NAME _____

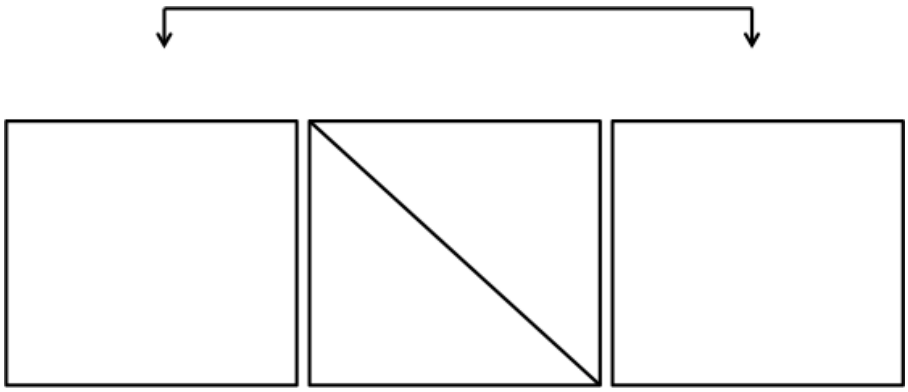
LECTURE GOALS:

☐ Appreciate the diversity of behavioral phenotypes within a sex and understand the different evolutionary process that leads to this diversity.

LECTURE OUTLINE:

1. Within a sex we see multiple behavioral phenotypes.
2. In some cases, scramble competition, all individuals are "striving" toward the same thing with varying levels of success.
3. In other cases, individuals adopt one or another phenotype, referred to as Alternate Reproductive Tactics (ARTs).
4. Evolutionary studies are concerned with why and how these multiple phenotypes are maintained in a population.
5. We expect to find alternative reproductive phenotypes when:
    a. Intermediate expression of the phenotype is not possible.
    b. Intermediate expression of the phenotype is selected against
    c. And when there is investment to be exploited
6. Alternative reproductive phenotypes may be genetically based or conditionally determined.
    a. Strategy - genetically based program or decision rule that results in the allocation of somatic and reproductive effort among alternative phenotypes. The strategy must operated through a mechanism.
    b. Tactic - a phenotype that results from a strategy. It has associated physiological and life history features.
7. Alternative strategies:
    a. Genetic polymorphism
    b. Maintained by frequency dependent selection
    c. The two (or more) phenotypes have equal average fitness.
8. Conditional strategies
    a. Genetic monomorphism
    b. Status (or condition) dependent selection
    c. The two (or more) phenotypes can have unequal average fitness (making the best ofa bad situation)
9. Ecology and demography can influence the switching point
10. Examples: isopods, cichlids, lizards, ruffs, salmon, earwigs

HELPFUL FIGURES & NOTES:
(All PowerPoint files will be available on the Moodle after lecture. This subset of unlabeled and incomplete figures and notes is meant to assist, not replace note taking.)



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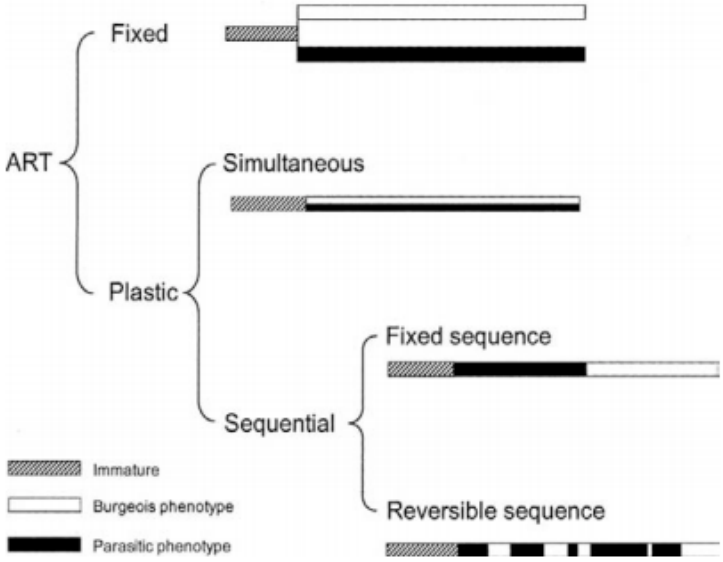
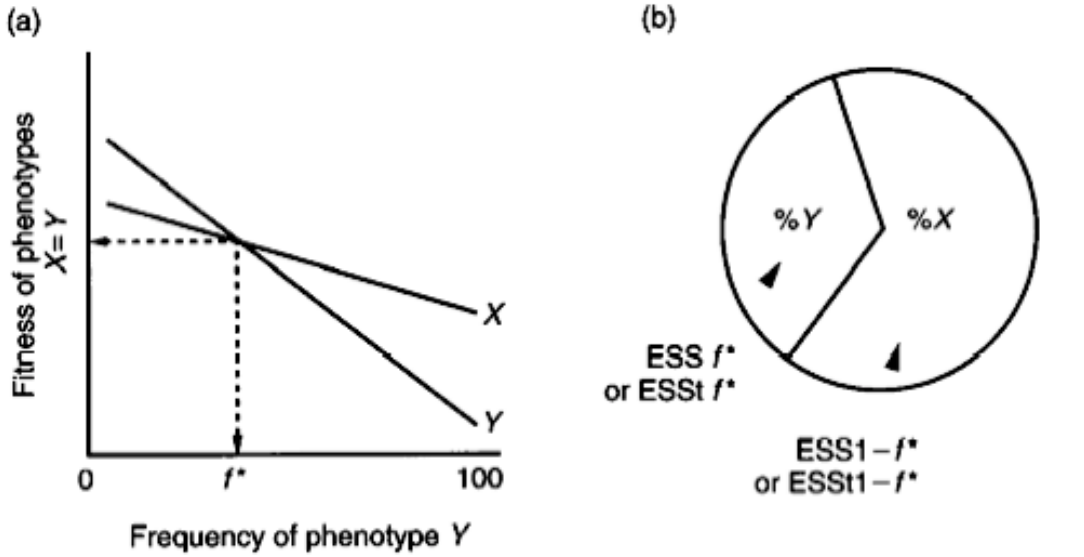
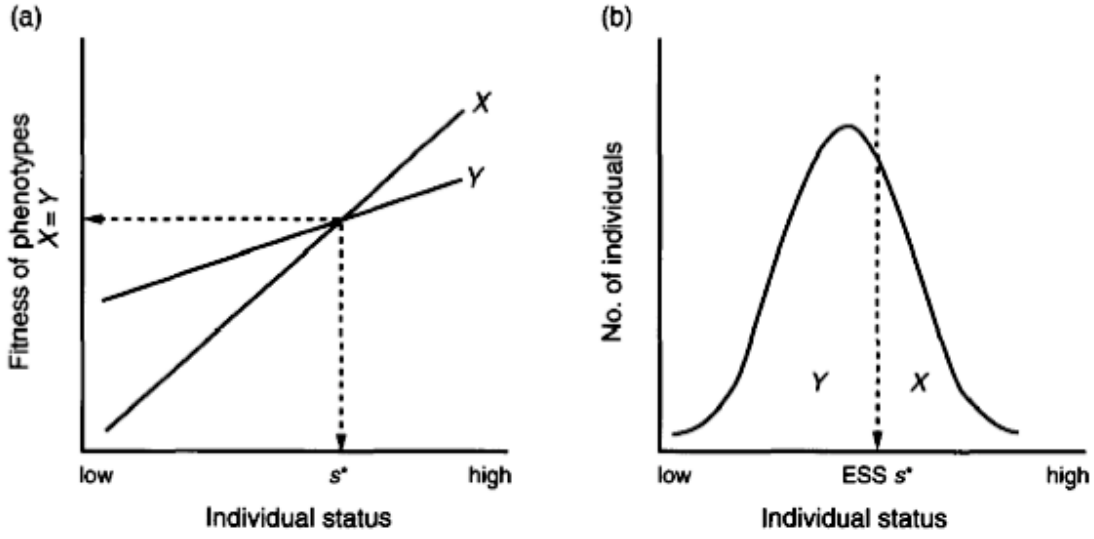
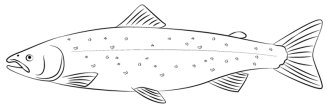
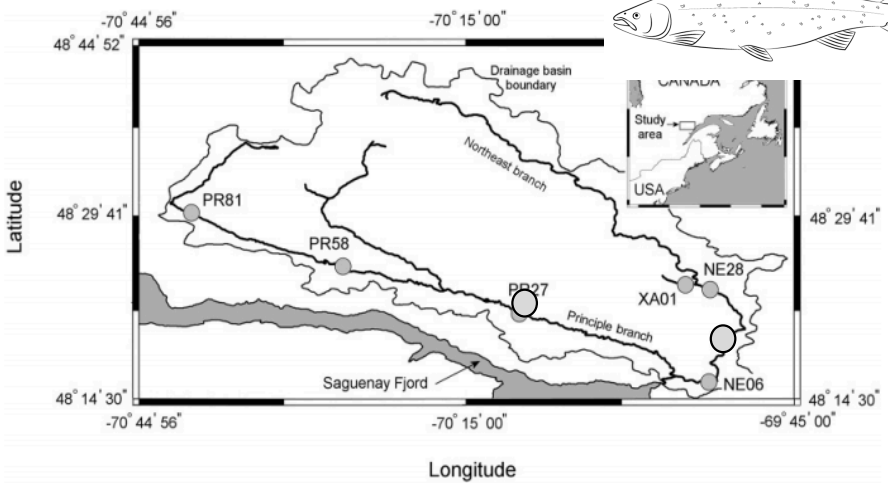
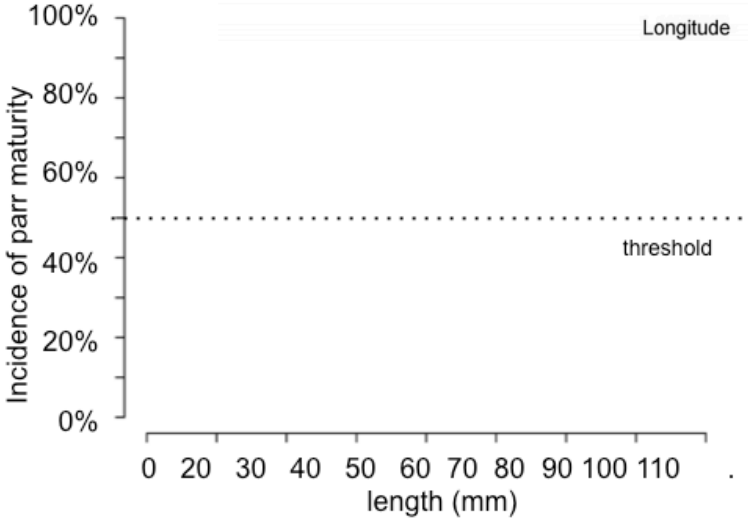


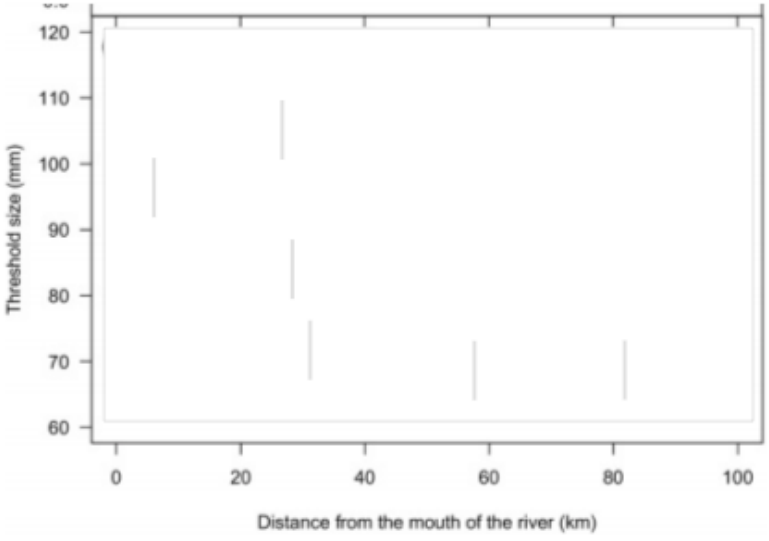

(a)
Fitness of phenotypes
X = Y
X
Y
0
f*
100
Frequency of phenotype Y
(b)
%Y
%X
ESS f*
or ESSt f*
ESS1 – f*
or ESSt1 – f*


(a)
Fitness of phenotypes
X = Y
X
Y
low
s*
high
Individual status
(b)
No. of individuals
Y
X
low
ESS s*
high
Individual status




-70° 44' 56"
-70° 15' 00"
48° 44' 52"
Drainage basin boundary
Study area
CANADA
USA
Northeast branch
PR81
48° 29' 41"
PR58
NE28
XA01
Principle branch
Saguenay Fjord
NE06
48° 14' 30"
-69° 45' 00"
Latitude
Longitude


100%
80%
60%
40%
20%
0%
Incidence of parr maturity
threshold
0 20 30 40 50 60 70 80 90 100 110
length (mm)


120
110
100
90
80
70
60
Threshold size (mm)
0
20
40
60
80
100
Distance from the mouth of the river (km)

VOCABULARY:

(Practice writing interesting, informative sentences that include, and capture the meaning of, 4-5 words from this list. To simply memorize a definition, is not sufficient).

ART
Tactic
Strategy
Switch point
Threshold
Condition Dependent
Frequency Dependence
Polymorphic
Monomorphic

PRACTICE EXAM QUESTIONS

When would you expect to find Alternative Reproductive Tactics?
Why is it important (in Suzy's opinion) to define tactic and strategy?
Why do most examples of ARTs involve male phenotypes?

READING FOR TODAY'S LECTURE:

Gross (1996) Alternative reproductive strategies and tactics: diversity within sexes. TREE 11:92-97.

Taborsky, Oliveira, and Brockman (2008) The evolution of alternative reproductive tactics: concepts and questions.. in *Alternative Reproductive Tactics*, ed. Rui F. Oliveira, Michael Taborsky, and H. Jane Brockmann. Published by Cambridge University Press. [a] Cambridge University Press 2008.

Mank and Avise (2006) Comparative phylogenetic analysis of malte alternative reproductive tactics in ray-finned fishes. Evolution 60:1311-1316.

NAME _____

FOR THURSDAY:
**Each student find an example of ART**
**Bonus for finding ARTs in females**
**Bonus for finding ARTs that no other student finds.**

First Author _____ year: _____

Title: _____

Journal _____ Vol. _____ pages _____

Organism: _____

Description of two (or more) reproductive phenotypes: (2-3 sentences)

If known, is this an example of 2 strategies or one strategy with alternative tactics (explain)?