

Erysipelothrix

Erysipelothrix rhusiopathiae causes erysipelas, an important disease of swine and poultry and a sporadic disease of sheep and lambs.

Clinical presentations include

- septicemia,
- arthritis,
- vegetative endocarditis,
- and generalized skin lesions.

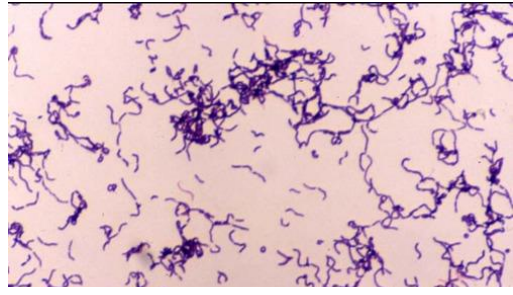
Source of isolation

1. The organism is commonly isolated from alimentary and lymphoid tissues of healthy animals
2. as well as the exterior slime layer on fish.
3. *E. rhusiopathiae* can survive for long periods without replication in soil and marine environments.
4. In humans *E. rhusiopathiae* causes erysipeloid, an occupational disease of fish handlers, butchers, and veterinarians and generally results in a self-limiting infection of the hands.

Other species

- A second species, *Erysipelothrix tonsillarum*, has been described for some strains previously designated as serotypes of *E. rhusiopathiae*.
- *E. tonsillarum* is biochemically and morphologically similar to *E. rhusiopathiae* but is genetically distinct by DNA–DNA homology. *E. tonsillarum* is only occasionally involved in clinical disease and is nonpathogenic for swine.
- An additional species, *E. inopinata*, and minor *Erysipelothrix* groups have been described.

Erysipelothrix



Morphology and Staining

E. rhusiopathiae is a

- gram-positive,
- nonmotile,
- non-acid-fast,
- non-spore-forming bacillus,
- which measures 0.2–0.4 μm by 0.8–2.5 μm in size.
- On subculture, rough colonies may develop and produce filamentous forms ≥ 60 μm in length.

Growth Characteristics

- E. rhusiopathiae* grows readily on most standard media.
- However, growth is enhanced in slightly alkaline media (pH of 7.2–7.6) with the addition of serum and glucose.
- E. rhusiopathiae* is a facultative anaerobe preferring a reduced oxygen environment containing 5–10% CO_2 .
- Optimal growth occurs in 24–48hrs 30–37 $^{\circ}\text{C}$; however, it is capable of growing over a temperature range of 5–42 $^{\circ}\text{C}$ and a pH range of 6.7–9.2.

Resistance

- E. rhusiopathiae* is resistant to drying and withstands salting, pickling, and smoking.
- It survives for upto 6 months in swine feces and fish slime at cool temperatures.
- It is killed by moist heat (55 $^{\circ}\text{C}$) in 15 min,
- but grows in the presence of potassium tellurite (0.05%), crystal violet (0.001%), phenol (0.2%), and sodium azide (0.1%).
- *E. rhusiopathiae* is susceptible to penicillin, cephalosporin, clindamycin, and fluoroquinolones,
- but is resistant to novobiocin, sulfonamides, and aminoglycosides.
- Resistance to erythromycin, oleandomycin, oxytetracycline, and dihydrostreptomycin has been observed. Resistance is apparently not plasmid mediated.

Reservoir

- *E. rhusiopathiae* is widely distributed in nature and is often recovered from sewage effluent, abattoirs, surface slime of fresh and saltwater fish, and soil.
- It has been recovered from over 50 species of mammals including swine, sheep, lambs, cattle, horses, dogs, mice, and rabbits
- and 30 species of wild birds such as turkeys, chickens, geese, pheasants, and pigeons.
- *E. rhusiopathiae* can be isolated from the tonsils and gastrointestinal tracts of apparently healthy pigs, considered the most prominent reservoir.

Transmission

- Transmission among animals is mostly by ingestion of contaminated material (food, soil, water, and feces).
- Wound infections and arthropod bites are other possible routes.

Disease Patterns

Swine. Swine with the septicemic form present with fever, anorexia, depression, vomiting, stiff gait, and reluctance to walk. Urticarial lesions in the skin may be palpable before becoming visible. They may be pink or, in severe cases, purplish, especially on the abdomen, thighs, ears, and tail..

Birds. Erysipelas in birds, especially turkeys, is usually a septicemia. Turkeys develop a cyanotic skin, become droopy, and may subsequently die. Other affected avian species include chickens, chukars, ducks, emus, geese, parrots, peacocks, pheasants, and pigeons.

Sheep. Polyarthritis is the most common presentation of *E. rhusiopathiae* infection in sheep..

Miscellaneous Species. *E. rhusiopathiae* causes arthritis and endocarditis in dogs. *E. tonsillarum* can also be a canine pathogen and has been isolated from dogs with endocarditis. Septicemia and urticaria due to *E. rhusiopathiae* have been reported in dolphins. Human infections of skin and subcutis are called erysipeloid and are seen mostly in animal and fish handlers.

Treatment, Control, and Prevention

Treatment with penicillin for at least 5 days is effective against the acute forms of erysipelas in swine and usually results in dramatic improvement with 24–36 h. Other antimicrobials that *E. rhusiopathiae* appears highly sensitive include ampicillin, ceftiofur, clindamycin, enrofloxacin, erythromycin, tiamulin, tilmicosin, and tylosin. Intermediate sensitivity is seen with chlortetracycline, florfenicol, gentamicin, oxytetracycline, and trimethoprim. Resistance to apramycin, neomycin, sulfadimethoxine, sulfachlorpyridazine, and sulfathiazole appears very high.

Good sanitation and nutrition are beneficial in preventing outbreaks. Infected carcasses should be disposed of in a proper manner and replacement animals isolated for at least 30 days before introduction into the herd.

Immunization with live attenuated vaccines or killed bacterins is recommended in areas with previous history of erysipelas.

In turkeys, penicillin is the drug of choice. Subcutaneous injection of penicillin and vaccination with erysipelas bacterin are recommended, if practicable. Penicillin in the drinking water for 4–5 days has been effective in controlling some outbreaks. Injectable erythromycin is a recommended alternative treatment.