Scientist disputes tumor findings

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turtletumor.jpg

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Fibropapilloma tumors on a green sea turtle.

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LIHUE — A group of scientists is rebutting a recent study suggesting that invasive algae is driving the grotesque, cancer-like tumors found in Hawaii's green sea turtle population.

In fact, they say it's equally plausible that the algae could be having the opposite effect, leading to a decline in tumors.

Dr. Thierry Work, a wildlife disease specialist for the U.S. Geological Survey in Honolulu, said those behind the paper, published Sept. 30 in the scientific journal PeerJ, did not do their homework.

"I don't think this paper has any scientific foundation," he said.

The paper was co-authored by University of Hawaii at Manoa Botany Professor Celia Smith and Kyle S. Van Houtan of the National Oceanic and Atmospheric Administration's Turtle Research Program. Their research suggests the fibropapilloma (FP) tumors are caused by turtles consuming non-native algae, dubbed "superweeds," along coastlines where nutrient pollution goes unchecked. Turtles that graze on blooms of invasive seaweeds end up with a diet that is rich in a particular amino acid, arginine, which they say promotes the virus that creates the tumors.

Work said there is no disputing that Hawaii's coastlines are degraded. However, he says the authors should not have used "bad science" to convey that message.

"When you do, science loses credibility," he said. "I don't think that's a good thing. It's unfortunate."

Attempts to reach Smith for comment Wednesday were not successful.

In their response, also published on PeerJ, Work and six other scientists wrote that the story of pollution being bad for the environment and harming wildlife is "appealing" and "resonates with a broad audience."

"However, scratch the surface, and the component parts of the story do not add up," they wrote.

Work said the paper's authors found that amino acids, including glycine, proline and arginine, in the tumors were elevated when compared to skeletal muscles, and that turtles' ingestion of invasive algae is "activating latent herpes infections and promoting tumors by foraging on arginine-enriched macroalgae."

"They're comparing apples to oranges," he said by phone.

A more straightforward explanation for the difference in amino acid signatures, according to Work, is that the tumors comprise mainly connective tissues highly enriched in glycine and proline relative to skeletal muscle.

"It is no surprise that connective tissue of skin tumors and skeletal muscle from the same animal have different amino acid profiles, and this difference likely has nothing to do with herpesviral replication or ingested arginine," he wrote.

And while invasive algae continues to be an ongoing ecological issue, Work wrote that the authors failed to acknowledge that the prevalence of FP in green sea turtles in Hawaii has been declining since the mid-1990s. Ultimately, he argues there is nothing to suggest arginine is driving FP.

Work discussed the invasive, non-native alga Hypnea musciformis, which the paper's authors suspect of playing a role in turtle tumors. Studies, however, have documented the alga contains an amino acid that plays a role in tumor suppression.

"One might speculate an equally plausible scenario in which ingestion of glutamic acid-laden invasive algae is somehow leading to the decline of FP in green turtles in Hawaii through the tumor-suppressing effects of glutamic acid," Work wrote

He wrote that the paper provides no compelling evidence that algae, arginine and tumors in turtles are linked.

To view Work's response to the Smith and Van Houtan article, visit https://peerj.com/preprints/539/

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- ***UncleAina*** **posted at 8:15 am on Sat, Oct 18, 2014.**

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Exactly! This research sounded like a bad high school science fair project. Arginine and glutamate are the 2 most common amino acids, testing the tumors for these AA is a joke!! That's like 1879 science! Then to conclude that because there's elevated levels that somehow it has anything to do with eating some specific algae is 1765 science! Do these guys believe in spontaneous generation too? Also PeerJ is NOT a prestigious journal, it's only 2 years old and has lots of questionable science that was rejected by journals like Science or Nature. Glad to see these other real scientists calling them out. Way too many people claiming to be "marine biologists" around here!

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