

**Thursday September 6<sup>th</sup> – Tilly / Tupper**  
**Miscellaneous**  
**Moderator – Matt Griffin** ( Mississippi State University )

3:15 PM	<b>Miscellaneous</b>	<u>Dennis</u> - Seeing Spots: What's Happening at the Microscopic Level in Caribbean Sea Fans With Purples Spots?
3:30 PM		<u>Kane</u> - Look Deep Into My Shell: Gross and Radiographic Observations of Shell Damage by Boring Parasites in the Eastern Oyster <i>Crassostrea virginica</i>
3:45 PM		<u>Gonzalez</u> - Surgical Resection of a Leiomyosarcoma in a Goldfish ( <i>Carassius auratus</i> )
4:00 PM		<u>Dennis</u> - What's Getting Under the Skin of Caribbean Surgeon fishes? An Investigation of a Prevalent Pigmented Dermatopathy in St. Kitts' <i>Acanthurus</i> spp.
4:15 PM		<u>Kane</u> - Seafood Workers Are Aquatic Animals Too: Surveillance of Health, Injuries and Fatalities Along the US Gulf Coast



**8<sup>th</sup> International Symposium on Aquatic Animal Health**

September 2-6, 2018 - Charlottetown, Prince Edward Island, Canada



## Seeing Spots: What's Happening at The Microscopic Level in Caribbean Sea Fans with Purple Spots ?

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While coral reefs are catastrophically declining around the world, octocorals seem more resilient than scleractinian corals and may become increasingly important to future reefs. The sea fans *Gorgonia ventalina* and *G. flabellum* are valued in Caribbean reef communities, yet information about their diseases is limited. In the 1990's, epidemics of mass mortality of sea fans were attributed to the common terrestrial fungus, *Aspergillus sydowii*, and presently aspergillosis remains endemic and widespread. Aspergillosis is typically diagnosed based on the presence of round to annular purple areas surrounding a central region of tissue loss, yet other injuries can result in purpling of sea fan tissue, and *A. sydowii* has been isolated from healthy-appearing colonies. More recently, an emerging disease termed multifocal purple spots (MFPS) was described, characterized by the presence of 1-3mm circular purple nodules, and *Aplonchytrium* sp. labyrinthulomycetes and *Sphaerippe* sp. copepods have been identified in these lesions. Our research aims to examine purple lesions in Caribbean sea fans and to establish histological case definitions for aspergillosis and MFPS. Microscopically, lesions grossly consistent with aspergillosis were composed of tissue loss with a margin of amoebocyte infiltrate and protein or melanin deposition. Atrophy, loss, or necrosis of polyps in the purple pigmented region were frequently observed. While fungal hyphae were present in the axis of all affected sea fans, they were typically not diffusely throughout the lesion, and in most cases they were associated with other etiologic agents, including algae and labyrinthulomycetes. MFPS lesions microscopically consisted of peri-axial chambers of protein containing fungus, or metazoan parasites, and similarly bordered by amoebocyte infiltrate or melanin deposition. One metazoan morphotype was identified as a barnacle based on morphology and molecular sequencing. These findings emphasize the heterogenous nature of purple lesions in sea fans, and the need to move away from macroscopic diagnosis of sea fan diseases. Greater research is needed to identify the pathogens involved in sea fan disease, and to understand their causal role and coinfection dynamics.

**Conference Session Designation:**

( Coral Diseases )

**Presentation Format:**

( Oral )



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## Look Deep Into My Shell: Gross and Radiographic Observations of Shell Damage by Boring Parasites in the Eastern Oyster, *Crassostrea virginica*

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Shell-boring parasites on oyster reefs can reduce shell density, increase shell surface area and contribute to accelerated shell erosion. Prevalence and severity of shell damage associated with shell parasites as part of a basic health assessment in restoration monitoring is important. This project examined severity of parasite shell damage in Eastern oyster, *Crassostrea virginica*, associated with *Polydora websteri* (polychaete), *Diplothyra smithii* (clam) and *Cliona celata* (sponge) based on current technology, i.e., gross visual examination, versus diagnostic radiography. Oysters (n=347) representing four size classes from 20-120mm were sampled from Apalachicola Bay during 2016, and shells were evaluated by gross visual observation and x-ray (i.e., “gold standard”) using an established 0-5 severity score based on percent area affected. Mean severity scores based on radiographic, visual internal and visual external shell observations for *Polydora* were 3.9, 1.6 and 1.0; for *Diplothyra* were 1.7, 0.7 and 1.2; and for *Cliona* were 2.3, 0.7 and 1.6, respectively. *Polydora* shell damage based on internal shell visual observations underestimated radiographic observations by 2.4 rank scores. *Diplothyra* shell damage based on internal and external visual observations underestimated radiographic observations by 1.0 and 0.4 rank scores, respectively. *Cliona* shell damage based on internal and external visual observations underestimated radiographic observations by 1.6 and 0.7 rank scores, respectively. While precision for visual and radiographic severity scoring is 0.5 ranks, and some cases of mean radiographic severity score minus mean visual severity score was <0.5 ranks, variability across severity scores indicated that visual severity data are not comparable with matched radiography data. Linear regression-derived correction factors for visual severity data are being validated and appear to provide statistically accurate shell damage estimates relative to gold standard radiographic data. Shell parasite presence and density in the environment is driven by temperature and salinity, and severity of parasite shell damage is associated with oyster height (p<0.01). Therefore, these studies in oysters also support an understanding of parasite-keystone host species under changing environmental and climate regimes. This study was supported by the National Fish and Wildlife Foundation, the Florida Fish and Wildlife Conservation Commission, the University of Florida Institute for Food and Agricultural Science (IFAS), and the Florida Sea Grant Program.

**Conference Session Designation:** ( Miscellaneous )  
**Presentation Format:** ( Oral )



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## Surgical Resection of a Leiomyosarcoma in a Goldfish ( *Carassius auratus* )

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Mesenchymal neoplasms are relatively uncommon in fish as compared to epithelial tumors. A specimen of goldfish (*Carassius auratus*) (51.7 g weight and 18 cm total length) was submitted by her owner for clinical evaluation to the laboratory of Aquatic Toxicology and Fish Medicine, School of Veterinary Medicine and Animal Science, Universidad Nacional de Colombia. The fish showed a unilateral mass invading the eyeball area. A surgical resection was scheduled considering possible risks for the fish and its tankmates. The fish was fasted 12 h prior to the surgery and induced to a deep surgical plane by immersion in an anesthetic solution of eugenol (100 ppm) (stock sol of 100 mg eugenol/ml ethanol from Eugenol<sup>®</sup>, 85 % EC). After reaching the loss of both its swimming axis and the opercular movements (3 min 36 sec), the specimen was maintained in a surgical plane during the procedure using a recirculating pump that allowed infusion of the branchial tissue with a 30ppm eugenol solution during approximately 15 minutes. The mass along with the eyeball was removed by enucleation. The fish was returned to a recovery tank and regained its swimming axis (7 min 25 sec) and recovered uneventfully after 20 min. The mass was fixed in 10% neutral buffered formalin and submitted for histopathological evaluation to Corpavet (Vet Path Corp). A leiomyosarcoma was diagnosed after hematoxylin & eosin, Masson trichromic (TM) staining and immunohistochemistry (IHC) to smooth muscle actin (SMA) and Ki-67 evaluation. Neoplasia involved superficial and deep dermis showing fusiform and oval shaped cells, highly infiltrative with moderate pleomorphic features. TM revealed red wine-coloured muscular cells compatible with leiomyosarcomas, leiomyomas, rhabdomyomas or rhabdomyosarcomas. SMA and Ki-67 markers determined the final leiomyosarcoma identification by showing a positive result in some pleomorphic cells. In short, resection of the mass using eugenol as the anesthetic protocol was successful in both the induction and maintaining of a surgical plane. Further histopathologic protocols allowed the identification of a leiomyosarcoma, a mesenchymal neoplasm uncommonly reported in fish.

**Conference Session Designation:**  
**Presentation Format:**

( Ornamental and Aquarium Medicine )  
( Oral )



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## What's Getting Under the Skin of Caribbean Surgeonfishes? An Investigation of a Prevalent Pigmented Dermatopathy in St. Kitts' *Acanthurus* Spp.

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*Acanthurus* spp. of St. Kitts and other Caribbean islands, including *A. bahianus* (ocean surgeonfish), *A. chirurgus* (doctorfish), and *A. coeruleus* (blue tang), are frequently observed to have multifocal, brown-black, circular cutaneous lesions. However, the pathology has not been described and the etiology is unknown. In free-living finfish, epidemics of multifocal pigmented dermatopathies are often ascribed to cutaneous parasite infections, and have also been observed with chromatophore neoplasia. This research aims to investigate the extent of the pigmented dermatopathy in *Acanthurus* spp. of St. Kitts and to describe its pathology. Surveys were undertaken which showed prevalence to be 33-52% across three locations. The pigmented dermatopathy was more common in *A. bahianus* and *A. coeruleus* relative to *A. chirurgus*. Thirty *Acanthurus* spp. showing the pigmented dermatopathy were collected by spearfishing. Affected regions of skin usually involved the dorsal, pelvic, and tail fins, and less frequently the body of the fish. The pigmented foci centrally contained a <1mm diameter cyst from which metazoan parasites were dissected. Histologically, pigmented areas had chronic perivascular dermatitis of variable severity, and the dermis contained an encysted metazoan parasite. In each species of fish, parasites dissected from pigmented skin lesions were morphologically and molecularly classified as a digenean of the family Heterophyidae. Future research is warranted to determine the ecology of the parasite and factors which may explain its apparently high prevalence in St. Kitts and potentially other Caribbean islands.

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**Presentation Format:**

( Caribbean Fish Health )  
( Oral )



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## Seafood Workers are Aquatic Animals Too: Surveillance of Health, Injuries and Fatalities Along the US Gulf Coast

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Surveillance studies with Gulf coast fishers, crabbers, shrimpers, and oyster and clam harvesters, supported by the National Institute for Occupational Safety and Health/CDC, are underway to identify risk factors associated with fatal and non-fatal injuries where the majority of workers are self-employed and uninsured. Community partnerships highlight the importance of engaging with seafood workers to implement an in-person questionnaire supplemented with workplace observations on harvesting and fishing vessels. Falls overboard and winch injuries are associated with many of the fatalities and severe injuries reported. Musculoskeletal injuries, cuts and lacerations, bites, spine punctures, and heat and sun exposure are common in these work sectors. Conditions associated with unstable work platforms in harsh settings, coupled with declining fisheries – related in part to climate and environmental change – appear to increase risk of onboard incidents, drug use and mental health issues. Surveillance data is being used to inform interventions and outreach tools to support Gulf coast seafood worker and aquaculture health and safety. Research investigators who engage in ship time for sample collections or observations, or who rely on commercial harvesters for samples, may also be subject to similar environmental conditions and hazards. Therefore, safety and health concerns related to working on the water, with equipment under strain, on a moving platform translates beyond commercial seafood workers.

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