

ANNUAL MEETING - JUNE 1967Scottish Biochemical Studies on Salmon

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In 1966 a programme of biochemical studies on salmon was commenced in Scotland, with a view to assessing the value of biochemical and immunological studies in identifying salmon of different geographic origin in the West Greenland fishery.

Small numbers of adults and smolts were sampled from various Scottish sources, and at the same time smolts were sampled in Canada and shipped to Scotland for analysis. In October and November 1966 adults were sampled from the West Greenland fishery. The techniques utilized in the analysis and some preliminary results are as follows:-

1. Red Cell Agglutinogens

Samples were reacted with the normal serum from cows and pigs, and with immune anti-salmon sera prepared in rabbits. None of these reagents were specific for any one red cell antigen. However, when the results of testing Scottish, Canadian and West Greenland material are compared, the following is observed:-

- (i) When reacted with normal pig serum, the Scottish material shows a reasonably homogeneous reaction, while the Canadian material exhibits a wide range of reaction. In the Greenland material, that from the Godthab region shows a reasonably homogeneous reaction, whereas that from the Disko area exhibits a wide range of reaction.
- (ii) When reacted with normal cow serum the Scottish and Godthab material exhibits a reasonably homogeneous reaction; the Disko and Canadian material exhibits a wider range of reaction. The reaction of both the West Greenland samples (Godthab and Disko areas) resembles more that of the Canadian material.
- (iii) Certain of the immune anti-salmon sera produced in rabbits were tested against all the samples. In general, the reactions observed in the Greenland material resemble the Canadian reaction

more than that of Scottish material.

(iv) Others of the immune anti-salmon sera have been tested against Greenland and Scottish material only. In these cases, the Greenland material exhibits a wide range of reactivity whereas that of Scottish origin exhibits a reasonably homogeneous reaction.

From the above preliminary results it appears reasonable to conclude that the samples collected at West Greenland represent a mixed population resembling, in red cell agglutinogens, the Canadian samples more than the Scottish samples. Furthermore, the material collected in the Disko area of West Greenland resembles the Canadian material more closely than does the Godthab (West Greenland) material.

2. Haemoglobin

Length-correlated variations in the Haemoglobin pattern (identified using Starch gel electrophoresis) of individual fish have been observed in both the West Greenland and Scottish samples. Similar variations were observed in both samples, and no pattern occurred in one sample which was not observed in the other. Previous studies indicate that the rate of change of the haemoglobin pattern with increase in length may be characteristic of individual stocks. The range of lengths at which any pattern is observed in the Greenland material is relatively large. Analyses are under way to determine the range of lengths at which identical patterns are observed in Scottish material. Preliminary indications are that the range is much narrower.

3. Serum Proteins

Serum samples have been collected from the three major areas (Scotland, Canada and West Greenland) in this study and have been maintained deep frozen. They have not yet been analysed. It is anticipated that they will be studied for transferrin and various serum antigen polymorphisms.

4. Tissue Enzymes

Enzymes from various tissues of Scottish and West Greenland caught salmon have been analysed.

No variations of ^a "racially usable" nature have been observed.

Conclusion

These preliminary analyses and results suggest that sampling should continue in the home rivers during 1967, and an effort be made to produce specific antisera with a view to elucidating the differences in reaction observed between the different areas. Outstanding analyses (e.g. of serum proteins) should be concluded before the salmon working group meeting in October. If facilities are available, further material may be collected in the West Greenland area in 1967.