

## Lionfish on the Loose in the Waters off St Vincent

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### ABSTRACT

**Objective:** The purpose of this study was to determine if the exotic venomous species, *Pterois volitans* (lionfish) had reached as far south as St Vincent in the Caribbean. This predatory marine fish has successfully invaded the waters of the Western Atlantic and the Caribbean. Such success as an exotic invasive species is rare for a predatory marine fish. It is possible that the fish are growing larger and spreading faster than anticipated, thanks to a lower burden of parasites and a paucity of natural predators in their new environment. But prior to this report, no sightings of this species this far south had been reported.

**Methods:** The authors conducted a search along with the help of local divers and fishermen in the waters of St Vincent.

**Results:** Approximately one year after the initiation of the search, a juvenile specimen was positively confirmed and captured off the southern coast of St Vincent.

**Conclusions:** The exotic predatory and venomous red lionfish, *Pterois volitans*, has successfully invaded marine waters as far south as the Windward Islands. Fishermen in these regions should be aware of this venomous species in the region and physicians must be aware of how to manage stings from such animals.

**Keywords:** Caribbean, envenomations, lionfish, St Vincent

## El Pez León anda Suelto por las Aguas Cercanas a San Vicente

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### RESUMEN

**Objetivo:** El propósito de este estudio fue determinar si la especie venenosa exótica, *Pterois volitans* (pez león) había llegado tan lejos al sur como a la altura de San Vicente en el Caribe. Este pez depredador marino ha invadido con éxito las aguas del Atlántico occidental y el Caribe. Semejante éxito de una especie exótica invasora es algo raro en un pez depredador marino. Es posible que los peces de esta especie estén creciendo de tamaño y extendiéndose más rápido de lo previsto, gracias a una menor carga de parásitos y a la escasez de depredadores naturales en su nuevo ambiente. Pero antes de este informe, no se habían reportado avistamientos de esta especie tan al sur.

**Métodos:** Los autores realizaron una búsqueda con la ayuda de buzos locales y pescadores en las aguas de San Vicente.

**Resultados:** Aproximadamente un año después de iniciada la búsqueda, se confirmó positivamente la presencia y captura de un espécimen joven cerca de la costa sur de San Vicente.

**Conclusiones:** *Pterois volitans*, el exótico depredador y venenoso rojo pez león, ha invadido exitosamente las aguas marinas lejos al sur a la altura de las Islas de Barlovento. Los pescadores de

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*estas regiones deben tomar conciencia de la presencia de esta especie venenosa en la región, y los médicos deben saber cómo tratar las picaduras de estos animales.*

**Palabras claves:** Caribe, envenamientos, pez león, San Vicente

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## INTRODUCTION

Following a lecture on marine envenomations in September 2010, a medical student mentioned that she had seen a lionfish in the waters off St Vincent while diving. The instructor expressed skepticism given that the lionfish (*Pterois volitans* [Linnaeus, 1758]), a native of the Indo-Pacific, had not previously been reported in this region. After the student was able to describe the fish in convincing detail, a search was initiated. Here, we discuss the first documented capture of the venomous lionfish in the waters of the Windward Islands.

## MATERIALS AND METHOD

After the team was convinced of the potential that this invasive species could possibly have reached St Vincent and the Grenadines, local divers were put on alert. After approximately one year of vigilance, on November 23, 2011, a specimen was captured off the southern coast of St Vincent (at 13° 7' 32" N and -61° 12' 5" W) and brought in for examination.

## RESULTS

The specimen (Figure) was identified as a juvenile red lionfish (*Pterois volitans*), measuring approximately 10 cm TL.



Figure: A juvenile red lionfish (*Pterois volitans*).

This represented the first documented capture of this exotic species in the Windward Islands. Since our discovery, several sightings have been reported in the region and the United States Geological Survey Non-indigenous Aquatic

Species (USGS NAS) has declared the species locally established in the Windward Islands.

## DISCUSSION

The first lionfish capture in the Atlantic was in 1985 off the coast of southeast Florida. Additional sightings immediately followed Hurricane Andrew in 1992 when a public aquarium was damaged and six specimens escaped (1). Schofield described the spread of *P volitans* and the closely related *P miles* and stated that at the time of publication (Nov 2010) no sightings of lionfish had been reported in the Windward Islands (1).

Invasions by predatory marine vertebrates are quite rare with only four other examples known (2). The two lionfish (*P volitans* and *P miles*) are the first non-native, obligate marine fishes to establish breeding populations off the Atlantic coast of the United States of America and in the Caribbean. The ecological impact of this invasion is uncertain but they do appear to grow slightly larger in Atlantic waters (2). Despite their modest size (adults average ~30 cm), they have no significant natural predators in the Caribbean and are at the top of the food chain perhaps thanks to their venomous spines. The Caribbean grouper will prey on lionfish although their numbers presently appear insufficient to keep populations in check (3). It may be that invasive lionfish have lower parasite burdens, enabling them to devote more energy to invasion when in Atlantic waters compared to their native waters; they do appear more relatively abundant than in their native waters (2). Ongoing efforts to cull the population include encouragement of consumption by humans, which might conceivably result in more envenomations in fishermen and other handlers. Possibly thwarting this effort is the recent discovery of ciguatoxin in some lionfish. The Nature Foundation, St Maarten, has recommended against consuming lionfish until further studies are completed (personal communication).

Lionfish are ornate members of the family Scorpaenidae, which boasts the most species of venomous fish. Fifty-seven species from 23 genera have been cited as possessing venomous properties including the world's most venomous fish, the stonefish (*Synanceja verrucosa*) and the scorpionfishes (*Scorpaenopsis* sp). Lionfish stings, while often excruciating, are generally less medically severe. Their venom is delivered through the dorsal, pelvic or anal fin spines but the 14 feathery pectoral rays are not venomous. Following skin puncture, the venom enters the wound by travelling up a groove in the spine. The mechanism involves

a loose integumentary sheath which is pushed down along the spine and compresses two venom glands at the spine base. An antigenic heat-labile protein is the primary toxin. “Dry stings” in which no venom has been injected have been described (4).

To inactivate the heat-labile protein, treatment for lionfish envenomations include immersion in non-scalding hot water (~45 °C) for 30–90 minutes or until pain is relieved (5). Opioids and local lidocaine, bupivocaine or sodium bicarbonate may be helpful. Antibiotic coverage for *Staphylococcus* and *Streptococcus* is advisable, and in immunocompromised patients, coverage should also include *Vibrio* species. Tetanus immunization should be updated. In rare severe envenomations, the stonefish antivenin can be considered.

Given that lionfish are now firmly established throughout the Caribbean, fishermen should be aware of these exotic

venomous species and medical practitioners should be familiar with the management of envenomations.

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