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Argentine scientist has a Fisheries Development Institute internship

MATÍAS SCHWARTZ, IS NATIONAL FISHERIES AND DEVELOPMENT RESEARCH INSTITUTE, IN ARGENTINA, (INIDEP) RESEARCHER. AS A PROFESSIONAL HE CARRIED OUT AN INTERNSHIP, WHICH CONSIDERED ONE WEEK IN OCTOBER, WORKING TOGETHER WITH IFOP RESEARCHERS.

Francisco Cárcamo, Repopulation and Culture Department head indicated "within the framework of the collaboration agreement that IFOP maintains with INIDEP, Matías contacted us so that we could train him in management techniques and laboratory bivalves larval development.

Matías Schwartz, works in the Patagonian scallop fishery (*Zygochlamys patagonica*) and has been experimenting with this species for a couple of years under controlled laboratory conditions to develop the complete biological cycle, which is still unknown for this species. In Argentina, Patagonian scallop banks are found at depths ranging between 80 and 100 meters, on the edge of the



Matías Schwartz, researcher at the National Institute of Fisheries Research and Development, in Argentina.

continental shelf, in the Malvinas Current waters with temperatures close to 7.5 °C. This species is also of commercial fishing importance in Chile's southern zone and is known as Patagonian oyster.

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The training work was mainly concentrated in IFOP's Hueihue Experimental Center, located on Chiloé Island, and was at Carlos Muñoz Center's head charge, who has extensive experience in invertebrate cultures in hatchery. Muñoz explained that "we worked with two species of scallops, northern oyster (*Argopecten purpuratus*) and another species that locally name it as a Chilote oyster, but that could be a Patagonian oyster according to the latest taxonomic revisions. For both species and based on the technique of seed



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IFOP participated in the first “Plogging” run in Valparaíso

On Sunday, November 25th, Fisheries Development Institute cooperated in the 1st “Plogging” run in Chile. The collaboration in the activity was a response to an invitation made by the National Fisheries and Aquaculture Service to commemorate the International Fishing Day. It was developed on Caleta Portales coastal edge in Valparaíso city.

“Plogging” concept comes from the union of the terms running (running) and collecting (plocka upp – Swedish expression), which was born as an idea in Stockholm to combine sports and care for the environment. It has been replicated in different parts of the planet in more than 100 countries. The “runners” provided with an organic bag and gloves ran back and forth from the coastal edge in front of the Industrial School, passing through the Caleta Portales to the area of Cerro Barón along the coast. After the tour the garbage collected was sorted and disposed in different containers for organic waste, glass, cardboard and plastics.

The project Research and monitoring program of discarding and incidental capture in pelagic fisheries was part of this event with the purpose of disseminating the problem of fishing discarding and incidental capture of mammalian and marine turtles, together with a campaign to raise awareness on the importance of preventing pollution by inorganic and / or plastic waste that is thrown irresponsibly into the sea, with emphasis on microplastic impact on the marine environment, fishing resources and eventually on human health. The stand also featured various graphic elements and gifts for attendees such as eco-bags, coloring books, bowls, calendars and posters. The researcher Luis Ossa Medina, said “the importance of these activities is that they are opportunities to show off our work and educate the community in aspects related to fishing activity impact on marine ecosystems.”

production of the northern oyster *A. purpuratus*, breeding methodologies, induction of spawning, fertilization, selection and maintenance of first larval stages were applied. The short but successful period of practical training was complemented with talks in which an attempt was made to transfer much of the accumulated experience in obtaining seed of this pectinid and other resources with which it has worked in the Hueihue Experimental Center.

Additionally, Schwartz learned about the work carried out by other groups of professionals within IFOP Aquaculture Research Division.



IFOP researcher presented work at Aquaculture International Congress in Colombia

ON BEHALF OF FISHERIES DEVELOPMENT INSTITUTE, DR. PABLO ROJAS VENEGAS, SENIOR RESEARCHER AT ENVIRONMENT DEPARTMENT, ATTENDED PRESENTING HIS RESEARCH "EUTROPHYING PROCESSES AT INTERIOR SEA OF CHILOÉ: HYDRODYNAMIC AND BIOGEOCHEMICAL MODELS COUPLING" WITHIN THE SESSION WHICH CORRESPONDS TO THE AQUACULTURE AND ENVIRONMENT TOPIC.

Between October 23rd and 26th in Bogotá, Colombia, Latin American & Caribbean Aquaculture 18 (LAQUA 18), "Aquaculture for Peace" organized by the World Aquaculture Society and the National University of Colombia, was held. The activity brought together researchers from Latin American countries, the US, Europe and Asia. Likewise, and in parallel, an International Exhibition was held with the participation of international suppliers of aquaculture, showing the latest advances in terms of equipment, supplies and services.

Representing IFOP, Dr. Pablo M. Rojas Venegas, senior researcher at Environment Department, presented his research (orally) "EUTROPHYING PROCESSES IN INLAND CHILOÉ: HYDRODYNAMIC AND BIOGEOCHEMICAL MODELS COUPLING" this lecture was included at the aquaculture and environment session.

Dr. Rojas explained "The presentation aim was knowing causes and consequences caused (on water quality and condition of the associated benthic system) a notable increase in the contributions of nutrients (eutrophication) from productive activities that they develop in Inland Sea of Chiloé.

To address this problem, the research incorporated oceanographic criteria, as well as quantitative modeling tools (hydrodynamics and biogeochemistry) to evaluate impact of organic matter and metabolic waste incorporation into the aquatic environment as a result of the productive activities carried out in the zone".



IFOP has an outstanding participation in an international conference on harmful algae held in France

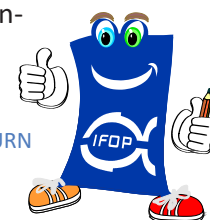
THE ACTIVITY IS THE MOST IMPORTANT THAT DEVELOPS WORLDWIDE ON HARMFUL ALGAL BLOOMS

The Eighteenth International Conference on Harmful Algae (ICHA) was held from 21th to 26th October 2018 in the city of Nantes, France, bringing together more than 750 participants from 64 countries. In this Conference, 7 researchers of the Harmful Algal Studies Center (CREAN) of the Institute of Fisheries Development (IFOP), presented 6 oral presentations and 3 posters, about various themes of Harmful Algal Blooms (FAN), covering four main topics: Biological oceanography, Ecology, Global Change and Impact of microalgae on Aquatic Organisms.

The instance, allowed to update knowledge status and to discuss importance and impact caused by harmful algal blooms in aquaculture environments of different regions of the world. In addition, to value the numerous participation of CREAN of IFOP during this congress, which positions it as the national institution that presented more work in the most important conference worldwide on FAN. The nineteenth conference is scheduled to be held in Mexico in October 2020.

Presentations

Two were carried out in the session "Biological Oceanography and Limnology on Harmful Algal Blooms" where researchers Leonardo Guzmán M. and Oscar Espinoza G. presented research works related to atmospheric and oceanographic processes in the distribution and abundance of *Alexandrium catenella* in the northern area of the fjords,



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Chilean and Argentinian Scientific institutes will carry out joint investigations in austral seas

On Tuesday, October 23rd, directors of the Austral Center for Scientific Research (CADIC) Gustavo Ferreyra and Fisheries Development Institute (IFOP) Luis Parot, together with CADIC researchers, met in Ushuaia city of Argentina: Gustavo Lovrich, Federico Tapella, Irene Schloss and from IFOP Eduardo Almonacid and Erik Daza.

The day's objective was to identify scientific-technical research areas to project a collaborative work in southern marine ecosystems. Since the end of 2016 both institutions have strengthened ties that they hope to formalize in the signing of an agreement during the first semester of 2019.

Gustavo Ferreyra added "this work model is in line with bilateral approach policies in basic and applied scientific research that both countries are currently developing. In the particular case of the Beagle Channel, initiatives such as this one are fundamental for biodiversity conservation and sustainable exploitation of marine and terrestrial living resources".

Luis Parot declared "scientific research on the resources we share is essential to understand their behavior, protecting them ensures their sustainable exploitation. This first step opens up enormous possibilities of joint work in the Austral and Antarctic Zone".

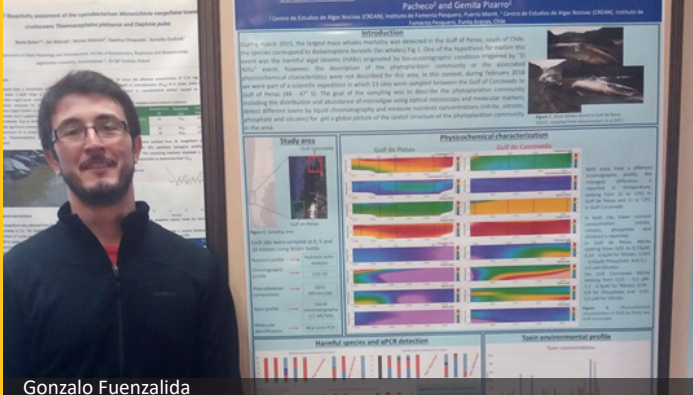
including the Pacific Ocean, both of the flowering occurred in 2016 and that registered during 2018.

In the session "Ecology – from Ecological Niche to Population Dynamics and Biogeography", researchers, Gemita Pizarro N. and Pamela Carbonell A. presented about decadal and bi-decadal distribution of harmful species in Magallanes region and on the "Toxicity and toxin content of *Alexandrium catenella* in natural populations of southern Chile", respectively.

In the session on "Ecology – Harmful Algae and Global Change", researcher Rodrigo Martínez G., presented a work related to "Large-scale climatic patterns and their relationship with harmful algae blooms in fjords and channels of southern Chile.

Finally, in the session on "Impact of Microalgae / Cyanobacteria on Aquatic Organisms, (including Fish and Shellfish Mortality)", the researcher Jorge Mardones S., presented a contribution about the growth dynamics and ichthyotoxicity of *Pseudochattonella verruculosa*, microalgae responsible for the massive mortality of salmonids in the summer of 2016.

Regarding contributions in poster format, researchers Gonzalo Fuenzalida D., Gemita Pizarro N. and Carolina Toro R. presented research works related to the "Mortality of whales in the Gulf of Penas and the possible responsibility of microalgae", "Abundances of the microfitoplankton and *Alexandrium catenella* in relation to climate-oceanographic indices in the region of Magallanes "and" Harmful species associated with massive mortalities of Atlantic salmon during their transport through the Gulf of Penas", respectively.



Gonzalo Fuenzalida



Oscar Espinoza



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Research on sea lice amaze attendees at 12th International Sea Lice Conference

MARGARITA GONZÁLEZ, MARINE BIOLOGIST AND PHD IN SCIENCES OF AQUACULTURE, PRESENTED HER RESEARCH WORK ON CALIGUS ROGERCRESSEYI PARASITE. THE TWO RESEARCHES CORRESPONDED TO "SURVEILLANCE OF THE RESISTANCE OF CALIGUS ROGERCRESSEYI TO ANTIPARASITIC AGENTS APPLIED IN THE NATIONAL SALMON FARMING", A PERMANENT PROGRAM EXECUTED BY IFOP DEPARTMENT OF HYDROBIOLOGICAL HEALTH PROFESSIONALS AND TECHNICIANS, FINANCED BY THE MINISTRY OF ECONOMY.

Between November 4th and 8th, the 12th International Sea Lice Conference 2018 was held in Punta Arenas, Chile. IFOP was represented by researchers Margarita González, Loreto Ovalle, Paola Olmos, Juan Pablo García and Sergio Contreras. Dr. Margarita González, in charge of research, commented "the event allowed us to make IFOP's research work known internationally, in addition to being able to interact with researchers in the area related to the parasite, in order to know new studies that are being carried out. lately, together with valuable information applicable in our research works. This conference brings together people from different countries, including Canada, Norway, Ireland, USA, Japan, Australia, Chile, among others.



The first research work was presented in an oral presentation format, called "Susceptibility to azamethipruses of *Caligus rogercresseyi* from native fish *Eleginops maclovinus*", shows susceptibility determination *C. rogercresseyi* variants profile obtained from native bass fish compared to parasites profiles obtained from salmon farming. The results suggest that susceptibility profile of *C. rogercresseyi* from *E. maclovinus* corresponds to one of high susceptibility to antiparasitic azamethifos.

The second work was presented in poster presentation format, called "Species *Caligidas* in fish *Eleginops maclovinus* and its transmission to *Salmo salar*" in which it is described that *Lepeophtheirus* sp. proportion was higher than *C. rogercresseyi* proportion in native fish *E. maclovinus*, being the transmission between native fish and salmonid fish lower than among individuals snook. Although transmission was low, population of *C. rogercresseyi* increased successfully when cultivated in Atlantic salmon, reaching a high parasitic number when environmental conditions are ideal.

Finally, Margarita González was invited to participate as an exhibitor in the technical workshop "Bioassay standardization", held on the last day of the congress, which aimed to update the international manual for the evaluation of sensitivity in sea lice.

Caligidosis is a disease caused by the ectoparasite *Caligus rogercresseyi* that inhabits marine and estuarine waters of Chile, parasitizing farmed salmonids and generating economic losses related to treatment costs, among others.



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Paola Olmos y Margarita González

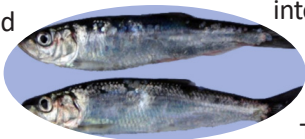
FIPA Project: Subpesca implements ecosystemic approach in southern sardine fishery in Los Lagos

BLUE FISH CAPTURE IS CARRIED OUT, ENTIRELY, BY AN ARTISANAL PURSE SEINE FLEET, AT THE REGION'S INTERIOR WATERS.

The purpose of an international methodological workshop held in Valparaíso was to show foreign and national researchers Subpesca (FIPA) project developed by Fisheries and Aquaculture Research Fund, focused on the implementation of an ecosystemic approach in the southern sardine fishery of Los Lagos Region inland waters “.

The meeting was conducted by the Subsecretary of Fisheries and Aquaculture (Subpesca), altogether with the Oceanographic Research Center of the University of Concepción.

Sergio Neira, Oceanographic Research Center of Universidad de Concepción researcher, explained that “in this project we are evaluating the situation in which we are dealing with countries with a greater fishing tradition and that are more advanced in this subject, to see also in what position we are in and how we move forward in the short and long term to apply the ecosystemic approach in Chilean fisheries.”



One of the speakers, Dr. Mimi Lam, researcher at the Institute for Oceans and Fisheries of the University of British Columbia, said: “There are very committed people in the workshop, which is very exciting for me, because there are representatives from different sectors interested in the ecosystem approach in fisheries. The current challenge is implementation, going from theory to practice.”

“Through this approach application we will be able to better understand what is happening in the different ecosystems and ensure the development of fishing activities,” said Lam.

In turn, Carlos Montenegro, IFOP fisheries evaluation department head, expressed his satisfaction regarding the realization of these instances, indicating that also as an institute they are developing research lines under ecosystemic approach: “All Chilean institutions are realizing the importance of this vision in fisheries and aquaculture “.



Jurgen Betzhold, Los Lagos Fisheries and Aquaculture zone director and president of the southern sardine management committee, said that the workshop “is very relevant for the Undersecretariat, since it is progressing in a concrete way, from FIPA project, in incorporating the ecosystemic approach mandated by the latest modification of the Fisheries Act to the southern sardine fishery “.

Also, Víctor Espejo, Subpesca professional and member of management committee for this species, said that “this research work was designed three years ago and intends to organize all the efforts that are being made, providing a route for the future of fishery and its approach”.

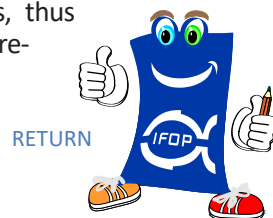
The southern sardine is a blue fish with high nutritional value. Resource capture is carried out, entirely, by an artisanal purse seine fleet, in inland waters of the Los Lagos Region.

SIBECORP was a success

THE V IBERO-AMERICAN SYMPOSIUM ON REPRODUCTIVE ECOLOGY, RECRUITMENT AND FISHERIES SIBECORP, WAS HELD IN IQUIQUE, CHILE, FROM NOVEMBER 5 TO 9

It was organized by the Faculty of Renewable Natural Resources of Universidad Arturo Prat and Fishing Promotion Institute with Ibero-American Fishing Research Network (INVIPECA) support-

Carolina Hernández, IFOP researcher and event organizer explained “the activity was a success, since it allowed us to share experiences and knowledge with colleagues from different countries, thus allowing cooperation in fisheries research”.



The event responds to Latin American researchers concern to promote collaboration among their countries, due to the importance of marine and continental fisheries as a vital economic resource for Latin America, Spain and Portugal. The main objective is to identify and define lines of research of common interest and encourage joint projects that promote cooperation among countries in the field of fisheries research.

IFOP Research Works

“Interannual variation of reproductive process in three fins hake (*Micromisistius Australis*) in extreme south of Chile between 1997 and 2017”, by

Authors: Claudio Bernal, Carola Hernández, Luis Adasme and Rodrigo San Juan, changes of three fins hake reproduction process date and duration for the last 20 years. This resource is overexploited and is captured from the Lagos region to the Magallanes region in southern Chile.

Reineta (*Brama australis*): Reproduction and hypothesis about its life cycle in the Pacific Ocean

Authors: Elson Leal, Eduardo Diaz, Gabriel Claramunt, Sergio Neira

Information on reproductive traits of Reineta and its life cycle is scarce. Through reproductive tissue analysis, it was confirmed, as in previous studies, that females mature on average at 38 cm in length. Based on the absence of specimens in recent reproductive activity, in this and other studies, the possibility arises that the main reproductive process of the species could be carried out in areas far from the coast, outside fleet area operation. It is necessary to continue studying reproductive process and distribution patterns of this species of high economic and social importance.

Study of larval development of southern sardine (*Sprattus fueguensis*) under captive conditions: First feeding and formation of micro-increments in otoliths.

Authors: Guillermo Moyano A, Elson Leal F & Francisco Cerna T.

The moment of the first feeding in fish larvae has been described as a critical period, which determines to a great extent their survival and consequently the success of the recruitment. In the present study, the ontogenetic development of southern sardine larvae obtained under laboratory conditions (Hueihue hatchery – IFOP) was analyzed. Where the relationship between the oral opening for the first feeding, functionality of the eye and formation of the first mark in the otolith sagittae was studied.



Chile brought together Fisheries and Aquaculture Research Institutes from Pacific Alliance countries

CHILE, PERU, COLOMBIA AND MEXICO, MAKE UP THIS REGIONAL INTEGRATION INITIATIVE WHICH ARISES BACK IN 2011 WITH THE AIM OF PROMOTING GREATER GROWTH AND COMPETITIVENESS AMONG MEMBER NATIONS.

Its aim is that Pacific Alliance countries advance in a work plan development on fisheries and aquaculture, between November 13th and 15th, in the Reñaca (Chile), IFOP held Fisheries and Aquaculture Research Institutes of the member countries of the Pacific Alliance (Chile, Peru, Colombia and Mexico) second meeting of this network.

In the activity participated: Luis Parot Fisheries Development Institute director; Cristóbal Hernández and Elena Valpuesta from Chilean Foreign Affairs Ministry; José Pedro Núñez, Subsecretariat of Fisheries and Aquaculture Fisheries Development Division head; Víctor Yépez from

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Peru Sea Institute ; Juan Carlos Lapuente from Mexico National Fishing Institute; Natalio Godoy from The Nature Conservancy NGO, Alfredo Sfeir from Founder and CEO Shellcatch, Erica Cunningham from the Environmental Defend Fund.

Elena Valpuesta from Relations Ministry, explained: “We are four countries that agreed to be able to build a deep area of integration on issues not only commercial, also in others areas such as fishing. For us it is very important and we are very glad that this second fishing institutes network meeting of these four countries can be materialized, since it has to do with the objective of being able to advance in integration and in fisheries research among the four countries.”

Luis Parot Donoso referred to the activity for Fisheries Development Institute “this meeting is very important with similar institutes in Mexico, Peru. The Pacific Alliance is part of an agreement established by each of the countries. This time we will review progress made in previous commitments made at the last meeting held in Lima. There is a conversation and an exchange of knowledge with Environment Ministry, Ministry of Foreign Affairs, Ministry of Economy, will be discussing marine protected areas, global positioning for fishing fleets, with some NGOs that are interested in the care and conservation of marine species and the ocean. It is a huge opportunity to exchange experiences and knowledge with fisheries and aquaculture research institutes.”

