Case #23: Unexpected Frog Deaths

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Background

• **Signalment**
  - 3-year-old male frog
  - 4-year-old female frog

• **History**
  - Inappetence
  - Anorexia
  - Bloated abdomens
    - Generalized intestinal distention
  - Ulceration of left axillary region
    - Gentamicin treatment

Frogs Euthanized
Gross Findings

• Good post-mortem condition
  • Adequate muscling and fat stores

• Numerous 1 mm white nodules
  • Throughout body cavity

• Liver
  • Diffusely pale gray

• Kidneys
  • Mottled green and tan

• Gall Bladder
  • Moderately dilated

• Intestines
  • Diffusely distended with gas
Histological Findings - Liver

- Hepatic lipidosis
- Melanin
- Multifocal aggregates of
  - Heavily pigmented macrophages
  - Epithelioid macrophages
  - Multinucleated giant cells
Histological Findings - Liver

- **Acid Fast Stain (Ziehl-Neelsen)**
  - Single to several acid-fast bacilli contained within macrophages
- **Similar Histological Findings in other organs**
  - Kidneys
  - Lung
  - Spleen
  - Intestines
  - Coelomic adipose tissue
Histological Findings - Kidney

100x

400x AF Stain
Histological Findings - Lung
Histological Findings Cont.

- Intestinal Lumen
  - *Balantidium coli* trophozoites and cysts
- Liver
  - Large trematode distending a portal vein
- Serosal surfaces
  - Multifocally widened by granulomas
- **Morphological diagnosis**
  - Granulomatous hepatitis, pneumonia, nephritis, splenitis, and serositis with intrallesional acid-fast bacilli.
Mycobacterium marinum

- Ribosomal RNA sequencing confirmed
- Zoonotic
- Mycobacterial species identified in amphibians
  - *M. chelonae, M. ulcerans, M. liflandi, and M. xenopi*
- Mycobacterial infections not uncommon in captive amphibians
  - Research frog colony
Mycobacterium marinum

- Often presents as disease of integument
  - Attributable to skin wounds and organism’s common presence in water.
- Internal organs commonly affected in amphibians
  - Liver, kidney, spleen and intestines
- Lesions may be misdiagnosed as
  - Lymphosarcoma
Mycobacterium marinum

- **Treatment**
  - Often ineffective
  - Requires culling

- **Current Status**
  - More individuals in this frog colony may be infected with *M. marinum*
    - Wild caught
    - Caught with the disease or acquired in captivity?
  - Assumption that the entire colony is affected
    - No diagnostics to confirm
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Questions?