

PRESUMPTIVE VIRAL ERYTHROCYTIC NECROSIS (VEN) IN FISHES OFF THE PORTUGUESE COAST

BY J.C. EIRAS AND P.J. SANTOS

Viral Erythrocytic Necrosis (VEN) is a condition characterized by the presence of typical cytoplasmic inclusion-like bodies in erythrocytes, occasionally in conjunction with varying degrees of nuclear degeneration. It was first described by Laird & Bullock (1969) for the Atlantic cod *Gadus morhua* under the name of piscine erythrocytic necrosis. Later, studies of the ultrastructure of infected cells showed that the inclusion-like bodies represented viral particles which were suggested as belonging to the Iridoviridae (Smail & Egglestone, 1980).

Since the first description of this condition, VEN has been reported in a wide range of fish species. In Portugal VEN has been described from photomicroscopic observations, in *Blennius pholis*, *Mugil cephalus* and *Platichthys flesus* (Eiras, 1984).

Recently we had the opportunity of examining a large number of blood smears from fish caught off the Portuguese coast. Examination of these smears has allowed a presumptive diagnosis of VEN infection in erythrocytes of *Micromesistius poutassou*. A total of 536 fish were caught at several sites along the Portuguese Coast (Fig. 1). The sample included *Trisopterus luscus*, *Merluccius merluccius*, *Lepidorhombus bosci*, *L. whiffiagonis*, *Micromesistius poutassou*, *Trachurus trachurus*, *Scomber scombrus* and *Pagellus acarne* (Table 1). Air fixed smears were made immediately after the fish were caught and stained with May-Grunwald and Giemsa.

Eleven out of the 27 specimens (37.9%) of *M. poutassou* caught at catch site H and 15 out of the 29 specimens (55.5%) caught at site I showed the presence of cytoplasmic inclusion-like bodies (Fig. 2). Their size ranged between 0.8 and 1.2 µm and the percentage

of infected cells varied between 40% and 80% in fish from both catches. These inclusions occurred always as single structures in the red blood cells. Nuclear degeneration, as described by Eiras (1990), sometimes occurred simultaneously with the presence of the cytoplasmic inclusion bodies. However, the same feature was observed, in a varied extent, in all the species examined.

A thorough observation of smears from the several species caught at the same and the other fishing sites did not show the presence of inclusion-like bodies in the erythrocytes.

Despite the fact that the erythrocytes were not examined by electron microscopy, the presence of the cytoplasmic inclusions (which were not obviously artifacts) provides strong evidence for VEN infection. As far as can be judged from these results, VEN is not frequent in fish off the Portuguese coast. Even at the *M. poutassou* sampling sites, the fish from the same area (*M. merluccius*, *S. scombrus* and *T. trachurus*) were not infected.

The pathology of this condition is largely unknown. MacMillan & Mulcahy (1979) reported a decline of haematocrit values from 40% to less than 10% over a 4 week period, indicating that the virus caused anaemia; MacMillan *et al.* (1980) showed that infected fish challenged with *Vibrio anguillarum* had about a 2.6 times greater mortality than controls; Walker & Sherburne (1977) reported skin darkening; Reno *et al.* (1978) observed haemorrhage, hyperaemic liver and blood haemolysis and, recently, a VEN-like infection was associated with a high mortality in cultured sea bass (Pinto *et al.*, 1989).

Despite these observations, the real impact of the disease in both wild and cultured populations is unknown. Our observations

did not clarify this problem. None of the specimens examined showed any gross signs which might be related to the disease. As far as the authors are aware *M. poutassou* is a new host for VEN infection.

Summary

Eight fish species from 9 sampling sites off the Portuguese West and South Coast were inspected for Viral Erythrocytic Necrosis (VEN) by light microscopy.

Micromesistius poutassou specimens from two sampling sites showed the presence of cytoplasmic inclusion-like bodies typical VEN infection. All other specimens were negative. A presumptive diagnosis of VEN in fish off the Portuguese coast is made.

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Table 1. Mean length + standard deviation (cm), length range and (number of specimens examined) from each sampling site along the Portuguese Coast.

Species	Sampling sites								
	A	B	C	D	E	F	G	H	I
<i>T. luscus</i>	20.5±2.0 18-24(9)		22.5±3.0 18-33(18)		21.4±2.4 17-27(16)				
<i>M. merluccius</i>			31.7±7.9 22-58(31)					25.5±7.2 14-34(4)	44.2±11.0 26-28(43)
<i>P. acarne</i>							26.1±4.2 18-32(21)		
<i>S. scombrus</i>		28.3±0.9 27-30(14)	28.2±1.1 24-30(21)					32.0±1.8 29-36(37)	
<i>M. poutassou</i>								22.7±1.4 20-26(29)	28.6±1.6 25-31(27)
<i>T. trachurus</i>	29.8±1.4 27-32(24)	25.6±1.4 24-28(13)	26.7±2.2 24-35(47)		22.7±2.2 20-27(24)	19.5±2.0 16-26(22)		27.6±3.0 21-33(32)	26.6±1.3 24-29(17)
<i>L. wiffiagonis</i>	30.5±0.5 30-31(2)		26.0±0 26(1)	25.0±0 25(1)	35.9±9 23-56(9)				
<i>L. boscii</i>	22.2±3.9 19-30(5)		19.3±3.4 12-25(30)	23.0±5.4 18-31(5)	21.1±5.8 12-31(34)				

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Authors address

Instituto de Zoologia, Faculdade de Ciências, Universidade do Porto, 4000 Porto, Portugal.

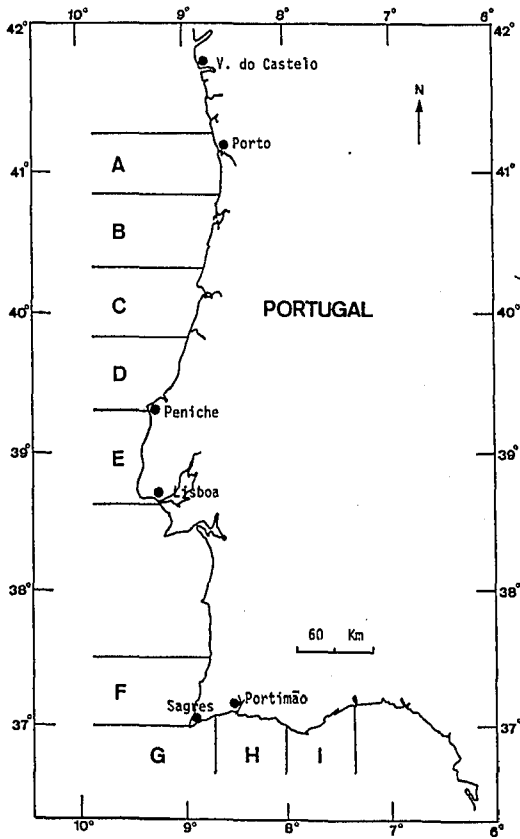


Figure 1. Sampling sites along the Portuguese Coast.

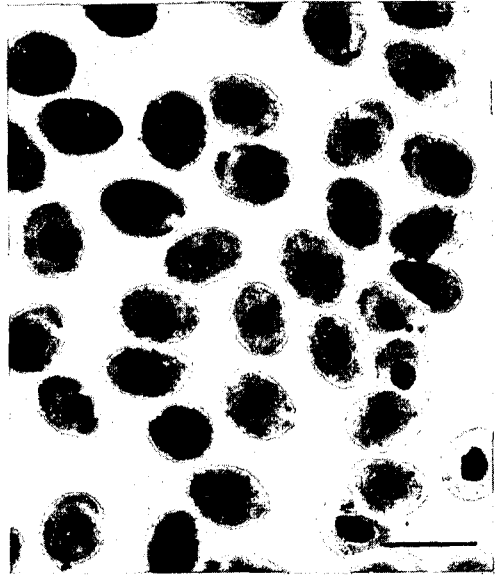


Figure 2. Blood smear of *Micromesistius poutassou*. Note the inclusion-like bodies within the erythrocytes. May Grunwald-Giemsa. Bar = 10µm.