

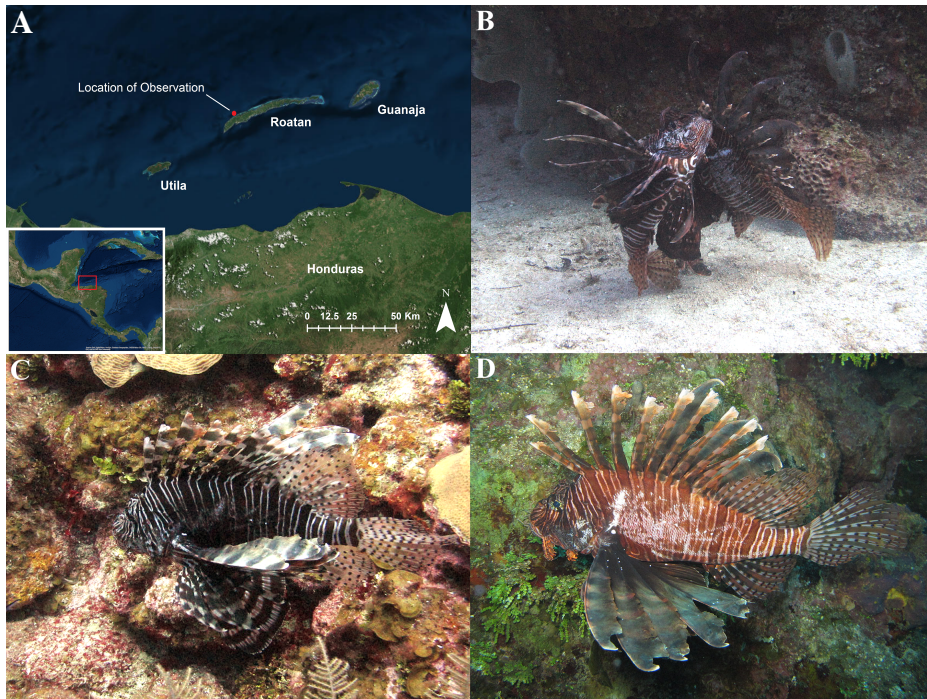
## Invasive lionfish (*Pterois* sp.) agonistic behavior observations

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Invasive lionfish (*Pterois* sp.) were first observed off southeast Florida in 1985 and are now established throughout much of the northwest Atlantic Ocean, Caribbean Sea, and Gulf of Mexico (Schofield 2010). Agonistic behavior has been observed in numerous reef fish species (Helfman 1986), including lionfish in aquaria and in their native range (Fishelson 1975, Moyer and Zaiser 1981). However, even with numerous studies having observed and documented invasive lionfish behavior for hundreds of hours (Green et al. 2011, Cure et al. 2012, Benkwitt 2016), and several videos being captured by recreational divers that show aggressive actions, there is a lack of documentation in the literature regarding the agonistic behavior of lionfish in their invaded range. On July 26, 2017, two lionfish were observed at a small coral patch reef in Roatan, Honduras (Panel A; 16°19.783'N, 86°34.383'W) in 17 m of water, exhibiting behavior similar to what Fishelson (1975) and Moyer and Zaiser (1981) reported. While the sexes of the observed lionfish are not known, the estimated size (400 mm total length) is greater than even the largest reported female lionfish

in their invaded range (Fogg 2017) and, therefore, it is assumed that both observed lionfish were males. The two lionfish were exhibiting what Fishelson (1975) described as “high intensity acts” toward each other, including facial contact with the head and flanks of the other lionfish (Panel B), as well as the venomous dorsal spines making direct contact with the opponent (see <https://youtu.be/PnRb1ybk1M8> for full video), resulting in several abrasions to both individuals. These acts of aggression continued at varying levels of intensity for approximately 5 min, although we did not observe the initiation of this behavior and the activity likely began prior to arrival of the authors. The culmination of the agonistic behavior involved the rapid retreat of the now subdominant lionfish (pale “black and white” coloration, pectoral fins and dorsal spines slightly depressed while swimming; Panel C), under temporary pursuit by the dominant lionfish (remained a darkened “red” color, fins spread out, and spines erect; Panel D). This coloration change, pursuit, and submissive behavior is consistent with observations of zebra lionfish [*Dendrochirus zebra* (Cuvier, 1829)] by Moyer and Zaiser (1981). This documentation of agonistic behavior in invasive lionfish provides additional information for what is known about lionfish behavior, provides the first description of intraspecific competition in the invaded range, and may be useful knowledge for future ethological studies of this marine invader.

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