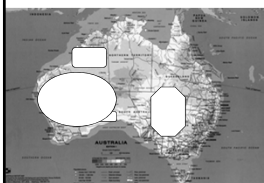


Biology and Medicine of the Bearded Dragon (*Pogona vitticeps*)

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College of Veterinary Medicine



Taxonomy



- Agamidae
 - *Pogona*
 - Storr (1982)
 - Central/Inland Dragon
 - *Pogona vitticeps*
 - Northwest Dragon
 - *P. minor mitchelli*
 - Nullarbor dragon
 - *P. nullarbor*
 - Western dwarf dragon
 - *P. minor minor*




Taxonomy




- Eastern dragon
 - *P. barbata*
- Kimberley dragon
 - *P. microlepidota*
- Black-soil plains dragon
 - *P. henrylawsoni*




Biology




- Diverse habitats
 - Temperate to tropical areas
 - Arid to semi-arid
 - Woodland, scrubland, grasslands




Habitat




- Variable habitats
 - Mallee
 - Eucalypt trees- swollen bases
 - Leaves/detritus
 - Deserts
 - Sandy deserts
 - Infertile sands
 - Scattered grasses
 - Stony deserts
 - Stony plains with scattered herbs
 - Grasslands
- Concepts should be used to develop vivariums



Behavior



- Ectothermic
- Terrestrial to semi-arboreal
- Diurnal
 - Bask early day
 - "sun-loving"
 - Dorsoventral compression
- Brumation
 - Southern Australia



Husbandry: Environment



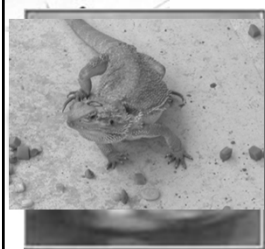
- Enclosure type and size
- Environmental temperature range
 - Day: 80-90°F
 - bask: 95-100°F
 - Night: 70-80°F
 - Radiant heat
- Photoperiod
 - 12:12
 - UVB light?
- Humidity: 30-50%

Husbandry: Environment



- Substrate
 - Newspaper
 - New arrivals
 - Fecal exams
 - "Play sand"
 - Avoid commercial CaCO₃
 - River rock
 - Orchid Bark
 - Foreign body

Diet



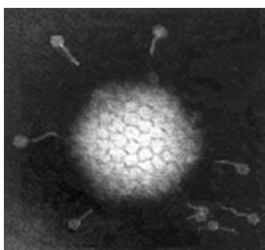
- Omnivorous
 - Invertebrates
 - Commercial
 - *Acheta domestica*
 - *Tenebrio molitor*
 - *Zoophobias*
 - Vertebrates
 - Wild-caught
 - Firefly: *Photinus*
 - Steroidal pyrones
 - *Lucibufagins*
 - Plant material
 - Greens
 - Romaine
 - Mixed veggies
 - Supplements?
 - Commercial diets
 - Extruded pellets
 - Frequency of feeding

Common diseases



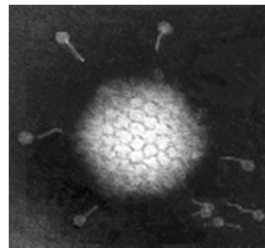
- Atadenovirus
- Coccidia and oxyurids
- Microsporidiosis
- Da Fungus
- Neoplasia

Adenovirus



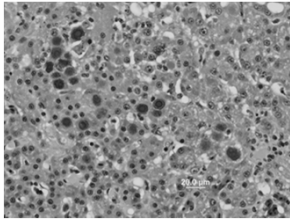
- Atadenovirus
 - snakes, lizards, crocodilians
 - high morbidity and mortality
 - immunocompromised
- Transmission
 - Direct: fecal-oral
 - Indirect ?

Adenovirus



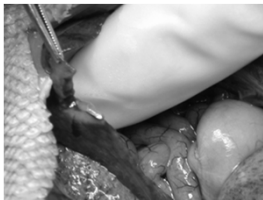
- Atadenovirus
 - Clinical signs
 - Absent
 - rosy boas, crocs, monitors
 - Dragons
 - anorexia, weight loss, regurgitation, limb paresis, diarrhea, opisthotonus
 - Concurrent disease
 - dependovirus
 - coccidia

Adenovirus



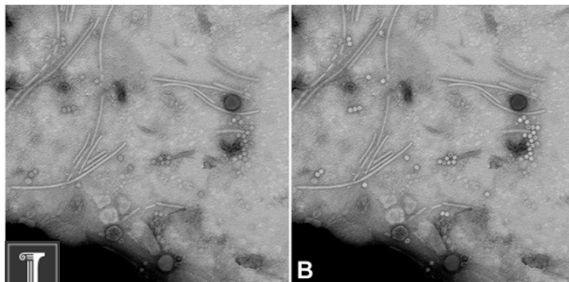
- Pathology
 - Hepatomegaly
 - hepatic necrosis
 - Hemorrhagic enteritis
 - necrotizing enteritis
 - Basophilic intranuclear inclusions
 - hepatocytes, renal and GI epithelial cells

Adenovirus



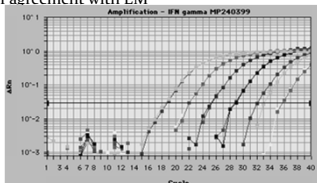
- Clinical Diagnosis
 - Biopsy
 - liver
 - stomach
 - esophagus
 - kidney

Electron Microscopy



Real time PCR

- Bearded dragon adenovirus
 - AAdV-1 (Wellehan)
 - Pilot population: 80% positive (Walden and Mitchell, 2009)
 - Poor agreement with EM

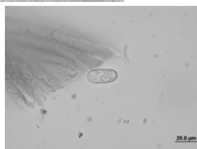


Atadenovirus

- Treatment
 - Supportive care
 - Antimicrobials
 - Anticoccidials
- Epidemiology unknown
 - Shedders?
 - Cull?
 - Well disseminated
 - 80% samples single population



Coccidia




- Coccidia
 - *Isospora amphiboluri*
 - Direct life cycle
 - epithelial surfaces of intestinal, biliary and renal systems
 - NOT self-limiting?
 - Clinical signs
 - juveniles: wasting, dehydration, poor-doer
 - *Eimeria* sp.
 - Walden and Mitchell, 2009




Coccidia

- Diagnosis
 - Fecal float
 - Direct smear
- Value of each?


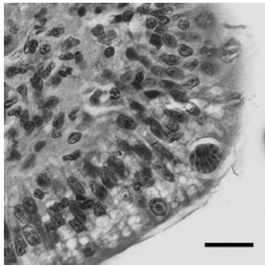
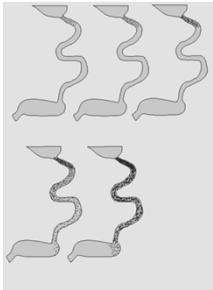


Cross-sectional study


- Walden and Mitchell, 2009
 - N=112, Adult dragons
- Results
 - *Isospora*: 23.2% (15.4-31.0)
 - *Eimeria*: 22.3% (14.6-30.0)
 - Oxyurids: 91.1% (85.8-96.4)
- Test characteristics
 - Float: sensitivity: 100%, specificity 93%
 - Direct: sensitivity: 76%, specificity 100%




Pathogenesis- *I. amphiboluri*



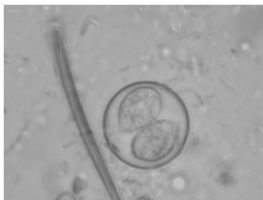
Coccidia




- Treatment
 - Juveniles
 - Necessary in adults?
- Coccidiostatic drugs
 - Trimethoprim-sulfadiazinmethoxine
 - 30 mg/kg PO once,
 - then 15 mg/kg PO x 10 days (minimum)
 - recheck fecal
 - monitor hydration
 - Success?



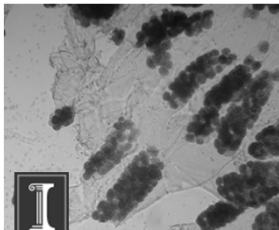
Coccidia




- Treatment
 - Oregano
 - Pedicococcus
 - No effect on coccidia
- Ponazuril
 - 15-45 mg/kg SID x 21 d
 - All clear
 - No pathology
 - Treatment length needed?
 - Roadrunner pharmacy



Microsporidiosis



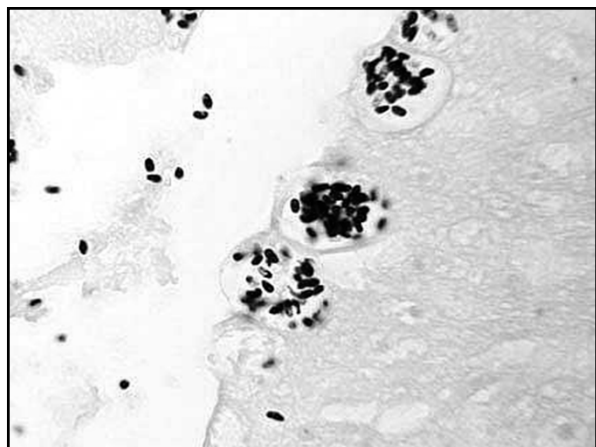
- Microsporidiosis
 - Obligate IC parasite
 - Life cycle
 - Injects sporoplasm into host cell
 - Merogenic phase: meronts
 - Sporogenic phase: meronts to sporonts
 - Parasite isolated from vertebrates
 - Common HIV patients
 - Common in fish
 - *Pleistophora* sp.



Microsporidiosis

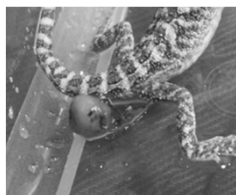


- Bearded dragons
 - *Pogona vitticeps*
- Clinical signs
 - Unthrifty
 - Weight loss
 - Acute death
- Histopathology
 - Basophilic intranuclear inclusion (H&E)
 - Hepatic and renal necrosis
 - Colon, adrenal, ovaries
- Transmission?
 - Feces and urine?
 - Vertical?
- Treatment?
- Prevention?

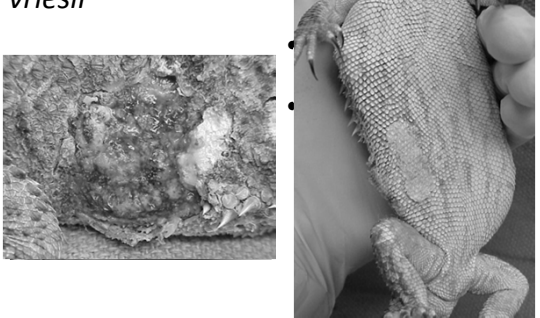


Vertical Transmission

- Microsporidia in foci of granulomatous yolk sacculitis and placentitis




Chrysosporium Anamorph of *Nanniopsis vriesii*




Diagnostics

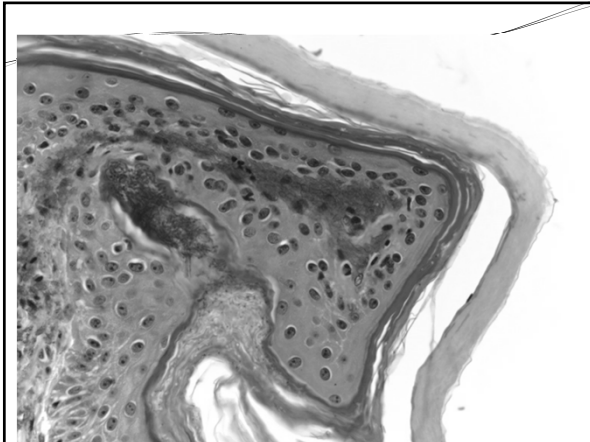
- Preliminary
 - KOH preparation
 - Cytology
 - Pyogranulomatous inflammation
 - CBC

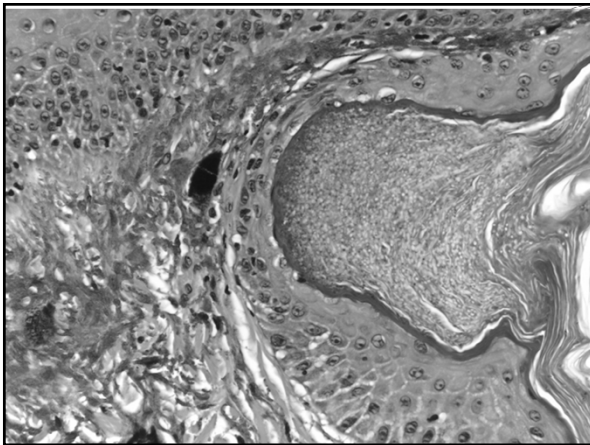


Diagnostics

- Biopsies
 - Anesthesia
 - Propofol
 - 10 mg/kg IV
 - Isoflurane
- Sample submission
 - Histopathology
 - University of Texas-Fungus testing laboratory
 - PCR
 - Culture






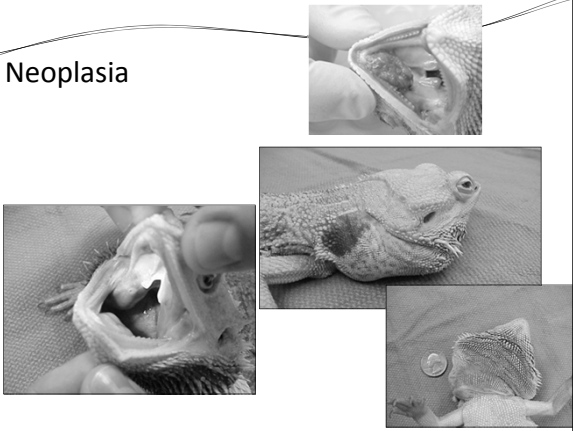


Treatment

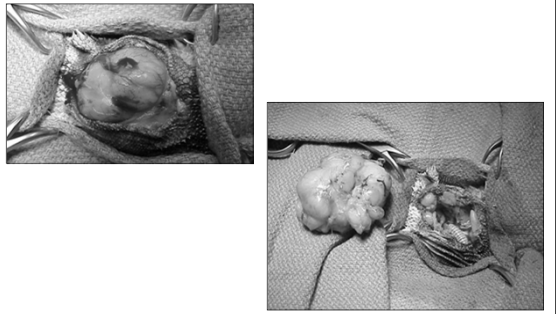
- Source
 - Soil?
 - Stress?
 - Environmental factors
 - Combination of factors plus stress?
 - Opportunistic vs. obligate
- Treatment
 - Itraconazole: 5-10 mg/kg SID
 - Voriconazole: 5 mg/kg-Safer



Neoplasia



Diagnostics



Questions?

