

THE OCCURRENCE OF *Aeromonas salmonicida* IN WRASSE (Labridae) AND IMPLICATIONS FOR ATLANTIC SALMON FARMING

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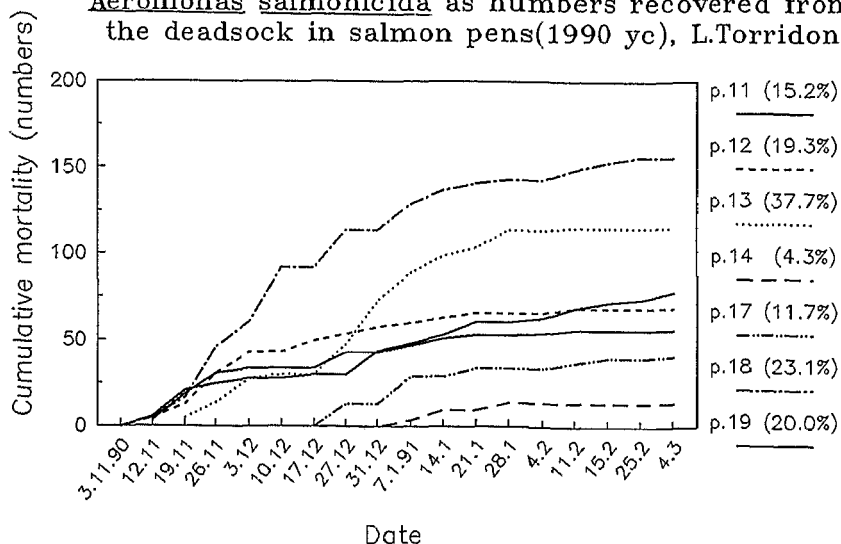
Wrasse (Labridae), small inshore benthic fishes, were once regarded as of 'no economic importance' (Muus and Dahlstrom, 1988) until the potential use of their cleaning behaviour in controlling sea lice (Caligidae) in Atlantic salmon, *Salmo salar*, farming was recognised (Costello and Bjordal, 1990). There is concern to ensure that wrasse have no diseases prior to stocking in salmon farms, particularly in view of the requirement to maintain the disease-free certified status of carcasses for the North American market.

Wrasse from 11 wild and 7 farm sources in the U.K. were examined in the present study. Although no viruses were detected, typical *Aeromonas salmonicida* isolates were identified from swabs (Table 1) plated on Trypticase soy agar and incubated at 20°C for 7 days from liver and kidney of goldsinny, *Ctenola-*

brus rupestris, rock cook, *Centrolabrus exoletus*, and cuckoo wrasse, *Labrus bimaculatus*. Antibiotic sensitivity tests were performed using the standard disc diffusion technique on all isolates. No *A. salmonicida* was isolated from wild wrasse (Table 1) but, in five farms where *A. salmonicida* was present in salmon, *A. salmonicida* with similar antibiotic sensitivities was identified in cohabiting wrasse.

Skin lesions typical of chronic furunculosis in Atlantic salmon were observed on these fish and there was noticeable hyperaemia at the base of the pectoral fins. Internal examination revealed congested liver and kidneys. Histological examination of *A. salmonicida* positive wrasse showed many bacterial microcolonies along the lamina propria of the gut, myocardial tissue of the heart, at the

Figure 1. Mortality of wrasse attributed to *Aeromonas salmonicida* as numbers recovered from the deadsock in salmon pens(1990 yc), L.Torridon



Pens 11,12,13,18 & 19 stocked with wrasse on 11.11.90 and p.14 & 17 on 13.12.90. Total % mortality shown in parentheses.

Pens stocked with ratio of 1 wrasse:50 salmon. Stocking numbers: p.11=370, p.12=358, p.13=332, p.14=325, p.17=350, p.18=580, and p.19=390.

Table 1. Bacteriological samples from wild wrasse and fish stocked on salmon farms, and in vitro sensitivities of *Aeromonas salmonicida* to antibiotics. Samples mainly obtained from damaged and moribund fish, or those that died during transport. Fish sampled July 1990 to February 1991.

Source/Location	Grid reference	Wrasse species	N positives/ N fishes sampled	In vitro sensitivities					
				OT	OA	SXT	AML	FR C	
Wild:									
Ardtoe	56°45'N, 5°54'W	G,R	0/8						
Torriddon	57°33'N, 5°38'W	B,C,CK,G	0/9						
Gairloch	57°42'N, 5°40'W	CK,G,R	0/16						
Holyhead, Wales	53°18'N, 4°44'W	B,C,G	0/6						
Linnhe	56°37'N, 5°30'W	B,C,CK,G,R	0/6						
Loch Ailort	56°50'N, 5°42'W	B,C,G	0/12						
Lochaline	56°32'N, 5°48'W	C,G,R	0/18						
Millport	55°45'N, 4°56'W	C,G,R	0/8						
Mull	56°37'N, 6°03'W	CK,G,R	0/10						
Sunart	56°41'N, 5°48'W	G,R	0/37						
Weymouth, Dorset	50°36'N, 2°20'W	G	0/9						
Farm: Ewe	57°48'N, 5°45'W	B,R	0/3	R	R	R	S	I	S
Ewe		G	5/19						
Harport, Skye	57°20'N, 6°25'W	G	0/5						
Linnhe	56°37'N, 5°30'W	B,C	0/3						
Linnhe		G	1/1	S	I/R	S	S	I	S
Loch Ailort	56°51'N, 5°40'W	C,G	0/5						
Sunart	56°40'N, 5°38'W	R	0/2						
Sunart		G	3/8						
Torriddon: mid	57°33'N, 5°38'W	CK	1/1	S	R	S	S	I	S
Torriddon: mid		G	1/13	S	R	S	S	I	S
Torriddon: inner	57°31'N, 5°32'W	G,R	5/5	R	R	R	S	I	S

KEY= Species: B=ballan, C=corkwing, CK=cuckoo, G=goldsinny, R=rock cook. Sensitivities: OT=Oxytetracycline, OA=Oxolinic acid, SXT=Tribrissen, AML=Amoxycillin, FR= Furazolidone, C=Clamoxyl, R=resistant, S=sensitive, I=intermediate.

bases of secondary gill lamellae; large numbers of bacterial microcolonies were observed in the spleen and kidney, and throughout skeletal muscle adjacent to infected skin lesions.

On one farm complete records were maintained of numbers of dead wrasse weekly (Fig.1). A mean mortality of 18.8% (total, 517 fish) was recorded over 17 weeks (range 4.3-37.7% for individual pens). This is likely to be a conservative estimate of losses as remains of these small fish may be lost through the net mesh and there may be unaccounted losses, e.g. escapees. 5/5 swabs taken from fresh dead/moribund wrasse produced a heavy growth of *A. salmonicida*. Can these results be extrapolated to other mortalities? This appears likely as there was no evidence of bird predation and salinity was high during the study (32‰) (wrasse cannot tolerate reduced salinity).

It is perhaps not surprising that *A. salmonicida* should be a problem in wrasse cohabiting with farmed salmon; *A. salmonicida* has been isolated from other marine species, e.g. *Gadus morhua* (Cornick *et al.*, 1984), *Ammodytes lancea* and *Hyperoplus lanceolatus* (Dalsgaard and Paulsen, 1986), and *Psetta maxima* (Nougayrede *et al.*, 1990). However, mortalities in wrasse were undoubtedly aggravated by the habit of wrasse, a bottom-dwelling fish, to seek the deepest, darkest part of the pen, the deadsock, where they faced a high bacterial challenge. Wrasse may also have been stressed as they normally spend the winter months in a relatively dormant condition among rocks.

In view of these findings, no wrasse should be released to the wild or transferred between farms at the end of a production cycle.

Summary

Aeromonas salmonicida was not detected in wild wrasse sampled at eleven locations in British waters but was isolated from *Ctenolabrus rupestris*, *Centrolabrus exoletus* and *Labrus bimaculatus*, stocked as cleaner fish in Atlantic salmon farms in western Scotland. Sensitivities of bacteria to antibiotics were identical to the bacterial strains isolated from salmon stocked in the same sea cages. Skin lesions typical of chronic furunculosis in Atlantic salmon were observed in the wrasse and large numbers of bacterial colonies were present in internal organs.

A mean total mortality of 18.8% (range 4.3-37.7%) attributed to *A. salmonicida* was recorded over 17 weeks through winter in a farm in Loch Torridon.

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