Research could boost coastal economics with crustacean molting on demand (w/ Video)

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UAB biologist Doug Watson, left, and graduate assistant Hsiang-Yin Chen say the team is close to discovering the structure of the molt-inhibiting hormone that could lead them to develop methods to induce molting on command to produce soft-shell crab as needed. Credit: UAB

University of Alabama at Birmingham researchers are close to

unraveling intricate cellular pathways that control molting in blue crabs. The discoveries could revolutionize the soft-shell crab industry, generating new jobs and additional profits for the U.S. fishing industry along the coastal Southeast.

Soft-shelled blue crabs are a delicacy enjoyed by food lovers each spring and early summer when the crustaceans naturally molt their hard outer shell in the wild. Molting is the process by which the crab discards its exoskeleton, replacing it with a temporarily soft, pliable new exoskeleton that is easy to eat.

Despite being limited by the crab's annual molting patterns, the blue crab fishing industry is valued at nearly $50 million a year in Alabama, Florida, Mississippi, Louisiana and Texas. The ability to manipulate molting, or facilitate molting on demand, could make the blue crab available to consumers year-round, potentially boosting the industry's overall economic impact.

UAB biologist and researcher Doug Watson, Ph.D., and his research team believe they have identified the blue crab molt-inhibiting hormone (MIH) receptor, a key protein in the cellular pathway that controls molting. They are testing a compound designed to block the MIH receptor in the hopes of inducing molting.

"No one yet has isolated or characterized this MIH receptor for any crustacean, but we think we have isolated a gene that codes for that receptor," Watson says. "We're not 100 percent sure yet, but the gene we have cloned has all the characteristics of the MIH receptor. We're trying to determine for sure if it is."

Conceivably, then the growth of the animals could be controlled, and this could create jobs and stimulate local economies through private aquaculture or farming operations across every state touching the ocean -

from Texas to Maryland, Watson says.

"Induced molting probably would have to take place in an aquaculture setting because it would be difficult to control in the wild," Watson says. "Once the blue crabs molt in the wild they are very vulnerable to predators because their shell is so soft."

The identification and characterization of the MIH receptor also would constitute a significant contribution to the field of invertebrate endocrinology.

"That's the basic science and a key to answering the question of how growth and development are regulated in this group of organisms with so much ecological and economical importance," Watson says.

Watson says they will either need to develop an injection or food pellet that could be used to induce the molting process.

Source: University of Alabama at Birmingham (news : web)

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