

Bio 45 - Discussion #8	12-14 Nov. 2002
Seahorses, Operational Sex Ratio and Mating Systems	

I. PURPOSE:

This week we make a transition from sexual selection theory to parental care and mating systems. A great way to do that is to return to pipefish, seahorses and other fish. Here we can see the interplay of a number of factors that influence male and female behavior in the contexts of parental care and mating systems. It will help us grasp the importance of **Operational Sex Ratio** for both sexual selection and mating systems.

Seahorse and pipefish were first thought to be the ultimate in reversed parental investment. We tend to get carried away with parental investment and ignore other ways in which one sex can become the limiting factor for the other's reproductive potential. These fish and guppies let us see those other things more clearly.

We will watch a recent film on seahorses. The film and the papers by Vincent, et. al. (1992) and Jirotkul (1999) give us the background to work on the questions below.

II. READINGS:

- 1) Vincent, A., I. Ahnesjö, A. Berglund, & G. Rosenqvist. 1992. Pipefishes and seahorses: Are they sex role reversed? *Trends Ecology & Evolution* 7(7): 237-241. (on web site)
- 2) Jirotkul, M. 1999. Operational sex ratio influences female preference and male-male competition in guppies. *Anim. Behav.* 58: 287-294 (e-library)

III. ASSIGNMENT:

Read the papers in detail. Think about all the things that can make mating or fertilization opportunities limited for one sex or the other. The key to it all is something called Operational Sex Ratio. Other things besides parental investment can affect OSR. I want you to identify these. Bring your list to section to share with others.

IV. QUESTIONS:

1. The operational sex ratio** is closely linked to sexual selection - the rare sex limits the reproductive potential of the other and is competed for. What can change operational sex ratios?
2. See if you can figure out how parental investment and operational sex ratio might be indirectly linked.
3. Seahorse monogamy is a bit of a puzzle to some. Here we have very high male parental care and yet no change in mating system to polyandry. What do you think is going on. See what Amanda Vincent has to say about it in the film and paper.

** Operational sex ratio (OSR) = ratio of males to females where only those ready for reproduction are counted. The population sex ratio is generally 1:1 but the OSR can be very different (strong male bias or strong female bias).