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Gavin Chua

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ABOUT ME

I am an aquaculture researcher passionate about building the future of sustainable seafood through Integrated Multi-Trophic Aquaculture (IMTA). My work is rooted in the belief that the key to meeting global demand lies in low-trophic production. By promoting and researching nutrient cycling and ecosystem synergy, we can transform aquaculture into a truly regenerative industry.

WORK EXPERIENCE

Pescalgarve – Lagos, Portugal

Business or sector: Agriculture, forestry and fishing

IMTA Research Intern

[01/08/2024 – 01/01/2025]

1. Designed, constructed and maintained 16 500L tank experimental system with full life support system on a minimal budget.
2. Planned and ran two IMTA nutrition experiments on the inclusion of various local macroalgae in sea bream diets (Sparus aurata) focusing on health and growth performance.
3. Supported farm operations such as feed management, fish harvesting and processing, disease diagnosis and treatment.

Singapore Food Agency (Government) – Singapore, Singapore

Aquaculture Scientist

[01/09/2021 – 01/07/2023]

1. Learned how to design, construct and operate RAS and flow-through systems for both research and commercial production for tropical marine finfish with a focus on larviculture.
2. Assisted in planning and running of experiments on larviculture nutrition in Asian seabass (Lates calcarifer) and red snapper (Lutjanus malabaricus) on health and growth performance. Collected data on growth performance and implemented methods to accurately assess the spinal deformities for fish juveniles and produced reports for findings dissemination.
3. Worked on live feed production and enrichment (artemia and rotifers) managing and optimizing protocols to ensure high hatching rates and adherence to biosecurity protocols.
4. Technical transfer of knowledge and protocols of larviculture and live-feed production to local farms.
5. Executed procurement for both laboratory and larviculture consumables ensuring timely arrival of supplies for experiments
6. Developed protocols to ensure that laboratory equipment and RAS are routinely inspected and maintained ensuring constant smooth operations.

James Cook University Singapore – Singapore, Singapore

Aquaculture Club Founder and President

[01/11/2020 – 01/07/2021]

1. Founded and led a student organization promoting aquaculture and marine science and recruited executive members that helped raise the club to more than 100 active members at the end of the term.
2. Organized and led more than 10 successful events including research workshops, field trips and tutoring sessions which helped educate and increase student and public engagement and awareness of aquaculture.
3. Secured funding of more than $1500 from the student council to build a student run aquaculture research station providing students a hands-on environment to learn about aquaculture and marine science.

Marine Life Aquaculture – Singapore, Singapore

Aquaculture Production Technician

[01/09/2017 – 01/02/2018]

1. Supported nursery operations of various marine finfish species such as Barramundi (Lates calcarifer) and Fourfinger Threadfin (Eleutheronema tetradactylum), which include feeding, general husbandry, sampling, disease monitoring and grading.

Barramundi Group – Singapore, Singapore

Aquaculture Cage Diver

[01/09/2017 – 01/02/2018]

1. Assisted in grow-out operations and broodstock management for Barramundi (Lates calcarifer) focusing on health and disease monitoring.
2. Performed daily cage dives to inspect sea cage integrity, monitor fish health, and remove sick or moribund fish to maintain optimal stock conditions.

Singapore Food Agency (Government) – Singapore, Singapore

Aquaculture Research Intern

[01/04/2017 – 01/08/2017]

1. Supported daily husbandry and experimental maintenance of salinity trials involving Jade Perch (Scortum barcoo).
2. Assisted in broodstock management of Barramundi (Lates calcarifer) including induced spawning, feeding and husbandry.
3. Provided technical support in the breeding programs of various fish species including Empurau (Tor tambroides), Giant Grouper (Epinephelus lanceolatus), Silver Perch (Bidyanus bidyanus) and Cobia (Rachycentron canadum).

Oceanus Group – Xiamen, China

Aquaculture Research Intern

[01/03/2017 – 01/04/2017]

1. Assisted in grow-out operations and production of Pacific Abalone (Haliotis discus hannai) in China's largest abalone production facility
2. Sets the precedence on my passion for low trophic aquaculture production by witnessing the low feed requirement and input in the production of abalone.

PROJECTS

[01/01/2025 – 01/06/2025]

Evaluating Different Dietary Osmolytes for Performance and Disease Resistance in Whiteleg Shrimp (Litopenaeus vannamei) under Different Salinity Conditions Double Master's Degree Thesis

1. Executed feeding trials assessing growth performance (body weights, specific growth rate, feed intake, FCR, survival) and physiological parameters (hemolymph osmolality, lysozyme activity, differential hemocyte count and hepatopancreas cell conditions).
2. Adapted and incorporated novel staining protocols with photometric quantification for hepatopancreas allowing rapid quantification of hepatopancreas quality.
3. Collected, processed and analyzed biological data using R software for statistical analysis.
4. Prepared, presented and successfully defended thesis, synthesizing experimental findings into a comprehensive academic contribution.

[01/08/2024 – 01/01/2025]

Growth Performance, Coloration and Health of Gilt-head Seabream (Sparus aurata) Co-cultured with Local Species of Macroalgae (Ulva lactuca, Fucus spiralis and Gracillaria gracilis) Double Master's Degree Internship

1. Designed, constructed and operated an experimental research system from the ground up, managing infrastructure setup, logistics and system functionality.
2. Procured, acclimated, quarantined and graded seabream for stocking into the experimental research system.

3. Procured and dehydrated the three macroalgae species and coordinated with a local feed company to incorporate them into custom-formulated diets used in the feeding trial.
4. Led data collection on growth performance, coloration, survival, performed statistical analyses and prepared comprehensive reports and findings to the stakeholders.

[01/09/2021 – 01/07/2023]

Developing Protocols for the Improvement of Growth Performance, Survival and Quality of Barramundi (Lates calcarifer) and Red Snapper (Lutjanus malabaricus) Larvae Aquaculture Scientist Work

1. Planned and executed larval rearing experiments, including experimental design, scheduling, resource allocation, team coordination and oversight of daily operations ensuring successful trial implementation.
2. Developed and applied a novel protocol to quantify spinal deformities in large numbers of juveniles which enhanced accuracy in morphological assessment.
3. Managed live feed production and enrichment of rotifers and artemia ensuring optimal nutritional profiles which yielded high survival rate and quality of fish larvae
4. Processed and analyzed experimental data, preparing visual presentations and reports to stakeholders.

[01/11/2020 – 01/03/2021]

Improvement of Coloration and Growth Performance of Red Snapper (Lutjanus malabaricus) with the Inclusion of Different Levels of Dietary Astaxanthin Bachelor's Degree Thesis

1. Planned, organized and executed a comprehensive feeding trial including feed formulation and production, fish selection, transfer, quarantine and feeding and husbandry of fish during experiment.
2. Designed and implemented a novel method of quantifying fish coloration which enhanced the data accuracy and reproducibility of the experiment results.
3. Collected and performed statistical analysis of experimental data and contributed to technical writing, synthesizing findings into clear results.

[01/09/2017 – 01/02/2018]

Growth Performance of Barramundi (Lates calcarifer) Larvae on Formulated Microencapsulated Feeds Polytechnic Diploma Thesis

1. Cultured and maintained live feed organisms, including microalgae, rotifers, and Artemia, ensuring optimal nutritional quality and availability for larval rearing.
2. Assisted in the preparation of technical reports and experimental documentation, contributing to data analysis and result interpretation.
3. Presented research findings at the Young Scientist Symposium and received the Best Poster Presentation award for excellence in scientific communication.

[01/05/2017 – 01/08/2017]

Salinity Tolerance and Growth Performance of Jade Perch (Scortum barcoo) Polytechnic Diploma Internship

1. Learned how to design RAS for individual tank system and applied mass balancing principles to ensure system suitable for current and future experiment use.
2. Performed daily husbandry tasks, water quality monitoring, salinity adaptation protocols and data collection to support experimental output and fish welfare.
3. Contributed to data collection, analysis and interpretation of results to assess the effects of varying salinity levels on physiological responses and growth metric of Jade Perch (Scortum barcoo).

EDUCATION AND TRAINING

International Master of Science in Health Management in Aquaculture

Ghent University [01/09/2023 – 01/09/2025]

City: Ghent | **Country:** Belgium | **Website:** https://aquah.eu/ | **Field(s) of study:** Aquaculture ; Agriculture, forestry, fisheries and veterinary: ● Fisheries | **Final grade:** Cum Laude | **Level in EQF:** EQF level 7 | **NQF Level:** 9 | **Type of credits:** ECTS |

Number of credits: 120 | **Thesis:** Evaluating Different Dietary Osmolytes for Performance and Disease Resistance in Whiteleg Shrimp (Litopenaeus vannamei) under Different Salinity Conditions

1. Applied Statistics
2. Aquaculture Genetics
3. Aquatic Microbial Community Management
4. Diseases in Aquaculture
5. Fish and Shellfish Immunology
6. Principles of Marine Fish Larviculture
7. Viral Disease Management
8. AquaHealth Club
9. Internship Comprehensive Project

Master Aquaculture and Marine Resource Management

Wageningen University and Research [01/09/2023 – 01/09/2025]

City: Wageningen | **Country:** Netherlands | **Website:** https://www.wur.nl/en/education/master/masters-aquaculture-and-marine-resource-management | **Field(s) of study:** Aquaculture ; Agriculture, forestry, fisheries and veterinary: ● Fisheries | **Level in EQF:** EQF level 7 | **NQF Level:** 9 | **Type of credits:** ECTS | **Number of credits:** 120 | **Thesis:** Evaluating Different Dietary Osmolytes for Performance and Disease Resistance in Whiteleg Shrimp (Litopenaeus vannamei) under Different Salinity Conditions

1. Frontiers in Animal Health
2. Nutrition and Health in Aquaculture
3. Sustainability in Fish and Seafood Production
4. Academic Consultancy Training and MOS Modules
5. Master's Dissertation

Bachelor of Business and Environmental Science (Aquaculture Major)

James Cook University [01/01/2020 – 01/12/2021]

City: Singapore | **Country:** Singapore | **Website:** https://www.jcu.edu.sg/courses-and-study/courses/course/bachelor-of-business-And-environmental-science-aquaculture | **Field(s) of study:** Business, administration and law: ● Business, administration and law not further defined ; Natural sciences, mathematics and statistics: ● Environmental sciences ; Aquaculture | **Final grade:** Distinction | **Level in EQF:** EQF level 6 | **NQF Level:** 7 | **Type of credits:** ECTS | **Number of credits:** 180 | **Thesis:** Improvement of Coloration and Growth Performance of Red Snapper (Lutjanus malabaricus) with the Inclusion of Different Levels of Dietary Astaxanthin

1. Introduction to Biodiversity
2. Introduction to Environmental Economics
3. The Case for Sustainability
4. Aquaculture: Stock Improvement
5. Sustainable Aquaculture
6. Project Management
7. Environmental Processes and Global Change
8. Bachelor's Dissertation

Polytechnic Diploma in Marine Science and Aquaculture

Republic Polytechnic Singapore [01/04/2015 – 01/04/2018]

City: Singapore | **Country:** Singapore | **Website:** https://www.rp.edu.sg/sas | **Field(s) of study:** Natural sciences, mathematics and statistics: ● Natural sciences, mathematics and statistics not further defined ; Aquaculture | **Level in EQF:** EQF level 5 | **NQF Level:** 5 | **Type of credits:** Modular Credits | **Number of credits:** 120 | **Thesis:** Growth Performance of Barramundi (Lates calcarifer) Larvae on Formulated Microencapsulated Feeds

1. Marine and Freshwater Biology
2. Chemical Oceanography and Water Chemistry
3. Aquaculture Technology
4. Marine Ecology and Conservation
5. Applied Genetics and Fish Breeding
6. Health Management of Marine and Freshwater Organisms
7. Fisheries and Farm Operations
8. Aquaculture Production
9. Feed Formulation and Nutrition
10. Seafood Handling, Processing and Food Safety
11. Polytechnic Diploma Dissertation

LANGUAGE SKILLS

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

Chinese

LISTENING A2 **READING** A2 **WRITING** A1

SPOKEN INTERACTION A2

Dutch

LISTENING A2 **READING** A2 **WRITING** A2

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A2

Portuguese

LISTENING A1 **READING** A2 **WRITING** A1

SPOKEN PRODUCTION A2 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PUBLICATIONS

[2024]

Development of Hatchery Technology for Red Snapper (Lutjanus malabaricus) During my work as a Aquaculture Scientist at SFA, we carried out research into the improvement of red snapper larviculture. We assessed multiple factors such as husbandry (light intensity, photoperiod, aeration, greenwater density, etc) and nutrition (enrichment of livefeeds). The factors developed to ascertain quality fingerlings was survival, deformity rate and float test. I proposed and developed a system that uses diaphonization to assess the deformity rates and to quantify the deformity amount which has not been used in Singapore before in this application. This made the assessment exponentially faster and more accurate.
This research was not published as it was not the goal of the aquaculture centre but rather to help solve and support the local farmers in increasing aquaculture production and consequently increase our nation's food security.

Authors: Chee Boon Amos Koh, Wei Li Quek, Rudy Hidajat, Henry HeYong, Shi Wei Gavin Chua, Yek Seng | **Journal Name**: Singapore Food Agency

[2023]

Comparative transcriptome analysis reveals factors involved in the influence of dietary astaxanthin on body colouration of Malabar Snapper (Lutjanus malabaricus) During my bachelor's program, I opted to undertake a research thesis which was not the norm as it required significantly larger effort and commitment. I proposed to test the effects of feed additives on the skin pigmentation of another species of fish but with discussion, settled on the red snapper due to it's relevance and interest in Singapore. I carried out the planning, procurement of fish, quarantine, development of color quantification protocol, managed two interns and ran the experiment from start to finish whilst studying for other subjects.
We collaborated with the government research facility (MAC) and tan a similar trial co-currently however, the data proved difficult to used and we used the data solely from the trial I ran instead. The project was a success and it was my first instance of running a research trial which gave me tremendous experience in trial planning, execution and writing.

Authors: Zhi Weng Josiah Poon, Xueyan Shen, Joseph Angelo Uichanco, Celestine Terence, Shi Wei Gavin Chua, Jose A. Domingos | **Journal Name**: Aquaculture | **Volume, Issue and Pages**: 562 | **Publisher**: Aquaculture

[2017]

Jade Perch (Scortum barcoo) Salinity Tolerance Assessment During my polytechnic internship, I was at the Marine Aquaculture Centre where I was tasked to carry out an experiment evaluating the growth performance of Jade Perch (*Scortum barcoo*) at different salinity conditions. This was done to see if they could adapt to marine production in the local waters of Singapore. During this, I was taught how to construct a simple RAS for each experimental tank (as seen in the URL), how to maintain such a system, undertaking daily fish husbandry and data collection.
This research was not published as it was not the goal of the aquaculture centre but rather to help solve and support the local farmers in increasing aquaculture production and consequently increase our nation's food security.

Authors: Xiao Xu, Shi Wei Gavin Chua, Liang Bing | **Journal Name**: Singapore Food Agency

[2024]

Application of RAS Technology in Hatchery Production During my work as an Aquaculture Scientist at SFA, we had to design, construct and operate multiple RAS for different applications ranging from small 5m3 to >30m3 systems. To adapt, I had to learn the theory of RAS from the "RAS handbook" by Timmons and apply this theory immediately. Not only this, we had to main complicated multi-million dollar RAS that utilizes ozone, automatic backflushing, sensors and oxygen generation, all of this skill we had to learn as problems arose. I was in charge of designing a procurement tender for a new RAS for both hatchery and broodstock system which required very accurate demands on system specifications and we did our mass balancing calculations

in-house to ensure that the demands are met.
This research was not published as it was not the goal of the aquaculture centre but rather to help solve and support the local farmers in increasing aquaculture production and consequently increase our nation's food security.

Authors: Chee Boon Amos Koh, Wei Li Quek, Rudy Hidajat, Henry HeYong, Shi Wei Gavin Chua, Ng Yek Seng | **Journal Name**: Singapore Food Agency

CONFERENCES AND SEMINARS

[22/11/2022 – 02/12/2022] Singapore
World Aquaculture Singapore During this conference, I presented my research on the "effects of different feed inclusion levels of astaxanthin and capsanthin on the skin pigmentation of Red Snapper (*Lutjanus malabricus*)".

[07/03/2018 – 07/03/2018] Singapore
Young Scientist Symposium During this symposium, I presented my research (in poster form) on the "Growth Performance of Barramundi (Lates calcarifer) Larvae on Formulated Microencapsulated Feeds" of which I was awarded a Certificate of Merit.