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Pseudomonosis

Psuedomonas spetecemia

Definition

"Acute, sub-acute, and chronic bacterial disease affect mainly cultured and aquarium freshwater, brackish and marine fishes, characterized by generalized septicemia accompanied with skin ulceration, high morbidities as well as high mortalities".

Etiology

Pseudomonas fluorences, is the most specie of this genus incriminated in fish pseudomonosis, however, there usually is a different species or strains of pseudomonades associated with each epizootic. Other pseudomonades have been isolated from fish septicemia, but most resemble *Pseudomonas fluorences.*

It is Gram-negative, rod-shape, oxidase positive, motile by one polar (axial) flagellum or three polar flagella in some strains, non-spore forming, non-acid fast, non-capsulated and produce diffusible pigment (dirty green) that fluoresce under UV light. The organisms attack glucose oxidatively with production of acid only and never fermentively {OF (+/-)}. The optimum growth temperature 20-25° C.

The organism produces hemolysins, dermolysins and proteolytic enzymes.

Susceptibility

All fish species are susceptible to be infected with *P. fluorences* particularly cultured and aquarium ones.

Pseudomonosis can occur as single-fish cases or as epizootics. Epizootics occur when all fish in the population become more or less susceptible to infection at the same time, such as the epizootics resulting from malnutrition.

Pseudomonas species consider as saprophytes opportunistic microorganisms, so outbreaks of pseudomonosis usually occurs secondary to chemical, physical and environmental stressors.

Predisposing causes (stressors)

- Overcrowding.
- Low dissolved oxygen.
- Presence of large amount of organic matter.
- Nutritional deficiencies.
- Injuries of the skin or gill either by trauma or ectoparasites.
- Temperature variation between seasons (eg. summer & spring).
- Rough handling especially during transportation.

Usually pseudomonosis is one time thing, if care is taken to keep fishes healthy under normal conditions.

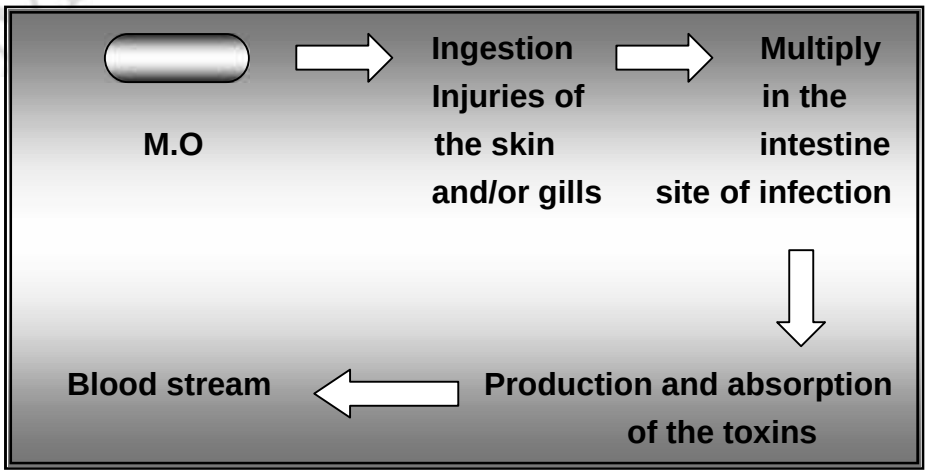
Mode of infection

Mainly through ingestion and injuries of skin and/or gills.

Source of infection

- Shaded microorganisms from infected fishes, infected dead carcasses as well as polluted water with the microorganism act as the source of infection.

Pathogenesis



As other septicemic disease with characterizations of:

- Erythema at the base of fins, mouth, groves under the lower

Disease signs

jaw and around the anal opening.

- Exophthalmia, edema and skin ulceration.

Postmortem (P.M.) Findings

- Generalization of petechial hemorrhages in the peritoneum and visceral organs.
- Intestine hemorrhagic and contain bloody fluids.
- Muscles may be more or less hemorrhagic according to the severity of the epizootic.

Microscopic Pathology

- Congestion, dilated blood vessels and edema together with hyper-anemia of the hypodermis as well as epidermis.
- Zenker's necrosis in the center of the dermis and hypodermal layers.
- Focal coagulative and lquifactive necrosis of the liver, kidney's cells.
- Deposition of hemosidrine in the melano-macrophage centers of the spleen and hematopiotic tissues of the kidneys.

Diagnosis

I. Case history revealed that:

- Cessation of feeding or the fish refuse the food.
- Sluggish swimming and the fish swimming just below the water surface.
- Presence of mortalities.

II. The disease signs

III. The P. M. findings.

IV. Laboratory diagnosis:

- Samples: kidney, liver, spleen, blood, muscles especially the deep layer of the muscles.
- Squash smear from the organs stained with Gram.
- Isolation and identification:

Pseudomonads could be isolated and grow well on ordinary medium, Nutrient agar (NA), typto-soy agar (TSA), MacConkey agar and Brain heart agar (BHA) or basal medium

supplemented with 5% hourse, bovine or sheep blood at 25-30º C giving yellowish-green round small colonies.

On Rimler-Shotts (R-S) medium it can grow as small yellowish-green colonies even the vibriostatic agent (0/129 and/or novobiocin) is included.

Identification through using biochemical tests, the oxidation-fermentation test (OF) thus becomes a prime method for separation of pseudomonads from aeromonads and vibrios.

API kits, gel-diffusion test, FAT, ELISA, and PCR (polymerase chain reaction).

- Histopathological findings (as mentioned above).

Chemotherapy

Quite often there is no drug of choice for treatment of the disease because of the difference in species or strain of pseudomonads, and each may be controlled by a different therapeutics.

Therapy & Control

- Oxytetracycline 55mg/Kg fish in the food for 10 days.
- Sulfamerazine 264mg/Kg fish in the food for 3 days followed by 154mg/Kg fish for additional 11 days.
- Sulfaguanidine + sulamerazine combination (1:2) 130mg/kg fish for 3days followed by 90mg/Kg fish for 11days
- Nitrofurzone 56mg/kg fish for 10 days.
- Oxolinic acid 10~30mg/Kg fish for 10 day.

Control

Good hygiene and removal of all stressors is the proper way for disease control this can be achieved through:

- Avoid overcrowding.
- Proper disposal of dead and dying fishes either by burning or burying.
- Control of aquatic animals such as reptiles and amphibians.
- Destruction of the carriers and disinfectant of the eggs.

- Proper disposal of infected fish if in small number.
- Proper drainage, drying, and disinfectant of the pond (quick lime 4 tone/acre.