

## LYMPHOCYSTIS OUTBREAKS IN FARMED SEA BREAM, *SPARUS AURATA*, FIRST REPORT ON FRENCH MEDITERRANEAN COAST

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### Introduction

Among the Iridovirus related infections frequently described on many teleosts fish species, Viral Erythrocytic Necrosis (VEN) (Pinto *et al.*, 1989), Epizootic Haematopoietic Necrosis Virus (EHNV) (Langdon *et al.*, 1988) as well as Lymphocystis Disease Virus (LDV) are not considered to directly cause fatality. Indeed, Lymphocystis outbreaks of farmed fish could be observed in some cases, as a consequence of a bacterial double infection or cannibalism (Ahne *et al.*, 1991; Moate *et al.*, 1992). Here, we report for the first time a strong LDV infection, and an additional physical stress responsible for mortalities of reared sea bream, *Sparus aurata*, from Toulon area, on French Mediterranean coast. Although, since the first report of Lymphocystis in sea bream under aquaculture conditions in Israel (Paperna *et al.*, 1982), LDVs were described in other farmed sea bream in Italy (Masoero *et al.*, 1986), Portugal (Menezes *et al.*, 1987), Spain (Basurco *et al.*, 1990), Turkey and Greece (Moate *et al.*, 1992).

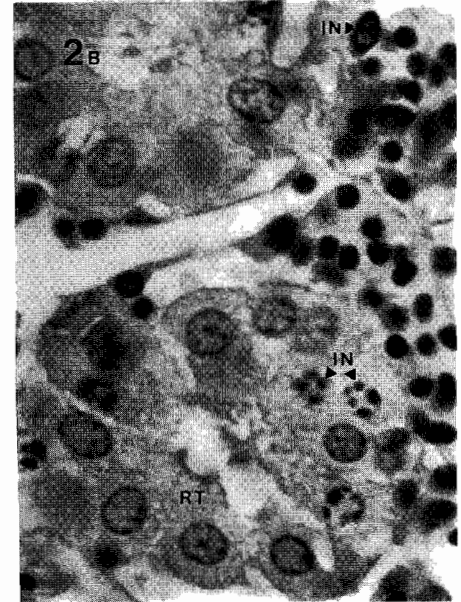
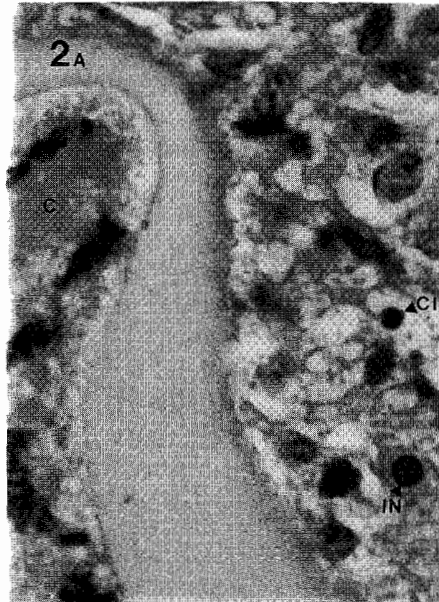
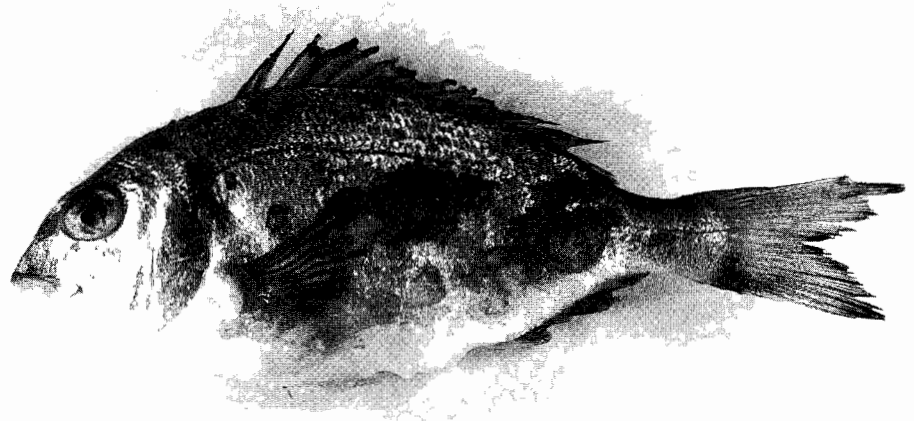
### Results and discussion

Consequent with a two days storm, important mortalities were observed among the very infected fish, whereas faintly or not infected fish were not affected. Propagation of the disease and losses were further considerably attenuated by doubling the volume of the cages. Young sea bream (8-10 cm long) showing a massive LDV infection at a late stage characterised by numerous cysts sprayed all over the body and fins (Fig. 1) were fixed for microscopic examination. Histological sections stained with hemalun eosin revealed irregular nucleus with peripheral packs of chromatin and basophilic

cytoplasmic inclusions (Fig. 2). Feulgen and Rossenbeck staining showed these cytoplasmic inclusions to contain DNA (Fig 3), thus, they can be considered as an accumulation of viral particles, or at least of viral DNA. These histological lesions could be observed in derm cells and kidney. However, cytoplasmic inclusions present in renal interstitial cells could not be detected in renal tubules. Thus, nucleus injury of these last cells could result in the proximity of LDV infected cells. Perhaps the presence of numerous late lesions all over the skin could also provoke a general osmoregulative breakdown resulting in disorder of kidney cells, and thus abnormality of nucleus.

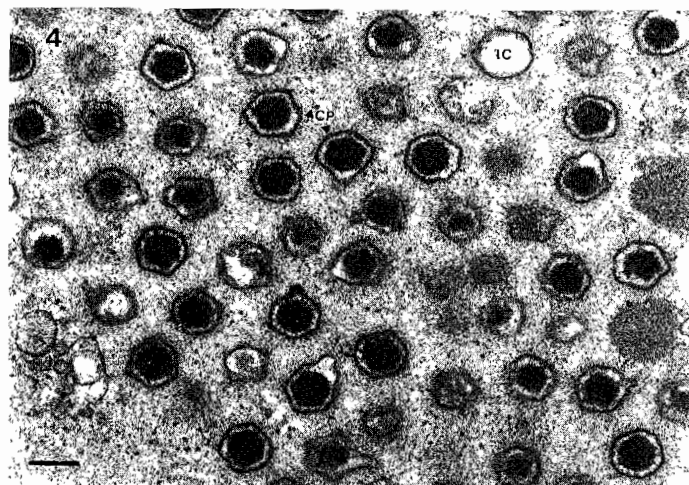
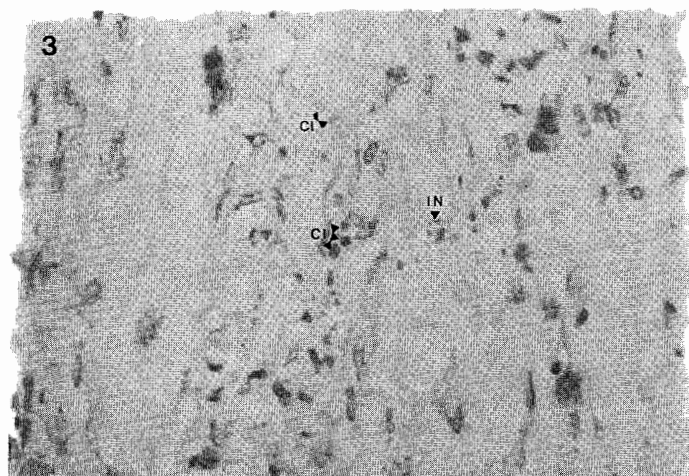
Thin sections of tumors and adjacent epithelial tissue examined by transmission electron microscopy revealed electron dense virus-like particles (fig 4), which average diameter was 211 nm (n = 43, range = 179 to 262 nm). Icosahedric shape and cytoplasmic location of virions in addition to the presence of DNA associated with these particles may belong them to the *Iridoviridae* family. Moreover, due to the presence of tumors corresponding to hypertrophied dermal host cells together with the great size of the viral particles contained in these cysts and adjacent cells, they may be related to the *Lymphocystis* virus genus (Samalecos, 1986; Walker and Weissenberg, 1965). We intend to improve description of this isolate of LDV from sea bream noticeably by determination of protein electrophoretic pattern of purified virus, and by antigenic characterization using monoclonal and polyclonal antibodies specific for largemouth bass (*Micropterus salmoides*) LDV (ATCC VR-342) produced on BF2 fish cell line (ATCC CCL 91). These results may be helpful for further comparisons with other LDVs.

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**Figure 1** : Occurrence of pseudotumors on the body surface and fins of sea bream, *Sparus aurata*

**Figure 2** : Hemalun eosin stained sections of infected fish. C: Cyst, IN: Irregular nucleus, CI: Basophilic cytoplasmic inclusion, RT: Renal tubule.



**Figure 3:** DNA staining of sections using Feulgen and Rossenbeck method. IN: Irregular nucleus CI: Cytoplasmic inclusion containing DNA

**Figure 4:** Electron micrograph showing typical Lymphocystis particles at different stages of maturation. IC: Incomplete empty particle. CP : Complete particle with nucleoid, Bar=200 nm.

#### Summary

Significant mortalities of farmed *Sparus aurata* are reported. Fish were densely covered by Lymphocystis tumors on skin and fins, an additional physical stress (a storm) seemed to have provoked losses. Histological observations revealed lesions in dermal and renal tissues while ultrastructural examination confirmed this disease to be Lymphocystis. This is the first report of LDV in farmed *Sparus aurata* in France.

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