

SUDDEN FISH DEATH ASSOCIATED WITH ALCIAN BLUE MARKING

BY I.R. BRICKNELL AND D. W. BRUNO.

Introduction.

Alcian Blue, injected intradermally by a Pan Jet (Wright Dental Health Dundee, Johnstone 1981), is commonly used to identify individual groups of fish cohabiting in the same experimental system (Herbinger *et al.*, 1989). As a technique it is often considered to be a safe and reliable marking method, causing little distress to the fish and providing identification marks that are visible for many months (Johnstone 1981). However, a syndrome inducing rapid, post marking, death has been observed in Atlantic salmon *Salmo salar* L..

Atlantic salmon parr, mean weight 12.7/1.8g, were vaccinated intraperitoneally with 100:f240,2Symbol,0,0,0m:fl of an experimental *Aeromonas salmonicida* vaccine or phosphate buffered saline (PBS Sigma). These groups were marked on the base of the left or right pectoral fin with, depending on which group they belonged

to, with a single Alcian Blue dot. Five other groups were also marked at the base of the pelvic, anal or caudal fins. Within 30 minutes 27% (54/200) of the groups that were marked at the base of the pectoral fins had died while none of the five other groups in the trial showed any mortality. At post mortem all mortalities in this group had profuse bleeding from the Pan Jet wound and large amounts of blood in the pericardium. Alcian Blue was visible as a discrete blue dot on each of the dead parrs' hearts. The hearts were removed and fixed in 8% buffered formal saline for histological investigation. Following fixation the samples were processed, embedded in paraffin wax and 5:f240,2Symbol,0,0,0m:fm sections were stained with Harris's haematoxylin and eosin.

Results

Throughout the stratum spongiosum of the ventricle distinct holes were observed. The movement of dye had pushed individual

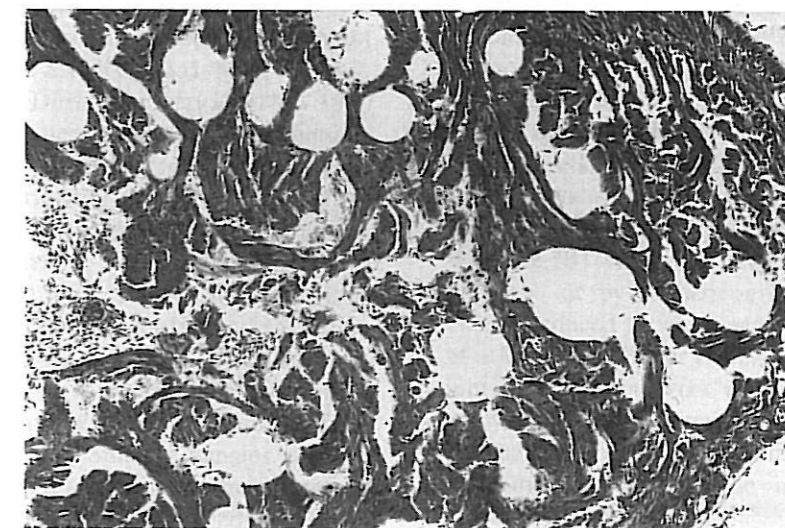


Figure 1. Distinct holes within the stratum spongiosum of the ventricle attributed to the effect of alcian blue dye passing through the tissue. The movement of the dye has pushed the individual fibres aside with some leakage of erythrocytes

fibres aside with some leakage of erythrocytes (Fig. 1.) A massive haemorrhage has occurred through the atrical epicardium. No other pathology was recorded.

Discussion.

Death of the salmon parr was attributed to an internal haemorrhage. Although marking by a Pan Jet is usually a safe and reliable marking technique it is worth remembering to match the strength of the delivery spring to the size of the fish being marked. Failure to do so results in the dye being injected through the body wall and into vital organs, in this case the heart. It is felt that the cardiac region should be avoided when marking small salmon parr. Although rapid death is the most obvious side effect of incorrect Pan Jet marking techniques there is a more insidious side to poor technique. If the spring setting is too strong and breaches the body wall, not only is a sizeable wound to the integument caused, but it is possible to inject a significant amount of Alcian Blue into the peritoneal cavity. Once in the tissues the dye appears to have a long half life, in excess of 6 months, (Herbinger *et al* 1989). This is of concern as Alcian Blue is a copper containing dye and is likely to have

detrimental effect on the salmon's physiology and the immune system, possibly influencing the results of any subsequent procedure.

Summary

Following routine marking, of salmon parr with alcian blue a rapid mortality was observed. This mortality was attributed to the alcian blue being injected through the body cavity and into the heart by the pan jet. Mortality was caused by an internal haemorrhage. The implication of the introduction of a large amount of alcian blue into salmon parr are discussed.

Authors' Address

SOAFD Marine Laboratory, PO. Box 101 Victoria Road, Torry, Aberdeen, Scotland

Acknowledgements.

The author's wish to acknowledge Ricky Butler and the staff of the SOAFD. Experimental Fish Production Unit, Aultbea for their help in this project.

References

- Johnstone R. (1981) Dye Marking. Colour guide to growth performance *Fish Farmer* 4, 24-25
Herbinger C. M., Newkirk G. F., and Lanes S.T., (1989) Individual marking of Atlantic salmon: evaluation of cold branding and jet injection of Alcian Blue in several fin locations. *J. Fish Biol.* 36, 99-101