

Fish Sex! How, Where, and When
They Do It (and When They Don't
Have To)

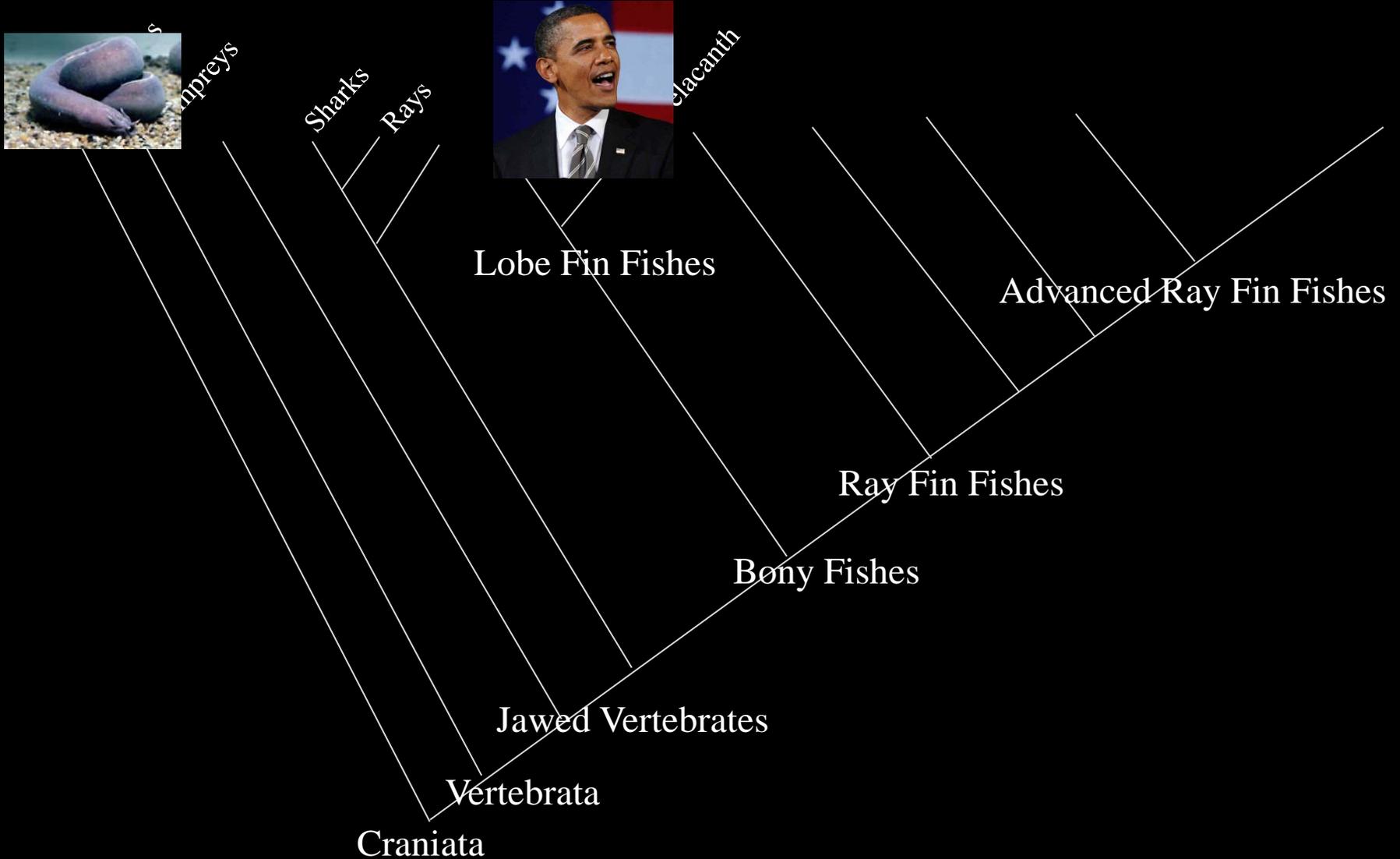
Grant Galland

NOAA Office of International Affairs

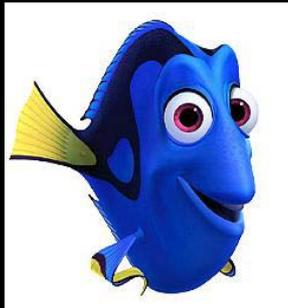
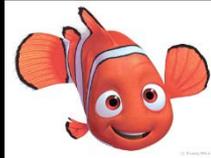
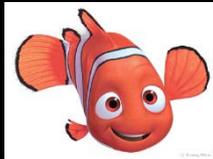
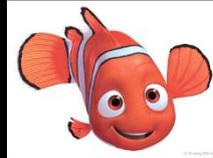
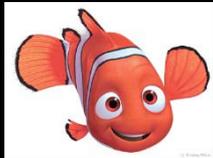
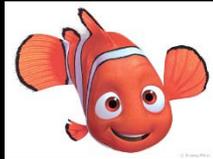
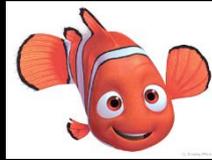
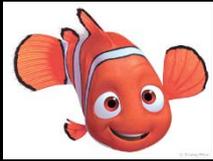
What is a fish?

- A “vertebrate” that lives (mostly) in the water, respire (mostly) with gills, is covered (mostly) with scales...
- ~35k species living from desert springs and alpine lakes to deep ocean trenches
- Geographic ranges from the size of a single desert spring (~10 m²) to the entire global ocean

What is a fish?



Fish vs. Fishes



1 Fish

7 Fish

8 Fishes

Fish Sex (ok, ok...reproduction)

- How a sperm finds an egg?
- Live birth, fert eggs, or something in between?
- Who mates (spawns) with whom?
 - One on one vs. group?
 - Cheating, sneaking, polygamy and other nefarious beh.
- Is that a male or a female?
- Parasitic mating (by males or females)
- Weird systems

How a sperm finds an egg?

- Internal vs. external fertilization
- When external, nesting vs. broadcast spawning



Nick Calovianis/National Geographic/Getty Images



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D. Seifert



J. Lund

Live birth, fert eggs, or something between

- If fertilization is external...
- If internal, could be any of the three
 - Viviparity = live birth
 - Oviparity = fertilized eggs
 - Ovoviviparity = fertilized eggs + live birth...

Viviparity



S. Berkely



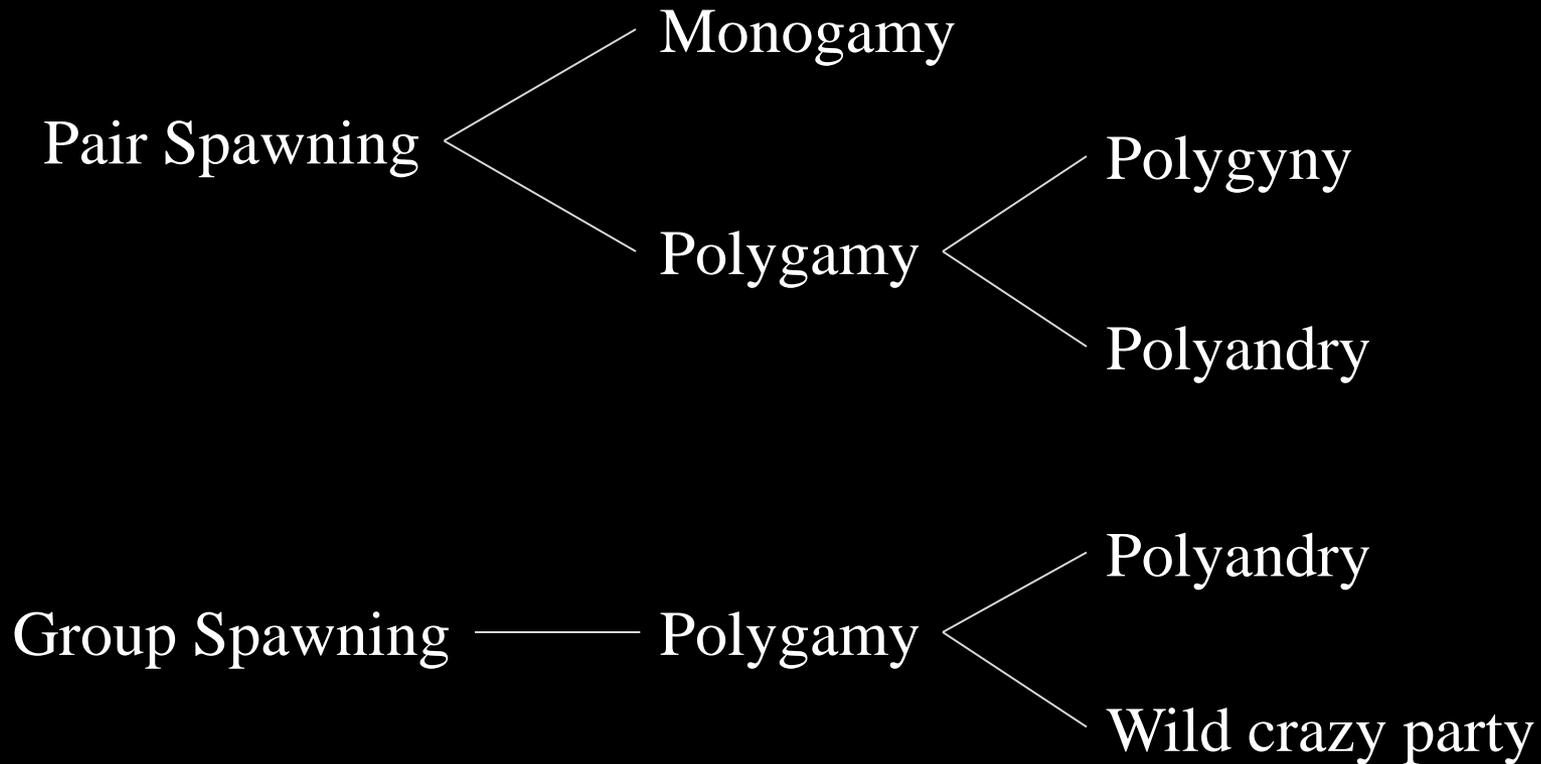
D. Perrine/naturepl.com

Ovoviviparity



B. Norman

Who mates with whom?



Pair Spawning – male competition



What about sneaky males?

What about cheater males?

Group Spawning – sperm competition



© D. Seifert

D. Seifert



B. Semmons

Is that a male or a female?

Gonochorism

- Male
- Female



Hermaphroditism

- Simultaneous
- Protogyny
- Protandry
- Bidirectional
- Androdioecy



K. Stander



O. Brett

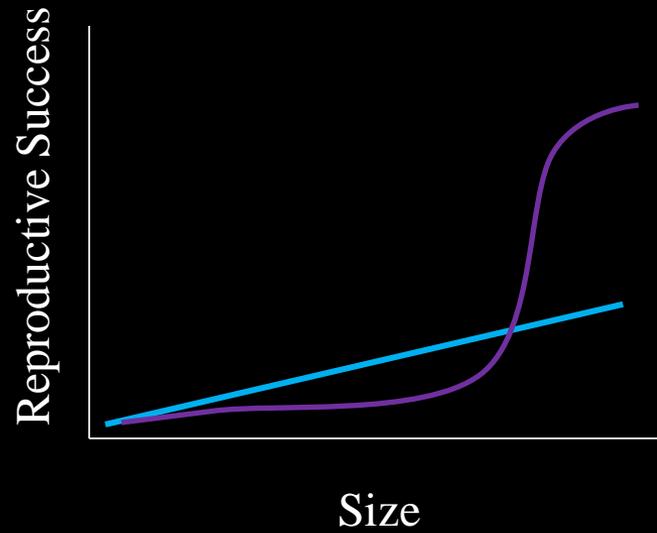
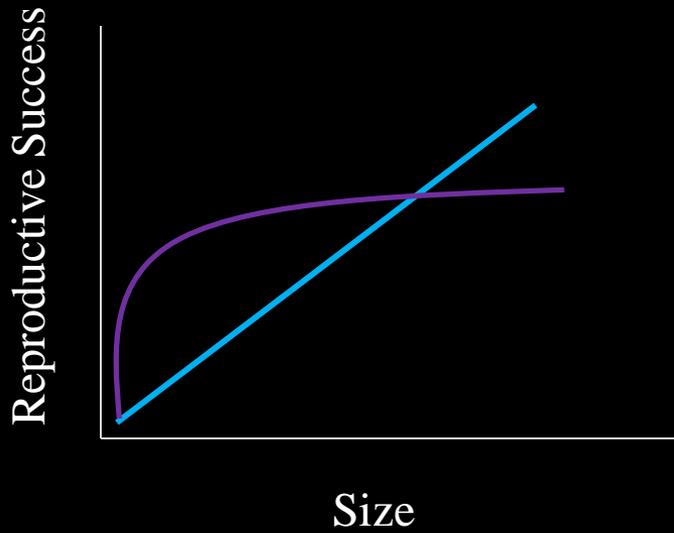


D. Brough

Androdioecy



When to change sex?



Parasitic mating (males first)



T. Pietch

Parasitic mating (males first)



M. Tule



P. David/Natural Visions

Parasitic mating (females)



© Dunja K. Lamatsch, University of Würzburg

D. Lamatsch

When they don't have sex?

Parthenogenesis

Clonal



Oceanwideimages.com

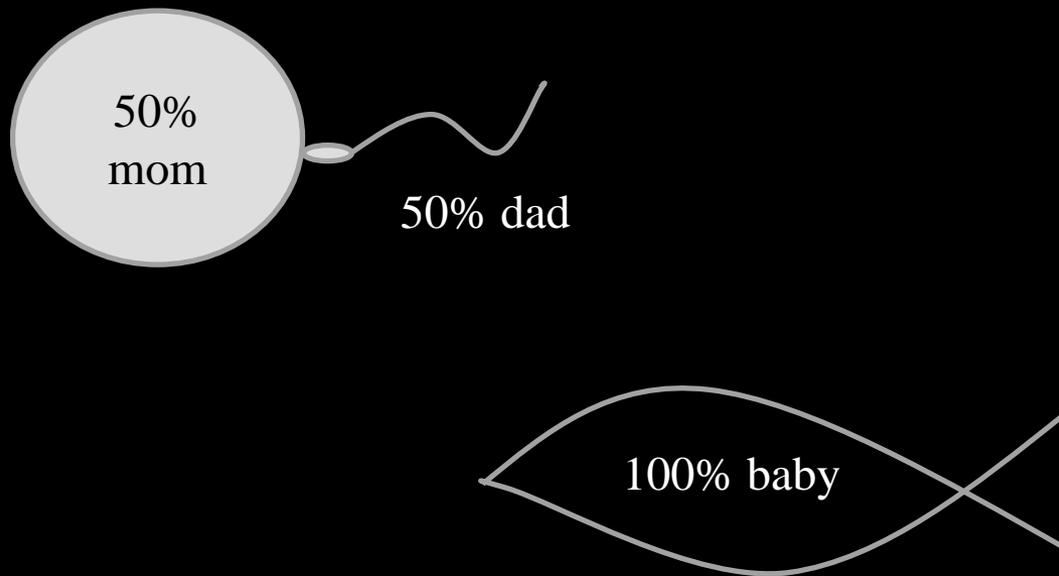
Automictic



Marinebio.org

Parasitic mating (females)

Sexual reproduction – a primer



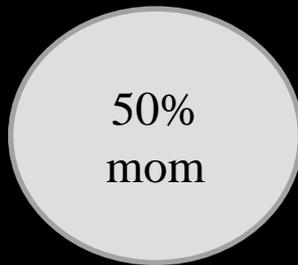
Parasitic mating (females)

Clonal parthenogenesis



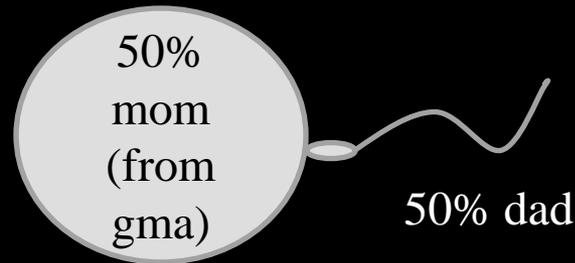
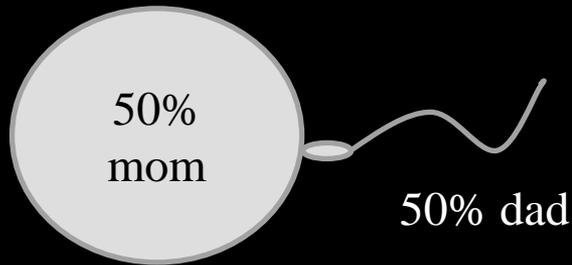
Parasitic mating (females)

Automictic parthenogenesis



Parasitic mating (females)

Hybridogenesis – evil females number one



Parasitic mating (females)

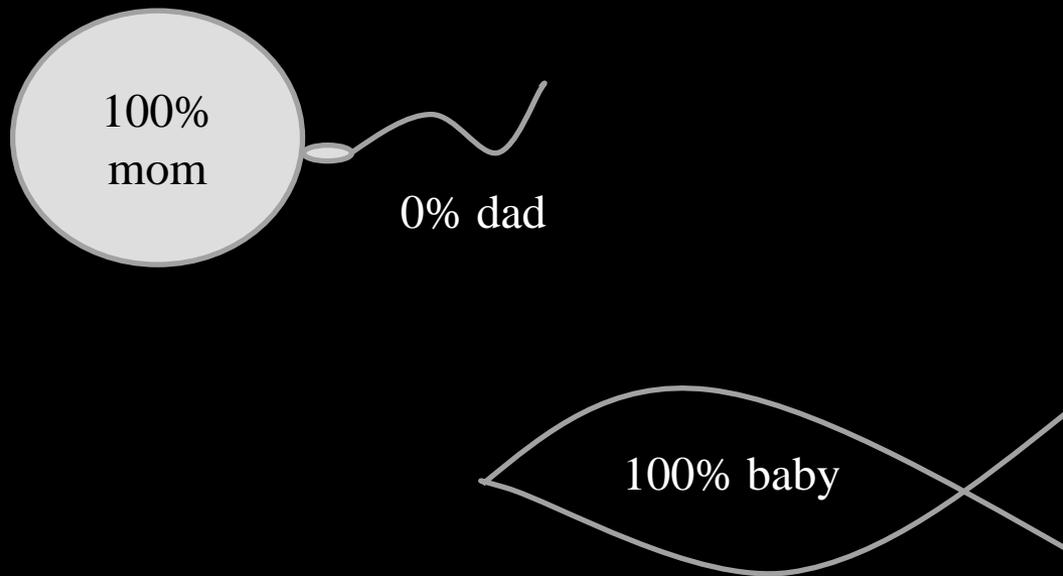


D. Lamatsch

Amazon Molly

Parasitic mating (females)

Gynogenesis – evil females number two



Fish sex – they have tried it all



Thank you for your time!



© Octavio Aburto

O. Aburto

Questions??

fish sex
(well, foreplay...)