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August 1, 2015

Parasitic *Kudoa inornata* Induces Post-Mortem Muscle Softness in Spotted Seatrout: Understanding the relationship between parasite infection and flesh quality

Parasites include a diverse range of organisms, including the lesser-known spore-forming microscopic parasites of the *Kudoa* genus. These *Kudoa* parasites are notorious for causing dramatic post-mortem muscle softness/deterioration in numerous fish species worldwide. Due to their harmful effects on meat quality and appearance, *Kudoa* species are a concern for the growing aquaculture industry and for commercial fishing.

One parasitic species, *Kudoa inornata*, infects wild spotted seatrout, an estuarine fish whose range stretches from the Southeastern Atlantic to the Gulf of Mexico. The health of the spotted seatrout is crucial because they are a popular recreational fish and are vital to the estuary ecosystem.

Sierra Duca, an undergraduate student at Goucher College and a summer intern the College of Charleston, researched the effects of *K. inornata* on the muscle tissue of wild spotted seatrout to discern if there was a correlation between post-mortem muscle softness and parasite density.

While no evidence suggests that *K. inornata* is a direct health threat to humans, the presence of the parasite can potentially induce indirect health hazards because degraded meat is more susceptible to bacterial infection. In addition, the findings of this study will further our understanding of how parasitic infection may reduce flesh quality.

“Parasites in muscle cannot be good news to the fish or to the consumer” –Dr. Isaure de Buron

Duca is one of ten selected students participating in National Science Foundation (NSF)’s Research Experience for Undergraduates (REU) through a partnership with the College of Charleston. Duca is working under the mentorship of Dr. Eric McElroy and Dr. Isaure de Buron.

In order to understand the effect of parasite infection on muscle tissue, Duca took muscle samples at time points between 0-6 days, which is the most likely period of time during which

the fish would be consumed. The samples were force tested to determine firmness of the muscle, and analyzed to determine parasite density (see photo 2).

Determination of the rates of post-mortem muscle softening will provide anglers with recommendations for the handling and shelf life of wild spotted seatrout. This information may also be used as a model to postulate how other *Kudoa* species impact the muscle firmness of commercially important fish.



(1) Spotted seatrout, *Cynoscion nebulosus* (PC:Duca)



(2) This micrograph shows a structure known as a plasmodium, which contains the spores of *K. inornata*. The number and areas of plasmodia were counted and measured to determine parasite density in the muscle samples (PC:Duca).



(3) Sierra Duca force testing muscle samples (PC: McElroy)

To learn more about Sierra Duca's project visit College of Charleston REU's blog at: <https://blogreu.wordpress.com/>

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