Seventh International Symposium on Genetics in Aquaculture

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NON-TECHNICAL SUMMARY

1999/335Seventh International Symposium on Genetics in Aquaculture

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OBJECTIVES:

- 1. To provide an International Class Symposium on genetics in Aquaculture, covering all aquaculture species, and different genetic approaches.
- 2. To ensure a financially viable event.

NON-TECHNICAL SUMMARY:

OUTCOMES ACHIEVED

The successful staging of the Seventh International Symposium on Genetics in Aquaculture, the premier international conference for genetic experts specializing in Aquaculture, for the first time in the southern hemisphere, has led to greater exposure of the Australian Aquaculture Industries to that group. It also facilitated the development of new contacts between Australian researchers and industry members with those overseas and provided a venue for exchange of the latest information in aquaculture genetics between Australian researchers and the international community. Considerable media interest during the conference raised the profile of genetic applications in Aquaculture. Positive feedback was received from research and industry groups as to the value of the conference.

As the aquaculture industry in Australia matures, much of the increase in cost-effectiveness of production, and the increased productivity of stock, will depend on the full domestication and genetic improvement of aquaculture species. Advances in genetics are occurring at considerable speed and there is a need to establish and maintain interactions with research groups worldwide. The International Association for Genetics in Aquaculture, runs symposia every three years and is the premier international body for exchange among the aquaculture genetics community. Holding the 7th Symposium in Australia (the first time the Symposium was held in the southern hemisphere) allowed the scientific and industrial community in Australia to exchange the latest information with experts from the rest of the world.

The event was widely advertised, by announcement several major conferences prior to 2000, through appropriate internet news groups. The Symposium was held at the Jupiters Sheraton Hotel in Townsville, 15-22 July 2000. Dr J. T. Baker, Chief Scientist for Queensland, opened the conference and Prof. C. Hew from Singapore, a pioneer in fish "anti-freeze" genes gave a plenary lecture on the application of molecular biotechnology to aquaculture.

Over 140 people attended, including representatives from more than 30 countries and 93% of the attendees were authors in either oral or poster presentations. A total of 137 papers were given that dealt with the complete range of genetics as applied to aquaculture; from surveys of the genetic structure of wild stocks, and their interactions with cultured stocks; gene expression, transgenesis and molecular genetics, quantitative genetics and animal breeding, gene and genome mapping, chromosome and ploidy manipulation. The papers covered a wide range of species from salmonids through *Tilapia*, carp, flounder and tench to ornamental fish, several crustacean species including prawns and crayfish, and several mollusks including abalone, scallop, pearl oysters, edible oysters and clams. The conference proceedings were published in a special issue of Aquaculture in February 2002 (Aquaculture 204 (3-4): 185-519). An International Class Symposium on genetics in Aquaculture, covering all aquaculture species, and different genetic approaches had therefore been achieved.

Support provided by the Fishing Research and Development Corporation (FRDC), the Australian Institute of Marine Science and the State Development Agency of the Queensland Government, together with the income from registrations, covered all expenses, and ensured the event was financially viable.

KEYWORDS: Genetics, aquaculture, Aquaculture Symposium.

FINAL REPORT

1999/335

Seventh International Symposium on Genetics in Aquaculture

BACKGROUND

The aquaculture industry in Australia is worth more than 600 million dollars annually and is projected to grow rapidly in to the next century. As the industry matures, much of the increase in cost-effectiveness of production, and the increased productivity of stock, will depend on the full domestication and genetic improvement of aquaculture species.

Australia has an established record of achievement in genetics in agriculture, and has begun some genetic improvement programs in aquaculture in the last 4-5 years. However, the scientific and industrial community in Australia would benefit from information exchange with experts in the field from the rest of the world.

The Australian Institute of Marine Science secured the position to host the 7th International Symposium on Genetics in Aquaculture in Townsville in the year 2000. The International Association for Genetics in Aquaculture, which runs these symposia every three years, is the premier international body for exchange among the aquaculture genetics community, and has a membership of about 200. Previous meetings have been held in Ireland (Galway 1982), USA (Davis California 1985), Norway (Oslo 1988), China (Wuhan 1991), Canada (Halifax 1994) and Scotland (Stirling 1997).

The meeting in Townsville was the first held in the southern hemisphere. It was timely given the growing interest and investment by the Australian Aquaculture Industry and the Australian Government in genetic improvement in Aquaculture, and the fact that the first major results of research in this area by several groups in Australia (e.g. work in the Aquaculture CRC). It was thought that the Symposium would afford an excellent venue for the exposure of these results, and for exchange of information with overseas experts. Experience in agriculture is that, over the long term, returns from genetic improvement programs are large: 17 dollars for every dollar invested, or more. Within aquaculture, the return on investment in the Norwegian salmon breeding program was 17:1. The Symposium was also considered to provide a means of enhancing industry knowledge and technical skills that will underpin further cost-effective developments in the Australian Industry, so assisting industry growth and regional employment.

NEED

As the Australian Aquaculture Industry makes more use of genetic techniques, and works more with fully domesticated stocks, there is a need to be fully informed of advances in this area. To remain competitive, and to maximize the effectiveness of limited research funds, industry and government will require to identify, and access technologies developed overseas as rapidly as possible.

Advances in genetics are occurring at considerable speed and there is a need to establish and maintain interactions with research groups worldwide. The effectiveness with which this can be done is enhanced not only by demonstrating the research skills developed in Australia, but by exposure of international scientists to Australia, its aquaculture industries and research groups.

Holding the 7th International Symposium on Genetics in Aquaculture in Australia was considered to provide an excellent opportunity to provide this exposure, to establish or strengthen networks, and, by maintaining the tradition of the "Genetics in Aquaculture" Symposia, establish Australia's position in the international scene in this area of research and technology development.

The importance of this area of research and technology development was demonstrated by the demand for, and successful conduct of, a national meeting on Genetics in Aquaculture in Perth in September 1998, supported by FRDC. At that meeting the development of international interactions was identified as an important requirement for Australia.

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OBJECTIVES

- 1. To provide an International Class Symposium on genetics in Aquaculture, covering all aquaculture species, and different genetic approaches.
- 2. To ensure a financially viable event.

METHODS

Organisation, planning and sponsorship of the conference.

The company, Science and Technology Events was hired to handle the details of conference organization, with planning for marketing, scheduling and event delivery done in conjunction with the International Association for Genetics in Aquaculture Board, through the President Dr J. Benzie. Science and Technology Events contacted a wide range of businesses to act as sponsors, provide advertising or occupy trade booths at the Conference.

Marketing

The event was advertised, by announcement at the previous meeting in Stirling 1997. The principal interest group, geneticists with interests in aquaculture, were targeted by advertisement through AquaGenetics, their internet news group. In order to reach a wider audience, flyers were also placed in each of 3000 delegate's satchels at the World Aquaculture Society meeting in Sydney 1999. The meeting was advertised at the TMMP meetings in Vietnam in October 1999, the Biotechnica trade fair in Germany (the largest biotechnology trade fair in Europe) in October 1999, and other aquaculture workshops within Australia. The Conference was also advertised in Austasia Aquaculture.

Flyers were posted to all attendees of the previous Symposium at Stirling in March 1999, and a second in December 1999. A web site with electronic registration was developed at the Australian Institute of Marine Science from June 1999, and this provided updated information up to the time the conference was held.

Conduct of the event

A small expert technical committee composed of Dr. J. Benzie, Dr. K. Wilson and Dr R. Ward, was developed to assess the acceptability of contributions and to determine which were to be presented as oral or poster presentations. Written papers presented for publication in the Proceedings were subjected to full peer review as required by the journal "Aquaculture" and

following their published procedures. Dr J. Benzie and the Genetics section editor for Aquaculture, Dr G. Hulata, edited the proceedings. A set of examiners was established to score presentations by students for award of the prizes for the best oral paper and best poster.

The conference itself was held at Jupiters Hotel in Townsville, 15-22 July 2000. Consistent with the Constitution of the International Association for Genetics in Aquaculture, there were no concurrent sessions. Oral sessions were conducted from Monday 17th July to Friday 21st July, all full days except Wednesday July 19th when a tour to view Australian wildlife at a local venue, and to view research at the Australian Institute of Marine Science was undertaken. Oral presentations consisted of fifteen minutes plus five minutes for questions.

RESULTS AND DISCUSSION

Objective 1: To provide an International Class Symposium on genetics in Aquaculture, covering all aquaculture species, and different genetic approaches.

The Seventh International Symposium on Genetics in Aquaculture (ISGA) was successfully held at the beach-side Jupiters Sheraton Hotel in Townsville, Queensland in northern Australia, 15-22 July 2000.

Over 140 people attended, including representatives from more than 30 countries. This number was much less than previous Symposia where attendances had reached over 200. Initial interest in the Seventh ISGA had been as high (the number of written expressions of interest in attendance had been 220), but the considerable number of meetings held in the year 2000 and economic factors affecting student and Asian representation were considered to have affected attendance at the 2000 meeting. (Some 25% of the record attendance at the previous meeting in Stirling had been students from Europe). The participation rate at the 7th IAGA was high, however, with 93% of the attendees being authors in either oral or poster presentations.

A total of 137 papers were given in six topic areas. In order that all participants can access presentations over the breadth of topics in Genetics in Aquaculture, the meeting has no concurrent sessions. This limited the number of oral presentations to 68, but this was still about half of all presentations. There were fewer papers in gene manipulation work, but growing interest evidenced in the use of a variety of molecular markers for a range of applications, but particularly in genome mapping. Chromosome manipulation and sex determination were also reported, but by far the greater number of papers dealt with quantitative genetics and processes or analyses related to genetic improvement programs utilizing selective breeding.

Dr J. T. Baker, Chief Scientist for Queensland, who has played a considerable role in encouraging aquaculture and aquaculture research in Australia, opened the conference. He noted the continuing growth of aquaculture, highlighted its increasing range, including its potential in production of chemicals and pharmaceuticals in addition to food products. Prof. C. Hew from Singapore gave a plenary lecture emphasizing the increasing potential for the application of molecular biotechnology to aquaculture. The role of transgenics attracted considerable media attention, and the conference was widely reported in Australia.

Papers dealt with the complete range of genetics as applied to aquaculture; from surveys of the genetic structure of wild stocks, and their interactions with cultured stocks; gene expression, transgenesis and molecular genetics, quantitative genetics and animal breeding, the application of genetic markers, gene and genome mapping, chromosome and ploidy manipulation.

Aquaculture in several continents was discussed and covered a wide range of species from salmonids through *Tilapia*, carp, flounder and tench to ornamental fish, several crustacean species including prawns and crayfish, and several mollusks including abalone, scallop, pearl oysters, edible oysters and clams.

The number of papers entered for publication was smaller than the last conference, but also came from a mixture of oral and poster presentations, and provided sufficient work for those editing the proceedings. Seventeen manuscripts for publication in the international scientific journal "Aquaculture" were received at the conference. This led to delays in editing material for the proceedings as time for receipt of papers was extended to December 2000, by which time approximately thirty manuscripts had been received. Of these, twenty one were accepted after peer review, and, together with the abstracts of all the other papers presented at the conference, were published in a special issue of Aquaculture in February 2002 (Aquaculture 204 (3-4): 185-519), within twenty months of the Conference. The difference of six months from the target of publication of the proceedings within 14 months of the Conference is fully explained by the six-month wait for additional manuscripts.

Student prizes were awarded for two equal best oral performances: to K. Nakamura for her presentation on "Genetic mapping of the dominant albino locus in rainbow trout (*Oncorhyncus mykiss*)" and to M. W. T. Tanck for his presentation on "Selective breeding for stress in common carp (*Cyprinus carpio* L.) using androgenesis", and for two equal best poster presentations: to M. R. M. Coimbra for her presentation on "A genetic linkage map of the Japanese flounder, Paralichthys olivaceous, and observations on sex recombination", and to P. Ishibashi for his presentation on "All maternal chromosomes are extruded as two first polar bodies in the androgenetic clam Corbicula leana – cytochalasin D treatment".

Daily attendance by the local press resulted in stories in the local newspapers. There were daily broadcasts on ABC radio, with long stories on ABC radio national (up to 8 minutes) at the beginning and end of the week. Stories appeared in local evening TV news, with one story achieving state, and national, coverage.

Although numbers attending were reduced relative to the previous record highs at Stirling, the project met performance indicators in achieving the numbers attending in the face of the large number of conferences held in the year 2000, and the expense of getting to Australia. There were large numbers of visits to the web site, strong positive feedback from the aquaculture industry and research communities, and membership of the International Association for Genetics in Aquaculture has increased.

Objective 2: To ensure a financially viable event.

In addition to support provided by the Fishing Research and Development Corporation (FRDC), substantial support was also received from the Australian Institute of Marine Science and the State Development Agency of the Queensland Government. Together with the income from registrations, and close monitoring and regulation of costs, the income from all these sources was marginally greater than expenses.

BENEFITS

The successful staging of the premier international conference for genetic experts specializing in Aquaculture, for the first time in the southern hemisphere, has led to greater exposure of the Australian Aquaculture Industries to that group. It also facilitated the development of new contacts between Australian researchers and industry members with those overseas and provided a venue for exchange of the latest information in aquaculture genetics between Australian researchers and the international community. Considerable media interest during the conference raised the profile of genetic applications in Aquaculture. Positive feedback was received from research and industry groups as to the value of the conference.

FURTHER DEVELOPMENT

The delegates voted overwhelmingly for the next meeting to be held in Chile in 2003. The membership fees for the International Association for Genetics in Aquaculture collected as part of the registration. The membership voted they be used to develop the AquaGenetics web site to improve communication among the Association members between conferences. The international connections established at the conference in Townsville then have mechanisms to allow their continuation prior to and at the next Symposium.

CONCLUSIONS

The two main objectives of the project were achieved:

Objective 1: To provide an International Class Symposium on genetics in Aquaculture, covering all aquaculture species, and different genetic approaches.

More than 140 persons from more than 30 countries attended giving 137 papers over all aspects of genetics in aquaculture and covering several species of finfish, mollusks and crustaceans, and all the major cultured species in the world. A total of 21 papers and 116 abstracts were published after peer review in a special issue of the international journal Aquaculture. Strong press attention raised the profile of genetics in aquaculture. Links between Australian researchers and industry members with the International genetics research community were established, or strengthened, at the conference.

Objective 2: To ensure a financially viable event.

Sponsorship and income from registrations attained was sufficient to cover all costs of the Symposium.