank



SYSTEM 3

✓ COUPLE BEHAVIOR (LARGER AND MIDDLE SIZED FISH): couple began digging the sand substrate and making dance movements, with the “male” quivering his body with the “female” closeness

✓ Largest fish caught the sand substrate with its mouth and threw up: “mating behavior”?

✓ The macroalgae *Caulerpa* sp. placed into the aquarium. Male started gathering up the macroalgae to build a nest inside the holes of the brick

✓ A significant increase in the female’s belly roundness was promptly noticed

CONCLUSIONS

- ✓ So far, there is no record of breeding this species in captivity
- ✓ Other Brazilian macroalgae species are being tested for nest formation by the gramma
- ✓ Also, the SYS 3 will be replicated to verify repeatability of behavior in the formation of couples
- ✓ It seems that the *Gramma brasiliensis* is similar to *G. loreto*, but not so domesticated as the latter species

OBRIGADA!

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Coordenação de Aprefeiçoamento de Pessoal de Nível Superior


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LABORATORIO DE PEIXES E ORNAMENTAIS MARINHOS/UFSC/BRAZIL