

ZOONOSES OF FISH, AMPHIBIANS AND REPTILES

Wearing the recommended personal protective equipment will make the transmission of diseases less likely.

PATHOGEN	TRANSMISSION	ANIMAL DISEASE	HUMAN DISEASE
<i>Salmonella spp.</i>	<ul style="list-style-type: none"> • direct contact, handling, and ingestion of animal and/or water • remains virulent in tap water for 3 months and pond water for 4 months 	<ul style="list-style-type: none"> • fish, amphibian and reptile carriers rarely show any clinical disease • intermittent shedding • Some animals may develop granulomatous lesions cutaneously or on internal organs 	<ul style="list-style-type: none"> • abdominal pain, acute gastroenteritis, bloody mucoid diarrhea, nausea, vomiting, fever • meningitis, osteomyelitis, urinary tract infections • increased prevalence and severity in immunocompromised individuals
<i>Aeromonas spp.</i>	<ul style="list-style-type: none"> • puncture wounds, lacerations, and ingestion 	<ul style="list-style-type: none"> • ulcerative stomatitis in snakes • fatal hemorrhagic septicemia in snakes and fish • common isolate of fish skin ulcers 	<ul style="list-style-type: none"> • wound infections, fever • diarrhea • septicemia if immunocompromised
<i>Campylobacter spp.</i>	<ul style="list-style-type: none"> • handling and ingestion of animal and/or contaminated water 	<ul style="list-style-type: none"> • fish, amphibian, and reptile carriers rarely show any clinical disease 	<ul style="list-style-type: none"> • diarrhea, acute gastroenteritis, nausea, vomiting, cramps, fever
<i>Klebsiella spp.</i> <i>Enterobacter spp.</i>	<ul style="list-style-type: none"> • direct contact, handling 	<ul style="list-style-type: none"> • fish and reptile carriers rarely show any clinical disease • pulmonary infections in snakes 	<ul style="list-style-type: none"> • urinary tract infections, septicemia
<i>Yersinia spp.</i>	<ul style="list-style-type: none"> • handling fish and reptiles 	<ul style="list-style-type: none"> • enteric “red-mouth” disease 	<ul style="list-style-type: none"> • acute painful gastroenteritis • mesenteric adenitis, nephritis, arthritis
<i>Mycobacterium spp.</i>	<ul style="list-style-type: none"> • handling, puncture wounds, scratches and/or inhalation 	<ul style="list-style-type: none"> • affects fish and reptiles • granulomatous disease affecting skin, subcutis, oral mucosa, lungs, liver, spleen, gonads, bones, and/or CNS (“fish tank granuloma”) • hemorrhages, exophthalmos, and skeletal deformities in fish • ulcerative stomatitis in snakes 	<ul style="list-style-type: none"> • circumscribed cutaneous granulomatous disease at infection site • immunocompromised individuals may develop disseminated respiratory disease, lymphadenitis, arthritis, osteomyelitis and/or tenosynovitis

Zygomycosis Phycomycosis Mucormycosis	<ul style="list-style-type: none"> • inhalation, ingestion, or inoculation with spores 	<ul style="list-style-type: none"> • saprophytic fungi are common isolates from fish, amphibian, and reptile gastrointestinal tracts • may produce upper respiratory disease and pneumonia 	<ul style="list-style-type: none"> • upper respiratory infections and conjunctivitis may lead to meningitis • dermatitis or subcutaneous infection if wound contamination • gastritis or enteritis if ingested
<i>Aspergillus spp.</i>	<ul style="list-style-type: none"> • direct contact, inhalation 	<ul style="list-style-type: none"> • isolated from skin, pulmonary, and systemic lesions of reptiles 	<ul style="list-style-type: none"> • immunocompromised patients are highly susceptible to disseminated disease • bronchopneumonia, disseminated infections (thyroid, brain, myocardium), and/or hypersensitivity
<i>Candida spp.</i>	<ul style="list-style-type: none"> • direct contact, inhalation 	<ul style="list-style-type: none"> • isolated from pulmonary and hepatic lesions of reptiles and skin lesions of fish 	<ul style="list-style-type: none"> • immunocompromised patients are susceptible to hematogenous spread to eyes, kidneys, and bones • white plaques on oral mucosa, skin-fold dermatitis
<i>Cryptosporidium</i>	<ul style="list-style-type: none"> • fecal / oral 	<ul style="list-style-type: none"> • isolated from reptiles and fish 	<ul style="list-style-type: none"> • immunocompromised patients are highly susceptible to severe, persistent diarrhea
Gnathostomiasis	<ul style="list-style-type: none"> • handling or ingestion of contaminated water 	<ul style="list-style-type: none"> • infected fish shed infective nematode larvae into water • amphibians and reptiles may be transport hosts 	<ul style="list-style-type: none"> • nausea, salivation, pruritus, edema, urticaria, and stomach discomfort • larvae may migrate to other organs leading to localized inflammation and/or specific organ disease
Mites	<ul style="list-style-type: none"> • direct contact with infested animal 	<ul style="list-style-type: none"> • heavy infestations on reptiles may lead to severe anemia, lethargy, and death 	<ul style="list-style-type: none"> • papular, vesicular, or bullous lesions with variable pruritus

References

- Nemetz, TG and EB Shotts, Jr. 1993. Zoonotic Diseases. In: Fish Medicine. MK Stoskopf, ed. W.B. Saunders Company, Philadelphia. pp. 214-20.
- Johnson-Delany, CA. 1996. Reptile Zoonoses and Threats to Public Health. In: Reptile Medicine and Surgery. DR Mader, ed. W.B. Saunders Company, Philadelphia. pp. 20-33.
- Acha, PN and B Szyfres. 1989. Zoonoses and Communicable Diseases Common to Man and Animals. 2nd Ed. Pan American Health Organization, Washington, D.C.