ULCERATIVE STOMATITIS

Animal Group(s) Affected	Transmission	Clinical Signs	Severity	Treatment	Prevention and Control	Zoonotic
Reptiles	Opportunistic-normal flora of the oral cavity or present in the environment	Anorexia, dysphagia, ptyalism, periodontal disease, ulceration of mucous membranes with caseous exudate, pneumonia, osteomyelitis	Severe cases can result in septicemia and death	Debridement, irrigation with antimicrobial solution, topical ointment, analgesia, and long term antibiotics or antifungal based on culture and sensitivity testing	Appropriate nutrition, hygiene, and temperature; minimize stress; prevent trauma to oral cavity	Yes

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Susceptible animal groups: Reptiles, especially snakes, chelonians, and some groups of lizards such as chameleons, bearded dragons, and monitor lizards.

Causative organisms: Multiple possible causative agents including various aerobic and anaerobic bacteria, viruses, and fungi. Gram-negative bacteria are most commonly implicated. *Aeromonas* spp., *Escherichia coli, Morganella* spp., *Proteus* spp., *Vibrio alginolyticus, Providencia* spp., *Pseudomonas* spp., *Salmonella* spp., *Corynebacterium* spp., *Flavobacterium* sp., *Citrobacter freundii*, *Acinetobacter* spp., *Micrococcus* spp., *Aureobacterium* spp., Beta-hemolytic *Staphylococcus* spp., *Streptococcus* group C, *Enterobacter* spp., *Klebsiella* spp., *Pasteurella* spp., *Bacteroides spp., Clostridium spp., Fusobacterium spp., Peptostreptococcus*, herpesvirus, iridovirus, ranavirus, adenovirus, virus X, West Nile virus, *Candida albicans*, and *Mycobacterium* species.

Zoonotic potential: Yes. Immunocompromised individuals and young children are most at risk. *Aeromonas* can cause enteric disease in humans. *Pseudomonas* can cause urinary tract, respiratory tract, soft tissue, bone, joint, and gastrointestinal disease. *Salmonella*, *E. coli, Klebsiella*, *Enterobacter*, *Pasteurella*, *Corynebacterium*, *Mycobacterium*, *Vibrio*, *Staphylococcus*, and *Streptococcus* also can cause disease in humans.

Distribution: Worldwide in both captive reptiles and injured and immunosuppressed free-living animals.

Incubation period: Weeks to months

Clinical signs: Anorexia, dysphagia, ptyalism, tongue paralysis, gingivitis, ecchymosis, petechiation, loss of teeth, tongue sheath abscesses, ulceration of mucous membranes with caseous material accumulation, and osteomyelitis. In lizards with acrodont dentition (e.g., bearded dragons, water dragons), periodontal disease may be seen. Infection can spread from the nasolacrimal duct and involve the eyes or can descend the trachea and cause pneumonia. Septicemia and death can result in complicated and untreated cases. An ulcerative stomatitis-obstructive rhinitis-pneumonia disease complex has been reported in sea turtles. Differential diagnosis in lizards includes exposure gingivitis due to nutritional secondary hyperparathyroidism.

Post mortem, gross, or histologic findings:
Gross findings: Yellow plaques with a diphtheritic membrane and caseous exudate covering eroded oral

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mucosa and surrounded by inflamed tissue that bleeds easily.
Histologic findings: Plaques consist of serofibrinous material, pyknotic nuclei, and cellular debris above an ulcerated, degenerated epithelium layer with lymphocytic infiltration and hyperplastic epithelium along the periphery of the ulcer.

Diagnosis: Aerobic and anaerobic bacterial culture and sensitivity; fungal culture and sensitivity; cytology showing increased heterophils and large numbers of Gram-negative bacteria; acid-fast stain for *Mycobacterium*; radiographs to determine bone involvement.

Material required for laboratory analysis: Culture swab or tissue sample of the affected area. A stab incision culture protocol may be necessary.

Relevant diagnostic laboratories: Laboratories should be experienced with reptilian tissue and culturing from ectotherms. Samples should be incubated at the standard 37° C and also at 25° C.

Treatment: Periodic debridement, irrigation with dilute antimicrobial solution (e.g. povidone-iodine, chlorhexidine, etc.), topical ointment (e.g. silver sulfadiazine cream, triple antibiotic, etc.), analgesia, and long term antibiotic or antifungal therapy based on culture and sensitivity testing. Antimicrobials should be given for both aerobic and anaerobic bacteria using doses established by species-specific pharmacokinetic testing, when available. Antibiotic classes that provide good Gram-negative coverage include the aminoglycosides, third generation cephalosporins, fluoroquinolones, and extended spectrum penicillins. Commonly used options include ceftazidime, trimethoprim-sulfa, amikacin, enrofloxacin, and piperacillin. Antibiotics that provide anaerobic coverage include chloramphenicol, clindamycin, and metronidazole. Other drugs such as tetracyclines may be used if indicated based on sensitivity results. Ensure proper husbandry and a low stress environment. Address any systemic infection or metabolic illness.

Prevention and control: Proper nutrition including adequate vitamin (especially Vitamin A) and mineral supplementation, appropriate temperatures, good hygiene, preventing oral trauma from food or habitat, minimizing stress, clearing mite infestations, and avoiding hibernating recently fed animals.

Suggested disinfectant for housing facilities: 1% sodium hypochlorite

Notification: None

Measures required under the Animal Disease Surveillance Plan: None

Measures required for introducing animals to infected animal: Isolate infected animal until lesions are healed. Ensure good hygiene and appropriate husbandry practices. Do not introduce infected animal to immunocompromised animals.

Conditions for restoring disease-free status after an outbreak: Properly disinfect habitat.

Experts who may be consulted:

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