

THE RELATIONSHIP BETWEEN IMPOSEX AND TRIBUTYLTIN (TBT) CONCENTRATION IN *STROMBUS* *GIGAS* FROM THE BRITISH VIRGIN ISLANDS

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ABSTRACT

The queen conch, *Strombus gigas* (Linnaeus, 1758), was collected from sites with substantial boating activity and adjacent reference sites from the British Virgin Islands in 2008–2009 to determine the incidence and severity of imposex. Comparisons were made to a previous study by Phillip (2000) in the same area to determine if there were any changes in imposex over the last decade. Imposex was present in *S. gigas* at all sites with boating activity, but not found in individuals collected at reference sites. Tributyltin (TBT) and its degradative product, dibutyltin (DBT), were found in *S. gigas*, turtle grass, *Thalassia testidium* (Banks ex König), and marine algae from sites with known point sources of TBT. We established a relationship between the highest incidence and severity of imposex and TBT concentrations in the tissues of *S. gigas* from sites with elevated boating activity (Road Harbour > Nanny Cay > Trellis Bay), suggesting that TBT, a known inducer of imposex in female prosobranch gastropods, is the causative agent. *Strombus gigas* is the second most important commercial fishery species in the Caribbean and any factors that could affect reproduction and population ecology are important in maintaining a viable population and managing a sustainable fishery. We suggest using *S. gigas* as a sentinel of TBT pollution despite not meeting all of the recommended criterion, such as lack of non-dispersive larvae.

The coastal environment of the Caribbean is comprised of mangroves, seagrass meadows, and coral reefs. Even though each habitat can be viewed as a single entity, they are interconnected and the demise of one will affect the environment as a whole. Environmental managers of these habitats are faced with the daunting task of balancing development and conservation of these valuable natural resources, which are impacted by both natural and anthropogenic influences. Some notable anthropogenic impacts on the Caribbean coast include eutrophication, coastline development for tourism related activities such as hotels, marinas, villas, cruise ship piers, and the dredging of harbors for marine traffic. Linton and Warner (2003) suggested the use of biomarkers as a tool to give early warning signs of ecosystems under stress in the Caribbean where natural resources are severely threatened and human resources are limited. Two widely used biomarkers are imposex and intersex, which are known to affect female gastropods. Imposex and intersex have been used globally as bioindicators of butyltin pollution, tributyltin (TBT) and triphenyltin (TPT), thought to be primarily released through their use in antifouling paint. In females affected by imposex, the entire female genital system is conserved, but superimposed by male organs, i.e., penis and/or vas deferens (Matthiessen et al. 1999), while in intersex females, there is a modification of the female pallial organs that eventually supplants the corresponding male formation (prostate gland, Matthiessen et al. 1999).