



## LUNG-EYE-TRACHEA DISEASE (LETD)

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE?	TREATMENT	PREVENTION & CONTROL
Sea turtles	Possible transmission by direct contact.	Conjunctivitis, stomatitis, glottitis, pharyngitis, tracheitis, pneumonia	Mortality 8-38%, can reach 70%.	No specific treatment. Antimicrobial to control secondary bacterial infections.	<i>In houses</i> Isolate affected turtles. Tanks should have separate water sources.  <i>in zoos</i> isolate affected turtles. Tanks should have separate water sources.

<b>Fact sheet compiled by</b> Rachel E. Marschang, Institut für Umwelt- und Tierhygiene, Universität Hohenheim, Stuttgart, Germany	<b>Last update</b> February 2009
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<b>Susceptible animal groups</b> Green sea turtles ( <i>Chelonia mydas</i> ).	
<b>Causative organism</b> Alphaherpesvirus.	
<b>Zoonotic potential</b> No.	
<b>Distribution</b> World-wide.	
<b>Transmission</b> Unclear. In the marine environment, lung-eye-trachea virus (LETV) could potentially be transmitted to uninfected individuals by direct contact between infected turtles or by contact with substrates harbouring virus, such as sediments, contaminated surfaces or seawater. LETV can remain infectious in seawater for over 5 days.	
<b>Incubation period</b> Clinical symptoms develop over a 2- to 3-week period.	
<b>Clinical symptoms</b> Gasping, harsh respiratory sounds, bouyancy abnormalities, inability to dive properly, presence of caseated material on the eyes, around the glottis and within the trachea. Some turtles will die after several weeks, but some may become chronically ill.	
<b>Post mortem findings</b> A moderate to severe periglottal necrosis. Exudate within airways of the lung, caseous material around the glottal opening and in the trachea, multifocal white nodules in the liver. Histologically, periglottal necrosis with an infiltrate of mixed inflammatory cells, a necrotizing tracheitis, and severe bronchopneumonia.	
<b>Diagnosis</b> Histopathologic evaluation of lesions, amphophilic intranuclear inclusion bodies in epithelial cells of the trachea and the lungs, electron microscopic detection of viral particles Virus isolation from infected tissues possible. Polymerase chain reaction (PCR). Detection of anti-LETV antibodies in plasma by serological assays: ELISA, Western blot and immunohistochemistry.	
<b>Material required for laboratory analysis</b> Samples from all major organ systems and subsequent histologic examination, plasma samples.	
<b>Relevant diagnostic laboratories</b> Contact pathologists with experience with reptiles.	



For virus detection: Virology laboratories with experience in the diagnosis of viruses in reptiles and/or detection of herpesviruses from various species:

- Dr. Rachel E. Marschang, Institut für Umwelt- und Tierhygiene (460), Hohenheim University, Stuttgart, Germany
- Dr. Silvia Blahak, Chemisches und Veterinäruntersuchungsamt OWL, Detmold, Germany
- Dr. Szilvia Farkas, Veterinary Medical Research Institute of the Hungarian Academy of Sciences, Budapest, Hungary

It is best to contact the laboratory before collecting and sending the samples to optimize chances of success.

**Treatment**

Use of antimicrobial to control secondary bacterial infections is the suggested therapy.

**Prevention and control in zoos**

- Strict hygiene and quarantine procedures. Newly acquired animals should be kept isolated for a minimum of 3 months and should undergo thorough physical examinations both before and after quarantine.
- Preventive measures to reduce stress may help reduce mortality. Reduction in the number of animals per tank, strict hygiene procedures, high water quality, and optimal water temperature will reduce the number of animals affected.

Herpesviruses can cause latent infections, so any infected animals should be considered life-long carriers.

**Suggested disinfectant for housing facilities****Notification****Guarantees required under EU Legislation****Guarantees required by EAZA Zoos****Measures required under the Animal Disease Surveillance Plan****Measures required for introducing animals from non-approved sources****Measures to be taken in case of disease outbreak or positive laboratory findings****Conditions for restoring disease-free status after an outbreak****Contacts for further information****References**

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3. Coberley SS, Condit RC, Herbst LH, Klein PA. 2002. Identification and expression of immunogenic proteins of a disease-associated marine turtle herpesvirus. J Virol 76 : 10553–10558.
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