

Epizootic Ulcerative Syndrome (Red-spot Disease)

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WHAT IS EPIZOOTIC ULCERATIVE SYNDROME?

Epizootic ulcerative syndrome (EUS) or 'red-spot' as it is known colloquially, is an ulcerative syndrome of fish which affects a range of native species in the Northern Territory. The disease also occurs in New South Wales, Queensland and in Western Australia, as well as in many Asian countries. It begins as a small area of reddening over a single scale, which subsequently spreads to involve a number of adjacent scales; this is the characteristic 'red spot'. As the condition progresses, the 'red-spot' expands and deepens, giving a deep ulcer, which sometimes extends into the abdominal cavity. Some fish, especially barramundi (*Lates calcarifer*) develop unilateral or bilateral cloudiness of the cornea; these changes in the eye may or may not be accompanied by lesions in the skin. Some cases of EUS heal spontaneously, but many affected fish, especially juveniles, die.

CAUSE

A pathogenic fungus, *Aphanomyces invadans* causes EUS. Infection occurs when motile spores in the water are attracted to the skin of fish. The spores penetrate the skin and germinate, forming fungal filaments or hyphae. The hyphae invade widely into the surrounding skin and deeply into underlying muscle tissues, resulting in extensive ulceration and destruction of tissues (Figures 1, 3, 4 and 5). In the Northern Territory the factors that initiate infection are not clear. Low water temperatures depress the immune system of fish, which may partially explain the apparent dry season occurrence of EUS. There appears to be no definite relationship between dissolved oxygen levels and EUS; affected fish have been seen in water with dissolved oxygen levels of between 2 to 8 ppm.

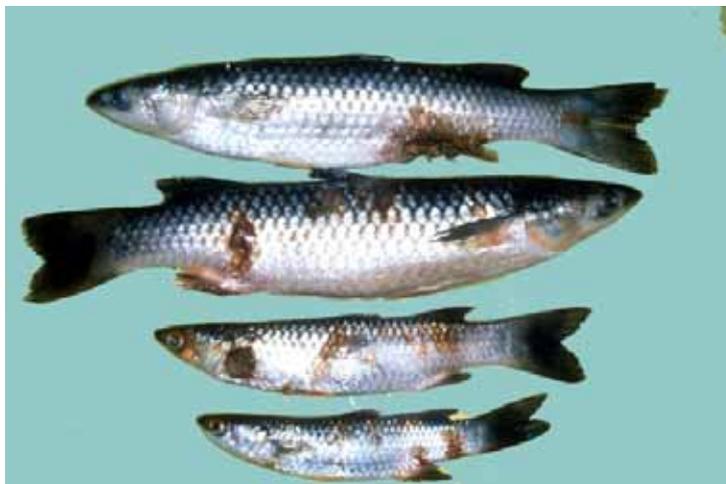


Figure 1. Ulcerating lesions of EUS in mullet

EPIDEMIOLOGY

EUS was first seen in the Northern Territory in 1986 on mullet from the Mary River. Subsequently, it was reported to affect fish from many other river systems in the Top End (Figure 2). In 1986, fish of all ages appeared to be affected by EUS. Reports of EUS decreased as the wet season approached in November. The disease has continued to appear in subsequent years and occurs particularly in the early dry season, around May and June. Fish younger than one year appear to be most seriously affected, while only sporadic cases have been reported in mature fish. There have been no confirmed reports of EUS during the wet season, from December to April and the syndrome seems to be restricted to fish in fresh water and in water of low salinity in the upper estuarine reaches of rivers.

SPECIES AFFECTED

In the Northern Territory, EUS has been reported in archer fish (*Toxotes chartareus*), barramundi (*Lates calcarifer*), bony bream (*Nematolosa erebi*), chanda perch (*Ambassis agassiz*), fork-tailed catfish (*Arius* sp), long tom (*Strongylura krefftii*), mangrove jack (*Lutjanus argentimaculatus*), mouth almighty (*Glossamia aprion*), mullet (*Liza diadema*), primitive archer fish (*Toxotes lorentzi*), red scat (*Scatophagus argus*), saratoga (*Scleropages jardini*), rainbow fish (*Melanotaenia splendida*), sleepy cod (*Oxyeleotris lineolatus*), spangled perch (*Leiopotherapon unicolor*) striped grunter (*Amniataba percoides*) and nursery fish (*Kurtus gulliveri*).

TREATMENT AND CONTROL

There are no specific control measures in fish for EUS in natural environments. Fish from infected waterways, especially those with lesions of EUS, should not be relocated to other waterways.

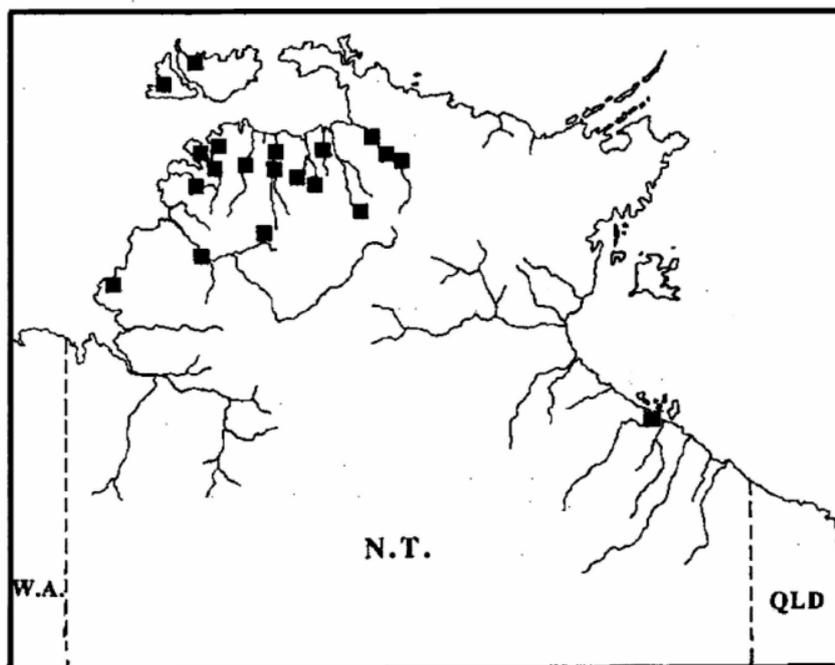
In captive fish, early 'red-spot' lesions may respond to topical treatment with an antiseptic iodophore solution. Increasing salinity of holding waters may prevent outbreaks of EUS in aquaculture ponds.

IMPLICATIONS FOR WILD FISH STOCKS AND AQUACULTURE

The overall impact of EUS on wild stocks of fish is uncertain, although high losses in juvenile stocks are known to occur. Currently, restrictions are placed in areas where EUS occurs on translocation of live fish from river basins and estuaries to prevent further spread of the disease in NT waters. If EUS invades aquaculture farms it may cause unsightly injuries in fish, market rejection and fish mortality.

PUBLIC HEALTH

The EUS fungus is not known to cause disease in humans. However, advanced lesions in fish sometimes contain bacteria which potentially cause disease in humans. Therefore, people should not eat EUS-affected fish.



■ Recorded outbreaks of EUS

Figure 2. Occurrence and distribution of outbreaks of EUS in the Northern Territory



Figure 3. Deeply ulcerating haemorrhage lesions of EUS in mullet (courtesy Dr. R. Callinan)



Figure 4. Advanced EUS lesion: ulceration with loss of scales and skin exposing underlying muscle

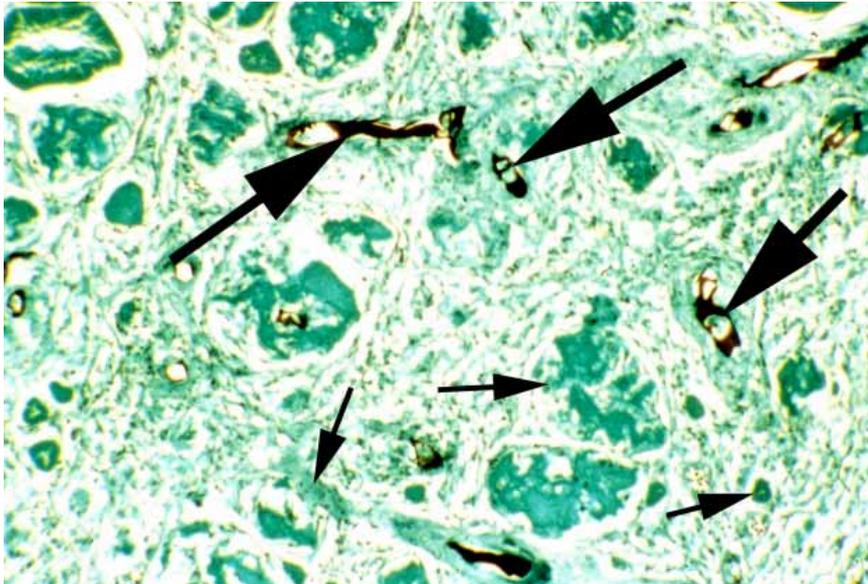


Figure 5. Stained microscopic section of fish with EUS showing massive destruction of muscle tissue (small arrows) and invading fungal filaments (large arrows)

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