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# Letter from the Director

Aloha,

We at CTSA hope that your 2021 is off to a safe and healthy start. This week, CTSA held its annual Board of Directors (BOD) meeting via Zoom. It was the first time we have conducted this important meeting virtually, and I am happy to report that all Directors were in attendance and it went very smoothly. I give credit and thanks to our Board for their preparation and active participation, especially in light of this year's unique circumstances.

During the meeting, the Board reviewed recently completed and ongoing CTSA projects, and discussed and voted on the FY20 Plan of Work. Several Directors also gave brief updates on aquaculture activities under their jurisdictions, and I would like to take this opportunity to highlight some of those activities. Darren Lerner of UH Sea Grant reported that Sea Grant is increasing federal funding opportunities for aquaculture in the region, and that the UH program hired two new aquaculture extension agents for Hawaii and is also supporting an extension position in Guam. CTSA is excited about these developments, and looking forward to more opportunities for collaboration with Sea Grant in the near future. In addition, Singeru Singeo reported that the College of Micronesia has established a partnership with Dr. Chad Callan of the Oceanic Institute of HPU to import surplus fingerlings from his CTSA-funded coral grouper project into Micronesia for additional research and potential commercial production. This is a wonderful unexpected impact of Dr. Callan's CTSA-funded research on this species. These are the types of activities that greatly help to create and increase strong aquaculture partnerships across the region.

Per our standard procedure, CTSA will now forward the Board-approved Plan of Work, comprised of eight proposals, to NIFA for final approval. Now that our FY20 Plan of Work is moving to its final stage of approval, our attention will shift to developing the FY21 Plan of Work. I strongly encourage you to send us your input and suggestions on priority areas for FY2021 funding - this is the best way we can learn about the most pressing needs of our industry. We also look forward to seeing increased support from the federal government. The trade group Stronger America Through Seafood (SATS) sent a letter to President Biden a few days ago to promote aquaculture in the United States. The letter stated that “Aquaculture presents a unique opportunity to build an American seafood future that can bring us through this challenging time and support a diverse workforce, enhance sustainable ecosystems, and guarantee healthful, locally-sourced protein for American consumers."

With much gratitude for your continued support of our program,

Dr. Cheng-Sheng Lee
Executive Director, CTSA

## CTSA 2020 Annual Progress Report Summaries Now Available for Download

As part of our NIFA reporting requirements, CTSA must submit a

comprehensive Annual Accomplishment Report to the USDA. This 100+ page report features full progress reports of ongoing CTSA-supported projects, as well as final reports of projects that were completed during the calendar year.

In an effort to consolidate information for our stakeholders, CTSA has prepared a 2-page summary of each project that was active during 2020. Each summary provides a brief description of the project, as well as the anticipated benefits, impacts, and current progress of the work being done. Click here to download the Summaries. The following are brief highlights from some of the ongoing and recently completed projects:

**Culture of a Local Marine Polychaete, *Marphysa sanguinea*, for Use as a Shrimp Maturation Feed**
During Year 4 of the project, a worm harvesting system using a small concrete mixer was developed. The mixer is used to slowly churn the sediment while a seawater hose (~100 lpm) is used to flush the worms that have been separated from the sediment into a harvesting net. Results from a shrimp maturation trial comparing live polychaetes with frozen worms were very good; mean eggs/spawn and total egg production were much higher in the live tank (30% and 74%, respectively) and mean nauplii/spawn and total nauplii production were much higher in the live tank (87% and 151%, respectively). These results show that commercial scale culture of *M. sanguinea* is possible. However, work on optimizing sediment, understanding reproduction output/trends, and further exploring harvesting techniques are likely needed to fully commercialize the culture of this species.

**Developing Bivalve Farming in Hawaii**
Despite some initial setbacks and the overall difficulty of performing this work, good progress has been made. Research was conducted to elucidate the genetic basis of gametogenesis in triploid Pacific Oysters (Crassostrea gigas) to determine whether the high levels of fecundity observed in approximately 30% of triploid female oysters may have a genetic basis. The hypotheses that there is a genetic basis for gametogenesis and that this may be heritable was based on previous research by a French group which showed differential expression of at least two genes when fecund and non-fecund triploid were compared. Initial results using American-sourced triploid oysters found that one of the two genes identified by the French research group (FoxL2) may contain mutations that prevented it from being used in this work unless other primers are developed. A second gene, Beta-catenin, was underexpressed in one oyster sample, and therefore can potentially be used in the next stage of this research. Trials using alternative feed sources (rice starch and pea protein) showed that use of rice starch led to a significantly higher condition index (CI) than for a diet consisting of only microalgae. The use of pea protein did not result in a significantly different CI. Neither rice starch nor pea protein produced any detrimental results. Thus, either of these can be used to spare the amount of microalgae needed. Although this work was targeted at optimizing the use of a land-based culture system, these feeds could potentially be used in other hatchery or nursery system applications.

**A Shrimp Disease Diagnostic Laboratory for Hawaii**
Through support from this recently-completed project, the UH Aquaculture Disease Lab (UHADL) has been established, and has hired the appropriate technical personnel, developed a quality management system, developed technical SOPs, and demonstrated the ability to perform molecular testing for the OIE-listed shrimp pathogens following OIE approved methods. The laboratory is currently being reviewed by the USDA for approval to perform official export testing. Training of HDOA and UH personnel in diagnostic PCR methods is ongoing. As a result of this project, the Hawaii shrimp broodstock industry will enjoy increased security and improved export testing services by having a local laboratory that can provide a reliable and shorter testing turnaround time.

**Improving Cost-effectiveness of Producing Local Aquatic Feed from Papaya Fruit Wastes via Innovative Bioprocessing**
Researchers have made several important discoveries and improvements in the fermentation process during this report period. Prior to this report period, they focused on developing effective surface culture of Yarrowia lipolytica cells directly on a bed of papaya puree placed in large commercially available aluminum trays. No energy intensive mixing is needed during such a mode of cultivation. Culture scale-up can be achieved by using multiple trays to grow the yeast on papaya puree in a tray bioreactor with humidity and temperature control, using a commercially available and economical heater/proofer. A main challenge in the surface culture is effective oxygenation of the culture because the culture is stationary, and Yarrowia lipolytica is an obligate aerobe. Researchers further improved the oxygenation by developing a method to generate oxygen in situ in the puree by using enzyme-catalyzed decomposition of hydrogen peroxide. Importantly, as papaya fruit contains a high level of catalase activity, the new oxygenation method exploits this interesting property of papaya by using the un-autoclaved puree as an inexpensive source of catalase. After fermentation, the

yeast/puree mixture can be efficiently dried in an off-the-shelf food dehydrator to remove over 90% of the remaining moisture, and the resulting dehydrated biomass is milled into powders which can be stored at room temperature. A tilapia feed trial will be conducted in co-PI García-Ortega's lab starting in early 2021. Thus far, the Su lab has already produced about 1 kg dry yeast powders from the culled papaya juice, and is producing more yeast biomass for evaluating more treatment conditions during the feed trial.

Read More Project Results

# Aquaculture Announcements

## New NOAA Fact Sheets on Marine Aquaculture

The National Oceanic and Atmospheric Administration (NOAA) has posted one or two-page fact sheets explaining the science, production practices, regulations, policies or programs behind significant marine aquaculture topics. Click on the hotlinked titles to read, download or share.

- Antibiotic Use in Finfish: The why, how and when antibiotics can be prescribed to restore farmed freshwater or marine fish health.
- Aquaculture and Environmental Interactions: In the U.S., responsible fish farming can be one of the most environmentally friendly ways to produce animal protein.
- Aquaculture Provides Beneficial Ecosystem Services: Shellfish and seaweed farms around the U.S. are providing sustainable seafood and improving the surrounding environment.
- Climate Resilience and Aquaculture: Ocean farming of fish, shellfish, and seaweeds can reduce resource pressure and help build resilience in a changing environment.
- Disaster Assistance for Fisheries: The public may apply for assistance after the President makes a major disaster declaration for your state, and your specific county is named for Individual Assistance. The types of help offered may be different for each disaster.
- Marine Aquaculture in the U.S.: Marine aquaculture is the breeding, rearing, and harvesting of marine plants and animals. NOAA collaborates with others to support economically and environmentally sustainable aquaculture practices in U.S. waters.
- Potential Risks of Aquaculture Escapes: Improved management practices and innovative equipment designs have dramatically reduced instances of aquaculture escapes.
- Regulation of Marine Aquaculture: NOAA strives to provide science, services, and guidance to foster the expansion and sustainability of U.S. marine aquaculture.
- Sustainable Aquaculture Feeds and Fish Nutrition: Feed innovation is improving aquaculture sustainability and increasing industry efficiency. Research and development by federal agencies and feed manufacturers helps reduce environmental impacts and conserve natural resources.

For additional information, resources or what the NOAA Office of Aquaculture is doing to ensure US marine aquaculture grows sustainably, click here.

## National Sea Grant Priorities Survey

The National Sea Grant Office is reaching out to NOAA line offices, federal and state agencies, the aquaculture industry, and aquaculture scientists to complete the following survey to help the National Sea Grant Office identify research, communication, education, and extension (including legal), needs that are best suited for Sea Grant investments at the national, regional or state level and help to plan future NSGO funding opportunities to advance aquaculture in the US. The mostly open-ended questions in this survey are framed around the 2016 Sea Grant Association 10-Year Vision Document.

**Click here** to take the Sea Grant survey. Surveys must be completed by February 8, 2021.

# AquaClip: US aquaculture lobbying group urges Biden to prioritize local seafood production

Stronger America Through Seafood (SATS), a trade group has emerged to promote aquaculture in the

United States, has sent a letter to U.S. President Joe Biden, asking that his administration prioritize domestic seafood production.

Specifically, the group has asked that aquaculture be included as part Biden's oceans and climate policies "as a means to build back a stronger, more resilient America."

"Aquaculture presents a unique opportunity to build an American seafood future that can bring us through this challenging time and support a diverse workforce, enhance sustainable ecosystems, and guarantee healthful, locally-sourced protein for American consumers," the group wrote. "As America begins to rebuild from the devastation of the COVID-19 pandemic, increasing America's seafood supply through aquaculture will have benevolent rippling effects throughout many areas of the country. Increased aquaculture production will increase demand for American-grown crops, such as soybeans, corn and peas, which can be used in fish feed, and will open up new markets to heartland farmers while lessening dependence on the uncertainty of foreign trade relationships."

SATS is an industry coalition that includes aquaculture firms and companies in related industries, including Cargill, Sysco, Red Lobster, Pacific Seafoods, High Liner Foods, Innovasea, Fortune Fish, Blue Ocean Mariculture, Pacifico Aquaculture, among others. The group has called for federal support of the aquaculture industry since it was founded in 2018, arguing that such support would make the domestic food supply more resilient to economic and climate changes, and would augment the country's sustainable food strategy.
The letter, sent on 28 January to Biden as well as Gina Raimondo and Tom Vilsack, Biden's nominees to lead the Commerce and Agriculture departments, was signed by corporate leaders of SATS' 23 members.

Source: Seafood Source // Original Article

This newsletter is written and prepared by the CTSA Information Specialist Meredith Brooks.
The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established and funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) under active grants 2016-38500-25751 and 2018-38500-28886. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development. CTSA was established in 1986 and is jointly administered by the University of Hawaii and the Oceanic Institute of Hawaii Pacific University.

**Center for Tropical and Subtropical Aquaculture**
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