ADENOVIRUS INFECTION in Reptiles

<table>
<thead>
<tr>
<th>ANIMAL GROUP AFFECTED</th>
<th>TRANSMISSION</th>
<th>CLINICAL SIGNS</th>
<th>FATAL DISEASE?</th>
<th>TREATMENT &amp; CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lizards</td>
<td>Most likely virus excreted in the faeces and ingested Respiratory droplets Vertically</td>
<td>Unspecific Poor doers Poor appetite Sometimes diarhea Sudden death Young lizards, 4 to 12 weeks old more affected</td>
<td>Not always. Inapparent carriers in adults</td>
<td>None against the virus Control of secondary bacterial infections, supportive treatment</td>
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<td>Snakes</td>
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<td>Quarantine, PCR testing of newly introduced animals, hygiene.</td>
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<td>Also detected in chelonians and crocodiles</td>
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Last update April 2009

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Susceptible animal groups:


Recent reports from chelonians: *Inotestudo forsteni* (Sulawesi tortoise), *Trachemys scripta elegans* (red-eared slider), *Terrapene ornata ornata* (ornate box turtle)

Earlier single report from crocodiles: *Crocodylus niloticus* (Nile crocodile)

Causative organism
Family *Adenoviridae*, mainly genus *Atadenovirus*, also genus *Siadenovirus* and unclassified (only in turtles)

Zoonotic potential
None

Distribution
World-wide

Transmission
Direct (fecal-oral), environmental (droplets), vertical (suspected to be through the egg in utero, or at time of oviposition)

Incubation period
Not known

Clinical symptoms
Unspecific, poor growth, poor appetite, sometimes diarrhea, sudden death, dermatitis in snakes. Mostly young animals, 4 to 12 weeks old, are affected. In snake adult animals can be affected too.

Post mortem findings
Possible findings: gastro-enteritis, stomatitis, oesophagitis, hepatitis, nephritis, pneumonia and encephalitis. Many bearded dragons don’t show significant gross lesions.
Microscopically: hepatic necrosis often with inflammatory cells in the sinusoids. Large basophilic intranuclear inclusion bodies in the hepatocytes and Kupffer cells. stomatitis, esophagitis, gastro-enteritis with intranuclear inclusion bodies in the epithelium. Intranuclear inclusion bodies in glial cells and endothelial cells in the brain.

**Diagnosis**
Polymerase Chain Reaction (PCR), in situ hybridization, histology (basophilic intranuclear inclusion bodies), transmission electron microscopy, virus isolation (if possible).
Serological testing for antibodies against adenoviruses has been described in snakes using a neutralization test.

**Material required for laboratory analysis**
Fresh cloacal swabs, feces or tissues (liver best, also lung, kidney, intestine, etc.) at best in medium or saline solution containing antibiotics or frozen for PCR and virus isolation. Formalin fixed material (liver as well as other tissues, e.g. intestine) for histology and possibly also for PCR.

**Relevant diagnostic laboratories**
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**Treatment**
Use of antibiotics to control secondary infections. E.g. enrofloxacine, marbofloxacin, trimetoprim sulfamethoxazol. Supportive treatment.

**Prevention and control in zoos**
- Quarantine new reptiles for a minimum of 90 days in a separate room, with separate set of husbandry tools, separate air duct system, use footbaths with virucidal disinfectant (e.g. bleach) at entrance. Weigh the animals as they enter and exit the quarantine. House the animals individually.
- Necropy all animals that are euthanised or die.
- Check for internal and external parasites; treat the animals against these common parasites.
- Disinfect used materials and housing on a regular basis

**Suggested disinfectant for housing facilities**
Virucidal disinfectants, e.g. 10% chlorine bleach solution, quaternary ammonium compounds, ammonia.

**Notification**

**References**