

UNIVERSITY OF CALIFORNIA

SAN DIEGO

A Chemosystematic Study of the Caribbean Gorgonian Genus  
Pseudopterogorgia (Octocorallia, Cnidaria)

A thesis submitted in partial satisfaction of the  
requirements for the degree Master of Science  
in Oceanography

by

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## ABSTRACT OF THE THESIS

### A Chemosystematic Study of the Caribbean Gorgonian Genus Pseudopterogorgia (Octocorallia, Cnidaria)

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Master of Science in Oceanography

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This thesis describes a chemosystematic study of the Caribbean Gorgonian genus, Pseudopterogorgia. Prior to my research, gorgonians of this genus exhibited a rich diversity of novel secondary metabolites. My research extended the range of metabolites even further. I isolated two series of highly oxygenated cembrenolides from P. bipinnata collected in the Bahamas. The compounds in the first series were furanocembrenolides related to lophotoxin; compounds in the second series were cembrenolides transannularly cyclized with a hemiketal ring. Pseudopterogorgia acerosa from Hogsty Reef, Bahamas, contained two unusual furan acids pos-

sessing the psuedopterane ring system. One compound was the free acid derivative of pseudopterolide, and the other was the 11,12-deoxy derivative of the first. A new species, Pseudopterogorgia sp., was found to contain aglycones of the amphilectane and biflorane ring systems. One of these aglycones was a novel cyclohexadienone hydroperoxide; another was a hydroxylated biflorane quinone. Pseudopterogorgia australiensis from Australia contained a very unusual metabolite whose structure has not yet been fully defined.

All of the compounds from Pseudopterogorgia were utilized in a chemosystematic study of this genus, whose taxonomy is poorly understood. Through extensive thin-layer chromatographic analyses of hundreds of single colonies, I have shown that secondary metabolite composition is consistent and species-specific and correlates well with morphological characters for a number of species of Pseudopterogorgia. Chemosystematics will be very useful in the taxonomy of Pseudopterogorgia. My work has already led to the recognition of three new species, and indicated that two formerly separate species are actually morphological variants of one.