

## A WESTERN ATLANTIC INVASION OF SUN CORALS: USING MORPHOLOGY AND GENETICS TO REFINE SPECIES IDENTIFICATION

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Scleractinian corals of *Tubastraea* genus have a typically Indo-Pacific distribution but currently, they became globally widespread living in natural and artificial substrates of shallow tropical waters. *Tubastraea* corals have a confusing taxonomy and systematic history because the interspecific overlapping of some morphological characters, resulting in the proposition of many synonyms. Currently, two species of *Tubastraea* are recognized along the Brazilian coast: *T. coccinea* and *T. tagusensis*. Additionally, many morphotypes have been observed and, although the genus to be widely distributed in the Western Atlantic, few characterization studies were performed. Here we sought to investigate the taxonomy of *Tubastraea* species based on morphological characters of Arraial do Cabo species and a molecular approach using the ITS gene on samples from southeastern coast of the United States and Brazil. In this study, we observed three morphotypes in Brazil that were delimited and identified as belonging to three distinct species: *T. aurea*, *T. coccinea* and *Tubastraea* sp. Morphologically, *T. aurea* is different from *T. coccinea* mainly due to larger corallites, presenting one more cycle of septa. *Tubastraea* sp., previously identified as *Tubastraea tagusensis* in Brazil (Arraial do Cabo), exhibited distinct morphological characteristics compared to the original species description. Molecular analyses showed that Brazilian *Tubastraea* fell into two well supported monophyletic clades and samples collected from the Florida overlapped in both clades. Our genetic data also indicated that all three morphotypes found in Brazil were genetically distinct (i.e. they did not share haplotypes). Florida samples showed greater diversity, presenting haplotypes in at least four other internal clades. Moreover, the similarity of samples found in both Brazil and southeastern US provide evidence of a possible relationship between these populations. This study highlights the need for an integrative approach to further examine species delimitation in *Tubastraea*, which is essential for the clarification and management of bioinvasions events by sun coral species.