

# ***Panulirus argus* Virus 1 in the Florida Spiny Lobster Fishery and its Role in Fishery Practices**

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## **EXTENDED ABSTRACT**

The Caribbean spiny lobster (*Panulirus argus*) is one of the most economically valuable fisheries in the Florida Keys and tops this list for most of the Caribbean. In 2001, the fishery in Florida experienced a major decline in landings of ~30% from which it has not recovered. This decline was coincident with discovery of a lethal viral pathogen, PaV1, found infecting juvenile lobsters in the Florida Keys. *P. argus* has a complex life history and is exploited throughout its range – two factors that have made it difficult to determine the cause of the decline. Here we describe the first assessment of PaV1 within the fished segment of the population.

Our first objective was to determine the prevalence of PaV1 infection among lobsters in the fishery. We traveled onboard commercial vessels during the 2008 – 2009 fishing season and took blood samples for PCR analysis from randomly sampled traps. Samples were taken from the Gulf of Mexico and Atlantic sides of the middle and lower Florida Keys at the beginning and end of the season. No lobster was observed to have a visible infection, but PCR analysis revealed that 11% were positive for PaV1. There were no significant differences between geographic areas or early versus late season.

To catch lobsters, the trap fishermen in Florida use juveniles as a social attractant within the traps. However, healthy lobsters avoid infected lobsters. Therefore, we sought to determine if the presence of a diseased lobster in a trap decreased the attractiveness of the trap to others. We found that traps deployed with diseased lobsters attracted significantly fewer lobsters to their traps compared to healthy lobsters.

PaV1 can be transmitted to healthy lobsters via contact with diseased lobsters, and considering that fishers typically pull traps at 1 – 2 week intervals, it is plausible that trap confinement could lead to PaV1 transmission. Our final objective was to determine if confining healthy lobsters with a diseased lobster increased transmission compared to controls with only healthy lobsters. We found greater transmission among lobsters confined with a diseased lobster compared to those confined with another healthy lobster, and greater transmission in traps deployed for two weeks versus one week. However, we also observed transmission to some lobsters not confined with a diseased lobster, indicating the presence of endemic transmission from an unknown source.

This study provides evidence that PaV1 exists within the Florida fishery at a level much higher than previously estimated. However, PaV1 positive lobsters did not show visible signs of infection, indicating they may be carriers and not actively infected. These trap dynamics could partially explain the decrease in catch, but making a definitive link between these findings and the decline in landings is difficult considering other factors that could be involved, including overexploitation of the stock throughout the Caribbean and environmental change.

KEY WORDS: Spiny lobster, *Panulirus argus*, PAV1 virus

## **Panulirus argus Virus 1 en la Pesquería de Langosta Espinosa de la Florida y su Papel en las Prácticas de Pesca**

PALABRAS CLAVE: Langosta espinosa, *Panulirus argus*, PAV1 virus

## **Le Virus 1 de *Panulirus argus* dans la Pêche de Langouste de Floride et son Rôle dans les Pratiques de Pêche**

MOTS CLÉS: Langouste de Floride, *Panulirus argus*, le virus 1