

Practical Project #1B (20 pts.)

Kinematic diagram of Male Bettas When Confronted by a Mirror or Female

Eth. & Behav. Ecol.

Biology 287

revised 2 / 10 / 2010

This is the ethogram that we will use (without diagrams, I am afraid).

Designator	Behavior and Brief Description
H	Hover -- hang in water column with fins NOT spread
BR	Bottom Rest
B	Breathing (surfacing and gulping air)
FS	Fin Swim -- slow swimming using pectoral fins; without fins in spread condition
SS	Serpentine Swim -- rapid, uses entire body and S-shaped movements without fins in spread condition
S	Shaking -- Does the shimmy: shimmies body, usually with fins and gills spread
GS	Gill Spread -- only indicate this if the behavior is not done as part of one of the next 5 behaviors.
FSH	Fin Spread with body <u>horizontal to mirror</u> .
FSP	Fin Spread with <u>body perpendicular to mirror</u> .
A	"Arches" body. This may include periods of gill spreading as part of the action pattern.
Ch	Charge mirror -- approach rapidly. This may start from FSP. A charging fish may have its fins and gills spread. A movement towards the mirror out of a display makes the behavior a charge.
L	Leave -- swim away from mirror

Important Notes: Note that it is a bit simpler than many of the ones you turned in. The reason is convenience – this will make it easier for you to construct the sequence (kinematic) diagram. So, **please look over the definitions given above before doing your observations**. Notice especially that some behaviors cannot be correctly scored until you have watched the fish for several seconds.

- For instance, if a fish does a fin spread, holds the position and opens and closes its gill covers, all of that counts as a FSH or FSP.
- If it maintains the position but then approaches the mirror, it counts as a FSH or FSP followed by a Ch or Ct (depending on where the fish stops).
- If the fish approaches, stops and then starts again and hits the mirror it is Ch, Ct.

I hope this makes sense, I think it does!

Once again, work in pairs. Here are the conditions for observation:

1. Place a male in the observation tank such that he can see no others and wait 15 minutes. (You can leave and come back – just leave a note and don't be gone for an hour!)
2. Next, observe him for 5 minutes **without** the mirror. He may not do much in this context but write out the sequence. Ideally, one person should watch and the other should write down the sequence as described by the observer.
3. Put the Mirror in the water; keep it in one place
4. Observe the behavior of the male for 5 minutes, writing down the sequence as before
5. Switch observers and fish. Wait 15 mins. again and then perform the same observations

Other Things to Try:

Hey, this didn't take that long. **Try one or both of these:**

1. Frustrated Sex: OK, now that I have your full attention, take the female *Betta* and put her in one of the large canning jars.
2. It should be $\frac{3}{4}$ full of water – you can get water from the male's tank before adding her.
3. **You may need to reduce the amount of water in the tank before the next step.** Then place her jar (with her inside) in the middle of the tank (you do not want the jar to float away and the water levels should be close to the same in each. Write the sequence of male behavior for 5 mins.
4. Does the male do anything different than when around the mirrors? (Do you need to expand your ethogram?)
5. What does the female do?
6. **DO NOT LET THE FISH SWIM AROUND TOGETHER -- HE PROBABLY WILL ATTACK HER.**

2. Try the same thing except this time put your other male in the container (instead of the female). If things get violent, please take the male out. Remember – they are not to be swimming around together but should be separated by the glass jar.

Submission of all sequence data is electronic using the spreadsheets on the website. Take your sequence data and count up and enter all transition for each experiment (see earlier handout and PowerPoint on ethograms). Then email me the spreadsheet using the following filename format:

LASTNAME1_LASTNAME2_Sequence.xls

On the next pages are four copies of the transition worksheets – please do not turn these in, move the data to the spreadsheet.