Other diseases of finfish

Epizootic ulcerative syndrome (EUS)

(Also known as red spot disease, mycotic granulomatosis and ulcerative mycosis)

EUS in sand whiting; note progression of red lesion (top) to deep ulcer (bottom) and classic red sores on the body

Source: New South Wales Department of Primary Industries

EUS in a juvenile silver perch; note classic red ulcer on the body

Source: New South Wales Department of Primary Industries

Signs of disease

Important: Animals with disease may show one or more of the signs below, but the pathogen may still be present in the absence of any signs.

Disease signs at the farm, tank or pond level are:

- loss of appetite
- dark body colour
- mass mortality
- erratic swimming
- 'rubbing' on the surfaces of tanks
- increased respiration and respiratory effort.

Gross pathological signs are:

- lesions on the body—red spots, black burn-like marks, or deeper ulcers with red centres and white rims
- progressive lesions—lesions start as reddening under a single scale but quickly spread to involve adjacent scales. Lesions continue to widen and deepen, forming ulcers that erode underlying tissues to expose (depending on location) skeletal musculature, vertebrae, brain or visceral organs
- unilateral or bilateral clouding of the eye (particularly in barramundi)

Microscopic pathological signs are:

- erythematous dermatitis
- hyphae (threads) associated with granulomatous tissue, sometimes extending into visceral organs
- liquefactive necrosis of muscle tissue.

Disease agent

EUS is caused by infection with the oomycete *Aphanomyces invadans*. Although previously regarded as a fungus, the genus *Aphanomyces* is now classified with diatoms and brown algae in a group called Stramenopiles or Chromista.

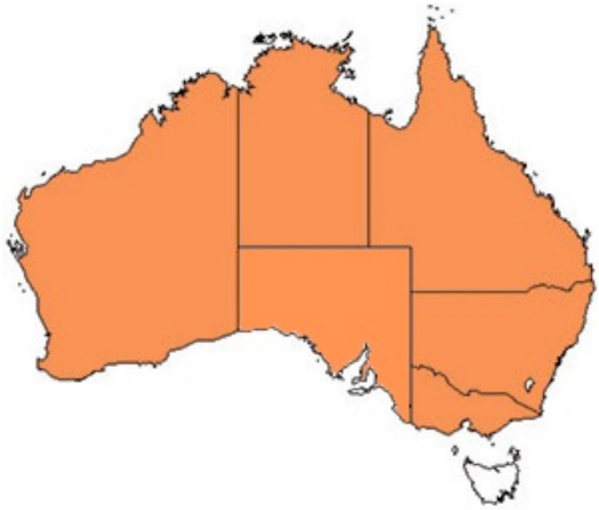
Host range

More than 100 estuarine and freshwater species of fish are known to be susceptible to EUS. Known susceptible species likely to be encountered in Australia are listed on the next page (b).

Common name	Scientific name
Australian bass	*Macquaria novemaculeata*
Archer fish **a**	*Toxotes chatareus*
Barcoo grunter	*Scortum barcoo*
Barramundi **a**	*Lates calcarifer*
Bony bream **a**	*Nematalosa erebi*
Chanda perch **a**	*Ambassis agassizii*
Cichlids **a**	*Cichlidae*
Climbing perch **a**	*Anabas testudineus*
Cyprinids **a**	*Cyprinidae*
Dusky flathead	*Platycephalus fuscus*
Eastern freshwater cod	*Maccullochella ikei*
Eel **a**	*Anguilla australis*
Estuarine rockcod **a**	*Epinephelus tauvina*
Flathead goby **a**	*Glossogobius giuris*
Fork-tailed catfish	*Arius spp.*
Froggatt's catfish	*Cinetodus froggatti*
Giant glassfish **a**	*Parambassis gulliveri*
Giant gudgeon **a**	*Oxyeleotris selheimi*
Goldfish	*Carassius auratus auratus*
Golden perch	*Macquaria ambigua*
Long tom **a**	*Strongylura krefftii*
Mangrove jack **a**	*Lutjanus argentimaculatus*
Mouth almighty **a**	*Glossamia aprion*
Mullet **a**	*Mugil cephalus*
Mullets **a**	*Mugilidae*
Murray cod	*Maccullochella peelii*
Nurseryfish	*Kurtus gulliveri*
Primitive archer fish **a**	*Toxotes lorentzi*
Rainbow fish **a**	*Melanotaenia splendida*
Rainbow trout	*Oncorhynchus mykiss*
Saratoga **a**	*Scleropages jardini*
Scat **a**	*Scatophagus argus*
Silver perch **a**	*Bidyanus bidyanus*
Silver trevally **a**	*Pseudocaranx dentex*
Sleepy cod **a**	*Oxyeleotris lineolatus*
Striped grunter **a**	*Amniataba percoides*
Spangled perch **a**	*Leiopotherapon unicolor*
Triangular shield catfish **a**	*Arius leptaspis*
Tropical two-winged flying fish **a**	*Exocoetus volitans*
Whiting **a**	*Sillago ciliata*
Yellowfin bream **a**	*Acanthopagrus australis*

a Naturally susceptible (other species have been shown to be experimentally susceptible). **b** A current list of known susceptible species found both within and outside of Australia can be accessed at the address below (see further reading).

Presence in Australia



EUS is endemic in many freshwater catchments and estuaries in Australia and has been officially reported from New South Wales, the Northern Territory, Queensland, Victoria, South Australia and Western Australia.

Epidemiology

- The disease is seen in more than 100 freshwater and estuarine species of fish and infection has spread rapidly throughout Asia, associated with the movement of ornamental fish.
- Predisposing factors leading to skin damage, such as parasites, bacterial or viral infection, physical trauma or acidic water are normally required to allow the *Aphanomyces* oomycete to initiate clinical signs of EUS. Secondary opportunistic infections are also a common finding.
- Disease is often associated with acid water run-off and can appear after heavy rains (particularly after a long, dry period) with water temperatures of 18–22°C favouring sporulation.
- Disease transmission is through zoospore transfer in water, direct contact between fish and skin contamination (penetration assisted by damage to skin).

Differential diagnosis

The list of similar diseases below refers only to the diseases covered by this field guide. Gross pathological signs may be representative of a number of diseases not included in this guide, which therefore should not be used to provide a definitive diagnosis, but rather as a tool to help identify the listed diseases that most closely account for the gross signs.

Similar diseases

Aeromonas salmonicida—atypical strains, koi herpesvirus disease, viral haemorrhagic septicaemia

Sample collection

Due to the uncertainty in differentiating diseases using only gross pathological signs, and because some aquatic animal disease agents might pose a risk to humans, only trained personnel should collect samples. You should phone your state or territory hotline number and report your observations if you are not appropriately trained. If samples have to be collected, the agency taking your call will provide advice on the appropriate course of action. Local or district fisheries or veterinary authorities may also provide advice regarding sampling

Emergency disease hotline

The national disease hotline number is 1800 675 888. This number will put you in contact with the appropriate state or territory agency.

Further reading

Further information can be found on the following websites:

Network of Aquaculture Centres in Asia–Pacific: library.enaca.org/Health/DiseaseLibrary/EpizooticUlcerativeSyndrome.pdf

Northern Territory Government: www.nt.gov.au/d/Content/File/p/Fishnote/FN01.pdf.

The accepted procedures for a conclusive diagnosis of EUS and a full list of susceptible species are summarised in the World Organisation for Animal Health *Manual of diagnostic tests for aquatic animals 2011*, available at www.oie.int/en/international-standard-setting/aquatic-manual/access-online. These hyperlinks were correct and functioning at the time of publication.