

SANGUINICOLIASIS IN THE CULTURED AMBERJACK *SERIOLA DUMERILI* RISSO, FROM THE SPANISH MEDITERRANEAN AREA

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Sanguinicoliasis is a serious disease caused by blood flukes (Digenea: Sanguinicolidae) affecting both wild and cultured fish populations (Smith, 1972 for review). Blood fluke infections in freshwater fish are well documented in the literature, but reports on the biology, life cycles or pathogenicity of blood flukes in marine fish are relatively scarce (Rohde, 1984). Ogawa and Egusa (1986) reported the first case of a disease of cultured marine fish caused by blood fluke infections: mass mortalities in 0⁺ age class amberjack (*Seriola purpurascens*) reared in net cages in Japan were related to a heavy infection by *Paradeontacylix*.

The object of the present communication is to report recurrent outbreaks of sanguinicoliasis in the cultured amberjack (*Seriola dumerili*, Risso) from the Spanish Mediterranean area. Mass mortalities in 0⁺ amberjack cultured in cages in mariculture facilities from Majorca, Catalonia and Murcia (Spain) have occurred annually since 1989, from December to March. Fish losses also occurred in the 1⁺ age class resulting in a final mortality of 3%. Since 1989, 10% buffered formalin-fixed samples from diseased fish have been periodically sent to our laboratory for a routine histological examination. The main causative agent of mass mortalities in the 0⁺ age class was identified as a prokaryotic organism causing epitheliocystis disease (Crespo *et al.*, 1990; Grau and Crespo, 1991). However 50% of the epitheliocystis diseased amberjack were also heavily infected by blood flukes. Older fish (1⁺ age class) were not affected by epitheliocystis; therefore, fish losses in 1⁺ age class were related only to Sanguinicoliasis. Adult digenea were observed in the spongy muscle of the ventricle (Fig. 1A) whereas encysted trematode eggs, in differ-

ent stages of development, were found in the marginal blood channel of the gill lamellae (Fig. 1B) as well as in the afferent branchial artery (Fig. 1C). No parasites were found in the efferent blood vessels. The acute disease manifested itself in infarction of the gills due to blockage of capillaries by fluke eggs. Haemorrhagic lesions occurred when the eggs hatched and miracidia (Fig. 1D) burst out of the gills. Fluke eggs were also found in the spongy muscle of the ventricle eliciting a light inflammatory response as well as in the mesenteric arteries leading to pancreatic and fat necrosis. Hyperinfected fish sampled in January 1992 exhibited zonal necrosis and degeneration of the liver (Fig. 1E). Vacuolation of the hepatocytes was mainly found near central veins. These zonal changes, associated with hypoxic conditions, have also been described in Salmonids suffering from severe gill disease (Ferguson, 1989).

Summary

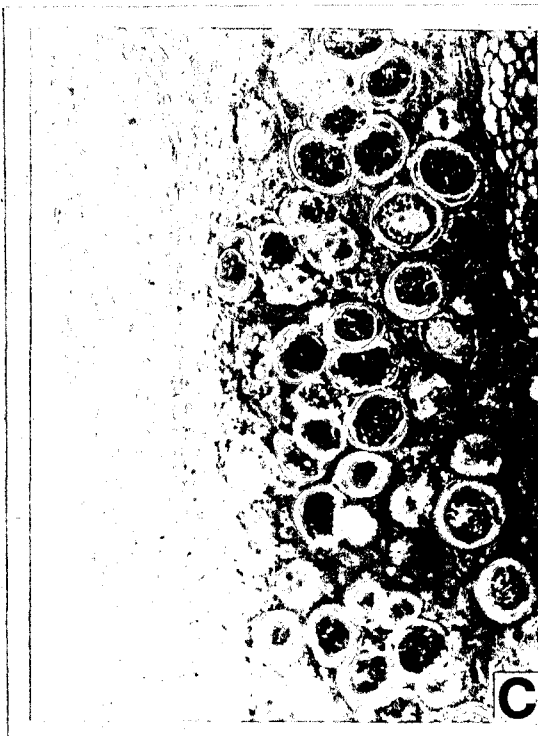
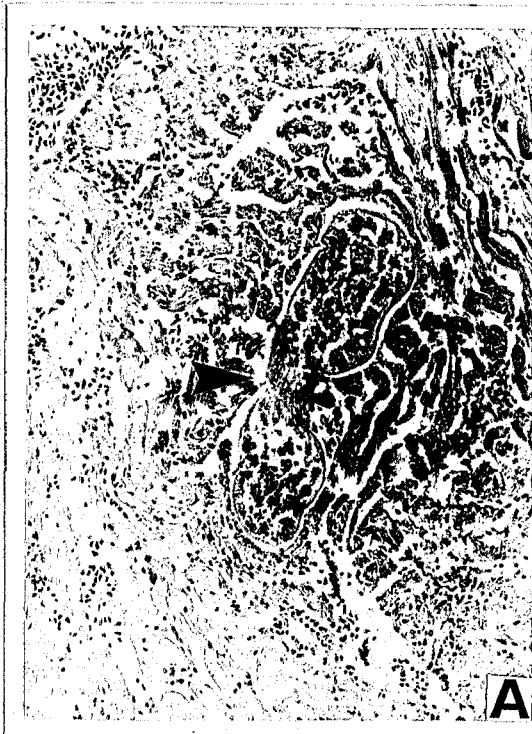
Sanguinicoliasis is reported in the cultured amberjack *Seriola dumerili* Risso from the Spanish Mediterranean area affecting both 0⁺ and 1⁺ age classes. Although mass mortalities in the 0⁺ class are also due to an epitheliocystis infection, fish losses in the 1⁺ class (up to 3% final mortality) are only caused by blood flukes. In hyperinfected fish, infarction of the gills due to blockage of capillaries by fluke eggs leads to a severe hypoxia at the internal level which induces zonal necrosis and degeneration of the liver.

Acknowledgements

This work received financial support from the CICYT, Mar 91 - 0638.

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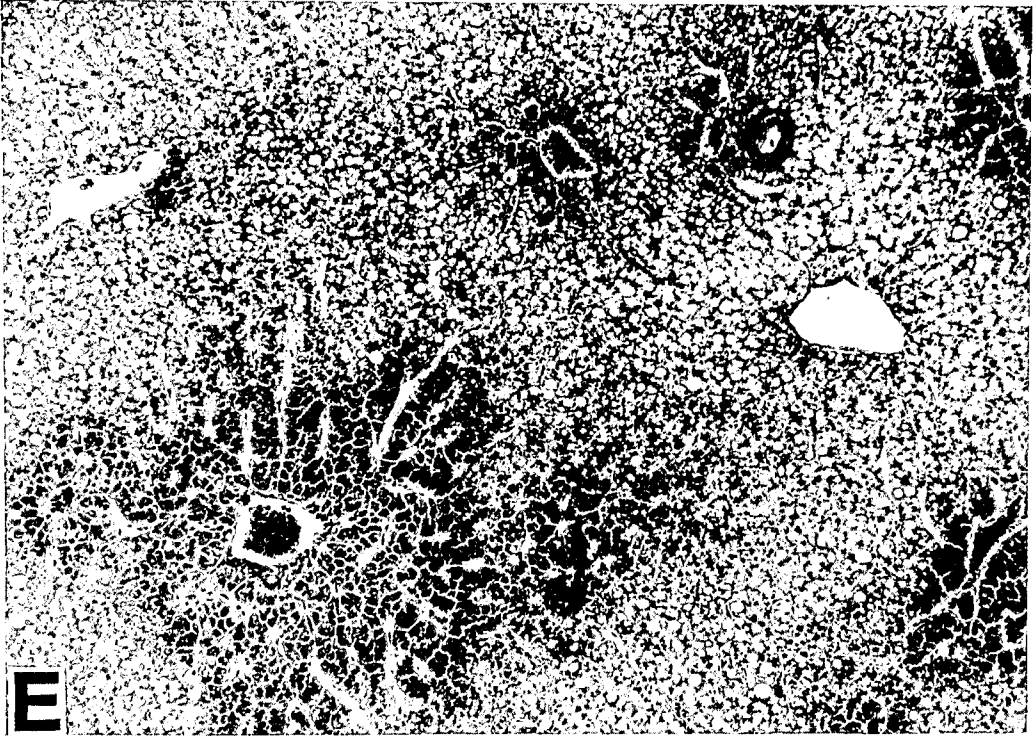


Fig. 1. Opposite and above Sanguinicoliasis in *Seriola dumerili*. Note, in A (x230), the presence of blood flukes (arrowhead) in the spongial muscle of the ventricle. Fluke eggs are found in the marginal channel of gill lamellae (B; x1155) as well as in the afferent branchial artery (C; x230) where they turn into miracidia (D; x1155). Hyperinfected fish exhibited zonal necrosis and degeneration of the liver (E; x115).

References

- Crespo, S., Grau, A. & Padrós, F., 1990. Epitheliocystis disease in the cultured amberjack *Seriola dumerili* Risso (Carangidae). *Aquaculture*, 90, 197-207.
- Ferguson, H.W., 1989. *Systemic pathology of fish. A text and atlas of comparative tissue responses in disease of teleosts*. Iowa State University Press, Ames.
- Grau, A. and Crespo, S., 1991. Epitheliocystis in the wild and cultured amberjack, *Seriola dumerili* Risso: ultrastructural observations. *Aquaculture*, 95, 1-6.
- Ogawa, K., and Egusa, S., 1986. Two new species of *Paradeontacylix* McIntosh, 1934 (Trematoda: Sanguinicolidae) from the vascular system of a cultured marine fish, *Seriola purpurascens*. *Fish Pathology*, 21, 15-19.
- Rohde, K., 1984. *Diseases caused by Metazoan: Helminths*. In: Kinne, O. (ed.), *Diseases of Marine Animals*. Biologische Anstalt Helgoland, Hamburg, p. 193-320.
- Smith, J., 1972. The blood flukes (Digenea: Sanguinicolidae and Spirorchidae) of cold blooded vertebrates and some comparison with schistosomes. *Helminthological Abstracts*, 41, 161-204.