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the Exploration of the Sea /
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Mariculture
Committee

Report
of the Working Group on Genetics
(by correspondence)
1992

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Denmark

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(1) Introductory Remarks

According to the adopted resolutions of the 79th Statutory Meeting, France 1991, the ICES Working-Group on Genetics was asked to work by correspondence in 1992 to:

- a) review and report on progress in research on biochemical markers and related techniques for species discrimination (including distinguishing between wild and aquacultured species);
- b) evaluate trends in advanced "gene technology", specifically:
 - genetic fingerprinting,
 - provide a working definition of genetically modified organisms (GMO) and comment on their production, including progress of basic research and applied aspects and concerns related to possible risks to donor species and the environment.
- c) review and report on development of genetic concepts for aquaculture species and environmental protection;
- d) submit a written report on progress to the Mariculture Committee at the 1992 Statutory Meeting with the expectation of a meeting in 1993 in Stockholm, Sweden.

Before returning to the given topics it is my sad task to call the Committee's attention to the fact that again from a number of 23 nominated representatives of ICES-member countries less than the half followed the repeated invitation for supplying the signer with relevant informations upon the listed topics. Because of this fact, there is no sufficient material to be reported on. The recommended meeting in 1993 in Stockholm, Sweden, will be the signer's last attempt to get together at least the majority of the working-group members for becoming enabled to deliver a functional report. If this attempt will end again without the expected success, the signer of this report will hereby announce his definite resignation from the chair of the working group in concern.

(2) List of co-operating working-group members

1. Dr. Krzysztof GORYCZKO / Poland
2. Dr. Håkan JANSSON / Sweden
3. Dr. Marja-Liisa Koljonen / Finland
4. Prof. Dr. Gunnar NÆVDAL (together with Dr. Knut JØRSTAD) / Norway
5. Prof. Dr. Richard L. SAUNDERS / Canada
6. Dr. Jean-Marie SÉVIGNY / Canada
7. Dr. D. THOMPSON (replacing Prof. Dr. C. PURDOM) / U.K.
8. Prof. Dr. Wolfgang VILLWOCK / Fed. Rep. of Germany (chairman)
9. Dr. Alan F. YOUNGSON /U.K. (Scotland)

No answers by:

1. Dr. G. Andorsdottir / Denmark
2. Prof. Dr. M.S. Bougrier / France
3. Prof. Dr. M. Chevassus / France

4. Dr. J. CLAYTON / Canada
5. Dr. M. GUYOMARD / France
6. Dr. G. NEWKIRK / Canada
7. Prof. Dr. L. NYMAN / Sweden
8. Prof. Dr. D. POWERS / USA
9. Dra. A.M.T. DOS SANTOS / Portugal
10. Dr. V. THORSTEINSSON / Iceland
11. Dr. E. VERSPOOR / U.K.
12. Prof. Dr. N.P. WILKINS / Ireland
13. Dr. J. WORMS / Canada

(3) Reports on Genetics from the contributing working-group members (in alphabetic order of the member countries: mainly on forms with brief remarks, annexes 1a-7b, pages 1-18)

1. **Canada** (compiled by Richards L. SAUNDERS, Dept. of Fisheries and Oceans, Aquaculture and Invertebrate Fisheries Division, Biological Station St. Andrews: **Annex 1a, pp. 1-3** and 2nd by Jean-Marie SÉVIGNY, Maurice-Lamontagne Institute, Mont-Joli, Quebec: **Annex 1b, pp. 4-6**).
2. **Finland** (given by Dra. Marja-Liisa KOLJONEN, Finnish Game and Research Institute, Aquaculture Division, Helsinki: **Annex 2, p. 7**).
3. **Germany** (given by Prof. Dr. Wolfgang VILLWOCK, Zoologisches Institut und Zoologisches Museum, Universität Hamburg: **Annex 3, p. 8**).
4. **Norway** (compiled by Prof. Dr. Gunnar NÆVDAL, Department of Fisheries and Marine Biology, University of Bergen, Bergen High-Technology Center [together with: Knut E. JØRSTAD and Geir DAHLE: **Annex 4, pp. 9-13**]).
5. **POLAND** (Dr. Krzysztof GORYCZKO, Inland Fisheries Institute, Salmonid Research Laboratory Rutki, Zukowo: **Annex 5, pp. 14-15**).
6. **Sweden** (Dr. Håkan JANSSON, Salmon Research Institute, Älvkarleby: **Annex 6, p. 16**).
7. **United Kingdom** (Dr. D. THOMPSON, MAFF, Fisheries Laboratory, Lowestoft: **Annex 7a, p. 17**; Dr. Alan F. YOUNGSON, SOAFD Marine Laboratory, Aberdeen, Scotland: **Annex 7b, p. 18**).

(4) Brief summaries of above listed reports, with reference to the recommended topics (see: adopted resolutions 2:44, 1991)

to pos. a) Biochemical Markers are more often used than in the past for differentiating populations, and even subpopulations, within certain given species. Main subjects are the herring and the cod (Norway), atlantic salmon (diff. countries), redfish (Canada: Sévigny). However, there are still no as foregoing investigations carried out upon species discrimination by means of immunobiological research as again has being done by members of the signer's working-group in Germany (as far as has been reported!). Subjects of the Hamburg working-group are different tilapias, wild species as well as their aquacultured relatives. - Hopefully, these techniques and related ones will be spread all over

the active working-groups within in the different ICES-member countries.

to pos.b) Genetic fingerprinting still is no very common technique within the field of fish genetics. It is used in different Canadian working-groups (e.g. on chinook salmon), in Norway (cod), and is said to become applied in an UK- / Ireland cooperation project "on marine organisms" (see D. THOMPSONs report from Lowestoft, p. 17). Test studies are carried out by the working-group of Professor PÄÄBO, Munich, Germany.

Studies on mtDNA are reported by different member countries, e.g. by SÉVIGNY / Canada (northern Atlantic capelin [*Mallotus villosus*]), Germany (different tilapias), Norway (cod, herring), and UK (salmon populations in Great Britain and Wales or in Scottish rivers, respectively).

A working definition of genetically modified organisms (GMO) has shortly been worked out by the ICES-WG on Introductions and Transfers of Marine Organisms (Chairman: Dr. J.T. CARLTON). The given definition was adopted by the members of the above mentioned working-group and of the WG on Genetics, Helsinki, June 05, 1991. As far as I have been told by Dr. CARLTON he was intending to present a well formulated definition on GMOs on the Warnemünde-meeting: There is no own comment for the moment being, however, if needed it may become discussed again on the next meeting of the WG on Genetics in Stockholm, 1993.

to pos.c) Caused by the given circumstances, to work by correspondence in 1992, there couldn't be expected many constructive contributions in the sense of "developing genetic concepts for aquaculture species and environmental protection" - although there are many intentions for deepening discussion upon this highly important topic. A review can't be given for the present Statutory Meeting because nobody of the representatives from the ICES-member countries contributed to this topic any word - which mainly seems to depend on the running, resultless discussion. However, the WG on Genetics will come back to this position in the center of its discussion in Stockholm, in 1993.

to pos.d) With concern to the expected meeting in Stockholm, 1993, the signer proposes to meet at 3-4 days in June 1993, (June 01-04, 1993, if Professor NYMAN may finally agree).

(5) Closing remarks

Again many members of the WG on Genetics stated the importance of non neglecting so-called "classic genetics" in fish ("culture and selection").

On the other hand, some papers dealt with "genetransfer", manipulation of genotypes, e.g. Gunnar NÆVdal, Norway, by transfer of genes coding for growth hormones and other characters. These two aspects should become severiously discussed during the next WG on Genetics meeting in 1993.

(6) Recommendations

Because of the relatively low success in 'working by correspondence', the signer suggests to repeat the recommendations of 1991 in order to get better and more reliable answers by a real meeting of the WG on Genetics - in case of hopefully numerous participation. The recommendations are suggested to become repeated the following way (under addition of the two positions mentioned under "closing remarks"):

- a) discuss intensively and report on development of genetic concepts for aquaculture species and environmental protection;
- b) discuss again on a working definition of genetically modified organisms (GMOs) and comment on their production, including progress of basic research and applied aspects and concerns related to possible risks to donor species and the environment.
- c) review and report on further progress in research on biochemical markers and related techniques for species discrimination (including distinguishing between wild and aquacultured species);
- d) evaluate trends in advanced "gene technology", specifically:
 - genetic fingerprinting,
 - mtDNA-analysis,
 - **genetransfer** (in combination with pos. b)
- e) review and report on the **use of "classical genetics"** in fish.
- d) the WG on Genetics is expected to meet at 3-4 days in June 1993 in Stockholm.



(Prof. Dr. W. Villwock)
Chairman
of the Working Group on Genetics

Information Form on activities of the members of the ICES-WG on Genetics

Name and full address of the member signed below:

Richard L. Saunders
Department of Fisheries and Oceans
Biological Station
St. Andrews, New Brunswick E0G 2X0
CANADA

(1) Actual research in fishgenetics (brief description of used techniques, aims and species concern)

- a) Continuation of Dr. Tillmann Benfey's research on production of all-female triploid Atlantic salmon, brook trout and brown trout, as described in 1991 Canadian Report to Working Group on Genetics.
- b) Continuation of Peter E. Ihssen's work with Roy Danzmann and Moira Ferguson on biochemical markers, DNA research on salmonids as reported on 1991 Canadian Report.
- c) Continuation of work in Roger Doyle's gene probe lab, on DNA fingerprinting and DNA pedigree probes as described in 1991 Canadian Report.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- a) Continuing in 1992.
- b) Continuing in 1992.
- c) Continuing in 1992.

.../2

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

- 2 -

Information Form on activities of the members of the ICES-WG on Genetics

Name and full address of the member signed below:

Richard L. Saunders

(1) Actual research in fishgenetics (brief description of used techniques, aims and species concern)

- d) Continuation of work in Edward M. Donaldson's lab with study of sockeye salmon growth hormone genes for production of transgenics, insulin-like growth factor genes, aromatase gene and heat-shock genes as reported in 1991 Canadian Report.
- e) Continuation of DNA fingerprinting in chinook salmon for identification with particular reference to identifying escaped farmed salmon, as described in 1991 Canadian Report.
- f) R. L. Saunders has discontinued work on an Atlantic salmon stock with spots on their dorsal and caudal fins - a possible genetic marker.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- d) Continuing.
- e) Continuing.
- f) Discontinued.

.../3

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Information Form on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Richard L. Saunders

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- g) Production of freeze resistance and enhanced growth of Atlantic salmon using gene transfer, by Garth Fletcher, Choy Hew, Peter Davies, Richard Saunders and David Idler. Successful gene transfer took place; freeze resistance and enhanced growth have been observed.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- g) This planned, five-year study follows some early work by this team giving encouraging results.

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

CANADA: annex 1b -4-

Information Form
on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Richard L. Saunders

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- g) Production of freeze resistance and enhanced growth of Atlantic salmon using gene transfer, by Garth Fletcher, Choy Hew, Peter Davies, Richard Saunders and David Idler. Successful gene transfer took place; freeze resistance and enhanced growth have been observed.
- h) Continuation of the research program of François Dubé, Louise Dufresne and Richard Desrosiers on marine invertebrates aquaculture, developmental and molecular biology as reported on 1991 Canadian Report.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- g) This planned, five-year study follows some early work by this team giving encouraging results.
- h) Continuing in 1992.

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date April 28, 1992

Name Richard L. Saunders

- 5 -

Information Form on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

~~Richard L. Saunders~~

Jean-Marie Sévigny
Institut Maurice-Lamontagne
Dept. Fisheries and Oceans
850 Route de la Mer
P.O. Box 1000, Mont-Joli, P.Q. G5H 3Z4

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- i) The genetic program conducted in the laboratory of Julian J. Dodson on the retention and population structure of smelt (Osmerus mordax) and tomcod (Microgadus tomcod) in the turbid middle estuary of the St. Lawrence River, Quebec. The relationship between spawning mode, spawning site and phylogeographic structure in mitochondrial DNA of North Atlantic capelin (Mallotus villosus) and populations structure of the mussel (Mytilus edulis) is continuing as described in the Canadian Report.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- i) Continuing in 1992.

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date April 28, 1992

Name J.-M. Sévigny

- 6 -

Information Form
on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Jean-Marie Sévigny

~~Richard L. Saunders~~

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- j) The genetic program of J.-M. Sévigny, B. Sainte-Marie, M. Fréchette and L. Savard on the genetic variation in the Greenland halibut, the northern shrimp and the snow crab from the Saint Lawrence system and the Northwest Atlantic and the genetic aspects of the summer mortality in cultured blue mussel in the Magdalen Islands is continuing as described in the 1991 Canadian Report.
- k) A research project of J.-M. Sévigny on biochemical systematics of the redfish (Sebastes) in the Gulf of St. Lawrence is initiated in 1992.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- j) Continuing in 1992.
- k) Starting in 1992.

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date April 28, 1992

Name J.-M. Sévigny

Information Form on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Marja-Liisa Koljonen
Finnish Game and Fisheries Research Institute,
Aquaculture Division,
P.O. Box 202,
SF-00151 Helsinki,
FINLAND

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

a) Population genetic studies by enzyme electrophoresis on Baltic salmon and brown trout stocks in connection of conservation and enhancement projects.

b) Selective breeding programme for rainbow trout.

c) Studies on Coregonids evolution by enzyme electrophoresis.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

a) continues

b) continues

c) continues

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date 22.5.1992

Name Marja-Liisa Koljonen

Information Form

on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Prof. Dr. W. Villwock
 Universität Hamburg
 Zoologisches Institut
 und Zoologisches Museum
 Martin-Luther-King-Platz 3
 D-2000 Hamburg 13
 Fed. Rep. of Germany

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- a) The reported activities (see June 04, 1991) were continued and will be continued further on, e.g.
- mtDNA-analysis of tilapias,
 - immunobiological analysis of Ghanean wild stock tilapias,
- b) in press: "Western Blot Analysis of Plasma Components of three Tilapia Species, *T. aurea*, *T. nilotica* and *T. gallilea*". by OBERST, S., VILLWOCK, W. and L. RENWRANTZ (J.Appl.Ichthyol.).
- in press: "On Interspecific Blood Group Characteristics of two Tilapias, *T. aurea* and *T. nilotica*, and the Existence of Soluble Substances for Discrimination". OBERST, S. and W. VILLWOCK (J.Appl.Ichthyol.).
- c) - Erythrocyte contents of blood of tilapine fishes.

Untersuchungen der Erythrocyten-Inhaltsstoffe von Tilapia-Arten (*Oreochromis niloticus* L. 1757, und *Sarotherodon melanothron* RUPPELL 1852)(Pisces: Cichlidae). Master Thesis by Thomas M. FALK (working-group VILLWOCK).


(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- a) Intensivating all three aspects; the same has been reported by the working-groups SCHARTL, University of Würzburg, Fed.Rep.of Germany and PÄÄBO, University of Munich, Fed.Rep.of Germany
- b)
- c)

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date..... April 1992

Name 

Prof. Dr. W. Villwock

**ICES Working
Group on Genetics**

**GENETIC STUDIES
RELATED TO
AQUACULTURE AND FISHERIES
RESEARCH IN NORWAY
IN 1992**

An overview compiled by

**Gunnar Nævdal
Department of Fisheries and Marine Biology
UNIVERSITY OF BERGEN
Bergen High-Technology Center
N-5020 BERGEN - Norway**

and

**Knut E. Jørstad and Geir Dahle
Institute of Marine Research
P.O.Box 1870, Nordnes
N-5024 BERGEN - Norway**

INTRODUCTION

This report represent an updated overview of corresponding reports worked out for the Working Group on Genetics in the years 1989 to 1991. Traditionally the genetic investigations have had to main purposes; (1) Studies on genetic variation and populations structure of commercially important resource species and (2) studies on quantitative genetics of productive traits with the aim of genetic improvement for aquaculture. In recent years, however, interrelations between natural and farmed populations have become of increasing importance, and this is reflected in the projects which are undertaken.

In the following overview these topics are dealt with:

Identification of population units and sibling species

Genetic tags applied in sea ranching for studies of gene introgression

Genetic improvement of salmonids - classical quantitative genetics

Chromosome engineering

Gene technology

IDENTIFICATION OF POPULATION UNITS AND SIBLING SPECIES

At Department of Fisheries and Marine Biology, University of Bergen, in cooperation with the Institute of Marine Research, studies on species identification, species validity and intraspecies variation of redfishes, *Genus Sebastes* from Iceland and Greenland water are in progress.

Genetic studies on cod and herring stocks have been continued at the Institute of Marine Research, including analyses of new yearclasses. The last mentioned work is mainly focused on yearclass variation and identification of subpopulations by using protein electrophoresis and restriction fragment analysis of mtDNA. Studies on resident and anadromous brown trout populations by enzyme polymorphism are continued at the same institute.

The Institute of Marine Research has included DNA-fingerprint (multilocus) analysis in the cod subpopulation studies. The same two institutions in Bergen are cooperating on studies of genetic composition of natural and stocked cod populations in several areas along the Norwegian coast. A central part of these investigations is use of genetically tagged cod.

At Trondheim Biological Station, University of Trondheim, the following projects are continued:

- Population structure and evolution of various gadoid fishes, at the moment especially blue whiting, studied by electrophoretic methods.
- Studies on homing in marine fishes (cod, plaice) by tagging/transplantation experiments.

- Biochemical genetic identification of fish eggs.
- Mathematical modelling and computer simulation of evolutionary processes (genetic drift, selection, immigration) for use in genetic resource management.

At Norwegian Institute of Nature Research, Trondheim, studies on population structure of salmon in Norwegian rivers have been continued with the aim of establishing a genetic model for wild salmon stocks in Norway. This could be used as basis for evaluating the genetic impact of reared salmon on natural salmon gene pools.

Investigations on enzyme polymorphism for use in population studies on harp seal and hooded seal are nearly completed at the Department of Fisheries and Marine Biology and Institute of Marine Research. Studies on the same species by use of multilocus DNA probes are undertaken this year. Similar studies on minke whale and harp seal applying mtDNA technique are carried out at Department of Medical Biology, University of Tromsø.

GENETIC TAGGING APPLIED IN SEA RANCHING FOR STUDIES ON GENE

A morphological genetic marker (fine spotted) in trout has been identified at the Institute of Marine Research, Bergen, and are utilized for field studies on interaction between natural and reared populations.

Likewise a biochemical genetic marker has been identified in cod, and a homozygous brood fish population has been developed. The offspring are being used in sea ranch experiments for studies of survival and interaction between natural and released cod. Genetically tagged cod have been released for two years, and data on recoveries are now being collected.

Genetic analyses have been incorporated in a salmon ranching programme started at the western coast of Norway (Institute of Marine Research, Bergen). These include analyses of wild spawners used as broodstock (allozymes, DNA-fingerprinting) for evaluation of straying/genetic impact on river stocks, and families/stock analyses with respect to survival and return rates. A pilot study of disease resistance have been initiated.

GENETIC IMPROVEMENT OF SALMONIDS - CLASSICAL QUANTITATIVE GENETICS

The large scale programme for genetic improvement of salmonids initiated by the fish farmers associations and Institute of Aquaculture Research (AKVAFORSK), Ås, are continued. The breeding programme is carried out at the breeding station at Kyrksæterøra and at Sunndalsøra. The improved fish material is transferred to the fish farming industry via multiplying stations in each county.

Institute of Aquaculture Research continue to carry out quantitative genetics on salmonids at the research stations at Sunndalsøra and Averøya, both located in the county of Møre And Romsdal, and at the Agricultural University of Norway, Ås. The following projects give an overview of the activity:

Selection for genetic improvement in cooperation with the breeding station at Kyrksæterøra, is carried out continuously on growth rate, age at maturity and survival. Genetic parameter

of "new" productive traits are also estimated.

Additive genetic variations are found to be the main contribute to the variation of traits connected to fish quality (fat in flesh, intestine fat, flesh colour, belly thickness etc.) in rainbow trout and Atlantic salmon. Datatomography was found to be of considerably help in the registrations of body composition in fish. Non-additive genetic variation explain a minor part of total genetic variation for this traits.

Immunological factors which may be connected to genetically determined disease resistance are identified and tested for genetic variation and covariation with productive traits and actual resistance. Also the connection between "stress" and immuneresponse is studied. These studies are carried out in cooperation with Department of Animal Breeding, Agricultural University of Norway, and Department of Microbiology and Immunology, Veterinarian University of Norway. Challenge test have shown great differences in mortality between full and half sibs families when exposed to furunculosis, vibriosis and cold water vibriosis. A project for studying the ironbinding proteins (transferrins) and their effect on disease resistance has been started. In vitro-tests on fish patogenes are carried out, and also cell lines and model fish are used for studies on gene regulations.

At Institute of Marine Research, Aquaculture Station Matre, studies of trypsin isozymes in salmonids have been continued, These involve studies on the inheritance control as well as growth performance of selected families and specific genotypes.

CHROMOSOME ENGINEERING

Studies on the combination of triploidy and gynogenesis are still carried out at Institute of Aquaculture Research, N-6600 Sunndalsøra, with the aim of producing sterile all-female rainbow trout and Atlantic salmon.

GENE TECHNOLOGY

Characterization and isolation of genes coding for growth hormones, prolactin, trypsin isozymes, insulin and genes involved in disease resistance have been undertaken by several laboratories with the double aim of basic studies of such mechanisms and of transferring "valuable" genes between and within species. Both Atlantic salmon and a model fish (zebrafish) are used for such investigations.

Another aspect of these investigations have been constructions of "genome libraries" and studies on homeobox genes of salmon.

The laboratories engaged in gene technology studies on fish in Norway are listed below.

Laboratory for Biotechnology, University of Bergen,
Bergen High-Technology Center, N-5020 BERGEN

Department of Biotechnology,
Norwegian Technical University
N-7034 TRONDHEIM

Department of Genetics and Biotechnical Disease Control
Norwegian Veterinarian University
P.O.Box 8146 Dep., N-0033 OSLO 1

Institute for Aquaculture Research
Agricultural University
P.O.Box 32, N-1432 ÅS-NLH

Laboratory for Microbial Gene Technology
Norwegian Agricultural University
P.O.Box 37, N-1432 ÅS-NLH

Information Form

on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Krzysztof Goryczko
Inland Fisheries Institute
Salmonid Research Laboratory Rutki
83-330 Zukowo Poland

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

a) Rainbow trout family selection (F2). 100 parental pairs were selected and spawned in the way to enable the equal share of initial four lines genotype in the resulting progeny. After four months of separate rearing, the amount of families was reduced to 60 + 4 (pure lines), fish tagged (PIT and "Carlin" tags), mixed and splitted for two parts: one left at Rutki, second transported to production farm.

b) Vistula sea trout outbred broodstock is being builded as an "gene bank" in IFI SRL Rutki. *Genetic variation and stock differentiation of Polish sea trout is being examined using biochemical and cytogenetic methods.

Genetic variation and taxonomy in Coregonidae species. Morphological and biochemical studies of anadromous populations of Pomeranian Bay whitefish, of the four populations of vendace and the spawning populations of whitefish, peled and whitefish peled reciprocal hybrids in ten Polish lakes were analyzed.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

a) To be continued: survival and growth will be analyzed in spring and autumn.

b) To be continued.

c) To be continued

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date Feb. 24 - 92

Name K. Goryczko

The institutions engaged in afore mentioned studies:

1. Inland Fisheries Institute, Salmonid Research Lab. Rutki, 83-330 Zukowo
 2. University of Agriculture and Technology, Department of Basic Fishery Sciences, 10-718 Olsztyn. Poland
 3. Institute of Aquatic Ecology and Fisheries, Berlin-Friedrichshagen, Muggelseedamm 310. Germany
 4. University of Joensuu, Department of Biology, P.O. Box 6, SF-80101 Joensuu, Finland.
- Publications list backside:

Bodaly R.A., J. Vuorinen, R.D. Ward, M. Luczyński, J.D. Reist. 1991. Genetic comparison of New and Old World coregonid fishes. *J. Fish Biol.* 38: 37-51.

Goryczko K., S. Dobosz, T. Makinen, L. Tomasik. 1991. UV-irradiation of rainbow trout sperm as a practical method for induced gynogenesis. *J. Appl. Ichthyol.* 7: 136-146.

Vuorinen J., M. Luczyński, T. Heese, R.A. Bodaly. 1991. Morphological and genetic description of the whitefish (*Coregonus lavaretus* L.) population inhabiting Pomeranian Bay, Poland. *Acta Hydrobiol.* 33: 65-75.

Vuorinen J., M. Luczyński. 1991. Electrophoretic variation in four Polish populations of vendace, *Coregonus albula* (L). *Acta Hydrobiol.* 33: 77-86.

Goryczko K., S. Dobosz, M. Luczyński, M. Jakun. 1992. Triploidized trout hybrids in aquaculture. *Proc. Symp. 70 Years of the Sea Fisheries Institute in Gdynia "Baltic Environment and Fisheries"* in press.

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Information Form on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Håkan Jansson
Salmon Research Institute
S-810 70 Älvkarleby
Sweden

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

a)

Studies on genetic variation in natural populations and hatchery stocks of Atlantic salmon (*Salmo salar*) and brown trout (*S. trutta*) by enzyme electrophoresis.

b)

Studies on natural hybridization between Atlantic salmon and brown trout by enzyme electrophoresis.

c)

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

a) (continued)

(continued)

b)

c)

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date..... 1992-04-30

Name Håkan Jansson

Information Form

on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

Dr D Thompson
MAFF
Fisheries Laboratory
LOWESTOFT NR33 0HT
ENGLAND

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

- a) Identification of Atlantic salmon populations in rivers of England and Wales using allozyme variation and mitochondrial DNA clonal lines.
- b) Behavioural studies to assess the effectiveness of restocking and enhancement exercises in Atlantic salmon using above techniques.
- c) Using the above techniques, again in Atlantic salmon, to test for any relationship between genotype and the timing of migrations from and into rivers.


(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

- a) Continuation of 1a, b and c.
- b) Application of above techniques to population studies of commercially important marine species (as part of an EC-funded research project).
- c) Cooperation with University College, Cork, Ireland and the University of East Anglia, England in the development of single locus DNA probes and DNA sequencing and a comparison of the effectiveness of these and established techniques in population identification in marine species (again as part of an EC-funded research project coordinated by Lowestoft).

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date...19/2/92...

Name 

Information Form

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on activities of the members of the ICES-WG on Genetics.

Name and full address of the member signed below:

A.F. YOUNGSON
SOAFD MARINE LABORATORY
VICTORIA ROAD
TORRY
ABERDEEN AB9 8DB, UK.

(1) Actual research in fishgenetics (brief description of used techniques, aims and species of concern)

a) Work continues using protein polymorphisms to define population structure in Atlantic salmon in rivers and streams in Scotland. The relationship between geographical patterns of MEP-2 allele distribution in juveniles and seasonal patterns of return among adults is being examined. Studies of the interactive effects of MEP-2 genotype and temperature during juvenile development are in progress.

b) The deposition of ova by escaped farmed salmon was assessed following 1990's spawning, using canthaxanthin as a marker. Alevins containing maternal canthaxanthin were present in 14 of 16 western and northern Scottish rivers. Overall, 5% of salmonid alevins could be shown to have spawned by escaped female salmon.

c) Scottish salmon populations have been screened for within and between river variation in mtDNA detected by three restriction endonucleases. The distribution of maternal lineages in relation to other measures of stock structure is being assessed.

(2) Planned research in fishgenetics for the next 12 months (continued and/or new):

a) A study of the genetic population structure of Salmo trutta populations in Scotland is planned. Work will be carried out collaboratively with Queen's University, Belfast.

b) Genetic polymorphisms will be used to determine effective population size in controlled, natural populations of adult salmon. This work will also be carried out collaboratively with Queen's, Belfast.

c) Additional restriction enzymes will be assessed for their utility in revealing variation in salmon mtDNA. Methods for the non-destructive screening of mtDNA variants using PCR analysis will be developed.

In case of more than 3 different projects within pos. (1) and/or pos. (2), or, if brief explanations are wanted, please, use backside.

Deadline for return: April 30, 1992 !

Date... 14th April, 1992.

Name A.F. Youngson