

# *Bacterial Diseases of Fish (2)*

# *Pseudomonas fluorescens*

- Causes pseudomonas septicemia mainly in general pond fish, seldom in salmonids
- normally a secondary invader, hard to distinguish from *Aeromonas septicemia*, not a huge concern in fish
- **Agent:** ubiquitous bacterium of soil, water, spoilage-vulnerable foods; G- rod motile via polar flagellum; grows @ 18-25°C; cytox positive, catalase positive, strict aerobe
- **culture:** std media, round glistening colonies w/undulating edge, radial striations, easily seen green pigment under UV light (pseudomonas F agar)

# *Pseudomonas fluorescens*

- **Epizootiology**: worldwide in fw/sw, all fish susceptible but mainly ww, problem for aquarium fish
- **reservoirs**: mud and water; infected or carrier fish and others (frogs)
- **transmission**: horizontal, no vertical
- **environment**: stress, mainly elevated temps
- **Pathology**: in catfish, largely hemorrhaging and necrosis of internal orgs, external lesions, loss of pigmentation; *individuals can withstand large losses, bone exposure*

# *Pseudomonas fluorescens*

- **Diagnosis:** isolation from kidney on TSA or BHI; confirmation via serology no help
- **Control:** remove stressor, drug therapy as with other G-(oxytet @50-75 mg/kg/f/day for 10 days); no vaccine yet

# *Pseudomonas fluorescens*



Fig. 12.5 — Transmission electron micrograph of a thin section of *Pseudomonas anguilliseptica*, lacking any signs of an extracellular layer. Bar equals 1  $\mu\text{m}$ . (Photograph courtesy of Dr G. Dear.)

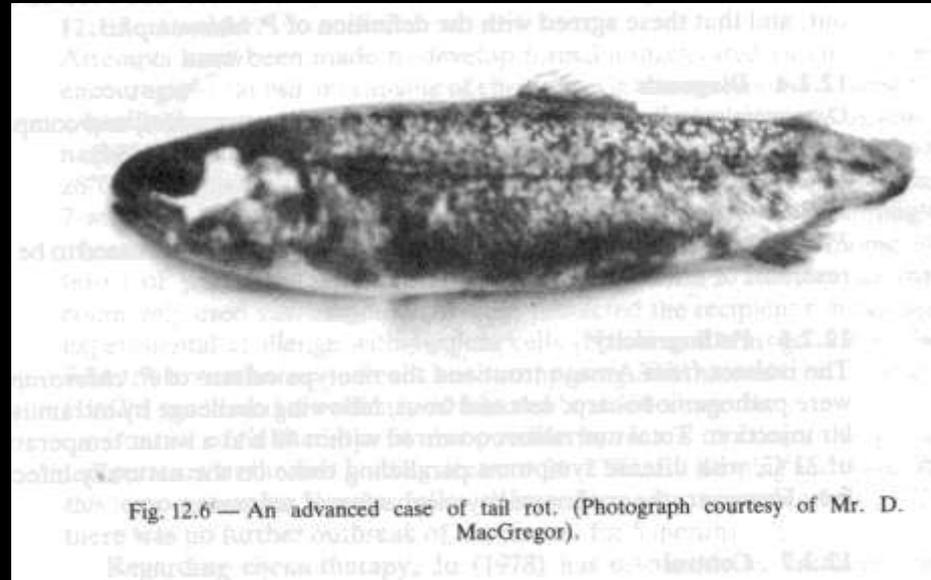


Fig. 12.6 — An advanced case of tail rot. (Photograph courtesy of Mr. D. MacGregor).



# *Aeromonas hydrophila* (MAS)

- Causes **Motile Aeromonas Septicemia**, often referred to as a complex of species, mainly affecting ww fish, opportunistic pathogen, can cause red-leg in frogs
- **Agent**: taxonomy confused (more than 10 other species claimed); G- motile rod w/polar flagella; oxidase pos, catalase pos, glucose fermenter; virulence may be via endotoxin
- **culture**: TSA, BHI; can grow at 4°C, but best at 18-25°C; white, circular, convex colonies, often confused w/*Citrobacter*

# *Aeromonas hydrophila* (MAS)

- **Epizootiology:** worldwide in fw, all fw species susceptible (both ww and cw); others such as frogs, alligators, snails, shrimp and humans
- **reservoir:** freshwaters w/high organic loads, usually in sewage, normal gut flora of healthy fish; diseased fish/frogs; survivors are carriers
- **transmission:** horizontal only from intestinal tract, external lesions, through water, via external parasites
- **environment:** stress from crowding, variable temps, changes in weather; rough handling, low DO, high organics

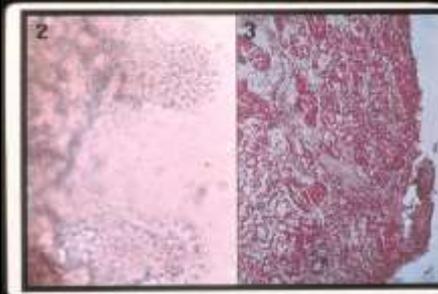
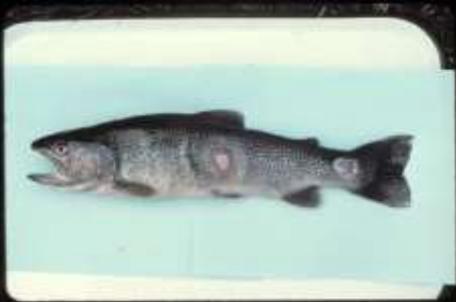
# *Aeromonas hydrophila* (MAS)

- **External pathology:** usually hemorrhagia + necrosis or internal organs + necrotic lesions on skin/muscles = G- septicemias
- superficial circular or greyish-red ulcerations
- lesions around mouth similar to **ERD**
- hemorrhaging of fins, exophthalmia
- **Internal pathology:** swollen, soft kidney; petechiae of musculature, intestines free of food

# *Aeromonas hydrophila* (MAS)

- **Diagnosis:** isolation from kidney into TSA or BHI
- **presumptive:** G- motile rod, cytox +, ferments in glucose, no fluorescent pigment
- **confirmative:** no serology, too many types
- **Control:** prevention via good management, injection w/chloramphenicol, no vaccines; therapy via oxytet (50-75mg/kg fish/day for 10 days), chloramphenicol in Europe

# *Aeromonas hydrophila*



# *Aeromonas salmonicida* (*furunculosis*)

- First isolated from farmed trout in 1894
- name of disease derived from boil-like lesions known as “furuncles” (not correct)
- at one time very common, resulted in Furunculosis Committee in England
- diminished as of late due to better mgmt
- **Agent:** comes in three subspecies, the most common is salmonicida (produced pigment), G- nonmotile rod, bipolar staining

# *Aeromonas salmonicida* (*furunculosis*)

- **Culture:** TSA/BHI, brown pigment in presence of TYR/PHE, grows well at 18-25°C, small white round raised convex colonies
- **Biochem:** G-, oxidase +, non-motile, ferments glucose but no gas
- **Pathogenicity:** both virulent and avirulent strains, produces endotoxin
- **Epizootiology:** wherever salmonids are cultured in fw (besides Tasmania/NZ), entered Australia via goldfish, brook trout most susceptible
- **reservoirs:** obligate fish pathogen, found in waters w/infected or carrier fish

# *Aeromonas salmonicida* (*furunculosis*)

- **transmission**: primarily horizontal, contaminated water, eggs, carriers, equipment, clothing, surface of aquatic birds; no vertical demonstrated
- **pathogenesis**: acute, subacute, chronic forms (dose, temp, host resistance, virulence of strain)
- **environment**: severity increases w/temp, nutrition, handling stress

# *Aeromonas salmonicida* (*furunculosis*)

- **Pathology:** similar to other G- septicemias w/hemorrhaging, necrosis of internal organs, external lesions
- **external:** focal necrosis in muscle develops to abscess, hemorrhaging and lesions at base of fins, fraying of fins, bloody discharge from vent; **blue irridescent sheen on body near eyes, bleeding from gills**
- **internal:** petechiae in body musculature, congestion of posterior intestine, no inflammatory response

# *Aeromonas salmonicida* (*furunculosis*)

- **Diagnosis**: look at hatchery history with disease; isolation easy from kidney into TSA, BHI;
- **presumptive**: G-, non-motile rod, brown diffuseable pigment, oxidase +
- **definitive**: serological (rapid slide agglutination, FAT)
- **Control**: avoidance via clean water/fish; several vaccines on the market; selective breeding??
- **therapy**: oxytet @ 50-75mg/kg fish/day for 10 days, sulfamerazine, sulfonamide (Romet)

# *Furunculosis*

