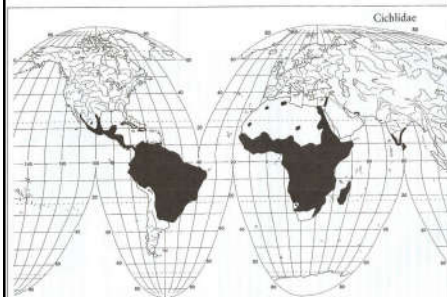
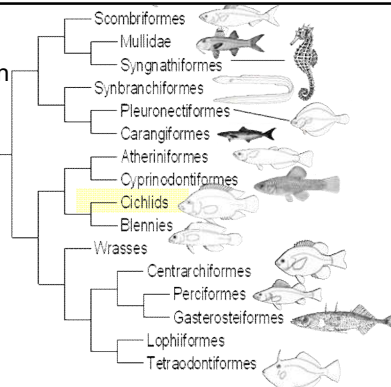


Order Cichliformes, cichlids

- South America, Africa, India, one North American species
- 112 genera, 1300 species, many undescribed
- Interrupted lateral line
- Oviparous, Variable forms of parental care

- Centrarchid convergence, introductions and conservation concerns



Cichlid mouth part diversity

Diverse Cichlid Fishes of Lake Malawi



***Genyochromis mento*:**
eats fish scales and fins



***Caprichromis orthognathus*:**
eats baby fish and eggs



***Trematocranus placodon*:**
eats mollusks



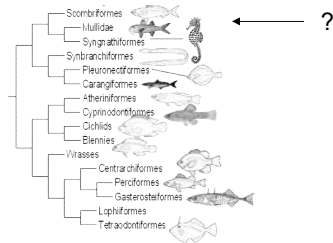
***Rhamphochromis*:**
eats small fish



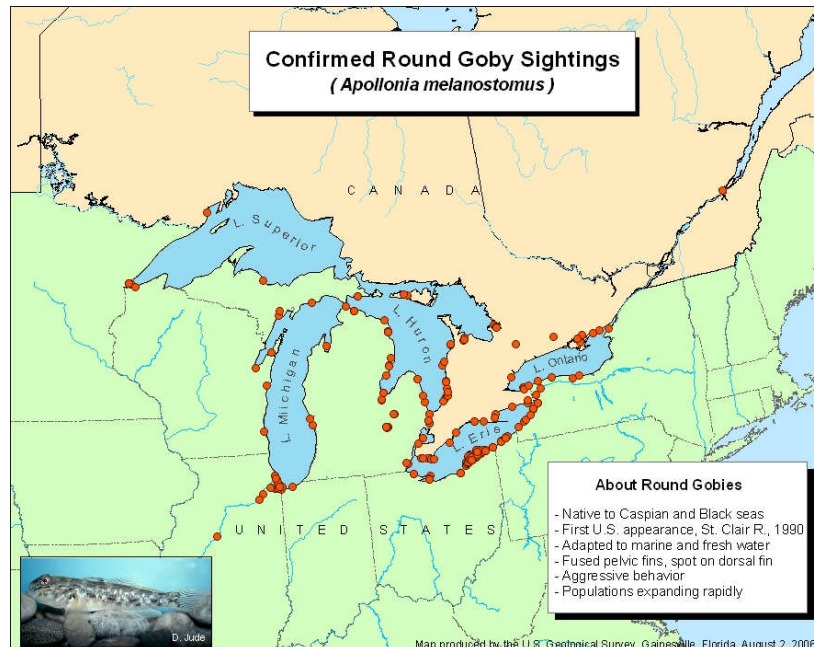
***Melanochromis labrosus*:**
eats insect larvae

Order Gobiiformes, gobies

- Mostly marine, few freshwater
- 210 genera, 1900 species
- Pelvic fins usually modified into sucker
- Many with adaptations to terrestrial life
- Smallest vertebrates in group are thought to be neotonous
- Some catadramous



Conservation concerns – round goby introduction



Order Labriformes, wrasses

- 2 families (Labridae and Odacidae)
- 530 species in ~77 genera
- Jaw teeth sometimes protrude
- Some Parental care



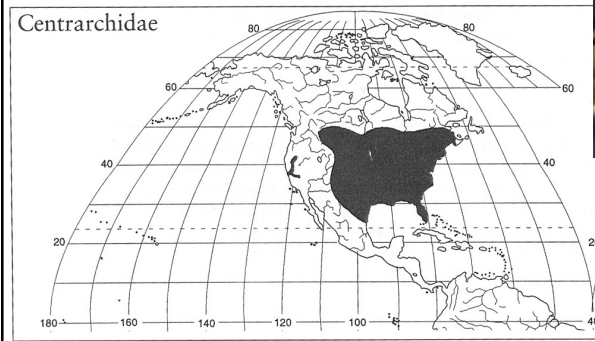
i) Model

ii) Mimic



Order Centrarchiformes, Family Centrarchidae, sunfishes

- North American, Freshwater
- 8 genera, 31 species
- Male nest builders
- Dominant carnivores in US lakes



Order Centrarchiformes, Family Elasmomatidae, pygmy sunfishes

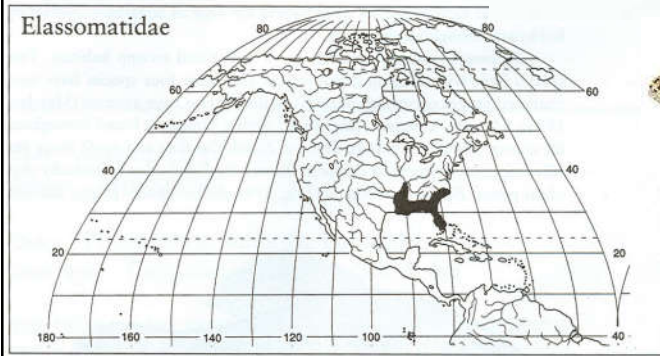
- North American, Freshwater
- 6 species
- Swampy habitats in SE US



Photo credit: Howard Jetts

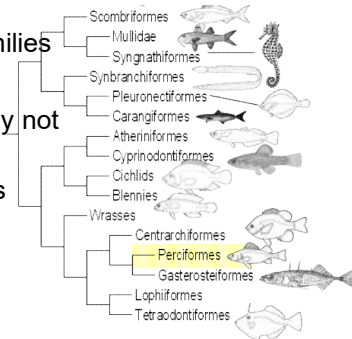


ESD402098



Order Perciformes

- Largest order of fishes, currently over 150 families
- Mostly marine
- Poorly defined in terms of characteristics, likely not monophyletic
- Group formerly contained centrarchids, labrids (wrasses) and cichlids.



Order Perciformes, Family Percidae, perches

- North America (mostly), some in Eurasia
- 10 genera, 201 species
- Northern North America and European lakes dominated by yellow perch, walleye and Eurasian perch
- Darters some of the most colorful and sexually dimorphic fishes



WALLEYE

Stizostedion vitreum



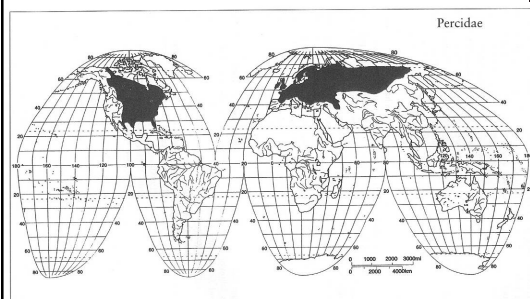
William Roston



William Roston

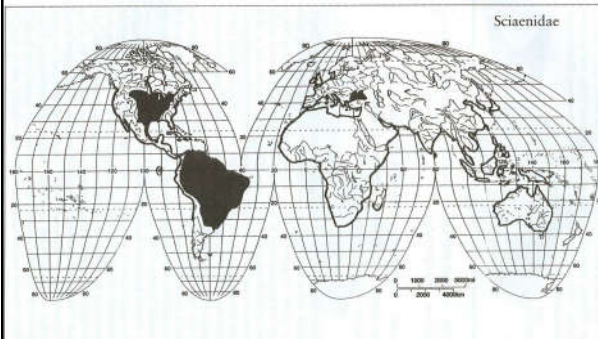
Order Perciformes, Family Percidae, perches

- Most darters males will spawn with multiple females (polygamy)
- Females judge male quality based on
 - Color
 - Nest quality and/or parenting skills (presence of eggs)



Order Perciformes, Family Sciaenidae, drums and croakers

- North American (mostly), other species marine or coastal
- 70 genera, 270 species
- Large otolith
- Produce sound via swim bladder, extensive well developed lateral line



Order Perciformes, Family Serranidae, sea basses

- Temperate and tropical Marine
- 64 genera, 475 species
- Three opercular spines
- Many large piscivores



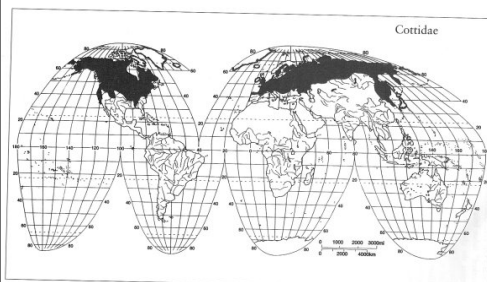
Order Perciformes, Family Scorpaenidae

- Scorpionfishes, rockfishes
- Dorsal, anal and pelvic spines often with venom glands, most venomous fish
- Marine, commercial importance of some (rockfish fishery declines)



Order Perciformes, Family Cottidae, sculpins

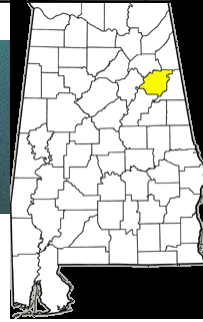
- 70 genera, 275 species
- Anal fin without spines
- Large head and mouth
- Egg layers, male parental care



Sculpin Conservation

- Pygmy sculpin

- Western Endemics
 - Kalamath lake sculpin
 - Bear lake sculpin
 - Utah lake sculpin

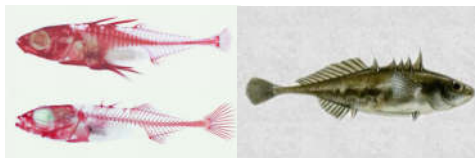
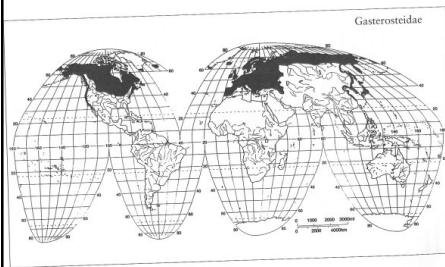
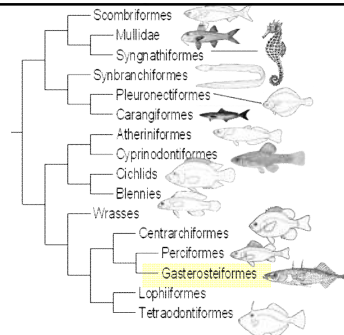


Order Gasterosteiformes

- 5 genera, 16 species
- Small mouth, elongate body
- Dermal plates

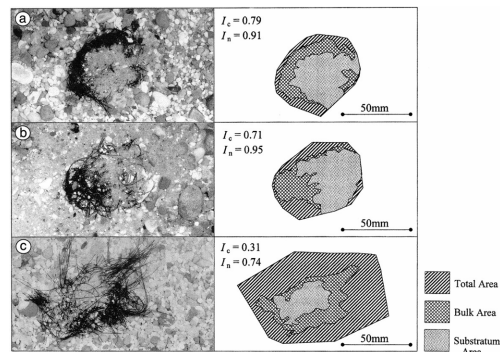
- Well developed, isolated dorsal spines

- Marine and brackish with some forms recently evolved in glacial lakes



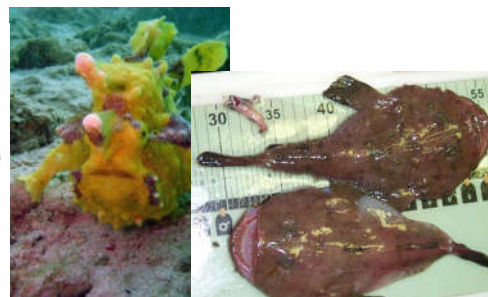
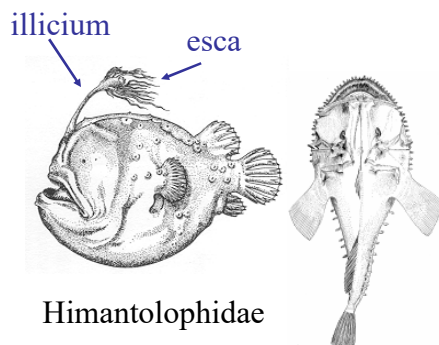
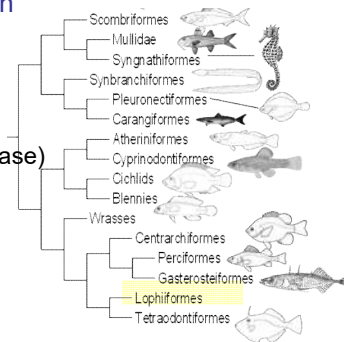
Stickleback nest construction

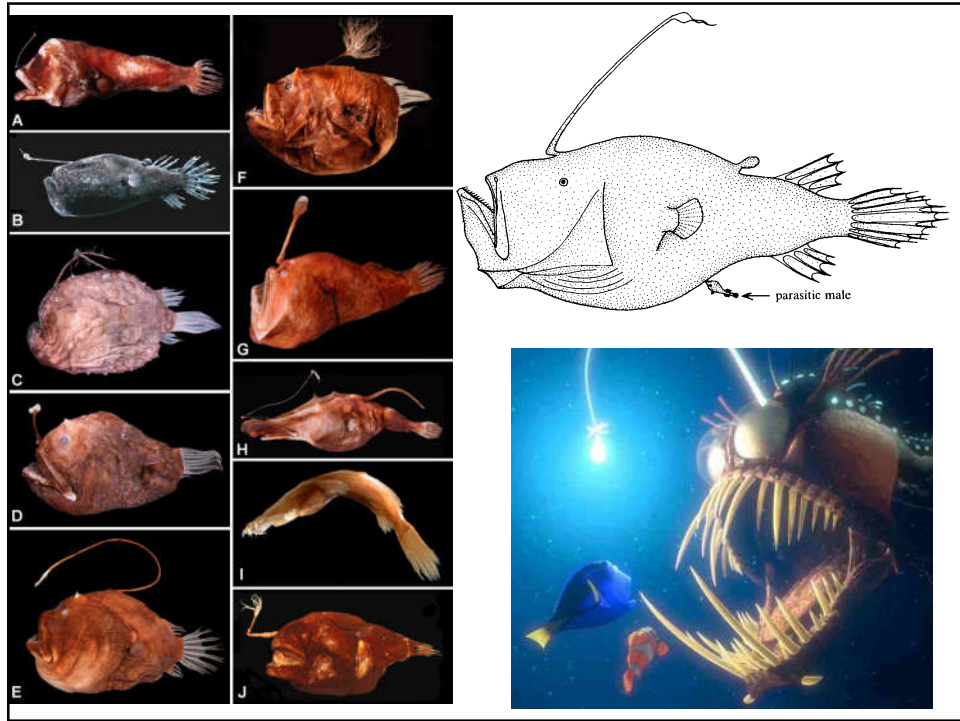
- Kidney secretes glue-like protein used to construct nest
- Females judge size and neatness of nest
- Males with larger kidneys can produce larger, neater nests



Order Lophiiformes, anglerfish, goosefish, frogfish

- 313 species, 66 genera, 18 families
- suction feeders (gill opening posterior to pectoral base)
- No ribs
- Foot-like pectoral fins in goosefish





Superorder Paracanthopterygii, Order Lophiiformes, anglerfish, goosefish, frogfish

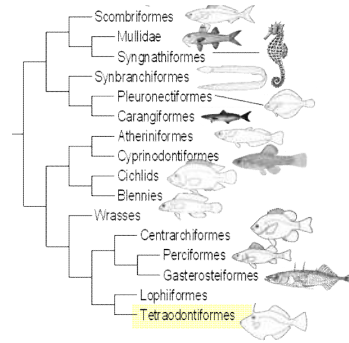


Photo by George Burgess ©



Order Tetraodontiformes

- 357 species, 101 genera, 9 families
- No parietal, nasal or infraorbital bones (secondary losses)
- Jaw bones fused into “beak”, suture produce four sections (“teeth”) giving the group its name
- Scales modified into spines, shields or plates
- Some have inflatable stomach (water or air)
- 14 species freshwater only

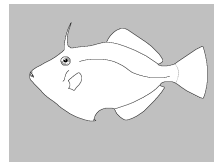


Tetraodontiformes, Family Balistidae (triggerfish) and Monacanthidae (filefish)

- Balistidae
 - Three dorsal spines
 - Platelike scales
 - All marine
 - 11 genera, 40 species



- Monacanthidae
 - 1 or 2 dorsal spines
 - Reduced scales, body often “fury”
 - 32 genera, 102 species many in Australia



Tetraodontiformes, Family Molidae, molas

- No dorsal or anal spines
- Posterior body reduced to flap (pseudocaudal)
- No lateral line
- Open water marine, feed only on jellyfish
- 3 genera, four species

