



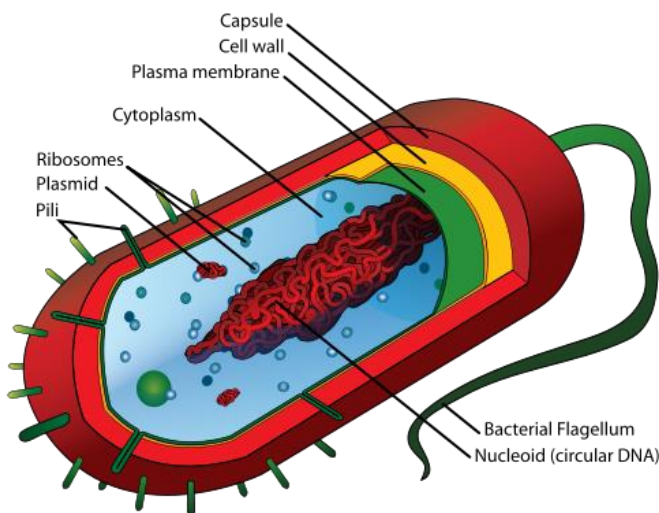
Ofte går snakken på i forbindelse med vandskifte, om man skal bruge helt koldt vand, eller man skal bruge lunkent vand. Helt kort, er det hamrende lige gyldigt om man bruger det ene eller det andet, men der er visse ting man skal være opmærksom på...

Visse fisk som f.eks. Corydoras (Pansermaller) elsker koldt vand, og man kan faktisk få dem til at gå i leg ved at bruge koldt vand og hvis man samtidig smuldrer en ganske lille smule ler i vandet, så tror de, at det er regntid og går i leg... formentlig fordi regntiden også normalt medfører en stigning i foderemner, så det er jo et perfekt tidspunkt for dem at gå i leg, da der er sikret godt med foderemner til ungerne....

Den anden del er Tetra fiskene, som f.eks. både Neon og rød næser, hvis vandet er koldt, og især hvis det tilsættes hurtigt, så kan disse fisk hænde at gå i en form for chok og kan ligefrem drive rundt i akvariet helt livløse. De kommer dog til sig selv igen efter et stykke tid, men vil mene, at det er værd at tage hensyn til fiskene, og ikke udsætte dem for denne oplevelse, som formentlig påvirker deres immun-forsvar og i princippet gør dem mindre modstandsdygtige overfor andre sygdomme...

Så i den forbindelse vil jeg foreslå at man bruger lunkent vand for at undgå dette forhold...

En af ankerne mod lunkent vand, er at det kan indeholde bakterier, som er skadelige for fiskene. De der løfter forholdet, tænker ofte på legionella bakterien (*Legionella pneumophila*), der kan optræde i forbindelse med vand der ligger i et temperatur område fra 12 - 55° Celsius i varmtvandsbeholderen, så vil man give legionella'en ugunstige betingelser, skal temperaturen ved koldt vand altså holdes under 12° Celsius eller over 55° Celsius. Legionella er dog ikke farlig for fiskene, men legionella kan være farlig for os, som mennesker, hvis vandet forstøves i f.eks. brusebadet og indåndes, der kan den give lungeinfektion, men fiskene eller de fleste af dem har ikke lunger og vil slet ikke påvirkes overhovedet, så under normale forhold, vil der ikke i forbindelse med anvendelsen af varmt eller lunkent vand, være tale om bakterier, der kan skade fiskene.



Her i listeform en oversigt og betydning af de bakterier som fiskene kan påvirkes af...

Table 1.1. Bacterial pathogens of freshwater and marine fish

Pathogen	Disease	Host range	Geographical distribution
ANAEROBES			
" <i>Catenabacterium</i> " sp.	—	Grey mullet (<i>Mugil auratus</i>)	U.S.A.
Clostridiaceae representative			
<i>Clostridium botulinum</i>	Botulism	Redfish (<i>Sebastes</i> sp.) Salmonids	Denmark, England, U.S.A.
Eubacteriaceae representative			
<i>Eubacterium tarantellae</i>	Eubacterial meningitis	Striped mullet (<i>Mugil cephalus</i>)	U.S.A.
GRAM-POSITIVE BACTERIA— THE "LACTIC ACID" BACTERIA			
Carnobacteriaceae representative			
<i>Carnobacterium piscicola</i>	Lactobacillosis, pseudokidney disease	Salmonids	North America, U.K.
Enterococcaceae representatives			
<i>Enterococcus (Streptococcus) faecalis</i> subsp. <i>liquefaciens</i>	—	Rainbow trout (<i>Oncorhynchus mykiss</i>), catfish	Italy
<i>Vagococcus salmoninarum</i>	Lactobacillosis, pseudokidney disease, peritonitis, septicæmia	Atlantic salmon (<i>Salmo salar</i>), brown trout (<i>Salmo trutta</i>), rainbow trout	Australia, France, North America
Lactobacillaceae representative			
<i>Lactobacillus</i> spp.	Lactobacillosis, pseudokidney disease	Salmonids	North America, U.K.
Streptococcaceae representatives			
<i>Lactococcus garvieae</i> (= <i>Enterococcus seriolicida</i>)	Streptococcicosis/ streptococcosis	Many fish species	Australia, Europe, Israel, Japan, Saudi Arabia, Red Sea, South Africa, Taiwan, U.S.A.
<i>Lactococcus piscium</i>	Lactobacillosis, pseudokidney disease	Rainbow trout	North America
<i>Streptococcus dysgalactiae</i>	—	Amberjack (<i>Seriola dumerilii</i>), yellowtail (<i>Seriola quinqueradiata</i>)	Japan
<i>Streptococcus difficilis</i> (= <i>Str. agalactiae</i>)	Meningo-encephalitis	Carp (<i>Cyprinus carpio</i>), rainbow trout, silver pomfret (<i>Pampus argenteus</i>), tilapia (<i>Oreochromis</i> spp.)	Israel, Kuwait, USA
<i>Streptococcus iniae</i> (= <i>Str. shiloi</i>)	Meningo-encephalitis, streptococcicosis/ streptococcosis	Various freshwater and coastal fish species	Australia, Bahrain, Europe, Israel, Japan, Saudi Arabia, South Africa, U.S.A.
<i>Streptococcus milleri</i>	—	Koi carp (<i>Cyprinus carpio</i>)	U.K.
<i>Streptococcus parauberis</i>	Streptococcicosis/ streptococcosis	Turbot (<i>Scophthalmus maximus</i>)	Spain
AEROBIC GRAM-POSITIVE RODS AND COCCI			
Renibacterium salmoninarum			
<i>Renibacterium salmoninarum</i>	Bacterial kidney disease (BKD; Dee disease; corynebacterial kidney disease)	Salmonids	Europe, Japan, North and South America
Bacillaceae representatives			
<i>Bacillus</i> spp.	Septicæmia; bacillary necrosis	Various freshwater fish species including catfish (<i>Pangasius hypophthalmus</i>)	Nigeria, Vietnam
<i>Bacillus cereus</i>	Branchio-necrosis	Carp (<i>Cyprinus</i> sp.), striped bass (<i>Morone saxatilis</i>)	U.S.A.
<i>Bacillus mycoides</i>	Ulceration	Channel catfish (<i>Ictalurus punctatus</i>)	Poland, U.S.A.
<i>Bacillus subtilis</i>	Branchio-necrosis	Carp	Poland

(continued)

Table 1.1 (cont.)

Pathogen	Disease	Host range	Geographical distribution
Corynebacteriaceae representatives			
<i>Corynebacterium aquaticum</i>	Exophthalmia	Striped bass	U.S.A.
Coryneform bacteria			
	“Corynebacteriosis”	Salmonids	England
Micrococcaceae representative			
<i>Micrococcus luteus</i>	Micrococcosis	Rainbow trout	England
Mycobacteriaceae representatives			
<i>Mycobacterium</i> spp. (<i>Myc. abscessus</i> , <i>Myc. anabanti</i> , <i>Myc. chelonae</i> subsp. <i>piscarium</i> , <i>Myc. fortuitum</i> , <i>Myc. gordonae</i> , <i>Myc. marinum</i> , <i>Myc. montefiorensis</i> , <i>Myc. neoaurum</i> , “ <i>Myc. piscium</i> ”, “ <i>Myc. platypocilus</i> ”, <i>Myc. pseudoshottsii</i> , “ <i>Myc. ranae</i> ”, “ <i>Myc. salmoniphilum</i> ”, <i>Myc. shottsii</i> , <i>Myc. scrofulaceum</i> , <i>Myc. simiae</i> , <i>Myc. smegmatis</i> , <i>Myc. ulcerans</i>)	Mycobacteriosis (fish tuberculosis)	Most fish species	Worldwide
Nocardiaceae representatives			
<i>Nocardia</i> spp. (<i>Noc. asteroides</i> , <i>Noc. salmonicida</i> , <i>Noc. seriolae</i>)	Nocardiosis	Most fish species	Worldwide
<i>Rhodococcus</i> sp.	Ocular oedema	Chinook salmon (<i>O. tshawytscha</i>)	Canada
<i>Rhodococcus erythropolis</i>	?	Atlantic salmon	Norway, Scotland
Planococcaceae representative			
<i>Planococcus</i> sp.	—	Salmonids	England

Staphylococcaceae representatives			
<i>Staphylococcus aureus</i>	Eye disease	Silver carp (<i>Hypophthalmichthys molitrix</i>)	India
<i>Staphylococcus epidermidis</i>	—	Gilthead sea bream (<i>Sparus aurata</i>), red sea bream (<i>Chrysophrys major</i>), yellowtail (<i>Seriola quinqueradiata</i>)	Japan, Turkey
<i>Staphylococcus warneri</i>	Ulcerations	Rainbow trout	Spain
GRAM-NEGATIVE BACTERIA			
Aeromonadaceae representatives			
<i>Aeromonas allosaccharophila</i>	—	Eelers	Spain
<i>Aeromonas bestiarum</i>	—		U.S.A.
<i>Aeromonas caviae</i>	Septicaemia	Atlantic salmon (<i>Salmo salar</i>)	Turkey
<i>Aeromonas hydrophila</i> (= <i>Aer. liquefaciens</i> , <i>Aer. punctata</i>)	Haemorrhagic septicaemia, motile aeromonas septicaemia, redsore disease, fin rot	Many freshwater fish species	Worldwide
<i>Aeromonas jandaai</i>	—	Eel (<i>Anguilla</i> sp.)	Spain
<i>Aeromonas salmonicida</i> (subspecies <i>achromogenes</i> , <i>masoucida</i> , <i>salmonicida</i> and <i>smithia</i>) (= <i>Haemophilus piscium</i>)	Furunculosis, carp erythrodermatitis, ulcer disease	Salmonids, cyprinids, and marine species (dabs, cod)	Worldwide
<i>Aeromonas sobria</i>	—	Perch (<i>Perca fluviatilis</i>), gizzard shad (<i>Dorosoma cepedianum</i>)	Switzerland, U.S.A.
<i>Aeromonas veronii</i> biovar <i>sobria</i>	Epizootic ulcerative syndrome	African catfish (<i>Clarias gariepinus</i>), rajputi (<i>Puntius gonionotus</i>), rui (<i>Labeo rohita</i>), catla (<i>Catla catla</i>), shole (<i>Channa striatus</i>)	Bangladesh

(continued)

Table 1.1 (cont.)

Pathogen	Disease	Host range	Geographical distribution
Alteromonadaceae representative <i>Pseudoalteromonas piscicida</i>	Egg disease	Damselfish	U.S.A.
<i>Shewanella putrefaciens</i>	Septicaemia	Rabbit fish (<i>Siganus rivulatus</i>)	Saudi Arabia
Campylobacteriaceae representative <i>Arcobacter cryaerophilus</i>	—	Rainbow trout	Turkey
Enterobacteriaceae representatives <i>Citrobacter freundii</i>	—	Salmonids, sunfish (<i>Mola mola</i>), carp (<i>Cyprinus carpio</i>)	Europe, India, U.S.A
<i>Edwardsiella ictaluri</i>	Enteric septicaemia of catfish	Brown bullhead (<i>Ameiurus nebulosus</i>), channel catfish, freshwater catfish (<i>Pangasius hypophthalmus</i>), danio (<i>Danio devario</i>), striped catfish (<i>Pangasius hypophthalmus</i>)	Indonesia, U.S.A., Vietnam
<i>Edwardsiella tarda</i> (<i>Paracolobactrum anguillimortiferum</i> , <i>Edw. anguillimortifera</i>)	Redpest, edwardsiellosis, emphysematous putrefactive disease of catfish	Various freshwater fish species	Japan, Spain, U.S.A.
<i>Escherichia vulneris</i>	Septicaemia	Various freshwater fish species	Turkey
<i>Hafnia alvei</i>	Haemorrhagic septicaemia	Cherry salmon (<i>O. masou</i>), rainbow trout	Bulgaria, England, Japan
<i>Klebsiella pneumoniae</i>	Fin and tail disease	Rainbow trout	Scotland
<i>Plesiomonas shigelloides</i>	—	African catfish (<i>Heterobranchus bidorsalis</i>), ccl, gourami (<i>Osphyronemus gourami</i>), rainbow trout, sturgeon (<i>Acipenser sturio</i>)	Germany, Portugal, Spain

<i>Pantoea</i> (= <i>Enterobacter</i>) <i>agglomerans</i>	—	Dolphin fish (<i>Coryphaena hippurus</i>)	U.S.A.
<i>Providencia</i> (<i>Proteus</i>) <i>rettgeri</i>	—	Silver carp	Israel
<i>Salmonella enterica</i> subsp. <i>arizonae</i> (= <i>Sal. choleraesuis</i> subsp. <i>arizonae</i> = <i>Sal. arizonae</i>)	Septicaemia	Piarucu (<i>Arapaima gigas</i>)	Japan
<i>Serratia liquefaciens</i>	Septicaemia	Arctic charr (<i>Salvelinus alpinus</i>), Atlantic salmon, turbot	France, Scotland, U.S.A
<i>Serratia marcescens</i>	—	White perch (<i>Morone americanus</i>)	U.S.A.
<i>Serratia plymuthica</i>	—	Rainbow trout	Poland, Scotland, Spain
<i>Yersinia intermedia</i>	—	Atlantic salmon	Australia
<i>Yersinia ruckeri</i>	Enteric redmouth (ERM), salmonid blood spot	Salmonids	Australia, Europe, North and South America
Flavobacteriaceae representatives <i>Chryseobacterium balustinum</i> (= <i>Flavobacterium balustinum</i>)	Flavobacteriosis	Marine fish	U.S.A.
<i>Chryseobacterium scophthalmum</i> (= <i>Flavobacterium scophthalmum</i>)	Gill disease, generalised septicaemia	Turbot	Scotland
<i>Flavobacterium branchiophilum</i>	Gill disease	Salmonids	Europe, Korea, Japan, U.S.A.
<i>Flavobacterium columnare</i> (= <i>Flexibacter</i>) <i>Cytophaga columnaris</i>)	Columnaris, saddleback disease	Many freshwater fish species	Worldwide
<i>Flavobacterium hydatis</i> (= <i>Cytophaga aquatilis</i>)	Gill disease	Salmonids	Europe, U.S.A.
<i>Flavobacterium johnsoniae</i> (= <i>Cytophaga johnsonae</i>)	Gill disease, skin disease	Barramundi (<i>Lates calcarifer</i>)	Australia, France
	Bacterial gill disease	Salmonids	Europe, U.S.A.

(continued)

Table 1.1 (cont.)

Pathogen	Disease	Host range	Geographical distribution
<i>Flavobacterium psychrophilum</i> (= <i>Cytophaga psychrophila</i>)	Coldwater disease, rainbow trout fry syndrome, necrotic myositis	Salmonids, sea lamprey (<i>Petromyzon marinus</i>)	Australia, Europe, Japan, North America
<i>Tenacibaculum maritimum</i> (= <i>Flexibacter maritimus</i>)	Bacterial stomatitis, gill disease, black patch necrosis	Many marine fish species	Europe, Japan, North America
<i>Tenacibaculum ovolyticum</i> (= <i>Flexibacter ovolyticus</i>)	Larval and egg mortalities	Halibut (<i>Hippoglossus hippoglossus</i>)	Norway
" <i>Cytophaga rosea</i> "	Gill disease	Salmonids	Europe, U.S.A.
<i>Sporocytophaga</i> sp.	Saltwater columnaris	Salmonids	Scotland, U.S.A.
Francisellaceae representative <i>Francisella</i> sp.	Granulomatous inflammatory disease	Atlantic cod (<i>Gadus morhua</i>), hybrid striped bass (<i>Morone chrysops</i> × <i>M. saxatilis</i>), three-line grunt (<i>Parapristipoma trilineatum</i>)	Japan, Norway, USA
Halomonadaceae representative <i>Halomonas</i> (= <i>Deleya</i>) <i>cupida</i>	—	Black sea bream (<i>Acanthopagrus schlegelii</i>)	Japan
Moraxellaceae representatives <i>Acinetobacter</i> sp.	Acinetobacter disease	Atlantic salmon, channel catfish	Norway, U.S.A.
<i>Moraxella</i> sp.	—	Striped bass	U.S.A.
Moritellaceae representatives <i>Moritella marina</i> (= <i>V. marinus</i>)	Skin lesions	Atlantic salmon	Iceland
<i>Moritella viscosa</i>	Winter ulcer disease/syndrome	Atlantic salmon	Iceland, Norway, Scotland

Mycoplasmataceae representative <i>Mycoplasma mobile</i>	Red disease	Tench (<i>Tinca tinca</i>)	U.S.A.
Myxococcaceae representative <i>Myxococcus piscicola</i>	Gill disease	Green carp (<i>Ctenopharyngodon idellus</i>)	China
Neisseriaceae representative <i>Aquaspirillum</i> sp.	Epizootic ulcerative syndrome	Snakeheads (<i>Ophicephalus striatus</i>) and catfish (<i>Clarias batrachus</i>)	Thailand
Oxalobacteraceae representative <i>Janthinobacterium lividum</i>	Anaemia	Rainbow trout	Scotland
Pasteurellaceae representative <i>Pasteurella skyensis</i>	?	Atlantic salmon	Scotland
Photobacteriaceae representatives <i>Photobacterium damsela</i> subsp. <i>damselae</i> (= <i>Photobacterium histaminum</i>)	Vibriosis	Damsel fish (<i>Chromis punctipinnis</i>), redbanded sea bream (<i>Pagrus auriga</i>), sharks, turbot, yellowtail	Europe, U.S.A.
<i>Photobacterium damsela</i> subsp. <i>piscicida</i> (= <i>Pasteurella piscicida</i>)	Pasteurellosis, pseudotuberculosis	Bluefin tuna (<i>Thunnus thynnus</i>), gilt-head sea bream (<i>Sparus aurata</i>), sole (<i>Solea senegalensis</i>), striped bass (<i>Morone saxatilis</i>), white perch (<i>Roccus americanus</i>), yellowtail	Europe, Japan, U.S.A.
Piscirickettsiaceae representative <i>Piscirickettsia salmonis</i>	Coho salmon syndrome, salmonid rickettsial septicaemia	Salmon, sea bass (<i>Atractoscion nobilis</i>)	Canada, Chile, Greece, Norway, Scotland, U.S.A.

(continued)

Table 1.1 (cont.)

Pathogen	Disease	Host range	Geographical distribution
Pseudomonaceae representatives			
<i>Pseudomonas anguilliseptica</i>	Red spot (Sekiten-byo), winter disease	Rainbow trout, marine fish species, and particularly cod, eels (<i>Anguilla anguilla</i> , <i>A. japonica</i>), black spot sea bream (<i>Pagellus bogaraveo</i>), gilthead sea bream (<i>Sparus aurata</i>)	Finland, France, Japan, Portugal, Scotland, Spain
<i>Pseudomonas chlororaphis</i>	—	Amago trout (<i>Oncorhynchus rhodurus</i>)	Japan
<i>Pseudomonas fluorescens</i>	Generalised septicaemia	Most fish species	Worldwide
<i>Pseudomonas plecoglossicida</i>	Bacterial haemorrhagic ascites	ayu (<i>Plecoglossus altivelis</i>), pejerrey (<i>Odonthestes bonariensis</i>)	Japan
<i>Pseudomonas pseudoalcaligenes</i>	Skin ulceration	Rainbow trout	Scotland
<i>Pseudomonas putida</i>	Haemorrhagic ascites, ulceration	ayu, rainbow trout	Japan, Turkey
Vibrionaceae representatives			
<i>Vibrio alginolyticus</i>	Eye disease, septicaemia	Cobia (<i>Rachycentron canadum</i>), gilt-head sea bream, grouper (<i>Epinephelus malabanicus</i>), sea bream (<i>Sparus aurata</i>)	Asia, Europe, Israel
<i>Vibrio anguillarum</i> (= <i>Listonella anguillara</i>)	Vibriosis	Most marine fish species	Worldwide

<i>V. cholerae</i> (non-01)	Septicaemia	Ayu, goldfish (<i>Carassius aurata</i>)	Australia, Japan
<i>V. fischeri</i>	—	Gilt-head sea bream, turbot	Spain
<i>V. furnissii</i>	—	Eel	Spain
<i>Vibrio harveyi</i> (= <i>V. carchariae</i> and <i>V. trachurii</i>)	Eye disease (blindness), necrotising enteritis, vasculitis	Gilt-head sea bream, sea bass, common snook (<i>Centropomus undecimalis</i>), horse mackerel (<i>Trachurus japonicus</i>), milkfish, red drum (<i>Sciaenops ocellatus</i>), sharks (<i>Carcharhinus plumbeus</i> , <i>Negaprion brevirostris</i>), sole (<i>Solea senegalensis</i>), summer flounder (<i>Paralichthys dentatus</i>)	Europe (notably Spain), Japan, Taiwan, U.S.A.
<i>V. ichthyenteri</i>	Intestinal necrosis	Japanese flounder (<i>Paralichthys olivaceus</i>), summer flounder	Japan, Korea, USA
<i>V. logei</i>	Skin lesions	Atlantic salmon	Iceland
<i>V. ordalii</i>	Vibriosis	Most marine fish species	Worldwide
<i>V. pelagius</i>	—	Turbot	Spain
<i>V. salmonicida</i>	Coldwater vibriosis, Hitra disease	Atlantic salmon	Canada, Norway, Scotland
<i>V. splendidus</i>	Septicaemia, vibriosis	Corkwing wrasse (<i>Symphodus melops</i>), gilt-head sea bream, turbot	Norway, Spain
<i>V. tapetis</i>	Vibriosis	Corkwing wrasse	Norway
<i>V. vulnificus</i>	Septicaemia, ovate pompano (<i>Trachinotus ovatus</i>)	Eel	Europe, Japan, P.R.C., U.S.A.
<i>V. wodanis</i>	Winter ulcer disease/syndrome	Atlantic salmon	Iceland, Norway, Scotland

(continued)

Table 1.1 (cont.)

Pathogen	Disease	Host range	Geographical distribution
Miscellaneous pathogens			
" <i>Candidatus</i> <i>Arthromitus</i> "	Summer enteric syndrome	Rainbow trout	France, Spain
<i>Streptobacillus</i>	—	Atlantic salmon	Ireland
Unidentified	Gill lesions	Rockfish	Japan
Unidentified	<i>Varracalbmī</i>	Atlantic salmon	Norway
Unidentified	Ulceration	Rainbow trout	Scotland

Names in quotation marks are not included in the Approved Lists of Bacterial Names (Skerman *et al.*, 1980) or their supplements.