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The marine finfish aquaculture industry requires large numbers of larvae growing in a healthy environment available throughout the year. We know that the most important commercial fish has external fertilization with floating eggs. Furthermore, after fertilization, the embryo continues to develop using the vitelline reserves provided by the mother, but this embryo is exposed to many ambient changes before hatching. Sometimes these changes negatively affect the eggs and prevent larval hatching. After hatching, the permanent transformation of the larva's internal organs and external structures begins. Depending on the species and water temperature, as early as the first day after hatching, larvae assemble their sensory systems, digestive tract, urinary system, visual system, circulatory system, and central nervous system. The next day after hatching, the larvae start to test all their new systems for locomotion, feeding, and digestion including intestinal peristaltic contractions, elaboration of their vascular system, blood/monocyte circulation, and gut enzyme secretion in preparation for the first feeding stage. This stage is one of the most important stages for future survival. The energy and nutrients they demand to maintain their development and growth are very high and precise, so any failure or lack of adequate food manifests itself as developmental alterations, reduced growth, pathogen susceptibility, body malformations, and any failure or lack in the supply of adequate food manifests itself as developmental alterations even massive mortality. Therefore, in aquaculture, the difficulties to raise and feed fish larvae make one of the most critical and exciting phases that can limit the juvenile's final production. Therefore, to get a better understanding of each larvae stage, we use development, histology, biochemical, and molecular approaches to study and integrate our basic research to increase our knowledge, which in turn facilitates the development of state-of-the-art management strategies leading to develop technologies that optimize larval grow-out. Our research models include commercially important food fish such as snook, red snapper, and red drum, and a promising specie for live bait production, the Atlantic croaker. My laboratory is focused on applying knowledge gained from our basic studies to improve the aquaculture industry. This new Whitney aquaculture program has research-based knowledge transfer and reproductive management practices for producers and professionals worldwide.

Education

January-December 2010 (Mexico)	Postdoctoral fellow Universidad Nacional Autónoma de México, UMIDI-Sisal, Mérida, Yucatán.
January-December 2009 (E.U.)	Postdoctoral fellow in Reproduction and Cultivation of Larval of Marine Fish, Marine Science Institute, Port Aransas, Texas; University of Texas
August 2005 - July 2008	Ph.D. in Science Research Center in Food and Development, CIADMazatlán Specific Area, Reproduction of Marine Fish Period
August 2002 - July 2004	Master's in science, Research Center in Food and Development, CIAD Mazatlán, Reproduction of Marine Fish
1991-1996	Lic. In Aquaculture Biology Universidad Autónoma de Sinaloa, Facultad de Ciencias del Mar

Professional Experience

2022-Present	Assistant Professor of Forest, Fisheries, and Geomatic Sciences, Whitney Laboratory for Marine Bioscience, University of Florida
2019-2022	Research Scientist, Whitney Laboratory for Marine Bioscience, University of Florida
April 2011-2019	Research Centre in Food and Development, CIADMazatlan 1) Leader for the Marine Fish Breeding and Reproduction Laboratory (Research program) 2) Hatchery Manager for the Pilot-Commercial Plant of Juveniles of Marine fish (Production Program)
2004-2005	Research Centre in Food and Development, CIADMazatlan, Handling on Breeding of Marine Fish
1998-1999	Fish Industrialized S.A. de C.V. (PINSA), Mazatlan, Sinaloa, Production Supervisor
1997-1998	Shrimp Farm Biomar I, Las Grullas Margen Derecha Manager of Production
1996-1997	Cia. Embotelladora del Pacifico (COCA-COLA) Mazatlan, Sinaloa, Operator of Plant of Wastewater Treatment

Training

2018	Sabbatical Stay, University of Miami Department of Marine Ecosystem and Society Rosenstiel School of Marine & Atmospheric Science
August-December 2007	Darwin Aquaculture Centre of Darwin Australia, in intensive production of juveniles of barramundi <i>Lates calcarifer</i> (Bloch).

Publications

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- Galkanda Arachchige Harsha, S. C., Davis, R. P., Nazeer, S., Ibarra-Castro, L., and Davis D. A. 2021. Effect of salinity on growth, survival, and serum osmolality of red snapper, *Lutjanus campechanus*. *Fish Physiol Biochem* doi. org/10.1007/s10695-021-01009-5
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Larios-Soriano, E., Re-Araujo, A. D., Díaz, F., Lopez-Galindo, L. L., Rosas, C., Ibarra-Castro, L. 2021. Effects of recent thermal history on thermal behaviour, thermal tolerance and oxygen uptake of Yellowtail Kingfish (*Seriola lalandi*) juveniles. Journal of Thermal Biology 99, 103023. <https://doi.org/10.1016/j.jtherbio.2021.103023>

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Angel Humberto Rojo-Cebreros, Ibarra-Castro Leonardo, Ernesto Guerrero-Carlock, Juan Luis Sánchez-Téllez and Luis Alvarez-Lajonchère. 2017. Pilot-scale production of the rotifer *Brachionus sp.* under different culture systems. *Revista de Biología Marina y Oceanografía*, Vol. 52, N°3: 539-549.

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Guillermo-Galindo R. J. Medina-Jaso M.A., Villagrana C. and Ibarra-Castro L. 1997. Environmental and pollution condition of the huizache-caimanero lagoon, in the north-west of Mexico. *Marine Pollution Bulletin*, Volume 34, Issue 12, December, Pages 1072-1077.

Books, Chapter Books and Manuals

Chapter 5. Ángel H. Rojo-Cebreros, Ibarra-Castro Leonardo, Juan M. Martínez-Brown, Gabriela Velasco-Blanco, Miguel A. Martínez-Téllez, María A. Medina-Jasso, Mario Nieves-Soto, Delia Quintana-Zavala. 2018. Potential of Nannochloropsis in Beta Glucan Production. In book: *Nannochloropsis: Biology, Biotechnological, Potential and Challenges Edition: Chapter Book*.

Book: Producción de Huevos, Larvas y Juveniles del Pargo Flamenco, *Lutjanus Guttatus*. L. Alvarez-Lajonchere, M. I. Abdo de la Parra, N. Duncan, A. García Ortega, E. Fajer Ávila, L. Ibarra Castro, N. García Aguilar, L. E. Rodríguez Ibarra, G. Velasco Blanco, A. Puello Cruz, B. González Rodríguez. *Unidad Mazatlán en Acuicultura y Manejo Ambiental Centro de Investigación en Alimentación y Desarrollo*. A. C.

Chapter Book: L. Alvarez-Lajonchere, M. A. Avilés-Quevedo, F. Castelló-Orvay, Ibarra-Castro L. y M. I. Abdo de la Parra. 2013. Cultivo de pargos, Familia Lutjanidae. In *La piscicultura Marina en Latinoamérica: Bases Científicas y Técnicas para su Desarrollo*. ISBN 978-84-475-3436-4. Pages 178-192.

Chapter Book: L. Alvarez-Lajonchere, Mônica Y. Tsuzuki y Ibarra-Castro L. Cultivo de robalos, Familia Centropomidae. In *La piscicultura Marina en Latinoamérica: Bases Científicas y Técnicas para su Desarrollo*. ISBN 978-84-475-3436-4. Pages 231-245.

Chapter Book: Neil Duncan, Zohar Ibarra-Zatarain, Crisintema Hernandez, Noemí Garcia, Gabriela Velasco-Blanco, Estela Rodriguez-Ibarra, Ibarra-Castro L., Gustavo Rodriguez, Isabel Abdo de la Parra, Juan Carlos Quintana-Casares, Ana Roque, Gabriela del Valle. 2010. Maduración del pargo prieto (*Lutjanus novemfasciatus*) en cautiverio. "Avances en Acuicultura y Manejo Ambiental" Centro de Investigación en Alimentación y Desarrollo. Pages. 39-56.

Chapter Book: L. Alvarez-Lajonchère, M. C. Chávez-Sánchez, M.A. Reina-Cañez, M.A. Camacho-Hernández, M. I. Abdo-de la Parra, N. García-Aguilar, Ibarra-Castro L., L. E. Rodríguez-Ibarra, E. J. Fajer-Ávila, G. Velasco-Blanco, A. Puello Cruz, B. González Rodríguez y A. Ibarra-Soto. 2011. Evolución de la escala experimental a la piloto para las tecnologías de producción de juveniles de peces marinos en la Unidad Mazatlán del CIAD A.C. "Avances en Acuicultura y Manejo Ambiental" Centro de Investigación en Alimentación y Desarrollo. Pages. 17-38.

Editing and Arbitration

-Review Editor on the Editorial Board of Aquatic Physiology (specialty section of *Frontiers in Marine Science and Frontiers in Physiology*) since 2022.

-Review Editor on the Editorial Board of Developmental Physiology (specialty section of *Frontiers in Physiology*) since 2020.

-Member of the Evaluation Committee of the Marine and Coastal Sciences Journal of the National University of Costa Rica, 2014.

-Participation in the Academic Committee as Evaluator (Autonomous University of Nayarit).

-Member of the CONACyT Register of Accredited Evaluators (RCEA).

-Member of the Editorial Committee of *Hidrobiológica*, since September 17, 2012.
Reviewer for different journals such as, *Aquaculture*, *aquaculture Research*, *North America journal of Aquaculture*, *Aquaculture Reports*, *Animals*, *Fishes*

Conferences and Courses Taught

Aquaculture 2022, February 28 - 4, 2022 - San Diego, California, International Conference & Exposition. Different experiences at first feeding in juvenile fish production for several marine species.

XIX National Congress of Oceanography, from 21 to 23 September 2016, Institute of Marine Sciences and Limnology of the National Autonomous University of Mexico, Mexico City. Master Lecture: Advances and implications in the production of juvenile marine fish: *Ocyurus chrysurus*, *Centropomus undecimalis*, *Lutjanus guttatus*.

Third Economic Forum on Fisheries and Aquaculture "Aquaculture: An alternative for food in Mexico" 25 and 26 November 2013, Mexico City. Master Lecture: Massive Production of Snapper and its Operating Costs.

XII International Symposium on Aquaculture Nutrition. November 20 - 22, 2013, Villahermosa, Tabasco, Mexico. Master Lecture: Pilot-Commercial Level Production of the Flamingo Snapper *Lutjanus guttatus* (ESTEINDACHNER, 1869) in CIAD A.C. Unit Mazatlan.

11th INTERNATIONAL AQUAMAR. Mazatlán Sinaloa Mexico 6, 7 and 8 November 2013. Master Lecture: Production of snapper at the CIAD-Mazatlán Unit.

Centre for Research in Food and Development, A.C. November 30, 2011. Conference: Massive production of snapper First experience on growing of snapper in floating cages in Mazatlán Sinaloa Mexico.

National Autonomous University of Mexico, Institute of Sea Sciences and Limnology Academic Unit Mazatlán. 21-January-2011. Conference: Technologies in the reproduction and culture of marine fish.

5º International Forum of Aquaculture, Hermosillo 2010, Noviembre 10, 11 y 12.

Master Lecture: Reproduction and larval rearing of snook *Centropomus undecimalis*. This paper was awarded the second place as the best proposal of the 1st. International fair of technological offers for the aquaculture, fishing and processing industry (FITEC-AQUA)

Postgraduate Course (Theoretical-Practical): Reproduction in marine fish. UNAM-Postgraduate in Marine Sciences and Limnology, 4 to 13 October 2010, UMDI UNAM, Sisal, Yucatan.

2nd International Symposium on Biology and Cultivation of Snook, 13 al 15 de Julio de 2009 Villahermosa, Tabasco, México. Master Lecture: Culture of Asian sea bass (*Lates calcarifer*) in Australia.

4th International Forum on Aquaculture, Guadalajara 2008, October 29, 30 y 31.

Master Lecture: Production and larval rearing: One Experience in a Pilot commercial laboratory from Australia.

National Fisheries Institute, Patzcuaro Michoacan Mexico. May 26, 2008.

Conference: Intensive Production of Barramundi *Lates calcarifer* in the center of Aquaculture Darwin, Northern Territory of Australia.

Technological Institute of the Sea No. 2, Mazatlan Sinaloa Mexico. February to June 2007. Course: Reproduction of Marine fish.

Autonomous University of Sinaloa, Faculty of Sciences of the Sea, Mazatlán Sinaloa Mexico. November 23, 2005. Conference: Reproduction of Marine fish in captivity

Technological Institute of the Sea No. 6 Bahía de Banderas, Nayarit Mexico. May 27 2004. Conference: Use of hormones for Induction of spawning fish

Courses and Conference Assistance

XIX National Congress of Oceanography, from 21 to 23 September 2016, Institute of Marine Sciences and Limnology of the National Autonomous University of Mexico, Mexico City.

Third Economic Forum on Fisheries and Aquaculture "Aquaculture: An alternative for food in Mexico" 25 and 26 November 2013, Mexico City.

Nutrition Congress: XII International Symposium on Aquaculture Nutrition, 20 - 22 November 2013, Villahermosa, Tabasco, Mexico.

11th AQUAMAR INTERNACIONAL, Mazatlán Sinaloa Mexico 6, 7 and 8 November 2013.

5º International Forum of Aquaculture, Hermosillo 2010, Noviembre 10, 11 y 12.

2º Symposium International about culture and Biology of Snook, 13 al 15 de Julio de 2009 Villahermosa, Tabasco, México.

Course: Engineering Applied to the Design and Operation of Units of Aquaculture production Date: 24 to 29 May of 2010

Universidad Católica del Norte, Chile

Universidad Marista de Mérida, México

Instructor: PhD: Germán Merino, Ing. Joel Barraza and C. Dr. Marcelo Araneda

4º International Forum of Aquaculture, Guadalajara 2008, October 29,30 y 31. Third National Meeting of the Network of Cultivation of Marine fish.

Congress of Nutrition: Advances in Nutrition Aquaculture. VIII International Symposium on Nutrition Aquaculture, 15-17 November 2006, Mazatlan, Sinaloa, Mexico.

Course: Digestion and Enzymology Applied to the cultivation of Fish

Date: January 10 2006

Universidad Autónoma de Sinaloa Facultad de Ciencias del Mar

Taught by: Dr. Alfonso Álvarez

Course: Course of Operation and Maintenance of the Plant of Wastewater Treatment of Embotelladora del Pacifico S.A. De C. V., Made from 20 to 24 May 1996

Taught: Hawk International Ecological Projects S.A. de C. V., Ing. José Alfredo Orozco G. Project Manager

Course:

National Seminar on Science and Technology Shrimp

Made from 29 to 31 May 1993

Mazatlán, Sinaloa. 31 may 1993

Technical Reports

Final Technical Report About The "Feeding Demonstration" In The Pilot Production Plant Of Marine Fish At CIAD A.C. Mazatlan Unit. 2014.

Development model, Report on "Demonstrative Unit and Technological Transfer for the Growing of the Flamingo Snapper", 2013-2014.

"Validation of snapper growing production models". 2013-2014.

Research Support:

Project: "Aquaculture Production of Red Snapper, *Lutjanus campechanus*"